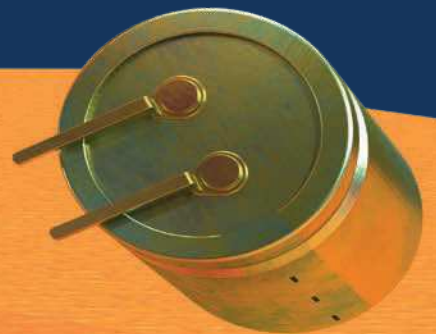
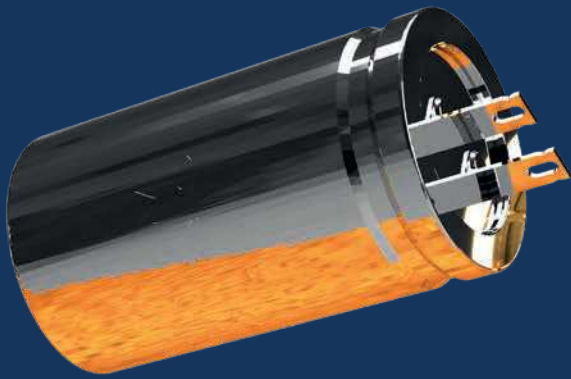


CAPXON

ELECTROLYTIC
CAPACITORS

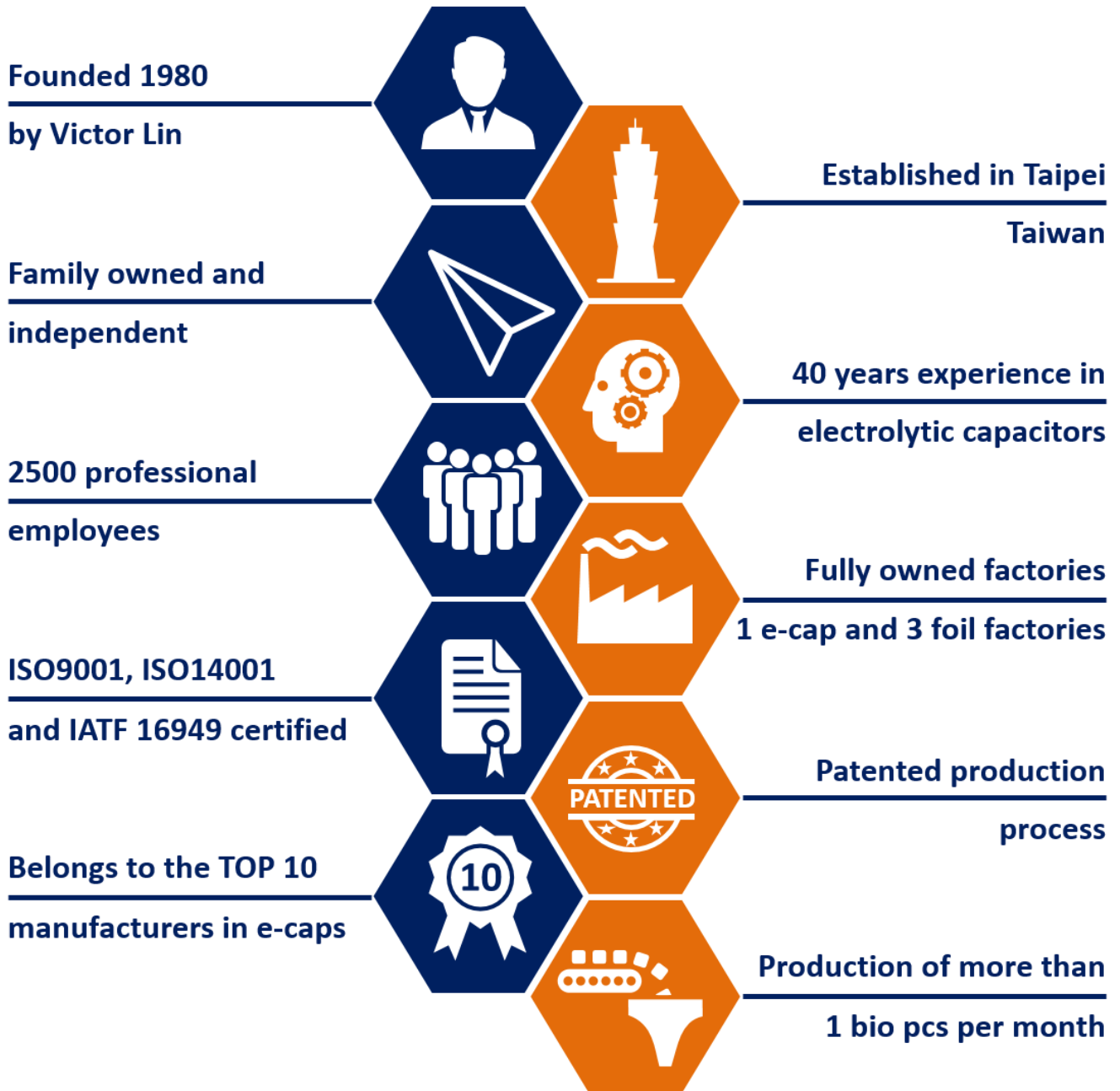
LARGE CAN CAPACITORS



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10 FACTS ABOUT CAPXON



A WORLD OF ELECTROLYTIC CAPACITORS

CapXon's know-how in Electrolytic Capacitors covers technologies with aluminium foil. These are Aluminum Electrolytics, Solid Conductive Polymers and the combination known as Hybrid Conductive Polymers:

Aluminum Electrolytic	Description	Features
	<p>Rated Voltage • V_R</p> <p>Cathode Material</p> <p>Self-healing of Dielectric</p> <p>Package</p> <p>Stability</p> <p>Lifetime</p> <p>Reliability</p>	<p>4 VDC to 650 VDC</p> <p>Liquid Electrolyte</p> <p>Yes</p> <p>Widest range in all sizes</p> <p>Reduced performance at low temperature</p> <p>Limited life at high temperature</p> <p>Automotive AEC-Q200 qualified</p>
Solid Conductive Polymer	Description	Features
	<p>Rated Voltage • V_R</p> <p>Cathode Material</p> <p>Self-Healing of Dielectric</p> <p>ESR</p> <p>Stability</p> <p>Lifetime</p> <p>Reliability</p>	<p>2.5 VDC to 100 VDC</p> <p>Solid Conductive Polymer</p> <p>No</p> <p>Ultra-low ESR at high frequency</p> <p>Stable for low and high temperature</p> <p>Very stable and long life - no dry out</p> <p>Only internal standard qualification</p>
Hybrid Conductive Polymer	Description	Features
	<p>Rated Voltage • V_R</p> <p>Cathode Material</p> <p>Self-Healing of Dielectric</p> <p>ESR</p> <p>Stability</p> <p>Leakage Current • I_{LEAK}</p> <p>Reliability</p>	<p>16 VDC to 400 VDC</p> <p>Solid Conductive Polymer & Liquid Electrolyte</p> <p>Yes</p> <p>Very low ESR at high frequency</p> <p>Even more stable than liquid type</p> <p>Lower leakage current than Solid Conductive Polymer Type</p> <p>Automotive AEC-Q200 qualified</p>

COMPARISON OF ELECTROLYTIC CAPACITOR TECHNOLOGIES

Characteristics	Aluminum Electrolytic Capacitor	Solid Conductive Polymer Capacitor	Hybrid Conductive Polymer Capacitor
ESR at High Frequency	● (120 ~ 1 000 mΩ)	++ (7 ~ 15 mΩ)	+ (20 ~ 30 mΩ)
Leakage Current · I _{LEAK}	++ (0.01·C _R ·V _R)	● (0.2·C _R ·V _R)	++ (0.01·C _R ·V _R)
Ripple Current · I _R	● (~ 600 mA)	++ (2 000 ~ 7 000 mA)	+ (2 000 ~ 3 000 mA)
Rated Voltage · V _R	++ (~ 700 V)	● (~ 100 V)	+ (~ 400 V)
Operating Temperature Characteristics	+ (-40 ~ + 125 °C)	+ (-55 ~ + 125 °C)	++ (-55 ~ + 150 °C)
Low Temperature Characteristics	● (-40 ~ + 125 °C)	++ (-55 ~ + 125 °C)	+ (-55 ~ + 150 °C)
Lifetime	● (105 °C / 3 000h)	++ (105 °C / 5 000h)	++ (105 °C / 10 000h)
Failure Mode	+ Open	● Short	+ Open

++ ... best performance

+ ... well performance

● ... basic performance

CERTIFICATION ACCORDING TO INTERNATIONAL STANDARDS

Quality, the environment, safety, and conservation of resources are the focus of our daily added value.

To meet the high requirements in the electronics industry, CapXon, as a global company, is certified according to the highest international standards. In this way, we ensure that all procedures and processes in our company are always structured and continuously optimized based on the valid and defined requirements.

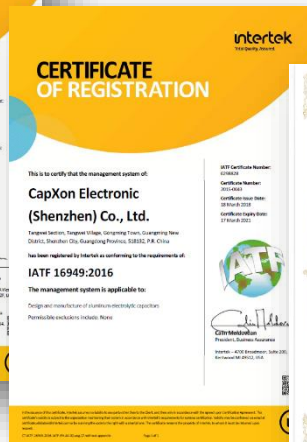
CapXon is certified according to the following standards:



ISO 9001



ISO 14001



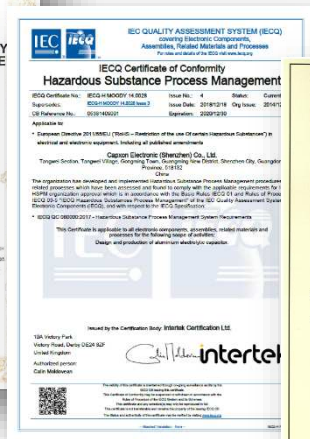
IATF 16949



ISO 50001



OHSAS 18001



OC 080000



China RoHS



ISO/IEC 17025

SMART PRODUCTION

Since 1980 CapXon focuses on research, development and manufacturing of Aluminum Electrolytic Capacitors and is a leading brand with its own capacitor production in Shenzhen and its own foil production in Yichang, Qinghai and Baotou. 40 years of experience give us a deep understanding of foil material, high performance electrolytes, advance lead wire technology, conductive polymer and electrochemical systems.

Precision equipment ensures the quality of key components



Capacitor production for all core technologies as Aluminium Electrolytic, Solid Conductive and Hybrid Conductive Polymer capacitors with R&D and Quality headquarters in Shenzhen

Development of our own production process and machinery with the highest grade of automated production equipment and software



ADVANCED TECHNOLOGY

Only with the best production equipment and well-trained staff is it possible to maintain and expand the market position. Every year CapXon invests very large sums in machine, software and the education for our more than 2500 employees. To recognize deviation immediately during the production process, CapXon uses various precise inspection equipment.

All productions are qualified with strict specifications and every operation is monitored and measured at the machine



The products and the production meet the requirements of all industries even Medical or Automotive

Automated and full controlled manufacturing process



NEW RESEARCH

Highly roughened and formed anode foils are the heart of every Aluminum Electrolytic Capacitor. CapXon has been conducting intensive research and development for decades to bring low-voltage and high-voltage films into new spheres and at the same time to optimize processability and durability. The electrolytes and conductive polymers used on the cathode side are subject to a continuous improvement process, taking commercial and technical aspects into account.

Electrolyte and polymer development to achieve maximum product reliability and a long life



High grade etching foil, high grade forming foil through consistent further development to the limit of what is technically feasible

Well-equipped ISO/IEC 17025: 2005 accredited laboratories for research, analysis and testing



COMPONENT RELIABILITY DATA

In this section, the main parameters for predictive reliability and availability calculations are explained and in which way CapXon can provide you with such data.

FAILURE RATE λ

The failure rate λ describes the frequency which components possibly fail. The failure rate describes how many defects can be expected, if you run the application in operation for a certain time.

The failure rate can be calculated as following:

$$(1) \quad \lambda = \frac{n}{N \cdot t}$$

- n ... Number of defect components
- N ... Number of tested components
- t ... Amount of operating hours

FAILURE CRITERIA

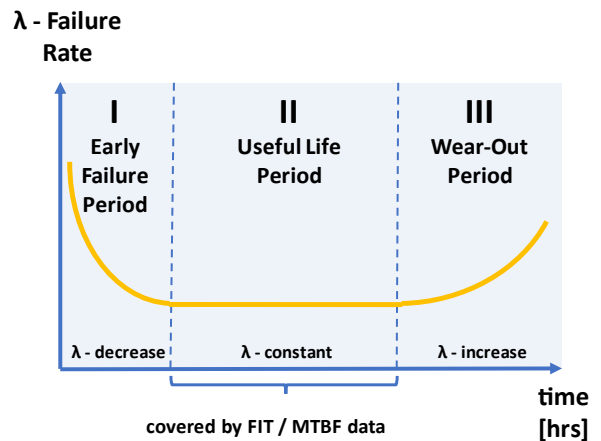
Capacitors will show certain wear-out phenomenon's by aging and so as times goes by the capacitors can possibly change their electrical performance.

As soon as the component is no longer fulfilling their electrical spec, stated features or with customer agreed parameters, the status of capacitor is seen as in failure mode or defect. This does not necessarily mean that the application will fail. An essential influence are the design and dimensioning by customer, which lead to major impact on possible failure modes and fail criteria for the application itself.

All given data by CapXon is just concerning the failure mode cases of the single component and is not representing the complexity of complete applications, assembled systems nor full electronic PCB boards.

BATHTUB CURVE

It's a widely used model within the reliability engineering to describe the expected failure rates over the whole application lifetime / product life cycle.



Bathtub curve

The Bathtub Curve states the failure rate behaviour within the three different product life cycle stages. These are the Early Failure Period, the Useful Life Period and the Wear Out Period.

With production control, monitoring and quality assurance, it is possible to reduce the early failures to a best possible minimum.

Failures within the Useful Life Period, which are described as FIT or MTBF value, are defined as events of coincidence and are not representing any systematic or epidemic failures.

FIT – FAILURES IN TIME

FIT - Failures In Time is the common way to describe the expected failure rate for electronics.

The FIT values describe certain failure rate within the useful life period and provides the basis for calculations, assumptions and extrapolation of reliability and availability to gather the understanding for expected failures / defects. These calculated figures are used to decide whether the component is a proper choice for the desired use case. Additionally, it need to be clarified whether redundancies are necessary and which redundancies are needed to fulfil the desired mission profile of an application.

The unit FIT defines the expected amount of failures per application hour.

$$(2) \quad 1 \text{ FIT} = \frac{10^{-9}}{h} = \frac{10^{-9} \text{ failures}}{\text{per operating hour}}$$

So as higher the stated FIT value is, as higher the statistical chance of defect is.

Please find the following example of a failure rate test determined by a useful life test:

- Number of failures $n = 2$
- Number of tested components $N = 10\ 000$
- Operating hours $t = 20\ 000\ h$

$$(3) \quad \lambda = \frac{n}{N \cdot t} = \frac{2}{10\ 000 \cdot 20\ 000\ h} = 10\ FIT$$

$$(4) \quad 10\ FIT = \frac{10^{-8}}{h} = \frac{0.001\%}{1\ 000\ h}$$

MTBF - MEANTIME BETWEEN FAILURES

It's the predicted elapsed time between inherent failures of an electronic system during normal operation. The MTBF can be calculated as arithmetic mean / average time between failures of a system.

Assuming a constant failure rate, the MTBF can be easily calculated by reciprocal value of the Failure Rate λ :

$$(5) \quad MTBF = \frac{1}{\lambda}$$

MTBF is just a different way to describe the failure rate and can be easily converted to FIT and vice versa:

$$(6) \quad MTBF = \frac{10^9\ h}{FIT} = \frac{114\ 000\ years}{FIT}$$

$$(7) \quad FIT = \frac{10^9\ h}{MTBF} = \frac{114\ 000\ years}{MTBF}$$

The **MTBF** values are just covering the useful life period (flat middle section) of the bathtub curve. Because of this, a FIT or MTBF value can't be extrapolated to estimate the service lifetime for a component. FIT or MTBF values doesn't cover the higher failure rates of the wear-out period, where the expected failure rate would be higher due to occurring wear-out phenomenon's.

LIFETIME TESTS

Due to the fact that all electrolytic capacitors show aging behaviour and a possible drift of electrical parameters over usage time, lifetime tests are performed by manufacturers to describe the related reliability and performance of a certain capacitor. Different product series as well as the single product itself can provide very different lifetime performance. So, these test results are given to select the proper product in relation to the applied stress profile of application to gain the desired application performance within the whole product life cycle.

There are various names (e.g. Endurance, Load Life, Useful Life, Operational Life, Life Expectancy, Shelf Life, ...) and different lifetime tests that are existing within the industry. Please kindly check the specific test specification and given data for the capacitor before design-in.

Sadly, there is no standardized naming and test criteria existing, given by any international accepted standard committee for all the lifetime tests, which are applied to electrolytic capacitors. Customers need to compare competitor products carefully with each other to see if test specifications are similar or different.

Please see particular datasheets for the specific test results and criteria of an individual product of CapXon.

Again, please note that the criteria of failure are given by the test specification limits of the dedicated lifetime test and as soon as a component is not fulfilling these given limits, it is rated as a failure. So, failure does not necessarily mean defect or breakdown of application. It is just describing that the drift of electrical performance is bigger than the checked limits of the particular test. It doesn't matter whether the measured C value is lower as the allowed test limit or the component is in a failure mode of open circuit, both cases are treated the same as a failure. Design and dimensioning of application will arrange how much drift of electrical parameters can be accepted for the individual capacitor. For example, when the rate of capacitance change is becoming critical within the application is defined by customer design. The lifetime tests are in place to provide a common and industry-wide comparable performance index of the capacitors.

As manufacturer, we can state and check how fast a drift of capacitance and further parameters will happen. Dimensioning within application design will set how long an error-free operation is possible. A proper dimensioning can enlarge the acceptable drift and so the lifetime performance. But be aware, if it is not done properly or component is overstressed, it also can shorten the expected lifetime performance. Please be aware to check dimensioning and drift estimation to assure your product performance for the desired lifetime. For support with lifetime estimations and dimensioning, we are pleased to support you and feel free to get in touch with our technical support.

In the following section CapXon's lifetime tests, which are performed with our products, are described in detail.

ENDURANCE

The Endurance test of the product checks the performance of its electrical parameters, such as capacitance change, leakage current and dissipation factor on their behaviour over time at a predetermined test setup of electrical stress and ambient condition.

Depending on the product series, the Endurance test is performed according to one of the settings below:

Setting 1 - applying Endurance test:

- max. Temperature
- V_R - Rated Voltage

Setting 2 - applying Endurance test:

- max. Temperature
- V_R - Rated Voltage
- I_R - Rated Ripple

Setting 1 is in accordance to the IEC 60364-4 / JIS 51001-4 test criteria and Setting 2 is enlarging the electrical stress setup with additional appliance of I_R , to get a more representative result in comparison to possible real-life application stress.

The Endurance test is performed within product qualification at the stage of internal product validation and is repeated periodically for product requalification.

USEFUL LIFE

To get more representative understanding of lifetime performance for typical capacitor use, the useful life test represents such criteria.

The applied electrical stress is like the Endurance test - Setting 2. The test specification limits are wider as the endurance test specification, but as described the applied electrical stress stays similar. So, a larger acceptable drift of electrical parameters results in a larger expected lifetime. This represents the operational frame which is set by customer at dimensioning the capacitor specification for their application and the possible borders of an error-free operation.

Also, we state a FIT value related to the useful life test. These failure rate describes the deviation / possibility of occurrence of failures within the useful life period when the settings of useful life test are applied. This is related to the middle section of the bathtub curve the so-called useful life period (see above page 12 - Bathtub Curve of Product Reliability).

In the datasheet you will find the following phrase:

Failure Rate (during useful Life): 1%/1 000h with a confidence level of 60%. As a result, this is like a 10 000 FIT:

$$\lambda = \frac{1\%}{h} = 10\,000 \text{ FIT} = 10\,000 \text{ failures} * 10^{-9h}$$

Example:

If you have 8 000 components running in applications for 5 000 hours with the test conditions applied like the useful life test, you can estimate the number of components that show a higher drift as given by the useful life test spec borders as follows:

- Number of components $N = 8\,000$
- Operating hours $t = 5\,000 \text{ h}$

$$\lambda = \frac{n}{N * t}$$

$$n = \lambda * N * t = \frac{1\%}{1\,000h} * 8\,000 * 5\,000h = 400$$

This means that when there are 8 000 pcs in operation for 5 000 hours at the maximum possible operating conditions (max. temp., V_R & I_R similar to useful life test criteria) an amount of 400 products (with a confidence level of 60%) can be expected to show a higher drift as given in the test spec.

SHELF LIFE

The shelf life test simulates the aging of the capacitor, if it is just stressed with ambient temperature without any electrical load. The shelf life is not defining the possible storage time of the capacitor but just to describe the aging situation before mounting / PCB assembly.

The Shelf Life test criteria shall be satisfied, if the capacitor was restored to 20°C and following a conditioning by voltage treatment in accordance with 4.1 of JIS 5101-4 was applied, before measuring the capacitor.

LIFETIME TEST EXAMPLES

Example 1 - Useful Life, Endurance (Setting 1) and Shelf life tests of SMD types – HV Series:

Lifetime Test		
Endurance 105°C (V _a applied)	Test	2000 hours
	ΔC/C	≤ ±30% of initial measured value
	tanδ	≤ 300% of initial specified value
	I _{leak}	≤ the initial specified value
Shelf Life 105°C (None)	Test	1000 hours
	ΔC/C	≤ ±30% of initial measured value
	tanδ	≤ 300% of initial specified value
	I _{leak}	≤ the initial specified value
Resistance to Soldering Heat	The capacitors shall be kept on a hot plate maintained at 250°C for 30 seconds. After removing from the hot plate and restored at room temperature, they meet the characteristic requirements listed below	
	ΔC/C	Within ±10% of initial value
	tanδ	Less than specified value
	I _{leak}	Less than specified value

Example 2 - of Useful Life, Endurance (Setting 2) and Shelf life tests of Radial types – GF Series

Lifetime Test			
Endurance 105°C (V _a & I _a applied)	Test	2000 hours	ø D 5 ~ 6.3 mm
		3000 hours	ø D 8 mm
		5000 hours	ø D ≥ 10 mm
	ΔC/C	≤ ±20% of initial measured value	
	tanδ	≤ 200% of initial specified value	
Shelf Life 105°C (None)	Test	1000 hours	
		ΔC/C ≤ ±20% of initial measured value	
		tanδ ≤ 200% of initial specified value	
		I _{leak} ≤ the initial specified value	

Example 3 - of Useful Life, Endurance (Setting 2) and Shelf life tests of Snap In types – HU Series:

Lifetime Test		V _a ≤ 100V		V _a > 100V	
		Test		Test	
Useful Life 105°C (V _a & I _a applied)	Test	5000 hours		8000 hours	
	ΔC/C	≤ ±30% of initial measured value		≤ ±20% of initial measured value	
	tanδ	≤ 300% of initial specified value		≤ 200% of initial specified value	
	I _{leak}	≤ the initial specified value		≤ the initial specified value	
Endurance 105°C (V _a applied)	Test	3000 hours			
	ΔC/C	≤ ±15% of initial measured value		≤ ±10% of initial measured value	
	tanδ	≤ 130% of initial specified value		≤ 130% of initial specified value	
	I _{leak}	≤ the initial specified value		≤ the initial specified value	
Shelf Life 105°C (None)	Test	1000 hours			
	ΔC/C	≤ ±15% of initial measured value		≤ ±10% of initial measured value	
	tanδ	≤ 130% of initial specified value		≤ 130% of initial specified value	
	I _{leak}	≤ the initial specified value		≤ the initial specified value	

Example 4 - Useful Life, Endurance (Setting 2) and Shelf life tests of Screw types – RK Series:

Lifetime Test		
Useful Life 105°C (V _a & I _a applied)	Test	4000 hours
	ΔC/C	≤ ±45% of initial measured value
	tanδ	≤ 300% of initial specified value
	I _{leak}	≤ the initial specified value
Endurance 105°C (V _a applied)	Test	2000 hours
	ΔC/C	≤ ±15% of initial measured value
	tanδ	≤ 130% of initial specified value
	I _{leak}	≤ the initial specified value
Shelf Life 105°C (None)	Test	1000 hours
	ΔC/C	≤ ±15% of initial measured value
	tanδ	≤ 130% of initial specified value
	I _{leak}	≤ the initial specified value

TELCORDIA SR-332

This industry-wide accepted standard provides data and tools for reliability predictions of components, devices or full hardware units of electronic equipment. Telcordia (for-

merly Bellcore). With the given figures and data, it is possible to assure system availability and to gather the desired system reliability.

FIT & MTBF DATA OF CAPXON PRODUCTS

CapXon provides FIT & MTBF values based on Telcordia SR332 standard for all components. From our perspective, it provides more reliable prediction because it is more specific and detailed than MIL-217 or Siemens SN 29500.

Please find the FIT values for CapXon components and application-based reliability prediction calculations on the following page.

The table of SMD / RADIAL / Snap-In is covering all Electrolytic Technologies – Liquid, Solid and Hybrid Electrolytic Capacitors in SMD & Radial.

The table of Screw capacitors is just concerning Liquid Aluminum Electrolytic Capacitors.

Mounting Type	SMD / Radial / Snap-In					
	100%		75%		50%	
Electrical Stress						
Operating Temp. [°C]	λ [FIT]	σ [FIT]	λ [FIT]	σ [FIT]	λ [FIT]	σ [FIT]
≤ 30	1,19	0,28	0,65	0,15	0,36	0,08
35	1,52	0,35	0,84	0,19	0,46	0,11
40	1,94	0,45	1,06	0,25	0,58	0,14
45	2,45	0,57	1,34	0,31	0,74	0,17
50	3,07	0,71	1,68	0,39	0,92	0,22
55	3,82	0,89	2,10	0,49	1,15	0,27
60	4,72	1,10	2,59	0,60	1,42	0,33
65	5,80	1,35	3,19	0,74	1,75	0,41
70	7,09	1,65	3,89	0,91	2,14	0,50
75	8,61	2,01	4,73	1,10	2,59	0,60
80	10,40	2,42	5,71	1,33	3,13	0,73
85	12,50	2,91	6,86	1,60	3,76	0,88
90	14,94	3,48	8,20	1,91	4,50	1,05
95	17,78	4,14	9,76	2,27	5,35	1,25
100	21,05	4,90	11,55	2,69	6,34	1,48
105	24,82	5,78	13,62	3,17	7,47	1,74
110	29,13	6,78	15,99	3,72	8,77	2,04
115	34,05	7,93	18,69	4,35	10,26	2,39
120	39,65	9,23	21,76	5,07	11,94	2,78
125	45,99	10,71	25,24	5,88	13,85	3,23
130	53,15	12,38	29,17	6,79	16,01	3,73
135	61,20	14,25	33,59	7,82	18,43	4,29
140	70,24	16,36	38,55	8,98	21,15	4,93
145	80,34	18,71	44,09	10,27	24,20	5,64
150	91,60	21,33	50,27	11,71	27,59	6,43

Table 1: FIT values for SMD, Radial, Snap-In

Remark: Above values are only valid within the max. specified temperature range of the particular component. All given FIT data is meant for lifetime predictions only and is not representing any warranty.

For particular products (e.g. screw capacitors) within the datasheet, further FIT or MTBF data is added and in such a case, this substitutes the general information stated above.

Mounting Type	Screw terminal					
	100%		75%		50%	
Electrical Stress						
Operating Temp. [°C]	λ [FIT]	σ [FIT]	λ [FIT]	σ [FIT]	λ [FIT]	σ [FIT]
≤ 30	34,20	24,43	18,77	13,40	10,30	7,36
35	43,85	31,32	24,06	17,19	13,21	9,43
40	55,78	39,84	30,61	21,87	16,80	12,00
45	70,42	50,30	38,65	27,61	21,21	15,15
50	88,27	63,05	48,44	34,60	26,59	18,99
55	109,88	78,48	60,30	43,07	33,09	23,64
60	135,88	97,06	74,57	53,27	40,93	29,23
65	166,99	119,28	91,65	65,46	50,30	35,93
70	203,99	145,71	111,95	79,97	61,44	43,89
75	247,76	176,97	135,97	97,12	74,62	53,30
80	299,26	213,76	164,24	117,31	90,14	64,38
85	359,57	256,84	197,34	140,96	108,30	77,36
90	429,86	307,04	235,91	168,51	129,47	92,48
95	511,39	365,28	280,66	200,47	154,03	110,02
100	605,57	432,55	332,34	237,39	182,39	130,28
105	713,89	509,92	391,79	279,85	215,02	153,59

Table 2: FIT values for Screw types

λ - Mean Component Failure Rate

σ - Standard Deviation of Component Failure Rate

CALCULATION OF FIT VALUE FOR APPLICATION CASE

By using the given Telcordia SR-332 figures and by the assumption that the failure rate follows a gamma distribution, the FIT value can be calculated with given mean λ and standard deviation σ (see section tables in section 8.8) and desired UCL - Upper Confidence Level as follows:

$$\text{shape } \kappa = \left(\frac{\lambda}{\sigma} \right)^2$$

$$\text{scale } \theta = \frac{\sigma^2}{\lambda}$$

The desired FIT value for the application case is the P% quantile of the gamma distribution and it can be calculated by the inverse cumulative gamma distribution with the shape κ and scale θ parameters as follows:

$$\lambda_{P\%UCL} = G^{-1}(P/100; \kappa; \theta)$$

If the shape κ parameter is >100 the FIT can also be calculated by using the P% quantile of the normal distribution, by inverse cumulative distribution of normal distribution with mean λ and standard deviation σ :

$$\lambda_{P\%UCL} = N^{-1}(P/100; \lambda; \sigma)$$

Customer need to define which UCL is desired for the reliability prediction for their application case (typical values for UCL are e.g. 60%,90%, 95%, 99%).

CALCULATION EXAMPLE

Example 1:

GF Series – Radial type
Aluminum Electrolytic Capacitor

@ 70°C and 75% electrical stress
Upper Confidence Level (UCL) = 90%

Values according to table 1 at page 16:

$\lambda = 3.89$ FIT / $\sigma = 0.91$ FIT

$$\text{shape } \kappa = \left(\frac{3.89}{0.91} \right)^2 = 18.27$$

$$\text{scale } \theta = \frac{0.91^2}{3.89} = 0.21$$

$$\lambda_{90\%UCL} = G^{-1}(90/100; 18.27; 0.21) = 5.02 \text{ FIT}$$

In Microsoft Excel you can solve this with the following formula:

International / American Excel Version:
=GAMMAINV(0.9,18.27,0.21)

European Excel Version:
=GAMMAINV(0,9;18,27;0,21)

Example 2:

RG Series - Screw type
Aluminum Electrolytic Capacitor

@ 60°C and 75% electrical stress
Upper Confidence Level (UCL) = 90%

Values according to table 2 at page 16:

$\lambda = 74.57$ FIT / $\sigma = 53,27$ FIT

$$\text{shape } \kappa = \left(\frac{74.57}{53.27} \right)^2 = 2.01$$

$$\text{scale } \theta = \frac{0.91^2}{3.89} = 38.05 \text{ FIT}$$

$$\lambda_{90\%UCL} = G^{-1}(90/100; 2.01; 38.05) = 148.57 \text{ FIT}$$

In Microsoft Excel you can solve this with the following formula:

International / American Excel Version:
=GAMMAINV(0.9,2.01,38.05)

European Excel Version:
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QUALITY MANAGEMENT SYSTEM

We are committed and living the principle of **QUALITY FIRST - to offer highly satisfying products and service to the customer**. This global aim is shared by the CapXon quality and environmental management system and part of our business philosophy:

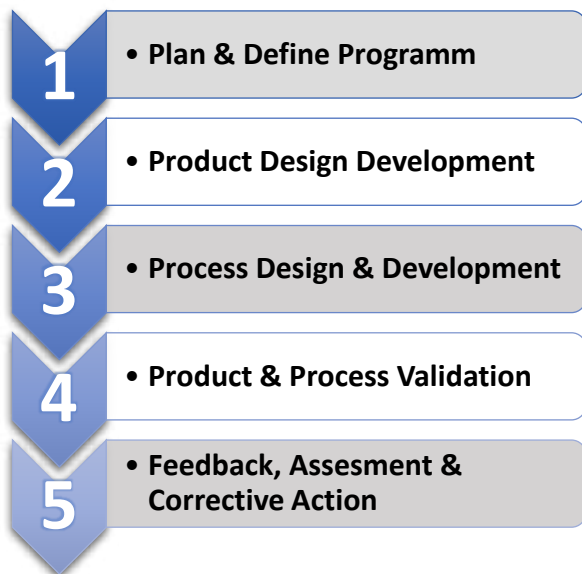
QUALITY MANAGEMENT SYSTEM CERTIFICATION

In accordance with our quality commitment, CapXon quality management is certified by **ISO 9001** and **IATF 16949**. The certification covers our production plants as well as our sales organization. This standard is applied throughout the company and is used to implement, monitor and to proceed the CapXon quality policy in all process steps.

PRODUCT AND PROCESS QUALITY

Our product and process development follows the sequence and phases of **APQP – Advance Product Quality Planning**:

5 Phases of APQP



Quality tools such quality tools, including **5S, PDCA, FMEA, (DFMEA & PFMEA), MSA, APQP, PPAP, SPC** and others, are in place to minimize risks, provide constant monitoring and ensure continuous improvements in conjunction with regular internal audits and QM reviews.

QUALITY ASSURANCE

For our sample checks, we refer to **AQL - Acceptable Quality Level** figures, which are based on a random sampling

plan in accordance with **MIL-STD-1916**. Referring to instructions of this standard, a delivered lot will be accepted with a probability of 90%, if the percentage of non-conformance does not exceed the stated AQL figure. As a general internal target, the percentage of non-conformance in deliveries from CapXon is significantly below the AQL figure. The acceptance value we apply to non-conform components is $c=0$.

INCOMING GOODS INSPECTION BY CUSTOMER

We recommend applying planned random sampling checks in accordance with MIL-STD-1916, is compliant with MIL STD 105 D and IEC 60410, for incoming goods inspection. The test methods, which shall be applied, are laid down in the relevant standards.

ENVIRONMENTAL MANAGEMENT

Environmental Policy

CapXon defines internally the following environmental protection principles:

- comply with the given law & regulations
- observe and act to reduce pollution
- produce cleanly
- reduce the consumption and save resources
- cut down usage of toxic substances
- make continuous improvements
- protect the environment

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATION

CapXon environmental management system is certified in accordance with ISO 14001 and is applied throughout the whole company as well as CapXon's environmental policy is implemented.

ENVIRONMENTAL HAZARDOUS SUBSTANCES FREE MANAGEMENT SYSTEM

To show our commitment to protect the environment and people, CapXon drives a sustainable effort to produce environment-friendly products.

IECQ QC 080000 HSPM - Hazardous Substance Process Management, which is based on the quality management system of ISO 9001.

The CapXon QC080000 based HSF management system is company-wide applied for implementing the CapXon environmental Hazardous Substances management and that CapXon products effectively in the management of hazardous substances.

ENERGY MANAGEMENT SYSTEM

CapXon establishes comprehensive energy use management in accordance with the requirements of ISO 50001 Energy Management System in order to meet the social responsibility of low carbon environmental protection and efficiency

CERTIFICATION IN ACCORDANCE TO ISO 14001, ISO 50001, QC 080000

The CapXon Group operates an environmental management system that conforms to the requirements of **ISO 14001** and is mandatory for all plants. The CapXon Group operates an Energy management system that conforms to the requirements of **ISO 50001** and is mandatory for all plants. The CapXon Group operates an environmental **Hazardous Substances Free management system** that conforms to the requirements of QC 080000 and is mandatory for all plants. The company certificate is posted on the CapXon internet: (www.capxongroup.com).

RoHS COMPLIANCE

The abbreviation **RoHS** is usually called **Restriction of Hazardous Substances**, the full term is the short term for the **Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment** and is referring to the EU directive 2011/65/EU. The RoHS 2 – 2011/65/Eu substituted the former RoHS 1- 2002/95/EC.

The aim of RoHS is to banish Hazardous Substances of electronic waste, which can harm the environment and others. Based on this regulation, we as component manufacturer, need to design, observe and control that such hazardous materials are fully avoided and reduced to the max. Moreover, it's possible to replace them by adequate non concerned materials within the given limitations .

For all by RoHS scoped materials (excluding exempt products) the maximum permitted concentrations are:

all concerned materials (except Cd)

- 0,1% / 1000ppm

Cadmium -Cd:

- 0,01% or 100ppm

These limitations for the restricted materials focus on each homogeneous material within the product. So, the limitations are concerning each individual / single substance or part, which can be separated mechanically (e.g. aluminum can, rubber sealant) and are not apply to the weight of the whole component itself.

Last update of RoHS was Directive (EU) 2015/863, which was published on 2015-03-31 and implemented by 2019-07-22. According to this directive, the following ten substances are restricted:

- **Pb** - Lead
- **Hg**- Mercury
- **Cd** - Cadmium
- **Cr⁺⁶** - Hexavalent chromium
- **PBB** - Polybrominated biphenyls
- **PBDE** - Polybrominated diphenyl ether
- **DEHP** - Bis (2-ethylhexyl) phthalate
- **BBP** - Butyl benzyl phthalate
- **DBP** - Dibutyl phthalate
- **DIBP** - Diisobutyl phthalate

By the update DEHP, BBP, DBP and DIBP were added to the list of hazardous substances.

Since 2011 RoHS compliance is mandatory to be able to get CE approval.

C-RoHS / CHINA RoHS COMPLIANCE

The common speech so called China RoHS means the conformance to **SJ/T 11363-2006** for electrical components and assemblies and is fully called **Administrative Measure on the Control of Pollution Caused by Electronic Information Products**.

In China RoHS, the following substances are banned because they are considered as environmentally hazardous:

- **Pb** - Lead
- **Hg**- Mercury
- **Cd** - Cadmium
- **Cr⁺⁶** - Hexavalent chromium
- **PBB** - Polybrominated biphenyls
- **PBDE** - Polybrominated diphenyl ether

Since December 2012, CapXon has provided China RoHS certification for our products and certifications.

SONY GP CERTIFICATION

Since Nov 2011, CapXon has been certified as Green Partner by SONY and we are running an environmental management system that continuously meet the requirements of the SONY Green Partner Program and we are working in

accordance with the Sony environmental quality assurance. The Certificate is listed by **SONY GP Certificate No.: FC012746**

REACH CERTIFICATION

REACH is the abbreviation for Registration, Evaluation, Authorization of Chemicals and by Regulation (EC) No 1907 /2006 it is

So each manufacturer or importer, who is shipping goods to the European Union, need to declare and be compliant according to REACH, if within the shipped goods a substance, which is listed out SVHC-List (Substances of Very High Concern) is included and overall a total mass of bigger a ton per year is imported.

CapXon is working in accordance with REACH requirements and certification is available for our products.

ROHS & REACH MARKING

Within our datasheets, we mark the RoHS and REACH compliance with our "RoHS & REACH compliant"- marking, please see marking below for reference:



HALOGEN FREE (HF)

The Halogen Free requirements are based on customer and environmental regulations on management and control requirements of halogens, such as the **European Directive 2002/95/EC, IEC 61249-2-21, Montreal Protocol on Substances that Deplete the Ozone Layer and Controls the Stockholm joint pledge about durable organic pollutant.**

Concerned by the halogen-free initiative are elements like:

- **Fluorine**
- **Chlorine**
- **Bromine**
- **Iodine**
- **Astatine**

In case of fire, these elements can release toxic fumes, which could harm humans and can also cause corrosion of metals.

CapXon is using halogen-free materials for all our electrolytic capacitors. Since 31st of Oct 2009 all products meet the halogen-free requirements.

BANNED AND ENVIRONMENTAL HAZARDOUS SUBSTANCES IN COMPONENTS

As a manufacturer of passive components, we develop our products focussing on sustainability. In order to guarantee a standardized procedure within CapXon, a mandatory avoidance list of Environmental Hazardous Substances with special interest is part of our environmental management system. The planning and development instructions include regulations and guidelines that aim to identify environmental aspects and to optimize products as well as processes with respect to material usage and environmental compliance to design them with sparing use of resources and to substitute hazardous substances as far as possible.

The environmental officer provides support in the assessment of the environmental impacts of our development projects and as part of our environmental management these aspects are checked and recorded in internal design reviews.

AEC-Q200 & AUTOMOTIVE REQUIREMENTS

To serve the high standards of automotive applications, CapXon provides AEC-Q200 versions for many of their product series.

If AEC-Q200 version is available, the product series or single component is marked with the following marking on the datasheet:



Marking of components with references in reliability testing to AEC-Q200

The AEC-Q200 versions are different in case of reliability testing, production monitoring and available material declaration. For details, please see the table below:

	Standard Version	AEC-Q200 Version
Reliability Testing		
Tests according to internal specification	✓	✓
Tests according to AEC-Q200 applied test range related to product	✗	✓
Production Monitoring		
Production & documentation in accordance with ISO 9001	✓	✓
Production & documentation in accordance with IATF 16949	✗	✓
Compliance and Declarations		
RoHS & REACH compliance	✓	✓
IMDS entry available (on request)	✗	✓
PPAP (on request)	✗	✓

Table 9: Differences between standard and AEC-Q200 components

AEC-Q200

The AEC-Q200 was issued as a global reliability test standard by the AEC - Automotive Electronics Council. The overall aim of this standard is to define the minimum stress test driven qualification requirements and references of test conditions for qualification of passive components.

AEC-Q200 qualified components are highly qualified products for critical surroundings and can withstand the harsh and challenging usage conditions of an automotive environment.

For Aluminum Electrolytic Capacitors, concerning all technologies of Liquid Aluminum Electrolytic, Solid and hybrid types, the AEC-Q200 claims a test plan of 27 different reliability tests (e.g.: Temperature Cycling, Vibration, Biased Humidity, Surge Voltage, ...) with a sample size of about 77 pcs. and a maximum test duration of particular test of about 1000 hours.

By AEC-Q200 at least the temperature range of -40°C to 105°C need to be tested and applicable for Aluminum Electrolytic Capacitors, if not, differently specified by datasheet.

In case of AEC-Q200 version, reliability testing is performed for the dedicated components in addition to CapXon's internal qualification setup as well as additional agreed requirements between CapXon and their customers.

PPAP

PPAP – Production Part Approval Process is a documentation to assure quality of supplier and their production process within the automotive supply chain.

The PPAP covers and ensure the following aspects:

- Manufacturability and meeting all given quality requirements
- Design records and specification requirements
- Manufacturing process can consistently meet all component requirements

For our AEC-Q200 components, we provide PPAP Level 3 on request, which is providing product samples as well as the complete supporting data.

IMDS

The IMDS – International Material Database System contains information about the used materials within the build-up of the component.

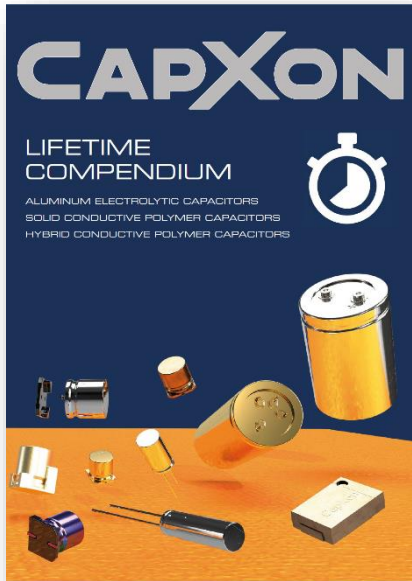
With IMDS, it is possible to monitor and control hazardous substances and prohibited substances down to the single component. IMDS is mainly used to fulfil various reporting requirements of automotive manufacturers.

For all our AEC-Q200 components and in case of an automotive use case, we provide IMDS entries on request. For further information, visit our website <http://www.capxongroup.com/en/> or contact CapXon directly.

LIFETIME ESTIMATION • LIFETIME COMPENDIUM

The accurate estimation of the lifetime of components is one of the elementary considerations of any electronic assembly. If electrolytic capacitors are not properly designed for the application environment and load, they will inevitably lead to a disproportionate change in their electrical performance or, in the worst case, failure of the capacitor. CapXon's lifetime compendium helps users to calculate and estimate the expected lifetime of **Aluminum Electrolytic Capacitors**.

The lifetime compendium is available to download from our website http://www.capxongroup.com/files/Lifetime%20Compendium_EN.pdf



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Technical Background

LIFETIME COMPENDIUM

structure of the component. To explain and calculate the additional heating, the relationship of the thermal resistance, or the ability of electronic components to dissipate heat.

Like all electronic components, electrolytic capacitors are not ideal components, but have issues that give off in the form of heat under load. For all electronic components, the cooler the component, the longer the expected lifetime.

For e-caps the ohmic losses are grouped under the term "ESR" for Equivalent Series Resistance. These include the ohmic losses resulting from the terminals of the capacitor, the contact connections of the terminals, the contact resistance of the electrode contacting and the dielectric losses, also referred to as a dissipation factor tan δ.

(1) $P_{\Sigma} = I_{RMS}^2 \cdot ESR$

WITH

- P_{Σ} Internal power losses [W]
- I_{RMS} Ripple current flowing in the capacitor [A-RMS]
- ESR Equivalent series resistance [Ω]

(3) $P_T = \frac{\Delta T_A}{R_{\theta JA}} = \Delta T_A \cdot \beta \cdot A$

WITH

- P_T Thermal power [W]
- ΔT_A Core temperature rise (°C) by internal heating due to the application current
- $R_{\theta JA}$ Thermal resistance of the electrolytic capacitor [K/W]
- β Radiation coefficient [W/(cm²·K)]
- A Surface of the capacitor [cm²]

(4) $\Delta T_A = \frac{P_{\Sigma}}{\beta \cdot A}$

DETERMINATION OF THE CORE TEMPERATURE INCREASE ΔT_A .

To calculate the lifetime, the determination of ΔT_A , core temperature rise due to the application current in the capacitor, is necessary.

This can be done in different ways:

- Temperature measurement of core temperature T_c

By this very precise method, a thermocouple (usually a K sensor) is inserted into the capacitor, which is possible only during the production of the e-cap, and determines the core temperature T_c over time. The ambient temperature T_a is measured secondarily.

Fig. 2: Thermal output of the e-cap via convection, radiation and dissipation

If the thermal power P_T is now equal to the internal power losses P_{Σ} , the temperature increase caused by the alternating current flowing in the capacitor and in which heat generation and dissipation are in equilibrium can be determined.

Fig. 4: Snap-in capacitor with integrated thermocouple for measuring the core temperature

The integration of a temperature sensor is not that simple and only possible with electrolytic capacitors with some.

Calculation base

LIFETIME COMPENDIUM

For all CapXon high-performance series ≤ 200V, see table 3

(8) $I_{\Delta T} = I_{RMS} \cdot K_{Temp} \cdot K_{Voltage} = I_{RMS} \cdot 2 \cdot \frac{\Delta T_A}{T_A} \cdot \frac{V_{RMS}}{V_{NOM}}$

WITH

- I_{RMS} Ripple current influence
- ΔT_A Core temperature increase (°C) by internal heating due to the application current
- V_{RMS} Core temperature increase (°C) by internal heating due to the application current

Upper operation temperature T_A

Temperature rise ΔT_A	80°C	100°C	115°C	≥ 120°C
Thermal resistance $R_{\theta JA}$	30°C	20°C	15°C	10°C

Table 3: Maximum permissible core temperature rise due to the permissible rated alternating current

HIGH VOLTAGE E-CAPS (≥ 160V) WITH LIQUID ELECTROLYTES

Under the low voltage electrolytic capacitors are described in the previous chapter, in e-cap series with ≥ 160V another factor influencing the life-time is added: the operating voltage is applied to the electrolytic capacitor. It is known that the nominal voltage of the capacitor V_N the thermal stress on its dielectric decreases, which in turn leads to an extension of the service life. For all cases V_N between 80% to 100% of V_N , take for calculations $V_{N(80\%)}$.

$K_{Voltage}$	K_{Temp}	Type	Product	CapXon series
1	1	Kadial	1K, 1L, 2D (≥ 200V), PCH (100 to 200V), SH (20 to 200V), RL (20 to 100V), KS, OV, LV, TC (20 to 100V), TH (20 to 100V)	
1	1	Snap-in	1H, 1L (≥ 160V), 1P (≥ 160V), 1T, 1U (≥ 100V), 1D (≥ 160V), 1P (≥ 160V), 1T (≥ 160V), 1U (≥ 160V), 1S, 1C, 1K, 1A	
1	1	Scrap terminal	8G, 1H, 1G, 1M, 1P, 1U, 1X	

Table 2: Influence of the application current and the application voltage on CapXon high-voltage series

$K_{Voltage}$	K_{Temp}	Type	Product	CapXon series
1	1.5	Kadial	1H, 1L, 1S, 1A, 1L, 1H, 1K	

Table 2: Influence of the application current and application voltage on CapXon high voltage series for use in lightning application

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Application example

LIFETIME COMPENDIUM

CALCULATION EXAMPLE - OUTPUT FILTER CAP - IN A SWITCH MODE POWER SUPPLY

Fig. 1: Principal diagram for switching mode power supply with active PFC and galvanically isolated output

Output voltage: 27V
 Rated filter: 83 μF ± 5% 200V
 Operating cycles: 200,000 during the operating period of 10 years

Operation under different conditions according to the following table:

Operation in Mode 1	Operation in Mode 2	Stand / Standby
Duty cycle D_{max} : 0.85	Duty cycle D_{max} : 0.85	Duty cycle D_{max} : 0.20
Ambient temperature T_a : 20°C	Ambient temperature T_a : 20°C	Ambient temperature T_a : 45°C

Frequency f [kHz]	I [RMS]	f [kHz]	I [RMS]	Frequency f [kHz]	I [RMS]
10kHz	5.5A	30kHz	1.8A	10kHz	0.05A
30kHz	2A	100kHz	1.2A		
170kHz	0.8A	170kHz	0.0A		
300kHz	0.5A	300kHz	0.7A		

Table 16: Requirement profile for the calculation example - switched-mode power supply

Selected Type: **6F561M035G250ETA**

Rated capacitance C _r	Rated voltage V _N	Rated current I _N	Dimension φ x L	Endurance
500 μF	35V	3.6A at 100kHz/105°C	10mm x 25mm	5000h at 100°C

Table 17: Main parameter 6F561M035G250ETA

Graphical estimation

LIFETIME COMPENDIUM

The first step is to calculate the equivalent ripple current I_{RMS} and $I_{\Delta T}$ as well as the resulting RMS value I_{RMS} .

WITH

(15) $I_{RMS} = \frac{I_{\Delta T}}{K_T}$

(16) $I_{RMS} = \sqrt{I_{EQU1}^2 + I_{EQU2}^2 + \dots + I_{EQUn}^2}$

The necessary ripple current correction factors are shown in table 14. Extract data sheet 001 series

Frequency [kHz]	50 [kHz]	100	200	300	1k	2.5k
Ripple current correction factor K_T	0.8	1.0	1.2	1.5	1.8	2.38

Table 20: Ripple current correction factor for the CapXon series

Equip. 120Hz current 1: $I_{EQU1} = \frac{I_{RMS}}{K_T} = 20A$

Equip. 120Hz current 2: $I_{EQU2} = \frac{I_{RMS}}{K_T} = 11.4A$

RMS value: $I_{RMS} = \sqrt{20^2 + 11.4^2} = 23A$

In the second step, the ripple current ratio $I_{\Delta T}$ can be calculated with

Ripple current ratio: $\frac{I_{\Delta T}}{I_{RMS}} = \frac{23A}{23A} = 1.0$

Fig. 3: Nomogram for the CapXon series with intersection point for the application example

The ripple current ratio and the ambient temperature of 60°C show the intersection of the graph in the nomogram. The useful life is between the 50,000h and 100,000h curve, exactly at 60,000h and meets the minimum requirement of > 40,000h.

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TECHNICAL NOTES • TECHNICAL COMPENDIUM

Due to their compact design, **Aluminum Electrolytic Capacitors** are the most common high-capacitance storage and filter elements in electronics. Like all electronic components, they do not have an “ideal” electrical behavior, they have losses. Their properties are very dependent on temperature and frequency. Detailed knowledge of these components is an absolute must for all electronics developers, especially for power supplies and converters.

The CapXon Technical Compendium describes the basics, electrical parameters, production steps, provides suggestions for the selection of suitable capacitors and design rules for reliable and long-lasting operation.

The technical compendium is available to download from our website http://www.capxongroup.com/files/Technical%20Compendium_EN.pdf



Basics

TECHNICAL INFORMATION

1. BASICS

Aluminum Electrolytic Capacitors are by far the most important and common high-capacitance storage or filter capacitors in electronic devices.

The enormous importance of electrolytic capacitors is related to their properties:

- Extremely high CV (capacitance per volume) values on the smallest volume
- High dielectric strength of even the thinnest layers (2 to a 10⁷ V/cm)
- Relatively high dielectric constant ϵ (up to 1000)
- Etching ability of aluminum, which allows a surface enlargement of up to 200 times and thus a dramatic space reduction
- Very wide range of design and dimensions

1.1. BASIC STRUCTURE OF A CAPACITOR

When voltage is applied between both conducting electrode plates, a certain amount of charge Q will be stored in the dielectric surface by a proportional relative voltage. The proportional constant is designating the ability of the capacitor to store energy in electric field.

Fig. 1: Basic structure of a point capacitor

The capacitance can be calculated using the amount of charge and the applied voltage

$$C = \frac{Q}{U}$$

Fig. 2: Sectional view of an aluminum electrolytic capacitor

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Production steps

TECHNICAL INFORMATION

2. PRODUCTION STEPS

To achieve the highest level of reliability for all our products, CapXon only uses 99.99% pure aluminum in its electrolytic capacitors. Foreign atoms on the surface in connection with the electrolyte would lead to corrosion.

Raw material: Aluminum foil

Fig. 3: Production steps - from foil to capacitor

The processing of the foils, the so-called etching process, the forming and the subsequent manufacture of the electrolytic capacitor with cutting, winding, contacting, impregnating, assembling, aging and final tests take place entirely in our own production facilities under the strictest environmental and cleanliness standards.

Electrolytic capacitors are extremely sensitive to halogens, of which chlorine is the most common. It is therefore warned against the use of halogen-containing agents for removing flux residues on printed circuit boards, as this could result in halogen on the electrolytic capacitors.

ETCHING

The surface of the aluminum foil is enlarged by 50 to 200 times by etching. At CapXon, this is done in its own factories using appropriate continuous baths. The etching process, especially of high-quality high-voltage foils, requires enormous know-how and decades of experience. The electrolyte thin foils (20 - 100µm) have to be mechanically stable enough to survive the further manufacturing steps like multiple etching, winding, drying, chemical rinsing without damage. Only a high understanding of the complex processing of etched aluminum foils are the guarantee for an aluminum electrolytic capacitor of the highest quality!

FORMING

The oxide layer required as a dielectric is produced electrochemically on the oxide foil after the etching process (etching) by immersing the foil in a bath with boric acid or similar chemical and applying voltage during the process. The process is called forming. Over time, the layer thickness increases, while the current decreases and the voltage on the oxide layer increases. At first very strongly then increasingly a maximum value. Depending on the bath composition, rated voltages of 650V or higher can be achieved.

Fig. 4: Direct link between forming voltage, oxide layer thickness and specific capacitance

As can be seen from the curve above, the capacitance is inversely proportional to the forming voltage.

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Electrical parameters

TECHNICAL INFORMATION

Apart from the ultra low ESR already explained, what are the main advantages of conductive polymer capacitors?

Technology	Solid Conductive Polymer	Hybrid Conductive Polymer
Capacitance	0.22 - 1000µF	1.2 - 1500µF
Rated voltage	2.5 - 300VDC	16 - 400VDC
Max. temperature	100 - 125°C	100 - 150°C
ESR	7 - 120mΩ	11 - 200mΩ

4.3. STABILITY OF ELECTRICAL PARAMETERS

If we compare the solid polymer or hybrid polymer technology with other capacitors designs, the advantages become clear.

The capacitance of ceramic capacitors reduces for high-capacitance types with the applied voltage, the advantage becomes clear.

Ceramic materials like X7R, X7V, Y5V or Z5U are ferroelectric materials and classified as class 2 ceramics. As higher the applied voltage is lower the permittivity, i.e. lower the capacitance value. The capacitance measured as applied at higher voltage may drop to 50% of the value measured with the standardized measurement voltage of 0.5 or 1.0V, what that means for the circuit in filters or memory applications need not be further elaborated here. This is the reason for harmonic distortions in audio applications.

Fig. 23: Change in capacitance as a function of the applied voltage for an MLCC and a polymer capacitor

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Capacitor selection

TECHNICAL INFORMATION

6.2. HIGH FREQUENCY OUTPUT SMOOTHING

In the output stage on the secondary side, a rectification and smoothing circuit converts the AC voltage supplied by the full-bridge MOSFET into the desired DC voltage. For example, 2.2VDC. The smoothing circuit can consist of capacitors or the combination of capacitor and inductor. See Fig. 56. The output current smooth ripples in the rectified voltage and also ensure the stability during transient increase in the load current.

Fig. 27: Output smoothing capacitors in a Flyback SMPS

When the MOSFET is not turned on, no current flows through the secondary diode and the output capacitors must supply the load with power. When the MOSFET is turned off, the diode conducts, supplies the load and charges the output capacitor too.

Technology	Type	Normal	Low ESR	High CV	ESR (mΩ)	120°C	150°C	160°C
Aluminum Electrolytic	SMC	RM	RL	RLH	PL	SL	SL	SL
SMC	FD	FL	FLH	FLH	PL	PL	PL	PL
Conductive Polymer	SMC	PS	PL	PL	PL	PL	PL	PL
Hybrid	SMC	-	AL	AL	-	AL	AL	AL
Superconductor	SMC	-	AS	-	-	AT	AL	AL

Table 20: Recommended capacitor series for output smoothing

6.3. BUFFERING

The block diagram in Fig. 38 shows a microcontroller (µC) that is supplied by a linear voltage regulator, whose output voltage is 5V. In the application we assume a steadily under-fulfillment with minimal power consumption and an operating mode of the µC. As standby current (I_{standby}) and the operating current between 50mA and 500mA are necessary for the µC. The threshold value between standby and operating current is therefore 50mA, which leads to a standby current requirement of the µC up to rise times of 1000ms on the linear regulator.

Fig. 38: Simplest power supply circuit

These rise times are too fast for the connected voltage regulator, so that the control loop does not yet react and there is a voltage drop at the input of the µC. The result would be an unstable operation of the µC, misoperation of binary values or, in the worst case, a system crash.

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Design rules

TECHNICAL INFORMATION

7. DESIGN RULES

7.1. ARRANGEMENT

Never arrange electrolytic capacitors near hot components such as heaters, transformers, power semiconductors etc. to avoid thermal heating of the liquid electrolyte.

7.3. CLEARANCE / OVERPRESSURE VENT

During operation, current flows through the capacitor and the ohmic losses, converted to ESR, create conduction in the form of heat.

The hydrogen released inside the electrolytic capacitor increases the internal pressure. If the internal pressure is too high, the overpressure vent opens and the gas escapes in a controlled manner.

In order not to impair the functioning of the vent, a minimum distance to other components must be maintained above.

No conducting tracks, wires or other circuit parts may be arranged above the valve.

Fig. 36: Recommended distance for optimal cooling

If possible, leave the half diameter between the electrolytic capacitor for optimal cooling of the heat-sensitive component.

7.2. CONDUCTOR TRACKS

Make conductor tracks sufficiently thick. Especially at high IFRMS currents the track can be very hot. If the proximity effect is ignored, large widths at 20µm doesn't help! Provide 100µm, 200µm thickness or more.

Power	Track thickness
Very low	35µm
> 25W	100µm
> 100W	200µm

Table 31: Recommended track thickness for high IFRMS current

No other conductor tracks may run under the electrolytic capacitor and the minimum distance to the housing should be 2mm or more.

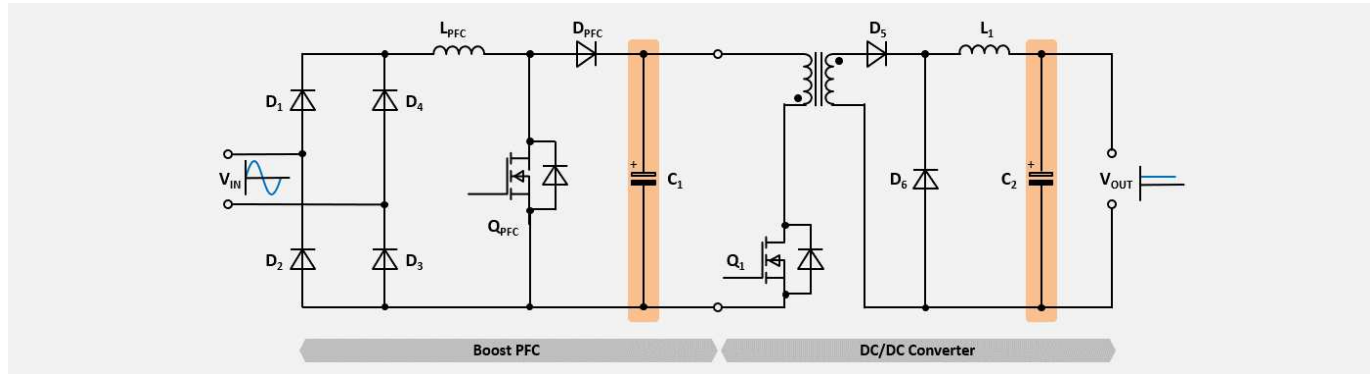
Case diameter Ø	Clearance distance CI
4mm to 16mm	Min. 2mm
16mm to 35mm	Min. 5mm
> 40mm	Min. 8mm

Table 32: Recommended minimum clearance distance between topside capacitor and device case

CapXon_Ver_001 - 01/07/2022 31 Main Product Catalogue

SWITCH MODE POWER SUPPLY (SMPS)

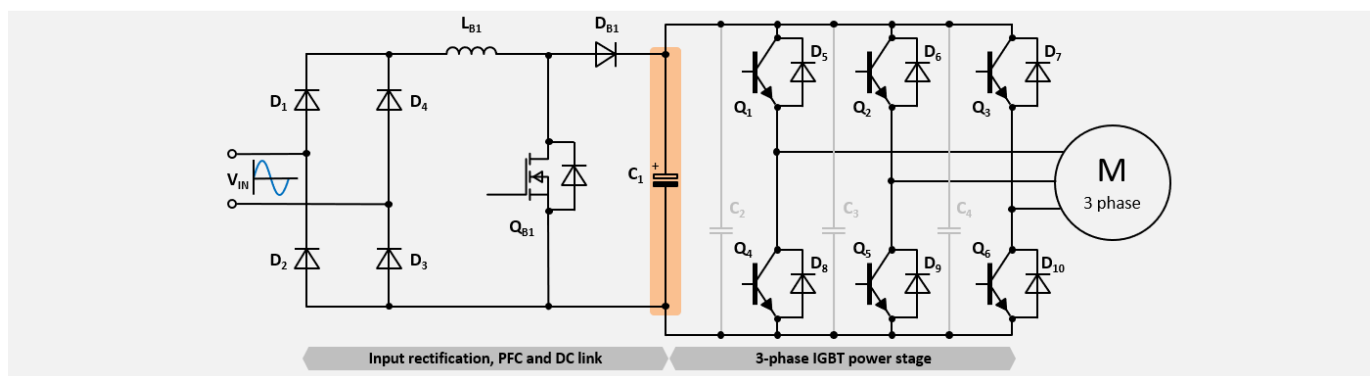
Example of a Switch Mode Power Supply with boost Power Factor Correction (PFC) and downstream DC/DC converter in Fly-back topology with recommended products.



Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁	Boost PFC	Inductor ripple current filtering	100µF; 400V; 105°C; Radial; 2000h D18xL31.5mm; 0.53A@120Hz	KM	KM101M400K315A
C ₁	Boost PFC	Inductor ripple current filtering	470µF; 450V; 105°C; Snap-In ; 5000h D35xL45mm; 1.94A@120Hz	HP	HP471M450P450A
C ₂	DC/DC Converter	Output filtering	470µF; 25V; 105°C; SMD; 2000h D10xL10.5mm; 0.65A@100kHz	DV	DV471M025G105A
C ₂	DC/DC Converter	Output filtering	1000µF; 25V; 105°C; Radial; 10000h D13xL20mm; 1.91A@100kHz	FH	FH102M025I200A
C ₂	DC/DC Converter	Output filtering	82µF; 25V; 105°C; Radial; 2000h D8xL11.5mm; 4.1A@100kHz	PS	PS820M025F115A

INDUSTRIAL MOTOR DRIVE

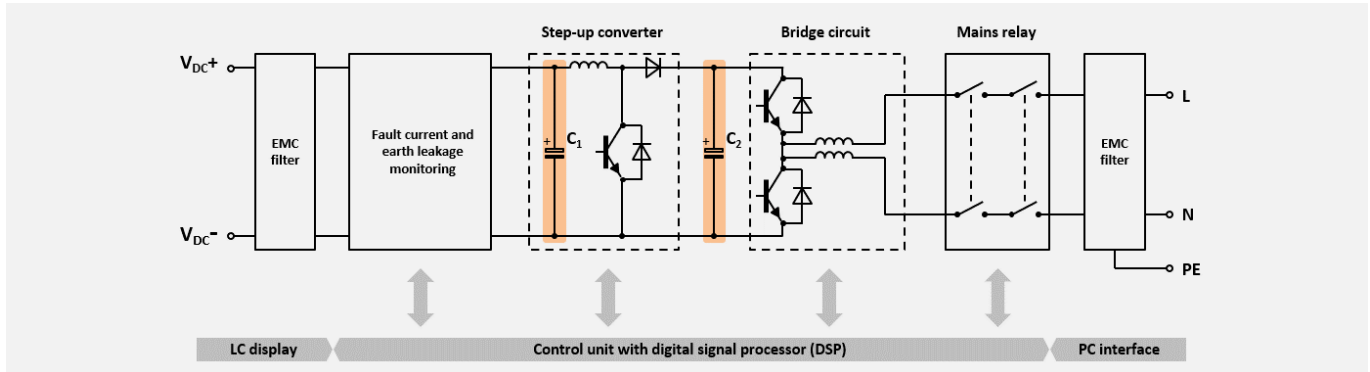
Example of a typical industrial motor drive for pumps, fans or compressors. The power circuit consist input rectifier, Power Factor Correction (PFC), DC link bank and 3-phase IGBT power stage. CapXon offers the full range of DC link solutions in electrolyte technology



Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁	DC link bank	Energy storage and supply	560µF; 450V; 85°C; Snap-In; 7000h D30xL50mm; 3.17A@120Hz	UC	UC561M450O500A
C ₁	DC link bank	Energy storage and supply	470µF; 500V; 85°C; Snap-In; 10000h D35xL55mm; 2.99A@120Hz	UD	UD471M500P550A
C ₁	DC link bank	Energy storage and supply	680µF; 450V; 105°C; Snap-In; 8000h D35xL60mm; 2.94A@120Hz	UK	UK681M450P600A
C ₁	DC link bank	Energy storage and supply	680µF; 450V; 105°C; Snap-In; 10000h D35xL55mm; 3A@120Hz	UL	UL821M450Q550A

PHOTO VOLTAIC INVERTER

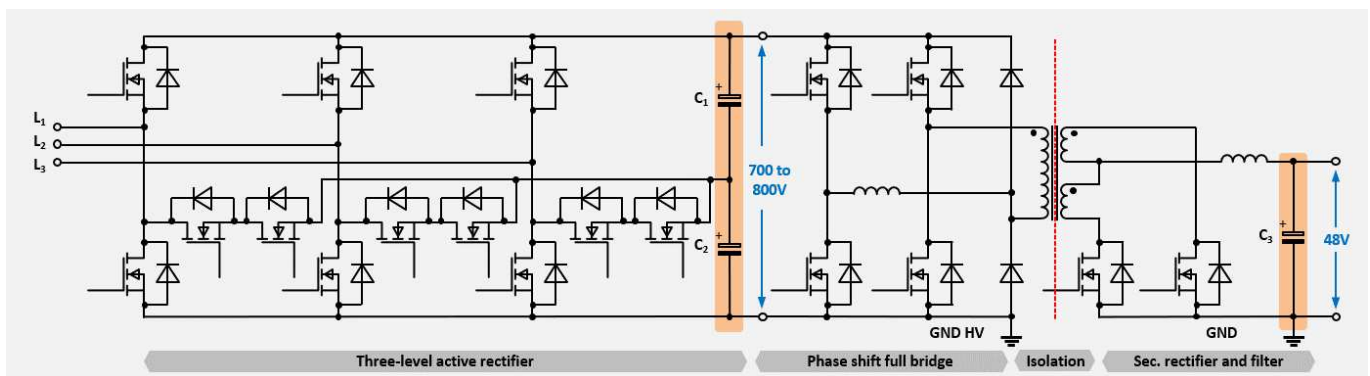
Block diagram of the power circuit of a photo voltaic inverter with EMC filter, monitoring circuit, step-up converter, bridge circuit, and mains relay with recommended products.



Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁ , C ₂	Step-up + DC link	Energy storage and supply	680µF; 500V; 105°C; Snap-In; 5000h D40xL60mm; 3A@120Hz	UJ	UJ681M500Q600A
C ₁ , C ₂	Step-up + DC link	Energy storage and supply	5600µF; 450V; 105°C; Screw; 20000h D63.5xL165mm; 21.7@120Hz	RX	RX562M450SA65A
C ₁ , C ₂	Step-up + DC link	Energy storage and supply	470µF; 450V; 105°C; Snap-In; 10000h D30xL50mm; 1.97A@120Hz	UL	UL471M450O500A
C ₁ , C ₂	Step-up + DC link	Energy storage and supply	1000µF; 450V; 105°C; Screw; 8000h D51xL80mm; 4.6A@120Hz	RH	RH102M350R800A

3-PHASE HIGH VOLTAGE BATTERY CHARGER

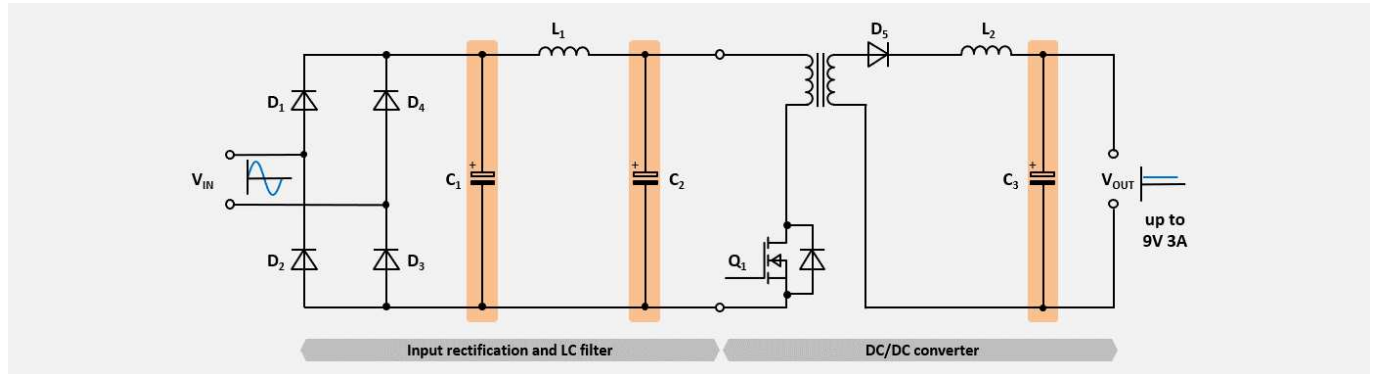
Principal circuit of a 3-phase high voltage battery charger for bidirectional applications such as electric vehicle charging (e-cars, fork-lift trucks, transport vehicles with recommend products for the active rectifier and output filter.



Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁ , C ₂	Three-level active rectifier	Energy storage and supply	2200µF; 450V; 85°C; Snap-In; 7000h D45xL90mm; 8.5A@120Hz	UC	UC222M450V900A
C ₁ , C ₂	Three-level active rectifier	Energy storage and supply	1000µF; 500V; 105°C; Snap-In; 5000h D40xL80mm; 4.68A@120Hz	UJ	UJ102M500Q800A
C ₃	Output filter	Output buffering and ensure stability	56µF; 63V; 105°C; Radial; 10000h D10xL12.5mm; 2.4A@100kHz	AS	AS560M063G125PTA
C ₃	Output filter	Output buffering and ensure stability	150µF; 63V; 105°C; Radial; 2000h D10xL18mm; 3A@100kHz	PH	PH151M063G125PTA

27W PORTABLE POWER USB-C ADAPTER

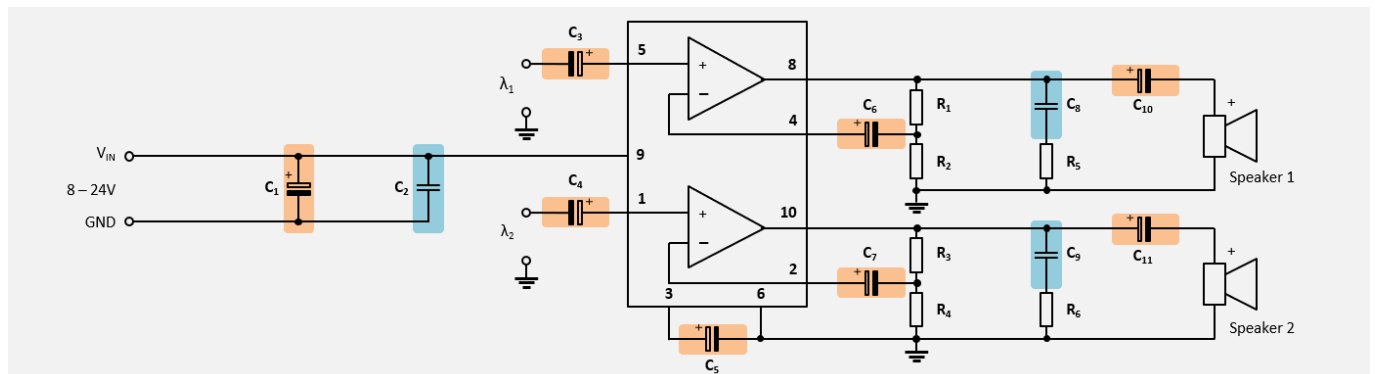
Example of a portable power adapter for USB-C laptops, smartphones and tablets with recommend products for the LC filter and to ensure stability (smoothing) during transient increase in the load voltage.



Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁ , C ₂	LC filter	Input filtering	22μF; 400V; 105°C; Radial; 2000h D10xL25mm; 0.125A@120Hz	KM	KM220M400G250A
C ₁ , C ₂	LC filter	Input filtering	15μF; 400V; 105°C; Radial; 5000h D10xL20mm; 0.24A@120Hz	KF	KF150M400G200A
C ₃	DC/DC converter	Output filtering	470μF; 16V; 105°C; Radial; 2000h D5.5xL11mm; 2.69A@100kHz	PX	PX471M016C090P
C ₃	DC/DC converter	Output filtering	330μF; 12V; 105°C; Radial; 2000h D5xL9mm; 2.69A@100kHz	PX	PX331M012C090P

AUDIO SPEAKER

Example of an active audio speaker with treble and bass and the recommend products for the NF filter as well as the acoustic coupling.

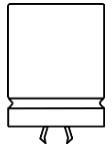


Designation	Circuit	Purpose	Specification	Series	Part Number
C ₁ , C ₃ , C ₄ , C ₅ C ₆ , C ₇ , C ₁₀ , C ₁₁	Audio speaker	NF filter	470μF; 35V; 85°C; Radial; 2000h D10xL16mm; 0.63A@120Hz	RW	RW471M035G160A
C ₂ , C ₈ , C ₉	Audio speaker	Acoustic coupling	47μF; 35V; 85°C; Radial; 2000h D10xL12.5mm; 0.15A@120Hz	NR	NR470M035G125ETA

TECHNICAL TERMS

Item	Description	SI units
V_R	Rated voltage	V
V_S	Surge voltage	V
V_{Ripple_AC}	Ripple voltage	V
$V_{Reverse}$	Reverse voltage	V
V_A	Application voltage, operating voltage	A
I_R	Rated ripple current, rated alternating current	A
I_A	Application current, operating current	A
I_{A_Max}	Maximum application current, maximum operating current	A
I_{Leak}	Leakage current	A
T_{0_Max}	Upper category temperature	°C
T_{0_Min}	Lower category temperature	°C
T_A	Application temperature, operating temperature	°C
T_S	Capacitor surface temperature	°C
ΔT_0	Core temperature increase by internal heating due to rated ripple current	°C
ΔT_A	Core temperature increase by internal heating due to application ripple current	°C
C_R	Rated capacitance	F
ΔC	Capacitance tolerance	%
C/C_R	Capacitance drift	-
$\tan \delta$	Dissipation factor	-
Z	Impedance	Ω
ESR	Equivalent series resistance	Ω
ESL	Equivalent series inductance	H
X_C	Capacitive reactance	Ω
X_L	Inductive reactance	Ω
f	Frequency	Hz
ω	Angular frequency	Hz
λ	FIT = failure in time	-
K_f	Multiplier for ripple current vs. frequency	-
K_T	Multiplier for ripple current vs. temperature	-
K_0	Dielectric constant derating coefficient at high temperature	-
L_0	Specified lifetime at max. capacitor temperature, rated voltage (and rated ripple current)	h
L_A	Expected lifetime at application conditions	h

OVERVIEW - SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS



Features



Series	Page	AEC-Q200	High Reliability	High Temperature	Low ESR	Long Life	Multi Pin	Photo Flash	Standard	Ultra Long Life	Vibration Proof	Temperature Range (°C)		Voltage Range (V)		Capacitance Range (µF)		Endurance (hours)	Useful Life (hours)
SF	27							•				-20	+55	330	350	150	1500	5000 times	
LR	29						•		•			-40	+85	16	100	68	33000	2000	-
LP	43						•		•			-40	+85	6.3	350	100	1mF	2000	3000 to 5000
												-25		385	600	22	2700		
LT	65						•					-40	+85	16	350	390	82000	2000	3000 to 5000
												-25		385	500	220	2700		
UB	72		•			•	•					-40	+85	200	450	68	3300	2000	5000
												-25		500		100	1500		
LU	81					•	•					-40	+85	10	350	82	82000	3000	4000 to 7000
												-25		400	600	47	1500		
UC	102		•			•	•					-40	+85	200	450	68	6800	3000	7000
												-25		500	630	56	1500		
LD	114				•		•				•	-40	+85	10	350	82	1mF	5000	7000 to 10000
												-25		400	500	47	1800		
UD	132		•		•		•				•	-40	+85	200	450	68	2700	5000	10000
												-25		500	600	47	680		
HP	141						•		•			-40	+105	6.3	350	68	1mF	2000	3000 to 5000
												-25		400	550	47	1200		
HT	163						•					-40	+105	160	350	180	2700	2000	> 5000
UJ	169	•	•			•	•					-40	+105	200	450	82	3300	2000	5000
												-25		500	550	47	1000		
HU	178					•	•					-40	+105	10	350	56	82000	3000	5000 to 8000
												-25		385	500	33	1200		
UK	198	•	•				•				•	-40	+105	200	450	68	2200	3000	8000
												-25		500	550	47	680		
HL	208				•		•				•	-40	+105	10	350	39	56000	5000	7000 to 10000
												-25		385	500	39	1200		
UL	227	•	•		•		•				•	-40	+105	200	450	82	2700	5000	10000
												-25		500	550	47	680		
HC	240	•	•	•	•		•				•	-55	+125	25	63	600	3300	3000	4000
HH	244	•	•	•			•				•	-40	+125	400	450	47	560	3000	4000

SF SERIES ■ PULSE & PHOTO-FLASH TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR • Snap-In type
- Small dimensions and low leakage current
- Optimized material combination to achieve low ESR and low dissipation factor
- Especially for impulse applications as photo flash generators, intense pulse light hair removers, laser power supplies and warning beacons



SPECIFICATIONS

Items		Performance Characteristics
Operating Temperature Range		-20 ~ +55°C
Rated Voltage Range	V_R	330 ~ 350V DC
Capacitance Range	C_R	150 ~ 1500µF
Cap. Tolerance	ΔC	-10 ~ +20% (120Hz • 25°C)
Leakage Current (20°C • V_R applied)	I_{LEAK}	$\leq 1 \cdot C_R$ • After 5 minutes [I_{LEAK} (µA) ; C_R (µF)]
Dissipation Factor % (20°C • 120Hz)	$\tan\delta$	8% max.

Lifetime Test			
Charge and Discharge 5 ~ 35°C (V_R applied)	Test	5 000 times	Duration time
	Cycles	30 sec	Charge and discharge cycles
	R_D	0.7 ~ 1Ω	Discharge resistance
	$\Delta C/C_R$	$\leq \pm 10\%$ of initial measured value	
	$\tan\delta$	$\leq 150\%$ of initial specified value	
	I_{Leak}	$\leq 150\%$ of initial specified value	
Shelf Life 55°C ($V_R = 0$)	Test	1 000 hours	
	$\Delta C/C_R$	$\leq \pm 10\%$ of initial measured value	
	$\tan\delta$	$\leq 150\%$ of initial specified value	
	I_{Leak}	$\leq 150\%$ of initial specified value	
Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4			

Pulse and flash-light capacitors are specially adapted to the application.

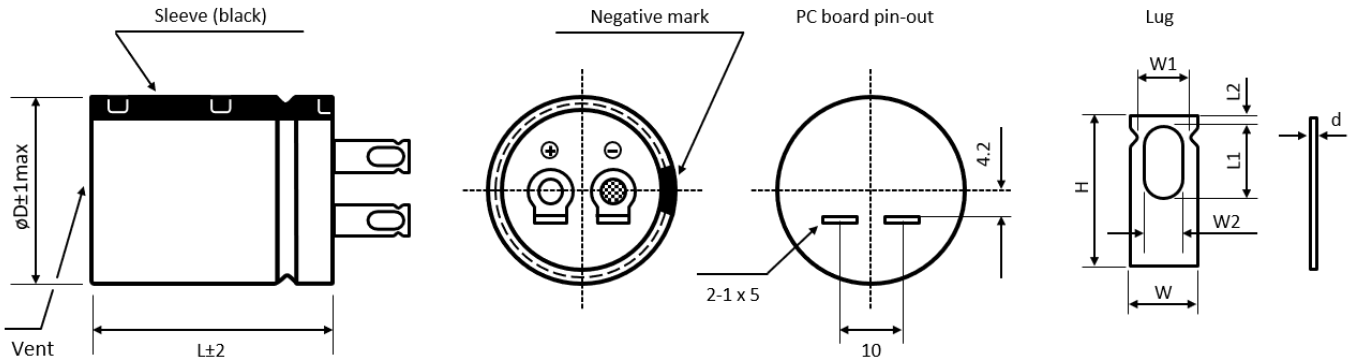


The data listed in the upper table and the following page are therefore **only a guide** for possible designs of the capacitance, voltage, dimensions, pulse frequency.

Please contact our CapXon product specialists for further details.

DIMENSIONS ▪ All dimensions in mm

Lug type version ▪ Standard type



∅D	H ± 0.5	L1 ± 0.1	L2 ± 0.2	W ± 0.2	W1 ± 0.2	W2 ± 0.2	d ± 0.1
25	8	3.5	1	4.6	3.7	2	0.8
30	8	3.5	1	4.6	3.7	2	0.8
35	8	3.5	1	4.6	3.7	2	0.8
40	8	3.5	1	4.6	3.7	2	0.8

Further possible terminal styles can be found in our packaging information liquid snap-in.

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

LR SERIES ▪ STANDARD, AUDIO 85°C TYPE

KEY FEATURES

- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Endurance: 85°C ▪ 2 000 hours
- Small dimensions
- Especially for audio applications
- Designed to improve audio frequency characteristics and downgrade signal noise



SPECIFICATIONS

Items		Performance Characteristics							
Operating Temperature Range		-40 ~ +85°C							
Rated Voltage Range	V_R	16 ~ 100V DC							
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$							
Capacitance Range	C_R	680 ~ 33000 μ F							
Cap. Tolerance	ΔC	$\pm 20\%$ (120Hz ▪ 20°C)							
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I_{LEAK} (μ A) ; C_R (μ F) ; V_R (V)]							
Dissipation Factor % (20°C ▪ 120Hz)	tan δ	μ F / V DC	16	25	35	50	63	80	100
		≤ 8200	35	30	25	20	20	15	15
		10000 ~ 22000	40	35	30	30	25	20	-
		≥ 27000	40	35	35	30	25	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	16	25	35	50	63	80	100
		Z-25°C/Z+20°C	5	4	4	4	4	4	4
		Z-40°C/Z+20°C	15	15	12	12	12	12	12

Lifetime Test			
Endurance 85°C (V_R applied)	Test	2 000 hours	
	$\Delta C/C_R$	$\leq \pm 25\%$ of initial measured value	
	tan δ	$\leq 200\%$ of initial specified value	
	I_{Leak}	\leq the initial specified value	
Shelf Life 85°C ($V_R = 0$)	Test	1 000 hours	
	$\Delta C/C_R$	$\leq \pm 25\%$ of initial measured value	
	tan δ	$\leq 200\%$ of initial specified value	
	I_{Leak}	\leq the initial specified value	
Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4			

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
16	1200	22	20	950	LR122M016M200A □□
	1500	25	20	1100	LR152M016N200A □□
	1800	22	25	1200	LR182M016M250A □□
	2200	30	20	1350	LR222M016O200A □□
	2700	25	25	1750	LR272M016N250A □□
	3300	22	20	1500	LR332M016M200A □□
	3300	25	30	2000	LR332M016N300A □□
	3300	35	20	1950	LR332M016P200A □□
	3900	22	45	2300	LR392M016M450A □□
	3900	25	20	1550	LR392M016N200A □□
	3900	25	35	2350	LR392M016N350A □□
	3900	30	25	2350	LR392M016O250A □□
	4700	22	20	1350	LR472M016M200A □□
	4700	22	25	1750	LR472M016M250A □□
	4700	22	50	2750	LR472M016M500A □□
	4700	25	40	2700	LR472M016N400A □□
	4700	30	30	2700	LR472M016O300A □□
	4700	35	25	2600	LR472M016P250A □□
	5600	25	45	2900	LR562M016N450A □□
	5600	30	20	1850	LR562M016O200A □□
	5600	30	35	2900	LR562M016O350A □□
	6800	22	30	2200	LR682M016M300A □□
	6800	25	20	1700	LR682M016N200A □□
	6800	25	25	2150	LR682M016N250A □□
	6800	25	50	3200	LR682M016N500A □□
	6800	30	40	3200	LR682M016O400A □□
	6800	35	30	3150	LR682M016P300A □□
	8200	22	25	1900	LR822M016M250A □□
	8200	22	35	2400	LR822M016M350A □□
	8200	25	30	2300	LR822M016N300A □□
	8200	30	45	3350	LR822M016O450A □□
	8200	35	20	2250	LR822M016P200A □□
	8200	35	35	3300	LR822M016P350A □□
	10000	22	30	2050	LR103M016M300A □□
	10000	22	40	2650	LR103M016M400A □□
	10000	25	25	2000	LR103M016N250A □□
	10000	25	35	2450	LR103M016N350A □□
	10000	30	20	2100	LR103M016O200A □□
	10000	30	25	2500	LR103M016O250A □□
	10000	35	40	3500	LR103M016P400A □□
12000	22	35	2200	LR123M016M350A □□	
12000	22	50	2750	LR123M016M500A □□	
12000	25	30	2150	LR123M016N300A □□	
12000	25	40	2750	LR123M016N400A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
16	12000	30	30	2720	LR123M016O300A □□
	12000	35	20	2100	LR123M016P200A □□
	12000	35	40	3500	LR123M016P400A □□
	12000	35	45	3700	LR123M016P450A □□
	15000	22	40	2500	LR153M016M400A □□
	15000	25	35	2400	LR153M016N350A □□
	15000	25	45	3100	LR153M016N450A □□
	15000	30	25	2500	LR153M016O250A □□
	15000	30	35	3100	LR153M016O350A □□
	18000	22	45	2800	LR183M016M450A □□
	18000	25	40	2600	LR183M016N400A □□
	18000	25	50	3500	LR183M016N500A □□
	18000	30	30	2650	LR183M016O300A □□
	18000	30	40	3400	LR183M016O400A □□
	18000	35	30	3450	LR183M016P300A □□
	22000	25	45	2950	LR223M016N450A □□
	22000	30	35	2900	LR223M016O350A □□
	22000	30	45	3800	LR223M016O450A □□
	22000	35	25	2900	LR223M016P250A □□
	22000	35	35	3800	LR223M016P350A □□
	27000	25	50	3400	LR273M016N500A □□
	27000	30	40	3250	LR273M016O400A □□
	27000	30	50	4250	LR273M016O500A □□
27000	35	30	3350	LR273M016P300A □□	
27000	35	40	4250	LR273M016P400A □□	
33000	30	45	3700	LR333M016O450A □□	
33000	35	35	3650	LR333M016P350A □□	
33000	35	45	4500	LR333M016P450A □□	
25	820	22	20	750	LR821M025M200A □□
	1000	25	20	950	LR102M025N200A □□
	1500	30	20	1300	LR152M025O200A □□
	1800	25	25	1550	LR182M025N250A □□
	2200	22	35	1850	LR222M025M350A □□
	2200	25	20	1500	LR222M025N200A □□
	2200	25	30	1800	LR222M025N300A □□
	2200	30	25	1800	LR222M025O250A □□
	2200	35	20	1750	LR222M025P200A □□
	2700	22	25	1700	LR272M025M250A □□
	2700	22	45	2200	LR272M025M450A □□
	2700	25	35	2150	LR272M025N350A □□
	3300	22	20	1500	LR332M025M200A □□
	3300	22	30	1800	LR332M025M300A □□
	3300	22	50	2500	LR332M025M500A □□
3300	25	40	2450	LR332M025N400A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
25	3300	30	20	1850	LR332M025O200A □□
	3300	30	30	2400	LR332M025O300A □□
	3300	35	25	2450	LR332M025P250A □□
	3900	25	20	1550	LR392M025N200A □□
	3900	25	25	1100	LR392M025N250A □□
	3900	25	45	2800	LR392M025N450A □□
	3900	30	35	2800	LR392M025O350A □□
	4700	22	25	1700	LR472M025M250A □□
	4700	22	35	2300	LR472M025M350A □□
	4700	25	30	2250	LR472M025N300A □□
	4700	30	40	3250	LR472M025O400A □□
	4700	35	20	2200	LR472M025P200A □□
	4700	35	30	3150	LR472M025P300A □□
	5600	22	40	2500	LR562M025M400A □□
	5600	25	35	2400	LR562M025N350A □□
	5600	30	20	1850	LR562M025O200A □□
	5600	30	25	2500	LR562M025O250A □□
	5600	30	45	3500	LR562M025O450A □□
	5600	35	35	3500	LR562M025P350A □□
	6800	22	30	2200	LR682M025M300A □□
	6800	22	50	2650	LR682M025M500A □□
	6800	25	25	2150	LR682M025N250A □□
	6800	25	40	2650	LR682M025N400A □□
	6800	30	30	2650	LR682M025O300A □□
	6800	35	40	3800	LR682M025P400A □□
	8200	22	35	2350	LR822M025M350A □□
	8200	25	30	2300	LR822M025N300A □□
	8200	25	45	2900	LR822M025N450A □□
	8200	30	35	2850	LR822M025O350A □□
	8200	35	20	2250	LR822M025P200A □□
	8200	35	25	3050	LR822M025P250A □□
	8200	35	45	4000	LR822M025P450A □□
	10000	22	40	2650	LR103M025M400A □□
	10000	25	35	2500	LR103M025N350A □□
	10000	25	50	3300	LR103M025N500A □□
	10000	30	25	2650	LR103M025O250A □□
10000	30	40	3300	LR103M025O400A □□	
10000	35	30	3300	LR103M025P300A □□	
12000	22	45	2900	LR123M025M450A □□	
12000	25	40	2750	LR123M025N400A □□	
12000	30	30	2800	LR123M025O300A □□	
12000	30	45	3550	LR123M025O450A □□	
12000	35	25	2650	LR123M025P250A □□	
12000	35	35	3500	LR123M025P350A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
25	15000	25	25	3150	LR153M025N450A □□
	15000	25	30	3100	LR153M025O350A □□
	15000	25	30	4150	LR153M025O500A □□
	15000	25	35	4000	LR153M025P400A □□
	18000	25	25	3550	LR183M025N500A □□
	18000	25	30	3400	LR183M025O400A □□
	18000	25	35	3500	LR183M025P300A □□
	18000	25	35	4450	LR183M025P450A □□
	22000	25	30	3850	LR223M025O450A □□
	22000	25	35	3850	LR223M025P350A □□
	27000	25	35	4300	LR273M025P400A □□
33000	25	35	4850	LR333M025P450A □□	
35	820	35	25	850	LR821M035N200A □□
	1000	35	22	1000	LR102M035M250A □□
	1200	35	22	1300	LR122M035M200A □□
	1200	35	22	1450	LR122M035M300A □□
	1200	35	25	1400	LR122M035N250A □□
	1200	35	30	1400	LR122M035O200A □□
	1500	35	22	1550	LR152M035M350A □□
	1500	35	25	1550	LR152M035N300A □□
	1800	35	22	1550	LR182M035M250A □□
	1800	35	22	1450	LR182M035M400A □□
	1800	35	25	1650	LR182M035N200A □□
	1800	35	30	1750	LR182M035O250A □□
	1800	35	35	1700	LR182M035P200A □□
	2200	35	22	1950	LR222M035M450A □□
	2200	35	25	1950	LR222M035N350A □□
	2200	35	30	1950	LR222M035O300A □□
	2700	35	22	2050	LR272M035M300A □□
	2700	35	25	2000	LR272M035N250A □□
	2700	35	25	2350	LR272M035N450A □□
	2700	35	30	2050	LR272M035O200A □□
	2700	35	30	2300	LR272M035O350A □□
	2700	35	35	2300	LR272M035P250A □□
	3300	35	22	1750	LR332M035M250A □□
	3300	35	22	2250	LR332M035M350A □□
	3300	35	25	2200	LR332M035N300A □□
	3300	35	25	2700	LR332M035N500A □□
	3300	35	30	2700	LR332M035O400A □□
	3300	35	35	2650	LR332M035P300A □□
3900	35	22	2400	LR392M035M400A □□	
3900	35	25	2300	LR392M035N350A □□	
3900	35	30	1850	LR392M035O200A □□	
3900	35	30	2400	LR392M035O250A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
35	3900	30	45	3000	LR392M035O450A □□
	3900	35	20	2500	LR392M035P200A □□
	3900	35	35	3000	LR392M035P350A □□
	4700	22	30	2200	LR472M035M300A □□
	4700	22	45	2700	LR472M035M450A □□
	4700	25	25	2150	LR472M035N250A □□
	4700	30	30	2550	LR472M035O300A □□
	4700	30	50	3550	LR472M035O500A □□
	4700	35	40	3550	LR472M035P400A □□
	5600	22	35	2350	LR562M035M350A □□
	5600	22	40	3000	LR562M035M400A □□
	5600	22	50	2600	LR562M035M500A □□
	5600	25	30	2250	LR562M035N300A □□
	5600	25	40	3000	LR562M035N400A □□
	5600	35	20	2250	LR562M035P200A □□
	5600	35	25	2850	LR562M035P250A □□
	5600	35	45	3800	LR562M035P450A □□
	6800	30	25	2600	LR682M035O250A □□
	6800	30	35	3300	LR682M035O350A □□
	6800	35	30	3050	LR682M035P300A □□
	6800	35	50	4150	LR682M035P500A □□
	8200	22	45	2900	LR822M035M450A □□
	8200	25	40	2700	LR822M035N400A □□
	8200	30	30	2750	LR822M035O300A □□
	8200	30	40	3600	LR822M035O400A □□
	8200	35	35	3300	LR822M035P350A □□
	10000	25	45	3050	LR103M035N450A □□
	10000	30	35	3000	LR103M035O350A □□
	10000	30	50	3800	LR103M035O500A □□
	10000	35	25	3200	LR103M035P250A □□
	10000	35	40	3700	LR103M035P400A □□
	12000	25	50	3450	LR123M035N500A □□
12000	30	40	3300	LR123M035O400A □□	
12000	35	30	3400	LR123M035P300A □□	
12000	35	35	4100	LR123M035P350A □□	
12000	35	45	3800	LR123M035P450A □□	
15000	30	45	3800	LR153M035O450A □□	
15000	35	50	4800	LR153M035P500A □□	
18000	30	50	4300	LR183M035O500A □□	
18000	35	40	4150	LR183M035P400A □□	
22000	35	45	4700	LR223M035P450A □□	
50	680	22	25	1000	LR681M050M250A □□
	820	22	20	1000	LR821M050M200A □□
	820	22	30	1250	LR821M050M300A □□

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
50	820	25	20	1350	LR821M050N200A □□
	1000	25	20	1500	LR102M050N200A □□
	1500	22	20	1550	LR152M050M200A □□
	1500	22	30	1800	LR152M050M300A □□
	1500	22	45	2200	LR152M050M450A □□
	1500	25	35	2150	LR152M050N350A □□
	1500	30	20	1800	LR152M050O200A □□
	1500	30	25	2150	LR152M050O250A □□
	1800	22	50	2450	LR182M050M500A □□
	1800	25	20	1650	LR182M050N200A □□
	1800	25	25	2150	LR182M050N250A □□
	1800	25	40	2450	LR182M050N400A □□
	1800	35	25	2400	LR182M050P250A □□
	2200	22	25	1850	LR222M050M250A □□
	2200	22	35	2350	LR222M050M350A □□
	2200	25	30	2300	LR222M050N300A □□
	2200	25	50	2650	LR222M050N500A □□
	2200	30	35	2600	LR222M050O350A □□
	2200	35	20	2600	LR222M050P200A □□
	2200	35	30	2600	LR222M050P300A □□
	2700	22	45	2450	LR272M050M450A □□
	2700	25	35	2500	LR272M050N350A □□
	2700	30	25	2600	LR272M050O250A □□
	2700	30	45	3000	LR272M050O450A □□
	2700	35	35	2950	LR272M050P350A □□
	3300	22	35	2200	LR332M050M350A □□
	3300	22	50	2800	LR332M050M500A □□
	3300	25	40	2800	LR332M050N400A □□
	3300	30	30	2800	LR332M050O300A □□
	3300	30	50	3300	LR332M050O500A □□
	3300	35	40	3250	LR332M050P400A □□
	3900	22	40	2450	LR392M050M400A □□
	3900	25	30	2500	LR392M050N300A □□
	3900	25	45	3000	LR392M050N450A □□
3900	30	25	2350	LR392M050O250A □□	
3900	30	35	3000	LR392M050O350A □□	
3900	35	20	2450	LR392M050P200A □□	
3900	35	25	3150	LR392M050P250A □□	
3900	35	45	3500	LR392M050P450A □□	
4700	22	45	2600	LR472M050M450A □□	
4700	25	35	2700	LR472M050N350A □□	
4700	25	50	3400	LR472M050N500A □□	
4700	30	40	3300	LR472M050O400A □□	
4700	35	30	3350	LR472M050P300A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
50	4700	35	50	3900	LR472M050P500A □□
	5600	22	50	2900	LR562M050M500A □□
	5600	25	40	2900	LR562M050N400A □□
	5600	30	30	3000	LR562M050O300A □□
	5600	30	45	3600	LR562M050O450A □□
	5600	35	20	2850	LR562M050P200A □□
	5600	35	35	3600	LR562M050P350A □□
	6800	25	40	3300	LR682M050N400A □□
	6800	30	35	3250	LR682M050O350A □□
	6800	30	50	4100	LR682M050O500A □□
	6800	35	40	3950	LR682M050P400A □□
	8200	30	40	3550	LR822M050O400A □□
	8200	35	30	3650	LR822M050P300A □□
	8200	35	45	4400	LR822M050P450A □□
	10000	30	45	4000	LR103M050O450A □□
	10000	35	35	4000	LR103M050P350A □□
	10000	35	50	5500	LR103M050P500A □□
	12000	35	40	4350	LR123M050P400A □□
15000	35	50	4700	LR153M050P500A □□	
63	680	22	25	1750	LR681M063M250A □□
	820	22	20	1300	LR821M063M200A □□
	820	22	30	1900	LR821M063M300A □□
	820	25	20	1650	LR821M063N200A □□
	820	25	25	1850	LR821M063N250A □□
	820	30	20	1900	LR821M063O200A □□
	1000	22	25	1850	LR102M063M250A □□
	1000	22	35	2050	LR102M063M350A □□
	1000	25	30	2000	LR102M063N300A □□
	1200	22	30	1950	LR122M063M300A □□
	1200	22	40	2250	LR122M063M400A □□
	1200	25	20	1650	LR122M063N200A □□
	1200	25	25	1900	LR122M063N250A □□
	1200	30	20	1950	LR122M063O200A □□
	1200	30	25	2200	LR122M063O250A □□
	1200	35	20	2300	LR122M063P200A □□
	1500	22	25	1900	LR152M063M250A □□
	1500	22	35	2150	LR152M063M350A □□
	1500	22	45	2600	LR152M063M450A □□
	1500	25	30	2100	LR152M063N300A □□
	1500	25	35	2650	LR152M063N350A □□
	1800	22	30	2000	LR182M063M300A □□
	1800	22	40	2350	LR182M063M400A □□
	1800	22	50	2900	LR182M063M500A □□
1800	25	25	2000	LR182M063N250A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
63	1800	25	40	2900	LR182M063N400A □□
	1800	30	20	2050	LR182M063O200A □□
	1800	30	25	2350	LR182M063O250A □□
	1800	30	30	2900	LR182M063O300A □□
	1800	35	20	2450	LR182M063P200A □□
	1800	35	25	2700	LR182M063P250A □□
	2200	22	35	2200	LR222M063M350A □□
	2200	22	45	2700	LR222M063M450A □□
	2200	25	30	2150	LR222M063N300A □□
	2200	25	35	2750	LR222M063N350A □□
	2200	25	45	3250	LR222M063N450A □□
	2200	30	30	2500	LR222M063O300A □□
	2200	30	35	3200	LR222M063O350A □□
	2200	35	20	2100	LR222M063P200A □□
	2700	22	40	2450	LR272M063M400A □□
	2700	25	35	2350	LR272M063N350A □□
	2700	25	45	2800	LR272M063N450A □□
	2700	30	25	2500	LR272M063O250A □□
	2700	30	35	2750	LR272M063O350A □□
	2700	30	45	3300	LR272M063O450A □□
	2700	35	25	2950	LR272M063P250A □□
	2700	35	30	3650	LR272M063P300A □□
	3300	22	45	2800	LR332M063M450A □□
	3300	25	40	2600	LR332M063N400A □□
	3300	25	50	3200	LR332M063N500A □□
	3300	30	30	2700	LR332M063O300A □□
	3300	30	40	3200	LR332M063O400A □□
	3300	30	50	3800	LR332M063O500A □□
	3300	35	30	3150	LR332M063P300A □□
	3300	35	35	4000	LR332M063P350A □□
	3900	25	45	2850	LR392M063N450A □□
	3900	30	35	2850	LR392M063O350A □□
	3900	30	45	3350	LR392M063O450A □□
	3900	35	35	3350	LR392M063P350A □□
	3900	35	40	4300	LR392M063P400A □□
	4700	25	50	3200	LR472M063N500A □□
	4700	30	40	3100	LR472M063O400A □□
	4700	30	50	3800	LR472M063O500A □□
	4700	35	30	3200	LR472M063P300A □□
	4700	35	50	4500	LR472M063P500A □□
5600	30	45	3450	LR562M063O450A □□	
5600	35	35	3400	LR562M063P350A □□	
5600	35	40	4350	LR562M063P400A □□	
6800	30	50	3900	LR682M063O500A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
63	6800	35	40	3750	LR682M063P400A □□
	6800	35	50	4600	LR682M063P500A □□
	8200	35	45	4200	LR822M063P450A □□
	10000	35	50	4800	LR103M063P500A □□
80	680	22	35	2250	LR681M080M350A □□
	680	25	30	2150	LR681M080N300A □□
	820	22	30	2050	LR821M080M300A □□
	820	22	40	2450	LR821M080M400A □□
	820	25	20	1650	LR821M080N200A □□
	820	25	25	2000	LR821M080N250A □□
	820	25	35	2350	LR821M080N350A □□
	820	30	20	2050	LR821M080O200A □□
	820	30	25	2400	LR821M080O250A □□
	820	35	20	2550	LR821M080P200A □□
	1000	22	25	1850	LR102M080M250A □□
	1000	22	35	2200	LR102M080M350A □□
	1000	22	50	2600	LR102M080M500A □□
	1000	25	30	2150	LR102M080N300A □□
	1000	25	40	2600	LR102M080N400A □□
	1000	30	30	2600	LR102M080O300A □□
	1000	35	20	2100	LR102M080P200A □□
	1200	22	30	1950	LR122M080M300A □□
	1200	22	40	2450	LR122M080M400A □□
	1200	25	25	1900	LR122M080N250A □□
	1200	25	35	2300	LR122M080N350A □□
	1200	25	45	2850	LR122M080N450A □□
	1200	30	20	2000	LR122M080O200A □□
	1200	30	25	2400	LR122M080O250A □□
	1200	30	35	2800	LR122M080O350A □□
	1200	35	25	2950	LR122M080P250A □□
	1500	22	35	2150	LR152M080M350A □□
	1500	22	50	2600	LR152M080M500A □□
	1500	25	30	2100	LR152M080N300A □□
	1500	25	40	2650	LR152M080N400A □□
	1500	25	50	3300	LR152M080N500A □□
	1500	30	30	2650	LR152M080O300A □□
	1500	30	40	3200	LR152M080O400A □□
	1500	35	30	3250	LR152M080P300A □□
	1800	22	40	2350	LR182M080M400A □□
	1800	22	45	2700	LR182M080M450A □□
1800	25	45	2850	LR182M080N450A □□	
1800	30	25	2400	LR182M080O250A □□	
1800	30	35	2850	LR182M080O350A □□	
1800	30	45	3550	LR182M080O450A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	I_r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
80	1800	35	20	2500	LR182M080P200A □□
	1800	35	25	3000	LR182M080P250A □□
	1800	35	35	3500	LR182M080P350A □□
	2200	25	35	2750	LR222M080N350A □□
	2200	25	50	3250	LR222M080N500A □□
	2200	30	30	2550	LR222M080O300A □□
	2200	30	40	3150	LR222M080O400A □□
	2200	30	50	4050	LR222M080O500A □□
	2200	35	30	3250	LR222M080P300A □□
	2200	35	40	3900	LR222M080P400A □□
	2700	30	35	2800	LR272M080O350A □□
	2700	30	45	3600	LR272M080O450A □□
	2700	35	25	3000	LR272M080P250A □□
	2700	35	35	3550	LR272M080P350A □□
	2700	35	45	4450	LR272M080P450A □□
	3300	25	50	3250	LR332M080N500A □□
	3300	30	40	3150	LR332M080O400A □□
	3300	30	50	4100	LR332M080O500A □□
	3300	35	30	3200	LR332M080P300A □□
	3300	35	40	3950	LR332M080P400A □□
	3300	35	50	5050	LR332M080P500A □□
	3900	30	45	3450	LR392M080O450A □□
	3900	35	35	3400	LR392M080P350A □□
	3900	35	45	4350	LR392M080P450A □□
4700	30	45	3850	LR472M080O450A □□	
4700	35	40	3750	LR472M080P400A □□	
4700	35	50	4850	LR472M080P500A □□	
5600	35	45	4100	LR562M080P450A □□	
6800	35	50	4650	LR682M080P500A □□	
100	680	22	25	1750	LR681M100M250A □□
	680	22	35	2150	LR681M100M350A □□
	680	22	45	2650	LR681M100M450A □□
	680	25	30	2100	LR681M100N300A □□
	680	25	35	2700	LR681M100N350A □□
	820	22	30	1850	LR821M100M300A □□
	820	22	40	2400	LR821M100M400A □□
	820	22	50	3000	LR821M100M500A □□
	820	25	25	1800	LR821M100N250A □□
	820	25	40	3000	LR821M100N400A □□
	820	30	20	1900	LR821M100O200A □□
	820	30	25	2350	LR821M100O250A □□
	820	35	20	2450	LR821M100P200A □□
	820	35	25	2850	LR821M100P250A □□
	1000	22	45	2700	LR102M100M450A □□

□□: See description at end of standard ratings

STANDARD RATINGS

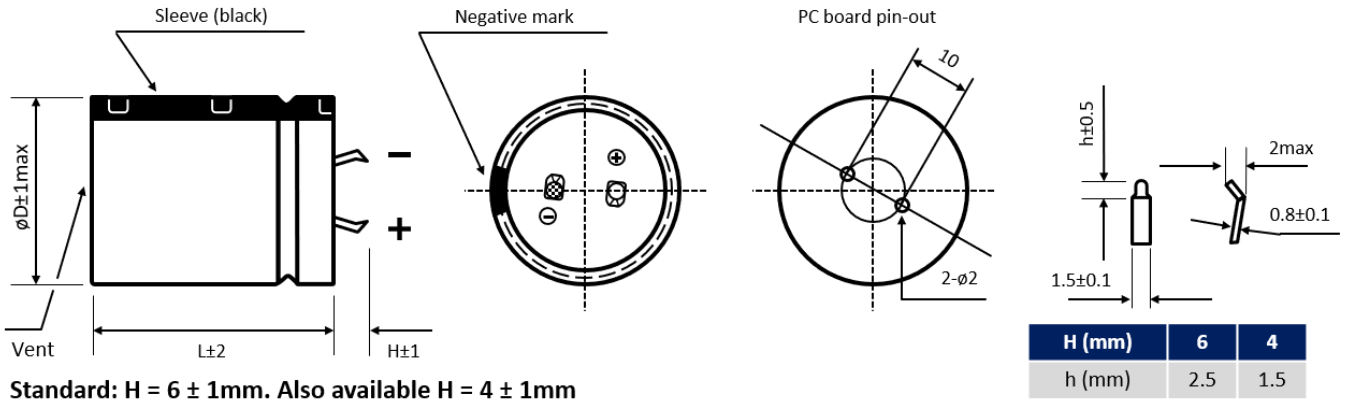
V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	I _r - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
100	1000	25	35	2350	LR102M100N350A □□
	1000	25	40	3100	LR102M100N400A □□
	1000	25	50	2350	LR102M100N500A □□
	1000	30	30	3000	LR102M100O300A □□
	1000	30	35	3300	LR102M100O350A □□
	1000	35	30	3050	LR102M100P300A □□
	1200	22	40	2200	LR122M100M400A □□
	1200	22	50	3000	LR122M100M500A □□
	1200	25	30	2750	LR122M100N300A □□
	1200	30	25	2200	LR122M100O250A □□
	1200	30	30	3050	LR122M100O300A □□
	1200	30	40	3600	LR122M100O400A □□
	1200	35	20	2300	LR122M100P200A □□
	1200	35	25	2900	LR122M100P250A □□
	1200	35	35	3300	LR122M100P350A □□
	1500	22	45	2550	LR152M100M450A □□
	1500	25	35	3600	LR152M100N350A □□
	1500	25	50	3200	LR152M100N500A □□
	1500	30	35	3400	LR152M100O350A □□
	1500	30	50	3900	LR152M100O500A □□
	1500	35	30	3400	LR152M100P300A □□
	1500	35	40	3950	LR152M100P400A □□
	1800	22	50	2850	LR182M100M500A □□
	1800	25	40	2850	LR182M100N400A □□
	1800	30	30	2900	LR182M100O300A □□
	1800	30	40	3700	LR182M100O400A □□
	1800	35	25	2750	LR182M100P250A □□
	1800	35	35	3400	LR182M100P350A □□
	1800	35	45	4150	LR182M100P450A □□
	2200	25	45	3200	LR222M100N450A □□
	2200	30	35	3200	LR222M100O350A □□
	2200	30	50	3950	LR222M100O500A □□
	2200	35	30	3000	LR222M100P300A □□
	2200	35	40	3800	LR222M100P400A □□
	2200	35	50	4750	LR222M100P500A □□
	2700	30	40	3550	LR272M100O400A □□
2700	35	35	3250	LR272M100P350A □□	
2700	35	45	4300	LR272M100P450A □□	
3300	30	50	3750	LR332M100O500A □□	
3300	35	50	4950	LR332M100P500A □□	
3900	35	40	4300	LR392M100P400A □□	
4700	35	50	4500	LR472M100P500A □□	

□□: Enter **P6** for standard type ▪ 6mm pin length
 □□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□: Enter **Y6** for multipin-type ▪ 6mm pin length

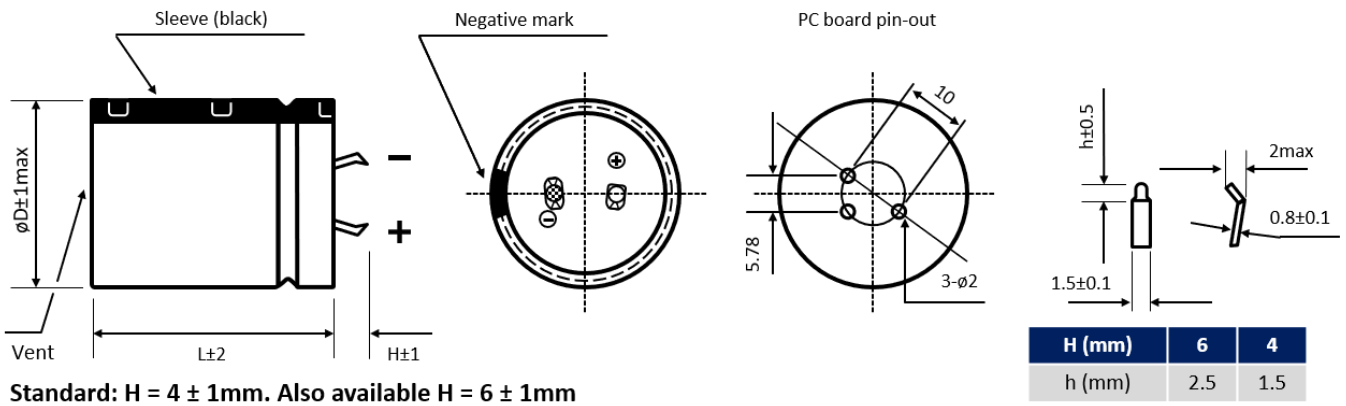
□□: Enter **P4** for standard type ▪ 4mm pin length
 □□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□: Enter **Y4** for multipin type ▪ 4mm pin length

DIMENSIONS - All dimensions in mm

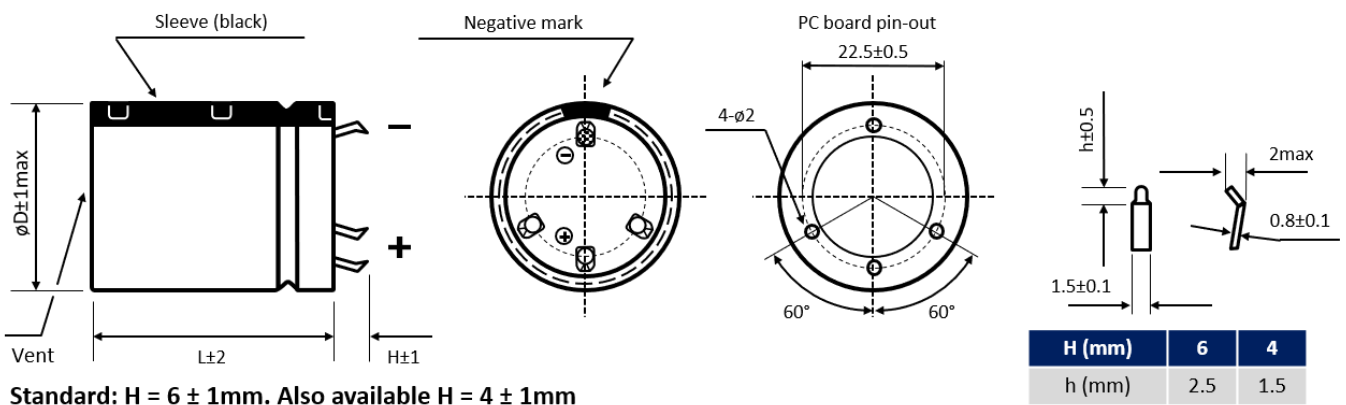
2-pin version - Standard type



3-pin version - Polarity protection



Multipin version - Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

C_R (μ F) / Frequency (Hz)	50/60	100/120	1k	10k	100k
$C_R \leq 100$	0.8	1	1.36	1.48	1.53
$> 100 < C_R \leq 1000$	0.8	1	1.25	1.35	1.38
$1000 \leq C_R$	0.8	1	1.17	1.25	1.28

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

LP SERIES ▪ STANDARD 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 85°C ▪ 3 000 up to 5 000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics											
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C						
Rated Voltage Range	V _R	6.3 ~ 350V DC					385 ~ 600V DC						
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R						
Capacitance Range	C _R	100 ~ 100000μF					22 ~ 2700μF						
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)											
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]											
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	μF / V DC	6.3	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 600
		≤ 8200	-	35	35	30	25	20	20	15	15	15	20
		10000 ~ 22000	55	40	40	35	30	30	25	20	-	-	-
		≥ 27000	60	50	40	35	35	30	25	-	-	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	6.3 ~ 16		25	35	50 ~ 100		160 ~ 250		315 ~ 350	400 ~ 600	
		Z-25°C/Z+20°C	5		4	4	4		4		8	8	
		Z-40°C/Z+20°C	15		15	12	12		8		12	-	
Lifetime Test			V _R ≤ 100V					V _R > 100V					
Useful Life 85°C (V _R & I _R applied)		Test	3 000 hours					5 000 hours					
		ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value					
		tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value					
		I _{Leak}	≤ the initial specified value					≤ the initial specified value					
		Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria											
Endurance 85°C (V _R & I _R applied)		Test	2 000 hours										
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value					
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value					
		I _{Leak}	≤ the initial specified value					≤ the initial specified value					
Shelf Life 85°C (V _R = 0)		Test	1 000 hours										
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value					
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value					
		I _{Leak}	≤ the initial specified value					≤ the initial specified value					
		Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4											
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6											

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
6.3	15000	22	25	37	49	2500	LP153M6R3M250A
	18000	22	30	31	41	2700	LP183M6R3M300A
	18000	25	25	31	41	2710	LP183M6R3N250A
	22000	22	30	26	33	3100	LP223M6R3M300A
	22000	25	25	26	33	3120	LP223M6R3N250A
	27000	22	35	23	29	3500	LP273M6R3M350A
	27000	25	30	23	29	3550	LP273M6R3N300A
	27000	30	25	23	29	3600	LP273M6R3O250A
	33000	22	40	19	24	3580	LP333M6R3M400A
	33000	25	35	19	24	4000	LP333M6R3N350A
	33000	30	25	19	24	4000	LP333M6R3O250A
	39000	22	50	16	20	4600	LP393M6R3M500A
	39000	25	40	16	20	4500	LP393M6R3N400A
	39000	30	30	16	20	4500	LP393M6R3O300A
	39000	35	25	16	20	4550	LP393M6R3P250A
	47000	25	45	13	17	5100	LP473M6R3N450A
	47000	30	35	13	17	5100	LP473M6R3O350A
	47000	35	30	13	17	5120	LP473M6R3P300A
	56000	25	50	11	14	5750	LP563M6R3N500A
	56000	30	40	11	14	5800	LP563M6R3O400A
	56000	35	30	11	14	5800	LP563M6R3P300A
	68000	30	45	9	12	6500	LP683M6R3O450A
	68000	35	35	9	12	6500	LP683M6R3P350A
	82000	30	50	8	10	7350	LP823M6R3O500A
82000	35	40	8	10	7380	LP823M6R3P400A	
100000	35	45	6	8	8350	LP104M6R3P450A	
10	4700	22	20	76	99	2400	LP472M010M200A
	6800	22	25	53	68	2840	LP682M010M250A
	8200	22	25	44	57	2900	LP822M010M250A
	10000	22	25	36	46	2950	LP103M010M250A
	10000	25	25	36	46	3060	LP103M010N250A
	12000	22	25	34	44	3320	LP123M010M250A
	12000	25	25	34	44	3430	LP123M010N250A
	15000	22	30	27	35	3400	LP153M010M300A
	15000	25	25	27	35	3850	LP153M010N250A
	18000	22	35	23	29	4300	LP183M010M350A
	18000	25	25	23	29	4200	LP183M010N250A
	22000	22	40	19	24	4800	LP223M010M400A
	22000	25	30	19	24	4750	LP223M010N300A
	22000	30	25	19	24	4830	LP223M010O250A
	27000	22	45	19	25	5300	LP273M010M450A
	27000	25	35	19	25	5100	LP273M010N350A
	27000	30	30	19	25	5320	LP273M010O300A
33000	22	50	15	20	5500	LP333M010M500A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
10	33000	25	40	15	20	5500	LP333M010N400A □□
	33000	30	30	15	20	5500	LP333M010O300A □□
	33000	35	25	15	20	5600	LP333M010P250A □□
	39000	25	45	13	17	6310	LP393M010N450A □□
	39000	30	35	13	17	6250	LP393M010O350A □□
	39000	35	30	13	17	6390	LP393M010P300A □□
	47000	25	50	11	14	6600	LP473M010N500A □□
	47000	30	40	11	14	6700	LP473M010O400A □□
	47000	35	30	11	14	6720	LP473M010P300A □□
	56000	30	45	9	12	6800	LP563M010O450A □□
	56000	35	35	9	12	6900	LP563M010P350A □□
	68000	30	50	8	10	7600	LP683M010O500A □□
	68000	35	40	8	10	7800	LP683M010P400A □□
82000	35	50	6	8	8500	LP823M010P500A □□	
16	4700	22	20	76	99	2400	LP472M016M200A □□
	6800	22	25	53	68	2840	LP682M016M250A □□
	8200	22	25	44	57	2900	LP822M016M250A □□
	10000	22	25	36	46	3060	LP103M016M250A □□
	10000	25	25	36	46	3500	LP103M016N250A □□
	12000	22	30	34	44	3430	LP123M016M300A □□
	12000	25	25	34	44	3450	LP123M016N250A □□
	15000	22	35	27	35	3940	LP153M016M350A □□
	15000	25	30	27	35	4200	LP153M016N300A □□
	15000	30	25	27	35	3950	LP153M016O250A □□
	18000	22	40	23	29	4500	LP183M016M400A □□
	18000	25	30	23	29	4340	LP183M016N300A □□
	22000	22	45	19	24	4800	LP223M016M450A □□
	22000	25	35	19	24	4750	LP223M016N350A □□
	22000	25	40	19	24	5100	LP223M016N400A □□
	22000	30	30	19	24	5200	LP223M016O300A □□
	27000	25	45	15	20	6300	LP273M016N450A □□
	27000	30	35	15	20	6500	LP273M016O350A □□
	27000	35	25	15	20	5900	LP273M016P250A □□
	33000	25	50	12	16	6500	LP333M016N500A □□
	33000	30	40	12	16	6600	LP333M016O400A □□
	33000	35	30	12	16	6800	LP333M016P300A □□
	39000	25	45	10	14	5800	LP393M016N450A □□
	39000	30	45	10	14	7050	LP393M016O450A □□
	39000	35	35	10	14	7100	LP393M016P350A □□
	47000	25	50	9	11	6200	LP473M016N500A □□
	47000	30	50	9	11	7650	LP473M016O500A □□
47000	35	40	9	11	7750	LP473M016P400A □□	
56000	30	50	7	10	7800	LP563M016O500A □□	
56000	35	45	7	10	8100	LP563M016P450A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number	
16	56000	35	50	7	10	8200	LP563M016P500A □□	
	68000	35	50	6	8	8550	LP683M016P500A □□	
25	4700	22	25	65	85	2640	LP472M025M250A □□	
	5600	22	25	55	71	2720	LP562M025M250A □□	
	6800	22	30	45	59	3100	LP682M025M300A □□	
	6800	25	25	45	59	3200	LP682M025N250A □□	
	8200	22	30	37	49	3150	LP822M025M300A □□	
	8200	25	25	37	49	3250	LP822M025N250A □□	
	10000	22	35	31	40	3430	LP103M025M350A □□	
	10000	25	30	31	40	3900	LP103M025N300A □□	
	10000	30	25	31	40	3430	LP103M025O250A □□	
	12000	22	40	30	39	3840	LP123M025M400A □□	
	12000	25	35	30	39	4370	LP123M025N350A □□	
	12000	30	30	30	39	4400	LP123M025O300A □□	
	15000	22	50	24	31	4940	LP153M025M500A □□	
	15000	25	40	24	31	4800	LP153M025N400A □□	
	15000	30	30	24	31	4850	LP153M025O300A □□	
	18000	25	45	20	26	5500	LP183M025N450A □□	
	18000	30	35	20	26	5600	LP183M025O350A □□	
	22000	30	35	16	21	5400	LP223M025O350A □□	
	22000	35	30	16	21	5500	LP223M025P300A □□	
	27000	30	45	13	17	6250	LP273M025O450A □□	
	27000	35	35	13	17	6300	LP273M025P350A □□	
	33000	30	50	11	14	6850	LP333M025O500A □□	
	33000	35	40	11	14	6900	LP333M025P400A □□	
	39000	35	45	9	12	7360	LP393M025P450A □□	
	47000	35	50	8	10	8620	LP473M025P500A □□	
	35	2200	22	25	120	150	2180	LP222M035M250A □□
		3300	22	25	77	100	2460	LP332M035M250A □□
		3900	22	25	65	85	2500	LP392M035M250A □□
4700		22	30	54	71	3100	LP472M035M300A □□	
4700		25	25	54	71	3100	LP472M035N250A □□	
5600		22	30	46	59	2720	LP562M035M300A □□	
5600		25	25	46	59	2800	LP562M035N250A □□	
6800		22	35	38	49	3600	LP682M035M350A □□	
6800		25	30	38	49	3700	LP682M035N300A □□	
6800		30	25	38	49	3800	LP682M035O250A □□	
8200		22	40	31	40	3900	LP822M035M400A □□	
8200		25	35	31	40	3950	LP822M035N350A □□	
8200		30	30	31	40	4100	LP822M035O300A □□	
10000		22	45	26	33	4150	LP103M035M450A □□	
10000		25	40	26	33	4680	LP103M035N400A □□	
10000		30	30	26	33	4580	LP103M035O300A □□	
12000		22	50	26	33	4700	LP123M035M500A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
35	12000	25	45	26	33	5100	LP123M035N450A □□
	12000	30	35	26	33	5150	LP123M035O350A □□
	12000	35	30	26	33	5250	LP123M035P300A □□
	15000	25	50	20	27	5300	LP153M035N500A □□
	15000	30	40	20	27	5720	LP153M035O400A □□
	15000	35	30	20	27	5720	LP153M035P300A □□
	18000	30	45	17	22	6100	LP183M035O450A □□
	18000	35	35	17	22	6100	LP183M035P350A □□
	22000	30	50	14	18	6500	LP223M035O500A □□
	22000	35	40	14	18	6550	LP223M035P400A □□
	27000	35	45	13	17	6800	LP273M035P450A □□
	33000	35	50	11	14	7200	LP333M035P500A □□
50	1000	22	20	210	270	1200	LP102M050M200A □□
	1500	22	25	140	180	1440	LP152M050M250A □□
	2200	22	25	92	120	2040	LP222M050M250A □□
	2700	22	30	76	98	2300	LP272M050M300A □□
	3300	22	30	62	80	2900	LP332M050M300A □□
	3300	25	25	62	80	3100	LP332M050N250A □□
	3900	22	30	52	68	2950	LP392M050M300A □□
	3900	25	25	52	68	3150	LP392M050N250A □□
	4700	22	35	43	56	3300	LP472M050M350A □□
	4700	25	30	43	56	3400	LP472M050N300A □□
	4700	30	25	43	56	3500	LP472M050O250A □□
	5600	22	40	36	47	3600	LP562M050M400A □□
	5600	25	40	36	47	3750	LP562M050N400A □□
	5600	30	30	36	47	3800	LP562M050O300A □□
	5600	35	25	36	47	3850	LP562M050P250A □□
	6800	22	50	30	39	4200	LP682M050M500A □□
	6800	25	40	30	39	4150	LP682M050N400A □□
	6800	30	30	30	39	4200	LP682M050O300A □□
	8200	25	45	25	32	4750	LP822M050N450A □□
	8200	30	35	25	32	4800	LP822M050O350A □□
	8200	35	30	25	32	4900	LP822M050P300A □□
	10000	25	50	20	27	5200	LP103M050N500A □□
	10000	30	40	20	27	5500	LP103M050O400A □□
	10000	35	30	20	27	5200	LP103M050P300A □□
	12000	30	45	26	33	5800	LP123M050O450A □□
	12000	35	35	26	33	6100	LP123M050P350A □□
	15000	30	50	20	27	6500	LP153M050O500A □□
	15000	35	40	20	27	6800	LP153M050P400A □□
	18000	30	50	17	22	7100	LP183M050O500A □□
	18000	35	45	17	22	7200	LP183M050P450A □□
	22000	35	50	14	18	7800	LP223M050P500A □□

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
63	1000	22	20	210	270	1500	LP102M063M200A ☐☐
	1500	22	25	140	180	1680	LP152M063M250A ☐☐
	1800	22	25	120	150	2200	LP182M063M250A ☐☐
	2200	22	30	92	120	2520	LP222M063M300A ☐☐
	2200	25	25	92	120	2550	LP222M063N250A ☐☐
	2700	22	35	76	98	2820	LP272M063M350A ☐☐
	2700	25	30	76	98	2900	LP272M063N300A ☐☐
	3300	22	35	62	80	3150	LP332M063M350A ☐☐
	3300	25	30	62	80	3250	LP332M063N300A ☐☐
	3300	30	25	62	80	3350	LP332M063O250A ☐☐
	3900	22	40	52	68	3650	LP392M063M400A ☐☐
	3900	25	35	52	68	3750	LP392M063N350A ☐☐
	3900	30	30	52	68	3800	LP392M063O300A ☐☐
	4700	22	45	43	56	3400	LP472M063M450A ☐☐
	4700	25	35	43	56	3300	LP472M063N350A ☐☐
	4700	30	30	43	56	3450	LP472M063O300A ☐☐
	4700	35	25	43	56	3500	LP472M063P250A ☐☐
	5600	25	45	36	47	4650	LP562M063N450A ☐☐
	5600	30	35	36	47	4700	LP562M063O350A ☐☐
	5600	35	30	36	47	4800	LP562M063P300A ☐☐
	6800	25	50	30	39	5300	LP682M063N500A ☐☐
	6800	30	40	30	39	5300	LP682M063O400A ☐☐
	6800	35	30	30	39	5400	LP682M063P300A ☐☐
	8200	30	40	25	32	5450	LP822M063O400A ☐☐
	8200	35	35	25	32	5720	LP822M063P350A ☐☐
	10000	30	50	20	27	6350	LP103M063O500A ☐☐
10000	35	40	20	27	6500	LP103M063P400A ☐☐	
12000	35	45	21	28	6600	LP123M063P450A ☐☐	
15000	35	50	17	22	6800	LP153M063P500A ☐☐	
80	680	22	20	220	290	1250	LP681M080M200A ☐☐
	1000	22	25	150	200	1620	LP102M080M250A ☐☐
	1200	22	25	130	170	1650	LP122M080M250A ☐☐
	1500	22	30	100	130	2500	LP152M080M300A ☐☐
	1500	25	25	100	130	2500	LP152M080N250A ☐☐
	1800	22	30	85	110	2920	LP182M080M300A ☐☐
	1800	25	25	85	110	3000	LP182M080N250A ☐☐
	2200	22	35	70	90	3250	LP222M080M350A ☐☐
	2200	25	30	70	90	3350	LP222M080N300A ☐☐
	2200	30	25	70	90	3400	LP222M080O250A ☐☐
	2700	22	40	57	74	3500	LP272M080M400A ☐☐
	2700	25	35	57	74	3600	LP272M080N350A ☐☐
	2700	30	30	57	74	3650	LP272M080O300A ☐☐
	3300	22	45	46	60	3700	LP332M080M450A ☐☐
	3300	25	40	46	60	3900	LP332M080N400A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
80	3300	30	30	46	60	3900	LP332M080O300A □□
	3900	22	50	39	51	4800	LP392M080M500A □□
	3900	25	45	39	51	4900	LP392M080N450A □□
	3900	30	35	39	51	4900	LP392M080O350A □□
	4700	25	50	33	42	5400	LP472M080N500A □□
	4700	30	40	33	42	5450	LP472M080O400A □□
	4700	35	30	33	42	5500	LP472M080P300A □□
	5600	30	45	27	36	5600	LP562M080O450A □□
	5600	35	35	27	36	5650	LP562M080P350A □□
	6800	30	50	23	29	5800	LP682M080O500A □□
	6800	35	40	23	29	5850	LP682M080P400A □□
	8200	35	50	19	24	6200	LP822M080P500A □□
	10000	35	50	22	27	6650	LP103M080P500A □□
	12000	35	60	18	22	7100	LP123M080P600A □□
100	470	22	20	320	420	1340	LP471M100M200A □□
	680	22	25	220	290	1530	LP681M100M250A □□
	820	22	25	180	240	1900	LP821M100M250A □□
	1000	22	25	150	200	2000	LP102M100M250A □□
	1000	25	25	150	200	1950	LP102M100N250A □□
	1200	22	30	130	170	2400	LP122M100M300A □□
	1200	25	25	130	170	2400	LP122M100N250A □□
	1500	22	35	100	130	2850	LP152M100M350A □□
	1500	25	30	100	130	2950	LP152M100N300A □□
	1500	30	25	100	130	3100	LP152M100O250A □□
	1800	22	40	85	110	3300	LP182M100M400A □□
	1800	25	35	85	110	3500	LP182M100N350A □□
	1800	30	30	85	110	3400	LP182M100O300A □□
	2700	22	50	57	74	3730	LP272M100M500A □□
	2700	25	40	57	74	3750	LP272M100N400A □□
	2700	30	35	57	74	4000	LP272M100O350A □□
	2700	35	30	57	74	4100	LP272M100P300A □□
	3300	25	50	46	60	4150	LP332M100N500A □□
	3300	30	35	46	60	3900	LP332M100O350A □□
	3300	30	40	46	60	4200	LP332M100O400A □□
	3300	35	30	46	60	4200	LP332M100P300A □□
	3900	30	40	39	51	4500	LP392M100O400A □□
	3900	30	45	39	51	4600	LP392M100O450A □□
	3900	35	30	39	51	4520	LP392M100P300A □□
	3900	35	35	39	51	4700	LP392M100P350A □□
	4700	30	45	33	42	5100	LP472M100O450A □□
	4700	30	50	33	42	5860	LP472M100O500A □□
	4700	35	35	33	42	5100	LP472M100P350A □□
4700	35	40	33	42	5900	LP472M100P400A □□	
5600	30	50	27	36	5800	LP562M100O500A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
100	5600	35	40	27	36	5900	LP562M100P400A ☐☐
	5600	35	45	27	36	6340	LP562M100P450A ☐☐
	6800	35	45	23	29	6600	LP682M100P450A ☐☐
	6800	35	50	23	29	6800	LP682M100P500A ☐☐
	8200	35	60	19	24	7300	LP822M100P600A ☐☐
160	180	22	20	650	1110	1120	LP181M160M200A ☐☐
	220	22	20	530	900	1160	LP221M160M200A ☐☐
	220	22	25	530	900	1200	LP221M160M250A ☐☐
	270	22	25	440	740	1350	LP271M160M250A ☐☐
	330	22	25	350	600	1390	LP331M160M250A ☐☐
	330	22	30	350	600	1440	LP331M160M300A ☐☐
	390	25	25	300	510	1660	LP391M160N250A ☐☐
	470	22	30	250	420	1760	LP471M160M300A ☐☐
	470	25	25	250	420	1780	LP471M160N250A ☐☐
	560	22	25	210	360	2300	LP561M160M250A ☐☐
	560	22	30	210	360	2400	LP561M160M300A ☐☐
	680	22	30	170	290	2500	LP681M160M300A ☐☐
	680	25	30	170	290	2550	LP681M160N300A ☐☐
	820	22	35	140	240	2750	LP821M160M350A ☐☐
	820	25	25	140	240	2530	LP821M160N250A ☐☐
	1000	22	40	120	200	3000	LP102M160M400A ☐☐
	1000	25	30	120	200	3000	LP102M160N300A ☐☐
	1200	22	45	100	170	3260	LP122M160M450A ☐☐
	1200	25	35	100	170	3250	LP122M160N350A ☐☐
	1200	30	25	100	170	3050	LP122M160O250A ☐☐
	1500	22	50	76	130	3730	LP152M160M500A ☐☐
	1500	25	40	76	130	3730	LP152M160N400A ☐☐
	1500	30	30	76	130	3730	LP152M160O300A ☐☐
	1500	35	25	76	130	3500	LP152M160P250A ☐☐
	1800	25	45	65	110	4200	LP182M160N450A ☐☐
	1800	30	35	65	110	4200	LP182M160O350A ☐☐
	1800	35	30	65	110	4300	LP182M160P300A ☐☐
	2200	30	40	53	90	4780	LP222M160O400A ☐☐
	2200	35	35	53	90	4850	LP222M160P350A ☐☐
	2700	30	45	43	74	4900	LP272M160O450A ☐☐
	2700	35	40	43	74	5450	LP272M160P400A ☐☐
	3300	35	45	35	60	5750	LP332M160P450A ☐☐
3900	35	50	30	51	6000	LP392M160P500A ☐☐	
180	330	22	25	350	600	1430	LP331M180M250A ☐☐
	390	22	30	300	510	1620	LP391M180M300A ☐☐
	470	22	25	250	420	2090	LP471M180M250A ☐☐
	470	22	30	250	420	1800	LP471M180M300A ☐☐
	470	25	25	250	420	2000	LP471M180N250A ☐☐
	560	22	30	210	360	2100	LP561M180M300A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
180	560	22	35	210	360	2100	LP561M180M350A
	560	25	30	210	360	2150	LP561M180N300A
	680	22	30	170	290	2500	LP681M180M300A
	680	22	40	170	290	2600	LP681M180M400A
	680	25	25	170	290	2510	LP681M180N250A
	680	30	25	170	290	2620	LP681M180O250A
	820	22	35	140	240	2760	LP821M180M350A
	820	25	30	140	240	2800	LP821M180N300A
	820	30	30	140	240	2570	LP821M180O300A
	1000	22	45	120	200	3000	LP102M180M450A
	1000	25	35	120	200	3000	LP102M180N350A
	1000	30	25	120	200	3000	LP102M180O250A
	1200	22	50	100	170	3310	LP122M180M500A
	1200	25	40	100	170	3310	LP122M180N400A
	1200	30	30	100	170	3300	LP122M180O300A
	1200	35	25	100	170	3400	LP122M180P250A
	1500	25	45	76	130	3830	LP152M180N450A
	1500	30	35	76	130	3850	LP152M180O350A
	1500	35	30	76	130	3830	LP152M180P300A
	1800	25	50	65	110	4320	LP182M180N500A
	1800	30	40	65	110	4320	LP182M180O400A
	1800	35	30	65	110	4350	LP182M180P300A
	2200	30	45	53	90	4920	LP222M180O450A
	2200	35	40	53	90	5120	LP222M180P400A
2700	35	45	43	74	5520	LP272M180P450A	
200	150	22	20	780	1330	960	LP151M200M200A
	180	22	20	650	1110	980	LP181M200M200A
	180	22	25	650	1110	1000	LP181M200M250A
	220	20	25	530	900	1200	LP221M200L250A
	220	22	25	530	900	1360	LP221M200M250A
	220	22	30	530	900	1380	LP221M200M300A
	270	22	25	440	740	1460	LP271M200M250A
	270	22	30	440	740	1500	LP271M200M300A
	330	20	35	350	600	1600	LP331M200L350A
	330	22	25	350	600	1700	LP331M200M250A
	330	22	30	350	600	1890	LP331M200M300A
	330	25	25	350	600	1920	LP331M200N250A
	390	22	25	300	510	1750	LP391M200M250A
	390	22	30	300	510	1920	LP391M200M300A
	390	25	25	300	510	1950	LP391M200N250A
	390	25	30	300	510	1950	LP391M200N300A
	470	22	25	250	420	1900	LP471M200M250A
	470	22	30	250	420	2090	LP471M200M300A
470	25	25	250	420	2010	LP471M200N250A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	470	25	30	250	420	2230	LP471M200N300A
	560	22	30	210	360	2440	LP561M200M300A
	560	22	35	210	360	2500	LP561M200M350A
	560	25	25	210	360	2430	LP561M200N250A
	560	25	30	210	360	2500	LP561M200N300A
	680	22	35	170	290	2680	LP681M200M350A
	680	22	45	170	290	2900	LP681M200M450A
	680	25	30	170	290	2800	LP681M200N300A
	680	25	35	170	290	2980	LP681M200N350A
	680	30	25	170	290	2400	LP681M200O250A
	820	22	40	140	240	2930	LP821M200M400A
	820	22	45	140	240	3100	LP821M200M450A
	820	25	30	140	240	2930	LP821M200N300A
	820	25	35	140	240	3000	LP821M200N350A
	820	30	25	140	240	2950	LP821M200O250A
	820	30	30	140	240	3100	LP821M200O300A
	1000	22	45	120	200	3250	LP102M200M450A
	1000	22	50	120	200	3320	LP102M200M500A
	1000	25	35	120	200	3250	LP102M200N350A
	1000	30	30	120	200	3320	LP102M200O300A
	1000	35	25	120	200	3300	LP102M200P250A
	1200	22	50	100	170	3500	LP122M200M500A
	1200	25	40	100	170	3500	LP122M200N400A
	1200	30	30	100	170	3500	LP122M200O300A
	1200	30	35	100	170	3600	LP122M200O350A
	1500	25	50	76	130	4100	LP152M200N500A
	1500	30	35	76	130	3800	LP152M200O350A
	1500	35	30	76	130	3870	LP152M200P300A
	1800	30	40	65	110	3900	LP182M200O400A
	1800	30	45	65	110	4400	LP182M200O450A
	1800	35	35	65	110	4500	LP182M200P350A
	1800	35	45	65	110	5840	LP182M200P450A
2200	30	50	53	90	5000	LP222M200O500A	
2200	35	40	53	90	4920	LP222M200P400A	
2700	35	45	43	74	5900	LP272M200P450A	
2700	35	50	43	74	6000	LP272M200P500A	
3300	35	50	35	60	6100	LP332M200P500A	
250	120	22	20	980	1660	850	LP121M250M200A
	150	22	20	780	1330	900	LP151M250M200A
	150	22	25	780	1330	980	LP151M250M250A
	180	22	25	650	1110	1050	LP181M250M250A
	180	22	30	650	1110	1120	LP181M250M300A
	220	22	25	530	900	1260	LP221M250M250A
270	22	25	440	740	1410	LP271M250M250A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	270	22	30	440	740	1600	LP271M250M300A
	330	22	30	350	600	1770	LP331M250M300A
	330	25	25	350	600	1780	LP331M250N250A
	390	22	30	300	510	2000	LP391M250M300A
	390	25	25	300	510	2000	LP391M250N250A
	470	22	35	250	420	2120	LP471M250M350A
	470	25	30	250	420	2110	LP471M250N300A
	470	30	30	250	420	2380	LP471M250O300A
	560	22	40	210	360	2260	LP561M250M400A
	560	25	30	210	360	2260	LP561M250N300A
	560	25	35	210	360	2320	LP561M250N350A
	560	30	25	210	360	2260	LP561M250O250A
	680	22	45	170	290	2810	LP681M250M450A
	680	25	35	170	290	2590	LP681M250N350A
	680	30	30	170	290	2510	LP681M250O300A
	820	22	50	150	250	2980	LP821M250M500A
	820	25	40	140	240	2980	LP821M250N400A
	820	30	30	140	240	2780	LP821M250O300A
	820	35	25	140	240	2780	LP821M250P250A
	1000	25	45	120	200	3330	LP102M250N450A
	1000	25	50	120	200	3540	LP102M250N500A
	1000	30	35	120	200	3330	LP102M250O350A
	1000	35	30	120	200	3330	LP102M250P300A
	1200	30	40	100	170	3670	LP122M250O400A
1200	35	35	100	170	3800	LP122M250P350A	
1500	30	50	76	130	4450	LP152M250O500A	
1500	35	40	76	130	4450	LP152M250P400A	
1800	35	45	65	110	4560	LP182M250P450A	
2200	35	50	53	90	4760	LP222M250P500A	
315	180	25	25	650	1110	1320	LP181M315N250A
	220	22	30	530	900	1420	LP221M315M300A
	270	25	30	440	740	1630	LP271M315N300A
	330	22	40	350	600	1830	LP331M315M400A
	330	25	30	350	600	1830	LP331M315N300A
	330	30	25	350	600	1850	LP331M315O250A
	390	22	45	300	510	2020	LP391M315M450A
	390	25	35	300	510	1980	LP391M315N350A
	390	30	30	300	510	2150	LP391M315O300A
	470	25	40	250	420	2280	LP471M315N400A
	470	30	30	250	420	2300	LP471M315O300A
	470	35	25	250	420	2350	LP471M315P250A
	560	25	45	210	360	2570	LP561M315N450A
	560	30	35	210	360	2570	LP561M315O350A
	560	35	30	210	360	2650	LP561M315P300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
315	680	30	40	170	290	2880	LP681M315O400A
	680	35	35	170	290	2920	LP681M315P350A
	820	30	45	140	240	3260	LP821M315O450A
	820	35	40	140	240	3350	LP821M315P400A
	1000	30	50	120	200	3630	LP102M315O500A
	1000	35	45	120	200	3720	LP102M315P450A
350	100	22	25	1170	1990	760	LP101M350M250A
	120	22	25	980	1660	990	LP121M350M250A
	120	25	25	980	1660	1020	LP121M350N250A
	150	22	25	780	1330	1120	LP151M350M250A
	180	22	30	650	1110	1220	LP181M350M300A
	220	22	40	530	900	1410	LP221M350M400A
	220	25	35	530	900	1470	LP221M350N350A
	220	30	25	530	900	1480	LP221M350O250A
	270	22	40	440	740	1700	LP271M350M400A
	270	25	30	440	740	1670	LP271M350N300A
	330	22	45	350	600	1900	LP331M350M450A
	330	25	35	350	600	1890	LP331M350N350A
	330	35	30	350	600	1950	LP331M350P300A
	390	22	50	300	510	2080	LP391M350M500A
	390	25	40	300	510	2070	LP391M350N400A
	390	30	30	300	510	2090	LP391M350O300A
	390	35	25	300	510	2150	LP391M350P250A
	470	25	45	250	420	2410	LP471M350N450A
	470	30	35	250	420	2500	LP471M350O350A
	470	35	30	250	420	2550	LP471M350P300A
	560	25	50	210	360	2610	LP561M350N500A
	560	30	40	210	360	2630	LP561M350O400A
	560	35	30	210	360	2650	LP561M350P300A
	680	30	45	170	290	2970	LP681M350O450A
680	35	35	170	290	3000	LP681M350P350A	
820	30	50	140	240	3260	LP821M350O500A	
820	35	45	140	240	3400	LP821M350P450A	
1000	35	50	120	200	3550	LP102M350P500A	
385	82	22	25	1430	2430	750	LP820M385M250A
	100	22	30	1170	1990	850	LP101M385M300A
	120	22	30	980	1660	950	LP121M385M300A
	120	25	25	980	1660	980	LP121M385N250A
	150	22	35	780	1330	1120	LP151M385M350A
	150	25	30	780	1330	1150	LP151M385N300A
	180	22	40	650	1110	1210	LP181M385M400A
	180	25	35	650	1110	1250	LP181M385N350A
	180	30	25	650	1110	1310	LP181M385O250A
	220	22	45	530	900	1450	LP221M385M450A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
385	220	25	35	530	900	1450	LP221M385N350A □□
	220	30	30	530	900	1470	LP221M385O300A □□
	270	25	40	440	740	1590	LP271M385N400A □□
	270	30	35	440	740	1650	LP271M385O350A □□
	330	25	50	350	600	1850	LP331M385N500A □□
	330	30	40	350	600	1890	LP331M385O400A □□
	330	35	30	350	600	1910	LP331M385P300A □□
	390	30	40	300	510	2070	LP391M385O400A □□
	390	35	35	300	510	2100	LP391M385P350A □□
	470	30	50	250	420	2620	LP471M385O500A □□
	470	35	40	250	420	2840	LP471M385P400A □□
	560	35	45	210	360	2980	LP561M385P450A □□
	680	35	50	170	290	3710	LP681M385P500A □□
	680	40	40	170	290	3820	LP681M385Q400A □□
	820	35	55	140	240	4180	LP821M385P550A □□
	820	40	45	140	240	4250	LP821M385Q450A □□
	1000	35	65	120	200	4950	LP102M385P650A □□
	1000	40	50	120	200	4890	LP102M385Q500A □□
	1000	45	40	120	200	4850	LP102M385V400A □□
	1200	35	75	100	170	5680	LP122M385P750A □□
	1200	40	60	100	170	5550	LP122M385Q600A □□
	1200	45	45	100	170	5520	LP122M385V450A □□
	1500	35	90	76	130	6710	LP152M385P900A □□
	1500	40	70	76	130	6590	LP152M385Q700A □□
	1500	45	55	76	130	6550	LP152M385V550A □□
	1800	40	80	65	110	7230	LP182M385Q800A □□
	1800	45	60	65	110	7120	LP182M385V600A □□
2200	40	95	53	90	8540	LP222M385Q950A □□	
2200	45	75	53	90	8310	LP222M385V750A □□	
2700	45	85	43	74	8910	LP272M385V850A □□	
400	47	22	20	2490	4230	420	LP470M400M200A □□
	56	22	25	2090	3550	530	LP560M400M250A □□
	68	22	20	1720	2930	440	LP680M400M200A □□
	68	22	25	1720	2930	470	LP680M400M250A □□
	82	20	25	1430	2430	600	LP820M400L250A □□
	82	22	25	1430	2430	830	LP820M400M250A □□
	100	22	25	1170	1990	850	LP101M400M250A □□
	100	22	30	1170	1990	910	LP101M400M300A □□
	120	22	25	980	1660	1030	LP121M400M250A □□
	150	22	25	780	1330	1150	LP151M400M250A □□
	150	22	30	780	1330	1180	LP151M400M300A □□
	150	25	30	780	1330	1220	LP151M400N300A □□
	150	30	25	780	1330	1250	LP151M400O250A □□
180	22	30	650	1110	1500	LP181M400M300A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	180	25	25	650	1110	1500	LP181M400N250A ☐☐
	180	30	25	650	1110	1530	LP181M400O250A ☐☐
	220	22	35	530	900	1700	LP221M400M350A ☐☐
	220	25	30	530	900	1720	LP221M400N300A ☐☐
	220	30	35	530	900	1750	LP221M400O350A ☐☐
	270	22	40	440	740	1910	LP271M400M400A ☐☐
	270	25	35	440	740	2000	LP271M400N350A ☐☐
	270	30	25	440	740	1960	LP271M400O250A ☐☐
	270	35	30	440	740	2050	LP271M400P300A ☐☐
	330	22	50	350	600	2000	LP331M400M500A ☐☐
	330	25	40	350	600	2000	LP331M400N400A ☐☐
	330	30	30	350	600	2050	LP331M400O300A ☐☐
	330	35	25	350	600	2200	LP331M400P250A ☐☐
	330	35	30	350	600	2300	LP331M400P300A ☐☐
	390	22	50	300	510	2100	LP391M400M500A ☐☐
	390	25	45	300	510	2200	LP391M400N450A ☐☐
	390	30	30	300	510	2100	LP391M400O300A ☐☐
	390	30	35	300	510	2200	LP391M400O350A ☐☐
	390	35	25	300	510	2300	LP391M400P250A ☐☐
	390	35	30	300	510	2500	LP391M400P300A ☐☐
	470	25	50	250	420	2700	LP471M400N500A ☐☐
	470	30	35	250	420	2600	LP471M400O350A ☐☐
	470	35	30	250	420	2600	LP471M400P300A ☐☐
	560	30	40	210	360	2920	LP561M400O400A ☐☐
	560	30	45	210	360	2920	LP561M400O450A ☐☐
	560	35	35	210	360	2920	LP561M400P350A ☐☐
	560	35	40	210	360	2950	LP561M400P400A ☐☐
	680	30	45	170	290	3300	LP681M400O450A ☐☐
	680	30	50	170	290	3400	LP681M400O500A ☐☐
	680	35	35	170	290	3350	LP681M400P350A ☐☐
	680	35	40	170	290	3400	LP681M400P400A ☐☐
	820	35	45	140	240	3450	LP821M400P450A ☐☐
	820	35	50	140	240	3500	LP821M400P500A ☐☐
	1000	35	50	120	200	3940	LP102M400P500A ☐☐
1200	35	55	100	170	4450	LP122M400P550A ☐☐	
1200	35	80	100	170	5600	LP122M400P800A ☐☐	
1200	40	60	100	170	5330	LP122M400Q600A ☐☐	
1200	45	50	100	170	5200	LP122M400V500A ☐☐	
1500	35	95	76	130	6660	LP152M400P950A ☐☐	
1500	40	75	76	130	6320	LP152M400Q750A ☐☐	
1500	45	55	76	130	5920	LP152M400V550A ☐☐	
2200	45	80	53	90	7900	LP222M400V800A ☐☐	
2700	45	90	43	74	9090	LP272M400V900A ☐☐	

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
420	47	22	20	3320	5640	480	LP470M420M200A
	56	22	25	2790	4740	530	LP560M420M250A
	68	22	25	2290	3900	730	LP680M420M250A
	68	22	30	2290	3900	680	LP680M420M300A
	82	22	25	1900	3230	880	LP820M420M250A
	82	22	30	1900	3230	920	LP820M420M300A
	82	25	25	1900	3230	950	LP820M420N250A
	100	22	25	1560	2650	1030	LP101M420M250A
	100	22	30	1560	2650	1070	LP101M420M300A
	100	25	25	1560	2650	1120	LP101M420N250A
	120	22	25	1300	2210	1080	LP121M420M250A
	120	22	30	1300	2210	1100	LP121M420M300A
	120	25	25	1300	2210	1100	LP121M420N250A
	150	22	30	1040	1770	1330	LP151M420M300A
	150	25	25	1040	1770	1350	LP151M420N250A
	150	25	30	1040	1770	1350	LP151M420N300A
	150	30	25	1040	1770	1390	LP151M420Q250A
	180	22	35	860	1470	1500	LP181M420M350A
	180	25	30	860	1470	1500	LP181M420N300A
	180	30	25	860	1470	1550	LP181M420Q250A
	220	22	40	710	1210	1780	LP221M420M400A
	220	25	35	710	1210	1800	LP221M420N350A
	220	30	25	710	1210	1830	LP221M420Q250A
	270	22	45	580	980	1940	LP271M420M450A
	270	25	35	580	980	1940	LP271M420N350A
	270	25	40	580	980	1980	LP271M420N400A
	270	30	30	580	980	1940	LP271M420Q300A
	270	35	35	580	980	2000	LP271M420P350A
	330	25	45	470	800	2150	LP331M420N450A
	330	30	40	470	800	2180	LP331M420Q400A
	330	35	35	470	800	2210	LP331M420P350A
	330	35	40	470	800	2250	LP331M420P400A
	390	25	45	400	680	2350	LP391M420N450A
	390	30	40	400	680	2350	LP391M420Q400A
	390	35	35	400	680	2430	LP391M420P350A
	390	35	40	400	680	2520	LP391M420P400A
	470	30	40	330	560	2600	LP471M420Q400A
	470	30	45	330	560	2780	LP471M420Q450A
	470	35	35	330	560	2780	LP471M420P350A
	470	35	40	330	560	2800	LP471M420P400A
560	30	45	280	470	2850	LP561M420Q450A	
560	35	40	280	470	2950	LP561M420P400A	
560	35	45	280	470	2970	LP561M420P450A	
560	40	40	280	470	2950	LP561M420Q400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
420	680	35	45	230	390	3590	LP681M420P450A
	680	35	50	230	390	3620	LP681M420P500A
	680	40	45	230	390	3750	LP681M420Q450A
	820	35	50	190	320	4150	LP821M420P500A
	820	40	50	190	320	4230	LP821M420Q500A
	820	45	40	190	320	4320	LP821M420V400A
	1000	35	75	160	270	5010	LP102M420P750A
	1000	40	60	160	270	4910	LP102M420Q600A
	1000	45	45	160	270	4780	LP102M420V450A
	1200	35	85	130	220	5530	LP122M420P850A
	1200	40	70	130	220	5680	LP122M420Q700A
	1200	45	55	130	220	5480	LP122M420V550A
	1500	40	80	110	180	6380	LP152M420Q800A
	1500	45	65	110	180	6250	LP152M420V650A
	1800	40	95	88	150	7510	LP182M420Q950A
	1800	45	70	88	150	7210	LP182M420V700A
2200	45	85	71	120	7880	LP222M420V850A	
450	22	22	20	7090	12060	300	LP220M450M200A
	47	22	20	3320	5640	500	LP470M450M200A
	56	22	25	2790	4740	600	LP560M450M250A
	68	22	25	2290	3900	730	LP680M450M250A
	68	22	30	2290	3900	750	LP680M450M300A
	82	22	25	1900	3230	850	LP820M450M250A
	82	25	25	1900	3230	900	LP820M450N250A
	100	22	30	1560	2650	950	LP101M450M300A
	100	25	25	1560	2650	980	LP101M450N250A
	120	22	30	1300	2210	1100	LP121M450M300A
	120	25	25	1300	2210	1150	LP121M450N250A
	150	22	30	1040	1770	1390	LP151M450M300A
	150	22	35	1040	1770	1430	LP151M450M350A
	150	25	25	1040	1770	1430	LP151M450N250A
	150	30	25	1040	1770	1450	LP151M450O250A
	150	30	30	1040	1770	1470	LP151M450O300A
	180	22	35	860	1470	1350	LP181M450M350A
	180	25	30	860	1470	1380	LP181M450N300A
	180	25	35	860	1470	1410	LP181M450N350A
	180	30	25	860	1470	1380	LP181M450O250A
	220	22	40	710	1210	1560	LP221M450M400A
	220	25	35	710	1210	1610	LP221M450N350A
	220	25	40	710	1210	1650	LP221M450N400A
	220	30	25	710	1210	1610	LP221M450O250A
220	30	30	710	1210	1650	LP221M450O300A	
220	35	25	710	1210	1650	LP221M450P250A	
270	22	45	580	980	1900	LP271M450M450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	270	25	40	580	980	1920	LP271M450N400A □□
	270	25	45	580	980	1860	LP271M450N450A □□
	270	30	30	580	980	1880	LP271M450O300A □□
	270	35	25	580	980	1840	LP271M450P250A □□
	270	35	35	580	980	1920	LP271M450P350A □□
	330	25	45	470	800	2100	LP331M450N450A □□
	330	30	35	470	800	1980	LP331M450O350A □□
	330	30	40	470	800	2100	LP331M450O400A □□
	330	35	25	470	800	2000	LP331M450P250A □□
	330	35	30	470	800	2100	LP331M450P300A □□
	390	25	50	400	680	2300	LP391M450N500A □□
	390	30	35	400	680	2200	LP391M450O350A □□
	390	30	40	400	680	2300	LP391M450O400A □□
	390	35	30	400	680	2600	LP391M450P300A □□
	390	35	40	400	680	2540	LP391M450P400A □□
	470	30	40	330	560	2550	LP471M450O400A □□
	470	30	45	330	560	2580	LP471M450O450A □□
	470	35	35	330	560	2580	LP471M450P350A □□
	470	35	40	330	560	2600	LP471M450P400A □□
	470	35	45	330	560	2620	LP471M450P450A □□
	470	40	40	330	560	2650	LP471M450Q400A □□
	560	30	50	280	470	2830	LP561M450O500A □□
	560	35	40	280	470	2850	LP561M450P400A □□
	560	35	45	280	470	2880	LP561M450P450A □□
	560	40	45	280	470	3270	LP561M450Q450A □□
	680	30	55	230	390	3520	LP681M450O550A □□
	680	35	45	230	390	3520	LP681M450P450A □□
	680	40	50	230	390	3710	LP681M450Q500A □□
	680	45	40	230	390	3710	LP681M450V400A □□
	820	35	50	190	320	3750	LP821M450P500A □□
	820	35	70	190	320	4310	LP821M450P700A □□
	820	40	55	190	320	4300	LP821M450Q550A □□
	820	45	45	190	320	4140	LP821M450V450A □□
1000	35	80	160	270	5300	LP102M450P800A □□	
1000	40	60	160	270	4710	LP102M450Q600A □□	
1000	40	65	160	270	4890	LP102M450Q650A □□	
1000	45	50	160	270	4710	LP102M450V500A □□	
1200	35	95	130	220	5850	LP122M450P950A □□	
1200	40	75	130	220	5550	LP122M450Q750A □□	
1200	45	60	130	220	5550	LP122M450V600A □□	
1500	40	90	110	180	6560	LP152M450Q900A □□	
1500	45	70	110	180	6270	LP152M450V700A □□	
1800	45	80	88	150	7120	LP182M450V800A □□	
2200	45	95	71	120	8280	LP222M450V950A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
500	56	22	25	2790	4740	650	LP560M500M250A
	68	22	30	2290	3900	750	LP680M500M300A
	68	25	25	2290	3900	750	LP680M500N250A
	68	25	30	2290	3900	780	LP680M500N300A
	82	22	35	1900	3230	880	LP820M500M350A
	82	25	30	1900	3230	900	LP820M500N300A
	82	30	30	1900	3230	920	LP820M500Q300A
	100	22	40	1560	2650	960	LP101M500M400A
	100	25	30	1560	2650	980	LP101M500N300A
	100	30	30	1560	2650	1050	LP101M500Q300A
	120	22	45	1300	2210	1100	LP121M500M450A
	120	25	40	1300	2210	1130	LP121M500N400A
	120	30	30	1300	2210	1160	LP121M500Q300A
	150	22	50	1040	1770	1220	LP151M500M500A
	150	25	45	1040	1770	1270	LP151M500N450A
	150	30	30	1040	1770	1240	LP151M500Q300A
	180	25	50	860	1470	1420	LP181M500N500A
	180	30	35	860	1470	1400	LP181M500Q350A
	220	30	40	710	1210	1650	LP221M500Q400A
	220	35	40	710	1210	1680	LP221M500P400A
	270	30	40	580	980	1500	LP271M500Q400A
	270	35	40	580	980	1880	LP271M500P400A
	330	30	50	470	800	1950	LP331M500Q500A
	330	35	50	470	800	2100	LP331M500P500A
	390	35	55	400	680	2350	LP391M500P550A
	390	40	45	400	680	2370	LP391M500Q450A
	470	35	60	330	560	2600	LP471M500P600A
	470	40	50	330	560	2600	LP471M500Q500A
	560	35	70	280	470	2510	LP561M500P700A
	560	40	55	280	470	2490	LP561M500Q550A
680	40	65	230	390	2830	LP681M500Q650A	
680	45	50	230	390	2810	LP681M500V500A	
820	40	75	190	320	3220	LP821M500Q750A	
820	45	60	190	320	3200	LP821M500V600A	
1000	40	85	160	270	3660	LP102M500Q850A	
1000	45	70	160	270	3620	LP102M500V700A	
1200	45	80	130	220	4150	LP122M500V800A	
1500	45	100	110	180	4900	LP152M500VA00A	
550	47	25	25	3320	5640	520	LP470M550N250A
	56	25	25	2790	4740	650	LP560M550N250A
	68	25	30	2290	3900	750	LP680M550N300A
	82	25	35	1900	3230	850	LP820M550N350A
	82	30	25	1900	3230	850	LP820M550Q250A
100	25	35	1560	2650	940	LP101M550N350A	

: See description at end of standard ratings

STANDARD RATINGS

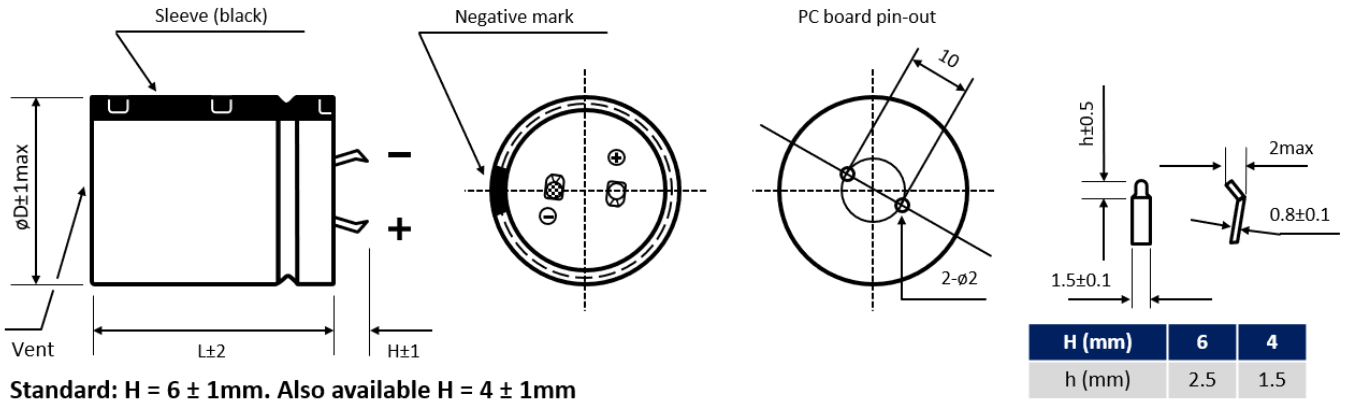
V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
550	100	30	30	1560	2650	1050	LP101M550O300A □□
	120	25	40	1300	2210	1080	LP121M550N400A □□
	120	30	35	1300	2210	1180	LP121M550O350A □□
	120	35	25	1300	2210	1180	LP121M550P250A □□
	150	25	50	1040	1770	1280	LP151M550N500A □□
	150	30	35	1040	1770	1300	LP151M550O350A □□
	150	35	30	1040	1770	1450	LP151M550P300A □□
	180	25	55	860	1470	1480	LP181M550N550A □□
	180	30	40	860	1470	1480	LP181M550O400A □□
	180	35	35	860	1470	1620	LP181M550P350A □□
	220	30	50	710	1210	1850	LP221M550O500A □□
	220	35	40	710	1210	1860	LP221M550P400A □□
	270	30	55	580	980	2150	LP271M550O550A □□
	270	35	45	580	980	2210	LP271M550P450A □□
	330	35	50	470	800	2200	LP331M550P500A □□
390	35	55	400	680	2820	LP391M550P550A □□	
600	47	25	25	3320	5640	620	LP470M600N250A □□
	56	25	30	2790	4740	710	LP560M600N300A □□
	68	25	35	2290	3900	770	LP680M600N350A □□
	68	30	25	2290	3900	780	LP680M600O250A □□
	82	25	35	1900	3230	870	LP820M600N350A □□
	82	30	30	1900	3230	920	LP820M600O300A □□
	100	25	40	1560	2650	1000	LP101M600N400A □□
	100	30	35	1560	2650	1100	LP101M600O350A □□
	100	35	25	1560	2650	1100	LP101M600P250A □□
	120	25	50	1300	2210	1200	LP121M600N500A □□
	120	30	35	1300	2210	1180	LP121M600O350A □□
	120	35	30	1300	2210	1300	LP121M600P300A □□
	150	25	55	1040	1770	1360	LP151M600N550A □□
	150	30	45	1040	1770	1470	LP151M600O450A □□
	150	35	35	1040	1770	1520	LP151M600P350A □□
	180	30	50	860	1470	1670	LP181M600O500A □□
	180	35	40	860	1470	1710	LP181M600P400A □□
	220	30	55	710	1210	1950	LP221M600O550A □□
220	35	45	710	1210	1950	LP221M600P450A □□	
270	35	50	580	980	2250	LP271M600P500A □□	

□□: Enter **P6** for standard type • 6mm pin length
 □□: Enter **Z6** for 3-pin type • 6mm pin length
 □□: Enter **Y6** for multipin-type • 6mm pin length

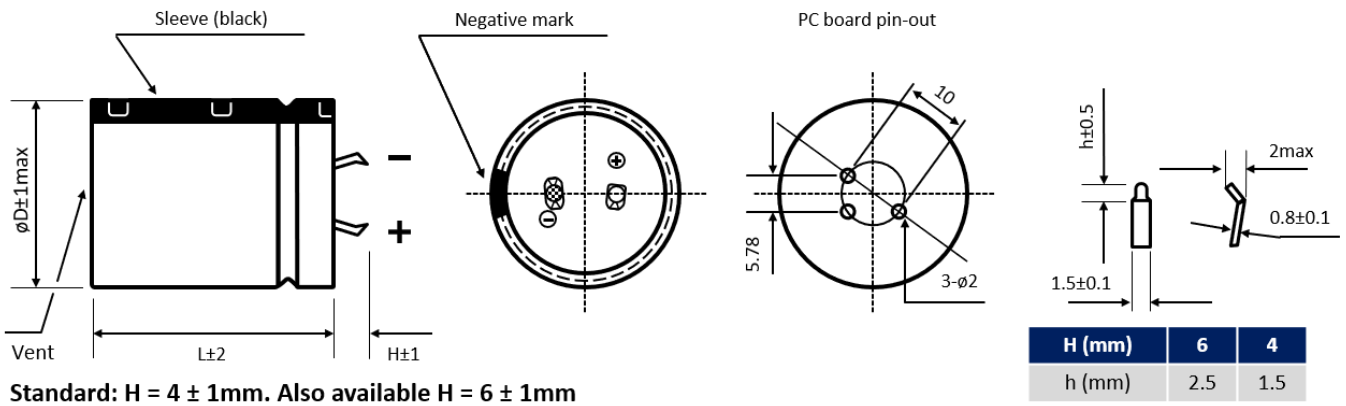
□□: Enter **P4** for standard type • 4mm pin length
 □□: Enter **Z4** for 3-pin type • 4mm pin length
 □□: Enter **Y4** for multipin type • 4mm pin length

DIMENSIONS ▪ All dimensions in mm

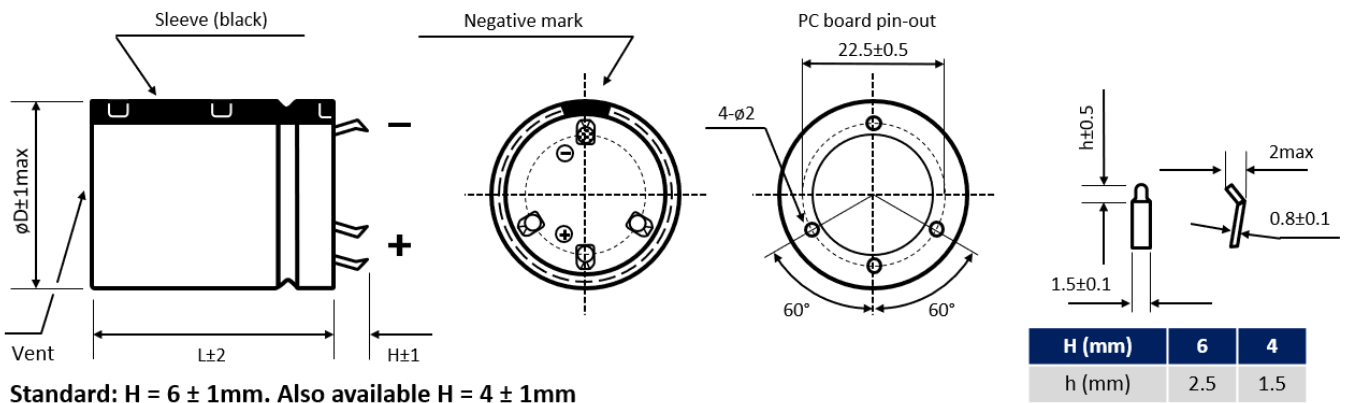
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter $\phi D \geq 30$ mm





Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$6.3 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 600$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

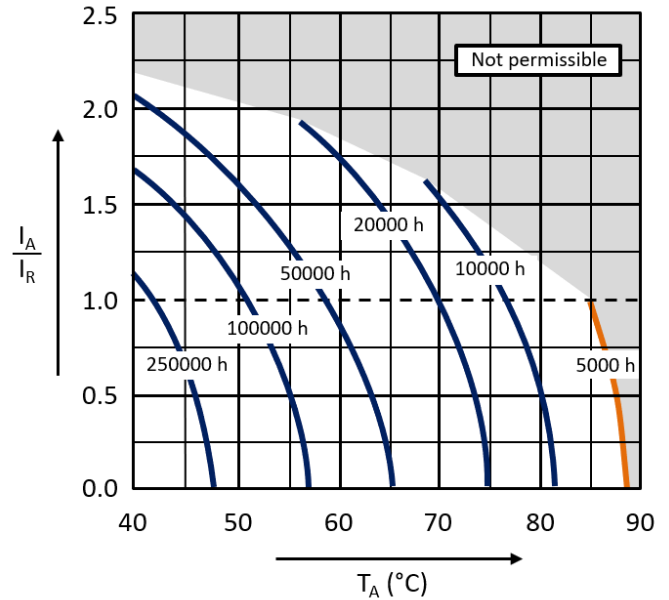
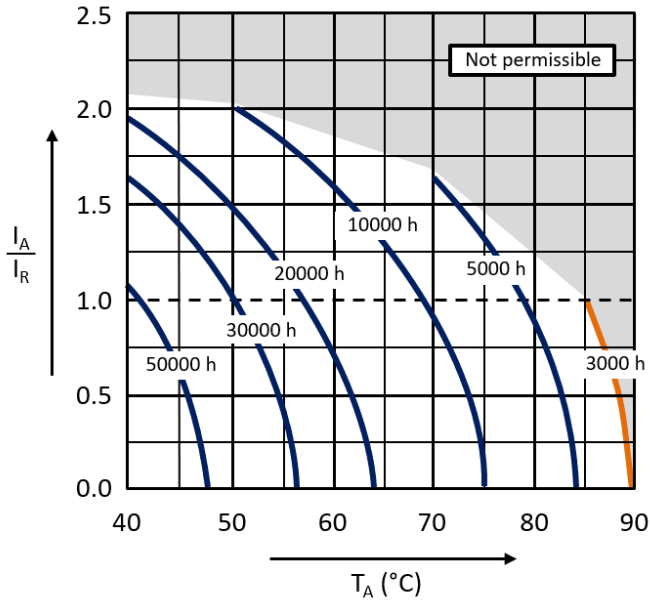
Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

	
General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE

$V_R \leq 100V$

$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

LT SERIES ■ STANDARD, MULTI-PIN 85°C TYPE

KEY FEATURES

- ALUMINUM ELECTROLYTIC CAPACITOR ■ Snap-In (Multi-Pin) type
- Useful life: 85°C ■ 3 000 hours up to 5 000 hours
- Miniature dimensions
- High reliability
- Polarity-protected assembly



NOT FOR NEW DESIGNS

Recommendation LP series



SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C					
Rated Voltage Range	V _R	16 ~ 350V DC					385 ~ 500V DC					
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R					
Capacitance Range	C _R	390 ~ 82000µF					220 ~ 2700µF					
Cap. Tolerance	ΔC	±20% (120Hz ■ 20°C)										
Leakage Current (20°C ■ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ■ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]										
Dissipation Factor % (20°C ■ 120Hz)	tanδ	µF / V DC	16	25	35	50	63	80	100	160 ~ 420	450 ~ 500	
		≤ 8200	35	30	25	20	20	15	15	15	20	
		10000 ~ 22000	40	35	30	30	25	20	-	-	-	
		≥ 27000	40	35	35	30	25	-	-	-	-	
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	16	25	35 ~ 100		160 ~ 250		315 ~ 350		400 ~ 500	
		Z-25°C/Z+20°C	5	4	4		4		8		8	
		Z-40°C/Z+20°C	15	15	12		8		12		-	
Lifetime Test			V _R ≤ 100V					V _R > 100V				
Useful Life 85°C (V _R & I _R applied)		Test	3 000 hours					5 000 hours				
		ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value				
		tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ■ parts show higher drift as test criteria										
Endurance 85°C (V _R & I _R applied)		Test	2 000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
Shelf Life 85°C (V _R = 0)		Test	1 000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4										
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ■ IEC 60068-2-6										

STANDARD RATINGS
NOT FOR NEW DESIGNS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
16	47000	35	30	9	11	5910	LT473M016P300A ☐☐
	56000	35	60	7	10	6510	LT563M016P600A ☐☐
	56000	40	50	7	10	6510	LT563M016Q500A ☐☐
	68000	35	80	6	8	7230	LT683M016P800A ☐☐
	68000	40	60	6	8	7230	LT683M016Q600A ☐☐
	82000	40	80	5	7	8190	LT823M016Q800A ☐☐
25	33000	35	50	11	14	5790	LT333M025P500A ☐☐
	39000	35	60	9	12	6270	LT393M025P600A ☐☐
	39000	40	50	9	12	6270	LT393M025Q500A ☐☐
	47000	35	80	8	10	7110	LT473M025P800A ☐☐
	47000	40	60	8	10	7110	LT473M025Q600A ☐☐
	56000	40	80	6	8	7430	LT563M025Q800A ☐☐
	68000	40	80	5	7	8580	LT683M025Q800A ☐☐
35	22000	35	50	14	18	5010	LT223M035P500A ☐☐
	27000	35	60	13	17	5850	LT273M035P600A ☐☐
	33000	35	80	11	14	6030	LT333M035P800A ☐☐
	33000	40	60	11	14	6410	LT333M035Q600A ☐☐
	39000	35	80	9	12	6940	LT393M035P800A ☐☐
	39000	40	60	9	12	7030	LT393M035Q600A ☐☐
	47000	40	80	8	10	7550	LT473M035Q800A ☐☐
50	15000	35	50	20	27	4560	LT153M050P500A ☐☐
	18000	35	60	17	22	5100	LT183M050P600A ☐☐
	18000	40	50	17	22	5100	LT183M050Q500A ☐☐
	22000	35	80	14	18	5770	LT223M050P800A ☐☐
	22000	40	60	14	18	5770	LT223M050Q600A ☐☐
	27000	40	60	11	15	6190	LT273M050Q600A ☐☐
63	12000	35	60	21	28	4680	LT123M063P600A ☐☐
	12000	40	50	21	28	4830	LT123M063Q500A ☐☐
	15000	35	80	17	22	4930	LT153M063P800A ☐☐
	15000	40	60	17	22	5030	LT153M063Q600A ☐☐
	18000	35	80	14	18	5890	LT183M063P800A ☐☐
	18000	40	80	14	18	6030	LT183M063Q800A ☐☐
80	4700	35	50	33	42	3230	LT472M080P500A ☐☐
	6800	35	50	23	29	3650	LT682M080P500A ☐☐
	8200	35	60	19	24	3950	LT822M080P600A ☐☐
	8200	40	50	19	24	3950	LT822M080Q500A ☐☐
	10000	35	80	22	27	4450	LT103M080P800A ☐☐
	10000	40	60	22	27	4450	LT103M080Q600A ☐☐
	12000	40	80	18	22	5130	LT123M080Q800A ☐☐
	15000	40	80	14	18	5610	LT153M080Q800A ☐☐
100	5600	35	60	27	36	3670	LT562M100P600A ☐☐
	5600	40	50	27	36	3670	LT562M100Q500A ☐☐
	6800	35	80	23	29	3970	LT682M100P800A ☐☐
	6800	40	60	23	29	3970	LT682M100Q600A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS
NOT FOR NEW DESIGNS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
100	8200	40	80	19	24	4500	LT822M100Q800A ☐☐
	1800	35	50	61	110	2490	LT182M160P500A ☐☐
160	2200	35	60	50	90	2800	LT222M160P600A ☐☐
	2200	40	50	50	90	2800	LT222M160Q500A ☐☐
	2700	35	80	41	74	3030	LT272M160P800A ☐☐
	2700	40	60	41	74	3030	LT272M160Q600A ☐☐
	3300	40	80	33	60	3290	LT332M160Q800A ☐☐
	1000	35	50	110	200	2050	LT102M220P500A ☐☐
220	1200	35	50	94	170	2270	LT122M220P500A ☐☐
	1500	35	60	72	130	2470	LT152M220P600A ☐☐
	1800	35	80	61	110	2680	LT182M220P800A ☐☐
	1800	40	60	61	110	2680	LT182M220Q600A ☐☐
	2700	40	80	41	74	3060	LT272M220Q800A ☐☐
	390	35	50	280	510	1210	LT391M250P500A ☐☐
250	1000	35	60	110	200	2130	LT102M250P600A ☐☐
	1200	35	60	94	170	2270	LT122M250P600A ☐☐
	1200	40	50	94	170	2270	LT122M250Q500A ☐☐
	1500	35	80	72	130	2400	LT152M250P800A ☐☐
	1500	40	60	72	130	2400	LT152M250Q600A ☐☐
	1800	40	80	61	110	2820	LT182M250Q800A ☐☐
385	470	35	40	230	420	2870	LT471M385P400A ☐☐
	560	35	45	200	360	3220	LT561M385P450A ☐☐
	680	35	50	160	290	3670	LT681M385P500A ☐☐
	680	40	40	160	290	3620	LT681M385Q400A ☐☐
	820	35	55	130	240	4160	LT821M385P550A ☐☐
	820	40	45	130	240	4090	LT821M385Q450A ☐☐
	1000	35	65	110	200	4820	LT102M385P650A ☐☐
	1000	40	50	110	200	4640	LT102M385Q500A ☐☐
	1000	45	40	110	200	4480	LT102M385V400A ☐☐
	1200	35	75	94	170	5530	LT122M385P750A ☐☐
	1200	40	60	94	170	5320	LT122M385Q600A ☐☐
	1200	45	45	94	170	5040	LT122M385V450A ☐☐
	1500	35	90	72	130	6570	LT152M385P900A ☐☐
	1500	40	70	72	130	6220	LT152M385Q700A ☐☐
	1500	45	55	72	130	5910	LT152M385V550A ☐☐
	1800	40	80	61	110	7090	LT182M385Q800A ☐☐
	1800	45	60	61	110	6600	LT182M385V600A ☐☐
	2200	40	95	50	90	8280	LT222M385Q950A ☐☐
	2200	45	75	50	90	7750	LT222M385V750A ☐☐
	2700	45	85	41	74	8900	LT272M385V850A ☐☐
400	470	35	40	230	420	2880	LT471M400P400A ☐☐
	560	35	45	200	360	3240	LT561M400P450A ☐☐
	560	40	40	200	360	3290	LT561M400Q400A ☐☐
	680	35	50	160	290	3690	LT681M400P500A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS
NOT FOR NEW DESIGNS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	680	40	40	160	290	3640	LT681M400Q400A
	820	35	60	130	240	4240	LT821M400P600A
	820	40	50	130	240	4190	LT821M400Q500A
	820	45	40	130	240	4130	LT821M400V400A
	1000	35	70	110	200	4900	LT102M400P700A
	1000	40	55	110	200	4750	LT102M400Q550A
	1000	45	45	110	200	4660	LT102M400V450A
	1200	35	80	94	170	5620	LT122M400P800A
	1200	40	60	94	170	5350	LT122M400Q600A
	1200	45	50	94	170	5220	LT122M400V500A
	1500	35	95	72	130	6680	LT152M400P950A
	1500	40	75	72	130	6340	LT152M400Q750A
	1500	45	55	72	130	5940	LT152M400V550A
	1800	40	85	61	110	7240	LT182M400Q850A
	1800	45	65	61	110	6790	LT182M400V650A
	2200	45	80	50	90	7930	LT222M400V800A
2700	45	90	41	74	9110	LT272M400V900A	
420	390	35	40	280	510	2470	LT391M420P400A
	470	35	45	230	420	2800	LT471M420P450A
	560	35	50	200	360	3150	LT561M420P500A
	560	40	40	200	360	3150	LT561M420Q400A
	680	35	55	160	290	3600	LT681M420P550A
	680	40	45	160	290	3570	LT681M420Q450A
	820	35	65	130	240	4130	LT821M420P650A
	820	40	50	130	240	4030	LT821M420Q500A
	820	45	40	130	240	3960	LT821M420V400A
	1000	35	75	110	200	4780	LT102M420P750A
	1000	40	60	110	200	4650	LT102M420Q600A
	1000	45	45	110	200	4480	LT102M420V450A
	1200	35	85	94	170	5490	LT122M420P850A
	1200	40	70	94	170	5300	LT122M420Q700A
	1200	45	55	94	170	5140	LT122M420V550A
	1500	40	80	72	130	6210	LT152M420Q800A
	1500	45	65	72	130	5990	LT152M420V650A
	1800	40	95	61	110	7150	LT182M420Q950A
1800	45	70	61	110	6720	LT182M420V700A	
2200	45	85	50	90	7830	LT222M420V850A	
450	330	35	40	440	800	2290	LT331M450P400A
	390	35	40	380	680	2560	LT391M450P400A
	470	35	45	310	560	2900	LT471M450P450A
	470	40	40	310	560	2940	LT471M450Q400A
	560	35	55	260	470	3300	LT561M450P550A
	560	40	45	260	470	3300	LT561M450Q450A
680	35	60	220	390	3770	LT681M450P600A	

: See description at end of standard ratings

STANDARD RATINGS

NOT FOR NEW DESIGNS

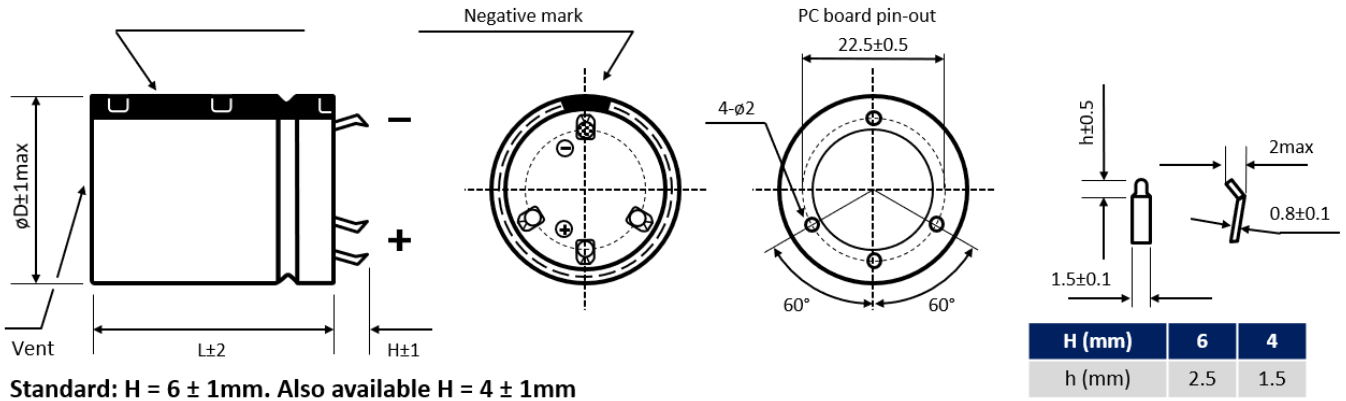
V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	680	40	50	220	390	3740	LT681M450Q500A □□
	680	45	40	220	390	3700	LT681M450V400A □□
	820	35	70	180	320	4340	LT821M450P700A □□
	820	40	55	180	320	4230	LT821M450Q550A □□
	820	45	45	180	320	4170	LT821M450V450A □□
	1000	35	80	150	270	5040	LT102M450P800A □□
	1000	40	60	150	270	4740	LT102M450Q600A □□
	1000	40	65	150	270	4870	LT102M450Q650A □□
	1000	45	50	150	270	4710	LT102M450V500A □□
	1200	35	95	120	220	5820	LT122M450P950A □□
	1200	40	75	120	220	5560	LT122M450Q750A □□
	1200	45	60	120	220	5390	LT122M450V600A □□
	1500	40	90	100	180	6590	LT152M450Q900A □□
	1500	45	70	100	180	6280	LT152M450V700A □□
	1800	45	80	83	150	7150	LT182M450V800A □□
2200	45	95	67	120	8310	LT222M450V950A □□	
500	220	35	40	670	1210	1300	LT221M500P400A □□
	270	35	45	540	980	1480	LT271M500P450A □□
	330	35	50	440	800	1690	LT331M500P500A □□
	330	40	40	440	800	1720	LT331M500Q400A □□
	390	35	55	380	680	1900	LT391M500P550A □□
	390	40	45	380	680	1920	LT391M500Q450A □□
	470	35	60	310	560	2160	LT471M500P600A □□
	470	40	50	310	560	2160	LT471M500Q500A □□
	470	45	40	310	560	2170	LT471M500V400A □□
	560	35	70	260	470	2460	LT561M500P700A □□
	560	40	55	260	470	2430	LT561M500Q550A □□
	560	45	45	260	470	2430	LT561M500V450A □□
	680	35	80	220	390	2840	LT681M500P800A □□
	680	40	65	220	390	2790	LT681M500Q650A □□
	680	45	50	220	390	2750	LT681M500V500A □□
	820	35	95	180	320	3290	LT821M500P950A □□
	820	40	75	180	320	3190	LT821M500Q750A □□
	820	45	60	180	320	3140	LT821M500V600A □□
	1000	40	85	150	270	3690	LT102M500Q850A □□
	1000	45	70	150	270	3610	LT102M500V700A □□
1200	45	80	120	220	4110	LT122M500V800A □□	
1500	45	100	100	180	4860	LT152M500VA00A □□	

□□: Enter **Y6** for multipin-type • 6mm pin length

□□: Enter **Y4** for multipin type • 4mm pin length

DIMENSIONS ▪ All dimensions in mm

Multi-pin version ▪ Standard type



MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$16 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 500$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

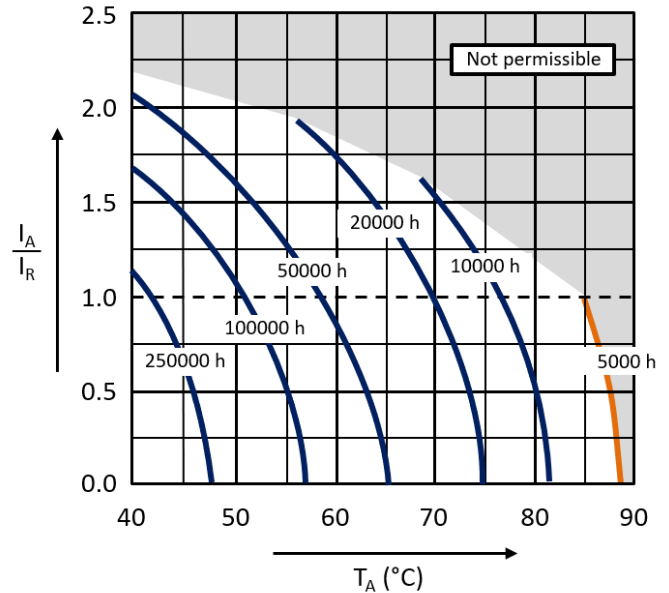
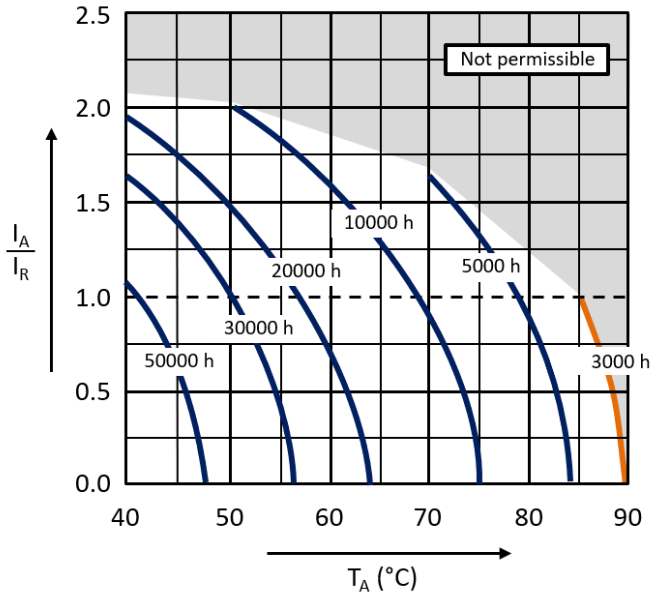
Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines Page 258	Packaging Information Liquid Snap-In Page 248

USEFUL LIFE

$V_R \leq 100V$

$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UB SERIES ▪ LONG LIFE 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 85°C ▪ 5 000 hours
- Extremely stable dissipation factor and leakage current
- High voltage up to 500V
- Especially for applications with demanding operating environment



SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +85°C		-25 ~ +85°C	
Rated Voltage Range	V _R	200 ~ 450V DC		500V DC	
Surge Voltage	V _S	(V _R ≤ 315V) ▪ V _S = 1.15·V _R		(V _R > 315V) ▪ V _S = 1.10·V _R	
Capacitance Range	C _R	68 ~ 3300µF		100 ~ 1500µF	
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ▪ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V _R (V DC)	200 ~ 400	450 ~ 500	
		tanδ	15	20	
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings			
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	200 ~ 250	315 ~ 450	500
		Z-25°C/Z+20°C	4	5	6
		Z-40°C/Z+20°C	7	10	-

Lifetime Test					
Useful Life 85°C (V _R & I _R applied)	Test	5 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria				
Endurance 85°C (V _R & I _R applied)	Test	2 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 85°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4				
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	120	22	25	980	1660	1100	UB121M200M250A
	220	22	25	530	900	1150	UB221M200M250A
	270	22	30	440	740	1300	UB271M200M300A
	330	22	30	350	600	1500	UB331M200M300A
	330	25	25	350	600	1500	UB331M200N250A
	390	22	35	300	510	1650	UB391M200M350A
	390	25	30	300	510	1700	UB391M200N300A
	470	22	40	250	420	1950	UB471M200M400A
	470	25	30	250	420	1800	UB471M200N300A
	470	30	25	250	420	1900	UB471M200O250A
	560	22	45	210	360	2150	UB561M200M450A
	560	25	35	210	360	2120	UB561M200N350A
	560	30	30	210	360	2200	UB561M200O300A
	560	35	20	210	360	2100	UB561M200P200A
	680	22	45	170	290	2350	UB681M200M450A
	680	25	40	170	290	2400	UB681M200N400A
	680	30	35	170	290	2500	UB681M200O350A
	680	35	20	170	290	2320	UB681M200P200A
	820	25	40	140	240	2650	UB821M200N400A
	820	30	35	140	240	2730	UB821M200O350A
	820	35	25	140	240	2820	UB821M200P250A
	1000	25	40	120	200	2720	UB102M200N400A
	1000	30	40	120	200	3150	UB102M200O400A
	1000	35	30	120	200	3000	UB102M200P300A
	1200	30	45	100	170	3500	UB122M200O450A
	1200	35	35	100	170	3500	UB122M200P350A
	1500	25	50	76	130	3740	UB152M200N500A
	1500	30	45	76	130	3930	UB152M200O450A
1500	35	40	76	130	3930	UB152M200P400A	
1800	35	40	65	110	4100	UB182M200P400A	
2200	35	50	53	90	4250	UB222M200P500A	
3300	35	60	35	60	4400	UB332M200P600A	
250	100	22	25	1170	1990	720	UB101M250M250A
	180	22	25	650	1110	1000	UB181M250M250A
	220	22	30	530	900	1150	UB221M250M300A
	220	25	25	530	900	1150	UB221M250N250A
	270	22	30	440	740	1280	UB271M250M300A
	330	22	30	350	600	1360	UB331M250M300A
	330	25	30	350	600	1420	UB331M250N300A
	330	30	25	350	600	1530	UB331M250O250A
	390	22	45	300	510	1720	UB391M250M450A
	390	25	35	300	510	1700	UB391M250N350A
	390	30	25	300	510	1690	UB391M250O250A
	470	22	50	250	420	2010	UB471M250M500A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	470	25	40	250	420	1890	UB471M250N400A
	470	30	30	250	420	1870	UB471M250O300A
	470	35	20	250	420	1860	UB471M250P200A
	560	25	45	210	360	2250	UB561M250N450A
	560	30	35	210	360	2250	UB561M250O350A
	560	35	25	210	360	2220	UB561M250P250A
	680	25	50	170	290	2650	UB681M250N500A
	680	30	40	170	290	2650	UB681M250O400A
	680	35	30	170	290	2610	UB681M250P300A
	820	30	40	140	240	2950	UB821M250O400A
	820	35	35	140	240	2920	UB821M250P350A
	1000	30	40	120	200	3180	UB102M250O400A
	1000	35	35	120	200	3250	UB102M250P350A
	1200	30	45	100	170	3580	UB122M250O450A
	1200	35	40	100	170	3580	UB122M250P400A
	1500	30	50	76	130	3940	UB152M250O500A
	1500	35	45	76	130	4300	UB152M250P450A
1800	35	45	65	110	4460	UB182M250P450A	
2200	35	50	53	90	4670	UB222M250P500A	
315	100	22	25	1170	1990	720	UB101M315M250A
	150	22	30	780	1330	900	UB151M315M300A
	150	25	25	780	1330	900	UB151M315N250A
	180	22	35	650	1110	1000	UB181M315M350A
	180	25	30	650	1110	1020	UB181M315N300A
	220	22	40	530	900	1150	UB221M315M400A
	220	25	35	530	900	1180	UB221M315N350A
	220	30	25	530	900	1120	UB221M315O250A
	270	22	45	440	740	1230	UB271M315M450A
	270	25	40	440	740	1350	UB271M315N400A
	270	30	30	440	740	1330	UB271M315O300A
	270	35	25	440	740	1380	UB271M315P250A
	330	25	45	350	600	1600	UB331M315N450A
	330	30	35	350	600	1600	UB331M315O350A
	390	35	30	300	510	1700	UB391M315P300A
	470	30	45	250	420	2090	UB471M315O450A
	470	35	35	250	420	2030	UB471M315P350A
560	30	50	210	360	2300	UB561M315O500A	
560	35	40	210	360	2270	UB561M315P400A	
680	35	45	170	290	2360	UB681M315P450A	
350	82	22	25	1430	2430	700	UB820M350M250A
	100	22	25	1170	1990	790	UB101M350M250A
	120	22	30	980	1660	840	UB121M350M300A
	120	25	25	980	1660	840	UB121M350N250A
	150	22	35	780	1330	980	UB151M350M350A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
350	150	25	30	780	1330	1010	UB151M350N300A
	180	22	40	650	1110	1180	UB181M350M400A
	180	25	35	650	1110	1150	UB181M350N350A
	180	30	30	650	1110	1150	UB181M350O300A
	220	22	45	530	900	1250	UB221M350M450A
	220	25	35	530	900	1230	UB221M350N350A
	220	30	30	530	900	1280	UB221M350O300A
	220	35	25	530	900	1330	UB221M350P250A
	270	25	45	440	740	1460	UB271M350N450A
	270	30	35	440	740	1460	UB271M350O350A
	330	25	50	350	600	1680	UB331M350N500A
	330	35	30	350	600	1650	UB331M350P300A
	390	30	40	300	510	1770	UB391M350O400A
	390	35	35	300	510	1830	UB391M350P350A
	470	30	45	250	420	2110	UB471M350O450A
	470	35	40	250	420	2160	UB471M350P400A
	560	35	45	210	360	2380	UB561M350P450A
	680	35	50	170	290	2660	UB681M350P500A
820	35	60	140	240	2870	UB821M350P600A	
400	68	22	20	1720	2930	580	UB680M400M200A
	82	22	25	1430	2430	720	UB820M400M250A
	100	22	30	1170	1990	860	UB101M400M300A
	100	25	25	1170	1990	860	UB101M400N250A
	120	22	30	980	1660	870	UB121M400M300A
	120	25	25	980	1660	870	UB121M400N250A
	150	22	30	780	1330	1030	UB151M400M300A
	150	25	30	780	1330	1070	UB151M400N300A
	150	30	25	780	1330	1070	UB151M400O250A
	180	22	45	650	1110	1200	UB181M400M450A
	180	25	35	650	1110	1190	UB181M400N350A
	180	30	30	650	1110	1210	UB181M400O300A
	180	35	25	650	1110	1260	UB181M400P250A
	220	22	50	530	900	1690	UB221M400M500A
	220	25	40	530	900	1690	UB221M400N400A
	220	30	30	530	900	1690	UB221M400O300A
	220	35	25	530	900	1620	UB221M400P250A
	270	25	40	440	740	1700	UB271M400N400A
	270	30	35	440	740	1800	UB271M400O350A
	270	35	30	440	740	1800	UB271M400P300A
	330	22	50	350	600	1820	UB331M400M500A
330	30	40	350	600	1900	UB331M400O400A	
330	35	35	350	600	2000	UB331M400P350A	
390	30	40	300	510	2050	UB391M400O400A	
390	35	35	300	510	2170	UB391M400P350A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	470	30	50	250	420	3030	UB471M400O500A
	470	35	40	250	420	2950	UB471M400P400A
	470	35	45	250	420	3110	UB471M400P450A
	560	30	50	210	360	3330	UB561M400O500A
	560	35	40	210	360	3280	UB561M400P400A
	560	35	45	210	360	3390	UB561M400P450A
	560	40	40	210	360	3420	UB561M400Q400A
	680	30	60	170	290	3810	UB681M400O600A
	680	35	45	170	290	3710	UB681M400P450A
	680	35	50	170	290	3850	UB681M400P500A
	680	40	40	170	290	3780	UB681M400Q400A
	820	35	55	140	240	4190	UB821M400P550A
	820	40	50	140	240	4260	UB821M400Q500A
	820	45	40	140	240	4220	UB821M400V400A
	1000	35	55	120	200	4890	UB102M400P550A
	1000	40	55	120	200	4990	UB102M400Q550A
	1000	45	45	120	200	4950	UB102M400V450A
	1200	35	80	100	170	5670	UB122M400P800A
	1200	40	60	100	170	5630	UB122M400Q600A
	1200	40	70	100	170	5690	UB122M400Q700A
1200	45	50	100	170	5590	UB122M400V500A	
1500	35	95	76	130	6700	UB152M400P950A	
1500	40	75	76	130	6400	UB152M400Q750A	
1500	45	55	76	130	6010	UB152M400V550A	
1800	40	85	65	110	7300	UB182M400Q850A	
1800	45	65	65	110	7150	UB182M400V650A	
2200	45	80	53	90	8420	UB222M400V800A	
450	68	22	30	2290	3900	630	UB680M450M300A
	82	22	35	1900	3230	730	UB820M450M350A
	100	22	35	1560	2650	890	UB101M450M350A
	100	25	30	1560	2650	920	UB101M450N300A
	120	22	40	1300	2210	1200	UB121M450M400A
	120	25	35	1300	2210	1230	UB121M450N350A
	120	30	30	1300	2210	1150	UB121M450O300A
	150	22	40	1040	1770	1260	UB151M450M400A
	150	25	35	1040	1770	1320	UB151M450N350A
	150	30	30	1040	1770	1320	UB151M450O300A
	150	35	20	1040	1770	1260	UB151M450P200A
	180	25	45	860	1470	1550	UB181M450N450A
	180	30	35	860	1470	1550	UB181M450O350A
	180	35	25	860	1470	1410	UB181M450P250A
	220	25	45	710	1210	1690	UB221M450N450A
	220	30	40	710	1210	1820	UB221M450O400A
220	35	30	710	1210	1730	UB221M450P300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	270	30	40	580	980	1900	UB271M450O400A
	270	35	35	580	980	1900	UB271M450P350A
	330	30	40	470	800	2030	UB331M450O400A
	330	30	45	470	800	2090	UB331M450O450A
	330	35	35	470	800	2070	UB331M450P350A
	330	35	40	470	800	2150	UB331M450P400A
	390	25	55	400	680	2550	UB391M450N550A
	390	30	45	400	680	2590	UB391M450O450A
	390	35	35	400	680	2550	UB391M450P350A
	390	35	40	400	680	2630	UB391M450P400A
	390	35	45	400	680	2700	UB391M450P450A
	470	30	50	330	560	3250	UB471M450O500A
	470	35	40	330	560	3210	UB471M450P400A
	470	40	40	330	560	3310	UB471M450Q400A
	560	35	50	280	470	3630	UB561M450P500A
	560	35	55	280	470	3690	UB561M450P550A
	560	35	60	280	470	3730	UB561M450P600A
	560	40	45	280	470	3700	UB561M450Q450A
	680	35	50	230	390	3930	UB681M450P500A
	680	35	60	230	390	3990	UB681M450P600A
	680	40	50	230	390	3990	UB681M450Q500A
	680	40	60	230	390	4050	UB681M450Q600A
	680	45	40	230	390	3960	UB681M450V400A
	820	35	60	190	320	4440	UB821M450P600A
	820	40	55	190	320	4530	UB821M450Q550A
	820	40	60	190	320	4580	UB821M450Q600A
	820	45	45	190	320	4490	UB821M450V450A
	1000	35	80	160	270	5230	UB102M450P800A
	1000	40	65	160	270	5190	UB102M450Q650A
	1000	40	70	160	270	5260	UB102M450Q700A
	1000	45	50	160	270	5150	UB102M450V500A
	1500	40	90	110	180	6830	UB152M450Q900A
1500	45	70	110	180	6780	UB152M450V700A	
1800	45	80	88	150	7390	UB182M450V800A	
2200	45	95	71	120	8610	UB222M450V950A	
500	100	30	25	1560	2650	930	UB101M500O250A
	120	30	30	1300	2210	1050	UB121M500O300A
	120	35	25	1300	2210	1070	UB121M500P250A
	150	30	35	1040	1770	1230	UB151M500O350A
	180	30	40	860	1470	1460	UB181M500O400A
	180	35	30	860	1470	1380	UB181M500P300A
	220	30	45	710	1210	1660	UB221M500O450A
	220	35	35	710	1210	1570	UB221M500P350A
270	30	50	580	980	1850	UB271M500O500A	

: See description at end of standard ratings

STANDARD RATINGS

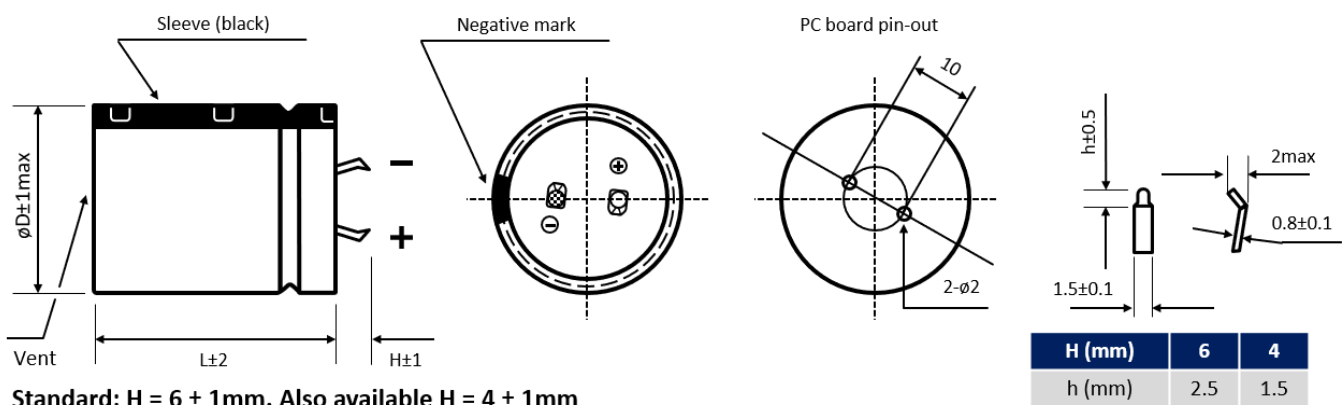
V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
500	270	35	40	580	980	1770	UB271M500P400A
	330	35	40	470	800	1790	UB331M500P400A
	330	35	45	470	800	1880	UB331M500P450A
	330	40	40	470	800	1880	UB331M500Q400A
	390	35	45	400	680	2120	UB391M500P450A
	390	35	50	400	680	2360	UB391M500P500A
	390	40	45	400	680	2410	UB391M500Q450A
	470	35	50	330	560	2420	UB471M500P500A
	470	35	55	330	560	2560	UB471M500P550A
	470	40	50	330	560	2600	UB471M500Q500A
	470	45	40	330	560	2580	UB471M500V400A
	560	35	55	280	470	2560	UB561M500P550A
	560	35	70	280	470	2820	UB561M500P700A
	560	40	55	280	470	2730	UB561M500Q550A
	560	45	45	280	470	2700	UB561M500V450A
	680	35	65	230	390	2700	UB681M500P650A
	680	35	70	230	390	2820	UB681M500P700A
	680	40	65	230	390	2890	UB681M500Q650A
	680	45	50	230	390	2820	UB681M500V500A
	820	35	95	190	320	3300	UB821M500P950A
	820	40	65	190	320	3000	UB821M500Q650A
	820	45	60	190	320	3200	UB821M500V600A
	1000	40	85	160	270	3700	UB102M500Q850A
	1000	45	70	160	270	3650	UB102M500V700A
1200	45	80	130	220	4150	UB122M500V800A	
1500	45	100	110	180	4950	UB152M500VA00A	

: Enter **P6** for standard type - 6mm pin length
: Enter **Z6** for 3-pin type - 6mm pin length
: Enter **Y6** for multipin-type - 6mm pin length

: Enter **P4** for standard type - 4mm pin length
: Enter **Z4** for 3-pin type - 4mm pin length
: Enter **Y4** for multipin type - 4mm pin length

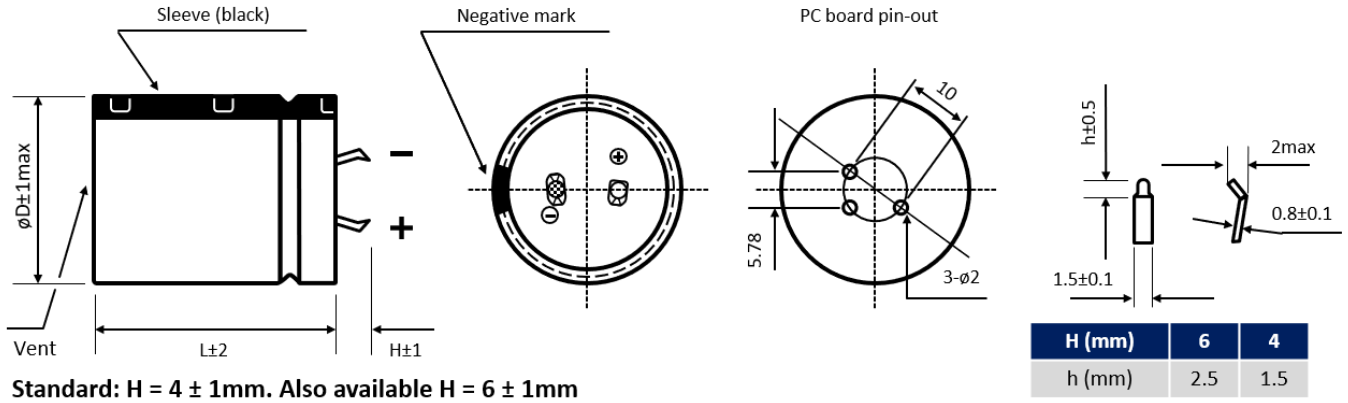
DIMENSIONS - All dimensions in mm

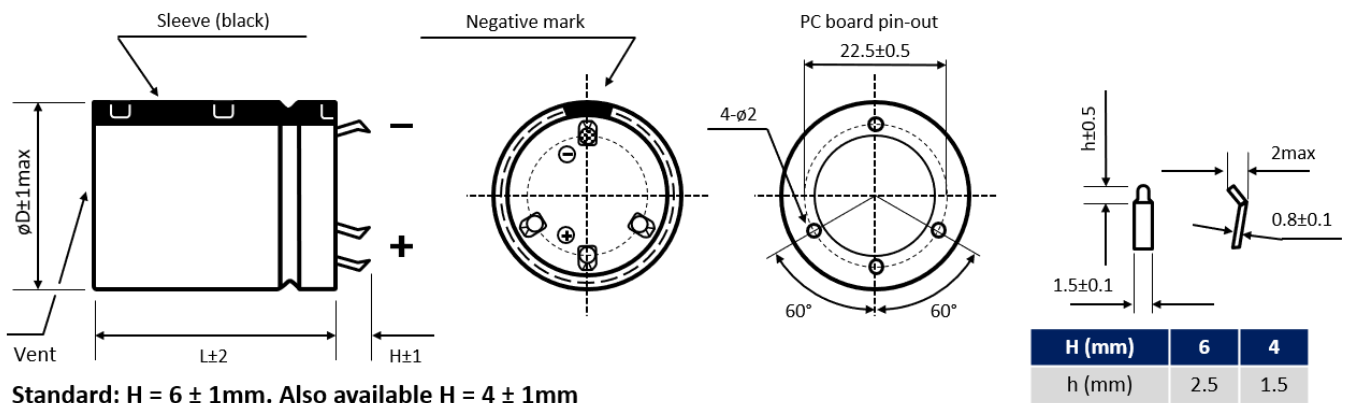
2-pin version - Standard type



DIMENSIONS ▪ All dimensions in mm

3-pin version ▪ Polarity protection


Standard: H = 4 ± 1mm. Also available H = 6 ± 1mm

 Multipin version ▪ Diameter $\phi D \geq 30$ mm

Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

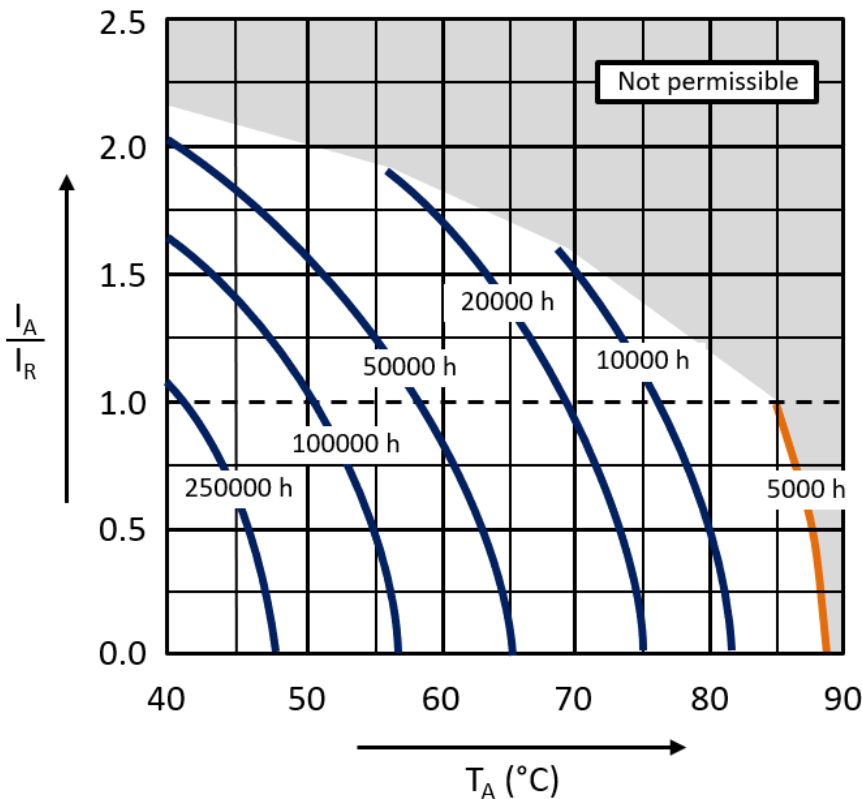
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 500$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

LU SERIES ■ LONG LIFE 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR • Snap-In type
- Useful life: 85°C ■ 4000 hours up to 7000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C					
Rated Voltage Range	V _R	10 ~ 350V DC					400 ~ 600V DC					
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R					
Capacitance Range	C _R	82 ~ 82000µF					47 ~ 2200µF					
Cap. Tolerance	ΔC	±20% (120Hz ■ 20°C)										
Leakage Current (20°C • V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ■ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]										
Dissipation Factor % (20°C • 120Hz)	tanδ	µF / V DC	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 600
		≤ 8200	-	35	30	25	20	20	15	15	15	20
		10000 ~ 22000	40	40	35	30	30	25	20	-	-	-
		≥ 27000	50	40	35	35	30	25	-	-	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	6.3 ~ 16		25	35	50 ~ 100		160 ~ 250	315 ~ 350	400 ~ 600	
		Z-25°C/Z+20°C	5		4	4	4		4	8	8	
		Z-40°C/Z+20°C	15		15	12	12		8	12	-	
Lifetime Test			V _R ≤ 100V					V _R > 100V				
Useful Life 85°C (V _R & I _R applied)		Test	4 000 hours					7 000 hours				
		ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value				
		tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ■ parts show higher drift as test criteria										
Endurance 85°C (V _R & I _R applied)		Test	3 000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
Shelf Life 85°C (V _R = 0)		Test	1 000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4										
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ■ IEC 60068-2-6										

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
10	10000	20	25	36	46	2230	LU103M010L250A □□
	12000	22	25	34	44	2900	LU123M010M250A □□
	15000	22	30	27	35	3200	LU153M010M300A □□
	15000	25	25	27	35	3210	LU153M010N250A □□
	18000	22	35	23	29	3220	LU183M010M350A □□
	18000	25	30	23	29	3650	LU183M010N300A □□
	22000	22	40	19	24	3790	LU223M010M400A □□
	22000	25	30	19	24	3750	LU223M010N300A □□
	22000	30	25	19	24	4100	LU223M010O250A □□
	27000	25	35	19	25	4040	LU273M010N350A □□
	27000	30	30	19	25	4060	LU273M010O300A □□
	33000	25	40	15	20	4600	LU333M010N400A □□
	33000	30	30	15	20	4800	LU333M010O300A □□
	39000	25	45	13	17	5290	LU393M010N450A □□
	39000	35	30	13	17	5300	LU393M010P300A □□
	47000	25	50	11	14	5800	LU473M010N500A □□
	47000	30	40	11	14	5820	LU473M010O400A □□
	47000	35	30	11	14	6000	LU473M010P300A □□
	56000	30	45	9	12	6700	LU563M010O450A □□
	56000	35	35	9	12	6800	LU563M010P350A □□
68000	30	50	8	10	7500	LU683M010O500A □□	
68000	35	40	8	10	7550	LU683M010P400A □□	
82000	35	45	6	8	8700	LU823M010P450A □□	
16	8200	20	25	44	57	2570	LU822M016L250A □□
	10000	22	25	36	46	2860	LU103M016M250A □□
	12000	22	25	34	44	2890	LU123M016M250A □□
	15000	22	30	27	35	3450	LU153M016M300A □□
	18000	25	25	23	29	3470	LU183M016N250A □□
	22000	25	30	19	24	3940	LU223M016N300A □□
	27000	30	30	15	20	4990	LU273M016O300A □□
	33000	30	35	12	16	5490	LU333M016O350A □□
	33000	35	25	12	16	5210	LU333M016P250A □□
	39000	30	40	10	14	6110	LU393M016O400A □□
	39000	35	30	10	14	6130	LU393M016P300A □□
	47000	30	45	9	11	6950	LU473M016O450A □□
	56000	30	50	7	10	7630	LU563M016O500A □□
	56000	35	40	7	10	7690	LU563M016P400A □□
	68000	35	45	6	8	8450	LU683M016P450A □□
82000	35	50	5	7	9150	LU823M016P500A □□	
25	5600	20	25	55	71	2330	LU562M025L250A □□
	5600	22	25	55	71	2400	LU562M025M250A □□
	6800	22	25	45	59	2620	LU682M025M250A □□
	6800	25	25	45	59	2680	LU682M025N250A □□
	8200	22	30	37	49	2910	LU822M025M300A □□

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
25	8200	25	25	37	49	2950	LU822M025N250A □□
	10000	22	35	31	40	3310	LU103M025M350A □□
	10000	25	25	31	40	3180	LU103M025N250A □□
	12000	22	40	30	39	3770	LU123M025M400A □□
	12000	25	30	30	39	3650	LU123M025N300A □□
	15000	22	45	24	31	4080	LU153M025M450A □□
	15000	25	35	24	31	4100	LU153M025N350A □□
	18000	25	40	20	26	4680	LU183M025N400A □□
	18000	30	30	20	26	4710	LU183M025O300A □□
	22000	25	45	16	21	4720	LU223M025N450A □□
	22000	30	35	16	21	4750	LU223M025O350A □□
	27000	25	50	13	17	6020	LU273M025N500A □□
	27000	30	40	13	17	6100	LU273M025O400A □□
	27000	35	35	13	17	6120	LU273M025P350A □□
	33000	30	45	11	14	6750	LU333M025O450A □□
	33000	35	40	11	14	6800	LU333M025P400A □□
	39000	30	50	9	12	7400	LU393M025O500A □□
39000	35	45	9	12	7610	LU393M025P450A □□	
47000	35	50	8	10	8300	LU473M025P500A □□	
35	3300	20	25	77	100	2140	LU332M035L250A □□
	3900	20	30	65	85	2280	LU392M035L300A □□
	3900	22	25	65	85	2220	LU392M035M250A □□
	4700	20	35	54	71	2460	LU472M035L350A □□
	4700	22	25	54	71	2470	LU472M035M250A □□
	5600	22	30	46	59	2800	LU562M035M300A □□
	5600	25	25	46	59	2820	LU562M035N250A □□
	6800	22	35	38	49	2890	LU682M035M350A □□
	6800	25	30	38	49	2920	LU682M035N300A □□
	6800	30	25	38	49	3090	LU682M035O250A □□
	8200	22	40	31	40	3470	LU822M035M400A □□
	8200	25	35	31	40	3500	LU822M035N350A □□
	8200	30	25	31	40	3510	LU822M035O250A □□
	10000	22	45	26	33	3600	LU103M035M450A □□
	10000	25	40	26	33	3650	LU103M035N400A □□
	10000	30	30	26	33	3670	LU103M035O300A □□
	10000	35	25	26	33	3710	LU103M035P250A □□
	12000	25	40	26	33	4510	LU123M035N400A □□
	12000	30	35	26	33	4550	LU123M035O350A □□
	12000	35	25	26	33	4520	LU123M035P250A □□
	15000	25	45	20	27	4550	LU153M035N450A □□
	15000	30	40	20	27	4800	LU153M035O400A □□
	15000	35	30	20	27	4820	LU153M035P300A □□
18000	25	50	17	22	4840	LU183M035N500A □□	
18000	30	40	17	22	4870	LU183M035O400A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
35	18000	35	35	17	22	5700	LU183M035P350A ☐☐
	22000	30	45	14	18	6380	LU223M035O450A ☐☐
	22000	35	40	14	18	6400	LU223M035P400A ☐☐
	27000	35	45	13	17	6900	LU273M035P450A ☐☐
	33000	35	50	11	14	7490	LU333M035P500A ☐☐
50	2200	20	25	92	120	2070	LU222M050L250A ☐☐
	2200	22	25	92	120	2190	LU222M050M250A ☐☐
	2700	20	30	76	98	2210	LU272M050L300A ☐☐
	2700	22	25	76	98	2210	LU272M050M250A ☐☐
	3300	20	35	62	80	2410	LU332M050L350A ☐☐
	3300	22	30	62	80	2410	LU332M050M300A ☐☐
	3300	25	25	62	80	2410	LU332M050N250A ☐☐
	3900	20	40	52	68	2720	LU392M050L400A ☐☐
	3900	22	30	52	68	2610	LU392M050M300A ☐☐
	3900	25	25	52	68	2560	LU392M050N250A ☐☐
	4700	22	35	43	56	2930	LU472M050M350A ☐☐
	4700	25	30	43	56	3070	LU472M050N300A ☐☐
	4700	30	25	43	56	3010	LU472M050O250A ☐☐
	5600	22	40	36	47	3410	LU562M050M400A ☐☐
	5600	25	35	36	47	3470	LU562M050N350A ☐☐
	5600	30	25	36	47	3370	LU562M050O250A ☐☐
	6800	22	45	30	39	3940	LU682M050M450A ☐☐
	6800	25	35	30	39	3890	LU682M050N350A ☐☐
	6800	30	30	30	39	3860	LU682M050O300A ☐☐
	6800	35	25	30	39	3840	LU682M050P250A ☐☐
	8200	25	45	25	32	4440	LU822M050N450A ☐☐
	8200	30	35	25	32	4470	LU822M050O350A ☐☐
	8200	35	30	25	32	4470	LU822M050P300A ☐☐
	10000	25	50	20	27	5020	LU103M050N500A ☐☐
	10000	30	40	20	27	5080	LU103M050O400A ☐☐
	10000	35	30	20	27	5020	LU103M050P300A ☐☐
	12000	30	45	26	33	5600	LU123M050O450A ☐☐
	12000	35	35	26	33	5600	LU123M050P350A ☐☐
	15000	30	50	20	27	6440	LU153M050O500A ☐☐
	15000	35	45	20	27	6560	LU153M050P450A ☐☐
	18000	35	45	17	22	7180	LU183M050P450A ☐☐
	63	1500	20	25	140	180	1700
1500		22	25	140	180	1750	LU152M063M250A ☐☐
1800		20	30	120	150	2050	LU182M063L300A ☐☐
1800		22	25	120	150	2040	LU182M063M250A ☐☐
2200		20	35	92	120	2400	LU222M063L350A ☐☐
2200		22	30	92	120	2410	LU222M063M300A ☐☐
2200		25	25	92	120	2430	LU222M063N250A ☐☐
2700		20	40	76	98	2530	LU272M063L400A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
63	2700	22	35	76	98	2540	LU272M063M350A
	2700	25	30	76	98	2580	LU272M063N300A
	3300	22	35	62	80	2720	LU332M063M350A
	3300	25	30	62	80	2740	LU332M063N300A
	3300	30	25	62	80	2840	LU332M063O250A
	3900	22	40	52	68	2950	LU392M063M400A
	3900	25	35	52	68	3160	LU392M063N350A
	3900	30	30	52	68	3170	LU392M063O300A
	3900	35	25	52	68	3190	LU392M063P250A
	4700	22	50	43	56	3690	LU472M063M500A
	4700	25	40	43	56	3590	LU472M063N400A
	4700	30	30	43	56	3700	LU472M063O300A
	4700	35	25	43	56	3710	LU472M063P250A
	5600	25	45	36	47	3810	LU562M063N450A
	5600	30	35	36	47	3850	LU562M063O350A
	5600	35	30	36	47	3910	LU562M063P300A
	6800	25	50	30	39	4530	LU682M063N500A
	6800	30	40	30	39	4610	LU682M063O400A
	6800	35	30	30	39	4950	LU682M063P300A
	8200	30	45	25	32	5150	LU822M063O450A
8200	35	35	25	32	5180	LU822M063P350A	
10000	30	50	20	27	5800	LU103M063O500A	
10000	35	40	20	27	5830	LU103M063P400A	
12000	35	45	21	28	6470	LU123M063P450A	
15000	35	50	17	22	6850	LU153M063P500A	
80	1000	20	25	150	200	1570	LU102M080L250A
	1200	20	30	130	170	1800	LU122M080L300A
	1200	22	25	130	170	1810	LU122M080M250A
	1500	20	30	100	130	2100	LU152M080L300A
	1500	22	30	100	130	2120	LU152M080M300A
	1500	25	25	100	130	2160	LU152M080N250A
	1800	20	35	85	110	2300	LU182M080L350A
	1800	22	30	85	110	2310	LU182M080M300A
	1800	25	25	85	110	2350	LU182M080N250A
	2200	20	40	70	90	2530	LU222M080L400A
	2200	22	35	70	90	2560	LU222M080M350A
	2200	25	30	70	90	2580	LU222M080N300A
	2200	30	25	70	90	2620	LU222M080O250A
	2700	22	40	57	74	2930	LU272M080M400A
	2700	25	35	57	74	2950	LU272M080N350A
	2700	30	25	57	74	2990	LU272M080O250A
	2700	35	25	57	74	3020	LU272M080P250A
	3300	22	45	46	60	3250	LU332M080M450A
3300	25	40	46	60	3290	LU332M080N400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
80	3300	30	30	46	60	3310	LU332M080O300A
	3300	35	25	46	60	3350	LU332M080P250A
	3900	22	50	39	51	3620	LU392M080M500A
	3900	25	45	39	51	3710	LU392M080N450A
	3900	30	35	39	51	3780	LU392M080O350A
	3900	35	30	39	51	3910	LU392M080P300A
	4700	25	50	33	42	4280	LU472M080N500A
	4700	30	40	33	42	4310	LU472M080O400A
	4700	35	30	33	42	4450	LU472M080P300A
	5600	30	45	27	36	4700	LU562M080O450A
	5600	35	35	27	36	4750	LU562M080P350A
	6800	30	50	23	29	5270	LU682M080O500A
	6800	35	40	23	29	5350	LU682M080P400A
	8200	35	45	19	24	5900	LU822M080P450A
	10000	35	50	22	27	7050	LU103M080P500A
100	680	20	25	220	290	1680	LU681M100L250A
	680	22	25	220	290	1710	LU681M100M250A
	820	20	30	180	240	1910	LU821M100L300A
	820	22	25	180	240	1900	LU821M100M250A
	1000	20	30	150	200	2020	LU102M100L300A
	1000	22	30	150	200	2040	LU102M100M300A
	1000	25	25	150	200	2100	LU102M100N250A
	1200	20	35	130	170	2120	LU122M100L350A
	1200	22	30	130	170	2150	LU122M100M300A
	1200	25	25	130	170	2180	LU122M100N250A
	1500	20	40	100	130	2450	LU152M100L400A
	1500	22	35	100	130	2470	LU152M100M350A
	1500	25	30	100	130	2500	LU152M100N300A
	1500	30	25	100	130	2560	LU152M100O250A
	1800	22	40	85	110	2770	LU182M100M400A
	1800	25	35	85	110	2810	LU182M100N350A
	1800	30	25	85	110	2850	LU182M100O250A
	1800	35	25	85	110	2890	LU182M100P250A
	2200	22	45	70	90	3150	LU222M100M450A
	2200	25	40	70	90	3210	LU222M100N400A
	2200	30	30	70	90	3250	LU222M100O300A
	2200	35	25	70	90	3280	LU222M100P250A
	2700	25	45	57	74	3660	LU272M100N450A
	2700	30	35	57	74	3700	LU272M100O350A
	2700	35	30	57	74	3770	LU272M100P300A
	3300	25	50	46	60	4150	LU332M100N500A
	3300	30	40	46	60	4180	LU332M100O400A
3300	35	35	46	60	4210	LU332M100P350A	
3900	30	45	39	51	4670	LU392M100O450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
100	3900	35	35	39	51	4690	LU392M100P350A
	4700	30	50	33	42	5260	LU472M100O500A
	4700	35	40	33	42	5310	LU472M100P400A
	5600	35	45	27	36	5890	LU562M100P450A
	6800	35	50	23	29	6010	LU682M100P500A
160	220	20	25	510	900	1110	LU221M160L250A
	270	20	25	420	740	1120	LU271M160L250A
	270	22	25	420	740	1270	LU271M160M250A
	330	20	30	340	600	1280	LU331M160L300A
	330	22	25	340	600	1550	LU331M160M250A
	390	20	30	290	510	1630	LU391M160L300A
	390	22	25	290	510	1650	LU391M160M250A
	390	25	20	290	510	1670	LU391M160N200A
	470	22	30	240	420	1900	LU471M160M300A
	470	25	25	240	420	1920	LU471M160N250A
	560	22	30	210	360	2150	LU561M160M300A
	560	25	25	210	360	2180	LU561M160N250A
	560	30	20	210	360	2210	LU561M160O200A
	680	22	35	170	290	2350	LU681M160M350A
	680	25	30	170	290	2380	LU681M160N300A
	680	30	25	170	290	2420	LU681M160O250A
	680	35	20	170	290	2510	LU681M160P200A
	820	22	40	140	240	2680	LU821M160M400A
	820	25	30	140	240	2710	LU821M160N300A
	820	30	25	140	240	2760	LU821M160O250A
	820	35	20	140	240	2790	LU821M160P200A
	1000	22	45	110	200	3020	LU102M160M450A
	1000	25	35	110	200	3030	LU102M160N350A
	1000	30	30	110	200	3050	LU102M160O300A
	1000	35	25	110	200	3130	LU102M160P250A
	1200	22	45	97	170	3250	LU122M160M450A
	1200	25	40	97	170	3430	LU122M160N400A
	1200	30	30	97	170	3450	LU122M160O300A
	1200	35	25	97	170	3480	LU122M160P250A
	1500	25	50	74	130	3960	LU152M160N500A
	1500	30	35	74	130	4010	LU152M160O350A
	1500	35	30	74	130	4030	LU152M160P300A
	1800	25	50	63	110	4200	LU182M160N500A
1800	30	40	63	110	4310	LU182M160O400A	
1800	35	35	63	110	4380	LU182M160P350A	
2200	30	45	52	90	4850	LU222M160O450A	
2200	35	40	52	90	4900	LU222M160P400A	
2700	30	50	42	74	5450	LU272M160O500A	
2700	35	45	42	74	5570	LU272M160P450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
160	3300	35	50	34	60	6210	LU332M160P500A
	3300	40	50	34	60	6340	LU332M160Q500A
	3900	35	80	29	51	7840	LU392M160P800A
	3900	40	60	29	51	7450	LU392M160Q600A
	4700	40	80	24	42	8790	LU472M160Q800A
180	220	22	20	510	900	1180	LU221M180M200A
	270	20	25	420	740	1290	LU271M180L250A
	330	20	30	340	600	1770	LU331M180L300A
	330	22	25	340	600	1790	LU331M180M250A
	330	25	20	340	600	1810	LU331M180N200A
	390	20	30	290	510	1840	LU391M180L300A
	470	20	30	240	420	2080	LU471M180L300A
	470	22	25	240	420	2080	LU471M180M250A
	470	30	20	240	420	1880	LU471M180O200A
	560	20	35	210	360	2250	LU561M180L350A
	560	22	30	210	360	2260	LU561M180M300A
	560	25	25	210	360	2270	LU561M180N250A
	680	20	40	170	290	2500	LU681M180L400A
	680	22	35	170	290	2510	LU681M180M350A
	680	25	30	170	290	2530	LU681M180N300A
	680	30	25	170	290	2550	LU681M180O250A
	680	35	20	170	290	2570	LU681M180P200A
	820	20	45	140	240	2750	LU821M180L450A
	820	22	40	140	240	2860	LU821M180M400A
	820	25	35	140	240	2870	LU821M180N350A
	820	30	25	140	240	2890	LU821M180O250A
	1000	22	50	110	200	3100	LU102M180M500A
	1000	25	40	110	200	3060	LU102M180N400A
	1000	30	30	110	200	3110	LU102M180O300A
	1200	22	50	97	170	3310	LU122M180M500A
	1200	25	45	97	170	3650	LU122M180N450A
	1200	30	35	97	170	3670	LU122M180O350A
	1200	35	30	97	170	3710	LU122M180P300A
	1500	25	50	74	130	3830	LU152M180N500A
	1500	30	40	74	130	4100	LU152M180O400A
	1500	35	35	74	130	4210	LU152M180P350A
	1800	30	45	63	110	4550	LU182M180O450A
	1800	35	35	63	110	4580	LU182M180P350A
2200	30	50	52	90	4920	LU222M180O500A	
2200	35	40	52	90	4960	LU222M180P400A	
2700	35	50	42	74	5300	LU272M180P500A	
200	120	22	20	950	1660	1050	LU121M200M200A
	220	22	25	510	900	1250	LU221M200M250A
	220	22	20	510	900	1190	LU221M200M200A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	270	22	25	420	740	1390	LU271M200M250A
	270	25	20	420	740	1400	LU271M200N200A
	330	22	25	340	600	1520	LU331M200M250A
	330	25	20	340	600	1560	LU331M200N200A
	390	22	30	290	510	1730	LU391M200M300A
	390	25	25	290	510	1740	LU391M200N250A
	470	22	30	240	420	1970	LU471M200M300A
	470	25	25	240	420	1990	LU471M200N250A
	560	22	35	210	360	2450	LU561M200M350A
	560	25	30	210	360	2480	LU561M200N300A
	560	30	25	210	360	2510	LU561M200O250A
	680	22	40	170	290	2700	LU681M200M400A
	680	25	30	170	290	2680	LU681M200N300A
	680	30	25	170	290	2720	LU681M200O250A
	820	22	45	140	240	2940	LU821M200M450A
	820	25	35	140	240	2930	LU821M200N350A
	820	30	30	140	240	2960	LU821M200O300A
	1000	22	50	110	200	3280	LU102M200M500A
	1000	25	40	110	200	3280	LU102M200N400A
	1000	30	35	110	200	3290	LU102M200O350A
	1000	35	30	110	200	3300	LU102M200P300A
	1200	30	35	97	170	3610	LU122M200O350A
	1200	35	30	97	170	3630	LU122M200P300A
	1500	30	45	74	130	4130	LU152M200O450A
	1500	35	35	74	130	4140	LU152M200P350A
	1800	30	50	63	110	4600	LU182M200O500A
	1800	35	40	63	110	4610	LU182M200P400A
	2200	35	45	52	90	4980	LU222M200P450A
	2700	35	50	42	74	5460	LU272M200P500A
	3300	35	60	34	60	6300	LU332M200P600A
	3900	40	60	29	51	7400	LU392M200Q600A
	4700	40	70	24	42	6780	LU472M200Q700A
5600	35	100	20	36	7370	LU562M200PA00A	
6800	40	100	17	29	8660	LU682M200QA00A	
220	180	22	20	630	1110	1070	LU181M220M200A
	270	25	20	420	740	1350	LU271M220N200A
	330	22	30	340	600	1700	LU331M220M300A
	330	25	25	340	600	1710	LU331M220N250A
	390	22	30	290	510	1890	LU391M220M300A
	390	25	25	290	510	1910	LU391M220N250A
	470	22	35	240	420	2080	LU471M220M350A
	470	25	30	240	420	2100	LU471M220N300A
	470	30	25	240	420	2130	LU471M220O250A
	560	22	40	210	360	2330	LU561M220M400A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
220	560	25	35	210	360	2390	LU561M220N350A
	560	30	25	210	360	2350	LU561M220O250A
	680	22	45	170	290	2680	LU681M220M450A
	680	25	35	170	290	2680	LU681M220N350A
	680	30	30	170	290	2690	LU681M220O300A
	820	25	45	140	240	3010	LU821M220N450A
	820	30	35	140	240	3020	LU821M220O350A
	820	35	30	140	240	3030	LU821M220P300A
	1000	25	50	110	200	3430	LU102M220N500A
	1000	30	35	110	200	3420	LU102M220O350A
	1200	30	40	97	170	3880	LU122M220O400A
	1200	35	35	97	170	3890	LU122M220P350A
	1500	30	50	74	130	4440	LU152M220O500A
	1500	35	40	74	130	4450	LU152M220P400A
	1800	35	45	63	110	4530	LU182M220P450A
2200	35	50	52	90	4980	LU222M220P500A	
250	100	22	25	1140	1990	690	LU101M250M250A
	150	22	20	760	1330	980	LU151M250M200A
	180	22	20	630	1110	1070	LU181M250M200A
	220	22	25	510	900	1260	LU221M250M250A
	220	25	20	510	900	1270	LU221M250N200A
	270	22	25	420	740	1510	LU271M250M250A
	330	22	30	340	600	1750	LU331M250M300A
	330	25	25	340	600	1760	LU331M250N250A
	390	22	35	290	510	1910	LU391M250M350A
	390	25	30	290	510	1920	LU391M250N300A
	390	30	25	290	510	1930	LU391M250O250A
	470	22	35	240	420	2150	LU471M250M350A
	470	25	35	240	420	2160	LU471M250N350A
	470	30	25	240	420	2160	LU471M250O250A
	560	22	40	210	360	2480	LU561M250M400A
	560	25	35	210	360	2490	LU561M250N350A
	560	30	25	210	360	2490	LU561M250O250A
	680	22	50	170	290	2710	LU681M250M500A
	680	25	40	170	290	2710	LU681M250N400A
	680	30	30	170	290	2710	LU681M250O300A
	820	25	45	140	240	3010	LU821M250N450A
	820	30	35	140	240	3020	LU821M250O350A
	820	35	30	140	240	3030	LU821M250P300A
	1000	30	40	110	200	3560	LU102M250O400A
1000	35	35	110	200	3570	LU102M250P350A	
1200	30	45	97	170	3990	LU122M250O450A	
1200	35	35	97	170	4010	LU122M250P350A	
1500	35	40	74	130	4340	LU152M250P400A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	1800	35	50	63	110	4560	LU182M250P500A ☐☐
	2200	35	50	52	90	5100	LU222M250P500A ☐☐
	2700	40	80	42	74	6310	LU272M250Q800A ☐☐
	3300	40	80	34	60	7010	LU332M250Q800A ☐☐
	3900	35	100	29	51	7480	LU392M250PA00A ☐☐
	4700	40	100	24	42	8890	LU472M250QA00A ☐☐
315	100	22	20	1140	1990	800	LU101M315M200A ☐☐
	120	25	20	950	1660	910	LU121M315N200A ☐☐
	150	22	25	760	1330	1070	LU151M315M250A ☐☐
	150	25	20	760	1330	1080	LU151M315N200A ☐☐
	180	22	30	630	1110	1380	LU181M315M300A ☐☐
	180	25	25	630	1110	1390	LU181M315N250A ☐☐
	220	22	30	510	900	1470	LU221M315M300A ☐☐
	220	25	25	510	900	1470	LU221M315N250A ☐☐
	220	30	20	510	900	1480	LU221M315O200A ☐☐
	270	22	35	420	740	1700	LU271M315M350A ☐☐
	270	25	30	420	740	1710	LU271M315N300A ☐☐
	270	30	25	420	740	1720	LU271M315O250A ☐☐
	270	35	20	420	740	1730	LU271M315P200A ☐☐
	330	22	40	340	600	1990	LU331M315M400A ☐☐
	330	25	35	340	600	2000	LU331M315N350A ☐☐
	330	30	25	340	600	1990	LU331M315O250A ☐☐
	390	22	45	290	510	2150	LU391M315M450A ☐☐
	390	25	40	290	510	2160	LU391M315N400A ☐☐
	390	30	30	290	510	2160	LU391M315O300A ☐☐
	390	35	25	290	510	2170	LU391M315P250A ☐☐
	470	25	45	240	420	2460	LU471M315N450A ☐☐
	470	30	35	240	420	2470	LU471M315O350A ☐☐
	470	35	30	240	420	2480	LU471M315P300A ☐☐
	560	25	50	210	360	2710	LU561M315N500A ☐☐
	560	30	35	210	360	2700	LU561M315O350A ☐☐
	560	35	30	210	360	2720	LU561M315P300A ☐☐
	680	30	45	170	290	3060	LU681M315O450A ☐☐
	680	35	35	170	290	3060	LU681M315P350A ☐☐
	820	30	50	140	240	3450	LU821M315O500A ☐☐
	820	35	40	140	240	3460	LU821M315P400A ☐☐
1000	35	45	110	200	3600	LU102M315P450A ☐☐	
350	82	22	20	1390	2430	730	LU820M350M200A ☐☐
	100	22	25	1140	1990	810	LU101M350M250A ☐☐
	120	22	25	950	1660	1050	LU121M350M250A ☐☐
	120	25	20	950	1660	1070	LU121M350N200A ☐☐
	150	22	30	760	1330	1240	LU151M350M300A ☐☐
	150	25	25	760	1330	1250	LU151M350N250A ☐☐
180	22	30	630	1110	1370	LU181M350M300A ☐☐	

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
350	180	25	25	630	1110	1380	LU181M350N250A
	180	30	20	630	1110	1390	LU181M350O200A
	220	22	35	510	900	1540	LU221M350M350A
	220	25	30	510	900	1550	LU221M350N300A
	220	30	25	510	900	1560	LU221M350O250A
	220	35	20	510	900	1570	LU221M350P200A
	270	22	40	420	740	1800	LU271M350M400A
	270	25	35	420	740	1810	LU271M350N350A
	270	30	25	420	740	1810	LU271M350O250A
	330	22	45	340	600	2030	LU331M350M450A
	330	25	35	340	600	2030	LU331M350N350A
	330	30	30	340	600	2040	LU331M350O300A
	330	35	25	340	600	2050	LU331M350P250A
	390	25	40	290	510	2240	LU391M350N400A
	390	30	35	290	510	2250	LU391M350O350A
	390	35	30	290	510	2260	LU391M350P300A
	470	25	50	240	420	2570	LU471M350N500A
	470	30	35	240	420	2560	LU471M350O350A
	470	35	30	240	420	2560	LU471M350P300A
	560	30	40	210	360	2760	LU561M350O400A
	560	35	35	210	360	2770	LU561M350P350A
	680	30	50	170	290	3210	LU681M350O500A
	680	35	40	170	290	3220	LU681M350P400A
	820	35	45	140	240	3520	LU821M350P450A
	1000	35	50	110	200	3660	LU102M350P500A
	1200	40	65	97	170	5710	LU122M350Q650A
1500	45	60	74	130	6480	LU152M350V600A	
1800	45	70	63	110	7400	LU182M350V700A	
2200	45	80	52	90	8080	LU222M350V800A	
2700	45	100	42	74	9490	LU272M350VA00A	
400	68	20	25	1670	2930	650	LU680M400L250A
	68	22	20	1670	2930	650	LU680M400M200A
	82	22	25	1390	2430	850	LU820M400M250A
	82	25	20	1390	2430	860	LU820M400N200A
	100	22	25	1140	1990	990	LU101M400M250A
	100	25	20	1140	1990	1000	LU101M400N200A
	120	22	25	950	1660	1100	LU121M400M250A
	120	25	25	950	1660	1140	LU121M400N250A
	150	22	30	760	1330	1250	LU151M400M300A
	150	22	35	760	1330	1380	LU151M400M350A
	150	25	25	760	1330	1300	LU151M400N250A
	150	25	30	760	1330	1400	LU151M400N300A
	150	30	25	760	1330	1420	LU151M400O250A
	180	22	30	630	1110	1500	LU181M400M300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
400	180	22	35	630	1110	1550	LU181M400M350A □□
	180	25	25	630	1110	1520	LU181M400N250A □□
	180	25	30	630	1110	1580	LU181M400N300A □□
	180	30	25	630	1110	1600	LU181M400O250A □□
	180	35	20	630	1110	1630	LU181M400P200A □□
	220	22	45	510	900	1620	LU221M400M450A □□
	220	22	30	510	900	1540	LU221M400M300A □□
	220	25	30	510	900	1600	LU221M400N300A □□
	220	25	35	510	900	1640	LU221M400N350A □□
	220	25	25	510	900	1560	LU221M400N250A □□
	220	30	30	510	900	1660	LU221M400O300A □□
	220	30	25	510	900	1620	LU221M400O250A □□
	270	22	45	420	740	1700	LU271M400M450A □□
	270	22	35	420	740	1600	LU271M400M350A □□
	270	25	40	420	740	1820	LU271M400N400A □□
	270	25	30	420	740	1650	LU271M400N300A □□
	270	30	30	420	740	1820	LU271M400O300A □□
	270	30	25	420	740	1680	LU271M400O250A □□
	330	22	50	340	600	2270	LU331M400M500A □□
	330	22	40	340	600	1980	LU331M400M400A □□
	330	25	45	340	600	2290	LU331M400N450A □□
	330	25	35	340	600	2050	LU331M400N350A □□
	330	30	35	340	600	2310	LU331M400O350A □□
	330	30	25	340	600	2060	LU331M400O250A □□
	330	35	30	340	600	2400	LU331M400P300A □□
	330	35	25	340	600	2300	LU331M400P250A □□
	390	22	50	290	510	2290	LU391M400M500A □□
	390	25	45	290	510	2360	LU391M400N450A □□
	390	30	40	290	510	2460	LU391M400O400A □□
	390	30	30	290	510	2300	LU391M400O300A □□
	390	35	35	290	510	2500	LU391M400P350A □□
	390	35	25	290	510	2380	LU391M400P250A □□
	470	25	50	240	420	2450	LU471M400N500A □□
	470	30	45	240	420	2660	LU471M400O450A □□
	470	30	35	240	420	2420	LU471M400O350A □□
	470	35	35	240	420	2710	LU471M400P350A □□
	470	35	25	240	420	2400	LU471M400P250A □□
	470	35	30	240	420	2600	LU471M400P300A □□
	560	25	55	210	360	3080	LU561M400N550A □□
	560	30	50	210	360	3190	LU561M400O500A □□
560	35	40	210	360	3440	LU561M400P400A □□	
560	35	30	210	360	3030	LU561M400P300A □□	
680	25	60	170	290	3280	LU681M400N600A □□	
680	30	55	170	290	3280	LU681M400O550A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	680	30	45	170	290	3250	LU681M400O450A
	680	35	50	170	290	3450	LU681M400P500A
	820	30	60	140	240	3420	LU821M400O600A
	820	35	50	140	240	3500	LU821M400P500A
	820	35	45	140	240	3420	LU821M400P450A
	1000	35	55	110	200	3850	LU102M400P550A
	1000	35	50	110	200	3600	LU102M400P500A
	1000	40	65	110	200	5150	LU102M400Q650A
	1200	35	65	97	170	4680	LU122M400P650A
	1200	40	60	97	170	4710	LU122M400Q600A
	1500	35	80	74	130	5550	LU152M400P800A
	1500	40	70	74	130	4610	LU152M400Q700A
	1800	40	80	63	110	6600	LU182M400Q800A
2200	45	95	52	90	8700	LU222M400V950A	
420	47	22	20	3220	5640	540	LU470M420M200A
	56	22	20	2710	4740	600	LU560M420M200A
	68	25	20	2230	3900	680	LU680M420N200A
	82	20	25	1850	3230	830	LU820M420L250A
	82	22	25	1850	3230	850	LU820M420M250A
	82	25	20	1850	3230	850	LU820M420N200A
	100	22	30	1510	2650	980	LU101M420M300A
	100	22	25	1510	2650	970	LU101M420M250A
	100	25	25	1510	2650	980	LU101M420N250A
	120	20	30	1260	2210	1050	LU121M420L300A
	120	22	30	1260	2210	1070	LU121M420M300A
	120	22	25	1260	2210	1020	LU121M420M250A
	120	25	25	1260	2210	1080	LU121M420N250A
	120	30	20	1260	2210	1100	LU121M420O200A
	150	22	35	1010	1770	1210	LU151M420M350A
	150	22	25	1010	1770	1110	LU151M420M250A
	150	25	30	1010	1770	1260	LU151M420N300A
	150	35	20	1010	1770	1320	LU151M420P200A
	180	22	40	840	1470	1330	LU181M420M400A
	180	22	30	840	1470	1320	LU181M420M300A
	180	25	35	840	1470	1460	LU181M420N350A
	180	25	25	840	1470	1330	LU181M420N250A
	180	30	25	840	1470	1480	LU181M420O250A
	180	35	20	840	1470	1480	LU181M420P200A
	220	22	45	690	1210	1600	LU221M420M450A
220	22	35	690	1210	1420	LU221M420M350A	
220	25	35	690	1210	1580	LU221M420N350A	
220	25	30	690	1210	1470	LU221M420N300A	
220	30	30	690	1210	1650	LU221M420O300A	
220	30	25	690	1210	1590	LU221M420O250A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
420	220	35	25	690	1210	1600	LU221M420P250A □□
	270	22	45	560	980	1750	LU271M420M450A □□
	270	25	40	560	980	1980	LU271M420N400A □□
	270	25	30	560	980	1680	LU271M420N300A □□
	270	30	35	560	980	1920	LU271M420O350A □□
	270	30	25	560	980	1700	LU271M420O250A □□
	270	35	30	560	980	1940	LU271M420P300A □□
	330	25	50	460	800	2280	LU331M420N500A □□
	330	25	40	460	800	1950	LU331M420N400A □□
	330	30	35	460	800	2200	LU331M420O350A □□
	330	30	30	460	800	1980	LU331M420O300A □□
	330	35	35	460	800	2370	LU331M420P350A □□
	330	35	25	460	800	2170	LU331M420P250A □□
	390	25	50	390	680	2300	LU391M420N500A □□
	390	30	40	390	680	2320	LU391M420O400A □□
	390	30	30	390	680	2100	LU391M420O300A □□
	390	35	35	390	680	2680	LU391M420P350A □□
	390	35	25	390	680	2200	LU391M420P250A □□
	470	30	45	320	560	2720	LU471M420O450A □□
	470	30	35	320	560	2470	LU471M420O350A □□
	470	35	40	320	560	2750	LU471M420P400A □□
	470	35	30	320	560	2630	LU471M420P300A □□
	560	25	55	270	470	2820	LU561M420N550A □□
	560	30	50	270	470	2850	LU561M420O500A □□
	560	30	40	270	470	2700	LU561M420O400A □□
	560	35	45	270	470	2950	LU561M420P450A □□
	560	35	35	270	470	2700	LU561M420P350A □□
	680	30	50	220	390	2900	LU681M420O500A □□
	680	35	50	220	390	3200	LU681M420P500A □□
	680	35	40	220	390	3150	LU681M420P400A □□
	820	30	55	180	320	3400	LU821M420O550A □□
	820	35	45	180	320	3450	LU821M420P450A □□
	820	35	55	180	320	3720	LU821M420P550A □□
	820	40	45	180	320	3720	LU821M420Q450A □□
1000	35	65	150	270	4500	LU102M420P650A □□	
1000	35	50	150	270	3780	LU102M420P500A □□	
1000	40	50	150	270	4300	LU102M420Q500A □□	
1200	35	70	130	220	4950	LU122M420P700A □□	
1200	35	60	130	220	3900	LU122M420P600A □□	
1200	40	55	130	220	4600	LU122M420Q550A □□	
1500	40	70	100	180	5980	LU152M420Q700A □□	
1800	40	80	86	150	6900	LU182M420Q800A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
450	47	22	20	3220	5640	550	LU470M450M200A
	56	20	25	2710	4740	610	LU560M450L250A
	56	22	20	2710	4740	590	LU560M450M200A
	68	20	25	2230	3900	620	LU680M450L250A
	68	22	25	2230	3900	710	LU680M450M250A
	68	25	20	2230	3900	720	LU680M450N200A
	82	20	30	1850	3230	870	LU820M450L300A
	82	22	25	1850	3230	860	LU820M450M250A
	82	25	20	1850	3230	880	LU820M450N200A
	100	20	35	1510	2650	910	LU101M450L350A
	100	22	30	1510	2650	950	LU101M450M300A
	100	25	25	1510	2650	970	LU101M450N250A
	120	22	30	1260	2210	1050	LU121M450M300A
	120	25	25	1260	2210	1070	LU121M450N250A
	150	22	35	1010	1770	1290	LU151M450M350A
	150	25	30	1010	1770	1310	LU151M450N300A
	150	30	25	1010	1770	1340	LU151M450O250A
	150	35	20	1010	1770	1360	LU151M450P200A
	180	22	35	840	1470	1380	LU181M450M350A
	180	25	30	840	1470	1400	LU181M450N300A
	180	30	25	840	1470	1440	LU181M450O250A
	180	30	30	840	1470	1450	LU181M450O300A
	180	35	25	840	1470	1470	LU181M450P250A
	220	22	40	690	1210	1870	LU221M450M400A
	220	25	35	690	1210	1890	LU221M450N350A
	220	30	30	690	1210	1910	LU221M450O300A
	220	35	25	690	1210	1920	LU221M450P250A
	270	25	35	560	980	2120	LU271M450N350A
	270	30	30	560	980	2150	LU271M450O300A
	270	35	25	560	980	2190	LU271M450P250A
	330	25	40	460	800	2410	LU331M450N400A
	330	30	35	460	800	2480	LU331M450O350A
	330	35	30	460	800	2530	LU331M450P300A
330	35	35	460	800	2630	LU331M450P350A	
390	25	45	390	680	2670	LU391M450N450A	
390	30	35	390	680	2700	LU391M450O350A	
390	35	30	390	680	2750	LU391M450P300A	
470	25	50	320	560	2780	LU471M450N500A	
470	30	40	320	560	2820	LU471M450O400A	
470	30	45	320	560	2880	LU471M450O450A	
470	35	35	320	560	2930	LU471M450P350A	
560	30	45	270	470	3130	LU561M450O450A	
560	30	50	270	470	3170	LU561M450O500A	
560	35	40	270	470	3210	LU561M450P400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	560	40	50	270	470	3460	LU561M450Q500A
	560	45	40	270	470	3480	LU561M450V400A
	680	30	50	220	390	3460	LU681M450O500A
	680	35	40	220	390	3510	LU681M450P400A
	680	35	45	220	390	3650	LU681M450P450A
	680	40	60	220	390	3980	LU681M450Q600A
	680	45	45	220	390	4010	LU681M450V450A
	820	30	60	180	320	3970	LU821M450O600A
	820	35	45	180	320	3900	LU821M450P450A
	820	35	50	180	320	4010	LU821M450P500A
	820	45	55	180	320	4470	LU821M450V550A
	1000	35	55	150	270	4010	LU102M450P550A
	1000	35	60	150	270	4110	LU102M450P600A
	1000	40	55	150	270	4600	LU102M450Q550A
	1000	45	60	150	270	5080	LU102M450V600A
	1200	40	65	130	220	5420	LU122M450Q650A
	1200	45	60	130	220	5790	LU122M450V600A
	1500	45	85	100	180	6840	LU152M450V850A
1800	45	100	86	150	7860	LU182M450VA00A	
2200	45	90	69	120	8480	LU222M450V900A	
500	47	22	20	3220	5640	560	LU470M500M200A
	56	20	25	2710	4740	620	LU560M500L250A
	56	22	25	2710	4740	630	LU560M500M250A
	56	25	20	2710	4740	640	LU560M500N200A
	68	20	30	2230	3900	650	LU680M500L300A
	68	22	25	2230	3900	630	LU680M500M250A
	68	22	30	2230	3900	750	LU680M500M300A
	68	25	20	2230	3900	680	LU680M500N200A
	68	25	25	2230	3900	780	LU680M500N250A
	82	20	30	1850	3230	850	LU820M500L300A
	82	22	30	1850	3230	920	LU820M500M300A
	82	25	25	1850	3230	950	LU820M500N250A
	100	22	35	1510	2650	1020	LU101M500M350A
	100	25	30	1510	2650	1060	LU101M500N300A
	100	30	20	1510	2650	1040	LU101M500O200A
	100	30	25	1510	2650	1070	LU101M500O250A
	120	22	40	1260	2210	1120	LU121M500M400A
	120	25	30	1260	2210	1080	LU121M500N300A
	120	25	35	1260	2210	1230	LU121M500N350A
	120	30	30	1260	2210	1250	LU121M500O300A
120	35	25	1260	2210	1280	LU121M500P250A	
150	22	45	1010	1770	1260	LU151M500M450A	
150	25	35	1010	1770	1250	LU151M500N350A	
150	25	40	1010	1770	1280	LU151M500N400A	
150	30	30	1010	1770	1340	LU151M500O300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μF)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
500	150	30	35	1010	1770	1380	LU151M500O350A □□
	150	35	25	1010	1770	1360	LU151M500P250A □□
	180	22	50	840	1470	1390	LU181M500M500A □□
	180	25	40	840	1470	1300	LU181M500N400A □□
	180	25	45	840	1470	1450	LU181M500N450A □□
	180	30	30	840	1470	1280	LU181M500O300A □□
	180	30	35	840	1470	1470	LU181M500O350A □□
	180	35	20	840	1470	1210	LU181M500P200A □□
	180	35	25	840	1470	1460	LU181M500P250A □□
	220	25	50	690	1210	1520	LU221M500N500A □□
	220	30	35	690	1210	1510	LU221M500O350A □□
	220	30	40	690	1210	1600	LU221M500O400A □□
	220	35	30	690	1210	1620	LU221M500P300A □□
	270	30	40	560	980	1770	LU271M500O400A □□
	270	30	45	560	980	1980	LU271M500O450A □□
	270	35	35	560	980	2020	LU271M500P350A □□
	330	30	50	460	800	2250	LU331M500O500A □□
	330	35	35	460	800	2030	LU331M500P350A □□
	330	35	40	460	800	2270	LU331M500P400A □□
	390	35	45	390	680	2450	LU391M500P450A □□
	470	35	50	320	560	2760	LU471M500P500A □□
	560	35	60	270	470	2900	LU561M500P600A □□
	560	40	50	270	470	3310	LU561M500Q500A □□
	680	35	70	220	390	3820	LU681M500P700A □□
	680	40	55	220	390	3790	LU681M500Q550A □□
	820	35	80	180	320	4560	LU821M500P800A □□
	820	40	60	180	320	4330	LU821M500Q600A □□
	1000	35	90	150	270	5310	LU102M500P900A □□
	1000	40	80	150	270	5420	LU102M500Q800A □□
	1500	40	100	100	180	6560	LU152M500QA00A □□

□□: See description at end of standard ratings

STANDARD RATINGS

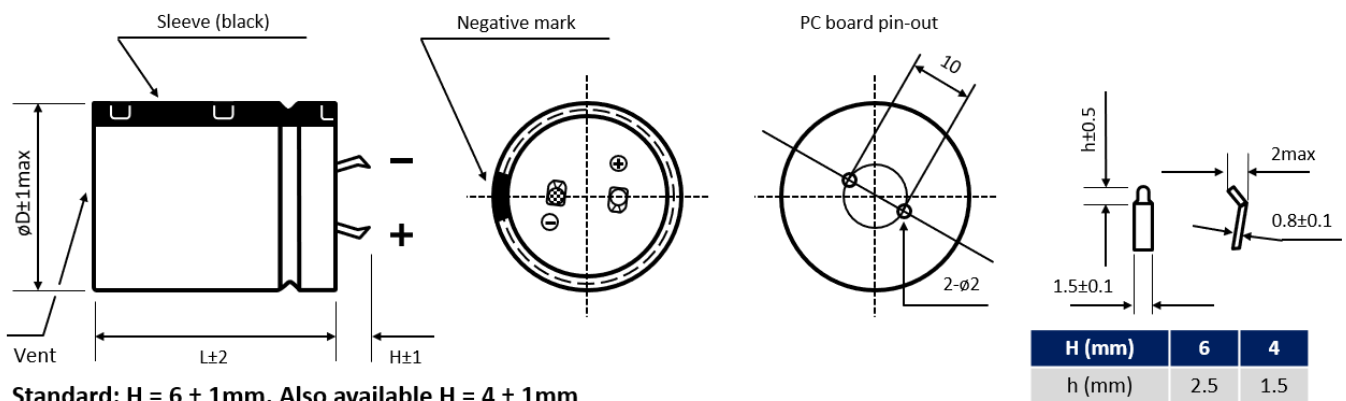
V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
600	150	30	45	1010	1770	950	LU151M600O450A □□
	180	30	50	840	1470	1100	LU181M600O500A □□
	220	30	60	690	1210	1220	LU221M600O600A □□
	270	30	70	560	980	1250	LU271M600O700A □□
	330	30	80	460	800	1360	LU331M600O800A □□
	330	40	50	460	800	1350	LU331M600Q500A □□
	390	40	60	390	680	1480	LU391M600Q600A □□
	470	40	70	320	560	1670	LU471M600Q700A □□
	470	45	55	320	560	1650	LU471M600V550A □□
	560	40	80	270	470	1780	LU561M600Q800A □□
	560	45	60	270	470	1750	LU561M600V600A □□
	680	40	90	220	390	1850	LU681M600Q900A □□
	680	45	70	220	390	1830	LU681M600V700A □□
	820	45	85	180	320	2010	LU821M600V850A □□
1000	45	100	150	270	2280	LU102M600VA00A □□	

□□: Enter **P6** for standard type ▪ 6mm pin length
 □□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□: Enter **Y6** for multipin-type ▪ 6mm pin length

□□: Enter **P4** for standard type ▪ 4mm pin length
 □□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□: Enter **Y4** for multipin type ▪ 4mm pin length

DIMENSIONS ▪ All dimensions in mm

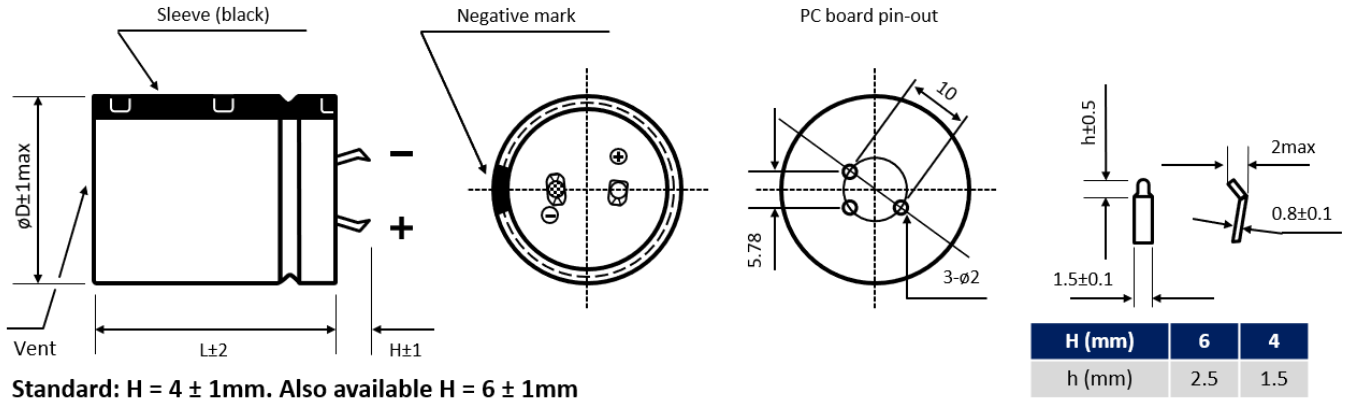
2-pin version ▪ Standard type



Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

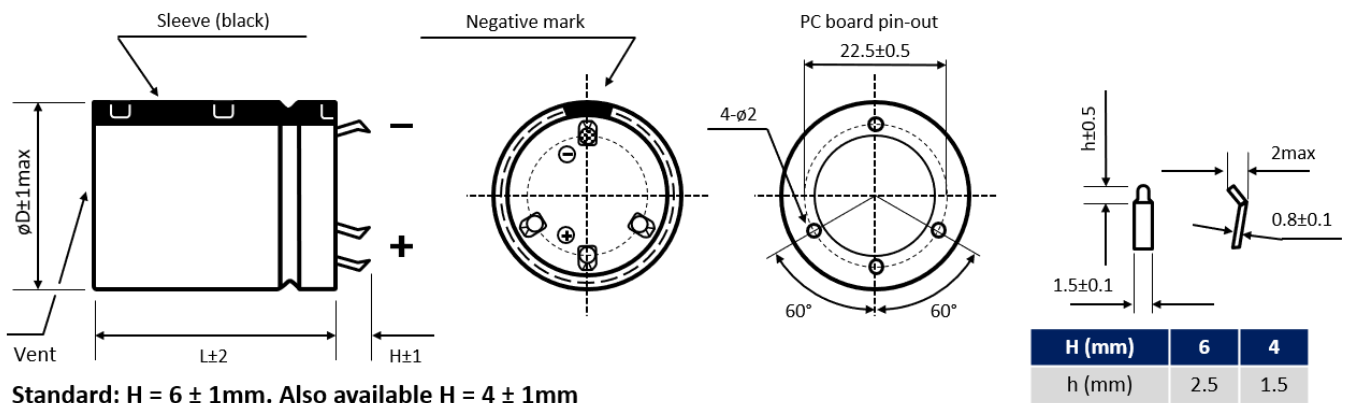
DIMENSIONS ▪ All dimensions in mm

3-pin version ▪ Polarity protection



Standard: H = 4 ± 1mm. Also available H = 6 ± 1mm

Multipin version ▪ Diameter $\phi D \geq 30$ mm



Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$10 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 600$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

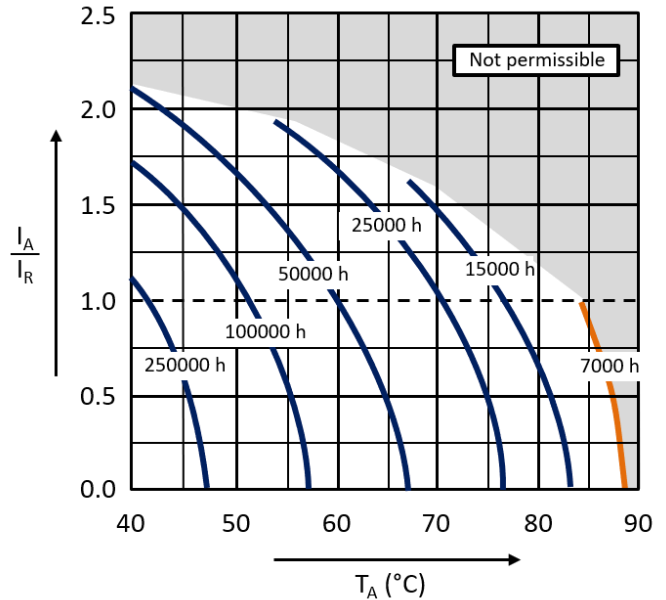
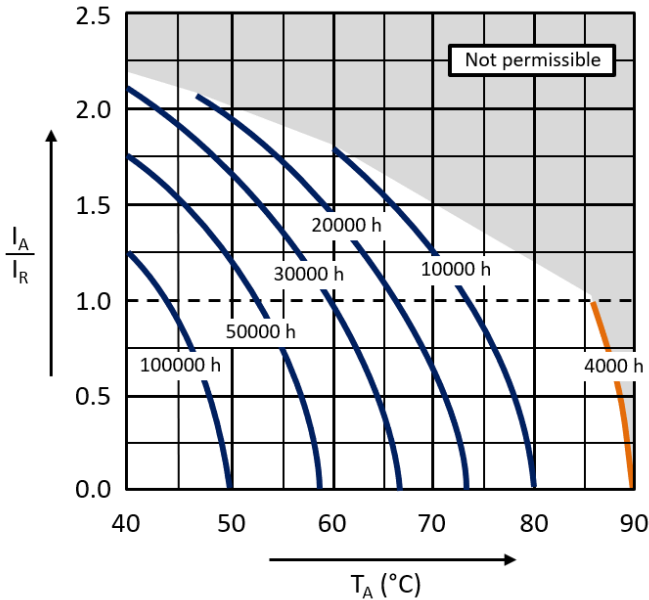
Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE

$V_R \leq 100V$

$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UC SERIES ▪ ULTRA LONG LIFE 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 85°C ▪ 7000 hours
- Extremely stable dissipation factor and leakage current
- High voltage up to 630V
- Especially for applications with demanding operating environment



SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-40 ~ +85°C		-25 ~ +85°C		
Rated Voltage Range	V _R	200 ~ 450V DC		500 ~ 630V DC		
Surge Voltage	V _S	(V _R ≤ 315V) ▪ V _S = 1.15·V _R		(V _R > 315V) ▪ V _S = 1.10·V _R		
Capacitance Range	C _R	68 ~ 2700μF		56 ~ 1500μF		
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)				
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ▪ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]				
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V _R (V DC)	200 ~ 400	450 ~ 630		
		tanδ	15	20		
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings				
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	200 ~ 250	315 ~ 450	500	575 ~ 630
		Z-25°C/Z+20°C	4	5	6	7
		Z-40°C/Z+20°C	7	10	-	-

Lifetime Test					
Useful Life 85°C (V _R & I _R applied)	Test	7 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria				
Endurance 85°C (V _R & I _R applied)	Test	3 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 85°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	220	22	25	510	900	1160	UC221M200M250A
	270	22	25	420	740	1310	UC271M200M250A
	330	22	25	340	600	1410	UC331M200M250A
	390	22	25	290	510	1430	UC391M200M250A
	470	22	30	240	420	1690	UC471M200M300A
	470	25	25	240	420	1690	UC471M200N250A
	560	22	35	210	360	2060	UC561M200M350A
	560	25	30	210	360	2060	UC561M200N300A
	560	30	25	210	360	2060	UC561M200O250A
	680	22	40	170	290	2260	UC681M200M400A
	680	25	30	170	290	2150	UC681M200N300A
	680	30	25	170	290	2230	UC681M200O250A
	820	22	45	140	240	2620	UC821M200M450A
	820	25	35	140	240	2620	UC821M200N350A
	820	30	30	140	240	2630	UC821M200O300A
	820	35	25	140	240	2690	UC821M200P250A
	1000	22	50	110	200	2700	UC102M200M500A
	1000	25	40	110	200	2640	UC102M200N400A
	1000	30	30	110	200	2630	UC102M200O300A
	1000	35	25	110	200	2690	UC102M200P250A
	1200	25	45	97	170	2900	UC122M200N450A
	1200	30	35	97	170	2900	UC122M200O350A
	1200	35	30	97	170	3000	UC122M200P300A
	1500	25	55	74	130	3450	UC152M200N550A
	1500	30	45	74	130	3470	UC152M200O450A
	1500	35	35	74	130	3450	UC152M200P350A
	1800	30	50	63	110	4000	UC182M200O500A
	1800	35	40	63	110	4000	UC182M200P400A
	2200	30	60	52	90	4600	UC222M200O600A
	2200	35	45	52	90	4430	UC222M200P450A
	2200	40	40	52	90	4520	UC222M200Q400A
	2700	35	55	42	74	5000	UC272M200P550A
	2700	40	50	42	74	5240	UC272M200Q500A
	3300	35	65	34	60	5850	UC332M200P650A
	3300	40	60	34	60	5910	UC332M200Q600A
	3900	35	80	29	51	6320	UC392M200P800A
3900	40	60	29	51	6000	UC392M200Q600A	
4700	40	70	24	42	6810	UC472M200Q700A	
5600	40	80	20	36	7450	UC562M200Q800A	
6800	40	100	17	29	8680	UC682M200QA00A	
250	180	22	25	630	1110	1010	UC181M250M250A
	220	22	25	510	900	1260	UC221M250M250A
	270	22	25	420	740	1410	UC271M250M250A
	330	22	30	340	600	1590	UC331M250M300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	330	25	25	340	600	1540	UC331M250N250A
	390	22	30	290	510	1600	UC391M250M300A
	390	25	25	290	510	1580	UC391M250N250A
	470	22	35	240	420	1740	UC471M250M350A
	470	25	30	240	420	1740	UC471M250N300A
	470	30	25	240	420	1810	UC471M250O250A
	560	22	45	210	360	2130	UC561M250M450A
	560	25	35	210	360	2050	UC561M250N350A
	560	30	25	210	360	2020	UC561M250O250A
	680	22	50	170	290	2500	UC681M250M500A
	680	25	45	170	290	2550	UC681M250N450A
	680	30	30	170	290	2400	UC681M250O300A
	820	25	50	140	240	2930	UC821M250N500A
	820	30	35	140	240	2800	UC821M250O350A
	820	35	30	140	240	2900	UC821M250P300A
	1000	25	55	110	200	3070	UC102M250N550A
	1000	30	45	110	200	3120	UC102M250O450A
	1000	35	35	110	200	3070	UC102M250P350A
	1200	25	60	97	170	3350	UC122M250N600A
	1200	30	50	97	170	3410	UC122M250O500A
	1200	35	35	97	170	3210	UC122M250P350A
	1500	30	60	74	130	4100	UC152M250O600A
	1500	35	45	74	130	3950	UC152M250P450A
	1500	40	40	74	130	4050	UC152M250Q400A
	1800	30	65	63	110	4300	UC182M250O650A
	1800	35	50	63	110	4200	UC182M250P500A
	1800	40	45	63	110	4300	UC182M250Q450A
	2200	35	60	52	90	4950	UC222M250P600A
	2200	40	50	52	90	4950	UC222M250Q500A
	2700	35	80	42	74	6100	UC272M250P800A
2700	40	70	42	74	6100	UC272M250Q700A	
3300	35	80	34	60	6520	UC332M250P800A	
3300	40	70	34	60	6610	UC332M250Q700A	
3900	40	80	29	51	7500	UC392M250Q800A	
4700	40	100	24	42	8910	UC472M250QA00A	
350	82	22	20	1390	2430	650	UC820M350M200A
	100	22	25	1140	1990	780	UC101M350M250A
	100	25	20	1140	1990	750	UC101M350N200A
	120	22	25	950	1660	1000	UC121M350M250A
	120	25	20	950	1660	980	UC121M350N200A
	150	22	30	760	1330	1260	UC151M350M300A
	150	25	25	760	1330	1260	UC151M350N250A
	180	22	35	630	1110	1300	UC181M350M350A
	180	25	30	630	1110	1320	UC181M350N300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
350	180	30	25	630	1110	1380	UC181M350O250A
	220	22	40	510	900	1410	UC221M350M400A
	220	25	30	510	900	1480	UC221M350N300A
	220	30	25	510	900	1480	UC221M350O250A
	270	22	45	420	740	1630	UC271M350M450A
	270	25	35	420	740	1660	UC271M350N350A
	270	30	30	420	740	1710	UC271M350O300A
	270	35	25	420	740	1720	UC271M350P250A
	330	22	50	340	600	1900	UC331M350M500A
	330	25	40	340	600	1850	UC331M350N400A
	330	30	30	340	600	1750	UC331M350O300A
	330	35	25	340	600	1780	UC331M350P250A
	390	25	45	290	510	2100	UC391M350N450A
	390	30	35	290	510	2150	UC391M350O350A
	390	35	30	290	510	2200	UC391M350P300A
	470	30	40	240	420	2520	UC471M350O400A
	470	35	30	240	420	2360	UC471M350P300A
	560	30	45	210	360	2630	UC561M350O450A
	560	35	35	210	360	2630	UC561M350P350A
	680	35	40	170	290	2800	UC681M350P400A
	820	35	45	140	240	3360	UC821M350P450A
	1000	35	60	110	200	4600	UC102M350P600A
	1000	40	50	110	200	4480	UC102M350Q500A
	1200	35	60	97	170	4650	UC122M350P600A
	1200	40	50	97	170	4650	UC122M350Q500A
	1500	35	80	74	130	6100	UC152M350P800A
	1500	40	70	74	130	6100	UC152M350Q700A
1500	45	60	74	130	6150	UC152M350V600A	
1800	40	80	63	110	7000	UC182M350Q800A	
1800	45	70	63	110	7000	UC182M350V700A	
2200	45	80	52	90	8070	UC222M350V800A	
2700	45	100	42	74	9480	UC272M350VA00A	
400	68	22	20	1670	2930	670	UC680M400M200A
	82	22	25	1390	2430	810	UC820M400M250A
	100	22	25	1140	1990	820	UC101M400M250A
	100	25	20	1140	1990	800	UC101M400N200A
	120	22	25	950	1660	1010	UC121M400M250A
	120	25	20	950	1660	1010	UC121M400N200A
	150	22	25	760	1330	1400	UC151M400M250A
	150	22	30	760	1330	1480	UC151M400M300A
	150	25	25	760	1330	1480	UC151M400N250A
	180	22	30	630	1110	1580	UC181M400M300A
	180	22	35	630	1110	1650	UC181M400M350A
180	25	30	630	1110	1630	UC181M400N300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	180	30	25	630	1110	1650	UC181M400O250A
	220	22	30	510	900	1740	UC221M400M300A
	220	22	35	510	900	1820	UC221M400M350A
	220	25	25	510	900	1780	UC221M400N250A
	220	25	30	510	900	1800	UC221M400N300A
	220	30	25	510	900	1800	UC221M400O250A
	270	22	35	420	740	1990	UC271M400M350A
	270	22	40	420	740	2060	UC271M400M400A
	270	25	30	420	740	2060	UC271M400N300A
	270	25	35	420	740	2160	UC271M400N350A
	270	30	25	420	740	2060	UC271M400O250A
	270	30	30	420	740	2100	UC271M400O300A
	330	22	45	340	600	2320	UC331M400M450A
	330	22	50	340	600	2400	UC331M400M500A
	330	25	35	340	600	2230	UC331M400N350A
	330	25	40	340	600	2320	UC331M400N400A
	330	30	30	340	600	2230	UC331M400O300A
	330	30	35	340	600	2270	UC331M400O350A
	330	30	40	340	600	2320	UC331M400O400A
	330	35	25	340	600	2230	UC331M400P250A
	330	35	35	340	600	2320	UC331M400P350A
	390	22	50	290	510	2640	UC391M400M500A
	390	25	40	290	510	2500	UC391M400N400A
	390	30	30	290	510	2300	UC391M400O300A
	390	30	35	290	510	2410	UC391M400O350A
	390	30	40	290	510	2640	UC391M400O400A
	390	35	25	290	510	2300	UC391M400P250A
	390	35	30	290	510	2410	UC391M400P300A
	390	35	35	290	510	2640	UC391M400P350A
	470	25	45	240	420	2810	UC471M400N450A
	470	25	55	240	420	2950	UC471M400N550A
	470	30	35	240	420	2610	UC471M400O350A
	470	30	40	240	420	2700	UC471M400O400A
	470	30	50	240	420	2860	UC471M400O500A
	470	35	30	240	420	2610	UC471M400P300A
	470	35	40	240	420	2810	UC471M400P400A
	470	35	45	240	420	2860	UC471M400P450A
	560	25	55	210	360	3240	UC561M400N550A
	560	30	40	210	360	3100	UC561M400O400A
	560	30	45	210	360	3210	UC561M400O450A
560	30	55	210	360	3360	UC561M400O550A	
560	35	35	210	360	3100	UC561M400P350A	
560	35	45	210	360	3360	UC561M400P450A	
680	30	50	170	290	3400	UC681M400O500A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	680	30	55	170	290	3550	UC681M400O550A
	680	35	40	170	290	3400	UC681M400P400A
	680	35	50	170	290	3550	UC681M400P500A
	820	30	55	140	240	3740	UC821M400O550A
	820	30	60	140	240	3850	UC821M400O600A
	820	35	45	140	240	3450	UC821M400P450A
	820	35	50	140	240	3740	UC821M400P500A
	820	35	55	140	240	3850	UC821M400P550A
	1000	35	55	110	200	4600	UC102M400P550A
	1000	35	70	110	200	4760	UC102M400P700A
	1000	40	45	110	200	4480	UC102M400Q450A
	1000	40	60	110	200	4760	UC102M400Q600A
	1000	45	40	110	200	4480	UC102M400V400A
	1200	35	55	97	170	4600	UC122M400P550A
	1200	35	60	97	170	4770	UC122M400P600A
	1200	35	65	97	170	4900	UC122M400P650A
	1200	40	60	97	170	4950	UC122M400Q600A
	1200	45	50	97	170	5200	UC122M400V500A
	1500	35	80	74	130	6200	UC152M400P800A
	1500	40	70	74	130	6200	UC152M400Q700A
	1500	45	60	74	130	6200	UC152M400V600A
	1800	40	80	63	110	7100	UC182M400Q800A
1800	45	70	63	110	7100	UC182M400V700A	
2200	45	85	52	90	8250	UC222M400V850A	
450	68	22	20	2230	3900	680	UC680M450M200A
	82	22	25	1850	3230	820	UC820M450M250A
	100	22	25	1510	2650	840	UC101M450M250A
	120	22	25	1260	2210	1300	UC121M450M250A
	120	22	30	1260	2210	1360	UC121M450M300A
	120	25	25	1260	2210	1400	UC121M450N250A
	150	22	30	1010	1770	1530	UC151M450M300A
	150	22	35	1010	1770	1590	UC151M450M350A
	150	25	30	1010	1770	1590	UC151M450N300A
	150	30	25	1010	1770	1550	UC151M450O250A
	180	22	35	840	1470	1650	UC181M450M350A
	180	22	40	840	1470	1710	UC181M450M400A
	180	25	35	840	1470	1710	UC181M450N350A
	180	30	25	840	1470	1690	UC181M450O250A
	220	22	35	690	1210	1790	UC221M450M350A
	220	22	40	690	1210	1880	UC221M450M400A
	220	25	30	690	1210	1850	UC221M450N300A
	220	30	30	690	1210	1900	UC221M450O300A
270	22	40	560	980	2150	UC271M450M400A	
270	22	45	560	980	2220	UC271M450M450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	270	25	35	560	980	2120	UC271M450N350A
	270	30	30	560	980	2120	UC271M450O300A
	330	22	50	460	800	2410	UC331M450M500A
	330	22	55	460	800	2460	UC331M450M550A
	330	25	40	460	800	2410	UC331M450N400A
	330	25	45	460	800	2440	UC331M450N450A
	330	30	30	460	800	2220	UC331M450O300A
	330	30	35	460	800	2410	UC331M450O350A
	330	35	25	460	800	2110	UC331M450P250A
	390	25	50	390	680	2650	UC391M450N500A
	390	30	35	390	680	2510	UC391M450O350A
	390	30	40	390	680	2650	UC391M450O400A
	390	35	30	390	680	2390	UC391M450P300A
	470	25	55	320	560	3090	UC471M450N550A
	470	30	40	320	560	2820	UC471M450O400A
	470	30	45	320	560	3090	UC471M450O450A
	470	35	35	320	560	2820	UC471M450P350A
	470	35	40	320	560	3090	UC471M450P400A
	470	35	45	320	560	3200	UC471M450P450A
	560	25	60	270	470	3400	UC561M450N600A
	560	30	50	270	470	3170	UC561M450O500A
	560	30	55	270	470	3230	UC561M450O550A
	560	35	35	270	470	2820	UC561M450P350A
	560	35	40	270	470	3170	UC561M450P400A
	680	30	55	220	390	3500	UC681M450O550A
	680	35	45	220	390	3400	UC681M450P450A
	680	35	50	220	390	3500	UC681M450P500A
	680	40	40	220	390	3400	UC681M450Q400A
	820	35	50	180	320	3600	UC821M450P500A
	820	35	55	180	320	3860	UC821M450P550A
	820	40	50	180	320	4100	UC821M450Q500A
	820	45	45	180	320	4100	UC821M450V450A
	1000	35	55	150	270	4600	UC102M450P550A
1000	35	60	150	270	4710	UC102M450P600A	
1000	40	55	150	270	4710	UC102M450Q550A	
1000	45	50	150	270	4710	UC102M450V500A	
1200	35	80	130	220	5520	UC122M450P800A	
1200	40	65	130	220	5430	UC122M450Q650A	
1200	45	55	130	220	5200	UC122M450V550A	
1500	45	70	100	180	6280	UC152M450V700A	
1800	45	80	86	150	7100	UC182M450V800A	
2200	45	90	69	120	8500	UC222M450V900A	
500	56	22	25	2710	4740	600	UC560M500M250A
	68	22	25	2230	3900	640	UC680M500M250A
	68	25	20	2230	3900	630	UC680M500N200A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
500	82	22	30	1850	3230	760	UC820M500M300A
	82	25	25	1850	3230	760	UC820M500N250A
	100	22	35	1510	2650	870	UC101M500M350A
	100	25	30	1510	2650	870	UC101M500N300A
	100	30	20	1510	2650	850	UC101M500O200A
	120	22	40	1260	2210	1050	UC121M500M400A
	120	25	30	1260	2210	1050	UC121M500N300A
	120	30	25	1260	2210	1050	UC121M500O250A
	150	22	45	1010	1770	1200	UC151M500M450A
	150	25	35	1010	1770	1200	UC151M500N350A
	150	30	30	1010	1770	1200	UC151M500O300A
	150	35	25	1010	1770	1200	UC151M500P250A
	180	22	50	840	1470	1350	UC181M500M500A
	180	25	40	840	1470	1310	UC181M500N400A
	180	30	30	840	1470	1300	UC181M500O300A
	180	35	25	840	1470	1230	UC181M500P250A
	220	30	35	690	1210	1520	UC221M500O350A
	220	35	30	690	1210	1550	UC221M500P300A
	270	30	40	560	980	1780	UC271M500O400A
	270	35	35	560	980	1830	UC271M500P350A
	330	30	50	460	800	2160	UC331M500O500A
	330	35	35	460	800	2040	UC331M500P350A
	390	35	45	390	680	2450	UC391M500P450A
	390	35	50	390	680	2580	UC391M500P500A
	470	35	50	320	560	2800	UC471M500P500A
	470	35	55	320	560	2920	UC471M500P550A
	560	35	60	270	470	3370	UC561M500P600A
	560	40	50	270	470	3320	UC561M500Q500A
	680	35	70	220	390	3920	UC681M500P700A
	680	40	55	220	390	3830	UC681M500Q550A
680	40	60	220	390	3920	UC681M500Q600A	
820	35	80	180	320	4570	UC821M500P800A	
820	40	60	180	320	4350	UC821M500Q600A	
1000	40	80	150	270	5450	UC102M500Q800A	
1500	40	100	100	180	6580	UC152M500QA00A	
575	180	30	45	840	1470	1160	UC181M575O450A
	220	30	50	690	1210	1310	UC221M575O500A
	270	30	60	560	980	1650	UC271M575O600A
	270	35	45	560	980	1650	UC271M575P450A
	330	30	70	460	800	1760	UC331M575O700A
	330	35	50	460	800	1760	UC331M575P500A
	330	40	45	460	800	1760	UC331M575Q450A
	390	30	85	390	680	2000	UC391M575O850A
	390	35	60	390	680	2000	UC391M575P600A
390	40	55	390	680	2000	UC391M575Q550A	

: See description at end of standard ratings

STANDARD RATINGS

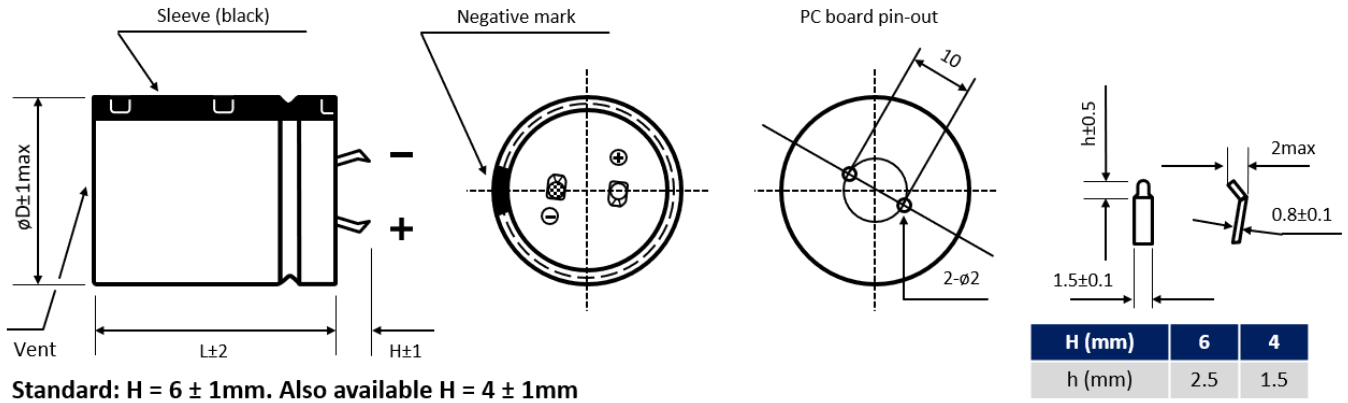
V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
575	470	35	70	320	560	2250	UC471M575P700A □□
	470	40	60	320	560	2250	UC471M575Q600A □□
	470	45	50	320	560	2250	UC471M575V500A □□
	560	35	80	270	470	2500	UC561M575P800A □□
	560	40	70	270	470	2500	UC561M575Q700A □□
	560	45	55	270	470	2500	UC561M575V550A □□
	680	35	95	220	390	2850	UC681M575P950A □□
	680	40	80	220	390	2850	UC681M575Q800A □□
	680	45	65	220	390	2850	UC681M575V650A □□
	820	40	100	180	320	3200	UC821M575QA00A □□
	820	45	75	180	320	3200	UC821M575V750A □□
	1000	45	90	150	270	3360	UC102M575V900A □□
1200	45	105	130	220	3560	UC122M575VA05A □□	
600	150	30	45	1010	1770	1100	UC151M600Q450A □□
	180	30	50	840	1470	1110	UC181M600O500A □□
	220	30	60	690	1210	1240	UC221M600O600A □□
	270	30	70	560	980	1350	UC271M600O700A □□
	330	30	80	460	800	1360	UC331M600O800A □□
	330	40	50	460	800	1360	UC331M600Q500A □□
	390	40	60	390	680	1600	UC391M600Q600A □□
	470	40	70	320	560	1750	UC471M600Q700A □□
	470	45	55	320	560	1750	UC471M600V550A □□
	560	40	80	270	470	1900	UC561M600Q800A □□
	560	45	60	270	470	1900	UC561M600V600A □□
	680	40	90	220	390	2000	UC681M600Q900A □□
	680	45	70	220	390	2000	UC681M600V700A □□
	820	45	85	180	320	2500	UC821M600V850A □□
1000	45	100	150	270	2900	UC102M600VA00A □□	
630	150	30	45	1010	1770	1000	UC151M630Q450A □□
	180	30	50	840	1470	1020	UC181M630O500A □□
	220	30	60	690	1210	1110	UC221M630O600A □□
	270	30	70	560	980	1300	UC271M630O700A □□
	330	30	85	460	800	1330	UC331M630O850A □□
	330	40	50	460	800	1330	UC331M630Q500A □□
	470	40	70	320	560	1700	UC471M630Q700A □□
	470	45	55	320	560	1700	UC471M630V550A □□
	560	40	80	270	470	1800	UC561M630Q800A □□
	560	45	65	270	470	1800	UC561M630V650A □□
	680	40	95	220	390	1950	UC681M630Q950A □□
	680	45	75	220	390	1950	UC681M630V750A □□
	820	45	90	180	320	2300	UC821M630V900A □□
	1000	45	105	150	270	2300	UC102M630VA05A □□

□□: Enter **P6** for standard type • 6mm pin length
 □□: Enter **Z6** for 3-pin type • 6mm pin length
 □□: Enter **Y6** for multipin-type • 6mm pin length

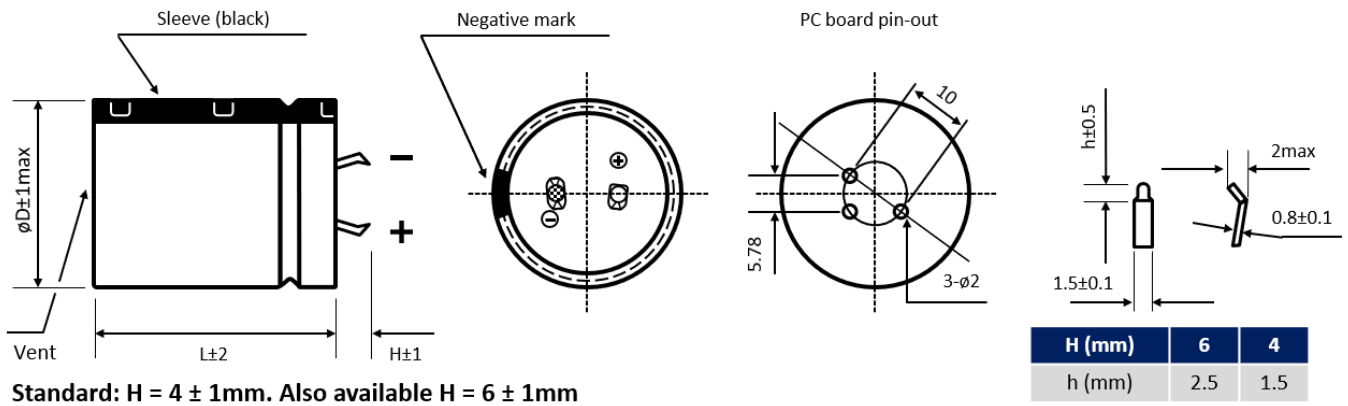
□□: Enter **P4** for standard type • 4mm pin length
 □□: Enter **Z4** for 3-pin type • 4mm pin length
 □□: Enter **Y4** for multipin type • 4mm pin length

DIMENSIONS ▪ All dimensions in mm

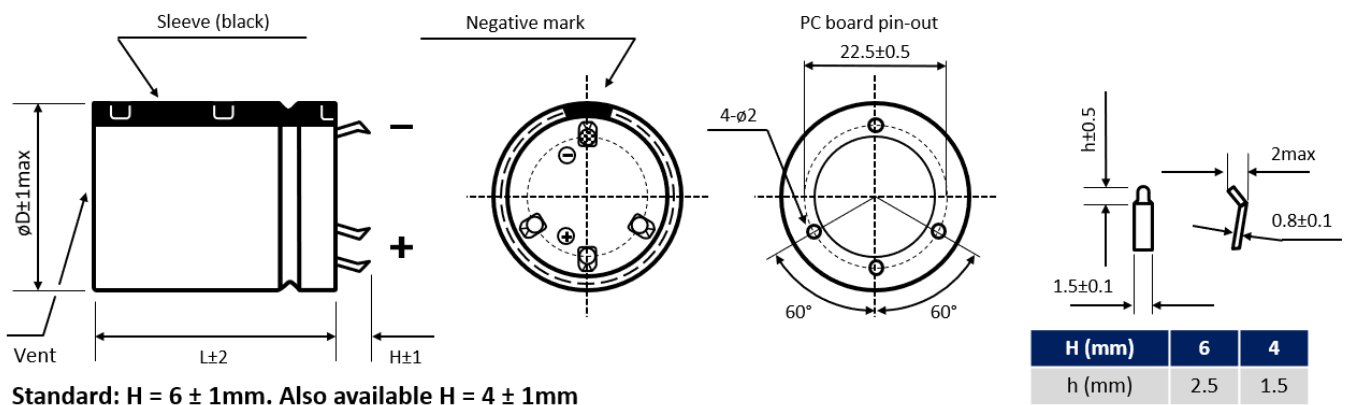
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

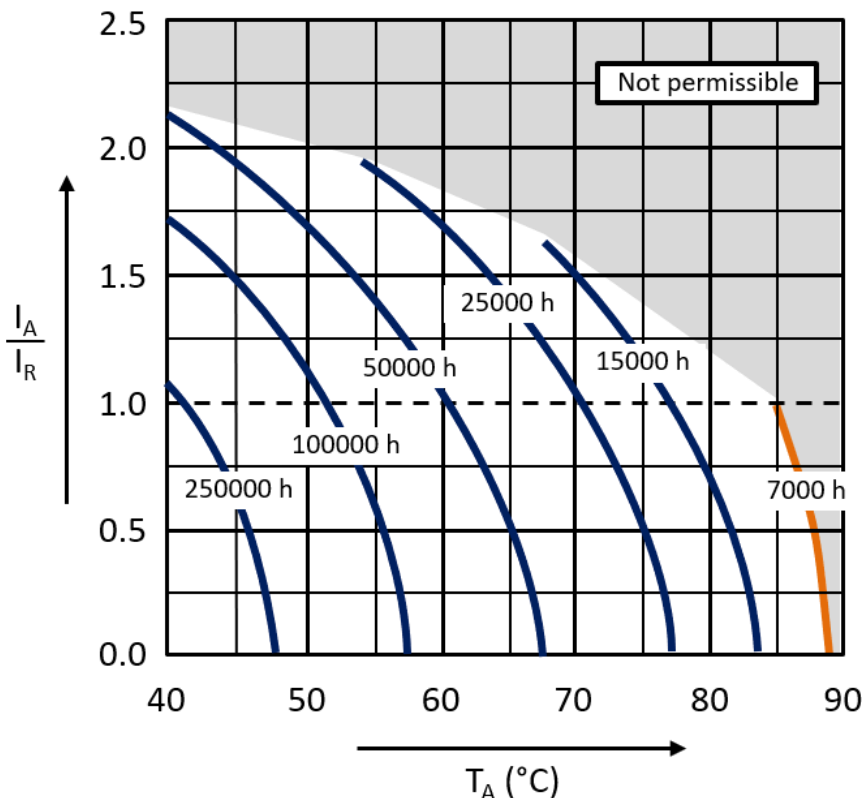
MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$350 \leq V_R \leq 630$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE


With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor



DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

LD SERIES ■ ULTRA LONG LIFE 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ■ Snap-In type
- Useful life: 85°C ■ 7000 hours up to 10000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +85°C					-25 ~ +85°C					
Rated Voltage Range	V _R	10 ~ 350V DC					400 ~ 500V DC					
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R					
Capacitance Range	C _R	82 ~ 100000µF					47 ~ 1800µF					
Cap. Tolerance	ΔC	±20% (120Hz ■ 20°C)										
Leakage Current (20°C ■ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ■ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]										
Dissipation Factor % (20°C ■ 120Hz)	tanδ	µF / V DC	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 500
		≤ 8200	35	35	30	25	20	20	15	15	15	20
		10000 ~ 22000	40	40	35	30	30	25	20	-	-	-
		≥ 27000	50	40	35	35	30	25	-	-	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	10 ~ 16	25	35	50 ~ 100	160 ~ 250	315 ~ 350	400 ~ 500			
		Z-25°C/Z+20°C	5	4	4	4	4	8	8			
		Z-40°C/Z+20°C	15	15	12	12	8	12	-			
Lifetime Test		V _R ≤ 100V					V _R > 100V					
Useful Life 85°C (V _R & I _R applied)	Test	7 000 hours					10 000 hours					
	ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value					
	tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value					
	I _{Leak}	≤ the initial specified value					≤ the initial specified value					
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ■ parts show higher drift as test criteria											
Endurance 85°C (V _R & I _R applied)	Test	5 000 hours										
	ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value					
	tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value					
	I _{Leak}	≤ the initial specified value					≤ the initial specified value					
Shelf Life 85°C (V _R = 0)	Test	1 000 hours										
	ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value					
	tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value					
	I _{Leak}	≤ the initial specified value					≤ the initial specified value					
	Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4											
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ■ IEC 60068-2-6										

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
10	10000	22	25	36	46	2510	LD103M010M250A
	12000	22	25	34	44	2710	LD123M010M250A
	15000	22	30	27	35	3210	LD153M010M300A
	15000	25	25	27	35	3210	LD153M010N250A
	18000	22	35	23	29	3610	LD183M010M350A
	18000	25	30	23	29	3610	LD183M010N300A
	22000	22	40	19	24	4110	LD223M010M400A
	22000	25	35	19	24	4110	LD223M010N350A
	22000	30	25	19	24	4110	LD223M010O250A
	33000	22	45	15	20	4810	LD333M010M450A
	33000	25	40	15	20	5210	LD333M010N400A
	33000	30	30	15	20	5210	LD333M010O300A
	47000	22	50	11	14	6010	LD473M010M500A
	47000	25	45	11	14	6310	LD473M010N450A
	47000	30	35	11	14	6310	LD473M010O350A
	56000	30	40	9	12	7210	LD563M010O400A
	56000	35	35	9	12	7510	LD563M010P350A
	68000	30	50	8	10	8210	LD683M010O500A
	68000	35	40	8	10	8210	LD683M010P400A
	82000	35	50	6	8	9310	LD823M010P500A
100000	35	55	5	7	10110	LD104M010P550A	
16	8200	22	25	44	57	2210	LD822M016M250A
	10000	22	30	36	46	2610	LD103M016M300A
	10000	25	25	36	46	2610	LD103M016N250A
	12000	22	35	34	44	2910	LD123M016M350A
	15000	22	40	27	35	3310	LD153M016M400A
	15000	25	30	27	35	3310	LD153M016N300A
	15000	30	25	27	35	3410	LD153M016O250A
	18000	22	45	23	29	3810	LD183M016M450A
	18000	25	35	23	29	3710	LD183M016N350A
	22000	22	50	19	24	4210	LD223M016M500A
	22000	25	40	19	24	4210	LD223M016N400A
	22000	30	30	19	24	4210	LD223M016O300A
	22000	35	25	19	24	4410	LD223M016P250A
	33000	25	45	12	16	5210	LD333M016N450A
	33000	30	35	12	16	5210	LD333M016O350A
	33000	35	30	12	16	5210	LD333M016P300A
	47000	25	50	9	11	6310	LD473M016N500A
	47000	30	40	9	11	6310	LD473M016O400A
	47000	35	35	9	11	6310	LD473M016P350A
	56000	30	45	7	10	9810	LD563M016O450A
56000	35	40	7	10	9810	LD563M016P400A	
56000	40	40	7	10	9810	LD563M016Q400A	
68000	35	50	6	8	10810	LD683M016P500A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
16	68000	40	50	6	8	11510	LD683M016Q500A
	82000	35	60	5	7	11810	LD823M016P600A
	82000	40	50	5	7	11810	LD823M016Q500A
	100000	35	80	4	6	13210	LD104M016P800A
	100000	40	60	4	6	13510	LD104M016Q600A
25	5600	22	25	55	71	2010	LD562M025M250A
	6800	22	30	45	59	2310	LD682M025M300A
	6800	25	25	45	59	2310	LD682M025N250A
	8200	22	35	37	49	2610	LD822M025M350A
	10000	22	40	31	40	2910	LD103M025M400A
	10000	25	30	31	40	2810	LD103M025N300A
	10000	30	25	31	40	3010	LD103M025O250A
	12000	22	45	30	39	3310	LD123M025M450A
	12000	25	35	30	39	3210	LD123M025N350A
	12000	30	30	30	39	3410	LD123M025O300A
	15000	25	40	24	31	3710	LD153M025N400A
	15000	35	25	24	31	3910	LD153M025P250A
	18000	25	50	20	26	4310	LD183M025N500A
	18000	30	35	20	26	4210	LD183M025O350A
	18000	35	30	20	26	4410	LD183M025P300A
	22000	30	40	16	21	5010	LD223M025O400A
	22000	35	35	16	21	5010	LD223M025P350A
	33000	35	40	11	14	8110	LD333M025P400A
	33000	40	40	11	14	8710	LD333M025Q400A
	39000	35	45	9	12	9010	LD393M025P450A
	39000	40	40	9	12	9610	LD393M025Q400A
	47000	35	50	8	10	9610	LD473M025P500A
56000	35	60	6	8	10310	LD563M025P600A	
56000	40	50	6	8	10810	LD563M025Q500A	
68000	35	80	5	7	11310	LD683M025P800A	
68000	40	60	5	7	11810	LD683M025Q600A	
82000	40	80	4	6	13510	LD823M025Q800A	
35	3300	22	25	77	100	1810	LD332M035M250A
	3900	22	30	65	85	2110	LD392M035M300A
	4700	25	25	54	71	2210	LD472M035N250A
	5600	22	35	46	59	2310	LD562M035M350A
	5600	25	30	46	59	2310	LD562M035N300A
	6800	22	40	38	49	2910	LD682M035M400A
	6800	25	35	38	49	2910	LD682M035N350A
	6800	30	25	38	49	2910	LD682M035O250A
	8200	22	50	31	40	2810	LD822M035M500A
	8200	25	40	31	40	2810	LD822M035N400A
	8200	30	30	31	40	2810	LD822M035O300A
	8200	35	25	31	40	2910	LD822M035P250A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
35	10000	25	45	26	33	3110	LD103M035N450A
	10000	30	35	26	33	3210	LD103M035O350A
	12000	25	50	26	33	3510	LD123M035N500A
	12000	30	40	26	33	3510	LD123M035O400A
	12000	35	30	26	33	3610	LD123M035P300A
	15000	30	45	20	27	4110	LD153M035O450A
	15000	35	35	20	27	4110	LD153M035P350A
	18000	30	50	17	22	4610	LD183M035O500A
	18000	35	40	17	22	4710	LD183M035P400A
	22000	35	45	14	18	5310	LD223M035P450A
	27000	35	45	13	17	8210	LD273M035P450A
	27000	40	40	13	17	8210	LD273M035Q400A
	33000	35	50	11	14	8710	LD333M035P500A
	39000	35	60	9	12	10310	LD393M035P600A
	39000	40	50	9	12	10310	LD393M035Q500A
	47000	35	80	8	10	11410	LD473M035P800A
	47000	40	60	8	10	10810	LD473M035Q600A
	56000	40	70	6	8	12110	LD563M035Q700A
68000	40	80	5	7	14210	LD683M035Q800A	
50	2200	22	25	92	120	1710	LD222M050M250A
	2700	22	30	76	98	1910	LD272M050M300A
	2700	25	25	76	98	1910	LD272M050N250A
	3300	25	30	62	80	1810	LD332M050N300A
	3900	22	35	52	68	2110	LD392M050M350A
	3900	25	30	52	68	2110	LD392M050N300A
	3900	30	25	52	68	2410	LD392M050O250A
	4700	22	40	43	56	2410	LD472M050M400A
	4700	25	35	43	56	2410	LD472M050N350A
	5600	22	50	36	47	2510	LD562M050M500A
	5600	25	40	36	47	2510	LD562M050N400A
	5600	30	30	36	47	2510	LD562M050O300A
	5600	35	25	36	47	2610	LD562M050P250A
	6800	25	45	30	39	3210	LD682M050N450A
	6800	30	35	30	39	3210	LD682M050O350A
	8200	25	50	25	32	3010	LD822M050N500A
	8200	30	40	25	32	3010	LD822M050O400A
	8200	35	30	25	32	3010	LD822M050P300A
	10000	30	45	20	27	3410	LD103M050O450A
	10000	35	35	20	27	3410	LD103M050P350A
	12000	30	45	26	33	3810	LD123M050O450A
	12000	35	35	26	33	3810	LD123M050P350A
15000	30	50	20	27	4510	LD153M050O500A	
15000	35	40	20	27	7710	LD153M050P400A	
15000	40	40	20	27	8110	LD153M050Q400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
50	18000	35	45	17	22	8310	LD183M050P450A ☐☐
	18000	40	40	17	22	8310	LD183M050Q400A ☐☐
	22000	35	50	14	18	9110	LD223M050P500A ☐☐
	22000	40	50	14	18	9410	LD223M050Q500A ☐☐
	27000	35	80	11	15	11210	LD273M050P800A ☐☐
	27000	40	60	11	15	10810	LD273M050Q600A ☐☐
	33000	35	80	9	12	13410	LD333M050P800A ☐☐
	33000	40	70	9	12	13410	LD333M050Q700A ☐☐
	39000	40	80	8	10	15510	LD393M050Q800A ☐☐
63	1500	22	25	140	180	1610	LD152M063M250A ☐☐
	1800	22	25	120	150	1810	LD182M063M250A ☐☐
	2200	22	30	92	120	2010	LD222M063M300A ☐☐
	2200	25	25	92	120	2010	LD222M063N250A ☐☐
	2700	22	35	76	98	2210	LD272M063M350A ☐☐
	2700	25	30	76	98	2310	LD272M063N300A ☐☐
	3300	22	40	62	80	2310	LD332M063M400A ☐☐
	3300	25	35	62	80	2310	LD332M063N350A ☐☐
	3300	30	25	62	80	2310	LD332M063O250A ☐☐
	3900	22	45	52	68	2510	LD392M063M450A ☐☐
	3900	25	40	52	68	2610	LD392M063N400A ☐☐
	3900	30	30	52	68	2610	LD392M063O300A ☐☐
	3900	35	25	52	68	2710	LD392M063P250A ☐☐
	4700	30	30	43	56	2910	LD472M063O300A ☐☐
	5600	25	45	36	47	3110	LD562M063N450A ☐☐
	5600	30	35	36	47	3210	LD562M063O350A ☐☐
	5600	35	30	36	47	3310	LD562M063P300A ☐☐
	6800	30	40	30	39	3610	LD682M063O400A ☐☐
	6800	35	35	30	39	3710	LD682M063P350A ☐☐
	8200	30	50	25	32	4710	LD822M063O500A ☐☐
	8200	35	40	25	32	4810	LD822M063P400A ☐☐
	10000	35	45	20	27	5310	LD103M063P450A ☐☐
	12000	35	50	21	28	7810	LD123M063P500A ☐☐
	12000	40	40	21	28	8610	LD123M063Q400A ☐☐
15000	35	70	17	22	10210	LD153M063P700A ☐☐	
15000	40	50	17	22	9510	LD153M063Q500A ☐☐	
18000	35	80	14	18	11210	LD183M063P800A ☐☐	
18000	40	60	14	18	10710	LD183M063Q600A ☐☐	
27000	40	80	9	12	12710	LD273M063Q800A ☐☐	
80	1000	22	25	150	200	1310	LD102M080M250A ☐☐
	1200	22	30	130	170	1510	LD122M080M300A ☐☐
	1500	25	25	100	130	1710	LD152M080N250A ☐☐
	1800	22	35	85	110	1910	LD182M080M350A ☐☐
	1800	25	30	85	110	1910	LD182M080N300A ☐☐

☐☐: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
80	2200	22	40	70	90	2110	LD222M080M400A
	2200	25	35	70	90	2210	LD222M080N350A
	2200	30	25	70	90	2210	LD222M080O250A
	2700	22	50	57	74	2510	LD272M080M500A
	2700	25	40	57	74	2510	LD272M080N400A
	2700	30	30	57	74	2510	LD272M080O300A
	2700	35	25	57	74	2510	LD272M080P250A
	3300	25	45	46	60	2810	LD332M080N450A
	3300	30	35	46	60	2810	LD332M080O350A
	3900	25	50	39	51	3110	LD392M080N500A
	3900	30	40	39	51	3210	LD392M080O400A
	3900	35	30	39	51	3210	LD392M080P300A
	4700	30	45	33	42	3610	LD472M080O450A
	4700	35	35	33	42	3610	LD472M080P350A
	5600	30	50	27	36	3810	LD562M080O500A
	5600	35	40	27	36	3810	LD562M080P400A
	6800	35	50	23	29	4110	LD682M080P500A
	8200	35	50	19	24	6910	LD822M080P500A
	10000	35	60	22	27	8710	LD103M080P600A
	12000	35	70	18	22	9710	LD123M080P700A
12000	40	50	18	22	9010	LD123M080Q500A	
15000	35	80	14	18	10510	LD153M080P800A	
15000	40	60	14	18	10210	LD153M080Q600A	
18000	40	80	12	15	12310	LD183M080Q800A	
100	680	22	25	220	290	1110	LD681M100M250A
	820	22	30	180	240	1210	LD821M100M300A
	1000	25	25	150	200	1410	LD102M100N250A
	1200	22	35	130	170	1610	LD122M100M350A
	1200	25	30	130	170	1610	LD122M100N300A
	1500	22	40	100	130	1810	LD152M100M400A
	1500	25	35	100	130	1810	LD152M100N350A
	1500	30	25	100	130	1810	LD152M100O250A
	1800	22	50	85	110	2110	LD182M100M500A
	1800	25	40	85	110	2010	LD182M100N400A
	1800	30	30	85	110	2110	LD182M100O300A
	1800	35	25	85	110	2210	LD182M100P250A
	2200	25	45	70	90	2210	LD222M100N450A
	2200	30	35	70	90	2310	LD222M100O350A
	2200	35	30	70	90	2510	LD222M100P300A
	2700	25	50	57	74	2610	LD272M100N500A
	2700	30	40	57	74	2710	LD272M100O400A
	3300	30	45	46	60	3010	LD332M100O450A
3300	35	35	46	60	3110	LD332M100P350A	
3900	30	45	39	51	3410	LD392M100O450A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
100	3900	35	35	39	51	3410	LD392M100P350A □□
	4700	35	40	33	42	4010	LD472M100P400A □□
	5600	35	45	27	36	7010	LD562M100P450A □□
	5600	40	40	27	36	7410	LD562M100Q400A □□
	6800	35	50	23	29	8010	LD682M100P500A □□
	6800	40	50	23	29	8910	LD682M100Q500A □□
	8200	35	70	19	24	9610	LD822M100P700A □□
	8200	40	60	19	24	9610	LD822M100Q600A □□
	10000	35	80	15	20	10410	LD103M100P800A □□
	10000	40	60	15	20	10210	LD103M100Q600A □□
	12000	40	80	13	17	12310	LD123M100Q800A □□
160	220	22	20	500	900	1010	LD221M160M200A □□
	270	22	25	410	740	1110	LD271M160M250A □□
	330	22	25	330	600	1510	LD331M160M250A □□
	390	22	30	280	510	1510	LD391M160M300A □□
	390	25	25	280	510	1610	LD391M160N250A □□
	470	22	35	230	420	1810	LD471M160M350A □□
	470	25	25	230	420	1710	LD471M160N250A □□
	560	22	35	200	360	2110	LD561M160M350A □□
	560	25	30	200	360	2210	LD561M160N300A □□
	560	30	25	200	360	2110	LD561M160Q250A □□
	680	22	40	160	290	2310	LD681M160M400A □□
	680	25	35	160	290	2310	LD681M160N350A □□
	820	22	50	130	240	2710	LD821M160M500A □□
	820	25	40	130	240	2710	LD821M160N400A □□
	820	30	30	130	240	2710	LD821M160Q300A □□
	820	35	25	130	240	2710	LD821M160P250A □□
	1000	25	45	110	200	3310	LD102M160N450A □□
	1000	30	35	110	200	3410	LD102M160Q350A □□
	1000	35	30	110	200	3410	LD102M160P300A □□
	1200	25	50	94	170	3710	LD122M160N500A □□
	1200	30	40	94	170	3810	LD122M160Q400A □□
	1200	35	35	94	170	3810	LD122M160P350A □□
	1500	30	45	72	130	4410	LD152M160Q450A □□
	1500	35	40	72	130	4410	LD152M160P400A □□
	1800	35	40	61	110	4410	LD182M160P400A □□
	2200	35	45	50	90	4910	LD222M160P450A □□
	2700	35	50	41	74	5310	LD272M160P500A □□
	3300	35	70	33	60	5510	LD332M160P700A □□
	3300	40	60	33	60	5510	LD332M160Q600A □□
	3900	35	80	28	51	5910	LD392M160P800A □□
4700	40	80	24	42	7310	LD472M160Q800A □□	
180	270	22	25	410	740	1210	LD271M180M250A □□
	330	22	30	330	600	1510	LD331M180M300A □□

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
180	390	25	25	280	510	1680	LD391M180N250A
	470	22	35	230	420	1710	LD471M180M350A
	470	25	30	230	420	1710	LD471M180N300A
	470	30	25	230	420	1810	LD471M180O250A
	560	22	40	200	360	2120	LD561M180M400A
	560	25	35	200	360	2120	LD561M180N350A
	680	22	50	160	290	2410	LD681M180M500A
	680	25	40	160	290	2410	LD681M180N400A
	680	30	30	160	290	2410	LD681M180O300A
	680	35	25	160	290	2410	LD681M180P250A
	820	25	45	130	240	2710	LD821M180N450A
	820	30	35	130	240	2710	LD821M180O350A
	820	35	30	130	240	2710	LD821M180P300A
	1000	25	50	110	200	3510	LD102M180N500A
	1000	30	40	110	200	3510	LD102M180O400A
	1200	30	45	94	170	3920	LD122M180O450A
	1200	35	35	94	170	3920	LD122M180P350A
1500	35	45	72	130	4610	LD152M180P450A	
1800	35	50	61	110	4110	LD182M180P500A	
200	220	22	25	500	900	1210	LD221M200M250A
	270	22	25	410	740	1320	LD271M200M250A
	330	22	25	330	600	1540	LD331M200M250A
	330	22	30	330	600	1610	LD331M200M300A
	330	25	25	330	600	1640	LD331M200N250A
	390	22	30	280	510	1750	LD391M200M300A
	390	25	25	280	510	1680	LD391M200N250A
	390	25	30	280	510	1870	LD391M200N300A
	390	30	25	280	510	2060	LD391M200O250A
	470	22	30	230	420	1950	LD471M200M300A
	470	22	35	230	420	2000	LD471M200M350A
	470	25	25	230	420	1950	LD471M200N250A
	470	25	30	230	420	2050	LD471M200N300A
	470	30	25	230	420	2280	LD471M200O250A
	560	22	35	200	360	2250	LD561M200M350A
	560	22	40	200	360	2320	LD561M200M400A
	560	25	30	200	360	2240	LD561M200N300A
	560	25	35	200	360	2340	LD561M200N350A
	560	30	25	200	360	2340	LD561M200O250A
	560	30	30	200	360	2590	LD561M200O300A
	560	35	25	200	360	2580	LD561M200P250A
680	22	40	160	290	2600	LD681M200M400A	
680	22	45	160	290	2570	LD681M200M450A	
680	25	35	160	290	2490	LD681M200N350A	
680	25	40	160	290	2680	LD681M200N400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	680	30	25	160	290	2420	LD681M200Q250A
	680	30	30	160	290	2870	LD681M200Q300A
	680	35	25	160	290	2900	LD681M200P250A
	820	22	45	130	240	2990	LD821M200M450A
	820	25	35	130	240	2760	LD821M200N350A
	820	25	40	130	240	2990	LD821M200N400A
	820	25	45	130	240	3060	LD821M200N450A
	820	30	30	130	240	2990	LD821M200Q300A
	820	30	35	130	240	3280	LD821M200Q350A
	820	35	25	130	240	3060	LD821M200P250A
	820	35	30	130	240	3300	LD821M200P300A
	1000	25	45	110	200	3630	LD102M200N450A
	1000	25	50	110	200	3800	LD102M200N500A
	1000	30	30	110	200	3510	LD102M200Q300A
	1000	30	35	110	200	3630	LD102M200Q350A
	1000	30	40	110	200	4000	LD102M200Q400A
	1000	35	25	110	200	3510	LD102M200P250A
	1000	35	30	110	200	4100	LD102M200P300A
	1200	25	50	94	170	4030	LD122M200N500A
	1200	30	45	94	170	4530	LD122M200Q450A
	1200	35	35	94	170	4530	LD122M200P350A
	1500	30	50	72	130	5260	LD152M200Q500A
	1500	35	35	72	130	4800	LD152M200P350A
	1500	35	40	72	130	5260	LD152M200P400A
	1800	30	50	61	110	5310	LD182M200Q500A
	1800	30	55	61	110	5670	LD182M200Q550A
	1800	35	40	61	110	5310	LD182M200P400A
	1800	35	45	61	110	5770	LD182M200P450A
	2200	35	45	50	90	5810	LD222M200P450A
	2200	35	50	50	90	5910	LD222M200P500A
	2700	35	55	41	74	6030	LD272M200P550A
	2700	35	60	41	74	6190	LD272M200P600A
	2700	40	50	41	74	6190	LD272M200Q500A
3300	35	80	33	60	7500	LD332M200P800A	
3300	40	60	33	60	7500	LD332M200Q600A	
3900	40	80	28	51	8000	LD392M200Q800A	
250	100	22	25	1110	1990	730	LD101M250M250A
	150	22	25	740	1330	930	LD151M250M250A
	180	22	25	620	1110	1120	LD181M250M250A
	220	22	30	500	900	1290	LD221M250M300A
	220	25	25	500	900	1290	LD221M250N250A
	270	22	30	410	740	1470	LD271M250M300A
	270	25	25	410	740	1540	LD271M250N250A
330	22	30	330	600	1670	LD331M250M300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	330	22	35	330	600	1700	LD331M250M350A
	330	25	25	330	600	1630	LD331M250N250A
	330	25	30	330	600	1790	LD331M250N300A
	390	22	35	280	510	1910	LD391M250M350A
	390	22	40	280	510	1940	LD391M250M400A
	390	25	30	280	510	1860	LD391M250N300A
	390	25	35	280	510	2020	LD391M250N350A
	390	30	25	280	510	2150	LD391M250O250A
	470	22	40	230	420	2190	LD471M250M400A
	470	22	45	230	420	2220	LD471M250M450A
	470	25	30	230	420	2060	LD471M250N300A
	470	25	35	230	420	2230	LD471M250N350A
	470	30	30	230	420	2450	LD471M250O300A
	560	22	40	200	360	2460	LD561M250M400A
	560	22	50	200	360	2540	LD561M250M500A
	560	25	35	200	360	2460	LD561M250N350A
	560	25	40	200	360	2530	LD561M250N400A
	560	30	30	200	360	2700	LD561M250O300A
	560	35	25	200	360	2730	LD561M250P250A
	680	22	50	160	290	2900	LD681M250M500A
	680	25	40	160	290	2720	LD681M250N400A
	680	25	45	160	290	2900	LD681M250N450A
	680	30	35	160	290	3090	LD681M250O350A
	680	35	25	160	290	2900	LD681M250P250A
	680	35	30	160	290	3350	LD681M250P300A
	820	25	45	130	240	3280	LD821M250N450A
	820	25	50	130	240	3360	LD821M250N500A
	820	25	55	130	240	3480	LD821M250N550A
	820	30	35	130	240	3300	LD821M250O350A
	820	30	40	130	240	3390	LD821M250O400A
	820	35	30	130	240	3440	LD821M250P300A
	820	35	35	130	240	3810	LD821M250P350A
	1000	25	50	110	200	3800	LD102M250N500A
	1000	30	40	110	200	4000	LD102M250O400A
	1000	30	45	110	200	4290	LD102M250O450A
	1000	35	30	110	200	4100	LD102M250P300A
	1000	35	35	110	200	4290	LD102M250P350A
	1000	35	40	110	200	4380	LD102M250P400A
	1200	30	45	94	170	4620	LD122M250O450A
	1200	30	50	94	170	4740	LD122M250O500A
1200	35	35	94	170	4620	LD122M250P350A	
1200	35	40	94	170	4760	LD122M250P400A	
1500	35	40	72	130	5380	LD152M250P400A	
1500	35	45	72	130	5480	LD152M250P450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	1800	35	45	61	110	5780	LD182M250P450A
	1800	35	55	61	110	6350	LD182M250P550A
	2200	35	55	50	90	6450	LD222M250P550A
	2200	35	65	50	90	6800	LD222M250P650A
315	100	22	25	1110	1990	730	LD101M315M250A
	120	22	30	920	1660	760	LD121M315M300A
	150	22	30	740	1330	940	LD151M315M300A
	150	25	25	740	1330	940	LD151M315N250A
	180	22	35	620	1110	1120	LD181M315M350A
	180	25	30	620	1110	1120	LD181M315N300A
	220	22	40	500	900	1320	LD221M315M400A
	220	25	35	500	900	1320	LD221M315N350A
	220	30	25	500	900	1320	LD221M315O250A
	270	22	45	410	740	1610	LD271M315M450A
	270	25	40	410	740	1610	LD271M315N400A
	270	30	30	410	740	1610	LD271M315O300A
	270	35	25	410	740	1610	LD271M315P250A
	330	25	45	330	600	1760	LD331M315N450A
	330	30	35	330	600	1760	LD331M315O350A
	390	25	50	280	510	2210	LD391M315N500A
	390	30	40	280	510	2210	LD391M315O400A
	390	35	30	280	510	2210	LD391M315P300A
	470	30	45	230	420	2450	LD471M315O450A
	470	35	35	230	420	2450	LD471M315P350A
560	30	50	200	360	2850	LD561M315O500A	
560	35	40	200	360	2850	LD561M315P400A	
680	35	45	160	290	2310	LD681M315P450A	
350	82	22	25	1350	2430	650	LD820M350M250A
	100	22	25	1110	1990	730	LD101M350M250A
	120	22	30	920	1660	830	LD121M350M300A
	120	25	25	920	1660	830	LD121M350N250A
	150	22	35	740	1330	950	LD151M350M350A
	150	25	30	740	1330	950	LD151M350N300A
	180	22	40	620	1110	1120	LD181M350M400A
	180	30	25	620	1110	1120	LD181M350O250A
	220	22	45	500	900	1420	LD221M350M450A
	220	25	35	500	900	1420	LD221M350N350A
	220	30	30	500	900	1420	LD221M350O300A
	220	35	25	500	900	1510	LD221M350P250A
	270	25	40	410	740	1720	LD271M350N400A
	270	30	35	410	740	1720	LD271M350O350A
	330	25	45	330	600	1830	LD331M350N450A
330	30	40	330	600	1830	LD331M350O400A	
330	35	30	330	600	1830	LD331M350P300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
350	390	30	40	280	510	2340	LD391M350O400A
	390	35	35	280	510	2340	LD391M350P350A
	470	30	45	230	420	2490	LD471M350O450A
	470	35	40	230	420	2490	LD471M350P400A
	560	35	45	200	360	3220	LD561M350P450A
	680	35	45	160	290	3700	LD681M350P450A
	820	35	50	130	240	4500	LD821M350P500A
	1000	35	55	110	200	5200	LD102M350P550A
	1200	35	60	94	170	5500	LD122M350P600A
	1200	40	50	94	170	5600	LD122M350Q500A
	1500	40	60	72	130	8500	LD152M350Q600A
	1800	40	70	61	110	7900	LD182M350Q700A
2200	40	80	50	90	8700	LD222M350Q800A	
400	68	22	25	1630	2930	630	LD680M400M250A
	82	22	25	1350	2430	790	LD820M400M250A
	100	22	25	1110	1990	870	LD101M400M250A
	100	22	30	1110	1990	910	LD101M400M300A
	100	25	25	1110	1990	1050	LD101M400N250A
	120	22	30	920	1660	990	LD121M400M300A
	120	22	35	920	1660	1100	LD121M400M350A
	120	25	25	920	1660	1100	LD121M400N250A
	120	25	30	920	1660	1200	LD121M400N300A
	150	22	30	740	1330	1150	LD151M400M300A
	150	22	35	740	1330	1190	LD151M400M350A
	150	25	25	740	1330	1150	LD151M400N250A
	150	25	30	740	1330	1220	LD151M400N300A
	150	30	25	740	1330	1240	LD151M400O250A
	180	22	35	620	1110	1310	LD181M400M350A
	180	22	40	620	1110	1370	LD181M400M400A
	180	25	30	620	1110	1300	LD181M400N300A
	180	25	35	620	1110	1460	LD181M400N350A
	180	30	30	620	1110	1460	LD181M400O300A
	220	22	40	500	900	1530	LD221M400M400A
	220	22	50	500	900	1760	LD221M400M500A
	220	25	35	500	900	1500	LD221M400N350A
	220	25	40	500	900	1760	LD221M400N400A
	220	30	25	500	900	1530	LD221M400O250A
	220	30	30	500	900	1780	LD221M400O300A
	220	35	25	500	900	1810	LD221M400P250A
	220	35	30	500	900	1860	LD221M400P300A
270	22	45	410	740	1790	LD271M400M450A	
270	25	40	410	740	1830	LD271M400N400A	
270	25	45	410	740	1970	LD271M400N450A	
270	30	30	410	740	1890	LD271M400O300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	270	30	35	410	740	2040	LD271M400O350A
	270	35	25	410	740	2170	LD271M400P250A
	270	35	30	410	740	2040	LD271M400P300A
	330	25	45	330	600	2030	LD331M400N450A
	330	25	50	330	600	2200	LD331M400N500A
	330	30	35	330	600	2150	LD331M400O350A
	330	30	40	330	600	2470	LD331M400O400A
	330	35	30	330	600	2370	LD331M400P300A
	390	25	50	280	510	2330	LD391M400N500A
	390	30	35	280	510	2350	LD391M400O350A
	390	30	45	280	510	2590	LD391M400O450A
	390	35	30	280	510	2320	LD391M400P300A
	390	35	35	280	510	2550	LD391M400P350A
	470	25	55	230	420	2660	LD471M400N550A
	470	30	40	230	420	2610	LD471M400O400A
	470	30	50	230	420	2750	LD471M400O500A
	470	35	35	230	420	2580	LD471M400P350A
	470	35	40	230	420	2790	LD471M400P400A
	560	30	55	200	360	3360	LD561M400O550A
	560	35	35	200	360	3150	LD561M400P350A
	560	35	45	200	360	3430	LD561M400P450A
	560	40	40	200	360	3480	LD561M400Q400A
	680	30	55	160	290	3500	LD681M400O550A
	680	35	40	160	290	3850	LD681M400P400A
	680	35	50	160	290	3930	LD681M400P500A
	680	35	55	160	290	4160	LD681M400P550A
	680	40	50	160	290	4380	LD681M400Q500A
	820	35	50	130	240	4500	LD821M400P500A
	820	35	55	130	240	4600	LD821M400P550A
	820	40	50	130	240	4600	LD821M400Q500A
	1000	35	65	110	200	5200	LD102M400P650A
	1000	40	60	110	200	5300	LD102M400Q600A
1000	45	50	110	200	5300	LD102M400V500A	
1200	35	70	94	170	5900	LD122M400P700A	
1200	40	60	94	170	5900	LD122M400Q600A	
1500	40	70	72	130	6700	LD152M400Q700A	
1800	45	80	61	110	7400	LD182M400V800A	
420	100	22	30	1470	2650	1080	LD101M420M300A
	100	25	25	1470	2650	1080	LD101M420N250A
	120	25	30	1230	2210	1230	LD121M420N300A
	150	22	40	980	1770	1190	LD151M420M400A
	150	25	35	980	1770	1240	LD151M420N350A
	180	25	35	820	1470	1460	LD181M420N350A
	180	30	30	820	1470	1460	LD181M420O300A

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
420	220	25	40	670	1210	1820	LD221M420N400A
	220	30	35	670	1210	1870	LD221M420O350A
	270	25	55	540	980	2070	LD271M420N550A
	270	30	35	540	980	2070	LD271M420O350A
	270	35	30	540	980	2070	LD271M420P300A
	330	30	45	440	800	2400	LD331M420O450A
	330	35	35	440	800	2400	LD331M420P350A
	390	30	50	380	680	2660	LD391M420O500A
	470	30	55	310	560	2840	LD471M420O550A
	470	35	45	310	560	2890	LD471M420P450A
	560	35	50	260	470	3450	LD561M420P500A
	680	35	60	220	390	4010	LD681M420P600A
	820	35	65	180	320	4610	LD821M420P650A
	1000	35	80	150	270	5610	LD102M420P800A
	1500	40	80	100	180	7210	LD152M420Q800A
1800	45	80	83	150	7810	LD182M420V800A	
450	47	22	25	3130	5640	530	LD470M450M250A
	56	22	25	2630	4740	610	LD560M450M250A
	68	22	30	2170	3900	690	LD680M450M300A
	68	25	25	2170	3900	720	LD680M450N250A
	82	25	25	1790	3230	820	LD820M450N250A
	82	25	30	1790	3230	930	LD820M450N300A
	100	22	35	1470	2650	1100	LD101M450M350A
	100	25	30	1470	2650	1120	LD101M450N300A
	100	30	25	1470	2650	1130	LD101M450O250A
	120	22	40	1230	2210	1240	LD121M450M400A
	120	25	30	1230	2210	1240	LD121M450N300A
	120	30	25	1230	2210	1240	LD121M450O250A
	150	22	45	980	1770	1330	LD151M450M450A
	150	25	30	980	1770	1200	LD151M450N300A
	150	25	35	980	1770	1300	LD151M450N350A
	150	30	30	980	1770	1360	LD151M450O300A
	150	35	25	980	1770	1430	LD151M450P250A
	180	25	35	820	1470	1460	LD181M450N350A
	180	25	40	820	1470	1480	LD181M450N400A
	180	30	35	820	1470	1700	LD181M450O350A
	180	35	25	820	1470	1550	LD181M450P250A
	180	35	30	820	1470	1720	LD181M450P300A
	220	22	50	670	1210	1840	LD221M450M500A
	220	25	40	670	1210	1820	LD221M450N400A
	220	25	50	670	1210	1930	LD221M450N500A
220	30	35	670	1210	1870	LD221M450O350A	
220	30	40	670	1210	1930	LD221M450O400A	
220	35	25	670	1210	1880	LD221M450P250A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	220	35	30	670	1210	1940	LD221M450P300A □□
	270	25	45	540	980	2110	LD271M450N450A □□
	270	25	55	540	980	2220	LD271M450N550A □□
	270	30	35	540	980	2100	LD271M450Q350A □□
	270	30	40	540	980	2220	LD271M450Q400A □□
	270	35	30	540	980	2050	LD271M450P300A □□
	270	35	35	540	980	2220	LD271M450P350A □□
	330	25	50	440	800	2240	LD331M450N500A □□
	330	30	40	440	800	2240	LD331M450Q400A □□
	330	30	45	440	800	2400	LD331M450Q450A □□
	330	35	30	440	800	2350	LD331M450P300A □□
	330	35	40	440	800	2530	LD331M450P400A □□
	390	30	45	380	680	2640	LD391M450Q450A □□
	390	30	55	380	680	2740	LD391M450Q550A □□
	390	35	35	380	680	2630	LD391M450P350A □□
	390	35	45	380	680	2830	LD391M450P450A □□
	470	30	50	310	560	2750	LD471M450Q500A □□
	470	35	40	310	560	2790	LD471M450P400A □□
	470	35	50	310	560	3220	LD471M450P500A □□
	470	40	40	310	560	3220	LD471M450Q400A □□
	560	30	55	260	470	3630	LD561M450Q550A □□
	560	35	45	260	470	3430	LD561M450P450A □□
	560	35	55	260	470	3630	LD561M450P550A □□
	560	40	50	260	470	3630	LD561M450Q500A □□
	680	35	50	220	390	3490	LD681M450P500A □□
	680	35	60	220	390	3520	LD681M450P600A □□
	680	40	50	220	390	3510	LD681M450Q500A □□
	820	35	65	180	320	4610	LD821M450P650A □□
	820	40	55	180	320	4610	LD821M450Q550A □□
	1000	35	70	150	270	5710	LD102M450P700A □□
	1000	40	60	150	270	5210	LD102M450Q600A □□
	1200	35	80	120	220	5910	LD122M450P800A □□
1200	40	65	120	220	5910	LD122M450Q650A □□	
1500	40	80	100	180	7310	LD152M450Q800A □□	
1800	45	80	83	150	7910	LD182M450V800A □□	
500	47	22	25	3130	5640	560	LD470M500M250A □□
	56	25	25	2630	4740	620	LD560M500N250A □□
	68	22	30	2170	3900	700	LD680M500M300A □□
	68	25	25	2170	3900	750	LD680M500N250A □□
	82	25	30	1790	3230	830	LD820M500N300A □□
	100	25	30	1470	2650	960	LD101M500N300A □□
	100	30	25	1470	2650	990	LD101M500Q250A □□
	120	25	35	1230	2210	1120	LD121M500N350A □□
120	30	30	1230	2210	1130	LD121M500Q300A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

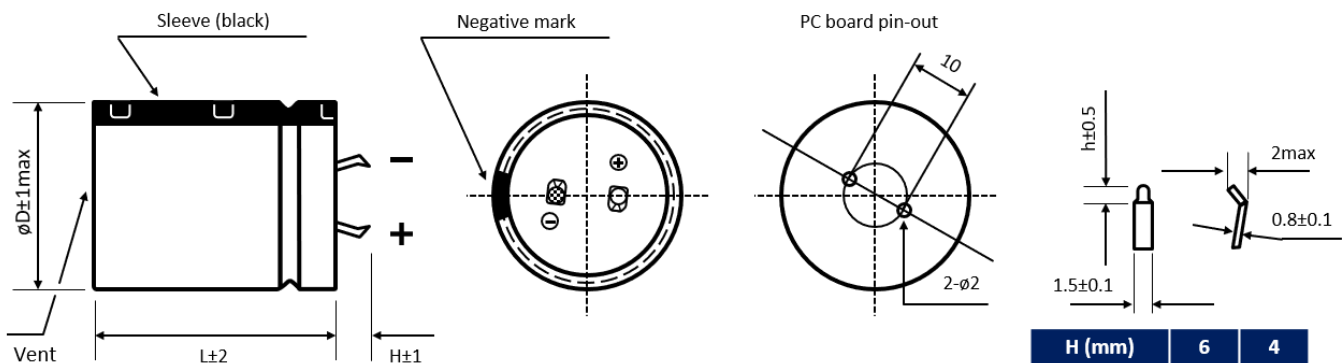
V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
500	120	35	25	1230	2210	1150	LD121M500P250A
	150	25	40	980	1770	1300	LD151M500N400A
	150	30	30	980	1770	1320	LD151M500O300A
	150	35	25	980	1770	1360	LD151M500P250A
	180	25	45	820	1470	1580	LD181M500N450A
	180	30	35	820	1470	1600	LD181M500O350A
	180	35	30	820	1470	1630	LD181M500P300A
	220	25	55	670	1210	1760	LD221M500N550A
	220	30	40	670	1210	1730	LD221M500O400A
	220	35	35	670	1210	1800	LD221M500P350A
	270	30	45	540	980	2150	LD271M500O450A
	270	35	35	540	980	2150	LD271M500P350A
	330	30	50	440	800	2410	LD331M500O500A
	330	35	40	440	800	2320	LD331M500P400A
	390	35	45	380	680	2710	LD391M500P450A
	470	35	55	310	560	2990	LD471M500P550A
	560	35	60	260	470	3110	LD561M500P600A
	560	40	50	260	470	3130	LD561M500Q500A
	680	35	70	220	390	3210	LD681M500P700A
	680	40	60	220	390	3220	LD681M500Q600A
820	35	80	180	320	4610	LD821M500P800A	
820	40	70	180	320	4430	LD821M500Q700A	
1000	40	80	150	270	5910	LD102M500Q800A	
1200	40	80	120	220	5980	LD122M500Q800A	
1500	40	100	100	180	6310	LD152M500QA00A	

: Enter **P6** for standard type ▪ 6mm pin length
: Enter **Z6** for 3-pin type ▪ 6mm pin length
: Enter **Y6** for multipin-type ▪ 6mm pin length

: Enter **P4** for standard type ▪ 4mm pin length
: Enter **Z4** for 3-pin type ▪ 4mm pin length
: Enter **Y4** for multipin type ▪ 4mm pin length

DIMENSIONS ▪ All dimensions in mm

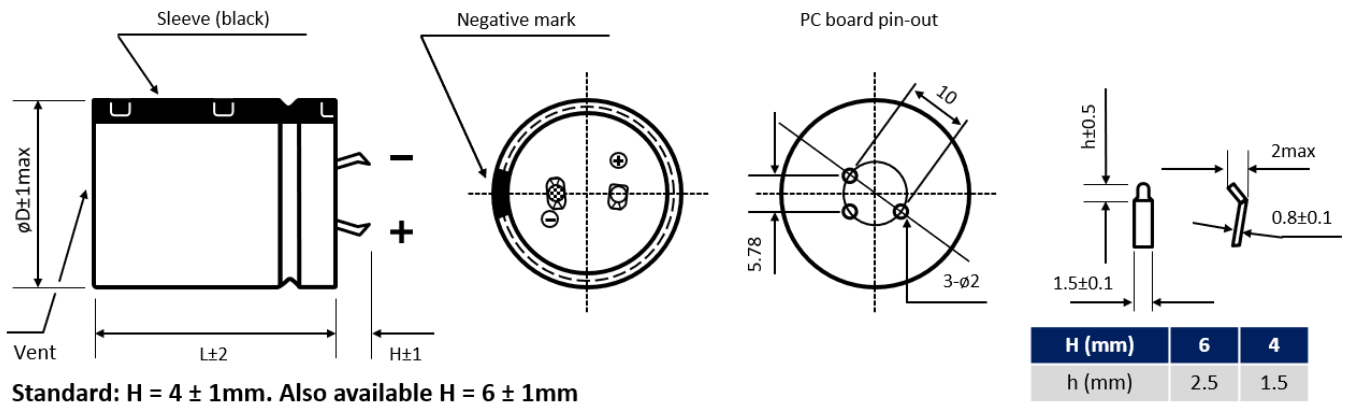
2-pin version ▪ Standard type


Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

H (mm)	6	4
h (mm)	2.5	1.5

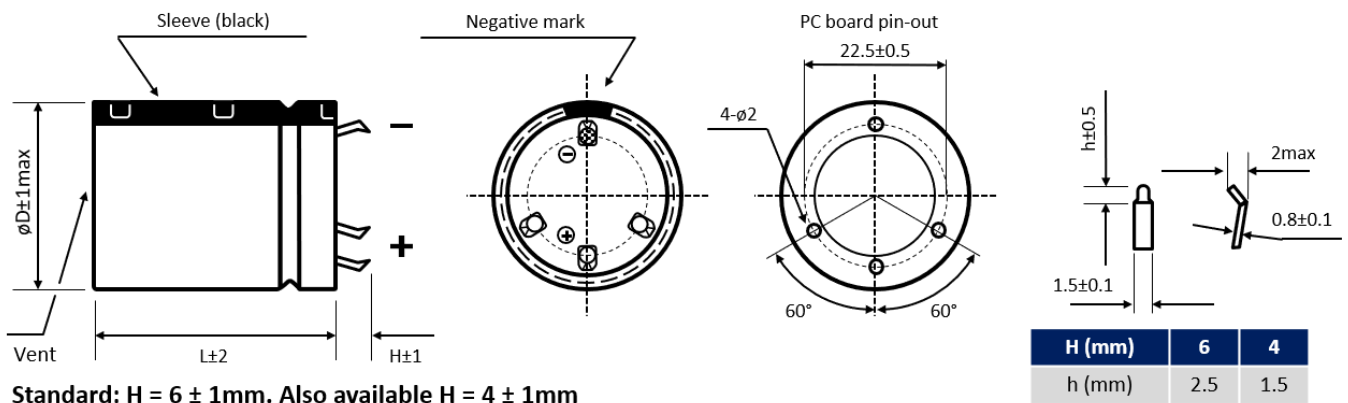
DIMENSIONS ▪ All dimensions in mm

3-pin version ▪ Polarity protection



Standard: H = 4 ± 1mm. Also available H = 6 ± 1mm

Multipin version ▪ Diameter $\phi D \geq 30$ mm



Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$10 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 500$	0.77	1	1.16	1.3	1.41	1.43

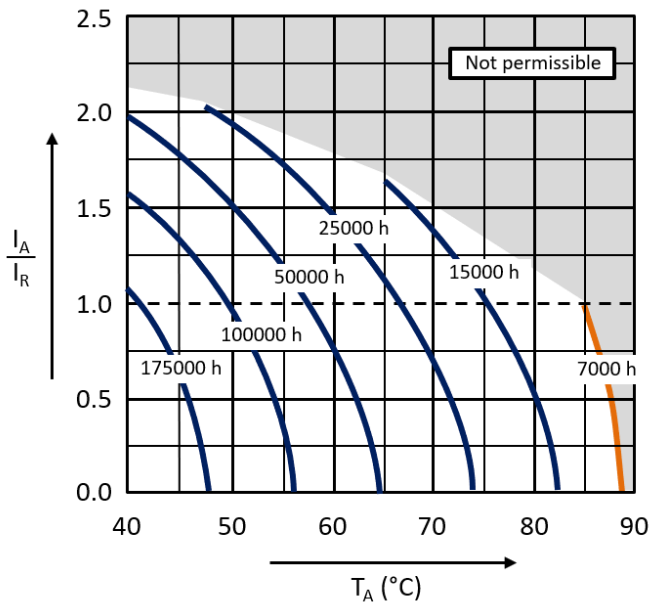
PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

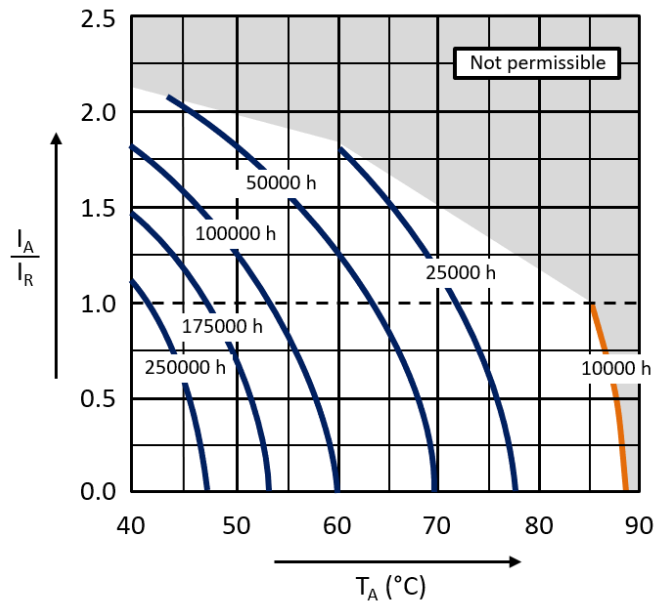
General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE

$V_R \leq 100V$



$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UD SERIES ▀ ULTRA LONG LIFE 85°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▀ Snap-In type
- Useful life: 85°C ▀ 10 000 hours
- Extremely stable dissipation factor and leakage current
- High voltage up to 600V
- Especially for applications with demanding operating environment



SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-40 ~ +85°C		-25 ~ +85°C		
Rated Voltage Range	V _R	200 ~ 450V DC		500 ~ 600V DC		
Surge Voltage	V _S	(V _R ≤ 315V) ▀ V _S = 1.15·V _R		(V _R > 315V) ▀ V _S = 1.10·V _R		
Capacitance Range	C _R	68 ~ 2700μF		47 ~ 680μF		
Cap. Tolerance	ΔC	±20% (120Hz ▀ 20°C)				
Leakage Current (20°C ▀ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ▀ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]				
Dissipation Factor % (20°C ▀ 120Hz)	tanδ	V _R (V DC)	200 ~ 400	450 ~ 600		
		tanδ	15	20		
Self-Resistance (20°C ▀ 120Hz)	ESR	Not to exceed the values shown in standard ratings				
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	200 ~ 250	315 ~ 450	500	550 ~ 600
		Z-25°C/Z+20°C	4	5	6	7
		Z-40°C/Z+20°C	7	10	-	-

Lifetime Test					
Useful Life 85°C (V _R & I _R applied)	Test	10 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▀ parts show higher drift as test criteria				
Endurance 85°C (V _R & I _R applied)	Test	5 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 85°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▀ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
200	330	22	25	330	600	1550	UD331M200M250A
	330	25	25	330	600	1650	UD331M200N250A
	390	22	30	280	510	1760	UD391M200M300A
	390	25	25	280	510	1660	UD391M200N250A
	470	22	30	230	420	1980	UD471M200M300A
	470	25	25	230	420	1930	UD471M200N250A
	560	22	35	200	360	2250	UD561M200M350A
	560	25	30	200	360	2150	UD561M200N300A
	680	22	40	160	290	2620	UD681M200M400A
	680	25	35	160	290	2560	UD681M200N350A
	680	30	25	160	290	2480	UD681M200O250A
	820	22	45	130	240	2990	UD821M200M450A
	820	25	35	130	240	2840	UD821M200N350A
	820	30	30	130	240	2600	UD821M200O300A
	820	35	25	130	240	2420	UD821M200P250A
	1000	25	45	110	200	3290	UD102M200N450A
	1000	30	30	110	200	2760	UD102M200O300A
	1000	35	25	110	200	2700	UD102M200P250A
	1200	25	50	94	170	3750	UD122M200N500A
	1200	30	35	94	170	3540	UD122M200O350A
	1200	35	30	94	170	3540	UD122M200P300A
	1500	30	40	72	130	3920	UD152M200O400A
	1500	35	35	72	130	3920	UD152M200P350A
	1800	30	50	61	110	4750	UD182M200O500A
1800	35	40	61	110	4700	UD182M200P400A	
2200	30	55	50	90	5310	UD222M200O550A	
2200	35	45	50	90	5300	UD222M200P450A	
2700	35	50	41	74	5480	UD272M200P500A	
250	150	22	25	740	1330	950	UD151M250M250A
	180	22	25	620	1110	1150	UD181M250M250A
	220	22	30	500	900	1290	UD221M250M300A
	220	25	25	500	900	1310	UD221M250N250A
	270	22	30	410	740	1470	UD271M250M300A
	270	25	25	410	740	1470	UD271M250N250A
	330	22	30	330	600	1680	UD331M250M300A
	330	25	25	330	600	1680	UD331M250N250A
	390	22	35	280	510	2000	UD391M250M350A
	390	25	30	280	510	1950	UD391M250N300A
	390	30	25	280	510	2100	UD391M250O250A
	470	22	40	230	420	2210	UD471M250M400A
	470	25	30	230	420	2150	UD471M250N300A
	470	35	25	230	420	2200	UD471M250P250A
	560	22	40	200	360	2500	UD561M250M400A
	560	25	35	200	360	2500	UD561M250N350A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
250	560	30	30	200	360	2510	UD561M250O300A
	560	35	25	200	360	2530	UD561M250P250A
	680	22	50	160	290	2910	UD681M250M500A
	680	25	40	160	290	2800	UD681M250N400A
	680	30	30	160	290	2750	UD681M250O300A
	680	35	25	160	290	2640	UD681M250P250A
	820	25	45	130	240	3120	UD821M250N450A
	820	30	35	130	240	3010	UD821M250O350A
	820	35	30	130	240	3000	UD821M250P300A
	1000	25	50	110	200	3600	UD102M250N500A
	1000	30	40	110	200	3460	UD102M250O400A
	1000	35	30	110	200	3390	UD102M250P300A
	1200	30	45	94	170	3930	UD122M250O450A
	1200	35	35	94	170	3810	UD122M250P350A
	1500	30	50	72	130	4520	UD152M250O500A
	1500	35	40	72	130	4520	UD152M250P400A
1800	35	45	61	110	5210	UD182M250P450A	
2200	35	55	50	90	5700	UD222M250P550A	
350	560	35	50	200	360	3210	UD561M350P500A
	680	35	40	160	290	3190	UD681M350P400A
	820	35	50	130	240	3670	UD821M350P500A
	1000	35	55	110	200	4230	UD102M350P550A
	1500	40	80	72	130	6520	UD152M350Q800A
	1500	45	70	72	130	6520	UD152M350V700A
	2200	45	100	50	90	8700	UD222M350VA00A
400	82	22	25	1350	2430	790	UD820M400M250A
	100	22	25	1110	1990	900	UD101M400M250A
	100	25	25	1110	1990	1050	UD101M400N250A
	120	22	30	920	1660	1050	UD121M400M300A
	120	25	25	920	1660	1050	UD121M400N250A
	150	22	30	740	1330	1150	UD151M400M300A
	150	25	25	740	1330	1150	UD151M400N250A
	180	22	35	620	1110	1310	UD181M400M350A
	180	25	30	620	1110	1320	UD181M400N300A
	180	30	25	620	1110	1320	UD181M400O250A
	220	22	40	500	900	1550	UD221M400M400A
	220	25	35	500	900	1520	UD221M400N350A
	220	30	25	500	900	1510	UD221M400O250A
	220	35	25	500	900	1550	UD221M400P250A
	270	22	45	410	740	1800	UD271M400M450A
	270	25	40	410	740	1760	UD271M400N400A
	270	30	30	410	740	1760	UD271M400O300A
270	35	25	410	740	1720	UD271M400P250A	
330	25	45	330	600	2050	UD331M400N450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
400	330	30	35	330	600	2020	UD331M400O350A
	330	35	25	330	600	2010	UD331M400P250A
	390	25	50	280	510	2330	UD391M400N500A
	390	30	35	280	510	2180	UD391M400O350A
	390	35	30	280	510	2240	UD391M400P300A
	470	25	55	230	420	2680	UD471M400N550A
	470	30	40	230	420	2650	UD471M400O400A
	470	35	35	230	420	2590	UD471M400P350A
	560	30	45	200	360	3000	UD561M400O450A
	560	35	35	200	360	2980	UD561M400P350A
	680	30	55	160	290	3510	UD681M400O550A
	680	35	40	160	290	3200	UD681M400P400A
	680	35	45	160	290	3420	UD681M400P450A
	820	35	50	130	240	3720	UD821M400P500A
	1000	35	55	110	200	4300	UD102M400P550A
	1200	35	65	94	170	4820	UD122M400P650A
	1200	40	55	94	170	4800	UD122M400Q550A
	1500	40	80	72	130	6620	UD152M400Q800A
1500	45	60	72	130	6310	UD152M400V600A	
1800	45	80	61	110	7600	UD182M400V800A	
450	68	22	25	2170	3900	680	UD680M450M250A
	82	22	25	1790	3230	810	UD820M450M250A
	82	25	25	1790	3230	810	UD820M450N250A
	100	22	30	1470	2650	940	UD101M450M300A
	100	30	25	1470	2650	980	UD101M450O250A
	120	22	30	1230	2210	1050	UD121M450M300A
	120	25	25	1230	2210	1090	UD121M450N250A
	150	22	35	980	1770	1210	UD151M450M350A
	150	25	30	980	1770	1210	UD151M450N300A
	150	30	25	980	1770	1210	UD151M450O250A
	180	22	40	820	1470	1390	UD181M450M400A
	180	25	35	820	1470	1390	UD181M450N350A
	180	30	25	820	1470	1350	UD181M450O250A
	220	22	50	670	1210	1680	UD221M450M500A
	220	25	40	670	1210	1680	UD221M450N400A
	220	30	30	670	1210	1620	UD221M450O300A
	220	35	25	670	1210	1600	UD221M450P250A
	270	25	45	540	980	1850	UD271M450N450A
	270	30	35	540	980	1820	UD271M450O350A
	270	35	30	540	980	1910	UD271M450P300A
330	25	50	440	800	2180	UD331M450N500A	
330	30	40	440	800	2210	UD331M450O400A	
330	35	30	440	800	2200	UD331M450P300A	
390	30	45	380	680	2510	UD391M450O450A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +85°C • 120Hz (mA rms)	CapXon Part Number
450	390	35	35	380	680	2500	UD391M450P350A
	470	30	50	310	560	2880	UD471M450O500A
	470	35	40	310	560	2800	UD471M450P400A
	560	30	55	260	470	3250	UD561M450O550A
	560	35	45	260	470	3260	UD561M450P450A
	680	35	50	220	390	3480	UD681M450P500A
	1500	45	100	100	180	7240	UD152M450VA00A
500	47	22	25	3130	5640	520	UD470M500M250A
	68	22	30	2170	3900	700	UD680M500M300A
	68	25	25	2170	3900	700	UD680M500N250A
	82	25	30	1790	3230	820	UD820M500N300A
	100	25	35	1470	2650	970	UD101M500N350A
	100	30	25	1470	2650	970	UD101M500O250A
	120	25	35	1230	2210	1090	UD121M500N350A
	120	30	30	1230	2210	1100	UD121M500O300A
	150	25	40	980	1770	1260	UD151M500N400A
	150	30	30	980	1770	1300	UD151M500O300A
	150	35	25	980	1770	1320	UD151M500P250A
	180	25	45	820	1470	1500	UD181M500N450A
	180	30	35	820	1470	1530	UD181M500O350A
	180	35	30	820	1470	1550	UD181M500P300A
	220	25	55	670	1210	1610	UD221M500N550A
	220	30	40	670	1210	1750	UD221M500O400A
	220	35	35	670	1210	1800	UD221M500P350A
	270	30	45	540	980	2010	UD271M500O450A
	270	35	35	540	980	2030	UD271M500P350A
	330	30	55	440	800	2320	UD331M500O550A
	330	35	40	440	800	2320	UD331M500P400A
390	35	45	380	680	2630	UD391M500P450A	
470	35	55	310	560	2990	UD471M500P550A	
560	35	65	260	470	3240	UD561M500P650A	
680	40	60	220	390	3900	UD681M500Q600A	
550	56	25	25	2630	4740	660	UD560M550N250A
	68	25	30	2170	3900	750	UD680M550N300A
	82	25	35	1790	3230	840	UD820M550N350A
	82	30	25	1790	3230	870	UD820M550O250A
	100	25	35	1470	2650	1010	UD101M550N350A
	100	30	30	1470	2650	1010	UD101M550O300A
	120	25	40	1230	2210	1120	UD121M550N400A
	120	30	35	1230	2210	1150	UD121M550O350A
	120	35	25	1230	2210	1150	UD121M550P250A
	150	25	50	980	1770	1360	UD151M550N500A
	150	30	35	980	1770	1300	UD151M550O350A
	150	35	30	980	1770	1450	UD151M550P300A

: See description at end of standard ratings

STANDARD RATINGS

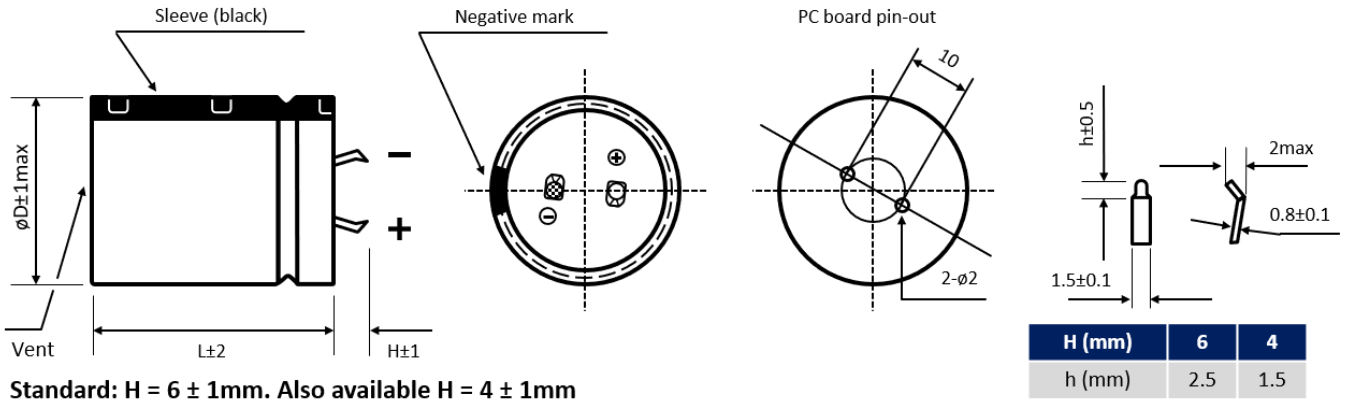
V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +85°C - 120Hz (mA rms)	CapXon Part Number
550	180	25	55	820	1470	1570	UD181M550N550A □□
	180	30	40	820	1470	1580	UD181M550O400A □□
	180	35	35	820	1470	1630	UD181M550P350A □□
	220	30	50	670	1210	1870	UD221M550O500A □□
	220	35	40	670	1210	1870	UD221M550P400A □□
	270	30	55	540	980	2120	UD271M550O550A □□
	270	35	45	540	980	2150	UD271M550P450A □□
	330	35	50	440	800	2450	UD331M550P500A □□
600	390	35	55	380	680	2780	UD391M550P550A □□
	47	25	25	3130	5640	610	UD470M600N250A □□
	56	25	30	2630	4740	680	UD560M600N300A □□
	68	25	35	2170	3900	820	UD680M600N350A □□
	68	30	25	2170	3900	820	UD680M600O250A □□
	82	25	35	1790	3230	880	UD820M600N350A □□
	82	30	30	1790	3230	920	UD820M600O300A □□
	100	25	40	1470	2650	1050	UD101M600N400A □□
	100	30	35	1470	2650	1070	UD101M600O350A □□
	100	35	25	1470	2650	1110	UD101M600P250A □□
	120	25	50	1230	2210	1190	UD121M600N500A □□
	120	30	35	1230	2210	1230	UD121M600O350A □□
	120	35	30	1230	2210	1310	UD121M600P300A □□
	150	25	55	980	1770	1530	UD151M600N550A □□
	150	30	45	980	1770	1530	UD151M600O450A □□
	150	35	35	980	1770	1530	UD151M600P350A □□
	180	30	50	820	1470	1680	UD181M600O500A □□
	180	35	40	820	1470	1720	UD181M600P400A □□
	220	30	55	670	1210	1950	UD221M600O550A □□
	220	35	45	670	1210	1950	UD221M600P450A □□
270	35	50	540	980	2260	UD271M600P500A □□	

□□: Enter **P6** for standard type ▪ 6mm pin length
 □□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□: Enter **Y6** for multipin-type ▪ 6mm pin length

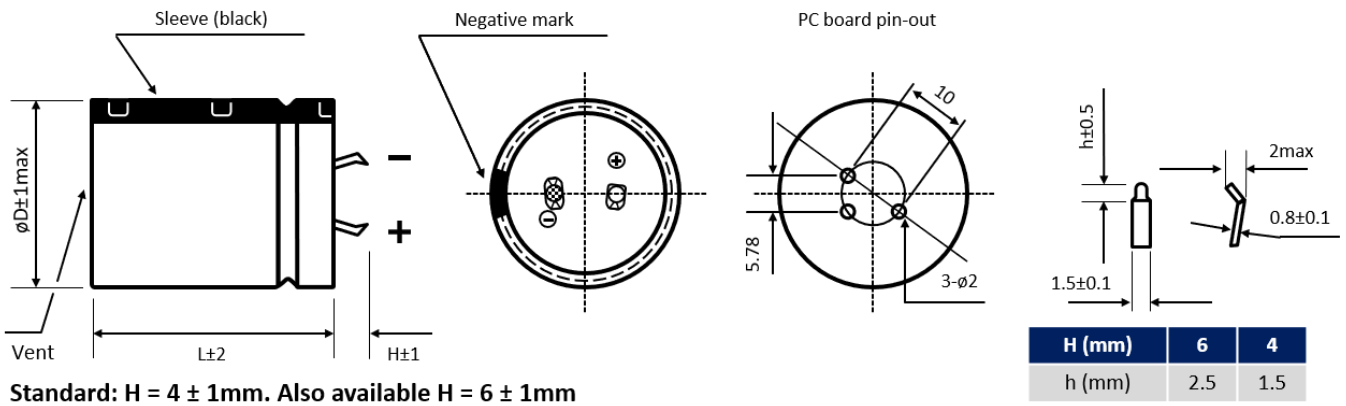
□□: Enter **P4** for standard type ▪ 4mm pin length
 □□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□: Enter **Y4** for multipin type ▪ 4mm pin length

DIMENSIONS ▪ All dimensions in mm

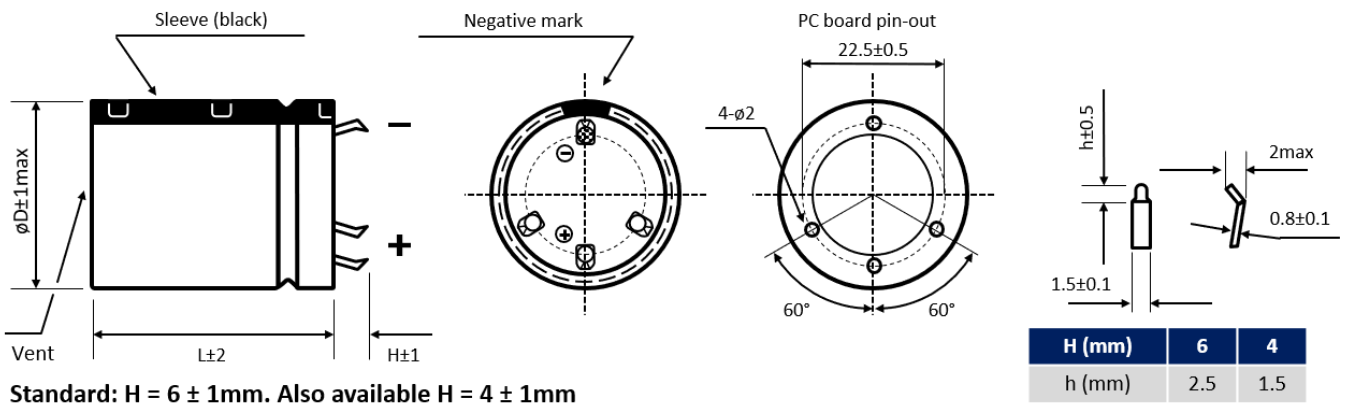
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

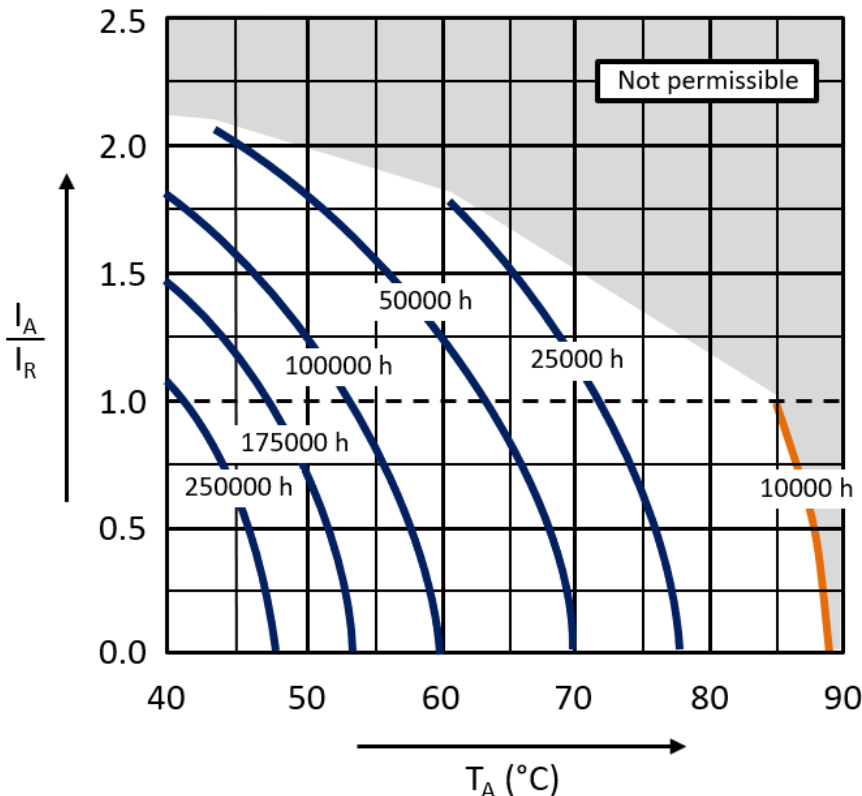
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$350 \leq V_R \leq 600$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor



DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HP SERIES ▪ STANDARD 105°C TYPE

KEY FEATURES

- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 105°C ▪ 3 000 hours up to 5 000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics												
Operating Temperature Range		-40 ~ +105°C					-25 ~ +105°C							
Rated Voltage Range	V _R	6.3 ~ 350V DC					400 ~ 550V DC							
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R							
Capacitance Range	C _R	68 ~ 100000μF					47 ~ 1200μF							
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)												
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]												
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	μF / V DC	6.3	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 550	
		≤ 8200	-	35	35	30	25	20	20	15	15	15	20	
		10000 ~ 22000	55	40	40	35	30	30	25	20	-	-	-	
		≥ 27000	60	50	40	35	35	30	25	-	-	-	-	
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	6.3 ~ 16		25	35	50 ~ 100		160 ~ 250		315 ~ 450		500	550
		Z-25°C/Z+20°C	4		3	3	3		4		8		8	10
		Z-40°C/Z+20°C	10		10	8	6		7		10		-	-
Lifetime Test			V _R ≤ 100V					V _R > 100V						
Useful Life 105°C (V _R & I _R applied)	Test	3 000 hours					5 000 hours							
	ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value							
	tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value							
	I _{Leak}	≤ the initial specified value					≤ the initial specified value							
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria													
Endurance 105°C (V _R & I _R applied)	Test	2 000 hours												
	ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value							
	tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value							
	I _{Leak}	≤ the initial specified value					≤ the initial specified value							
Shelf Life 105°C (V _R = 0)	Test	1 000 hours												
	ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value							
	tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value							
	I _{Leak}	≤ the initial specified value					≤ the initial specified value							
	Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4													
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6												

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
6.3	12000	22	25	47	61	1540	HP123M6R3M250A
	15000	22	25	37	49	1720	HP153M6R3M250A
	18000	22	30	31	41	1950	HP183M6R3M300A
	18000	25	25	31	41	1960	HP183M6R3N250A
	22000	22	35	26	33	2230	HP223M6R3M350A
	22000	25	30	26	33	2250	HP223M6R3N300A
	22000	30	25	26	33	2280	HP223M6R3O250A
	27000	22	40	23	29	2540	HP273M6R3M400A
	27000	25	35	23	29	2570	HP273M6R3N350A
	27000	30	25	23	29	2590	HP273M6R3O250A
	33000	22	45	19	24	2880	HP333M6R3M450A
	33000	25	40	19	24	2930	HP333M6R3N400A
	33000	30	30	19	24	2890	HP333M6R3O300A
	33000	35	25	19	24	2930	HP333M6R3P250A
	39000	25	40	16	20	3180	HP393M6R3N400A
	39000	30	35	16	20	3260	HP393M6R3O350A
	39000	35	30	16	20	3400	HP393M6R3P300A
	47000	25	50	13	17	3690	HP473M6R3N500A
	47000	30	40	13	17	3690	HP473M6R3O400A
	47000	35	30	13	17	3730	HP473M6R3P300A
	56000	30	45	11	14	4160	HP563M6R3O450A
	56000	35	35	11	14	4170	HP563M6R3P350A
	68000	30	50	9	12	4710	HP683M6R3O500A
	68000	35	40	9	12	4710	HP683M6R3P400A
82000	35	45	8	10	5320	HP823M6R3P450A	
10	4700	22	25	76	99	1240	HP472M010M250A
	6800	22	25	53	68	1400	HP682M010M250A
	8200	22	25	44	57	1650	HP822M010M250A
	10000	22	25	36	46	1900	HP103M010M250A
	12000	22	30	34	44	2480	HP123M010M300A
	12000	25	25	34	44	2480	HP123M010N250A
	15000	22	35	27	35	2710	HP153M010M350A
	15000	25	25	27	35	2600	HP153M010N250A
	18000	22	35	23	29	2890	HP183M010M350A
	18000	25	30	23	29	2940	HP183M010N300A
	18000	30	25	23	29	2940	HP183M010O250A
	22000	22	40	19	24	2960	HP223M010M400A
	22000	25	30	19	24	2960	HP223M010N300A
	22000	30	25	19	24	3080	HP223M010O250A
	27000	22	50	19	25	3120	HP273M010M500A
	27000	25	40	19	25	3120	HP273M010N400A
	27000	30	30	19	25	3130	HP273M010O300A
	27000	35	25	19	25	3210	HP273M010P250A
33000	25	45	15	20	3320	HP333M010N450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
10	33000	35	30	15	20	3850	HP333M010P300A
	39000	30	40	13	17	3850	HP393M010O400A
	47000	30	45	11	14	3980	HP473M010O450A
	47000	35	35	11	14	4050	HP473M010P350A
	56000	30	50	9	12	4210	HP563M010O500A
	56000	35	40	9	12	4320	HP563M010P400A
	68000	35	45	8	10	5120	HP683M010P450A
	100000	35	50	5	7	6140	HP104M010P500A
16	4700	22	25	76	99	1550	HP472M016M250A
	6800	22	25	53	68	1780	HP682M016M250A
	8200	22	25	44	57	2140	HP822M016M250A
	10000	22	30	36	46	2480	HP103M016M300A
	10000	25	25	36	46	2560	HP103M016N250A
	12000	22	35	34	44	2800	HP123M016M350A
	12000	25	30	34	44	2900	HP123M016N300A
	12000	30	25	34	44	2970	HP123M016O250A
	15000	22	40	27	35	3170	HP153M016M400A
	15000	25	35	27	35	3290	HP153M016N350A
	15000	30	30	27	35	3380	HP153M016O300A
	18000	22	45	23	29	3500	HP183M016M450A
	18000	25	40	23	29	3650	HP183M016N400A
	18000	30	30	23	29	3650	HP183M016O300A
	22000	22	45	19	24	3650	HP223M016M450A
	22000	25	40	19	24	3710	HP223M016N400A
	22000	30	35	19	24	3830	HP223M016O350A
	27000	25	40	15	20	3950	HP273M016N400A
	27000	30	35	15	20	3960	HP273M016O350A
	33000	25	45	12	16	4320	HP333M016N450A
	33000	30	35	12	16	4410	HP333M016O350A
	33000	35	30	12	16	4430	HP333M016P300A
	39000	30	40	10	14	4900	HP393M016O400A
	39000	35	35	10	14	5100	HP393M016P350A
	47000	30	45	9	11	5300	HP473M016O450A
	47000	35	40	9	11	5520	HP473M016P400A
	56000	30	50	7	10	6000	HP563M016O500A
	56000	35	40	7	10	6050	HP563M016P400A
	68000	35	50	6	8	6400	HP683M016P500A
	25	2200	22	25	140	180	1030
3300		22	25	92	120	1480	HP332M025M250A
4700		22	25	65	85	1730	HP472M025M250A
5600		22	25	55	71	1850	HP562M025M250A
6800		22	30	45	59	2050	HP682M025M300A
6800		25	25	45	59	2100	HP682M025N250A
8200		22	30	37	49	2310	HP822M025M300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
25	8200	25	25	37	49	2310	HP822M025N250A
	10000	22	35	31	40	2650	HP103M025M350A
	10000	25	30	31	40	2680	HP103M025N300A
	12000	22	40	30	39	2920	HP123M025M400A
	12000	25	30	30	39	2910	HP123M025N300A
	12000	30	25	30	39	2930	HP123M025O250A
	15000	22	45	24	31	3180	HP153M025M450A
	15000	25	35	24	31	3100	HP153M025N350A
	15000	30	30	24	31	3320	HP153M025O300A
	18000	22	45	20	26	3510	HP183M025M450A
	18000	25	40	20	26	3600	HP183M025N400A
	18000	30	30	20	26	3800	HP183M025O300A
	22000	25	45	16	21	4040	HP223M025N450A
	22000	30	35	16	21	4040	HP223M025O350A
	22000	35	30	16	21	4040	HP223M025P300A
	27000	30	40	13	17	4740	HP273M025O400A
	27000	35	35	13	17	4760	HP273M025P350A
	33000	30	45	11	14	5500	HP333M025O450A
	33000	35	40	11	14	5700	HP333M025P400A
39000	35	45	9	12	5800	HP393M025P450A	
47000	35	50	8	10	6300	HP473M025P500A	
35	1500	22	25	170	220	1260	HP152M035M250A
	2200	22	25	120	150	1350	HP222M035M250A
	2700	22	25	92	120	1360	HP272M035M250A
	3300	22	25	77	100	1490	HP332M035M250A
	3900	22	30	65	85	1820	HP392M035M300A
	4700	22	30	54	71	2020	HP472M035M300A
	4700	25	25	54	71	2120	HP472M035N250A
	5600	22	30	46	59	2250	HP562M035M300A
	5600	25	25	46	59	2350	HP562M035N250A
	6800	22	35	38	49	2360	HP682M035M350A
	6800	25	30	38	49	2410	HP682M035N300A
	6800	30	25	38	49	2500	HP682M035O250A
	8200	22	40	31	40	2550	HP822M035M400A
	8200	25	35	31	40	2610	HP822M035N350A
	8200	30	25	31	40	2650	HP822M035O250A
	10000	22	40	26	33	3000	HP103M035M400A
	10000	25	35	26	33	3150	HP103M035N350A
	10000	30	30	26	33	3350	HP103M035O300A
	12000	22	45	26	33	3470	HP123M035M450A
	12000	25	40	26	33	3500	HP123M035N400A
12000	30	35	26	33	3520	HP123M035O350A	
12000	35	30	26	33	3580	HP123M035P300A	
15000	25	45	20	27	3650	HP153M035N450A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
35	15000	30	40	20	27	3690	HP153M035O400A □□
	15000	35	35	20	27	3750	HP153M035P350A □□
	18000	25	50	17	22	3820	HP183M035N500A □□
	18000	30	40	17	22	3950	HP183M035O400A □□
	18000	35	35	17	22	4120	HP183M035P350A □□
	22000	30	45	14	18	4380	HP223M035O450A □□
	22000	35	40	14	18	4780	HP223M035P400A □□
	27000	30	50	13	17	4860	HP273M035O500A □□
	27000	35	45	13	17	5120	HP273M035P450A □□
	33000	35	50	11	14	5900	HP333M035P500A □□
50	1000	22	25	210	270	840	HP102M050M250A □□
	1500	22	25	140	180	1270	HP152M050M250A □□
	1800	22	25	120	150	1350	HP182M050M250A □□
	2200	22	25	92	120	1480	HP222M050M250A □□
	2700	22	25	76	98	1680	HP272M050M250A □□
	3300	22	30	62	80	1750	HP332M050M300A □□
	3300	25	25	62	80	1870	HP332M050N250A □□
	3900	22	30	52	68	2120	HP392M050M300A □□
	3900	25	25	52	68	2210	HP392M050N250A □□
	4700	22	35	43	56	2250	HP472M050M350A □□
	4700	25	30	43	56	2310	HP472M050N300A □□
	4700	30	25	43	56	2330	HP472M050O250A □□
	5600	22	40	36	47	2490	HP562M050M400A □□
	5600	25	35	36	47	2760	HP562M050N350A □□
	5600	30	30	36	47	2850	HP562M050O300A □□
	6800	22	50	30	39	3100	HP682M050M500A □□
	6800	25	40	30	39	3050	HP682M050N400A □□
	6800	30	35	30	39	3340	HP682M050O350A □□
	6800	35	30	30	39	3420	HP682M050P300A □□
	8200	25	45	25	32	3480	HP822M050N450A □□
	8200	30	35	25	32	3510	HP822M050O350A □□
	8200	35	30	25	32	3600	HP822M050P300A □□
	10000	25	50	20	27	3910	HP103M050N500A □□
	10000	30	40	20	27	3980	HP103M050O400A □□
	10000	35	30	20	27	4050	HP103M050P300A □□
	12000	30	45	26	33	4310	HP123M050O450A □□
	12000	35	35	26	33	4380	HP123M050P350A □□
	15000	35	50	20	27	4800	HP153M050P500A □□
18000	35	50	17	22	5300	HP183M050P500A □□	
22000	35	60	14	18	5500	HP223M050P600A □□	
63	680	22	25	300	390	700	HP681M063M250A □□
	1000	22	25	210	270	1000	HP102M063M250A □□
	1200	22	25	170	220	1210	HP122M063M250A □□
	1500	22	25	140	180	1360	HP152M063M250A □□

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
63	1800	22	30	120	150	1410	HP182M063M300A
	1800	25	25	120	150	1460	HP182M063N250A
	2200	22	30	92	120	1540	HP222M063M300A
	2200	25	25	92	120	1610	HP222M063N250A
	2700	22	35	76	98	2020	HP272M063M350A
	2700	25	30	76	98	2050	HP272M063N300A
	2700	30	25	76	98	2100	HP272M063O250A
	3300	22	40	62	80	2120	HP332M063M400A
	3300	25	35	62	80	2200	HP332M063N350A
	3300	30	25	62	80	2250	HP332M063O250A
	3300	35	25	62	80	2320	HP332M063P250A
	3900	22	40	52	68	2340	HP392M063M400A
	3900	25	35	52	68	2420	HP392M063N350A
	3900	30	25	52	68	2430	HP392M063O250A
	4700	22	45	43	56	2590	HP472M063M450A
	4700	25	40	43	56	2650	HP472M063N400A
	4700	30	30	43	56	2710	HP472M063O300A
	5600	25	45	36	47	2930	HP562M063N450A
	5600	30	35	36	47	3050	HP562M063O350A
	5600	35	30	36	47	3090	HP562M063P300A
	6800	30	40	30	39	3720	HP682M063O400A
	6800	35	35	30	39	3780	HP682M063P350A
	8200	30	40	25	32	3820	HP822M063O400A
8200	35	35	25	32	3920	HP822M063P350A	
10000	30	45	20	27	4050	HP103M063O450A	
10000	35	40	20	27	4100	HP103M063P400A	
12000	35	45	21	28	4760	HP123M063P450A	
15000	35	50	17	22	5400	HP153M063P500A	
80	680	22	25	220	290	750	HP681M080M250A
	820	22	25	180	240	1110	HP821M080M250A
	1000	22	25	150	200	1220	HP102M080M250A
	1200	22	30	130	170	1320	HP122M080M300A
	1200	25	25	130	170	1390	HP122M080N250A
	1500	22	30	100	130	1590	HP152M080M300A
	1500	25	25	100	130	1600	HP152M080N250A
	1800	22	35	85	110	1710	HP182M080M350A
	1800	25	30	85	110	1750	HP182M080N300A
	1800	30	25	85	110	1950	HP182M080O250A
	2200	22	40	70	90	2120	HP222M080M400A
	2200	25	30	70	90	2050	HP222M080N300A
	2700	22	45	57	74	2410	HP272M080M450A
	2700	25	40	57	74	2450	HP272M080N400A
	2700	30	30	57	74	2490	HP272M080O300A
	3300	25	45	46	60	2600	HP332M080N450A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
80	3300	30	35	46	60	2640	HP332M080O350A
	3300	35	25	46	60	2620	HP332M080P250A
	3900	30	35	39	51	2950	HP392M080O350A
	3900	35	30	39	51	3050	HP392M080P300A
	4700	30	45	33	42	3210	HP472M080O450A
	4700	35	30	33	42	3450	HP472M080P300A
	4700	35	35	33	42	3510	HP472M080P350A
	5600	30	45	27	36	3550	HP562M080O450A
	5600	35	35	27	36	3650	HP562M080P350A
	6800	30	50	23	29	3720	HP682M080O500A
	6800	35	45	23	29	3900	HP682M080P450A
	8200	35	50	19	24	4300	HP822M080P500A
10000	35	50	22	27	4400	HP103M080P500A	
100	330	22	25	460	600	550	HP331M100M250A
	470	22	25	320	420	790	HP471M100M250A
	560	22	25	280	360	1060	HP561M100M250A
	680	22	25	220	290	1160	HP681M100M250A
	680	22	30	220	290	1180	HP681M100M300A
	680	25	25	220	290	1200	HP681M100N250A
	680	30	25	220	290	1250	HP681M100O250A
	820	22	25	180	240	1410	HP821M100M250A
	820	22	30	180	240	1460	HP821M100M300A
	820	25	25	180	240	1510	HP821M100N250A
	820	30	25	180	240	1550	HP821M100O250A
	1000	22	30	150	200	1710	HP102M100M300A
	1000	25	30	150	200	1770	HP102M100N300A
	1000	25	35	150	200	1800	HP102M100N350A
	1000	30	25	150	200	1810	HP102M100O250A
	1200	22	30	130	170	1830	HP122M100M300A
	1200	25	25	130	170	1850	HP122M100N250A
	1200	25	35	130	170	1940	HP122M100N350A
	1200	30	25	130	170	1950	HP122M100O250A
	1500	22	35	100	130	2110	HP152M100M350A
	1500	25	30	100	130	2150	HP152M100N300A
	1500	25	35	100	130	2190	HP152M100N350A
	1500	30	25	100	130	2200	HP152M100O250A
	1500	35	25	100	130	2260	HP152M100P250A
	1800	22	40	85	110	2310	HP182M100M400A
	1800	25	35	85	110	2320	HP182M100N350A
	1800	25	40	85	110	2380	HP182M100N400A
	1800	30	25	85	110	2330	HP182M100O250A
1800	30	30	85	110	2360	HP182M100O300A	
1800	35	25	85	110	2400	HP182M100P250A	
2200	22	45	70	90	2620	HP222M100M450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
100	2200	25	40	70	90	2650	HP222M100N400A
	2200	30	35	70	90	2750	HP222M100O350A
	2200	35	25	70	90	2700	HP222M100P250A
	2700	25	45	57	74	2910	HP272M100N450A
	2700	30	35	57	74	2930	HP272M100O350A
	2700	35	35	57	74	3250	HP272M100P350A
	3300	25	50	46	60	3310	HP332M100N500A
	3300	30	40	46	60	3370	HP332M100O400A
	3300	35	35	46	60	3450	HP332M100P350A
	3300	35	40	46	60	3560	HP332M100P400A
	3900	30	45	39	51	3680	HP392M100O450A
	3900	35	35	39	51	3700	HP392M100P350A
	4700	30	50	33	42	3820	HP472M100O500A
	4700	35	40	33	42	3840	HP472M100P400A
	4700	35	50	33	42	3970	HP472M100P500A
	5600	35	45	27	36	4110	HP562M100P450A
	6800	35	50	23	29	4510	HP682M100P500A
8200	40	60	19	24	4950	HP822M100Q600A	
10000	40	60	15	20	5240	HP103M100Q600A	
160	220	22	25	500	900	420	HP221M160M250A
	270	22	25	410	740	950	HP271M160M250A
	330	22	25	330	600	1110	HP331M160M250A
	330	22	30	330	600	1120	HP331M160M300A
	330	25	25	330	600	1130	HP331M160N250A
	390	22	25	280	510	1150	HP391M160M250A
	390	22	30	280	510	1220	HP391M160M300A
	390	25	25	280	510	1250	HP391M160N250A
	470	22	25	230	420	1410	HP471M160M250A
	470	22	30	230	420	1450	HP471M160M300A
	470	25	25	230	420	1500	HP471M160N250A
	560	22	25	200	360	1620	HP561M160M250A
	560	25	30	200	360	1750	HP561M160N300A
	680	22	30	160	290	1840	HP681M160M300A
	680	25	25	160	290	1860	HP681M160N250A
	680	30	25	160	290	2010	HP681M160O250A
	820	22	35	130	240	2000	HP821M160M350A
	820	25	30	130	240	2010	HP821M160N300A
	820	25	45	130	240	2200	HP821M160N450A
	820	30	25	130	240	2050	HP821M160O250A
	820	30	30	130	240	2100	HP821M160O300A
1000	22	40	110	200	2340	HP102M160M400A	
1000	22	50	110	200	2410	HP102M160M500A	
1000	25	35	110	200	2360	HP102M160N350A	
1000	25	45	110	200	2470	HP102M160N450A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
160	1000	30	25	110	200	2060	HP102M160O250A
	1000	30	35	110	200	2470	HP102M160O350A
	1200	22	45	94	170	2620	HP122M160M450A
	1200	25	35	94	170	2610	HP122M160N350A
	1200	30	30	94	170	2660	HP122M160O300A
	1200	35	25	94	170	2700	HP122M160P250A
	1500	25	40	72	130	2830	HP152M160N400A
	1500	30	35	72	130	2890	HP152M160O350A
	1500	35	25	72	130	2880	HP152M160P250A
	1500	35	30	72	130	2960	HP152M160P300A
	1800	25	50	61	110	3250	HP182M160N500A
	1800	30	35	61	110	3200	HP182M160O350A
	1800	35	30	61	110	3250	HP182M160P300A
	2200	30	45	50	90	3260	HP222M160O450A
	2200	35	35	50	90	3320	HP222M160P350A
	2700	30	50	41	74	3670	HP272M160O500A
	2700	35	40	41	74	3680	HP272M160P400A
3300	35	45	33	60	3710	HP332M160P450A	
180	270	22	25	410	740	980	HP271M180M250A
	330	22	25	330	600	1140	HP331M180M250A
	390	22	25	280	510	1310	HP391M180M250A
	470	22	25	230	420	1460	HP471M180M250A
	470	22	30	230	420	1500	HP471M180M300A
	560	22	30	200	360	1670	HP561M180M300A
	560	25	25	200	360	1690	HP561M180N250A
	680	22	35	160	290	1880	HP681M180M350A
	680	25	30	160	290	1900	HP681M180N300A
	820	22	40	130	240	2120	HP821M180M400A
	820	25	30	130	240	2120	HP821M180N300A
	820	30	25	130	240	2150	HP821M180O250A
	1000	22	45	110	200	2390	HP102M180M450A
	1000	25	35	110	200	2390	HP102M180N350A
	1000	30	25	110	200	2360	HP102M180O250A
	1000	35	25	110	200	2470	HP102M180P250A
	1200	22	50	94	170	2700	HP122M180M500A
	1200	25	40	94	170	2700	HP122M180N400A
	1200	30	35	94	170	2750	HP122M180O350A
	1500	25	50	72	130	3000	HP152M180N500A
	1500	30	40	72	130	3050	HP152M180O400A
	1500	35	30	72	130	3070	HP152M180P300A
1800	30	45	61	110	3200	HP182M180O450A	
1800	35	35	61	110	3250	HP182M180P350A	
2200	30	50	50	90	3330	HP222M180O500A	
2200	35	40	50	90	3350	HP222M180P400A	

: See description at end of standard ratings

STANDARD RATINGS

V _R (V)	C _R (μF)	∅ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (mΩ)	Max. ESR +20°C - 120Hz (mΩ)	I _R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
180	2700	35	45	41	74	3690	HP272M180P450A □□
	3300	35	50	33	60	3720	HP332M180P500A □□
200	100	22	20	1110	1990	520	HP101M200M200A □□
	120	22	20	920	1660	530	HP121M200M200A □□
	150	22	20	740	1330	700	HP151M200M200A □□
	150	22	25	740	1330	720	HP151M200M250A □□
	150	25	20	740	1330	720	HP151M200N200A □□
	150	25	25	740	1330	730	HP151M200N250A □□
	180	22	25	620	1110	840	HP181M200M250A □□
	180	25	20	620	1110	850	HP181M200N200A □□
	180	30	20	620	1110	870	HP181M200O200A □□
	220	22	25	500	900	960	HP221M200M250A □□
	220	25	20	500	900	960	HP221M200N200A □□
	220	25	25	500	900	1140	HP221M200N250A □□
	220	30	20	500	900	1140	HP221M200O200A □□
	270	22	25	410	740	1100	HP271M200M250A □□
	270	22	30	410	740	1200	HP271M200M300A □□
	270	25	25	410	740	1200	HP271M200N250A □□
	270	30	20	410	740	1200	HP271M200O200A □□
	270	30	25	410	740	1250	HP271M200O250A □□
	330	22	25	330	600	1150	HP331M200M250A □□
	330	22	30	330	600	1220	HP331M200M300A □□
	330	25	25	330	600	1230	HP331M200N250A □□
	330	25	30	330	600	1300	HP331M200N300A □□
	330	30	25	330	600	1300	HP331M200O250A □□
	330	35	20	330	600	1270	HP331M200P200A □□
	390	22	25	280	510	1310	HP391M200M250A □□
	390	22	30	280	510	1370	HP391M200M300A □□
	390	25	25	280	510	1370	HP391M200N250A □□
	390	25	30	280	510	1450	HP391M200N300A □□
	390	30	25	280	510	1450	HP391M200O250A □□
	470	22	30	230	420	1510	HP471M200M300A □□
	470	22	35	230	420	1600	HP471M200M350A □□
	470	25	30	230	420	1600	HP471M200N300A □□
470	25	35	230	420	1650	HP471M200N350A □□	
470	30	25	230	420	1650	HP471M200O250A □□	
560	22	30	200	360	1670	HP561M200M300A □□	
560	22	35	200	360	1710	HP561M200M350A □□	
560	25	30	200	360	1710	HP561M200N300A □□	
560	25	35	200	360	1800	HP561M200N350A □□	
560	30	25	200	360	1750	HP561M200O250A □□	
560	30	30	200	360	1800	HP561M200O300A □□	
560	35	25	200	360	1760	HP561M200P250A □□	
680	22	35	160	160	290	HP681M200M350A □□	

□□: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
200	680	22	40	160	290	2000	HP681M200M400A
	680	25	30	160	290	2000	HP681M200N300A
	680	25	35	160	290	2150	HP681M200N350A
	680	30	30	160	290	2150	HP681M200O300A
	680	35	25	160	290	2150	HP681M200P250A
	820	22	40	130	240	2130	HP821M200M400A
	820	22	45	130	240	2250	HP821M200M450A
	820	25	35	130	240	2250	HP821M200N350A
	820	25	40	130	240	2400	HP821M200N400A
	820	30	30	130	240	2400	HP821M200O300A
	820	35	25	130	240	2400	HP821M200P250A
	820	35	30	130	240	2490	HP821M200P300A
	1000	22	50	110	200	2450	HP102M200M500A
	1000	25	40	110	200	2430	HP102M200N400A
	1000	25	45	110	200	2560	HP102M200N450A
	1000	30	30	110	200	2450	HP102M200O300A
	1000	30	35	110	200	2580	HP102M200O350A
	1000	35	25	110	200	2470	HP102M200P250A
	1000	35	30	110	200	2580	HP102M200P300A
	1200	25	45	94	170	2660	HP122M200N450A
	1200	25	50	94	170	2780	HP122M200N500A
	1200	30	35	94	170	2660	HP122M200O350A
	1200	30	40	94	170	2800	HP122M200O400A
	1200	35	25	94	170	2700	HP122M200P250A
	1200	35	30	94	170	2830	HP122M200P300A
	1500	25	50	72	130	2970	HP152M200N500A
	1500	30	40	72	130	3060	HP152M200O400A
	1500	35	30	72	130	3080	HP152M200P300A
	1500	35	45	72	130	3200	HP152M200P450A
	1800	30	45	61	110	3260	HP182M200O450A
	1800	35	35	61	110	3260	HP182M200P350A
	1800	35	40	61	110	3370	HP182M200P400A
2200	30	50	50	90	3510	HP222M200O500A	
2200	35	40	50	90	3510	HP222M200P400A	
2200	35	45	50	90	3630	HP222M200P450A	
2700	35	45	41	74	3700	HP272M200P450A	
2700	35	50	41	74	3830	HP272M200P500A	
220	150	22	25	740	1330	730	HP151M220M250A
	180	22	25	620	1110	850	HP181M220M250A
	180	25	25	620	1110	900	HP181M220N250A
	220	22	25	500	900	970	HP221M220M250A
	220	25	25	500	900	1050	HP221M220N250A
	220	30	20	500	900	1140	HP221M220O200A
270	22	25	410	740	1110	HP271M220M250A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
220	270	25	25	410	740	1230	HP271M220N250A
	330	22	35	330	600	1360	HP331M220M350A
	330	25	25	330	600	1360	HP331M220N250A
	330	30	25	330	600	1470	HP331M220O250A
	390	22	35	280	510	1480	HP391M220M350A
	390	25	30	280	510	1480	HP391M220N300A
	390	30	25	280	510	1450	HP391M220O250A
	470	22	35	230	420	1530	HP471M220M350A
	470	25	30	230	420	1540	HP471M220N300A
	470	30	25	230	420	1560	HP471M220O250A
	560	22	40	200	360	1690	HP561M220M400A
	560	25	35	200	360	1730	HP561M220N350A
	560	30	30	200	360	1730	HP561M220O300A
	560	35	25	200	360	1730	HP561M220P250A
	680	22	45	160	290	1910	HP681M220M450A
	680	25	40	160	290	1930	HP681M220N400A
	680	30	35	160	290	2050	HP681M220O350A
	680	35	30	160	290	2060	HP681M220P300A
	820	22	50	130	240	2170	HP821M220M500A
	820	25	40	130	240	2170	HP821M220N400A
	820	30	35	130	240	2180	HP821M220O350A
	820	35	30	130	240	2200	HP821M220P300A
	1000	25	45	110	200	2460	HP102M220N450A
	1000	30	35	110	200	2490	HP102M220O350A
	1000	35	30	110	200	2510	HP102M220P300A
	1200	25	50	94	170	2790	HP122M220N500A
	1200	30	40	94	170	2800	HP122M220O400A
	1200	35	35	94	170	2840	HP122M220P350A
	1500	30	45	72	130	3070	HP152M220O450A
	1500	35	40	72	130	3090	HP152M220P400A
1800	30	50	61	110	3270	HP182M220O500A	
1800	35	45	61	110	3270	HP182M220P450A	
2200	35	50	50	90	3540	HP222M220P500A	
250	68	22	25	1630	2930	380	HP680M250M250A
	82	22	25	1350	2430	480	HP820M250M250A
	100	22	25	1110	1990	530	HP101M250M250A
	100	25	25	1110	1990	650	HP101M250N250A
	120	22	25	920	1660	750	HP121M250M250A
	150	22	25	740	1330	780	HP151M250M250A
	150	25	25	740	1330	850	HP151M250N250A
	150	30	25	740	1330	890	HP151M250O250A
	180	22	25	620	1110	890	HP181M250M250A
	180	30	25	620	1110	950	HP181M250O250A
	220	22	25	500	900	1010	HP221M250M250A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
250	220	22	30	500	900	1070	HP221M250M300A
	220	25	25	500	900	1070	HP221M250N250A
	220	30	25	500	900	1150	HP221M250O250A
	270	22	25	410	740	1150	HP271M250M250A
	270	22	30	410	740	1200	HP271M250M300A
	270	25	25	410	740	1200	HP271M250N250A
	270	25	30	410	740	1250	HP271M250N300A
	270	30	25	410	740	1250	HP271M250O250A
	270	30	30	410	740	1320	HP271M250O300A
	330	22	35	330	600	1260	HP331M250M350A
	330	25	25	330	600	1270	HP331M250N250A
	330	25	30	330	600	1380	HP331M250N300A
	330	30	25	330	600	1380	HP331M250O250A
	330	35	25	330	600	1450	HP331M250P250A
	390	22	35	280	510	1420	HP391M250M350A
	390	25	30	280	510	1450	HP391M250N300A
	390	30	25	280	510	1450	HP391M250O250A
	390	30	30	280	510	1540	HP391M250O300A
	390	35	25	280	510	1560	HP391M250P250A
	470	22	35	230	420	1570	HP471M250M350A
	470	22	40	230	420	1700	HP471M250M400A
	470	25	30	230	420	1670	HP471M250N300A
	470	25	35	230	420	1720	HP471M250N350A
	470	30	25	230	420	1720	HP471M250O250A
	470	30	30	230	420	1790	HP471M250O300A
	470	35	25	230	420	1790	HP471M250P250A
	560	22	40	200	360	1870	HP561M250M400A
	560	22	45	200	360	1970	HP561M250M450A
	560	25	35	200	360	1880	HP561M250N350A
	560	25	40	200	360	1970	HP561M250N400A
	560	30	25	200	360	1880	HP561M250O250A
	560	30	30	200	360	1970	HP561M250O300A
	560	35	25	200	360	1980	HP561M250P250A
	560	35	30	200	360	2100	HP561M250P300A
	680	22	45	160	290	2150	HP681M250M450A
	680	25	40	160	290	2200	HP681M250N400A
	680	30	35	160	290	2240	HP681M250O350A
	680	35	30	160	290	2250	HP681M250P300A
	820	25	45	130	240	2560	HP821M250N450A
	820	30	35	130	240	2560	HP821M250O350A
820	35	30	130	240	2570	HP821M250P300A	
1000	25	50	110	200	2850	HP102M250N500A	
1000	30	40	110	200	2850	HP102M250O400A	
1000	35	30	110	200	2860	HP102M250P300A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
250	1200	30	45	94	170	3200	HP122M250O450A
	1200	35	35	94	170	2250	HP122M250P350A
	1500	30	50	72	130	3830	HP152M250O500A
	1500	35	40	72	130	3910	HP152M250P400A
	1800	35	45	61	110	4300	HP182M250P450A
	1800	35	50	61	110	4560	HP182M250P500A
	1800	35	55	61	110	4880	HP182M250P550A
	2200	35	50	50	90	5000	HP222M250P500A
	2200	35	55	50	90	5190	HP222M250P550A
315	120	22	25	920	1660	760	HP121M315M250A
	150	22	25	740	1330	830	HP151M315M250A
	180	22	30	620	1110	920	HP181M315M300A
	220	22	30	500	900	1070	HP221M315M300A
	270	22	35	410	740	1210	HP271M315M350A
	270	25	30	410	740	1250	HP271M315N300A
	330	22	45	330	600	1280	HP331M315M450A
	330	25	35	330	600	1310	HP331M315N350A
	330	30	25	330	600	1280	HP331M315O250A
	390	22	45	280	510	1530	HP391M315M450A
	390	25	40	280	510	1550	HP391M315N400A
	390	30	30	280	510	1560	HP391M315O300A
	390	35	25	280	510	1570	HP391M315P250A
	470	25	45	230	420	1730	HP471M315N450A
	470	30	35	230	420	1800	HP471M315O350A
	470	35	25	230	420	1830	HP471M315P250A
	560	25	50	200	360	1940	HP561M315N500A
	560	30	40	200	360	1950	HP561M315O400A
	560	35	30	200	360	2030	HP561M315P300A
	680	30	45	160	290	2250	HP681M315O450A
	680	35	35	160	290	2260	HP681M315P350A
	820	30	50	130	240	2580	HP821M315O500A
	820	35	40	130	240	2580	HP821M315P400A
	1000	35	45	110	200	2870	HP102M315P450A
1000	35	50	110	200	2880	HP102M315P500A	
1200	35	45	94	170	2920	HP122M315P450A	
1200	35	50	94	170	2950	HP122M315P500A	
350	82	22	25	1350	2430	520	HP820M350M250A
	100	22	25	1110	1990	550	HP101M350M250A
	120	22	30	920	1660	770	HP121M350M300A
	150	22	30	740	1330	820	HP151M350M300A
	180	22	30	620	1110	900	HP181M350M300A
	180	25	30	620	1110	970	HP181M350N300A
	220	22	35	500	900	1080	HP221M350M350A
	220	25	30	500	900	1090	HP221M350N300A

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
350	270	22	40	410	740	1220	HP271M350M400A
	270	25	35	410	740	1260	HP271M350N350A
	270	30	30	410	740	1270	HP271M350O300A
	330	22	45	330	600	1290	HP331M350M450A
	330	25	40	330	600	1320	HP331M350N400A
	330	30	30	330	600	1320	HP331M350O300A
	390	25	45	280	510	1560	HP391M350N450A
	390	30	35	280	510	1570	HP391M350O350A
	390	35	30	280	510	1560	HP391M350P300A
	470	25	45	230	420	1740	HP471M350N450A
	470	30	40	230	420	1810	HP471M350O400A
	470	35	35	230	420	1840	HP471M350P350A
	560	30	45	200	360	1960	HP561M350O450A
	560	35	40	200	360	2040	HP561M350P400A
	680	30	45	160	290	2260	HP681M350O450A
	680	35	40	160	290	2270	HP681M350P400A
	680	40	35	160	290	2280	HP681M350Q350A
	820	30	50	130	240	2270	HP821M350O500A
	820	35	45	130	240	2590	HP821M350P450A
	1000	35	50	110	200	2890	HP102M350P500A
1000	40	45	110	200	2900	HP102M350Q450A	
1200	35	50	94	170	2870	HP122M350P500A	
1200	40	45	94	170	2870	HP122M350Q450A	
400	56	22	20	1970	3550	460	HP560M400M200A
	68	22	20	1630	2930	510	HP680M400M200A
	82	22	25	1350	2430	640	HP820M400M250A
	82	25	25	1350	2430	690	HP820M400N250A
	100	22	25	1110	1990	690	HP101M400M250A
	100	25	25	1110	1990	750	HP101M400N250A
	120	22	25	920	1660	780	HP121M400M250A
	120	22	30	920	1660	830	HP121M400M300A
	120	25	25	920	1660	830	HP121M400N250A
	150	22	30	740	1330	860	HP151M400M300A
	150	25	25	740	1330	860	HP151M400N250A
	150	25	30	740	1330	900	HP151M400N300A
	150	30	25	740	1330	890	HP151M400O250A
	180	22	35	620	1110	1000	HP181M400M350A
	180	25	30	620	1110	1050	HP181M400N300A
	180	30	25	620	1110	1070	HP181M400O250A
	220	22	40	500	900	1090	HP221M400M400A
	220	25	30	500	900	1100	HP221M400N300A
	220	30	25	500	900	1100	HP221M400O250A
	220	30	30	500	900	1160	HP221M400O300A
270	25	35	410	740	1260	HP271M400N350A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
400	270	30	30	410	740	1280	HP271M400O300A
	330	22	45	330	600	1460	HP331M400M450A
	330	25	40	330	600	1480	HP331M400N400A
	330	30	35	330	600	1520	HP331M400O350A
	330	35	30	330	600	1520	HP331M400P300A
	390	25	45	280	510	1690	HP391M400N450A
	390	30	40	280	510	1720	HP391M400O400A
	390	35	35	280	510	1740	HP391M400P350A
	470	25	50	230	420	1840	HP471M400N500A
	470	30	40	230	420	1920	HP471M400O400A
	470	35	35	230	420	1950	HP471M400P350A
	560	30	45	200	360	2320	HP561M400O450A
	560	35	40	200	360	2330	HP561M400P400A
	680	30	50	160	290	2680	HP681M400O500A
	680	35	45	160	290	2750	HP681M400P450A
	820	35	45	130	240	2920	HP821M400P450A
	820	35	50	130	240	2970	HP821M400P500A
	1000	35	50	110	200	3150	HP102M400P500A
1200	35	60	94	170	3290	HP122M400P600A	
1200	40	50	94	170	3290	HP122M400Q500A	
420	68	22	25	2170	3900	530	HP680M420M250A
	82	22	25	1790	3230	650	HP820M420M250A
	82	25	25	1790	3230	700	HP820M420N250A
	100	22	25	1470	2650	710	HP101M420M250A
	100	22	30	1470	2650	750	HP101M420M300A
	100	25	25	1470	2650	750	HP101M420N250A
	120	22	25	1230	2210	790	HP121M420M250A
	120	22	30	1230	2210	830	HP121M420M300A
	120	25	25	1230	2210	840	HP121M420N250A
	120	25	30	1230	2210	890	HP121M420N300A
	150	22	30	980	1770	870	HP151M420M300A
	150	22	35	980	1770	930	HP151M420M350A
	150	25	30	980	1770	930	HP151M420N300A
	150	30	25	980	1770	930	HP151M420O250A
	180	22	35	820	1470	960	HP181M420M350A
	180	22	40	820	1470	1020	HP181M420M400A
	180	25	30	820	1470	1020	HP181M420N300A
	180	30	25	820	1470	1000	HP181M420O250A
	220	22	40	670	1210	1130	HP221M420M400A
	220	22	45	670	1210	1190	HP221M420M450A
220	25	35	670	1210	1150	HP221M420N350A	
220	30	25	670	1210	1160	HP221M420O250A	
220	30	30	670	1210	1210	HP221M420O300A	
220	35	25	670	1210	1230	HP221M420P250A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
420	270	22	50	540	980	1270	HP271M420M500A
	270	25	40	540	980	1260	HP271M420N400A
	270	30	30	540	980	1280	HP271M420O300A
	270	35	25	540	980	1300	HP271M420P250A
	330	22	50	440	800	1410	HP331M420M500A
	330	25	45	440	800	1490	HP331M420N450A
	330	30	35	440	800	1490	HP331M420O350A
	330	30	40	440	800	1540	HP331M420O400A
	330	35	30	440	800	1540	HP331M420P300A
	330	35	35	440	800	1670	HP331M420P350A
	390	22	55	380	680	1620	HP391M420M550A
	390	25	50	380	680	1700	HP391M420N500A
	390	30	40	380	680	1720	HP391M420O400A
	390	35	35	380	680	1750	HP391M420P350A
	470	25	50	310	560	1850	HP471M420N500A
	470	30	45	310	560	1900	HP471M420O450A
	470	35	35	310	560	1900	HP471M420P350A
	470	35	40	310	560	1970	HP471M420P400A
	560	30	50	260	470	2230	HP561M420O500A
	560	35	40	260	470	2240	HP561M420P400A
560	35	45	260	470	2320	HP561M420P450A	
680	35	45	220	390	2760	HP681M420P450A	
680	35	50	220	390	2770	HP681M420P500A	
820	35	55	180	320	2980	HP821M420P550A	
1000	35	60	150	270	3150	HP102M420P600A	
1000	40	50	150	270	3250	HP102M420Q500A	
450	68	22	25	2170	3900	530	HP680M450M250A
	82	22	25	1790	3230	660	HP820M450M250A
	82	22	30	1790	3230	710	HP820M450M300A
	82	25	25	1790	3230	710	HP820M450N250A
	100	22	25	1470	2650	720	HP101M450M250A
	100	22	30	1470	2650	750	HP101M450M300A
	100	25	25	1470	2650	750	HP101M450N250A
	100	25	30	1470	2650	820	HP101M450N300A
	100	30	25	1470	2650	830	HP101M450O250A
	120	22	30	1230	2210	820	HP121M450M300A
	120	22	35	1230	2210	860	HP121M450M350A
	120	25	25	1230	2210	820	HP121M450N250A
	120	25	30	1230	2210	860	HP121M450N300A
	120	30	25	1230	2210	860	HP121M450O250A
	120	35	25	1230	2210	950	HP121M450P250A
	150	22	30	980	1770	910	HP151M450M300A
150	22	35	980	1770	930	HP151M450M350A	
150	22	40	980	1770	950	HP151M450M400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	150	25	30	980	1770	940	HP151M450N300A
	150	25	35	980	1770	970	HP151M450N350A
	150	30	25	980	1770	980	HP151M450O250A
	150	30	30	980	1770	1060	HP151M450O300A
	150	35	25	980	1770	1080	HP151M450P250A
	180	22	35	820	1470	1020	HP181M450M350A
	180	22	40	820	1470	1050	HP181M450M400A
	180	25	30	820	1470	1050	HP181M450N300A
	180	25	35	820	1470	1100	HP181M450N350A
	180	30	25	820	1470	1100	HP181M450O250A
	180	30	30	820	1470	1190	HP181M450O300A
	180	35	25	820	1470	1200	HP181M450P250A
	180	35	30	820	1470	1280	HP181M450P300A
	220	22	40	670	1210	1120	HP221M450M400A
	220	22	45	670	1210	1200	HP221M450M450A
	220	25	35	670	1210	1200	HP221M450N350A
	220	25	40	670	1210	1250	HP221M450N400A
	220	30	25	670	1210	1170	HP221M450O250A
	220	30	30	670	1210	1250	HP221M450O300A
	220	35	25	670	1210	1240	HP221M450P250A
	220	35	30	670	1210	1330	HP221M450P300A
	270	22	50	540	980	1300	HP271M450M500A
	270	25	40	540	980	1300	HP271M450N400A
	270	30	30	540	980	1290	HP271M450O300A
	270	30	35	540	980	1420	HP271M450O350A
	270	35	25	540	980	1350	HP271M450P250A
	270	35	30	540	980	1420	HP271M450P300A
	330	25	50	440	800	1680	HP331M450N500A
	330	30	35	440	800	1540	HP331M450O350A
	330	30	40	440	800	1690	HP331M450O400A
	330	35	30	440	800	1700	HP331M450P300A
	330	35	35	440	800	1870	HP331M450P350A
	390	25	50	380	680	1710	HP391M450N500A
	390	30	40	380	680	1690	HP391M450O400A
	390	30	45	380	680	1900	HP391M450O450A
	390	35	35	380	680	1910	HP391M450P350A
	390	35	40	380	680	2070	HP391M450P400A
	470	30	45	310	560	1940	HP471M450O450A
	470	30	50	310	560	2230	HP471M450O500A
	470	35	35	310	560	1970	HP471M450P350A
470	35	40	310	560	2100	HP471M450P400A	
470	35	45	310	560	2500	HP471M450P450A	
560	30	50	260	470	2440	HP561M450O500A	
560	35	40	260	470	2400	HP561M450P400A	

: See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
450	560	35	45	260	470	2500	HP561M450P450A
	560	35	50	260	470	2790	HP561M450P500A
	680	35	45	220	390	2770	HP681M450P450A
	680	35	50	220	390	2900	HP681M450P500A
	820	35	55	180	320	3080	HP821M450P550A
	820	35	60	180	320	3220	HP821M450P600A
	1000	35	65	150	270	3310	HP102M450P650A
	1000	40	60	150	270	3400	HP102M450Q600A
	1200	35	80	120	220	3620	HP122M450P800A
	1200	40	70	120	220	3670	HP122M450Q700A
500	47	22	25	3130	5640	420	HP470M500M250A
	56	22	30	2630	4740	500	HP560M500M300A
	56	25	25	2630	4740	510	HP560M500N250A
	68	22	30	2170	3900	550	HP680M500M300A
	68	25	25	2170	3900	550	HP680M500N250A
	82	22	35	1790	3230	730	HP820M500M350A
	82	25	30	1790	3230	750	HP820M500N300A
	82	30	25	1790	3230	760	HP820M500O250A
	100	22	40	1470	2650	900	HP101M500M400A
	100	22	45	1470	2650	940	HP101M500M450A
	100	25	35	1470	2650	920	HP101M500N350A
	100	30	25	1470	2650	930	HP101M500O250A
	100	30	30	1470	2650	960	HP101M500O300A
	120	22	50	1230	2210	940	HP121M500M500A
	120	25	35	1230	2210	930	HP121M500N350A
	120	25	40	1230	2210	940	HP121M500N400A
	120	30	30	1230	2210	940	HP121M500O300A
	120	35	25	1230	2210	940	HP121M500P250A
	150	22	50	980	1770	1100	HP151M500M500A
	150	25	40	980	1770	1100	HP151M500N400A
	150	30	35	980	1770	1130	HP151M500O350A
	150	35	25	980	1770	1000	HP151M500P250A
	150	35	30	980	1770	1140	HP151M500P300A
	180	25	50	820	1470	1390	HP181M500N500A
	180	30	35	820	1470	1310	HP181M500O350A
	180	30	40	820	1470	1400	HP181M500O400A
	180	35	30	820	1470	1410	HP181M500P300A
	220	25	55	670	1210	1620	HP221M500N550A
	220	30	40	670	1210	1590	HP221M500O400A
	220	30	45	670	1210	1630	HP221M500O450A
220	35	35	670	1210	1650	HP221M500P350A	
270	30	50	540	980	1750	HP271M500O500A	
270	35	40	540	980	1760	HP271M500P400A	
330	30	55	440	800	2030	HP331M500O550A	

: See description at end of standard ratings

STANDARD RATINGS

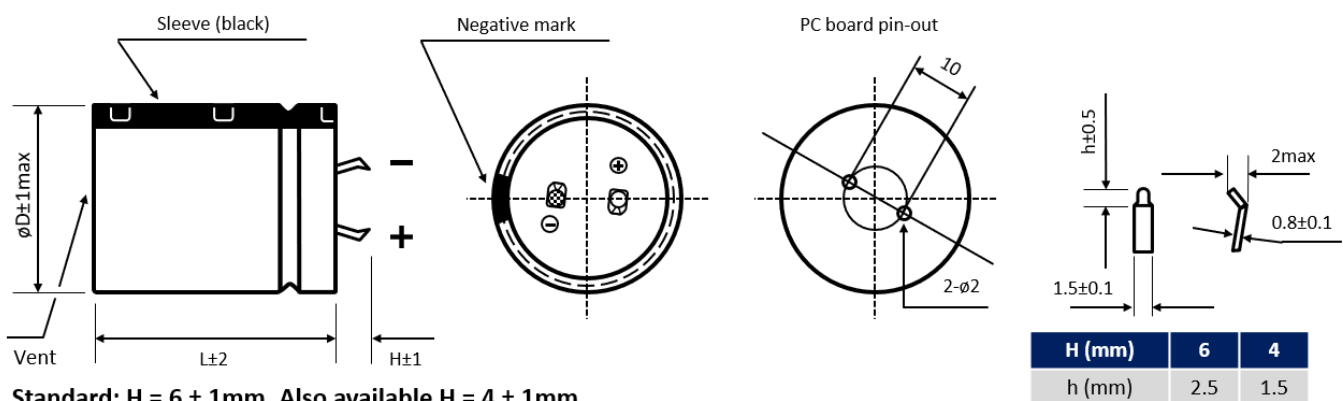
V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
500	330	35	45	440	800	2050	HP331M500P450A □□
	390	35	50	380	680	2470	HP391M500P500A □□
	470	35	55	310	560	2630	HP471M500P550A □□
	680	35	65	220	390	3190	HP681M500P650A □□
	820	35	75	180	320	3850	HP821M500P750A □□
	820	40	65	180	320	3850	HP821M500Q650A □□
	1000	40	80	150	270	4700	HP102M500Q800A □□
550	47	25	25	3130	5640	480	HP470M550N250A □□
	56	25	30	2630	4740	550	HP560M550N300A □□
	68	25	35	2170	3900	630	HP680M550N350A □□
	68	30	25	2170	3900	650	HP680M550O250A □□
	82	25	35	1790	3230	760	HP820M550N350A □□
	82	30	30	1790	3230	770	HP820M550O300A □□
	100	25	40	1470	2650	930	HP101M550N400A □□
	100	30	35	1470	2650	940	HP101M550O350A □□
	100	35	25	1470	2650	930	HP101M550P250A □□
	120	25	50	1230	2210	960	HP121M550N500A □□
	120	30	35	1230	2210	980	HP121M550O350A □□
	120	35	30	1230	2210	1060	HP121M550P300A □□
	150	25	55	980	1770	1130	HP151M550N550A □□
	150	30	45	980	1770	1180	HP151M550O450A □□
	150	35	35	980	1770	1220	HP151M550P350A □□
	180	30	50	820	1470	1350	HP181M550O500A □□
	180	35	40	820	1470	1380	HP181M550P400A □□
	220	30	55	670	1210	1560	HP221M550O550A □□
	220	35	45	670	1210	1580	HP221M550P450A □□
	270	35	50	540	980	1800	HP271M550P500A □□

□□: Enter **P6** for standard type ▪ 6mm pin length
 □□□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□□: Enter **Y6** for multipin-type ▪ 6mm pin length

□□: Enter **P4** for standard type ▪ 4mm pin length
 □□□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□□: Enter **Y4** for multipin type ▪ 4mm pin length

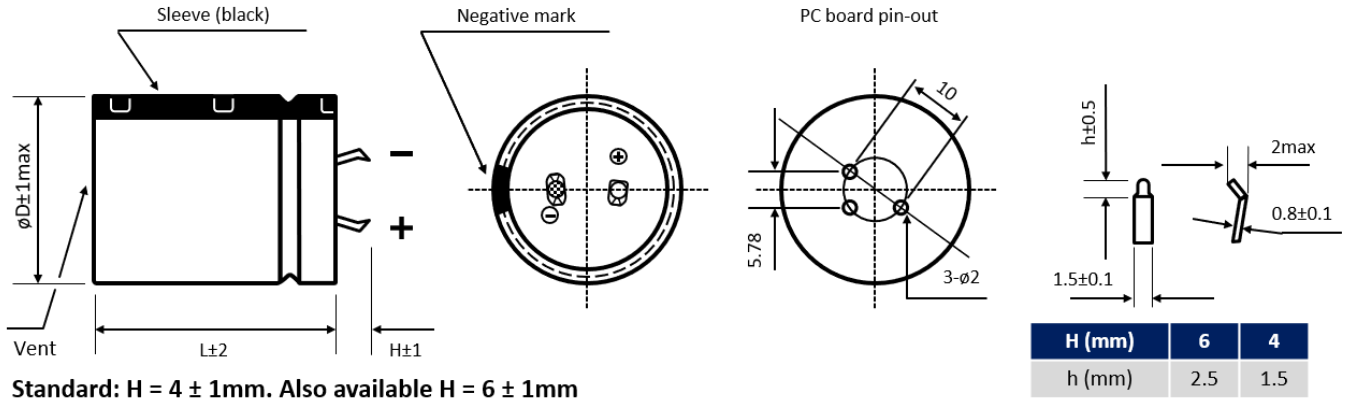
DIMENSIONS ▪ All dimensions in mm

2-pin version ▪ Standard type



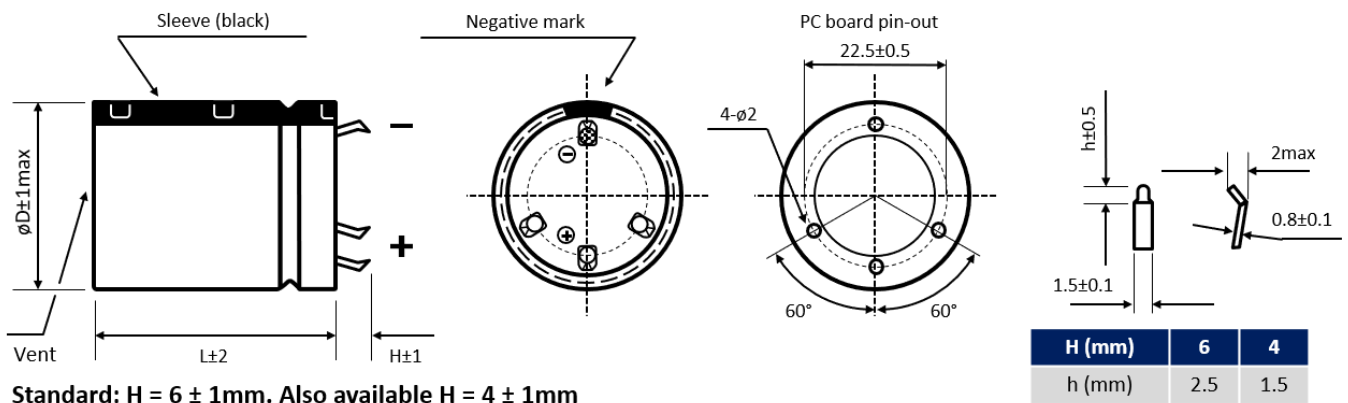
DIMENSIONS ▪ All dimensions in mm

3-pin version ▪ Polarity protection



Standard: H = 4 ± 1mm. Also available H = 6 ± 1mm

Multipin version ▪ Diameter $\phi D \geq 30$ mm



Standard: H = 6 ± 1mm. Also available H = 4 ± 1mm

Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$6.3 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 550$	0.77	1	1.16	1.3	1.41	1.43

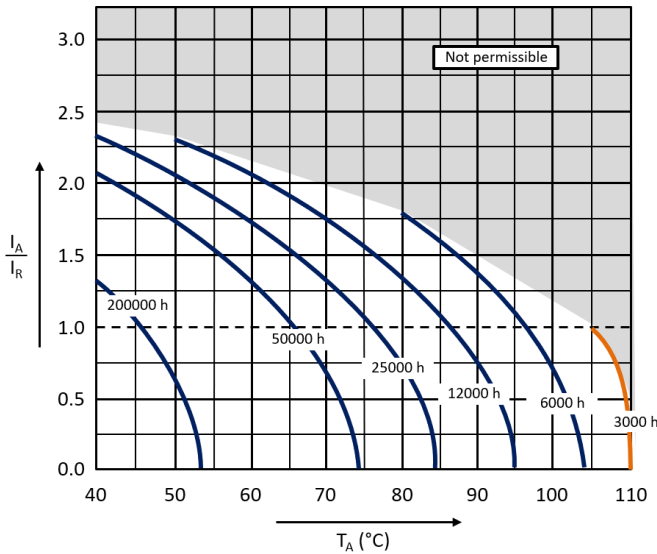
PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

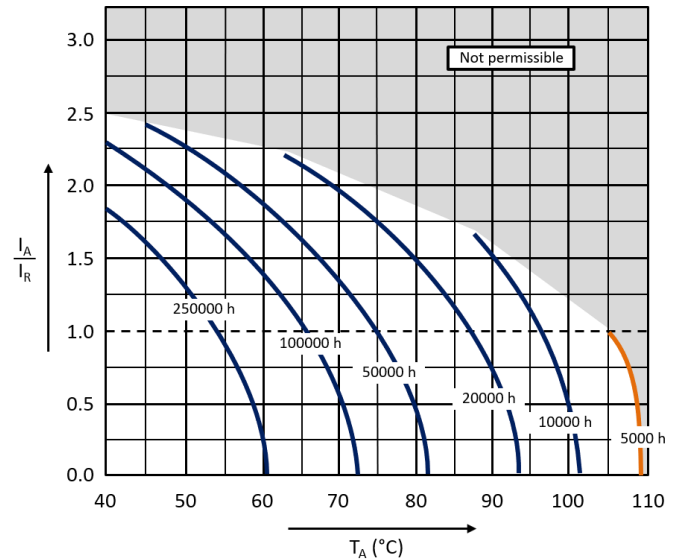
General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE

$V_R \leq 100V$



$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HT SERIES ■ LONG LIFE, MULTI-PIN 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ■ Snap-In (Multi-Pin) type
- Useful life: 105°C ■ 5 000 hours
- Miniature dimensions
- High reliability
- Polarity-protected assembly



NOT FOR NEW DESIGNS

Recommendation HP series



SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +105°C		-25 ~ +105°C	
Rated Voltage Range	V _R	160 ~ 350V DC		400 ~ 450V DC	
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R		(V _R > 315V): V _S = 1.10·V _R	
Capacitance Range	C _R	180 ~ 2700μF		82 ~ 1800μF	
Cap. Tolerance	ΔC	±20% (120Hz ■ 20°C)			
Leakage Current (20°C ■ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ■ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]			
Dissipation Factor % (20°C ■ 120Hz)	tanδ	V DC	160 ~ 400	450	
		tanδ	15	20	
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	160 ~ 250	315 ~ 350	400 ~ 450
		Z-25°C/Z+20°C	4	8	8
		Z-40°C/Z+20°C	8	12	-

Lifetime Test					
Useful Life 105°C (V _R & I _R applied)	Test	5 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ■ parts show higher drift as test criteria				
Endurance 105°C (V _R & I _R applied)	Test	2 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 105°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ■ IEC 60068-2-6				

STANDARD RATINGS
NOT FOR NEW DESIGNS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
160	330	30	25	310	600	1390	HT331M160O250A
	390	30	25	260	510	1470	HT391M160O250A
	470	30	30	220	420	1640	HT471M160O300A
	560	30	30	180	360	1760	HT561M160O300A
	680	30	35	150	290	1980	HT681M160O350A
	680	35	30	150	290	1980	HT681M160P300A
	820	30	40	120	240	2360	HT821M160O400A
	820	35	30	120	240	2360	HT821M160P300A
	1000	30	55	100	200	2800	HT102M160O550A
	1000	35	35	100	200	2600	HT102M160P350A
200	1200	30	55	87	170	3230	HT122M160O550A
	220	30	25	460	900	1150	HT221M200O250A
	270	30	25	380	740	1220	HT271M200O250A
	330	30	30	310	600	1530	HT331M200O300A
	390	30	30	260	510	1570	HT391M200O300A
	390	35	25	260	510	1570	HT391M200P250A
	470	30	35	220	420	1740	HT471M200O350A
	470	35	30	220	420	1740	HT471M200P300A
	560	30	40	180	360	1890	HT561M200O400A
	560	35	30	180	360	1890	HT561M200P300A
	680	30	45	150	290	2300	HT681M200O450A
	680	35	35	150	290	2300	HT681M200P350A
	820	30	50	120	240	2740	HT821M200O500A
	820	35	40	120	240	2740	HT821M200P400A
250	180	30	25	570	1110	980	HT181M250O250A
	220	30	30	460	900	1170	HT221M250O300A
	270	30	30	380	740	1320	HT271M250O300A
	330	30	35	310	600	1660	HT331M250O350A
	330	35	30	310	600	1660	HT331M250P300A
	390	30	40	260	510	1770	HT391M250O400A
	390	35	30	260	510	1770	HT391M250P300A
	470	30	40	220	420	1880	HT471M250O400A
	470	35	35	220	420	1880	HT471M250P350A
	560	30	50	180	360	2060	HT561M250O500A
	560	35	40	180	360	2060	HT561M250P400A
	350	390	35	40	260	510	1970
470		35	45	220	420	2220	HT471M350P450A
560		35	45	180	360	2460	HT561M350P450A
560		40	40	180	360	2510	HT561M350Q400A
680		35	55	150	290	2840	HT681M350P550A
680		40	45	150	290	2840	HT681M350Q450A
820		35	65	120	240	3260	HT821M350P650A
820		40	50	120	240	3200	HT821M350Q500A
820		45	40	120	240	3160	HT821M350V400A

: See description at end of standard ratings

STANDARD RATINGS
NOT FOR NEW DESIGNS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
350	1000	35	75	100	200	3760	HT102M350P750A
	1000	40	60	100	200	3680	HT102M350Q600A
	1000	45	45	100	200	3570	HT102M350V450A
	1200	35	85	87	170	4310	HT122M350P850A
	1200	40	65	87	170	4150	HT122M350Q650A
	1200	45	50	87	170	4000	HT122M350V500A
	1500	40	80	67	130	4960	HT152M350Q800A
	1500	45	65	67	130	4800	HT152M350V650A
	1800	40	95	56	110	5720	HT182M350Q950A
	1800	45	75	56	110	5450	HT182M350V750A
	2200	45	90	46	90	6320	HT222M350V900A
2700	45	100	38	74	7300	HT272M350VA00A	
400	82	30	25	1250	2430	730	HT820M400Q250A
	100	30	30	1020	1990	820	HT101M400Q300A
	120	30	35	850	1660	870	HT121M400Q350A
	120	35	25	850	1660	870	HT121M400P250A
	150	30	40	680	1330	1000	HT151M400Q400A
	150	35	30	680	1330	1000	HT151M400P300A
	180	30	45	570	1110	1160	HT181M400Q450A
	180	35	35	570	1110	1140	HT181M400P350A
	220	30	50	460	900	1280	HT221M400Q500A
	220	35	40	460	900	1280	HT221M400P400A
	330	35	40	310	600	1830	HT331M400P400A
	390	35	45	260	510	2050	HT391M400P450A
	470	35	45	220	420	2320	HT471M400P450A
	470	40	40	220	420	2330	HT471M400Q400A
	560	35	55	180	360	2600	HT561M400P550A
	560	40	45	180	360	2610	HT561M400Q450A
	560	45	40	180	360	2600	HT561M400V400A
	680	35	65	150	290	2990	HT681M400P650A
	680	40	50	150	290	2950	HT681M400Q500A
	680	45	40	150	290	2930	HT681M400V400A
	820	35	75	120	240	3430	HT821M400P750A
	820	40	60	120	240	3370	HT821M400Q600A
	820	45	45	120	240	3300	HT821M400V450A
	1000	35	85	100	200	3980	HT102M400P850A
	1000	40	65	100	200	3840	HT102M400Q650A
	1000	45	50	100	200	3730	HT102M400V500A
	1200	35	100	87	170	4590	HT122M400PA00A
1200	40	75	87	170	4380	HT122M400Q750A	
1200	45	60	87	170	4260	HT122M400V600A	
1500	40	95	67	130	5300	HT152M400Q950A	
1500	45	70	67	130	5050	HT152M400V700A	
1800	45	90	56	110	5820	HT182M400V900A	

: See description at end of standard ratings

STANDARD RATINGS

NOT FOR NEW DESIGNS

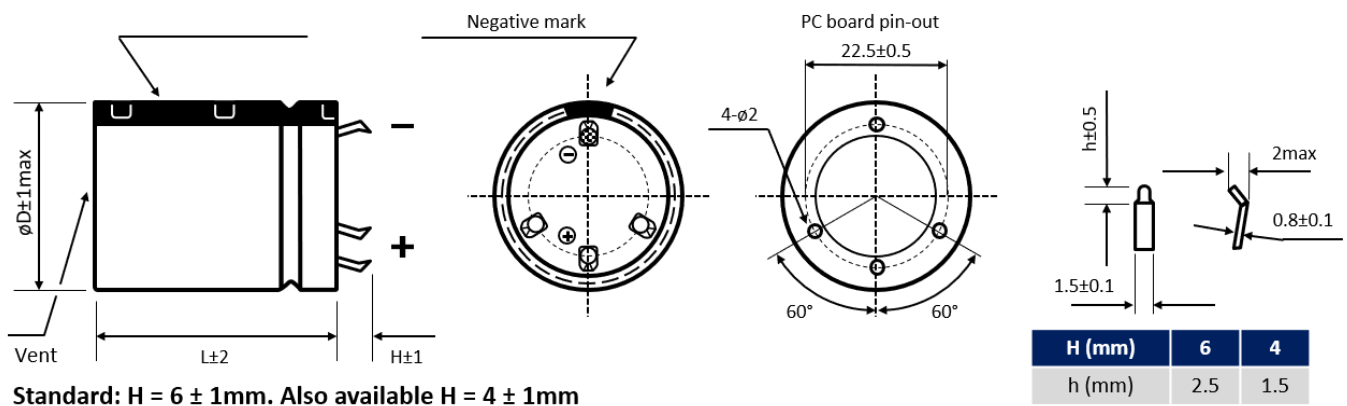
V_R (V)	C_R (μF)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
450	270	35	40	500	980	1620	HT271M450P400A <input type="checkbox"/>
	330	35	45	410	800	1850	HT331M450P450A <input type="checkbox"/>
	390	35	50	350	680	2070	HT391M450P500A <input type="checkbox"/>
	390	40	40	350	680	2080	HT391M450Q400A <input type="checkbox"/>
	470	35	55	290	560	2350	HT471M450P550A <input type="checkbox"/>
	470	40	45	290	560	2350	HT471M450Q450A <input type="checkbox"/>
	470	45	40	290	560	2360	HT471M450V400A <input type="checkbox"/>
	560	35	65	240	470	2660	HT561M450P650A <input type="checkbox"/>
	560	40	50	240	470	2640	HT561M450Q500A <input type="checkbox"/>
	560	45	40	240	470	2630	HT561M450V400A <input type="checkbox"/>
	680	35	75	200	390	3070	HT681M450P750A <input type="checkbox"/>
	680	40	60	200	390	3020	HT681M450Q600A <input type="checkbox"/>
	680	45	45	200	390	2970	HT681M450V450A <input type="checkbox"/>
	820	35	85	160	320	3540	HT821M450P850A <input type="checkbox"/>
	820	40	65	160	320	3430	HT821M450Q650A <input type="checkbox"/>
	820	45	50	160	320	3300	HT821M450V500A <input type="checkbox"/>
	1000	35	100	140	270	4130	HT102M450PA00A <input type="checkbox"/>
	1000	40	70	140	270	3750	HT102M450Q700A <input type="checkbox"/>
	1000	40	80	140	270	3980	HT102M450Q800A <input type="checkbox"/>
	1000	45	60	140	270	3860	HT102M450V600A <input type="checkbox"/>
1200	40	95	110	220	4660	HT122M450Q950A <input type="checkbox"/>	
1200	45	75	110	220	4500	HT122M450V750A <input type="checkbox"/>	
1500	45	90	92	180	5300	HT152M450V900A <input type="checkbox"/>	

: Enter **Y6** for multipin-type ▪ 6mm pin length

: Enter **Y4** for multipin type ▪ 4mm pin length

DIMENSIONS ▪ All dimensions in mm

Multi-pin version ▪ Standard type



MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

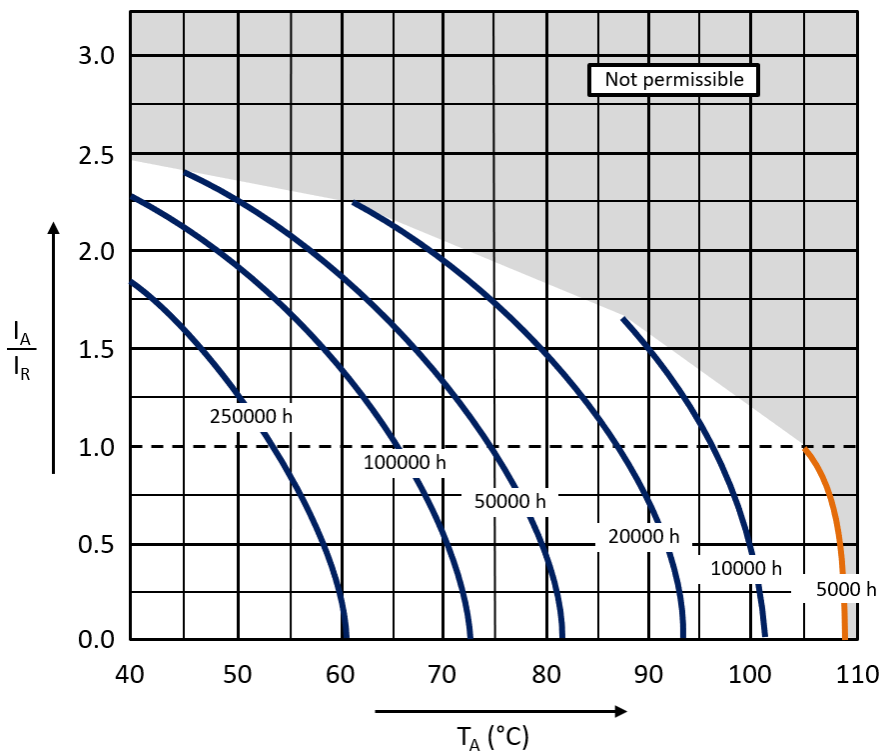
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$350 \leq V_R \leq 450$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor



DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UJ SERIES ▪ LONG LIFE, AUTOMOTIVE 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 105°C ▪ 5 000 hours
- Extremely stable dissipation factor and leakage current
- Especially for applications with demanding operating environment
- AEC-Q200 version available



SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +105°C		-25 ~ +105°C	
Rated Voltage Range	V_R	200 ~ 450V DC		500 ~ 550V DC	
Surge Voltage	V_S	$(V_R \leq 315V) \cdot V_S = 1.15 \cdot V_R$		$(V_R > 315V) \cdot V_S = 1.10 \cdot V_R$	
Capacitance Range	C_R	82 ~ 3300 μ F		47 ~ 1000 μ F	
Cap. Tolerance	ΔC	$\pm 20\%$ (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I_{LEAK} (μ A) ; C_R (μ F) ; V_R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	$\tan\delta$	V_R (V DC)	200 ~ 400	450 ~ 550	
		$\tan\delta$	15	20	
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings			
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	200 ~ 250	315 ~ 450	500 ~ 550
		Z-25°C/Z+20°C	4	5	6
		Z-40°C/Z+20°C	7	10	-

Lifetime Test					
Useful Life 105°C (V_R & I_R applied)	Test	5 000 hours			
	$\Delta C/C_R$	$\leq \pm 20\%$ of initial measured value			
	$\tan\delta$	$\leq 200\%$ of initial specified value			
	I_{Leak}	\leq the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria				
Endurance 105°C (V_R & I_R applied)	Test	2 000 hours			
	$\Delta C/C_R$	$\leq \pm 15\%$ of initial measured value			
	$\tan\delta$	$\leq 175\%$ of initial specified value			
	I_{Leak}	\leq the initial specified value			
Shelf Life 105°C ($V_R = 0$)	Test	1 000 hours			
	$\Delta C/C_R$	$\leq \pm 15\%$ of initial measured value			
	$\tan\delta$	$\leq 175\%$ of initial specified value			
	I_{Leak}	\leq the initial specified value			
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4				
Vibration Resistance Test		Max. 10g force, f_{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6			

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
200	330	22	25	330	600	1130	UJ331M200M250A□□□
	390	22	25	280	510	1210	UJ391M200M250A□□□
	390	22	30	280	510	1250	UJ391M200M300A□□□
	390	25	25	280	510	1310	UJ391M200N250A□□□
	470	22	30	230	420	1400	UJ471M200M300A□□□
	470	25	25	230	420	1400	UJ471M200N250A□□□
	470	25	30	230	420	1520	UJ471M200N300A□□□
	560	22	35	200	360	1610	UJ561M200M350A□□□
	560	25	30	200	360	1610	UJ561M200N300A□□□
	560	30	25	200	360	1620	UJ561M200O250A□□□
	680	22	40	160	290	1860	UJ681M200M400A□□□
	680	25	30	160	290	1690	UJ681M200N300A□□□
	680	30	25	160	290	1980	UJ681M200O250A□□□
	820	22	45	130	240	2140	UJ821M200M450A□□□
	820	25	35	130	240	2140	UJ821M200N350A□□□
	820	30	30	130	240	2290	UJ821M200O300A□□□
	1000	22	50	110	200	2480	UJ102M200M500A□□□
	1000	25	40	110	200	2480	UJ102M200N400A□□□
	1000	30	30	110	200	2520	UJ102M200O300A□□□
	1000	35	25	110	200	2440	UJ102M200P250A□□□
	1200	25	45	94	170	2890	UJ122M200N450A□□□
	1200	30	35	94	170	2890	UJ122M200O350A□□□
	1200	35	30	94	170	3030	UJ122M200P300A□□□
	1500	25	55	72	130	3520	UJ152M200N550A□□□
	1500	30	40	72	130	3590	UJ152M200O400A□□□
	1500	35	35	72	130	3520	UJ152M200P350A□□□
	1800	30	45	61	110	4090	UJ182M200O450A□□□
	1800	35	35	61	110	3770	UJ182M200P350A□□□
	2200	30	55	50	90	4820	UJ222M200O550A□□□
	2200	35	45	50	90	4820	UJ222M200P450A□□□
2700	35	50	41	74	5160	UJ272M200P500A□□□	
3300	35	55	33	60	5850	UJ332M200P550A□□□	
250	220	22	25	500	900	910	UJ221M250M250A□□□
	270	22	25	410	740	1030	UJ271M250M250A□□□
	330	22	30	330	600	1200	UJ331M250M300A□□□
	390	22	35	280	510	1370	UJ391M250M350A□□□
	390	25	25	280	510	1260	UJ391M250N250A□□□
	470	22	35	230	420	1530	UJ471M250M350A□□□
	470	25	30	230	420	1530	UJ471M250N300A□□□
	470	30	25	230	420	1690	UJ471M250O250A□□□
	560	22	40	200	360	1760	UJ561M250M400A□□□
	560	25	35	200	360	1680	UJ561M250N350A□□□
	680	22	45	160	290	2040	UJ681M250M450A□□□
	680	25	40	160	290	2130	UJ681M250N400A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
250	680	30	30	160	290	2130	UJ681M250O300A□□□
	680	35	25	160	290	2120	UJ681M250P250A□□□
	820	25	45	130	240	2230	UJ821M250N450A□□□
	820	30	35	130	240	2450	UJ821M250O350A□□□
	820	35	30	130	240	2620	UJ821M250P300A□□□
	1000	25	50	110	200	2570	UJ102M250N500A□□□
	1000	30	40	110	200	2850	UJ102M250O400A□□□
	1000	35	30	110	200	2770	UJ102M250P300A□□□
	1200	30	45	94	170	3420	UJ122M250O450A□□□
	1200	35	35	94	170	3260	UJ122M250P350A□□□
	1500	30	50	72	130	3720	UJ152M250O500A□□□
	1500	35	40	72	130	3780	UJ152M250P400A□□□
	1800	35	45	61	110	4090	UJ182M250P450A□□□
2200	35	55	50	90	5040	UJ222M250P550A□□□	
350	100	22	25	1110	1990	590	UJ101M350M250A□□□
	120	22	30	920	1660	690	UJ121M350M300A□□□
	120	25	25	920	1660	690	UJ121M350N250A□□□
	150	22	35	740	1330	800	UJ151M350M350A□□□
	180	25	30	620	1110	850	UJ181M350N300A□□□
	180	30	25	620	1110	890	UJ181M350O250A□□□
	220	22	40	500	900	990	UJ221M350M400A□□□
	220	25	40	500	900	1100	UJ221M350N400A□□□
	220	30	30	500	900	1080	UJ221M350O300A□□□
	220	35	25	500	900	1080	UJ221M350P250A□□□
	270	25	45	410	740	1280	UJ271M350N450A□□□
	270	30	35	410	740	1250	UJ271M350O350A□□□
	270	35	25	410	740	1250	UJ271M350P250A□□□
	330	25	50	330	600	1550	UJ331M350N500A□□□
	330	30	35	330	600	1460	UJ331M350O350A□□□
	330	35	30	330	600	1460	UJ331M350P300A□□□
	390	35	40	280	510	1920	UJ391M350P400A□□□
	470	35	45	230	420	2170	UJ471M350P450A□□□
	560	35	45	200	360	2410	UJ561M350P450A□□□
	560	40	40	200	360	2460	UJ561M350Q400A□□□
	680	35	55	160	290	2790	UJ681M350P550A□□□
	680	40	45	160	290	2790	UJ681M350Q450A□□□
	820	35	60	130	240	3210	UJ821M350P600A□□□
	820	40	50	130	240	3150	UJ821M350Q500A□□□
	820	45	40	130	240	3110	UJ821M350V400A□□□
	1000	35	60	110	200	3230	UJ102M350P600A□□□
	1000	40	50	110	200	3260	UJ102M350Q500A□□□
1200	40	55	94	170	3680	UJ122M350Q550A□□□	
1500	40	65	72	130	4560	UJ152M350Q650A□□□	
1800	40	75	61	110	5670	UJ182M350Q750A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
400	100	22	25	1110	1990	650	UJ101M400M250A□□□
	120	22	25	920	1660	920	UJ121M400M250A□□□
	150	22	30	740	1330	1080	UJ151M400M300A□□□
	180	22	30	620	1110	1150	UJ181M400M300A□□□
	180	25	25	620	1110	1120	UJ181M400N250A□□□
	220	22	35	500	900	1320	UJ221M400M350A□□□
	220	25	30	500	900	1300	UJ221M400N300A□□□
	270	22	40	410	740	1500	UJ271M400M400A□□□
	270	25	35	410	740	1490	UJ271M400N350A□□□
	270	30	25	410	740	1330	UJ271M400O250A□□□
	330	22	50	330	600	1760	UJ331M400M500A□□□
	330	25	40	330	600	1680	UJ331M400N400A□□□
	330	30	30	330	600	1550	UJ331M400O300A□□□
	330	35	25	330	600	1440	UJ331M400P250A□□□
	390	22	55	280	510	1940	UJ391M400M550A□□□
	390	25	45	280	510	1860	UJ391M400N450A□□□
	390	30	35	280	510	1750	UJ391M400O350A□□□
	390	35	30	280	510	1750	UJ391M400P300A□□□
	470	25	50	230	420	2070	UJ471M400N500A□□□
	470	30	40	230	420	1970	UJ471M400O400A□□□
	470	35	30	230	420	1910	UJ471M400P300A□□□
	560	25	60	200	360	2370	UJ561M400N600A□□□
	560	30	45	200	360	2180	UJ561M400O450A□□□
	560	35	35	200	360	1920	UJ561M400P350A□□□
	680	30	50	160	290	2410	UJ681M400O500A□□□
	680	35	40	160	290	2350	UJ681M400P400A□□□
	820	30	60	130	240	2760	UJ821M400O600A□□□
	820	35	45	130	240	2670	UJ821M400P450A□□□
	1000	35	55	110	200	3160	UJ102M400P550A□□□
	1000	40	50	110	200	3240	UJ102M400Q500A□□□
1200	35	60	94	170	3560	UJ122M400P600A□□□	
1200	40	55	94	170	3640	UJ122M400Q550A□□□	
1500	45	70	72	130	4680	UJ152M400V700A□□□	
1800	45	80	61	110	5290	UJ182M400V800A□□□	
450	82	22	25	1790	3230	590	UJ820M450M250A□□□
	100	22	30	1470	2650	690	UJ101M450M300A□□□
	100	25	25	1470	2650	690	UJ101M450N250A□□□
	120	22	35	1230	2210	720	UJ121M450M350A□□□
	150	22	35	980	1770	920	UJ151M450M350A□□□
	150	25	30	980	1770	910	UJ151M450N300A□□□
	150	30	25	980	1770	970	UJ151M450O250A□□□
	180	22	40	820	1470	1280	UJ181M450M400A□□□
	180	25	30	820	1470	1200	UJ181M450N300A□□□
	180	30	25	820	1470	1180	UJ181M450O250A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	220	22	45	670	1210	1440	UJ221M450M450A□□□
	220	25	35	670	1210	1370	UJ221M450N350A□□□
	220	30	30	670	1210	1360	UJ221M450O300A□□□
	330	22	60	440	800	1860	UJ331M450M600A□□□
	330	25	50	440	800	1820	UJ331M450N500A□□□
	330	30	35	440	800	1640	UJ331M450O350A□□□
	330	35	30	440	800	1640	UJ331M450P300A□□□
	390	25	55	380	680	2010	UJ391M450N550A□□□
	390	30	40	380	680	1830	UJ391M450O400A□□□
	390	35	35	380	680	1830	UJ391M450P350A□□□
	470	25	60	310	560	2210	UJ471M450N600A□□□
	470	30	45	310	560	2050	UJ471M450O450A□□□
	470	35	40	310	560	2050	UJ471M450P400A□□□
	560	30	50	260	470	2260	UJ561M450O500A□□□
	560	35	45	260	470	2180	UJ561M450P450A□□□
	680	30	60	220	390	2590	UJ681M450O600A□□□
	680	35	50	220	390	2580	UJ681M450P500A□□□
	820	35	60	180	320	2800	UJ821M450P600A□□□
	820	40	50	180	320	2800	UJ821M450Q500A□□□
	1000	35	65	150	270	3210	UJ102M450P650A□□□
1000	40	55	150	270	3210	UJ102M450Q550A□□□	
1200	40	70	120	220	3540	UJ122M450Q700A□□□	
500	56	22	25	2630	4740	630	UJ560M500M250A□□□
	82	22	35	1790	3230	820	UJ820M500M350A□□□
	82	25	25	1790	3230	780	UJ820M500N250A□□□
	120	22	45	1230	2210	1050	UJ121M500M450A□□□
	120	25	35	1230	2210	1020	UJ121M500N350A□□□
	120	30	25	1230	2210	970	UJ121M500O250A□□□
	150	22	50	980	1770	1200	UJ151M500M500A□□□
	150	25	40	980	1770	1170	UJ151M500N400A□□□
	150	30	30	980	1770	1130	UJ151M500O300A□□□
	150	35	25	980	1770	1090	UJ151M500P250A□□□
	180	22	60	820	1470	1370	UJ181M500M600A□□□
	180	25	45	820	1470	1310	UJ181M500N450A□□□
	180	30	35	820	1470	1280	UJ181M500O350A□□□
	180	35	30	820	1470	1260	UJ181M500P300A□□□
	220	25	50	670	1210	1460	UJ221M500N500A□□□
	220	30	40	670	1210	1450	UJ221M500O400A□□□
	220	35	35	670	1210	1440	UJ221M500P350A□□□
	270	25	60	540	980	1700	UJ271M500N600A□□□
	270	30	45	540	980	1630	UJ271M500O450A□□□
	270	35	35	540	980	1630	UJ271M500P350A□□□
330	30	50	440	800	1810	UJ331M500O500A□□□	
330	35	40	440	800	1710	UJ331M500P400A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

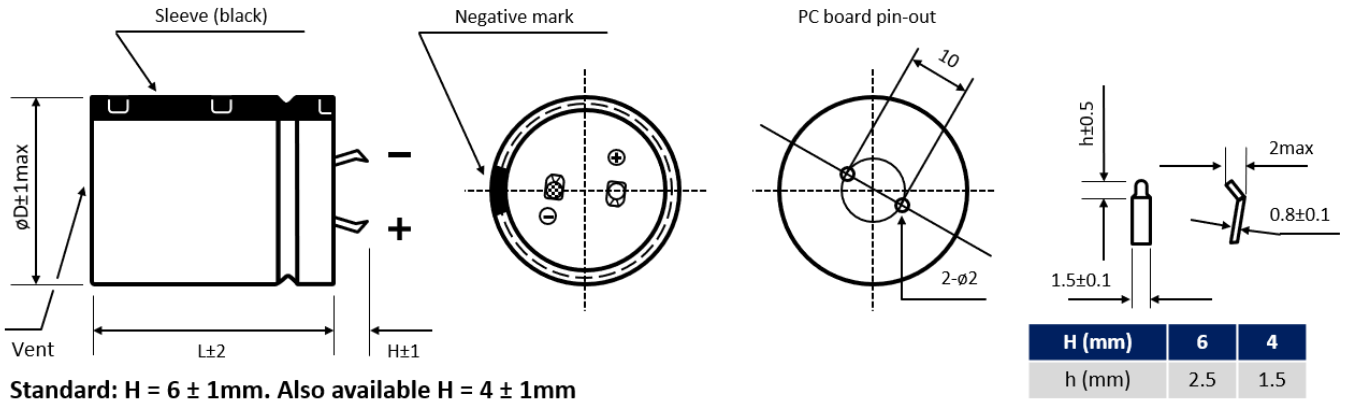
V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
500	390	30	60	380	680	2060	UJ391M500O600A□□□
	390	35	50	380	680	2060	UJ391M500P500A□□□
	470	35	55	310	560	2190	UJ471M500P550A□□□
	560	35	60	260	470	2650	UJ561M500P600A□□□
	680	40	60	220	390	3000	UJ681M500Q600A□□□
	820	40	70	180	320	4000	UJ821M500Q700A□□□
	1000	40	80	150	270	4680	UJ102M500Q800A□□□
550	47	25	25	3130	5640	470	UJ470M550N250A□□□
	56	25	30	2630	4740	540	UJ560M550N300A□□□
	68	25	35	2170	3900	620	UJ680M550N350A□□□
	68	30	25	2170	3900	650	UJ680M550O250A□□□
	82	25	35	1790	3230	690	UJ820M550N350A□□□
	82	30	30	1790	3230	730	UJ820M550O300A□□□
	100	25	40	1470	2650	800	UJ101M550N400A□□□
	100	30	35	1470	2650	840	UJ101M550O350A□□□
	100	35	25	1470	2650	870	UJ101M550P250A□□□
	120	25	50	1230	2210	920	UJ121M550N500A□□□
	120	30	35	1230	2210	940	UJ121M550O350A□□□
	120	35	30	1230	2210	1040	UJ121M550P300A□□□
	150	25	55	980	1770	1090	UJ151M550N550A□□□
	150	30	45	980	1770	1170	UJ151M550O450A□□□
	150	35	35	980	1770	1210	UJ151M550P350A□□□
	180	30	50	820	1470	1330	UJ181M550O500A□□□
	180	35	40	820	1470	1360	UJ181M550P400A□□□
	180	35	35	820	1470	1290	UJ181M550P350A□□□
	220	30	55	670	1210	1540	UJ221M550O550A□□□
	220	35	45	670	1210	1560	UJ221M550P450A□□□
	220	35	35	670	1210	1400	UJ221M550P350A□□□
	270	35	50	540	980	1790	UJ271M550P500A□□□
	270	35	40	540	980	1630	UJ271M550P400A□□□
330	35	50	440	800	1660	UJ331M550P500A□□□	
390	35	55	380	680	1850	UJ391M550P550A□□□	
470	35	60	310	560	2100	UJ471M550P600A□□□	

□□□: Enter **P6** for standard type • 6mm pin length
 □□□: Enter **P6X** for standard type • 6mm pin length • AEC-Q200
 □□□: Enter **Z6** for 3-pin type • 6mm pin length
 □□□: Enter **Z6X** for 3-pin type • 6mm pin length • AEC-Q200
 □□□: Enter **Y6** for multi-pin type • 6mm pin length
 □□□: Enter **Y6X** for multi-pin type • 6mm pin length • AEC-Q200

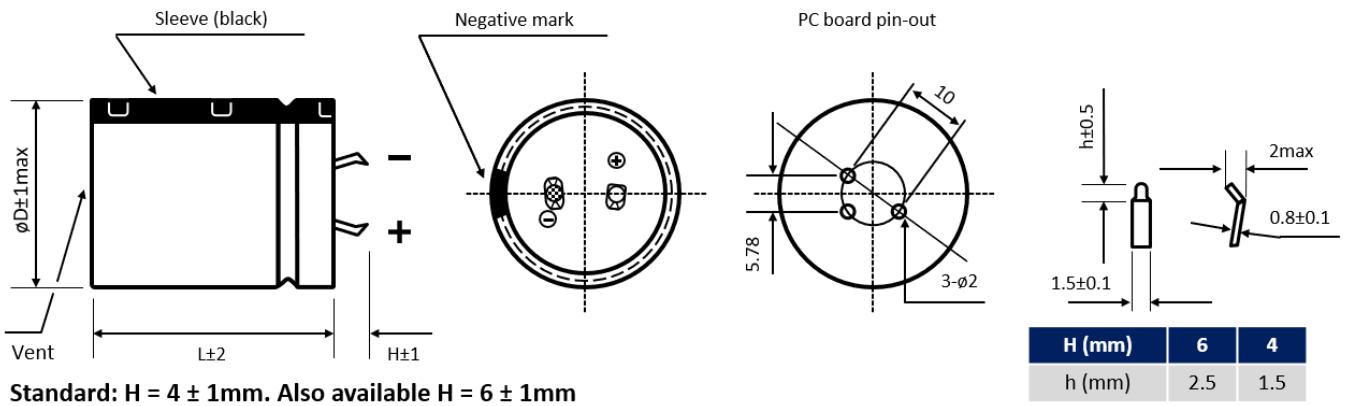
□□□: Enter **P4** for standard type • 4mm pin length
 □□□: Enter **P4X** for standard type • 4mm pin length • AEC-Q200
 □□□: Enter **Z4** for 3-pin type • 4mm pin length
 □□□: Enter **Z4X** for 3-pin type • 4mm pin length • AEC-Q200
 □□□: Enter **Y4** for multi-pin type • 4mm pin length
 □□□: Enter **Y4X** for multi-pin type • 4mm pin length • AEC-Q200

DIMENSIONS ▪ All dimensions in mm

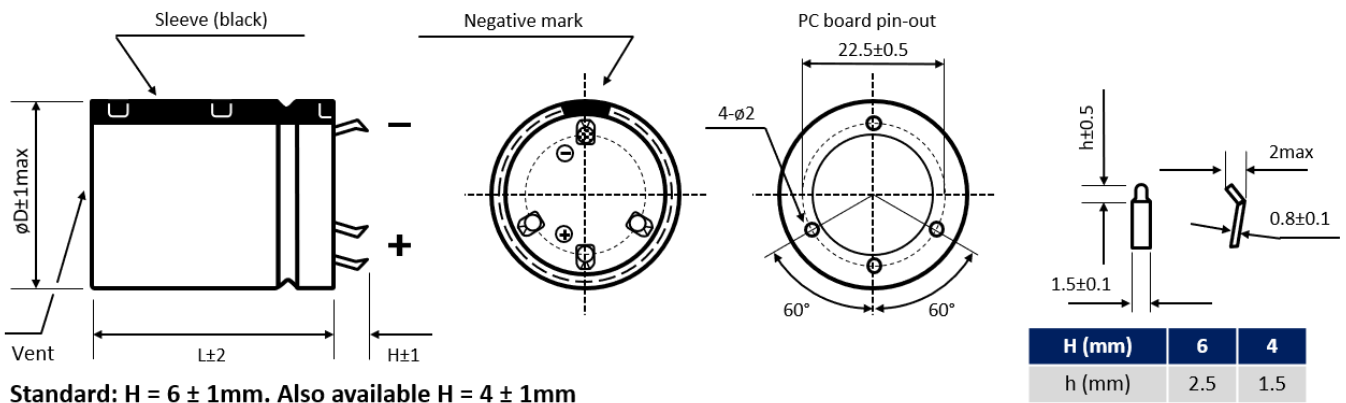
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

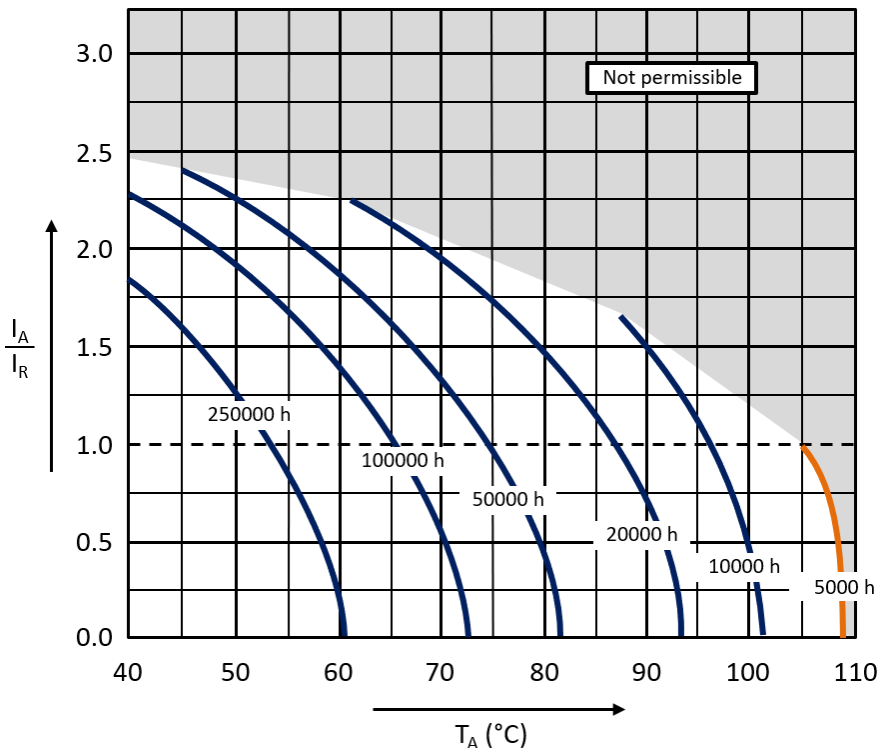
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$350 \leq V_R \leq 550$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor



DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HU SERIES ▀ ULTRA LONG LIFE 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▀ Snap-In type
- Useful life: 105°C ▀ 5 000 hours up to 8 000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +105°C					-25 ~ +105°C					
Rated Voltage Range	V _R	10 ~ 350V DC					385 ~ 500V DC					
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R					
Capacitance Range	C _R	56 ~ 82000μF					33 ~ 1200μF					
Cap. Tolerance	ΔC	±20% (120Hz ▀ 20°C)										
Leakage Current (20°C ▀ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R} \text{ ▀ After 5 minutes}$ [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]										
Dissipation Factor % (20°C ▀ 120Hz)	tanδ	μF / V DC	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 500
		≤ 8200	35	35	30	25	20	20	15	15	15	20
		10000 ~ 22000	40	40	35	30	30	25	20	-	-	-
		≥ 27000	50	40	35	35	30	25	-	-	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	10 ~ 16	25	35	50 ~ 100	160 ~ 250	315 ~ 350	400 ~ 500			
		Z-25°C/Z+20°C	4	3	3	3	4	8	8			
		Z-40°C/Z+20°C	15	10	8	6	8	12	-			

Lifetime Test	Test	V _R ≤ 100V		V _R > 100V	
			5 000 hours		8 000 hours
Useful Life 105°C (V _R & I _R applied)	ΔC/C _R	≤ ±30% of initial measured value		≤ ±20% of initial measured value	
	tanδ	≤ 300% of initial specified value		≤ 200% of initial specified value	
	I _{Leak}	≤ the initial specified value		≤ the initial specified value	
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▀ parts show higher drift as test criteria				
Endurance 105°C (V _R & I _R applied)	Test	3 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value		≤ ±15% of initial measured value	
	tanδ	≤ 200% of initial specified value		≤ 175% of initial specified value	
	I _{Leak}	≤ the initial specified value		≤ the initial specified value	
Shelf Life 105°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value		≤ ±15% of initial measured value	
	tanδ	≤ 200% of initial specified value		≤ 175% of initial specified value	
	I _{Leak}	≤ the initial specified value		≤ the initial specified value	
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▀ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
10	4700	22	25	76	99	860	HU472M010M250A
	6800	22	25	53	68	1310	HU682M010M250A
	8200	25	20	44	57	1600	HU822M010N200A
	10000	25	20	36	46	1810	HU103M010N200A
	12000	22	30	34	44	2110	HU123M010M300A
	15000	22	35	27	35	2310	HU153M010M350A
	18000	22	40	23	29	2400	HU183M010M400A
	22000	25	35	19	24	2600	HU223M010N350A
	27000	35	25	19	25	3110	HU273M010P250A
	33000	35	30	15	20	3420	HU333M010P300A
	39000	35	30	13	17	3700	HU393M010P300A
	47000	35	35	11	14	4210	HU473M010P350A
	56000	35	40	9	12	5100	HU563M010P400A
68000	35	50	8	10	5510	HU683M010P500A	
16	3300	22	25	110	140	1300	HU332M016M250A
	4700	22	25	76	99	1520	HU472M016M250A
	6800	22	25	53	68	1810	HU682M016M250A
	8200	22	30	44	57	2050	HU822M016M300A
	10000	22	30	36	46	2150	HU103M016M300A
	10000	25	25	36	46	2200	HU103M016N250A
	12000	22	35	34	44	2310	HU123M016M350A
	12000	25	30	34	44	2320	HU123M016N300A
	12000	30	25	34	44	2400	HU123M016O250A
	15000	22	40	27	35	2700	HU153M016M400A
	15000	25	35	27	35	2710	HU153M016N350A
	15000	30	30	27	35	2730	HU153M016O300A
	18000	22	45	23	29	2980	HU183M016M450A
	18000	25	40	23	29	3170	HU183M016N400A
	18000	30	30	23	29	3200	HU183M016O300A
	22000	25	45	19	24	3410	HU223M016N450A
	22000	30	35	19	24	3420	HU223M016O350A
	22000	35	30	19	24	3430	HU223M016P300A
	27000	25	50	15	20	3850	HU273M016N500A
	27000	30	40	15	20	3860	HU273M016O400A
	27000	35	30	15	20	3870	HU273M016P300A
	33000	30	45	12	16	4400	HU333M016O450A
	33000	35	35	12	16	4420	HU333M016P350A
	39000	30	50	10	14	4820	HU393M016O500A
	39000	35	40	10	14	4830	HU393M016P400A
	47000	35	45	9	11	5540	HU473M016P450A
	56000	35	50	7	10	5900	HU563M016P500A
	68000	35	60	6	8	6600	HU683M016P600A
82000	40	60	5	7	7660	HU823M016Q600A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
25	2200	22	25	140	180	1300	HU222M025M250A
	3300	22	25	92	120	1310	HU332M025M250A
	4700	22	25	65	85	1620	HU472M025M250A
	5600	22	30	55	71	1800	HU562M025M300A
	6800	25	25	45	59	1920	HU682M025N250A
	8200	22	35	37	49	2150	HU822M025M350A
	8200	30	25	37	49	2300	HU822M025O250A
	10000	22	40	31	40	2500	HU103M025M400A
	10000	25	30	31	40	2500	HU103M025N300A
	10000	30	30	31	40	2680	HU103M025O300A
	12000	22	45	30	39	2760	HU123M025M450A
	12000	25	40	30	39	2810	HU123M025N400A
	12000	30	30	30	39	2820	HU123M025O300A
	15000	25	45	24	31	3280	HU153M025N450A
	15000	30	35	24	31	3290	HU153M025O350A
	15000	35	30	24	31	3300	HU153M025P300A
	18000	25	50	20	26	3550	HU183M025N500A
	18000	30	40	20	26	3560	HU183M025O400A
	22000	30	45	16	21	4250	HU223M025O450A
	22000	35	35	16	21	4260	HU223M025P350A
27000	35	45	13	17	4760	HU273M025P450A	
33000	35	50	11	14	5500	HU333M025P500A	
35	2200	25	25	120	150	1520	HU222M035N250A
	3300	22	25	77	100	1530	HU332M035M250A
	3900	22	30	65	85	1700	HU392M035M300A
	4700	22	35	54	71	2030	HU472M035M350A
	4700	25	25	54	71	2040	HU472M035N250A
	5600	22	35	46	59	2130	HU562M035M350A
	5600	25	30	46	59	2140	HU562M035N300A
	5600	30	25	46	59	2150	HU562M035O250A
	6800	22	40	38	49	2600	HU682M035M400A
	6800	25	35	38	49	2600	HU682M035N350A
	6800	30	25	38	49	2550	HU682M035O250A
	8200	22	50	31	40	2850	HU822M035M500A
	8200	25	40	31	40	2860	HU822M035N400A
	8200	30	30	31	40	2870	HU822M035O300A
	10000	25	45	26	33	3070	HU103M035N450A
	10000	30	35	26	33	3080	HU103M035O350A
	12000	25	50	26	33	3370	HU123M035N500A
	12000	30	40	26	33	3380	HU123M035O400A
	12000	35	30	26	33	3400	HU123M035P300A
	15000	30	45	20	27	3750	HU153M035O450A
15000	35	35	20	27	3760	HU153M035P350A	
18000	35	40	17	22	4370	HU183M035P400A	
22000	35	50	14	18	4950	HU223M035P500A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
50	1500	25	20	140	180	1150	HU152M050N200A
	1800	22	25	120	150	1350	HU182M050M250A
	2200	22	25	92	120	1550	HU222M050M250A
	2700	22	30	76	98	1750	HU272M050M300A
	2700	25	25	76	98	1760	HU272M050N250A
	3300	22	35	62	80	1990	HU332M050M350A
	3300	25	30	62	80	2000	HU332M050N300A
	3900	22	40	52	68	2250	HU392M050M400A
	3900	30	25	52	68	2260	HU392M050O250A
	4700	22	45	43	56	2560	HU472M050M450A
	4700	25	35	43	56	2620	HU472M050N350A
	4700	30	30	43	56	2630	HU472M050O300A
	5600	22	50	36	47	2890	HU562M050M500A
	5600	25	40	36	47	2900	HU562M050N400A
	5600	30	30	36	47	2950	HU562M050O300A
	6800	25	45	30	39	3370	HU682M050N450A
	6800	30	35	30	39	3390	HU682M050O350A
	6800	35	30	30	39	3400	HU682M050P300A
	8200	30	40	25	32	3710	HU822M050O400A
	8200	35	35	25	32	3720	HU822M050P350A
10000	30	50	20	27	4090	HU103M050O500A	
10000	35	40	20	27	4100	HU103M050P400A	
12000	35	45	26	33	4560	HU123M050P450A	
15000	35	50	20	27	4770	HU153M050P500A	
63	1000	22	25	210	270	1170	HU102M063M250A
	1200	22	25	170	220	1250	HU122M063M250A
	1500	22	30	140	180	1480	HU152M063M300A
	1500	25	25	140	180	1500	HU152M063N250A
	1800	22	30	120	150	1590	HU182M063M300A
	1800	25	25	120	150	1600	HU182M063N250A
	2200	22	35	92	120	1830	HU222M063M350A
	2200	25	30	92	120	1840	HU222M063N300A
	2700	22	40	76	98	2050	HU272M063M400A
	2700	25	35	76	98	2050	HU272M063N350A
	2700	30	25	76	98	2030	HU272M063O250A
	3300	22	45	62	80	2330	HU332M063M450A
	3300	30	30	62	80	2400	HU332M063O300A
	3900	25	40	52	68	2540	HU392M063N400A
	3900	30	35	52	68	2570	HU392M063O350A
	4700	25	50	43	56	2980	HU472M063N500A
	4700	30	40	43	56	3020	HU472M063O400A
	4700	35	30	43	56	3050	HU472M063P300A
	5600	30	40	36	47	3280	HU562M063O400A
	5600	35	35	36	47	3310	HU562M063P350A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
63	6800	30	50	30	39	3730	HU682M063O500A
	6800	35	40	30	39	3750	HU682M063P400A
	8200	35	45	25	32	4200	HU822M063P450A
	10000	35	50	20	27	4700	HU103M063P500A
80	680	22	25	220	290	1000	HU681M080M250A
	820	22	25	180	240	1150	HU821M080M250A
	1000	22	25	150	200	1290	HU102M080M250A
	1200	22	30	130	170	1630	HU122M080M300A
	1200	25	25	130	170	1650	HU122M080N250A
	1500	22	30	100	130	1750	HU152M080M300A
	1500	25	25	100	130	1760	HU152M080N250A
	1800	22	35	85	110	1830	HU182M080M350A
	1800	25	30	85	110	1860	HU182M080N300A
	1800	30	25	85	110	1870	HU182M080O250A
	2200	22	40	70	90	2090	HU222M080M400A
	2200	25	35	70	90	2100	HU222M080N350A
	2200	30	25	70	90	2110	HU222M080O250A
	2700	25	40	57	74	2430	HU272M080N400A
	2700	30	30	57	74	2440	HU272M080O300A
	3300	25	45	46	60	2760	HU332M080N450A
	3300	30	35	46	60	2790	HU332M080O350A
	3300	35	30	46	60	2800	HU332M080P300A
	3900	25	50	39	51	3090	HU392M080N500A
	3900	30	40	39	51	3120	HU392M080O400A
	3900	35	30	39	51	3130	HU392M080P300A
	4700	30	45	33	42	3520	HU472M080O450A
	4700	35	35	33	42	3530	HU472M080P350A
	5600	30	50	27	36	3800	HU562M080O500A
5600	35	40	27	36	3870	HU562M080P400A	
6800	35	45	23	29	4190	HU682M080P450A	
100	330	22	20	460	600	800	HU331M100M200A
	470	22	25	320	420	920	HU471M100M250A
	470	25	20	320	420	1000	HU471M100N200A
	560	22	25	280	360	1100	HU561M100M250A
	680	22	30	220	290	1220	HU681M100M300A
	680	25	25	220	290	1240	HU681M100N250A
	820	22	30	180	240	1880	HU821M100M300A
	820	25	25	180	240	1960	HU821M100N250A
	1000	22	30	150	200	1930	HU102M100M300A
	1000	25	25	150	200	1920	HU102M100N250A
	1200	22	40	130	170	2080	HU122M100M400A
	1200	25	30	130	170	2080	HU122M100N300A
	1200	30	25	130	170	2080	HU122M100O250A
	1500	22	45	100	130	2150	HU152M100M450A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
100	1500	25	35	100	130	2150	HU152M100N350A □□
	1500	30	30	100	130	2150	HU152M100O300A □□
	1500	35	25	100	130	2150	HU152M100P250A □□
	1800	25	40	85	110	2370	HU182M100N400A □□
	1800	30	35	85	110	2370	HU182M100O350A □□
	2200	25	50	70	90	2650	HU222M100N500A □□
	2200	30	35	70	90	2610	HU222M100O350A □□
	2200	35	30	70	90	2750	HU222M100P300A □□
	2700	25	50	57	74	2760	HU272M100N500A □□
	2700	30	45	57	74	2960	HU272M100O450A □□
	2700	35	35	57	74	2960	HU272M100P350A □□
	3300	30	50	46	60	3340	HU332M100O500A □□
	3300	35	40	46	60	3340	HU332M100P400A □□
	3900	35	45	39	51	3690	HU392M100P450A □□
4700	35	50	33	42	4150	HU472M100P500A □□	
160	220	20	25	470	900	810	HU221M160L250A □□
	220	22	20	470	900	780	HU221M160M200A □□
	270	22	25	390	740	1010	HU271M160M250A □□
	270	25	20	390	740	1010	HU271M160N200A □□
	330	22	25	320	600	1170	HU331M160M250A □□
	330	25	20	320	600	1170	HU331M160N200A □□
	390	22	30	270	510	1430	HU391M160M300A □□
	390	25	25	270	510	1430	HU391M160N250A □□
	470	22	30	220	420	1520	HU471M160M300A □□
	470	25	25	220	420	1520	HU471M160N250A □□
	470	30	20	220	420	1530	HU471M160O200A □□
	680	22	40	150	290	1530	HU681M160M400A □□
	680	25	30	150	290	1530	HU681M160N300A □□
	680	30	25	150	290	1530	HU681M160O250A □□
	680	35	20	150	290	1560	HU681M160P200A □□
	820	22	45	130	240	1960	HU821M160M450A □□
	820	25	35	130	240	1960	HU821M160N350A □□
	820	30	30	130	240	1960	HU821M160O300A □□
	820	35	25	130	240	1960	HU821M160P250A □□
	1000	25	40	110	200	2230	HU102M160N400A □□
	1200	25	45	89	170	2400	HU122M160N450A □□
	1200	30	35	89	170	2400	HU122M160O350A □□
	1200	35	30	89	170	2400	HU122M160P300A □□
	1500	25	50	68	130	2600	HU152M160N500A □□
	1500	30	40	68	130	2600	HU152M160O400A □□
	1500	35	30	68	130	2600	HU152M160P300A □□
1800	30	45	58	110	2820	HU182M160O450A □□	
1800	35	35	58	110	2820	HU182M160P350A □□	
2200	30	50	48	90	3320	HU222M160O500A □□	

□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
160	2200	35	45	48	90	3500	HU222M160P450A
	2700	35	50	39	74	3780	HU272M160P500A
	3300	35	55	32	60	3860	HU332M160P550A
180	180	22	20	580	1110	760	HU181M180M200A
	220	25	20	470	900	900	HU221M180N200A
	270	22	25	390	740	1020	HU271M180M250A
	270	25	20	390	740	1030	HU271M180N200A
	330	20	30	320	600	1200	HU331M180L300A
	330	22	25	320	600	1200	HU331M180M250A
	330	25	20	320	600	1220	HU331M180N200A
	390	22	30	270	510	1320	HU391M180M300A
	390	25	25	270	510	1350	HU391M180N250A
	390	30	20	270	510	1350	HU391M180O200A
	470	22	35	220	420	1530	HU471M180M350A
	470	25	30	220	420	1540	HU471M180N300A
	470	30	25	220	420	1550	HU471M180O250A
	560	22	40	190	360	1670	HU561M180M400A
	560	25	30	190	360	1670	HU561M180N300A
	560	30	25	190	360	1670	HU561M180O250A
	560	35	20	190	360	1670	HU561M180P200A
	680	22	45	150	290	1780	HU681M180M450A
	680	25	35	150	290	1780	HU681M180N350A
	680	30	30	150	290	1780	HU681M180O300A
	680	35	25	150	290	1780	HU681M180P250A
	820	22	50	130	240	2090	HU821M180M500A
	820	25	40	130	240	2090	HU821M180N400A
	820	30	30	130	240	2090	HU821M180O300A
	820	35	25	130	240	2090	HU821M180P250A
	1000	22	50	110	200	2150	HU102M180M500A
	1000	25	45	110	200	2150	HU102M180N450A
	1000	30	35	110	200	2150	HU102M180O350A
	1000	35	30	110	200	2150	HU102M180P300A
	1200	22	60	89	170	2220	HU122M180M600A
	1200	25	50	89	170	2220	HU122M180N500A
	1200	30	40	89	170	2220	HU122M180O400A
	1200	35	30	89	170	2220	HU122M180P300A
	1500	25	50	68	130	2240	HU152M180N500A
	1500	30	45	68	130	2240	HU152M180O450A
	1500	35	35	68	130	2240	HU152M180P350A
1800	30	50	58	110	2880	HU182M180O500A	
1800	35	35	58	110	2880	HU182M180P350A	
1800	35	40	58	110	2940	HU182M180P400A	
2200	30	55	48	90	3120	HU222M180O550A	
2200	35	45	48	90	3120	HU222M180P450A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
180	2200	35	50	48	90	3230	HU222M180P500A
	2200	35	55	48	90	3320	HU222M180P550A
	2700	35	50	39	74	3810	HU272M180P500A
200	150	20	20	700	1330	740	HU151M200L200A
	180	22	20	580	1110	760	HU181M200M200A
	220	20	25	470	900	1010	HU221M200L250A
	220	22	25	470	900	1050	HU221M200M250A
	220	25	20	470	900	1060	HU221M200N200A
	270	20	25	390	740	1070	HU271M200L250A
	270	22	25	390	740	1110	HU271M200M250A
	330	20	30	320	600	1210	HU331M200L300A
	330	22	30	320	600	1260	HU331M200M300A
	330	25	25	320	600	1270	HU331M200N250A
	390	20	35	270	510	1350	HU391M200L350A
	390	22	25	270	510	1350	HU391M200M250A
	390	22	30	270	510	1360	HU391M200M300A
	390	25	25	270	510	1370	HU391M200N250A
	470	20	40	220	420	1550	HU471M200L400A
	470	22	30	220	420	1560	HU471M200M300A
	470	22	35	220	420	1570	HU471M200M350A
	470	25	30	220	420	1580	HU471M200N300A
	470	30	25	220	420	1590	HU471M200O250A
	560	20	45	190	360	1730	HU561M200L450A
	560	22	35	190	360	1730	HU561M200M350A
	560	22	40	190	360	1770	HU561M200M400A
	560	25	30	190	360	1770	HU561M200N300A
	560	30	25	190	360	1770	HU561M200O250A
	680	22	40	150	290	2120	HU681M200M400A
	680	22	45	150	290	2150	HU681M200M450A
	680	25	35	150	290	2150	HU681M200N350A
	680	30	30	150	290	2150	HU681M200O300A
	680	35	25	150	290	2150	HU681M200P250A
	820	22	50	130	240	2190	HU821M200M500A
	820	25	45	130	240	2190	HU821M200N450A
	820	30	25	130	240	2200	HU821M200O250A
	820	30	30	130	240	2240	HU821M200O300A
820	35	25	130	240	2240	HU821M200P250A	
1000	25	40	110	200	2240	HU102M200N400A	
1000	30	30	110	200	2240	HU102M200O300A	
1000	30	35	110	200	2500	HU102M200O350A	
1000	35	30	110	200	2500	HU102M200P300A	
1200	25	50	89	170	2950	HU122M200N500A	
1200	30	35	89	170	2700	HU122M200O350A	
1200	30	40	89	170	2950	HU122M200O400A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
200	1200	35	30	89	170	2950	HU122M200P300A
	1200	35	35	89	170	3130	HU122M200P350A
	1500	30	50	68	130	3200	HU152M200O500A
	1500	35	40	68	130	3200	HU152M200P400A
	1800	30	50	58	110	3300	HU182M200O500A
	1800	35	40	58	110	3300	HU182M200P400A
	1800	35	45	58	110	3550	HU182M200P450A
	2200	35	45	48	90	3850	HU222M200P450A
	2200	35	50	48	90	4000	HU222M200P500A
	2700	35	55	39	74	4300	HU272M200P550A
220	150	20	20	700	1330	710	HU151M220L200A
	180	22	20	580	1110	770	HU181M220M200A
	220	20	30	470	900	1070	HU221M220L300A
	220	22	25	470	900	1070	HU221M220M250A
	270	20	35	390	740	1160	HU271M220L350A
	270	22	30	390	740	1170	HU271M220M300A
	270	25	25	390	740	1180	HU271M220N250A
	330	20	35	320	600	1270	HU331M220L350A
	330	22	35	320	600	1280	HU331M220M350A
	330	25	25	320	600	1280	HU331M220N250A
	330	30	20	320	600	1300	HU331M220O200A
	390	20	40	270	510	1350	HU391M220L400A
	390	22	35	270	510	1410	HU391M220M350A
	390	25	30	270	510	1420	HU391M220N300A
	470	20	45	220	420	1630	HU471M220L450A
	470	22	40	220	420	1650	HU471M220M400A
	470	25	35	220	420	1650	HU471M220N350A
	470	30	25	220	420	1640	HU471M220O250A
	560	22	40	190	360	1790	HU561M220M400A
	560	22	45	190	360	1810	HU561M220M450A
	560	25	40	190	360	1830	HU561M220N400A
	560	30	30	190	360	1840	HU561M220O300A
	680	25	45	150	290	2230	HU681M220N450A
	680	30	35	150	290	2230	HU681M220O350A
	680	35	25	150	290	2230	HU681M220P250A
	820	25	50	130	240	2250	HU821M220N500A
	820	30	40	130	240	2250	HU821M220O400A
	820	35	30	130	240	2250	HU821M220P300A
	1000	25	55	110	200	2280	HU102M220N550A
	1000	30	45	110	200	2280	HU102M220O450A
	1000	35	35	110	200	2280	HU102M220P350A
	1200	30	50	89	170	2320	HU122M220O500A
1200	35	40	89	170	2320	HU122M220P400A	
1500	30	55	68	130	3130	HU152M220O550A	
1500	35	45	68	130	3230	HU152M220P450A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
220	1800	35	50	58	110	3890	HU182M220P500A
	2200	35	60	48	90	3950	HU222M220P600A
250	150	20	20	700	1330	670	HU151M250L200A
	150	22	25	700	1330	760	HU151M250M250A
	150	25	20	700	1330	770	HU151M250N200A
	180	22	25	580	1110	790	HU181M250M250A
	180	25	25	580	1110	910	HU181M250N250A
	220	22	25	470	900	1110	HU221M250M250A
	220	25	25	470	900	1120	HU221M250N250A
	270	22	30	390	740	1220	HU271M250M300A
	270	25	30	390	740	1250	HU271M250N300A
	270	30	25	390	740	1250	HU271M250O250A
	330	22	35	320	600	1440	HU331M250M350A
	330	25	25	320	600	1430	HU331M250N250A
	330	25	30	320	600	1450	HU331M250N300A
	330	30	25	320	600	1450	HU331M250O250A
	390	22	35	270	510	1720	HU391M250M350A
	390	22	40	270	510	1750	HU391M250M400A
	390	25	35	270	510	1770	HU391M250N350A
	390	30	25	270	510	1780	HU391M250O250A
	470	22	40	220	420	1850	HU471M250M400A
	470	22	45	220	420	1860	HU471M250M450A
	470	25	40	220	420	1870	HU471M250N400A
	470	30	35	220	420	1880	HU471M250O350A
	470	35	30	220	420	1890	HU471M250P300A
	560	22	45	190	360	2160	HU561M250M450A
	560	25	45	190	360	2170	HU561M250N450A
	560	30	30	190	360	2180	HU561M250O300A
	560	35	25	190	360	2190	HU561M250P250A
	680	22	50	150	290	2250	HU681M250M500A
	680	25	40	150	290	2250	HU681M250N400A
	680	30	30	150	290	2250	HU681M250O300A
	680	30	35	150	290	2400	HU681M250O350A
	680	35	30	150	290	2400	HU681M250P300A
820	25	50	130	240	2520	HU821M250N500A	
820	30	40	130	240	2520	HU821M250O400A	
820	35	35	130	240	2520	HU821M250P350A	
1000	30	40	110	200	2750	HU102M250O400A	
1000	30	50	110	200	2880	HU102M250O500A	
1000	35	40	110	200	2880	HU102M250P400A	
1200	30	50	89	170	3150	HU122M250O500A	
1200	30	60	89	170	3350	HU122M250O600A	
1200	35	45	89	170	3280	HU122M250P450A	
1500	35	45	68	130	3760	HU152M250P450A	
1800	35	50	58	110	4060	HU182M250P500A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
315	68	22	20	1540	2930	480	HU680M315M200A
	82	22	20	1280	2430	520	HU820M315M200A
	100	25	20	1050	1990	580	HU101M315N200A
	120	22	25	870	1660	760	HU121M315M250A
	120	30	20	870	1660	770	HU121M315O200A
	150	22	30	700	1330	830	HU151M315M300A
	150	25	25	700	1330	850	HU151M315N250A
	150	30	20	700	1330	860	HU151M315O200A
	180	22	30	580	1110	930	HU181M315M300A
	180	25	25	580	1110	950	HU181M315N250A
	220	22	40	470	900	1170	HU221M315M400A
	220	25	30	470	900	1140	HU221M315N300A
	220	30	25	470	900	1140	HU221M315O250A
	270	22	45	390	740	1280	HU271M315M450A
	270	25	35	390	740	1260	HU271M315N350A
	270	30	25	390	740	1270	HU271M315O250A
	330	22	50	320	600	1490	HU331M315M500A
	330	25	40	320	600	1490	HU331M315N400A
	330	30	30	320	600	1490	HU331M315O300A
	330	35	25	320	600	1490	HU331M315P250A
	390	25	45	270	510	1860	HU391M315N450A
	390	30	35	270	510	1860	HU391M315O350A
	390	35	30	270	510	1860	HU391M315P300A
	470	25	50	220	420	1960	HU471M315N500A
	470	30	40	220	420	1970	HU471M315O400A
	470	35	35	220	420	1990	HU471M315P350A
	560	30	45	190	360	2350	HU561M315O450A
	560	35	35	190	360	2360	HU561M315P350A
680	30	50	150	290	2370	HU681M315O500A	
680	35	40	150	290	2370	HU681M315P400A	
820	35	45	130	240	2380	HU821M315P450A	
1000	35	45	110	200	2460	HU102M315P450A	
350	56	22	20	1870	3550	420	HU560M350M200A
	68	25	20	1540	2930	520	HU680M350N200A
	82	25	20	1280	2430	550	HU820M350N200A
	100	22	30	1050	1990	710	HU101M350M300A
	120	25	25	870	1660	770	HU121M350N250A
	120	30	20	870	1660	770	HU121M350O200A
	150	22	30	700	1330	870	HU151M350M300A
	150	25	25	700	1330	870	HU151M350N250A
	150	30	20	700	1330	890	HU151M350O200A
	180	22	35	580	1110	950	HU181M350M350A
	180	25	30	580	1110	960	HU181M350N300A
	180	30	25	580	1110	1050	HU181M350O250A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
350	220	22	45	470	900	1250	HU221M350M450A
	220	25	35	470	900	1260	HU221M350N350A
	220	35	25	470	900	1280	HU221M350P250A
	270	22	50	390	740	1300	HU271M350M500A
	270	25	40	390	740	1310	HU271M350N400A
	270	30	30	390	740	1310	HU271M350O300A
	270	35	25	390	740	1320	HU271M350P250A
	330	25	45	320	600	1520	HU331M350N450A
	330	30	35	320	600	1540	HU331M350O350A
	330	35	30	320	600	1550	HU331M350P300A
	390	25	50	270	510	1940	HU391M350N500A
	390	30	35	270	510	1880	HU391M350O350A
	390	35	30	270	510	1880	HU391M350P300A
	470	25	50	220	420	2100	HU471M350N500A
	470	30	40	220	420	2100	HU471M350O400A
	470	35	40	220	420	2100	HU471M350P400A
	560	30	45	190	360	2390	HU561M350O450A
	560	35	40	190	360	2390	HU561M350P400A
680	30	50	150	290	2400	HU681M350O500A	
680	35	40	150	290	2410	HU681M350P400A	
820	35	45	130	240	2450	HU821M350P450A	
385	33	22	20	3170	6030	200	HU330M385M200A
	39	20	20	2680	5100	350	HU390M385L200A
	56	22	20	1870	3550	430	HU560M385M200A
	68	22	25	1540	2930	520	HU680M385M250A
	68	25	20	1540	2930	520	HU680M385N200A
	82	22	25	1280	2430	640	HU820M385M250A
	82	25	20	1280	2430	640	HU820M385N200A
	100	22	25	1050	1990	690	HU101M385M250A
	100	22	30	1050	1990	750	HU101M385M300A
	100	25	25	1050	1990	750	HU101M385N250A
	120	22	35	870	1660	800	HU121M385M350A
	120	25	25	870	1660	800	HU121M385N250A
	120	30	20	870	1660	800	HU121M385O200A
	150	22	35	700	1330	920	HU151M385M350A
	150	25	35	700	1330	920	HU151M385N350A
	150	30	30	700	1330	920	HU151M385O300A
	180	22	35	580	1110	1220	HU181M385M350A
	180	22	40	580	1110	1250	HU181M385M400A
180	25	30	580	1110	1320	HU181M385N300A	
180	30	30	580	1110	1340	HU181M385O300A	
180	35	25	580	1110	1340	HU181M385P250A	
270	30	30	390	740	1470	HU271M385O300A	
270	35	30	390	740	1480	HU271M385P300A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
385	390	25	50	270	510	1950	HU391M385N500A
	390	30	40	270	510	1950	HU391M385O400A
	390	35	30	270	510	1950	HU391M385P300A
	470	30	50	220	420	2320	HU471M385O500A
	470	35	35	220	420	2320	HU471M385P350A
	680	30	55	150	290	2550	HU681M385O550A
	680	35	50	150	290	2550	HU681M385P500A
	820	35	55	130	240	2650	HU821M385P550A
400	47	22	20	2230	4230	400	HU470M400M200A
	56	22	20	1870	3550	440	HU560M400M200A
	68	22	25	1540	2930	530	HU680M400M250A
	68	25	20	1540	2930	530	HU680M400N200A
	82	22	25	1280	2430	580	HU820M400M250A
	82	25	20	1280	2430	580	HU820M400N200A
	82	25	25	1280	2430	630	HU820M400N250A
	100	22	25	1050	1990	660	HU101M400M250A
	100	22	30	1050	1990	690	HU101M400M300A
	100	25	25	1050	1990	690	HU101M400N250A
	120	22	30	870	1660	760	HU121M400M300A
	120	22	35	870	1660	810	HU121M400M350A
	120	25	25	870	1660	810	HU121M400N250A
	120	25	30	870	1660	840	HU121M400N300A
	120	30	20	870	1660	810	HU121M400O200A
	120	30	25	870	1660	840	HU121M400O250A
	150	22	35	700	1330	900	HU151M400M350A
	150	22	40	700	1330	950	HU151M400M400A
	150	25	25	700	1330	900	HU151M400N250A
	150	25	30	700	1330	950	HU151M400N300A
	150	30	20	700	1330	900	HU151M400O200A
	150	30	25	700	1330	950	HU151M400O250A
	180	22	35	580	1110	990	HU181M400M350A
	180	22	40	580	1110	1050	HU181M400M400A
	180	22	45	580	1110	1100	HU181M400M450A
	180	25	30	580	1110	1050	HU181M400N300A
	180	25	35	580	1110	1100	HU181M400N350A
	180	30	30	580	1110	1050	HU181M400O300A
	180	35	25	580	1110	1050	HU181M400P250A
	220	22	45	470	900	1120	HU221M400M450A
	220	22	50	470	900	1160	HU221M400M500A
	220	25	35	470	900	1120	HU221M400N350A
220	25	40	470	900	1160	HU221M400N400A	
220	25	45	470	900	1160	HU221M400N450A	
220	30	25	470	900	1120	HU221M400O250A	
220	30	30	470	900	1160	HU221M400O300A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
400	220	30	35	470	900	1190	HU221M400O350A
	220	35	25	470	900	1160	HU221M400P250A
	270	22	50	390	740	1290	HU271M400M500A
	270	25	40	390	740	1290	HU271M400N400A
	270	25	45	390	740	1320	HU271M400N450A
	270	25	50	390	740	1380	HU271M400N500A
	270	30	30	390	740	1290	HU271M400O300A
	270	30	35	390	740	1320	HU271M400O350A
	270	35	30	390	740	1380	HU271M400P300A
	330	25	45	320	600	1460	HU331M400N450A
	330	25	50	320	600	1530	HU331M400N500A
	330	30	35	320	600	1480	HU331M400O350A
	330	30	40	320	600	1550	HU331M400O400A
	330	35	30	320	600	1550	HU331M400P300A
	330	35	35	320	600	1590	HU331M400P350A
	390	25	45	270	510	1610	HU391M400N450A
	390	30	40	270	510	1670	HU391M400O400A
	390	30	45	270	510	1760	HU391M400O450A
	390	35	30	270	510	1670	HU391M400P300A
	390	35	35	270	510	1760	HU391M400P350A
	390	35	40	270	510	1830	HU391M400P400A
	470	30	45	220	420	1930	HU471M400O450A
	470	30	50	220	420	2020	HU471M400O500A
	470	35	30	220	420	1670	HU471M400P300A
	470	35	35	220	420	1930	HU471M400P350A
	470	35	40	220	420	2010	HU471M400P400A
	560	30	50	190	360	2210	HU561M400O500A
	560	35	40	190	360	2210	HU561M400P400A
	560	35	45	190	360	2300	HU561M400P450A
	560	35	50	190	360	2410	HU561M400P500A
	680	30	55	150	290	2530	HU681M400O550A
	680	35	40	150	290	2530	HU681M400P400A
680	35	50	150	290	2650	HU681M400P500A	
820	35	55	130	240	2900	HU821M400P550A	
820	35	60	170	320	2950	HU821M400P600A	
1000	35	60	140	270	3000	HU102M400P600A	
1200	35	70	120	220	3120	HU122M400P700A	
420	47	22	20	2050	3900	400	HU470M420M200A
	56	22	20	1700	3230	440	HU560M420M200A
	68	22	25	1700	3230	540	HU680M420M250A
	68	25	20	1390	2650	540	HU680M420N200A
	82	22	25	1390	2650	580	HU820M420M250A
	82	25	25	1390	2650	630	HU820M420N250A
100	22	25	1390	2650	660	HU101M420M250A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
420	100	22	30	1160	2210	690	HU101M420M300A
	100	25	25	1160	2210	690	HU101M420N250A
	100	30	20	1160	2210	690	HU101M420O200A
	120	22	30	1160	2210	760	HU121M420M300A
	120	22	35	1160	2210	810	HU121M420M350A
	120	25	25	1160	2210	810	HU121M420N250A
	120	25	30	930	1770	830	HU121M420N300A
	120	30	25	930	1770	830	HU121M420O250A
	120	35	20	930	1770	830	HU121M420P200A
	150	22	35	930	1770	900	HU151M420M350A
	150	22	40	930	1770	960	HU151M420M400A
	150	25	30	770	1470	960	HU151M420N300A
	150	25	35	770	1470	970	HU151M420N350A
	150	30	25	770	1470	970	HU151M420O250A
	180	25	35	640	1210	1060	HU181M420N350A
	180	30	30	640	1210	1110	HU181M420O300A
	180	35	25	640	1210	1110	HU181M420P250A
	220	22	45	640	1210	1110	HU221M420M450A
	220	22	50	640	1210	1160	HU221M420M500A
	220	25	35	640	1210	1110	HU221M420N350A
	220	25	45	640	1210	1190	HU221M420N450A
	220	30	30	520	980	1120	HU221M420O300A
	220	30	35	520	980	1190	HU221M420O350A
	220	35	25	520	980	1190	HU221M420P250A
	270	25	40	520	980	1250	HU271M420N400A
	270	30	30	520	980	1250	HU271M420O300A
	270	30	35	520	980	1320	HU271M420O350A
	270	30	40	420	800	1390	HU271M420O400A
	270	35	25	420	800	1320	HU271M420P250A
	270	35	30	420	800	1390	HU271M420P300A
	330	25	50	420	800	1530	HU331M420N500A
	330	30	35	420	800	1460	HU331M420O350A
	330	30	40	420	800	1530	HU331M420O400A
	330	30	45	360	680	1620	HU331M420O450A
	330	35	30	360	680	1620	HU331M420P300A
	330	35	35	360	680	1630	HU331M420P350A
	390	30	40	360	680	1670	HU391M420O400A
	390	30	45	360	680	1760	HU391M420O450A
	390	30	50	290	560	1840	HU391M420O500A
	390	35	35	290	560	1770	HU391M420P350A
	390	35	40	290	560	1840	HU391M420P400A
	470	30	50	290	560	2020	HU471M420O500A
470	30	60	250	470	2190	HU471M420O600A	
470	35	40	250	470	2010	HU471M420P400A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
420	470	35	45	210	390	2110	HU471M420P450A
	560	35	45	210	390	2300	HU561M420P450A
	560	35	50	170	320	2410	HU561M420P500A
	680	35	50	170	320	2410	HU681M420P500A
	680	35	55	170	320	2760	HU681M420P550A
	820	30	60	170	320	2900	HU821M420O600A
	820	35	55	140	270	2950	HU821M420P550A
	820	35	60	120	220	3000	HU821M420P600A
450	56	22	25	2490	4740	470	HU560M450M250A
	68	22	25	2050	3900	520	HU680M450M250A
	68	22	30	2050	3900	560	HU680M450M300A
	68	25	25	2050	3900	570	HU680M450N250A
	82	22	25	1700	3230	560	HU820M450M250A
	82	22	30	1700	3230	620	HU820M450M300A
	82	25	25	1700	3230	620	HU820M450N250A
	100	22	30	1390	2650	680	HU101M450M300A
	100	22	35	1390	2650	730	HU101M450M350A
	100	25	25	1390	2650	730	HU101M450N250A
	100	25	30	1390	2650	760	HU101M450N300A
	100	30	25	1390	2650	760	HU101M450O250A
	120	22	35	1160	2210	800	HU121M450M350A
	120	22	40	1160	2210	840	HU121M450M400A
	120	25	30	1160	2210	840	HU121M450N300A
	120	25	35	1160	2210	860	HU121M450N350A
	120	30	25	1160	2210	860	HU121M450O250A
	150	22	40	930	1770	940	HU151M450M400A
	150	22	45	930	1770	990	HU151M450M450A
	150	25	30	930	1770	940	HU151M450N300A
	150	25	35	930	1770	990	HU151M450N350A
	150	25	40	930	1770	1010	HU151M450N400A
	150	30	25	930	1770	990	HU151M450O250A
	150	30	30	930	1770	1010	HU151M450O300A
	150	35	25	930	1770	1010	HU151M450P250A
	180	25	35	770	1470	1050	HU181M450N350A
	180	25	40	770	1470	1110	HU181M450N400A
	180	25	45	770	1470	1180	HU181M450N450A
	180	30	30	770	1470	1120	HU181M450O300A
	180	30	35	770	1470	1180	HU181M450O350A
	180	35	25	770	1470	1180	HU181M450P250A
	220	22	50	640	1210	1160	HU221M450M500A
220	25	40	640	1210	1160	HU221M450N400A	
220	25	45	640	1210	1190	HU221M450N450A	
220	25	50	640	1210	1250	HU221M450N500A	
220	30	30	640	1210	1160	HU221M450O300A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	220	30	35	640	1210	1190	HU221M450O350A
	220	30	40	640	1210	1250	HU221M450O400A
	220	35	25	640	1210	1190	HU221M450P250A
	220	35	30	640	1210	1250	HU221M450P300A
	270	25	50	520	980	1380	HU271M450N500A
	270	30	30	520	980	1180	HU271M450O300A
	270	30	35	520	980	1320	HU271M450O350A
	270	30	40	520	980	1390	HU271M450O400A
	270	30	45	520	980	1460	HU271M450O450A
	270	35	30	520	980	1400	HU271M450P300A
	270	35	35	520	980	1470	HU271M450P350A
	330	30	40	420	800	1540	HU331M450O400A
	330	30	45	420	800	1620	HU331M450O450A
	330	30	50	420	800	1690	HU331M450O500A
	330	35	35	420	800	1630	HU331M450P350A
	330	35	40	420	800	1700	HU331M450P400A
	390	30	50	360	680	1840	HU391M450O500A
	390	35	40	360	680	1860	HU391M450P400A
	390	35	45	360	680	1920	HU391M450P450A
	470	35	40	290	560	2010	HU471M450P400A
470	35	45	290	560	2110	HU471M450P450A	
560	30	60	250	470	2390	HU561M450O600A	
560	35	50	250	470	2410	HU561M450P500A	
560	35	55	250	470	2510	HU561M450P550A	
680	35	50	210	390	2650	HU681M450P500A	
680	35	55	210	390	2760	HU681M450P550A	
500	39	22	25	3580	6800	360	HU390M500M250A
	47	22	25	2970	5640	400	HU470M500M250A
	56	22	30	2490	4740	470	HU560M500M300A
	68	22	30	2050	3900	520	HU680M500M300A
	68	25	25	2050	3900	530	HU680M500N250A
	82	22	35	1700	3230	610	HU820M500M350A
	82	25	30	1700	3230	620	HU820M500N300A
	82	30	25	1700	3230	650	HU820M500O250A
	100	22	40	1390	2650	710	HU101M500M400A
	100	25	35	1390	2650	720	HU101M500N350A
	100	30	25	1390	2650	700	HU101M500O250A
	120	22	45	1160	2210	700	HU121M500M450A
	120	25	35	1160	2210	700	HU121M500N350A
	120	30	30	1160	2210	820	HU121M500O300A
	120	35	30	1160	2210	910	HU121M500P300A
150	22	50	930	1770	960	HU151M500M500A	
150	25	45	930	1770	980	HU151M500N450A	
150	30	35	930	1770	980	HU151M500O350A	

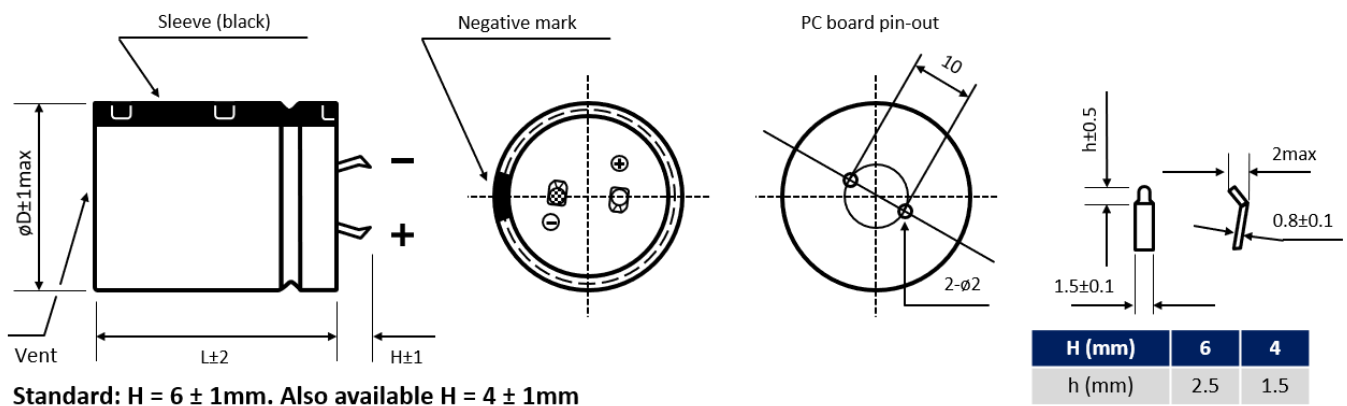
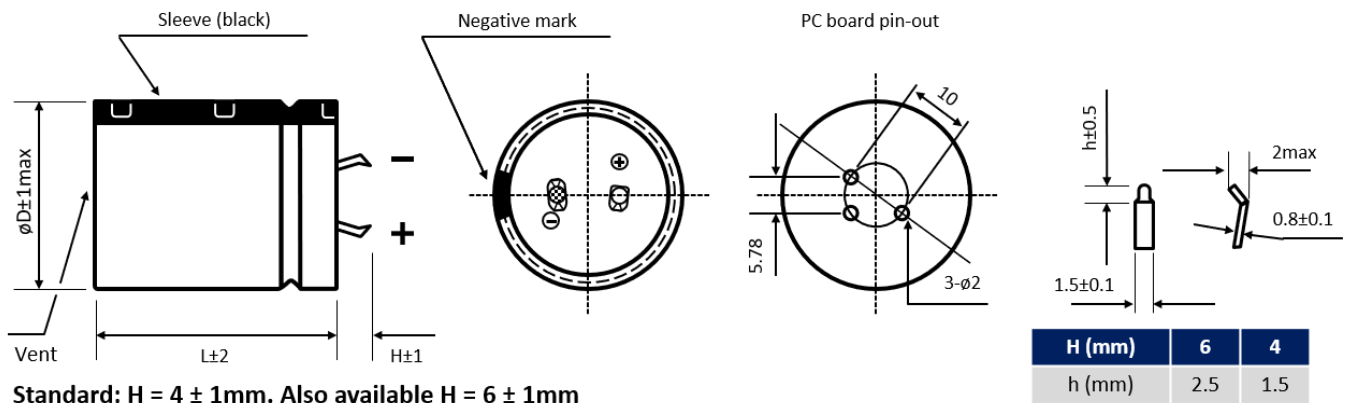
See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μF)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
500	150	35	30	930	1770	980	HU151M500P300A
	180	25	50	770	1470	1130	HU181M500N500A
	180	30	40	770	1470	1130	HU181M500O400A
	180	35	30	770	1470	1130	HU181M500P300A
	220	30	45	640	1210	1320	HU221M500O450A
	220	35	35	640	1210	1320	HU221M500P350A
	270	30	50	520	980	1530	HU271M500O500A
	270	35	40	520	980	1530	HU271M500P400A
	330	35	45	420	800	1770	HU331M500P450A
	390	35	50	360	680	1880	HU391M500P500A
470	35	55	290	560	2200	HU471M500P550A	

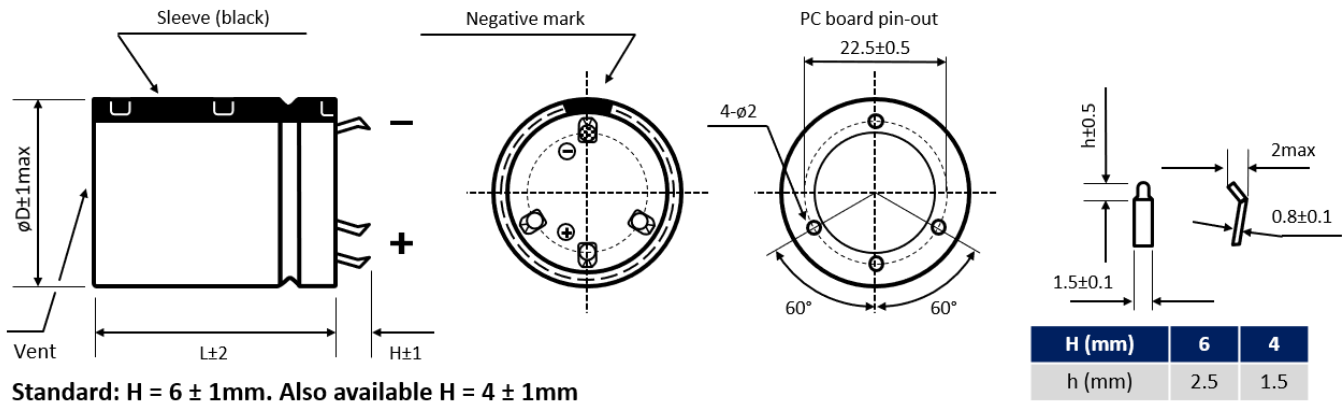
: Enter **P6** for standard type - 6mm pin length
: Enter **Z6** for 3-pin type - 6mm pin length
: Enter **Y6** for multipin-type - 6mm pin length

: Enter **P4** for standard type - 4mm pin length
: Enter **Z4** for 3-pin type - 4mm pin length
: Enter **Y4** for multipin type - 4mm pin length

DIMENSIONS - All dimensions in mm
2-pin version - Standard type

3-pin version - Polarity protection


DIMENSIONS ▪ All dimensions in mm

Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$10 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 500$	0.77	1	1.16	1.3	1.41	1.43

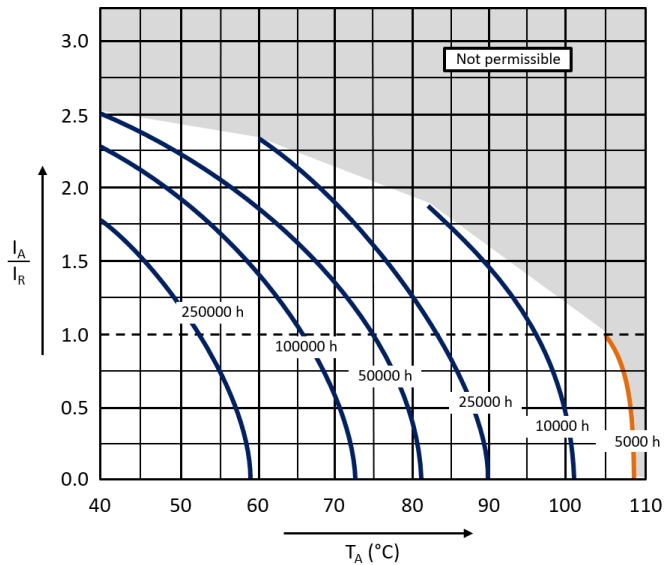
PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

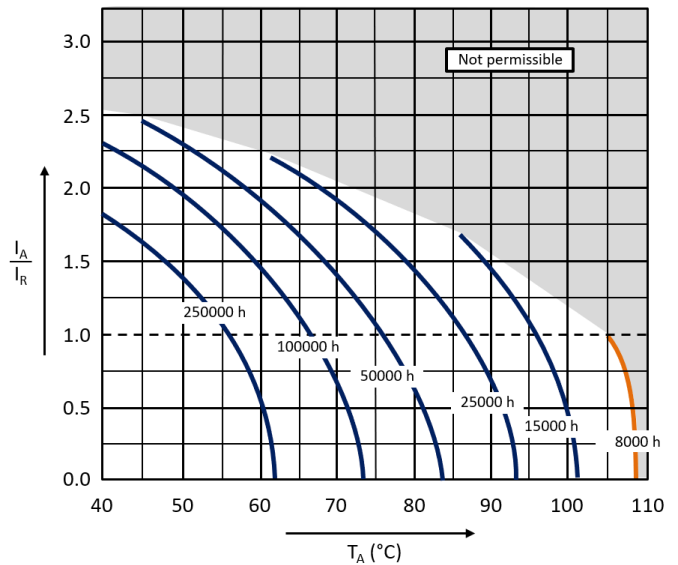
General Precautions and Guidelines	Packaging Information Liquid Snap-In
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USEFUL LIFE

$V_R \leq 100V$



$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UK SERIES ▪ ULTRA LONG LIFE, AUTOMOTIVE 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 105°C ▪ 8000 hours
- Extremely stable dissipation factor and leakage current
- Especially for applications with demanding operating environment
- AEC-Q200 version available



SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +105°C		-25 ~ +105°C	
Rated Voltage Range	V _R	200 ~ 450V DC		500 ~ 550V DC	
Surge Voltage	V _S	(V _R ≤ 315V) ▪ V _S = 1.15·V _R		(V _R > 315V) ▪ V _S = 1.10·V _R	
Capacitance Range	C _R	68 ~ 2200μF		47 ~ 680μF	
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ▪ After 5 minutes [I _{LEAK} (μA) ; C _R (μF) ; V _R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V _R (V DC)	200 ~ 400	450 ~ 550	
		tanδ	15	20	
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings			
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	200 ~ 250	315 ~ 450	500 ~ 550
		Z-25°C/Z+20°C	4	5	6
		Z-40°C/Z+20°C	7	10	-

Lifetime Test					
Useful Life 105°C (V _R & I _R applied)	Test	8000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria				
Endurance 105°C (V _R & I _R applied)	Test	3000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 105°C (V _R = 0)	Test	1000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
200	330	22	25	320	600	1380	UK331M200M250A□□□
	390	22	25	280	510	1450	UK391M200M250A□□□
	470	22	30	230	420	1680	UK471M200M300A□□□
	470	25	25	230	420	1680	UK471M200N250A□□□
	560	22	35	190	360	1810	UK561M200M350A□□□
	560	25	30	190	360	1780	UK561M200N300A□□□
	560	30	25	190	360	1960	UK561M200O250A□□□
	680	22	40	160	290	2150	UK681M200M400A□□□
	680	25	35	160	290	2060	UK681M200N350A□□□
	680	30	25	160	290	2170	UK681M200O250A□□□
	820	22	45	130	240	2420	UK821M200M450A□□□
	820	25	35	130	240	2220	UK821M200N350A□□□
	820	30	25	130	240	2340	UK821M200O250A□□□
	1000	25	45	110	200	2720	UK102M200N450A□□□
	1000	30	30	110	200	2910	UK102M200O300A□□□
	1000	35	25	110	200	3140	UK102M200P250A□□□
	1200	25	50	92	170	2870	UK122M200N500A□□□
	1200	30	35	92	170	3420	UK122M200O350A□□□
	1200	35	30	92	170	3380	UK122M200P300A□□□
	1500	25	60	70	130	3290	UK152M200N600A□□□
1500	30	45	70	130	4120	UK152M200O450A□□□	
1500	35	35	70	130	3910	UK152M200P350A□□□	
1800	30	50	59	110	4330	UK182M200O500A□□□	
1800	35	40	59	110	4460	UK182M200P400A□□□	
2200	30	60	49	90	4750	UK222M200O600A□□□	
2200	35	45	49	90	5110	UK222M200P450A□□□	
250	220	22	25	490	900	1150	UK221M250M250A□□□
	270	22	25	400	740	1210	UK271M250M250A□□□
	330	22	30	320	600	1520	UK331M250M300A□□□
	330	25	25	320	600	1450	UK331M250N250A□□□
	390	22	35	280	510	1720	UK391M250M350A□□□
	390	22	40	280	510	1820	UK391M250M400A□□□
	390	25	30	280	510	1580	UK391M250N300A□□□
	390	30	25	280	510	1620	UK391M250O250A□□□
	470	22	40	230	420	1960	UK471M250M400A□□□
	470	25	30	230	420	1720	UK471M250N300A□□□
	470	30	25	230	420	1880	UK471M250O250A□□□
	560	22	45	190	360	2160	UK561M250M450A□□□
	560	25	35	190	360	1960	UK561M250N350A□□□
	560	30	30	190	360	2220	UK561M250O300A□□□
	560	35	25	190	360	2080	UK561M250P250A□□□
	680	22	50	160	290	2410	UK681M250M500A□□□
680	25	40	160	290	2210	UK681M250N400A□□□	
680	30	30	160	290	2350	UK681M250O300A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
250	680	35	25	160	290	2500	UK681M250P250A□□□
	820	30	35	130	240	2780	UK821M250O350A□□□
	820	35	30	130	240	2900	UK821M250P300A□□□
	1000	30	40	110	200	3300	UK102M250O400A□□□
	1000	35	35	110	200	3360	UK102M250P350A□□□
	1200	30	50	92	170	3850	UK122M250O500A□□□
	1200	35	40	92	170	3820	UK122M250P400A□□□
	1500	30	55	70	130	4330	UK152M250O550A□□□
	1500	35	45	70	130	4340	UK152M250P450A□□□
	1800	35	50	59	110	4700	UK182M250P500A□□□
2200	35	60	49	90	5580	UK222M250P600A□□□	
315	150	22	25	720	1330	1000	UK151M315M250A□□□
	180	22	30	600	1110	1150	UK181M315M300A□□□
	220	22	30	490	900	1300	UK221M315M300A□□□
	220	25	25	490	900	1300	UK221M315N250A□□□
	270	22	35	400	740	1410	UK271M315M350A□□□
	270	25	30	400	740	1420	UK271M315N300A□□□
	330	22	40	320	600	1740	UK331M315M400A□□□
	330	25	35	320	600	1580	UK331M315N350A□□□
	330	30	25	320	600	1620	UK331M315O250A□□□
	390	22	50	280	510	1940	UK391M315M500A□□□
	390	25	35	280	510	1700	UK391M315N350A□□□
	390	30	30	280	510	1780	UK391M315O300A□□□
	390	35	25	280	510	1800	UK391M315P250A□□□
	470	22	55	230	420	2050	UK471M315M550A□□□
	470	25	45	230	420	2040	UK471M315N450A□□□
	470	30	35	230	420	2030	UK471M315O350A□□□
	470	35	30	230	420	2070	UK471M315P300A□□□
	560	25	50	190	360	2280	UK561M315N500A□□□
	560	30	35	190	360	2230	UK561M315O350A□□□
	560	35	30	190	360	2250	UK561M315P300A□□□
	680	25	55	160	290	2700	UK681M315N550A□□□
	680	30	40	160	290	2660	UK681M315O400A□□□
	680	35	35	160	290	2700	UK681M315P350A□□□
	820	30	50	130	240	3120	UK821M315O500A□□□
	820	35	40	130	240	3100	UK821M315P400A□□□
	1000	30	55	110	200	3640	UK102M315O550A□□□
	1000	35	45	110	200	3560	UK102M315P450A□□□
1200	35	50	92	170	4050	UK122M315P500A□□□	
1500	35	60	70	130	4350	UK152M315P600A□□□	
350	100	22	25	1080	1990	740	UK101M350M250A□□□
	100	25	20	1080	1990	520	UK101M350N200A□□□
	120	22	25	900	1660	920	UK121M350M250A□□□
	150	22	30	720	1330	1060	UK151M350M300A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
350	180	22	30	600	1110	1170	UK181M350M300A□□□
	180	25	25	600	1110	1170	UK181M350N250A□□□
	220	22	35	490	900	1320	UK221M350M350A□□□
	220	22	40	490	900	1400	UK221M350M400A□□□
	220	25	30	490	900	1330	UK221M350N300A□□□
	220	30	25	490	900	1350	UK221M350O250A□□□
	270	22	45	400	740	1550	UK271M350M450A□□□
	270	25	35	400	740	1470	UK271M350N350A□□□
	270	30	25	400	740	1370	UK271M350O250A□□□
	330	22	50	320	600	1760	UK331M350M500A□□□
	330	25	40	320	600	1680	UK331M350N400A□□□
	330	30	30	320	600	1640	UK331M350O300A□□□
	330	35	25	320	600	1690	UK331M350P250A□□□
	390	25	45	280	510	1860	UK391M350N450A□□□
	390	30	35	280	510	1840	UK391M350O350A□□□
	390	35	30	280	510	1870	UK391M350P300A□□□
	470	25	50	230	420	2090	UK471M350N500A□□□
	470	30	40	230	420	2090	UK471M350O400A□□□
	470	35	30	230	420	2080	UK471M350P300A□□□
	560	30	45	190	360	2240	UK561M350O450A□□□
	560	35	35	190	360	2260	UK561M350P350A□□□
	680	30	50	160	290	2670	UK681M350O500A□□□
	680	35	40	160	290	2710	UK681M350P400A□□□
	820	35	45	130	240	3110	UK821M350P450A□□□
820	35	50	130	240	3250	UK821M350P500A□□□	
1000	35	55	110	200	3580	UK102M350P550A□□□	
1200	35	60	92	170	4100	UK122M350P600A□□□	
400	82	22	25	1310	2430	610	UK820M400M250A□□□
	100	22	25	1080	1990	670	UK101M400M250A□□□
	120	22	30	900	1660	790	UK121M400M300A□□□
	120	25	25	900	1660	790	UK121M400N250A□□□
	120	25	30	900	1660	850	UK121M400N300A□□□
	150	22	35	720	1330	950	UK151M400M350A□□□
	150	22	40	720	1330	1000	UK151M400M400A□□□
	150	25	25	720	1330	890	UK151M400N250A□□□
	150	25	30	720	1330	960	UK151M400N300A□□□
	150	30	25	720	1330	990	UK151M400O250A□□□
	180	22	35	600	1110	1040	UK181M400M350A□□□
	180	22	40	600	1110	1100	UK181M400M400A□□□
	180	25	30	600	1110	1050	UK181M400N300A□□□
	180	25	35	600	1110	1120	UK181M400N350A□□□
	180	30	25	600	1110	1090	UK181M400O250A□□□
	180	30	30	600	1110	1170	UK181M400O300A□□□
	220	22	45	490	900	1200	UK221M400M450A□□□
	220	25	35	490	900	1200	UK221M400N350A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
400	220	25	45	490	900	1240	UK221M400N450A□□□
	220	30	25	490	900	1150	UK221M400O250A□□□
	220	30	30	490	900	1240	UK221M400O300A□□□
	220	35	25	490	900	1240	UK221M400P250A□□□
	270	22	50	400	740	1320	UK271M400M500A□□□
	270	25	40	400	740	1290	UK271M400N400A□□□
	270	25	50	400	740	1420	UK271M400N500A□□□
	270	30	30	400	740	1270	UK271M400O300A□□□
	270	30	35	400	740	1350	UK271M400O350A□□□
	270	35	25	400	740	1300	UK271M400P250A□□□
	270	35	30	400	740	1390	UK271M400P300A□□□
	330	25	45	320	600	1500	UK331M400N450A□□□
	330	25	50	320	600	1570	UK331M400N500A□□□
	330	30	35	320	600	1500	UK331M400O350A□□□
	330	30	40	320	600	1580	UK331M400O400A□□□
	330	35	30	320	600	1540	UK331M400P300A□□□
	330	35	35	320	600	1640	UK331M400P350A□□□
	390	25	50	280	510	1700	UK391M400N500A□□□
	390	30	40	280	510	1720	UK391M400O400A□□□
	390	30	45	280	510	1800	UK391M400O450A□□□
	390	35	30	280	510	1700	UK391M400P300A□□□
	390	35	35	280	510	1780	UK391M400P350A□□□
	470	30	45	230	420	1980	UK471M400O450A□□□
	470	30	50	230	420	2070	UK471M400O500A□□□
	470	35	35	230	420	1980	UK471M400P350A□□□
	470	35	40	230	420	2070	UK471M400P400A□□□
	470	35	45	230	420	2160	UK471M400P450A□□□
	560	30	50	190	360	2260	UK561M400O500A□□□
	560	35	40	190	360	2260	UK561M400P400A□□□
	560	35	45	190	360	2360	UK561M400P450A□□□
	680	30	50	160	290	2490	UK681M400O500A□□□
	680	35	45	160	290	2600	UK681M400P450A□□□
680	35	50	160	290	2720	UK681M400P500A□□□	
820	35	55	130	240	3110	UK821M400P550A□□□	
820	35	60	130	240	3230	UK821M400P600A□□□	
1000	35	55	110	200	3440	UK102M400P550A□□□	
1000	35	60	110	200	3570	UK102M400P600A□□□	
1200	35	60	92	170	3910	UK122M400P600A□□□	
450	68	22	25	2110	3900	550	UK680M450M250A□□□
	82	22	25	1750	3230	610	UK820M450M250A□□□
	100	22	30	1430	2650	720	UK101M450M300A□□□
	100	25	25	1430	2650	720	UK101M450N250A□□□
	120	22	35	1190	2210	850	UK121M450M350A□□□
	120	22	40	1190	2210	900	UK121M450M400A□□□
	120	25	30	1190	2210	850	UK121M450N300A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μF)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
450	120	25	35	1190	2210	910	UK121M450N350A□□□
	120	30	25	1190	2210	850	UK121M450O250A□□□
	150	22	40	960	1770	1000	UK151M450M400A□□□
	150	25	30	960	1770	960	UK151M450N300A□□□
	150	25	35	960	1770	1020	UK151M450N350A□□□
	150	30	25	960	1770	1000	UK151M450O250A□□□
	150	30	30	960	1770	1060	UK151M450O300A□□□
	150	35	25	960	1770	1090	UK151M450P250A□□□
	180	22	45	790	1470	1160	UK181M450M450A□□□
	180	22	50	790	1470	1210	UK181M450M500A□□□
	180	25	35	790	1470	1120	UK181M450N350A□□□
	180	25	40	790	1470	1210	UK181M450N400A□□□
	180	30	30	790	1470	1210	UK181M450O300A□□□
	180	30	35	790	1470	1240	UK181M450O350A□□□
	180	35	25	790	1470	1210	UK181M450P250A□□□
	180	35	30	790	1470	1280	UK181M450P300A□□□
	220	25	40	650	1210	1240	UK221M450N400A□□□
	220	25	45	650	1210	1280	UK221M450N450A□□□
	220	30	30	650	1210	1240	UK221M450O300A□□□
	220	30	35	650	1210	1280	UK221M450O350A□□□
	220	35	25	650	1210	1240	UK221M450P250A□□□
	220	35	30	650	1210	1280	UK221M450P300A□□□
	270	25	50	530	980	1420	UK271M450N500A□□□
	270	30	30	530	980	1280	UK271M450O300A□□□
	270	30	35	530	980	1350	UK271M450O350A□□□
	270	35	30	530	980	1390	UK271M450P300A□□□
	270	35	35	530	980	1480	UK271M450P350A□□□
	330	30	40	430	800	1580	UK331M450O400A□□□
	330	30	45	430	800	1660	UK331M450O450A□□□
	330	35	30	430	800	1580	UK331M450P300A□□□
	330	35	35	430	800	1660	UK331M450P350A□□□
	390	30	45	370	680	1800	UK391M450O450A□□□
	390	30	50	370	680	1890	UK391M450O500A□□□
	390	35	40	370	680	1890	UK391M450P400A□□□
	390	35	45	370	680	1970	UK391M450P450A□□□
	470	30	50	300	560	2080	UK471M450O500A□□□
	470	35	35	300	560	1970	UK471M450P350A□□□
	470	35	40	300	560	2080	UK471M450P400A□□□
	470	35	45	300	560	2160	UK471M450P450A□□□
	560	35	50	250	470	2470	UK561M450P500A□□□
560	35	55	250	470	2570	UK561M450P550A□□□	
680	35	50	210	390	2720	UK681M450P500A□□□	
680	35	60	210	390	2940	UK681M450P600A□□□	
820	35	60	170	320	3230	UK821M450P600A□□□	
820	35	65	170	320	3350	UK821M450P650A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

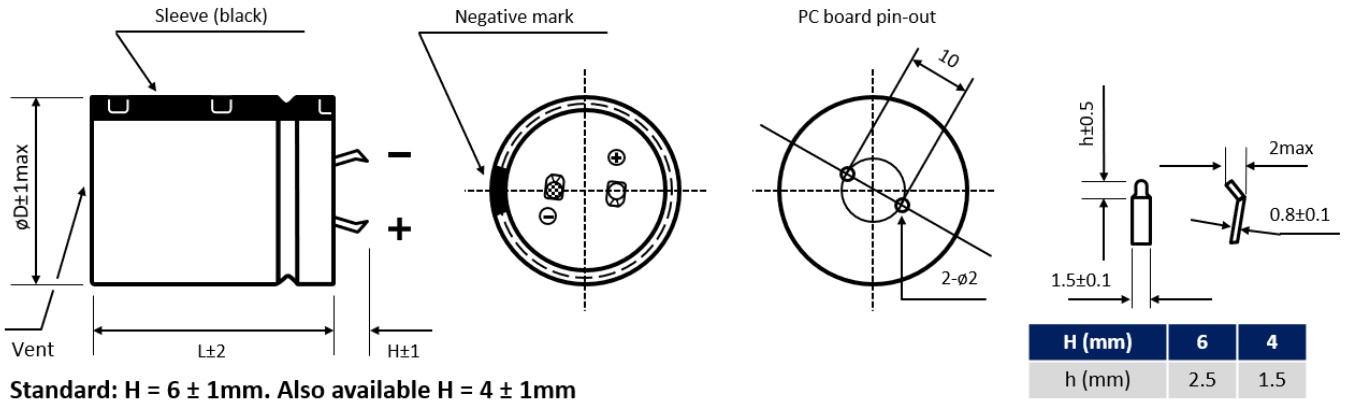
V _R (V)	C _R (µF)	ø D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (mΩ)	Max. ESR +20°C - 120Hz (mΩ)	I _r - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
500	47	22	25	3050	5640	450	UK470M500M250A□□□
	56	22	30	2560	4740	520	UK560M500M300A□□□
	68	22	30	2110	3900	520	UK680M500M300A□□□
	68	22	35	2110	3900	560	UK680M500M350A□□□
	68	25	25	2110	3900	540	UK680M500N250A□□□
	68	25	30	2110	3900	580	UK680M500N300A□□□
	82	22	35	1750	3230	700	UK820M500M350A□□□
	82	25	30	1750	3230	710	UK820M500N300A□□□
	100	22	40	1430	2650	810	UK101M500M400A□□□
	100	25	35	1430	2650	860	UK101M500N350A□□□
	100	30	30	1430	2650	850	UK101M500O300A□□□
	120	22	50	1190	2210	980	UK121M500M500A□□□
	120	25	40	1190	2210	950	UK121M500N400A□□□
	120	30	35	1190	2210	1000	UK121M500O350A□□□
	120	35	30	1190	2210	1030	UK121M500P300A□□□
	150	22	50	960	1770	1100	UK151M500M500A□□□
	150	25	45	960	1770	1130	UK151M500N450A□□□
	150	30	40	960	1770	1190	UK151M500O400A□□□
	150	35	35	960	1770	1230	UK151M500P350A□□□
	180	25	50	790	1470	1240	UK181M500N500A□□□
	180	30	45	790	1470	1310	UK181M500O450A□□□
	220	25	55	650	1210	1450	UK221M500N550A□□□
	220	30	45	650	1210	1470	UK221M500O450A□□□
	220	35	40	650	1210	1530	UK221M500P400A□□□
	220	35	35	650	1210	1450	UK221M500P350A□□□
	270	30	50	530	980	1550	UK271M500O500A□□□
	270	35	40	530	980	1620	UK271M500P400A□□□
	330	30	55	430	800	1890	UK331M500O550A□□□
	390	35	45	370	680	1850	UK391M500P450A□□□
	390	35	55	370	680	2020	UK391M500P550A□□□
470	35	60	300	560	2280	UK471M500P600A□□□	
560	35	65	250	470	2320	UK561M500P650A□□□	
680	40	60	210	390	2450	UK681M500Q600A□□□	
550	220	35	35	650	1210	1300	UK221M550P350A□□□
	270	35	45	530	980	1600	UK271M550P450A□□□
	330	35	50	430	800	1630	UK331M550P500A□□□
	390	35	55	370	680	1800	UK391M550P550A□□□
	470	35	65	300	560	2100	UK471M550P650A□□□

□□□: Enter **P6** for standard type ▪ 6mm pin length
 □□□: Enter **P6X** for standard type ▪ 6mm pin length ▪ AEC-Q200
 □□□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□□: Enter **Z6X** for 3-pin type ▪ 6mm pin length ▪ AEC-Q200
 □□□: Enter **Y6** for multi-pin type ▪ 6mm pin length
 □□□: Enter **Y6X** for multi-pin type ▪ 6mm pin length ▪ AEC-Q200

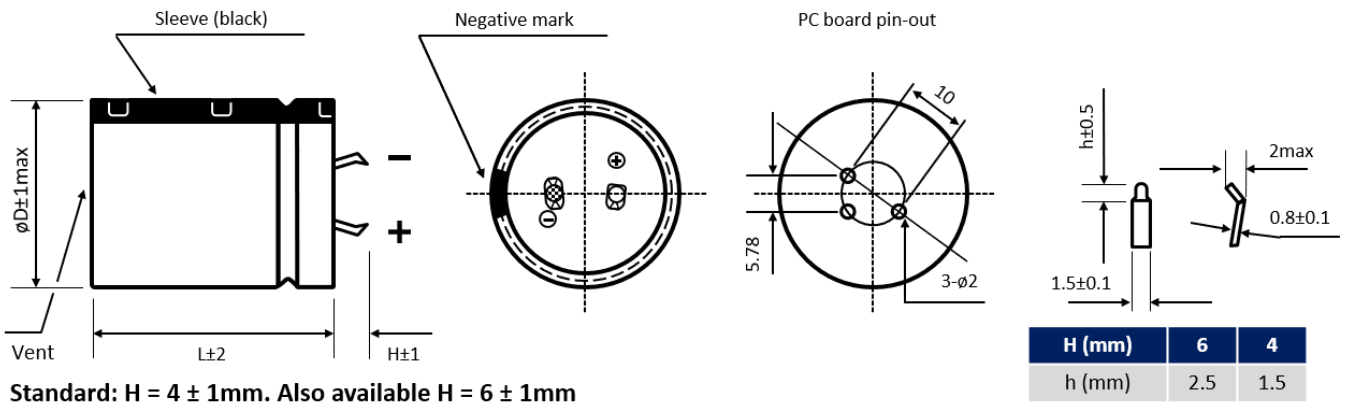
□□□: Enter **P4** for standard type ▪ 4mm pin length
 □□□: Enter **P4X** for standard type ▪ 4mm pin length ▪ AEC-Q200
 □□□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□□: Enter **Z4X** for 3-pin type ▪ 4mm pin length ▪ AEC-Q200
 □□□: Enter **Y4** for multi-pin type ▪ 4mm pin length
 □□□: Enter **Y4X** for multi-pin type ▪ 4mm pin length ▪ AEC-Q200

DIMENSIONS ▪ All dimensions in mm

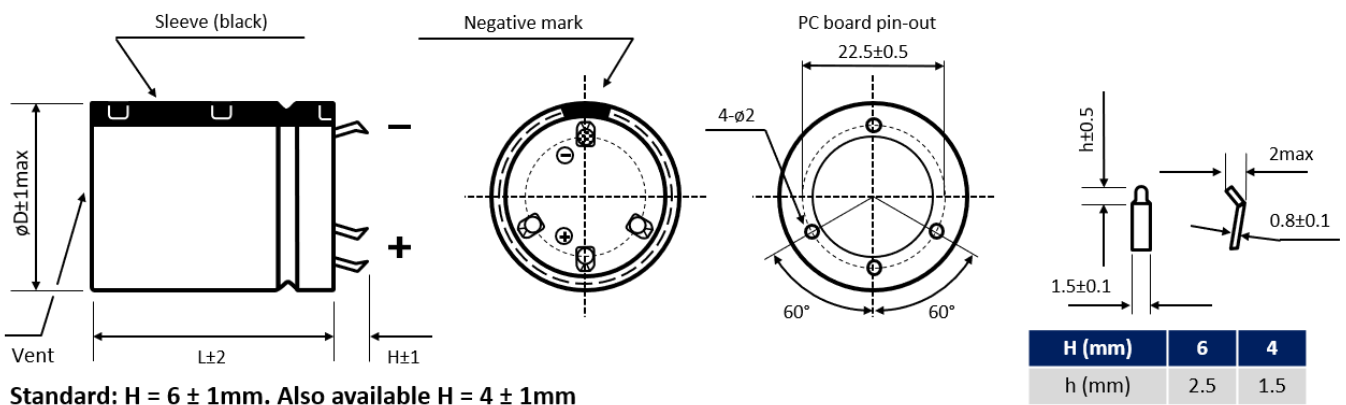
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter ø D ≥ 30 mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

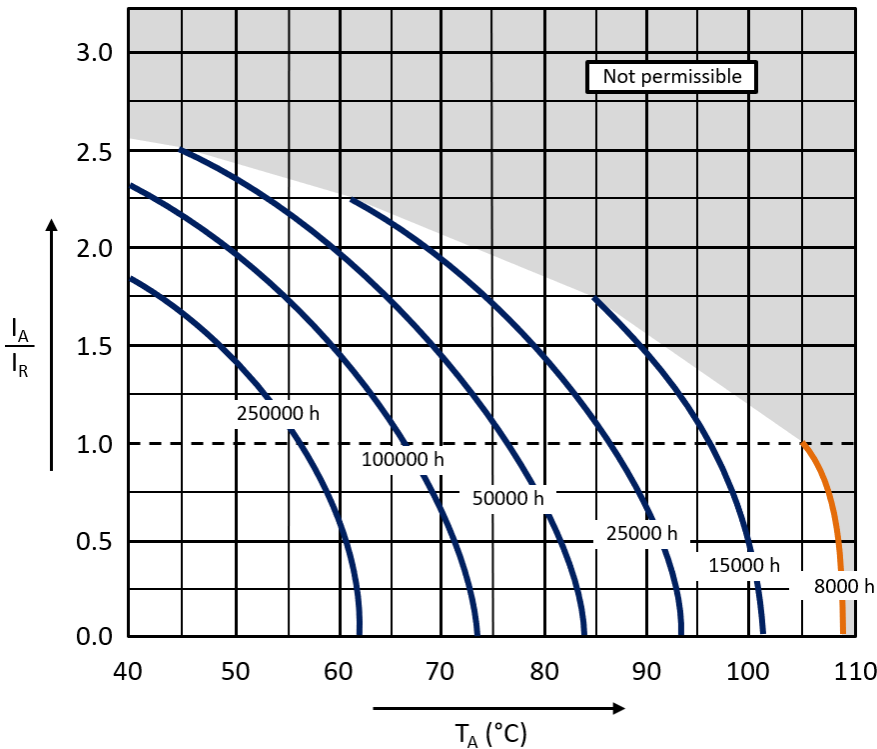
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 550$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HL SERIES ▪ ULTRA LONG LIFE 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR ▪ Snap-In type
- Useful life: 105°C ▪ 7000 hours up to 10000 hours
- Wide capacitance range
- Small dimensions
- Stable operating under steady state environment



SPECIFICATIONS

Items		Performance Characteristics										
Operating Temperature Range		-40 ~ +105°C					-25 ~ +105°C					
Rated Voltage Range	V _R	10 ~ 350V DC					385 ~ 500V DC					
Surge Voltage	V _S	(V _R ≤ 315V): V _S = 1.15·V _R					(V _R > 315V): V _S = 1.10·V _R					
Capacitance Range	C _R	56 ~ 56000µF					39 ~ 1200µF					
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)										
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]										
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	µF / V DC	10	16	25	35	50	63	80	100	160 ~ 420	450 ~ 500
		≤ 8200	35	35	30	25	20	20	15	15	15	20
		10000 ~ 22000	40	40	35	30	30	25	20	-	-	-
		≥ 27000	50	40	35	35	30	25	-	-	-	-
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	10 ~ 16	25	35	50 ~ 100	160 ~ 250	315 ~ 350	400 ~ 500			
		Z-25°C/Z+20°C	4	3	3	3	4	8	8			
		Z-40°C/Z+20°C	15	10	8	6	8	12	-			
Lifetime Test			V _R ≤ 100V					V _R > 100V				
Useful Life 105°C (V _R & I _R applied)		Test	7000 hours					10000 hours				
		ΔC/C _R	≤ ±30% of initial measured value					≤ ±20% of initial measured value				
		tanδ	≤ 300% of initial specified value					≤ 200% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria										
Endurance 105°C (V _R & I _R applied)		Test	5000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		Tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
Shelf Life 105°C (V _R = 0)		Test	1000 hours									
		ΔC/C _R	≤ ±20% of initial measured value					≤ ±15% of initial measured value				
		tanδ	≤ 200% of initial specified value					≤ 175% of initial specified value				
		I _{Leak}	≤ the initial specified value					≤ the initial specified value				
		Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4										
Vibration Resistance Test		Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6										

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
10	5600	22	25	64	83	1100	HL562M010M250A
	6800	22	25	53	68	1300	HL682M010M250A
	6800	25	25	53	68	1340	HL682M010N250A
	8200	22	25	44	57	1360	HL822M010M250A
	8200	25	25	44	57	1560	HL822M010N250A
	10000	25	25	36	46	1600	HL103M010N250A
	12000	25	25	34	44	1820	HL123M010N250A
	12000	30	25	34	44	1890	HL123M010O250A
	15000	22	40	27	35	2100	HL153M010M400A
	15000	25	30	27	35	2110	HL153M010N300A
	15000	30	25	27	35	2140	HL153M010O250A
	18000	25	30	23	29	2200	HL183M010N300A
	18000	30	30	23	29	2370	HL183M010O300A
	22000	22	40	19	24	2750	HL223M010M400A
	22000	25	35	19	24	2780	HL223M010N350A
	22000	30	30	19	24	2800	HL223M010O300A
	27000	25	45	19	25	3010	HL273M010N450A
	27000	30	35	19	25	3130	HL273M010O350A
	27000	35	30	19	25	3160	HL273M010P300A
	16	33000	25	50	15	20	3430
33000		30	40	15	20	3530	HL333M010O400A
33000		35	35	15	20	3560	HL333M010P350A
39000		30	45	13	17	3780	HL393M010O450A
39000		35	40	13	17	3960	HL393M010P400A
47000		30	50	11	14	4610	HL473M010O500A
47000		35	45	11	14	4630	HL473M010P450A
56000		35	50	9	12	5060	HL563M010P500A
5600		22	25	64	83	1450	HL562M016M250A
6800		22	30	53	68	1660	HL682M016M300A
6800		25	25	53	68	1670	HL682M016N250A
8200		22	30	44	57	1790	HL822M016M300A
8200		25	25	44	57	1800	HL822M016N250A
10000		22	35	36	46	2080	HL103M016M350A
10000		25	30	36	46	2090	HL103M016N300A
10000		30	25	36	46	2110	HL103M016O250A
12000		22	40	34	44	2360	HL123M016M400A
12000		25	35	34	44	2370	HL123M016N350A
12000		30	25	34	44	2400	HL123M016O250A
12000		35	25	34	44	2420	HL123M016P250A
15000	22	45	27	35	2690	HL153M016M450A	
15000	25	35	27	35	2700	HL153M016N350A	
15000	25	40	27	35	2720	HL153M016N400A	
15000	30	30	27	35	2740	HL153M016O300A	
18000	25	45	23	29	3060	HL183M016N450A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
16	18000	30	35	23	29	3080	HL183M016O350A
	18000	35	30	23	29	3090	HL183M016P300A
	22000	25	50	19	24	3390	HL223M016N500A
	22000	30	35	19	24	3400	HL223M016O350A
	22000	30	40	19	24	3460	HL223M016O400A
	22000	35	30	19	24	3480	HL223M016P300A
	27000	25	50	15	20	3600	HL273M016N500A
	27000	30	40	15	20	3620	HL273M016O400A
	27000	35	30	15	20	3650	HL273M016P300A
	27000	35	35	15	20	3850	HL273M016P350A
	33000	30	45	12	16	4000	HL333M016O450A
	33000	35	40	12	16	4330	HL333M016P400A
	39000	30	50	10	14	4320	HL393M016O500A
	39000	35	40	10	14	4320	HL393M016P400A
	39000	35	45	10	14	4960	HL393M016P450A
	47000	35	45	9	11	5100	HL473M016P450A
47000	35	50	9	11	5490	HL473M016P500A	
25	3900	22	25	77	100	1310	HL392M025M250A
	4700	22	30	65	85	1550	HL472M025M300A
	4700	25	25	65	85	1570	HL472M025N250A
	5600	22	30	55	71	1800	HL562M025M300A
	5600	25	25	55	71	1810	HL562M025N250A
	5800	22	35	53	69	1770	HL582M025M350A
	5800	25	25	53	69	1760	HL582M025N250A
	6800	22	30	45	59	1900	HL682M025M300A
	6800	22	40	45	59	1920	HL682M025M400A
	6800	25	25	45	59	1930	HL682M025N250A
	6800	25	30	45	59	1950	HL682M025N300A
	8200	22	35	37	49	2100	HL822M025M350A
	8200	25	30	37	49	2120	HL822M025N300A
	8200	30	25	37	49	2140	HL822M025O250A
	10000	22	40	31	40	2300	HL103M025M400A
	10000	25	35	31	40	2310	HL103M025N350A
	10000	30	30	31	40	2330	HL103M025O300A
	10000	35	30	31	40	2350	HL103M025P300A
	12000	25	40	30	39	2600	HL123M025N400A
	12000	30	35	30	39	2700	HL123M025O350A
	12000	35	30	30	39	2760	HL123M025P300A
	15000	25	45	24	31	2900	HL153M025N450A
	15000	30	40	24	31	3130	HL153M025O400A
	15000	35	35	24	31	3160	HL153M025P350A
18000	25	50	20	26	3170	HL183M025N500A	
18000	30	45	20	26	3520	HL183M025O450A	
18000	35	35	20	26	3560	HL183M025P350A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
25	18000	35	40	20	26	3600	HL183M025P400A
	22000	30	45	16	21	3620	HL223M025O450A
	22000	30	50	16	21	3920	HL223M025O500A
	22000	35	40	16	21	3940	HL223M025P400A
	22000	35	45	16	21	3950	HL223M025P450A
	27000	35	45	13	17	4100	HL273M025P450A
	27000	35	50	13	17	4700	HL273M025P500A
35	33000	35	50	11	14	4800	HL333M025P500A
	2200	22	25	120	150	1100	HL222M035M250A
	2700	22	25	92	120	1290	HL272M035M250A
	3300	22	30	77	100	1420	HL332M035M300A
	3300	25	25	77	100	1430	HL332M035N250A
	3900	22	30	65	85	1600	HL392M035M300A
	3900	25	25	65	85	1610	HL392M035N250A
	3900	25	30	65	85	1650	HL392M035N300A
	4700	22	35	54	71	1800	HL472M035M350A
	4700	22	40	54	71	1810	HL472M035M400A
	4700	25	30	54	71	1820	HL472M035N300A
	5600	22	45	46	59	2250	HL562M035M450A
	5600	25	30	46	59	2000	HL562M035N300A
	5600	25	35	46	59	2180	HL562M035N350A
	5600	30	30	46	59	2230	HL562M035O300A
	6800	25	35	38	49	2200	HL682M035N350A
	6800	25	40	38	49	2450	HL682M035N400A
	6800	30	30	38	49	2460	HL682M035O300A
	8200	25	40	31	40	2510	HL822M035N400A
	8200	25	45	31	40	2610	HL822M035N450A
	8200	30	35	31	40	2690	HL822M035O350A
	8200	35	30	31	40	2710	HL822M035P300A
	10000	30	40	26	33	3040	HL103M035O400A
	10000	35	35	26	33	3100	HL103M035P350A
	12000	30	40	26	33	3050	HL123M035O400A
	12000	30	45	26	33	3380	HL123M035O450A
	12000	35	40	26	33	3410	HL123M035P400A
	15000	30	45	20	27	3470	HL153M035O450A
	15000	35	40	20	27	3980	HL153M035P400A
	15000	35	45	20	27	4100	HL153M035P450A
18000	35	45	17	22	4400	HL183M035P450A	
18000	35	50	17	22	4460	HL183M035P500A	
50	1500	22	25	140	180	1210	HL152M050M250A
	1800	22	25	120	150	1300	HL182M050M250A
	1800	22	30	120	150	1340	HL182M050M300A
	1800	25	25	120	150	1350	HL182M050N250A
	2200	22	30	92	120	1520	HL222M050M300A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
50	2200	25	25	92	120	1540	HL222M050N250A
	2700	22	35	76	98	1770	HL272M050M350A
	2700	25	30	76	98	1780	HL272M050N300A
	3300	22	35	62	80	1800	HL332M050M350A
	3300	25	30	62	80	1870	HL332M050N300A
	3300	30	25	62	80	1890	HL332M050O250A
	3900	22	40	52	68	1910	HL392M050M400A
	3900	25	30	52	68	1920	HL392M050N300A
	3900	25	35	52	68	2200	HL392M050N350A
	4700	22	45	43	56	2250	HL472M050M450A
	4700	25	35	43	56	2250	HL472M050N350A
	4700	25	40	43	56	2430	HL472M050N400A
	4700	30	30	43	56	2440	HL472M050O300A
	4700	35	30	43	56	2460	HL472M050P300A
	5600	22	50	36	47	2430	HL562M050M500A
	5600	25	40	36	47	2430	HL562M050N400A
	5600	30	35	36	47	2600	HL562M050O350A
	5600	35	30	36	47	2610	HL562M050P300A
	6800	25	45	30	39	2620	HL682M050N450A
	6800	30	35	30	39	2620	HL682M050O350A
	6800	30	40	30	39	3010	HL682M050O400A
	6800	35	40	30	39	3020	HL682M050P400A
	8200	30	45	25	32	3420	HL822M050O450A
	8200	30	50	25	32	3630	HL822M050O500A
	8200	35	40	25	32	3640	HL822M050P400A
	10000	30	50	20	27	3640	HL103M050O500A
	10000	35	45	20	27	3650	HL103M050P450A
	10000	35	50	20	27	3680	HL103M050P500A
12000	35	45	26	33	3700	HL123M050P450A	
15000	35	50	20	27	3990	HL153M050P500A	
63	1000	22	25	210	270	1100	HL102M063M250A
	1200	22	25	170	220	1300	HL122M063M250A
	1500	22	30	140	180	1310	HL152M063M300A
	1500	25	25	140	180	1380	HL152M063N250A
	1800	22	30	120	150	1600	HL182M063M300A
	1800	25	25	120	150	1620	HL182M063N250A
	1800	25	30	120	150	1630	HL182M063N300A
	1800	30	25	120	150	1650	HL182M063O250A
	2200	22	35	92	120	1800	HL222M063M350A
	2200	25	30	92	120	1810	HL222M063N300A
	2200	30	25	92	120	1820	HL222M063O250A
	2700	22	40	76	98	2000	HL272M063M400A
	2700	25	35	76	98	2010	HL272M063N350A
	2700	30	25	76	98	2030	HL272M063O250A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
63	3300	22	45	62	80	2200	HL332M063M450A □□
	3300	25	35	62	80	2230	HL332M063N350A □□
	3300	30	30	62	80	2250	HL332M063O300A □□
	3900	25	40	52	68	2400	HL392M063N400A □□
	3900	30	35	52	68	2410	HL392M063O350A □□
	3900	35	30	52	68	2460	HL392M063P300A □□
	4700	25	50	43	56	2600	HL472M063N500A □□
	4700	30	40	43	56	2820	HL472M063O400A □□
	4700	35	30	43	56	2750	HL472M063P300A □□
	5600	30	45	36	47	3120	HL562M063O450A □□
	5600	35	35	36	47	3150	HL562M063P350A □□
	5600	35	40	36	47	3200	HL562M063P400A □□
	6800	30	50	30	39	3210	HL682M063O500A □□
	6800	35	40	30	39	3210	HL682M063P400A □□
	8200	35	45	25	32	3400	HL822M063P450A □□
	10000	30	50	20	27	3600	HL103M063O500A □□
10000	35	50	20	27	3800	HL103M063P500A □□	
80	820	22	25	180	240	1090	HL821M080M250A □□
	1000	22	30	150	200	1290	HL102M080M300A □□
	1000	25	25	150	200	1310	HL102M080N250A □□
	1200	22	35	130	170	1480	HL122M080M350A □□
	1200	25	25	130	170	1500	HL122M080N250A □□
	1200	30	25	130	170	1510	HL122M080O250A □□
	1500	22	35	100	130	1600	HL152M080M350A □□
	1500	25	25	100	130	1790	HL152M080N250A □□
	1500	25	30	100	130	1800	HL152M080N300A □□
	1500	30	25	100	130	1810	HL152M080O250A □□
	1800	22	45	85	110	1910	HL182M080M450A □□
	1800	25	35	85	110	1910	HL182M080N350A □□
	2200	22	45	70	90	2000	HL222M080M450A □□
	2200	25	35	70	90	2030	HL222M080N350A □□
	2200	30	30	70	90	2050	HL222M080O300A □□
	2200	35	30	70	90	2090	HL222M080P300A □□
	2700	25	40	57	74	2200	HL272M080N400A □□
	2700	30	30	57	74	2230	HL272M080O300A □□
	2700	35	30	57	74	2440	HL272M080P300A □□
	3300	25	45	46	60	2450	HL332M080N450A □□
	3300	30	35	46	60	2450	HL332M080O350A □□
	3300	35	30	46	60	2450	HL332M080P300A □□
	3900	30	40	39	51	2600	HL392M080O400A □□
	3900	35	30	39	51	2620	HL392M080P300A □□
	3900	35	40	39	51	3000	HL392M080P400A □□
	4700	30	45	33	42	3120	HL472M080O450A □□
	4700	35	40	33	42	3150	HL472M080P400A □□

□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
80	5600	35	40	27	36	3290	HL562M080P400A
	6800	35	45	23	29	3500	HL682M080P450A
100	390	22	25	390	510	780	HL391M100M250A
	560	22	25	280	360	1100	HL561M100M250A
	560	22	30	280	360	1110	HL561M100M300A
	560	25	25	280	360	1120	HL561M100N250A
	680	22	30	220	290	1200	HL681M100M300A
	680	25	30	220	290	1210	HL681M100N300A
	820	22	35	180	240	1330	HL821M100M350A
	820	25	30	180	240	1400	HL821M100N300A
	1000	22	35	150	200	1500	HL102M100M350A
	1000	22	40	150	200	1560	HL102M100M400A
	1000	25	30	150	200	1560	HL102M100N300A
	1000	30	25	150	200	1570	HL102M100O250A
	1000	35	25	150	200	1580	HL102M100P250A
	1200	22	40	130	170	1600	HL122M100M400A
	1200	25	35	130	170	1620	HL122M100N350A
	1200	30	25	130	170	1640	HL122M100O250A
	1200	30	30	130	170	1760	HL122M100O300A
	1200	35	30	130	170	1780	HL122M100P300A
	1500	22	45	100	130	1800	HL152M100M450A
	1500	25	40	100	130	1820	HL152M100N400A
	1500	30	30	100	130	1830	HL152M100O300A
	1500	35	30	100	130	1850	HL152M100P300A
	1800	25	45	85	110	2000	HL182M100N450A
	1800	30	35	85	110	2010	HL182M100O350A
	1800	35	30	85	110	2090	HL182M100P300A
	1800	35	35	85	110	2100	HL182M100P350A
	2200	25	50	70	90	2200	HL222M100N500A
	2200	30	40	70	90	2230	HL222M100O400A
	2200	35	35	70	90	2480	HL222M100P350A
	2200	35	40	70	90	2500	HL222M100P400A
	2700	30	45	57	74	2650	HL272M100O450A
	2700	35	35	57	74	2690	HL272M100P350A
2700	35	40	57	74	2870	HL272M100P400A	
3300	30	50	46	60	2990	HL332M100O500A	
3300	35	40	46	60	3090	HL332M100P400A	
3300	35	45	46	60	3250	HL332M100P450A	
3900	35	50	39	51	3560	HL392M100P500A	
4700	35	50	33	42	3600	HL472M100P500A	
160	270	22	25	380	740	1090	HL271M160M250A
	330	22	25	310	600	1200	HL331M160M250A
	390	22	25	260	510	1330	HL391M160M250A
	470	22	25	220	420	1480	HL471M160M250A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
160	560	22	30	180	360	1680	HL561M160M300A
	560	25	25	180	360	1690	HL561M160N250A
	680	22	30	150	290	1960	HL681M160M300A
	680	25	25	150	290	1970	HL681M160N250A
	680	30	25	150	290	1980	HL681M160O250A
	820	22	35	120	240	2110	HL821M160M350A
	820	25	30	120	240	2120	HL821M160N300A
	820	30	40	120	240	2130	HL821M160O400A
	820	35	30	120	240	2140	HL821M160P300A
	1000	22	40	100	200	2400	HL102M160M400A
	1000	25	35	100	200	2430	HL102M160N350A
	1000	30	25	100	200	2550	HL102M160O250A
	1000	35	25	100	200	2590	HL102M160P250A
	1200	22	50	87	170	2810	HL122M160M500A
	1200	25	40	87	170	2850	HL122M160N400A
	1200	30	30	87	170	2910	HL122M160O300A
	1200	35	25	87	170	2950	HL122M160P250A
	1500	25	45	67	130	3170	HL152M160N450A
	1500	30	35	67	130	3230	HL152M160O350A
	1500	35	35	67	130	3310	HL152M160P350A
	1800	25	50	56	110	3520	HL182M160N500A
	1800	30	40	56	110	3630	HL182M160O400A
	1800	35	30	56	110	3660	HL182M160P300A
	2200	30	45	46	90	4140	HL222M160O450A
2200	35	35	46	90	4150	HL222M160P350A	
2700	35	40	38	74	4780	HL272M160P400A	
3300	35	50	31	60	5420	HL332M160P500A	
180	220	22	25	460	900	630	HL221M180M250A
	270	22	30	380	740	1100	HL271M180M300A
	270	25	25	380	740	1110	HL271M180N250A
	330	22	35	310	600	1210	HL331M180M350A
	330	25	30	310	600	1220	HL331M180N300A
	390	22	40	260	510	1340	HL391M180M400A
	390	25	35	260	510	1350	HL391M180N350A
	390	30	25	260	510	1360	HL391M180O250A
	470	22	45	220	420	1490	HL471M180M450A
	470	30	30	220	420	1500	HL471M180O300A
	560	22	50	180	360	1700	HL561M180M500A
	560	25	40	180	360	1710	HL561M180N400A
	560	30	35	180	360	1720	HL561M180O350A
	680	25	45	150	290	2010	HL681M180N450A
	680	35	30	150	290	2020	HL681M180P300A
	820	25	50	120	240	2150	HL821M180N500A
820	30	40	120	240	2160	HL821M180O400A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
180	820	35	35	120	240	2170	HL821M180P350A
	1000	30	45	100	200	2180	HL102M180O450A
	1000	35	40	100	200	2200	HL102M180P400A
	1200	30	50	87	170	2250	HL122M180O500A
	1200	35	45	87	170	2280	HL122M180P450A
	1500	35	50	67	130	3320	HL152M180P500A
200	180	22	20	570	1110	990	HL181M200M200A
	220	22	25	460	900	1010	HL221M200M250A
	270	22	25	380	740	1120	HL271M200M250A
	330	22	25	310	600	1250	HL331M200M250A
	390	22	25	260	510	1530	HL391M200M250A
	390	25	25	260	510	1540	HL391M200N250A
	470	22	30	220	420	1630	HL471M200M300A
	470	25	25	220	420	1640	HL471M200N250A
	560	22	35	180	360	1820	HL561M200M350A
	560	25	25	180	360	1840	HL561M200N250A
	560	30	25	180	360	1850	HL561M200O250A
	680	22	40	150	290	2090	HL681M200M400A
	680	25	30	150	290	2100	HL681M200N300A
	680	30	25	150	290	2110	HL681M200O250A
	680	35	25	150	290	2110	HL681M200P250A
	820	22	45	120	240	2220	HL821M200M450A
	820	25	35	120	240	2230	HL821M200N350A
	820	30	35	120	240	2310	HL821M200O350A
	1000	22	50	100	200	2610	HL102M200M500A
	1000	25	40	100	200	2620	HL102M200N400A
	1000	30	30	100	200	2660	HL102M200O300A
	1000	35	25	100	200	2680	HL102M200P250A
	1200	25	45	87	170	2880	HL122M200N450A
	1200	30	35	87	170	2920	HL122M200O350A
	1200	35	30	87	170	2990	HL122M200P300A
	1500	30	40	67	130	3360	HL152M200O400A
	1500	35	35	67	130	3380	HL152M200P350A
1800	30	50	56	110	3820	HL182M200O500A	
1800	35	40	56	110	3860	HL182M200P400A	
2200	35	45	46	90	4350	HL222M200P450A	
2700	35	50	38	74	4890	HL272M200P500A	
220	270	22	25	380	740	1130	HL271M220M250A
	330	22	30	310	600	1290	HL331M220M300A
	390	22	30	260	510	1640	HL391M220M300A
	390	25	25	260	510	1650	HL391M220N250A
	470	22	35	220	420	1680	HL471M220M350A
	470	25	30	220	420	1690	HL471M220N300A
560	22	40	180	360	1880	HL561M220M400A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
220	560	25	35	180	360	1900	HL561M220N350A
	560	30	30	180	360	1910	HL561M220O300A
	680	22	45	150	290	1950	HL681M220M450A
	680	25	35	150	290	2180	HL681M220N350A
	680	30	35	150	290	2190	HL681M220O350A
	680	35	25	150	290	2200	HL681M220P250A
	820	25	40	120	240	2350	HL821M220N400A
	820	25	45	120	240	2480	HL821M220N450A
	820	30	40	120	240	2500	HL821M220O400A
	820	35	30	120	240	2510	HL821M220P300A
	1000	25	50	100	200	2700	HL102M220N500A
	1000	30	45	100	200	2710	HL102M220O450A
	1000	35	35	100	200	2750	HL102M220P350A
	1200	30	50	87	170	2890	HL122M220O500A
	1200	35	40	87	170	2990	HL122M220P400A
	1500	35	45	67	130	3420	HL152M220P450A
	1800	35	50	56	110	3830	HL182M220P500A
2200	35	60	46	90	3900	HL222M220P600A	
250	180	22	30	570	1110	1010	HL181M250M300A
	180	25	25	570	1110	1030	HL181M250N250A
	220	22	25	460	900	1300	HL221M250M250A
	220	25	25	460	900	1320	HL221M250N250A
	330	22	30	310	600	1320	HL331M250M300A
	330	25	25	310	600	1330	HL331M250N250A
	390	22	35	260	510	1550	HL391M250M350A
	390	25	30	260	510	1560	HL391M250N300A
	390	30	25	260	510	1570	HL391M250O250A
	470	22	40	220	420	1690	HL471M250M400A
	470	25	30	220	420	1710	HL471M250N300A
	560	22	45	180	360	1920	HL561M250M450A
	560	25	35	180	360	1920	HL561M250N350A
	560	30	25	180	360	1930	HL561M250O250A
	560	30	30	180	360	2000	HL561M250O300A
	560	35	25	180	360	2200	HL561M250P250A
	680	22	50	150	290	2230	HL681M250M500A
	680	25	40	150	290	2250	HL681M250N400A
	680	30	30	150	290	2270	HL681M250O300A
	680	30	35	150	290	2300	HL681M250O350A
	680	35	25	150	290	2310	HL681M250P250A
	820	25	45	120	240	2320	HL821M250N450A
	820	25	50	120	240	2400	HL821M250N500A
820	30	35	120	240	2410	HL821M250O350A	
820	35	30	120	240	2460	HL821M250P300A	
1000	30	40	100	200	2660	HL102M250O400A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
250	1000	35	35	100	200	2800	HL102M250P350A
	1000	35	40	100	200	3000	HL102M250P400A
	1200	30	45	87	170	3000	HL122M250O450A
	1200	35	40	87	170	3110	HL122M250P400A
	1500	35	45	67	130	3560	HL152M250P450A
	1800	35	50	56	110	3980	HL182M250P500A
315	68	22	25	1500	2930	320	HL680M315M250A
	82	22	30	1250	2430	380	HL820M315M300A
	100	25	25	1020	1990	410	HL101M315N250A
	150	22	25	680	1330	850	HL151M315M250A
	180	22	30	570	1110	1010	HL181M315M300A
	180	25	25	570	1110	1040	HL181M315N250A
	220	22	35	460	900	1100	HL221M315M350A
	220	25	25	460	900	1200	HL221M315N250A
	220	30	25	460	900	1250	HL221M315O250A
	270	22	40	380	740	1250	HL271M315M400A
	270	25	30	380	740	1260	HL271M315N300A
	270	30	30	380	740	1270	HL271M315O300A
	330	22	45	310	600	1320	HL331M315M450A
	330	25	35	310	600	1320	HL331M315N350A
	330	30	25	310	600	1320	HL331M315O250A
	330	30	30	310	600	1340	HL331M315O300A
	330	35	25	310	600	1380	HL331M315P250A
	390	22	50	260	510	1590	HL391M315M500A
	390	25	40	260	510	1610	HL391M315N400A
	390	30	40	260	510	1620	HL391M315O400A
	390	35	30	260	510	1630	HL391M315P300A
	470	22	60	220	420	1710	HL471M315M600A
	470	25	45	220	420	1750	HL471M315N450A
	470	30	35	220	420	1780	HL471M315O350A
	470	35	30	220	420	1790	HL471M315P300A
	560	25	50	180	360	2220	HL561M315N500A
	560	30	40	180	360	2250	HL561M315O400A
	560	35	30	180	360	2320	HL561M315P300A
	560	35	35	180	360	2350	HL561M315P350A
	680	25	60	150	290	2530	HL681M315N600A
	680	30	45	150	290	2530	HL681M315O450A
	680	35	35	150	290	2550	HL681M315P350A
	680	35	40	150	290	2560	HL681M315P400A
820	30	50	120	240	2790	HL821M315O500A	
820	35	40	120	240	2880	HL821M315P400A	
820	35	45	120	240	3000	HL821M315P450A	
1000	30	60	100	200	3200	HL102M315O600A	
1000	35	50	100	200	3300	HL102M315P500A	
1200	35	55	87	170	3310	HL122M315P550A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
350	56	22	20	1820	3550	3330	HL560M350M200A
	68	22	25	1500	2930	340	HL680M350M250A
	82	22	30	1250	2430	400	HL820M350M300A
	100	25	25	1020	1990	470	HL101M350N250A
	120	22	25	850	1660	720	HL121M350M250A
	150	22	30	680	1330	870	HL151M350M300A
	150	25	25	680	1330	890	HL151M350N250A
	180	22	40	570	1110	1060	HL181M350M400A
	180	25	25	570	1110	1070	HL181M350N250A
	180	25	30	570	1110	1080	HL181M350N300A
	220	22	40	460	900	1350	HL221M350M400A
	220	25	30	460	900	1360	HL221M350N300A
	220	30	25	460	900	1380	HL221M350O250A
	270	22	45	380	740	1390	HL271M350M450A
	270	25	35	380	740	1400	HL271M350N350A
	270	30	30	380	740	1410	HL271M350O300A
	270	35	25	380	740	1420	HL271M350P250A
	330	22	50	310	600	1430	HL331M350M500A
	330	25	40	310	600	1440	HL331M350N400A
	330	30	35	310	600	1440	HL331M350O350A
	330	35	30	310	600	1450	HL331M350P300A
	390	25	45	260	510	1600	HL391M350N450A
	390	30	40	260	510	1630	HL391M350O400A
	390	35	30	260	510	1640	HL391M350P300A
	470	25	50	220	420	1770	HL471M350N500A
	470	30	45	220	420	1810	HL471M350O450A
	470	35	35	220	420	1820	HL471M350P350A
	560	30	50	180	360	2360	HL561M350O500A
560	35	40	180	360	2370	HL561M350P400A	
680	35	45	150	290	2600	HL681M350P450A	
820	35	50	120	240	2870	HL821M350P500A	
385	100	22	25	1020	1990	680	HL101M385M250A
	120	22	25	850	1660	760	HL121M385M250A
	120	22	30	850	1660	860	HL121M385M300A
	150	22	30	680	1330	880	HL151M385M300A
	150	25	25	680	1330	890	HL151M385N250A
	180	22	30	570	1110	1060	HL181M385M300A
	180	22	40	570	1110	1070	HL181M385M400A
	180	25	25	570	1110	1090	HL181M385N250A
	180	25	30	570	1110	1100	HL181M385N300A
	180	30	25	570	1110	1120	HL181M385O250A
	220	22	35	460	900	1340	HL221M385M350A
	220	22	45	460	900	1450	HL221M385M450A
220	25	30	460	900	1390	HL221M385N300A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
385	220	25	35	460	900	1450	HL221M385N350A
	220	30	30	460	900	1400	HL221M385O300A
	220	35	25	460	900	1410	HL221M385P250A
	270	22	45	380	740	1450	HL271M385M450A
	270	22	50	380	740	1500	HL271M385M500A
	270	25	35	380	740	1450	HL271M385N350A
	270	25	40	380	740	1500	HL271M385N400A
	270	30	30	380	740	1500	HL271M385O300A
	270	35	30	380	740	1580	HL271M385P300A
	330	22	50	310	600	1550	HL331M385M500A
	330	22	55	310	600	1610	HL331M385M550A
	330	25	40	310	600	1560	HL331M385N400A
	330	25	45	310	600	1640	HL331M385N450A
	330	30	30	310	600	1610	HL331M385O300A
	330	30	35	310	600	1650	HL331M385O350A
	330	35	25	310	600	1660	HL331M385P250A
	330	35	30	310	600	1700	HL331M385P300A
	390	25	45	260	510	1700	HL391M385N450A
	390	25	50	260	510	1780	HL391M385N500A
	390	30	35	260	510	1700	HL391M385O350A
	390	30	40	260	510	1800	HL391M385O400A
	390	35	30	260	510	1720	HL391M385P300A
	390	35	35	260	510	1820	HL391M385P350A
	470	25	55	220	420	1900	HL471M385N550A
	470	30	40	220	420	1860	HL471M385O400A
	470	30	45	220	420	1900	HL471M385O450A
	470	35	35	220	420	1920	HL471M385P350A
	470	35	40	220	420	2100	HL471M385P400A
	560	25	60	180	360	2450	HL561M385N600A
	560	30	45	180	360	2390	HL561M385O450A
	560	30	50	180	360	2450	HL561M385O500A
	560	35	35	180	360	2430	HL561M385P350A
	560	35	45	180	360	2520	HL561M385P450A
	680	30	50	150	290	2640	HL681M385O500A
	680	30	55	150	290	2770	HL681M385O550A
	680	35	40	150	290	2720	HL681M385P400A
	680	35	50	150	290	2800	HL681M385P500A
	820	30	60	120	240	2850	HL821M385O600A
	820	35	50	120	240	2880	HL821M385P500A
	820	35	55	120	240	2980	HL821M385P550A
1000	35	55	100	200	3180	HL102M385P550A	
1000	35	60	100	200	3280	HL102M385P600A	

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
400	56	22	25	1820	3550	380	HL560M400M250A □□
	68	22	25	1500	2930	510	HL680M400M250A □□
	68	25	20	1500	2930	520	HL680M400N200A □□
	82	22	25	1250	2430	560	HL820M400M250A □□
	82	25	25	1250	2430	610	HL820M400N250A □□
	100	22	25	1020	1990	620	HL101M400M250A □□
	100	22	30	1020	1990	670	HL101M400M300A □□
	100	25	25	1020	1990	680	HL101M400N250A □□
	120	22	30	850	1660	730	HL121M400M300A □□
	120	25	25	850	1660	740	HL121M400N250A □□
	120	30	25	850	1660	800	HL121M400O250A □□
	150	22	30	680	1330	800	HL151M400M300A □□
	150	25	30	680	1330	880	HL151M400N300A □□
	150	30	25	680	1330	920	HL151M400O250A □□
	180	22	35	570	1110	960	HL181M400M350A □□
	180	25	30	570	1110	970	HL181M400N300A □□
	180	30	25	570	1110	1000	HL181M400O250A □□
	220	25	30	460	900	1020	HL221M400N300A □□
	220	30	25	460	900	1020	HL221M400O250A □□
	220	30	30	460	900	1050	HL221M400O300A □□
	270	22	45	380	740	1160	HL271M400M450A □□
	270	22	50	380	740	1210	HL271M400M500A □□
	270	25	35	380	740	1160	HL271M400N350A □□
	270	30	30	380	740	1210	HL271M400O300A □□
	270	30	35	380	740	1240	HL271M400O350A □□
	270	35	25	380	740	1230	HL271M400P250A □□
	330	25	40	310	600	1310	HL331M400N400A □□
	330	30	30	310	600	1310	HL331M400O300A □□
	330	35	25	310	600	1310	HL331M400P250A □□
	470	30	45	220	420	1820	HL471M400O450A □□
	470	35	35	220	420	1820	HL471M400P350A □□
	470	35	40	220	420	1890	HL471M400P400A □□
	560	30	45	180	360	1990	HL561M400O450A □□
	560	30	50	180	360	2080	HL561M400O500A □□
560	35	40	180	360	2080	HL561M400P400A □□	
560	35	45	180	360	2170	HL561M400P450A □□	
680	35	45	150	290	2390	HL681M400P450A □□	
680	35	50	150	290	2500	HL681M400P500A □□	
820	35	50	120	240	2500	HL821M400P500A □□	
820	35	55	120	240	2860	HL821M400P550A □□	
1200	35	60	87	170	3160	HL122M400P600A □□	

□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
420	39	22	25	3490	6800	340	HL390M420M250A
	68	25	25	2000	3900	550	HL680M420N250A
	82	22	25	1660	3230	560	HL820M420M250A
	100	22	25	1360	2650	620	HL101M420M250A
	100	22	30	1360	2650	670	HL101M420M300A
	100	25	25	1360	2650	670	HL101M420N250A
	120	22	30	1130	2210	730	HL121M420M300A
	120	25	25	1130	2210	740	HL121M420N250A
	150	22	35	910	1770	880	HL151M420M350A
	150	25	30	910	1770	890	HL151M420N300A
	150	30	25	910	1770	920	HL151M420O250A
	180	22	35	750	1470	960	HL181M420M350A
	180	22	40	750	1470	1020	HL181M420M400A
	180	25	30	750	1470	1010	HL181M420N300A
	180	30	25	750	1470	1020	HL181M420O250A
	220	22	45	620	1210	1050	HL221M420M450A
	220	25	35	620	1210	1050	HL221M420N350A
	220	30	30	620	1210	1050	HL221M420O300A
	220	35	25	620	1210	1050	HL221M420P250A
	270	22	50	500	980	1210	HL271M420M500A
	270	25	40	500	980	1210	HL271M420N400A
	270	30	30	500	980	1210	HL271M420O300A
	270	30	35	500	980	1240	HL271M420O350A
	270	35	25	500	980	1210	HL271M420P250A
	270	35	30	500	980	1280	HL271M420P300A
	330	25	50	410	800	1440	HL331M420N500A
	330	30	35	410	800	1370	HL331M420O350A
	330	35	30	410	800	1440	HL331M420P300A
	470	30	45	290	560	1820	HL471M420O450A
	470	35	40	290	560	1890	HL471M420P400A
560	30	55	240	470	2170	HL561M420O550A	
560	35	45	240	470	2170	HL561M420P450A	
680	30	60	200	390	2480	HL681M420O600A	
680	35	50	200	390	2500	HL681M420P500A	
820	35	55	160	320	2910	HL821M420P550A	
820	35	60	160	320	2970	HL821M420P600A	
1000	35	60	140	270	3280	HL102M420P600A	
450	39	22	25	3490	6800	370	HL390M450M250A
	47	22	25	2890	5640	380	HL470M450M250A
	56	22	25	2430	4740	450	HL560M450M250A
	68	22	30	2000	3900	550	HL680M450M300A
	68	25	25	2000	3900	550	HL680M450N250A
	82	22	25	1660	3230	560	HL820M450M250A
	82	22	30	1660	3230	610	HL820M450M300A

See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R - Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	82	25	30	1660	3230	650	HL820M450N300A
	100	22	30	1360	2650	670	HL101M450M300A
	100	25	25	1360	2650	670	HL101M450N250A
	100	30	25	1360	2650	750	HL101M450O250A
	120	22	35	1130	2210	750	HL121M450M350A
	120	25	30	1130	2210	750	HL121M450N300A
	120	30	30	1130	2210	880	HL121M450O300A
	150	22	40	910	1770	930	HL151M450M400A
	150	25	25	910	1770	880	HL151M450N250A
	150	30	30	910	1770	990	HL151M450O300A
	150	35	30	910	1770	1080	HL151M450P300A
	180	22	45	750	1470	1100	HL181M450M450A
	180	25	35	750	1470	1100	HL181M450N350A
	180	30	30	750	1470	1100	HL181M450O300A
	180	35	25	750	1470	1110	HL181M450P250A
	220	25	35	620	1210	1130	HL221M450N350A
	220	30	30	620	1210	1130	HL221M450O300A
	220	30	35	620	1210	1150	HL221M450O350A
	220	35	30	620	1210	1160	HL221M450P300A
	270	25	45	500	980	1240	HL271M450N450A
	270	25	50	500	980	1300	HL271M450N500A
	270	30	40	500	980	1300	HL271M450O400A
	270	35	30	500	980	1300	HL271M450P300A
	330	25	50	410	800	1440	HL331M450N500A
	330	30	40	410	800	1450	HL331M450O400A
	330	35	35	410	800	1500	HL331M450P350A
	390	30	45	350	680	1660	HL391M450O450A
	390	35	35	350	680	1630	HL391M450P350A
470	35	40	290	560	1890	HL471M450P400A	
560	35	50	240	470	2270	HL561M450P500A	
680	35	55	200	390	2610	HL681M450P550A	
500	47	22	25	2890	5640	380	HL470M500M250A
	56	25	25	2430	4740	440	HL560M500N250A
	68	22	30	2000	3900	490	HL680M500M300A
	68	25	25	2000	3900	490	HL680M500N250A
	82	22	35	1660	3230	570	HL820M500M350A
	82	25	30	1660	3230	580	HL820M500N300A
	82	30	25	1660	3230	600	HL820M500O250A
	100	22	40	1360	2650	670	HL101M500M400A
	100	25	35	1360	2650	680	HL101M500N350A
	100	30	25	1360	2650	670	HL101M500O250A
	120	25	40	1130	2210	790	HL121M500N400A
	120	30	25	1130	2210	720	HL121M500O250A
150	22	50	910	1770	910	HL151M500M500A	

See description at end of standard ratings

STANDARD RATINGS

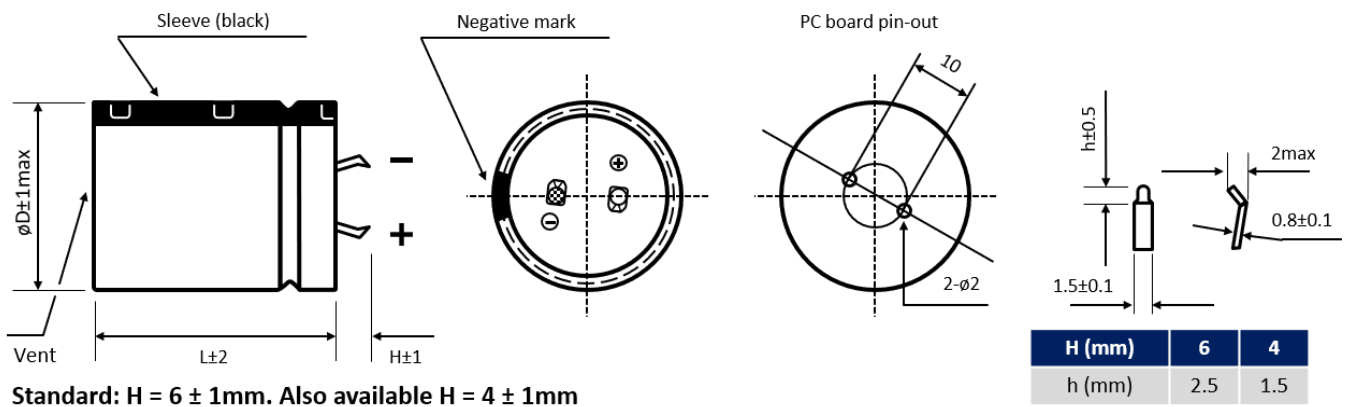
V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R = Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
500	150	25	45	910	1770	930	HL151M500N450A
	150	30	30	910	1770	910	HL151M500O300A
	180	25	50	750	1470	1060	HL181M500N500A
	180	30	35	750	1470	1010	HL181M500O350A
	180	35	30	750	1470	1050	HL181M500P300A
	220	25	50	620	1210	1180	HL221M500N500A
	220	30	45	620	1210	1250	HL221M500O450A
	220	35	30	620	1210	1160	HL221M500P300A
	270	30	50	500	980	1440	HL271M500O500A
	270	35	35	500	980	1360	HL271M500P350A
	330	35	40	410	800	1620	HL331M500P400A
	390	35	50	350	680	1830	HL391M500P500A
	470	35	55	290	560	2150	HL471M500P550A

: Enter **P6** for standard type • 6mm pin length
: Enter **Z6** for 3-pin type • 6mm pin length
: Enter **Y6** for multipin-type • 6mm pin length

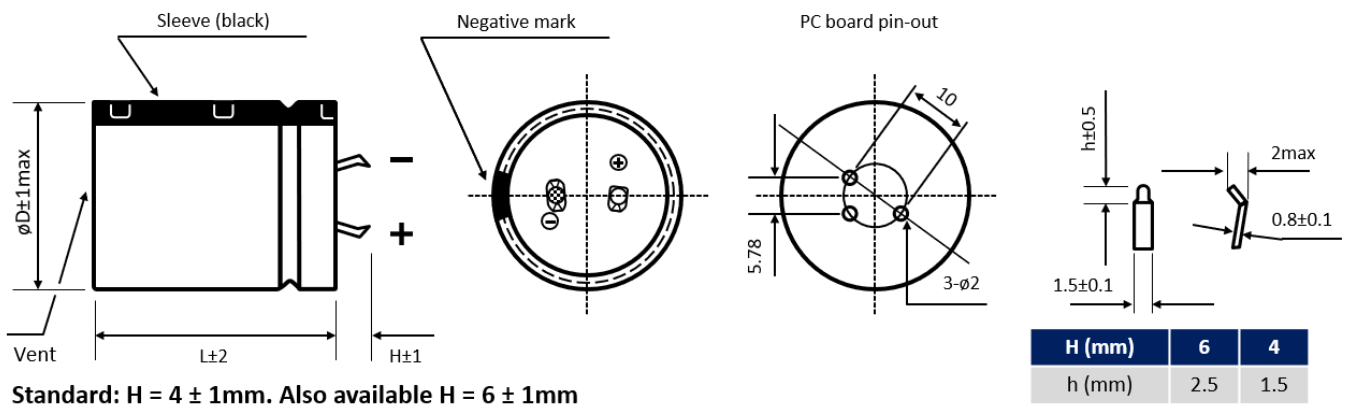
: Enter **P4** for standard type • 4mm pin length
: Enter **Z4** for 3-pin type • 4mm pin length
: Enter **Y4** for multipin type • 4mm pin length

DIMENSIONS • All dimensions in mm

2-pin version • Standard type

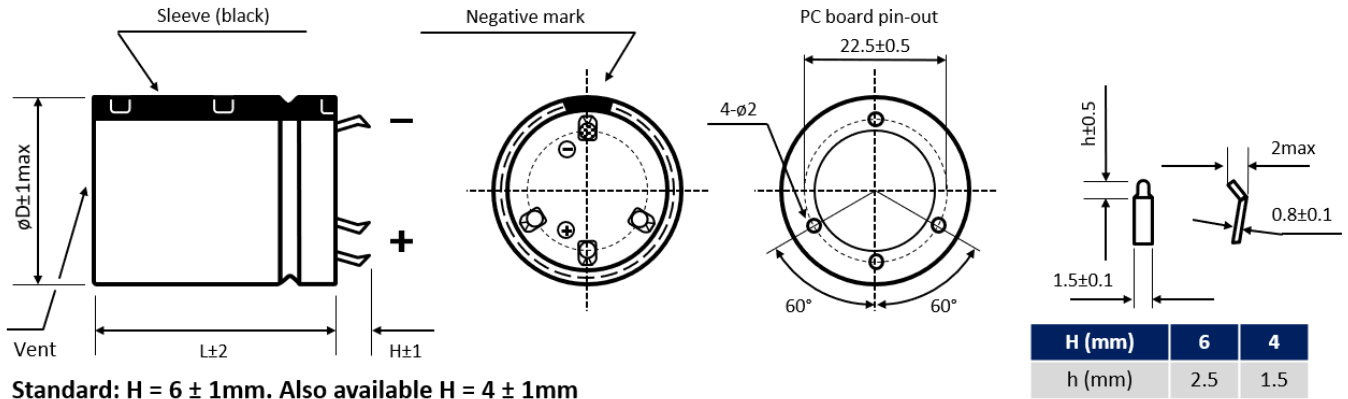


3-pin version • Polarity protection



DIMENSIONS ▪ All dimensions in mm

Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$10 \leq V_R \leq 100$	0.88	1	1.07	1.15	1.15	1.15
$160 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 500$	0.77	1	1.16	1.3	1.41	1.43

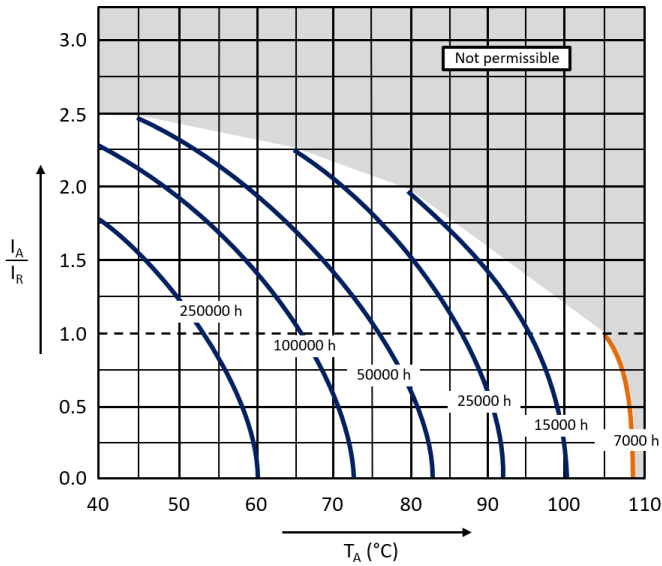
PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

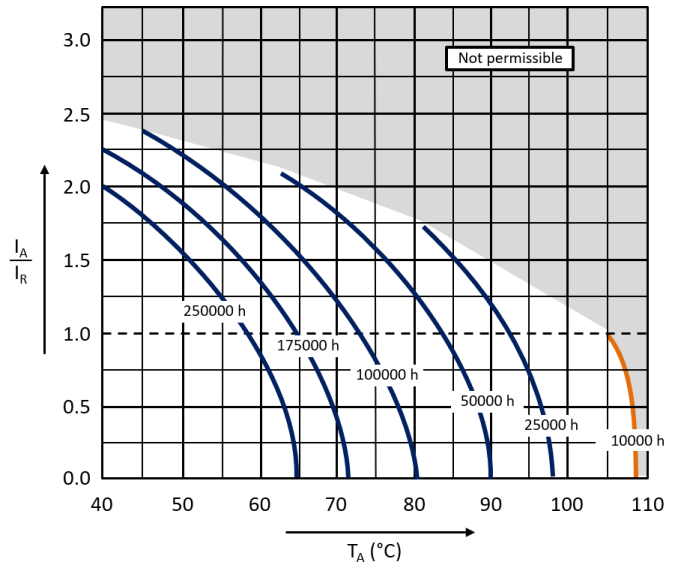
General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE

$V_R \leq 100V$



$V_R \geq 160V$



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor

DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

UL SERIES ▀ ULTRA LONG LIFE, AUTOMOTIVE 105°C TYPE

KEY FEATURES



- ALUMINUM ELECTROLYTIC CAPACITOR • Snap-In type
- Useful life: 105°C • 10000 hours
- Extremely stable dissipation factor and leakage current
- Especially for applications with demanding operating environment
- AEC-Q200 version available



SPECIFICATIONS

Items		Performance Characteristics			
Operating Temperature Range		-40 ~ +105°C		-25 ~ +105°C	
Rated Voltage Range	V _R	200 ~ 450V DC		500 ~ 550V DC	
Surge Voltage	V _S	(V _R ≤ 315V) ▪ V _S = 1.15·V _R		(V _R > 315V) ▪ V _S = 1.10·V _R	
Capacitance Range	C _R	82 ~ 2700µF		47 ~ 680µF	
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)			
Leakage Current (20°C ▪ V _R applied)	I _{LEAK}	≤ 3 · √C _R · V _R ▪ After 5 minutes [I _{LEAK} (µA) ; C _R (µF) ; V _R (V)]			
Dissipation Factor % (20°C ▪ 120Hz)	tanδ	V _R (V DC)	200 ~ 400	450 ~ 550	
		tanδ	15	20	
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings			
Low Temperature Characteristics at 120Hz	Z ratio max.	V _R (V DC)	200 ~ 250	315 ~ 450	500 ~ 550
		Z-25°C/Z+20°C	4	5	6
		Z-40°C/Z+20°C	7	10	-

Lifetime Test					
Useful Life 105°C (V _R & I _R applied)	Test	10 000 hours			
	ΔC/C _R	≤ ±20% of initial measured value			
	tanδ	≤ 200% of initial specified value			
	I _{Leak}	≤ the initial specified value			
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria				
Endurance 105°C (V _R & I _R applied)	Test	5 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Shelf Life 105°C (V _R = 0)	Test	1 000 hours			
	ΔC/C _R	≤ ±15% of initial measured value			
	tanδ	≤ 175% of initial specified value			
	I _{Leak}	≤ the initial specified value			
Before measurement: Restore capacitor to 20°C, apply V _R for 30 min according JIS-C-5101-4					
Vibration Resistance Test	Max. 10g force, f _{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6				

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
200	180	22	20	580	1110	750	UL181M200M200A□□□
	220	22	25	470	900	800	UL221M200M250A□□□
	270	22	25	390	740	1310	UL271M200M250A□□□
	270	22	30	390	740	1350	UL271M200M300A□□□
	270	25	25	390	740	1350	UL271M200N250A□□□
	330	22	25	320	600	1410	UL331M200M250A□□□
	330	22	30	320	600	1530	UL331M200M300A□□□
	330	25	25	320	600	1480	UL331M200N250A□□□
	390	22	30	270	510	1630	UL391M200M300A□□□
	390	22	35	270	510	1680	UL391M200M350A□□□
	390	25	25	270	510	1630	UL391M200N250A□□□
	390	25	30	270	510	1680	UL391M200N300A□□□
	390	30	25	270	510	1680	UL391M200O250A□□□
	470	22	30	220	420	1720	UL471M200M300A□□□
	470	22	35	220	420	1840	UL471M200M350A□□□
	470	25	25	220	420	1630	UL471M200N250A□□□
	470	25	30	220	420	1750	UL471M200N300A□□□
	470	35	25	220	420	1750	UL471M200P250A□□□
	560	22	35	190	360	1950	UL561M200M350A□□□
	560	22	40	190	360	2070	UL561M200M400A□□□
	560	25	30	190	360	1840	UL561M200N300A□□□
	560	25	35	190	360	1920	UL561M200N350A□□□
	560	30	30	190	360	1840	UL561M200O300A□□□
	560	35	25	190	360	1840	UL561M200P250A□□□
	680	22	40	150	290	2220	UL681M200M400A□□□
	680	22	45	150	290	2320	UL681M200M450A□□□
	680	25	35	150	290	2110	UL681M200N350A□□□
	680	25	40	150	290	2320	UL681M200N400A□□□
	680	30	30	150	290	2110	UL681M200O300A□□□
	680	30	35	150	290	2320	UL681M200O350A□□□
	680	35	30	150	290	2320	UL681M200P300A□□□
	820	22	50	130	240	2600	UL821M200M500A□□□
	820	25	40	130	240	2370	UL821M200N400A□□□
	820	30	30	130	240	2110	UL821M200O300A□□□
	820	30	35	130	240	2370	UL821M200O350A□□□
	820	35	30	130	240	2370	UL821M200P300A□□□
	1000	22	60	110	200	3000	UL102M200M600A□□□
	1000	25	45	110	200	2630	UL102M200N450A□□□
	1000	30	35	110	200	2370	UL102M200O350A□□□
	1000	30	40	110	200	2420	UL102M200O400A□□□
1000	35	30	110	200	2370	UL102M200P300A□□□	
1000	35	35	110	200	2420	UL102M200P350A□□□	
1200	25	50	89	170	2880	UL122M200N500A□□□	
1200	30	40	89	170	2550	UL122M200O400A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
200	1200	35	30	89	170	2440	UL122M200P300A□□□
	1200	35	35	89	170	2880	UL122M200P350A□□□
	1500	30	45	68	130	2820	UL152M200O450A□□□
	1500	30	50	68	130	3000	UL152M200O500A□□□
	1500	35	35	68	130	2980	UL152M200P350A□□□
	1500	35	40	68	130	3080	UL152M200P400A□□□
	1800	30	50	58	110	3080	UL182M200O500A□□□
	1800	35	40	58	110	3180	UL182M200P400A□□□
	1800	35	45	58	110	3280	UL182M200P450A□□□
	2200	35	50	48	90	3450	UL222M200P500A□□□
2700	35	60	39	74	4000	UL272M200P600A□□□	
250	220	22	25	470	900	850	UL221M250M250A□□□
	270	22	25	390	740	1320	UL271M250M250A□□□
	270	22	30	390	740	1360	UL271M250M300A□□□
	270	25	25	390	740	1360	UL271M250N250A□□□
	330	22	30	320	600	1550	UL331M250M300A□□□
	330	22	35	320	600	1600	UL331M250M350A□□□
	330	25	25	320	600	1450	UL331M250N250A□□□
	330	25	30	320	600	1600	UL331M250N300A□□□
	390	22	35	270	510	1750	UL391M250M350A□□□
	390	22	40	270	510	1800	UL391M250M400A□□□
	390	25	30	270	510	1680	UL391M250N300A□□□
	390	25	35	270	510	1730	UL391M250N350A□□□
	390	30	30	270	510	1730	UL391M250O300A□□□
	470	22	40	220	420	1970	UL471M250M400A□□□
	470	22	45	220	420	2020	UL471M250M450A□□□
	470	25	30	220	420	1750	UL471M250N300A□□□
	470	25	35	220	420	1800	UL471M250N350A□□□
	470	30	25	220	420	1750	UL471M250O250A□□□
	470	30	30	220	420	1800	UL471M250O300A□□□
	560	22	45	190	360	2200	UL561M250M450A□□□
	560	25	40	190	360	2200	UL561M250N400A□□□
	560	30	30	190	360	1970	UL561M250O300A□□□
	560	30	35	190	360	2050	UL561M250O350A□□□
	560	35	30	190	360	2050	UL561M250P300A□□□
	680	22	50	150	290	2450	UL681M250M500A□□□
	680	25	45	150	290	2250	UL681M250N450A□□□
	680	30	35	150	290	2180	UL681M250O350A□□□
	680	30	40	150	290	2250	UL681M250O400A□□□
	680	35	30	150	290	2180	UL681M250P300A□□□
	820	25	50	130	240	2490	UL821M250N500A□□□
820	30	45	130	240	2190	UL821M250O450A□□□	
820	35	35	130	240	2150	UL821M250P350A□□□	
1000	25	55	110	200	2910	UL102M250N550A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
250	1000	30	40	110	200	2440	UL102M250O400A□□□
	1000	30	45	110	200	2540	UL102M250O450A□□□
	1000	35	35	110	200	2380	UL102M250P350A□□□
	1000	35	40	110	200	2540	UL102M250P400A□□□
	1200	30	45	89	170	2680	UL122M250O450A□□□
	1200	30	50	89	170	2730	UL122M250O500A□□□
	1200	35	40	89	170	2720	UL122M250P400A□□□
	1500	30	55	68	130	3150	UL152M250O550A□□□
	1500	35	45	68	130	3150	UL152M250P450A□□□
	1500	35	50	68	130	3200	UL152M250P500A□□□
	1800	35	50	58	110	3420	UL182M250P500A□□□
	1800	35	55	58	110	3600	UL182M250P550A□□□
2200	35	60	48	90	3750	UL222M250P600A□□□	
315	120	22	25	870	1660	720	UL121M315M250A□□□
	150	22	25	700	1330	1000	UL151M315M250A□□□
	150	22	30	700	1330	1030	UL151M315M300A□□□
	150	30	25	700	1330	1000	UL151M315O250A□□□
	180	22	30	580	1110	1140	UL181M315M300A□□□
	180	22	35	580	1110	1180	UL181M315M350A□□□
	180	25	30	580	1110	1180	UL181M315N300A□□□
	220	22	35	470	900	1310	UL221M315M350A□□□
	220	22	40	470	900	1350	UL221M315M400A□□□
	220	25	30	470	900	1310	UL221M315N300A□□□
	220	25	35	470	900	1350	UL221M315N350A□□□
	220	30	25	470	900	1310	UL221M315O250A□□□
	270	22	40	390	740	1490	UL271M315M400A□□□
	270	22	45	390	740	1540	UL271M315M450A□□□
	270	25	35	390	740	1390	UL271M315N350A□□□
	270	25	40	390	740	1540	UL271M315N400A□□□
	270	30	30	390	740	1390	UL271M315O300A□□□
	330	22	45	320	600	1690	UL331M315M450A□□□
	330	22	50	320	600	1760	UL331M315M500A□□□
	330	25	35	320	600	1590	UL331M315N350A□□□
	330	25	40	320	600	1630	UL331M315N400A□□□
	330	30	25	320	600	1410	UL331M315O250A□□□
	330	30	30	320	600	1460	UL331M315O300A□□□
	330	35	25	320	600	1460	UL331M315P250A□□□
	390	22	50	270	510	1870	UL391M315M500A□□□
	390	25	40	270	510	1780	UL391M315N400A□□□
	390	25	45	270	510	1830	UL391M315N450A□□□
	390	30	30	270	510	1630	UL391M315O300A□□□
	390	30	35	270	510	1680	UL391M315O350A□□□
	390	35	25	270	510	1480	UL391M315P250A□□□
390	35	30	270	510	1550	UL391M315P300A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
315	470	22	55	220	420	2090	UL471M315M550A□□□
	470	25	45	220	420	1990	UL471M315N450A□□□
	470	30	35	220	420	1860	UL471M315O350A□□□
	470	30	40	220	420	1990	UL471M315O400A□□□
	470	35	30	220	420	1740	UL471M315P300A□□□
	470	35	35	220	420	1990	UL471M315P350A□□□
	560	22	60	190	360	2290	UL561M315M600A□□□
	560	25	50	190	360	2210	UL561M315N500A□□□
	560	30	40	190	360	2080	UL561M315O400A□□□
	560	30	45	190	360	2160	UL561M315O450A□□□
	560	35	30	190	360	2080	UL561M315P300A□□□
	560	35	35	190	360	2160	UL561M315P350A□□□
	680	25	55	150	290	2440	UL681M315N550A□□□
	680	25	60	150	290	2500	UL681M315N600A□□□
	680	30	45	150	290	2320	UL681M315O450A□□□
	680	30	50	150	290	2400	UL681M315O500A□□□
	680	35	35	150	290	2160	UL681M315P350A□□□
	680	35	40	150	290	2130	UL681M315P400A□□□
	820	30	50	130	240	2550	UL821M315O500A□□□
	820	30	55	130	240	2590	UL821M315O550A□□□
	820	35	40	130	240	2260	UL821M315P400A□□□
	820	35	45	130	240	2350	UL821M315P450A□□□
	1000	30	55	110	200	2780	UL102M315O550A□□□
	1000	30	60	110	200	2820	UL102M315O600A□□□
	1000	35	50	110	200	2700	UL102M315P500A□□□
	1200	30	60	89	170	3010	UL122M315O600A□□□
	1200	35	55	89	170	2920	UL122M315P550A□□□
	1200	35	60	89	170	2960	UL122M315P600A□□□
1500	35	60	68	130	3420	UL152M315P600A□□□	
1500	35	65	68	130	3620	UL152M315P650A□□□	
350	100	22	25	1050	1990	500	UL101M350M250A□□□
	120	22	25	870	1660	920	UL121M350M250A□□□
	120	22	30	870	1660	940	UL121M350M300A□□□
	150	22	30	700	1330	1080	UL151M350M300A□□□
	150	25	25	700	1330	1050	UL151M350N250A□□□
	180	22	35	580	1110	1220	UL181M350M350A□□□
	180	22	40	580	1110	1270	UL181M350M400A□□□
	180	25	30	580	1110	1200	UL181M350N300A□□□
	220	22	40	470	900	1390	UL221M350M400A□□□
	220	22	45	470	900	1430	UL221M350M450A□□□
	220	25	30	470	900	1300	UL221M350N300A□□□
	220	25	35	470	900	1350	UL221M350N350A□□□
	220	30	25	470	900	1300	UL221M350O250A□□□
	270	22	45	390	740	1570	UL271M350M450A□□□

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STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
350	270	22	50	390	740	1620	UL271M350M500A□□□
	270	25	35	390	740	1490	UL271M350N350A□□□
	270	25	40	390	740	1530	UL271M350N400A□□□
	270	30	25	390	740	1340	UL271M350O250A□□□
	270	30	30	390	740	1490	UL271M350O300A□□□
	270	35	25	390	740	1420	UL271M350P250A□□□
	330	22	50	320	600	1770	UL331M350M500A□□□
	330	25	40	320	600	1690	UL331M350N400A□□□
	330	25	45	320	600	1770	UL331M350N450A□□□
	330	30	30	320	600	1560	UL331M350O300A□□□
	330	30	35	320	600	1690	UL331M350O350A□□□
	330	35	25	320	600	1560	UL331M350P250A□□□
	390	22	55	270	510	1960	UL391M350M550A□□□
	390	25	45	270	510	1880	UL391M350N450A□□□
	390	25	50	270	510	1970	UL391M350N500A□□□
	390	30	35	270	510	1770	UL391M350O350A□□□
	390	30	40	270	510	1830	UL391M350O400A□□□
	390	30	45	270	510	1920	UL391M350O450A□□□
	390	35	30	270	510	1660	UL391M350P300A□□□
	390	35	35	270	510	1730	UL391M350P350A□□□
	470	25	50	220	420	2090	UL471M350N500A□□□
	470	25	55	220	420	2140	UL471M350N550A□□□
	470	30	40	220	420	1990	UL471M350O400A□□□
	470	30	45	220	420	2090	UL471M350O450A□□□
	470	35	35	220	420	1900	UL471M350P350A□□□
	560	25	55	190	360	2300	UL561M350N550A□□□
	560	25	60	190	360	2380	UL561M350N600A□□□
	560	30	45	190	360	2200	UL561M350O450A□□□
	560	30	50	190	360	2300	UL561M350O500A□□□
	560	35	40	190	360	2130	UL561M350P400A□□□
	560	35	45	190	360	2350	UL561M350P450A□□□
	680	30	50	150	290	2430	UL681M350O500A□□□
	680	30	55	150	290	2480	UL681M350O550A□□□
	680	35	40	150	290	2170	UL681M350P400A□□□
	680	35	45	150	290	2400	UL681M350P450A□□□
	820	30	55	130	240	2500	UL821M350O550A□□□
	820	30	60	130	240	2650	UL821M350O600A□□□
	820	35	45	130	240	2450	UL821M350P450A□□□
	820	35	50	130	240	2500	UL821M350P500A□□□
	1000	35	50	110	200	2800	UL102M350P500A□□□
1000	35	60	110	200	3000	UL102M350P600A□□□	
1000	40	50	110	200	3000	UL102M350Q500A□□□	
1200	35	60	89	170	3010	UL122M350P600A□□□	
1200	35	70	89	170	3230	UL122M350P700A□□□	

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STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C - 120Hz (m Ω)	Max. ESR +20°C - 120Hz (m Ω)	I_R - Max. Ripple Current +105°C - 120Hz (mA rms)	CapXon Part Number
350	1200	40	60	89	170	3250	UL122M350Q600A□□□
	1500	40	80	68	130	4210	UL152M350Q800A□□□
	1500	45	60	68	130	4060	UL152M350V600A□□□
	1800	40	90	58	110	4900	UL182M350Q900A□□□
	1800	45	70	58	110	4750	UL182M350V700A□□□
	2200	45	85	48	90	5400	UL222M350V850A□□□
	2700	45	100	39	74	6430	UL272M350VA00A□□□
400	82	22	25	1280	2430	550	UL820M400M250A□□□
	100	22	25	1050	1990	660	UL101M400M250A□□□
	100	22	30	1050	1990	680	UL101M400M300A□□□
	100	25	25	1050	1990	680	UL101M400N250A□□□
	120	22	25	870	1660	700	UL121M400M250A□□□
	120	22	30	870	1660	760	UL121M400M300A□□□
	120	25	25	870	1660	760	UL121M400N250A□□□
	150	22	30	700	1330	850	UL151M400M300A□□□
	150	22	35	700	1330	900	UL151M400M350A□□□
	150	25	25	700	1330	850	UL151M400N250A□□□
	150	25	30	700	1330	900	UL151M400N300A□□□
	180	22	35	580	1110	990	UL181M400M350A□□□
	180	22	40	580	1110	1050	UL181M400M400A□□□
	180	25	30	580	1110	1050	UL181M400N300A□□□
	180	25	35	580	1110	1100	UL181M400N350A□□□
	180	30	25	580	1110	1050	UL181M400O250A□□□
	220	22	45	470	900	1120	UL221M400M450A□□□
	220	22	50	470	900	1160	UL221M400M500A□□□
	220	25	30	470	900	1070	UL221M400N300A□□□
	220	25	35	470	900	1120	UL221M400N350A□□□
	220	30	25	470	900	1100	UL221M400O250A□□□
	220	30	30	470	900	1160	UL221M400O300A□□□
	270	22	50	390	740	1260	UL271M400M500A□□□
	270	25	40	390	740	1260	UL271M400N400A□□□
	270	25	45	390	740	1290	UL271M400N450A□□□
	270	30	30	390	740	1260	UL271M400O300A□□□
	270	30	35	390	740	1290	UL271M400O350A□□□
	270	35	25	390	740	1260	UL271M400P250A□□□
	330	22	55	320	600	1450	UL331M400M550A□□□
	330	25	40	320	600	1350	UL331M400N400A□□□
	330	25	45	320	600	1420	UL331M400N450A□□□
	330	30	30	320	600	1350	UL331M400O300A□□□
	330	30	35	320	600	1420	UL331M400O350A□□□
330	35	30	320	600	1460	UL331M400P300A□□□	
390	25	50	270	510	1620	UL391M400N500A□□□	
390	25	55	270	510	1690	UL391M400N550A□□□	
390	30	40	270	510	1620	UL391M400O400A□□□	

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STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕD (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
400	390	30	45	270	510	1690	UL391M400O450A□□□
	390	35	30	270	510	1590	UL391M400P300A□□□
	390	35	35	270	510	1690	UL391M400P350A□□□
	470	30	45	220	420	1880	UL471M400O450A□□□
	470	30	50	220	420	1970	UL471M400O500A□□□
	470	35	35	220	420	1860	UL471M400P350A□□□
	470	35	40	220	420	1960	UL471M400P400A□□□
	560	35	40	190	360	2130	UL561M400P400A□□□
	560	35	45	190	360	2250	UL561M400P450A□□□
	680	35	45	150	290	2480	UL681M400P450A□□□
	680	35	50	150	290	2600	UL681M400P500A□□□
	820	35	55	130	240	2670	UL821M400P550A□□□
	820	35	60	130	240	2780	UL821M400P600A□□□
	820	40	50	130	240	2780	UL821M400Q500A□□□
	1000	35	65	110	200	3250	UL102M400P650A□□□
	1000	40	55	110	200	3250	UL102M400Q550A□□□
	1200	35	75	89	170	3720	UL122M400P750A□□□
	1200	40	65	89	170	3720	UL122M400Q650A□□□
	1200	45	55	89	170	3720	UL122M400V550A□□□
	1500	40	80	68	130	4560	UL152M400Q800A□□□
1500	45	65	68	130	4560	UL152M400V650A□□□	
1800	45	80	58	110	5360	UL182M400V800A□□□	
450	82	22	25	1700	3230	600	UL820M450M250A□□□
	100	22	25	1390	2650	640	UL101M450M250A□□□
	100	22	30	1390	2650	690	UL101M450M300A□□□
	100	25	25	1390	2650	690	UL101M450N250A□□□
	120	22	30	1160	2210	760	UL121M450M300A□□□
	120	22	35	1160	2210	810	UL121M450M350A□□□
	120	25	25	1160	2210	760	UL121M450N250A□□□
	120	25	30	1160	2210	810	UL121M450N300A□□□
	150	22	35	930	1770	900	UL151M450M350A□□□
	150	22	40	930	1770	960	UL151M450M400A□□□
	150	25	30	930	1770	900	UL151M450N300A□□□
	150	25	35	930	1770	960	UL151M450N350A□□□
	150	30	25	930	1770	900	UL151M450O250A□□□
	150	30	30	930	1770	960	UL151M450O300A□□□
	180	22	40	770	1470	1050	UL181M450M400A□□□
	180	22	45	770	1470	1100	UL181M450M450A□□□
	180	25	30	770	1470	1050	UL181M450N300A□□□
	180	25	35	770	1470	1100	UL181M450N350A□□□
	180	30	25	770	1470	1030	UL181M450O250A□□□
	180	30	30	770	1470	1110	UL181M450O300A□□□
180	35	25	770	1470	1110	UL181M450P250A□□□	
220	22	45	640	1210	1160	UL221M450M450A□□□	

□□□ See description at end of standard ratings

STANDARD RATINGS

V_R (V)	C_R (μ F)	ϕ D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (m Ω)	Max. ESR +20°C • 120Hz (m Ω)	I_R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
450	220	25	35	640	1210	1150	UL221M450N350A□□□
	220	25	40	640	1210	1180	UL221M450N400A□□□
	220	30	30	640	1210	1150	UL221M450O300A□□□
	220	30	35	640	1210	1200	UL221M450O350A□□□
	220	35	25	640	1210	1150	UL221M450P250A□□□
	270	22	55	520	980	1310	UL271M450M550A□□□
	270	25	45	520	980	1290	UL271M450N450A□□□
	270	25	50	520	980	1310	UL271M450N500A□□□
	270	30	30	520	980	1230	UL271M450O300A□□□
	270	30	40	520	980	1350	UL271M450O400A□□□
	270	35	30	520	980	1350	UL271M450P300A□□□
	330	25	50	420	800	1500	UL331M450N500A□□□
	330	30	40	420	800	1500	UL331M450O400A□□□
	330	30	45	420	800	1580	UL331M450O450A□□□
	330	35	30	420	800	1500	UL331M450P300A□□□
	330	35	35	420	800	1580	UL331M450P350A□□□
	390	25	55	360	680	1690	UL391M450N550A□□□
	390	30	45	360	680	1720	UL391M450O450A□□□
	390	30	50	360	680	1800	UL391M450O500A□□□
	390	35	35	360	680	1720	UL391M450P350A□□□
	390	35	40	360	680	1790	UL391M450P400A□□□
	470	30	50	290	560	1970	UL471M450O500A□□□
	470	30	55	290	560	2060	UL471M450O550A□□□
	470	35	40	290	560	1950	UL471M450P400A□□□
	470	35	45	290	560	2060	UL471M450P450A□□□
	560	30	55	250	470	2240	UL561M450O550A□□□
	560	35	45	250	470	2160	UL561M450P450A□□□
	560	35	50	250	470	2360	UL561M450P500A□□□
	680	35	50	210	390	2500	UL681M450P500A□□□
	680	35	55	210	390	2620	UL681M450P550A□□□
	820	35	65	170	320	3000	UL821M450P650A□□□
	820	40	55	170	320	3000	UL821M450Q550A□□□
1000	35	70	140	270	3100	UL102M450P700A□□□	
1000	35	80	140	270	3560	UL102M450P800A□□□	
1000	40	70	140	270	3600	UL102M450Q700A□□□	
1000	45	60	140	270	3600	UL102M450V600A□□□	
1200	40	80	120	220	3950	UL122M450Q800A□□□	
1500	45	80	95	180	4800	UL152M450V800A□□□	
1800	45	90	79	150	5670	UL182M450V900A□□□	
500	47	22	25	2970	5640	400	UL470M500M250A□□□
	56	22	25	2490	4740	430	UL560M500M250A□□□
	56	22	30	2490	4740	470	UL560M500M300A□□□
	56	25	25	2490	4740	470	UL560M500N250A□□□
	68	22	30	2050	3900	520	UL680M500M300A□□□

□□□ See description at end of standard ratings

STANDARD RATINGS

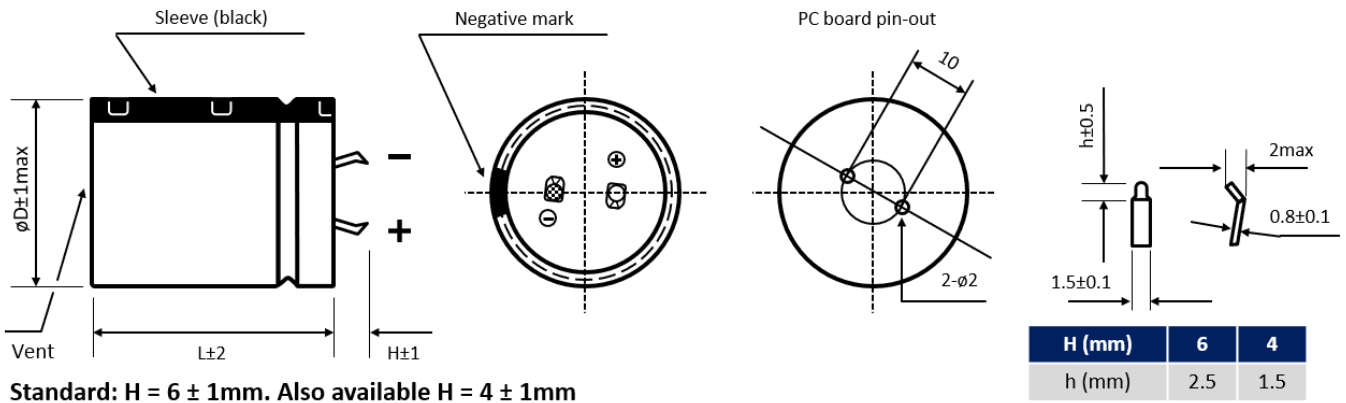
V _R (V)	C _R (μF)	ø D (mm)	L (mm)	Typ. ESR +20°C • 120Hz (mΩ)	Max. ESR +20°C • 120Hz (mΩ)	I _R • Max. Ripple Current +105°C • 120Hz (mA rms)	CapXon Part Number
500	68	22	35	2050	3900	550	UL680M500M350A□□□
	68	25	25	2050	3900	520	UL680M500N250A□□□
	68	25	30	2050	3900	550	UL680M500N300A□□□
	82	22	35	1700	3230	610	UL820M500M350A□□□
	82	25	30	1700	3230	610	UL820M500N300A□□□
	100	22	40	1390	2650	720	UL101M500M400A□□□
	100	25	35	1390	2650	720	UL101M500N350A□□□
	100	30	30	1390	2650	720	UL101M500O300A□□□
	120	22	45	1160	2210	740	UL121M500M450A□□□
	120	25	40	1160	2210	740	UL121M500N400A□□□
	120	30	35	1160	2210	770	UL121M500O350A□□□
	120	35	30	1160	2210	800	UL121M500P300A□□□
	150	22	50	930	1770	960	UL151M500M500A□□□
	150	25	45	930	1770	980	UL151M500N450A□□□
	150	30	35	930	1770	920	UL151M500O350A□□□
	150	35	30	930	1770	920	UL151M500P300A□□□
	180	25	50	770	1470	1130	UL181M500N500A□□□
	180	30	35	770	1470	1050	UL181M500O350A□□□
	180	35	30	770	1470	1100	UL181M500P300A□□□
	220	25	50	640	1210	1220	UL221M500N500A□□□
	220	30	45	640	1210	1250	UL221M500O450A□□□
	220	35	30	640	1210	1100	UL221M500P300A□□□
	220	35	35	640	1210	1230	UL221M500P350A□□□
	270	30	50	520	980	1510	UL271M500O500A□□□
	270	35	35	520	980	1310	UL271M500P350A□□□
	270	35	40	520	980	1420	UL271M500P400A□□□
	330	35	40	420	800	1480	UL331M500P400A□□□
	330	35	45	420	800	1560	UL331M500P450A□□□
	390	35	50	360	680	1780	UL391M500P500A□□□
	470	35	55	290	560	2140	UL471M500P550A□□□
470	35	60	290	560	2260	UL471M500P600A□□□	
560	35	65	250	470	2380	UL561M500P650A□□□	
680	40	65	210	390	2520	UL681M500Q650A□□□	
550	220	35	40	640	1210	1300	UL221M550P400A□□□
	270	35	50	520	980	1600	UL271M550P500A□□□
	330	35	55	420	800	1630	UL331M550P550A□□□
	390	35	60	360	680	1800	UL391M550P600A□□□
	470	35	70	290	560	2100	UL471M550P700A□□□

□□□: Enter **P6** for standard type • 6mm pin length
 □□□: Enter **P6X** for standard type • 6mm pin length • AEC-Q200
 □□□: Enter **Z6** for 3-pin type • 6mm pin length
 □□□: Enter **Z6X** for 3-pin type • 6mm pin length • AEC-Q200
 □□□: Enter **Y6** for multi-pin type • 6mm pin length
 □□□: Enter **Y6X** for multi-pin type • 6mm pin length • AEC-Q200

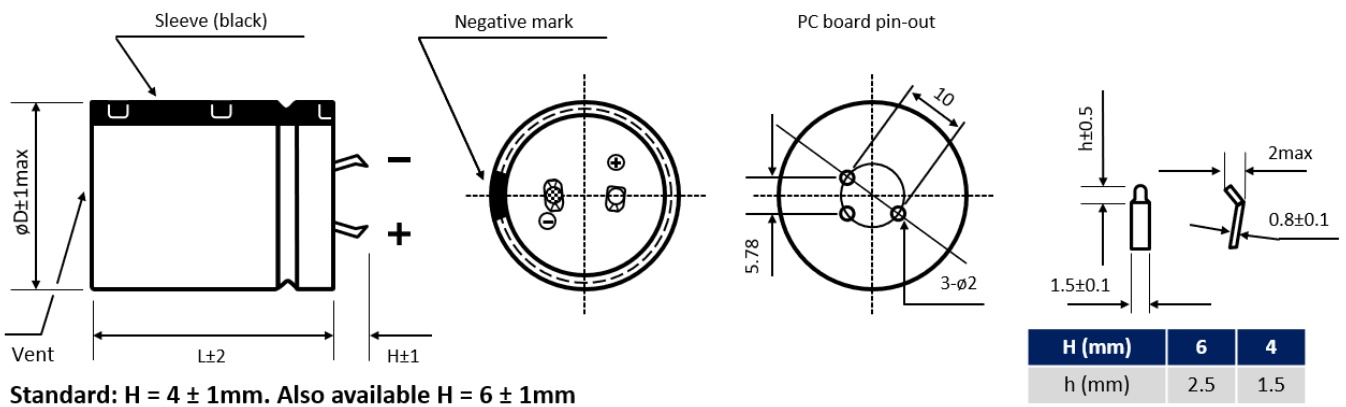
□□□: Enter **P4** for standard type • 4mm pin length
 □□□: Enter **P4X** for standard type • 4mm pin length • AEC-Q200
 □□□: Enter **Z4** for 3-pin type • 4mm pin length
 □□□: Enter **Z4X** for 3-pin type • 4mm pin length • AEC-Q200
 □□□: Enter **Y4** for multi-pin type • 4mm pin length
 □□□: Enter **Y4X** for multi-pin type • 4mm pin length • AEC-Q200

DIMENSIONS ▪ All dimensions in mm

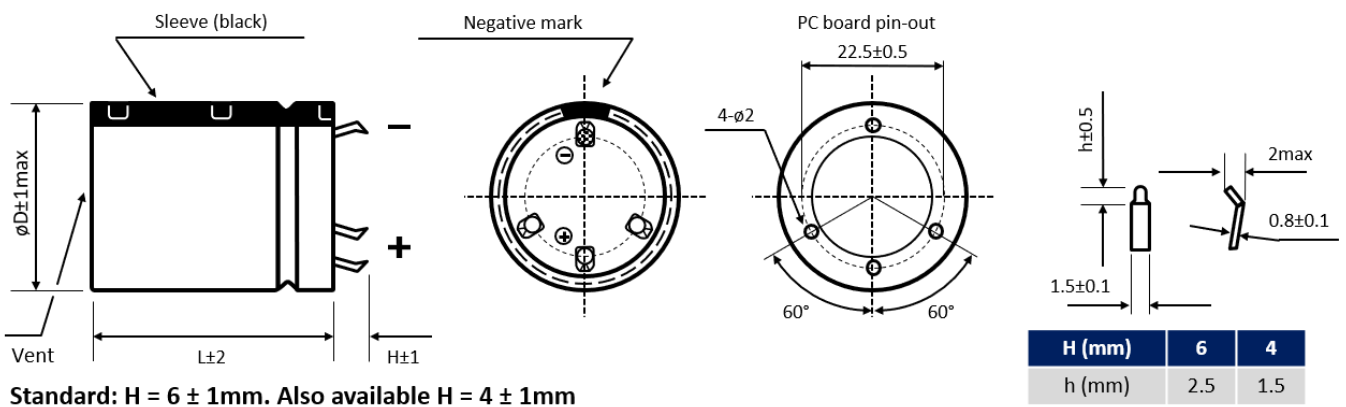
2-pin version ▪ Standard type



3-pin version ▪ Polarity protection



Multipin version ▪ Diameter $\phi D \geq 30$ mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

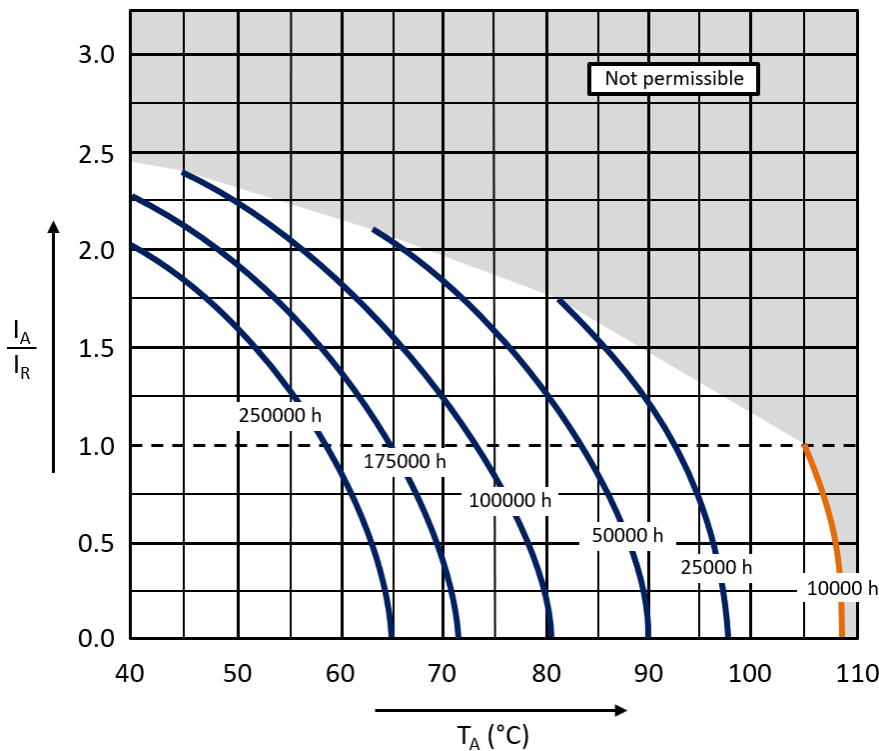
V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k - 100k
$200 \leq V_R \leq 250$	0.81	1	1.17	1.32	1.45	1.5
$315 \leq V_R \leq 550$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248

USEFUL LIFE



With: I_A : Application current
 I_R : Rated ripple current (A RMS)
 T_A : Application temperature of the capacitor



DISCLAIMER

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CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HC SERIES ▪ HIGH RELIABILITY, AUTOMOTIVE 125°C TYPE

KEY FEATURES



- **DOUBLE-CRAMPING** ▪ Snap-In type
- Useful life: 125°C ▪ 4000 hours
- Low ESR and high ripple current
- High vibration (up to 30g) stability. Consult CapXon for test details
- AEC-Q200 version available



SPECIFICATIONS

Items		Performance Characteristics				
Operating Temperature Range		-55 ~ +125°C				
Rated Voltage Range	V_R	25 ~ 63V DC				
Surge Voltage	V_S	$V_S = 1.15 \cdot V_R$				
Capacitance Range	C_R	600 ~ 3300μF				
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)				
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	$\leq 3 \cdot \sqrt{C_R \cdot V_R}$ ▪ After 5 minutes [I_{LEAK} (μA) ; C_R (μF) ; V_R (V)]				
Dissipation Factor % (20°C ▪ 120Hz)	$\tan\delta$	Not to exceed the values shown in standard ratings				
Self-Resistance (20°C ▪ 100kHz)	ESR	Not to exceed the values shown in standard ratings				
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	25	35	50	63
		Z-25°C/Z+20°C	4	4	4	4
		Z-55°C/Z+20°C	10	8	6	6

Lifetime Test						
Useful Life 125°C (V_R & I_R applied)	Test	4 000 hours				
	$\Delta C/C_R$	$\leq \pm 30\%$ of initial measured value				
	$\tan\delta$	$\leq 300\%$ of initial specified value				
	I_{Leak}	\leq the initial specified value				
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria					
Endurance 125°C (V_R & I_R applied)	Test	3 000 hours				
	$\Delta C/C_R$	$\leq \pm 20\%$ of initial measured value				
	$\tan\delta$	$\leq 200\%$ of initial specified value				
	I_{Leak}	\leq the initial specified value				
Shelf Life 125°C ($V_R = 0$)	Test	1 000 hours				
	$\Delta C/C_R$	$\leq \pm 20\%$ of initial measured value				
	$\tan\delta$	$\leq 200\%$ of initial specified value				
	I_{Leak}	\leq the initial specified value				
Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4						
Vibration Resistance Test	Max. 30g force, f_{RANGE} 10Hz ... 2kHz, amplitude max. 2mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ JIS-C-5101-1 (2010)					

STANDARD RATINGS

V_R (V)	C_R (μF)	ϕD (mm)	L (mm)	I_{LEAK} (μA , 5min)	$\tan\delta$ +20°C • 120Hz (%)	Max. ESR +20°C • 100kHz (m Ω)	I_R - Max. Ripple Current +125°C • 100kHz (mA rms)	CapXon Part Number
25	1800	20	30	637	20	28	4100	HC182M025L300A□□□
	2200	20	35	704	20	22	4870	HC222M025L350A□□□
	3300	20	40	862	20	16	5500	HC332M025L400A□□□
35	1200	20	30	615	15	31	3900	HC122M035L300A□□□
	1500	20	35	687	15	26	5000	HC152M035L350A□□□
	2200	20	40	832	15	19	5900	HC222M035L400A□□□
50	1200	20	35	735	10	36	4200	HC122M050L350A□□□
	1500	20	40	822	10	33	4900	HC152M050L400A□□□
63	600	20	30	583	10	50	3740	HC601M063L300A□□□
	820	20	35	682	10	39	4300	HC821M063L350A□□□
	1000	20	40	753	10	31	5250	HC102M063L400A□□□

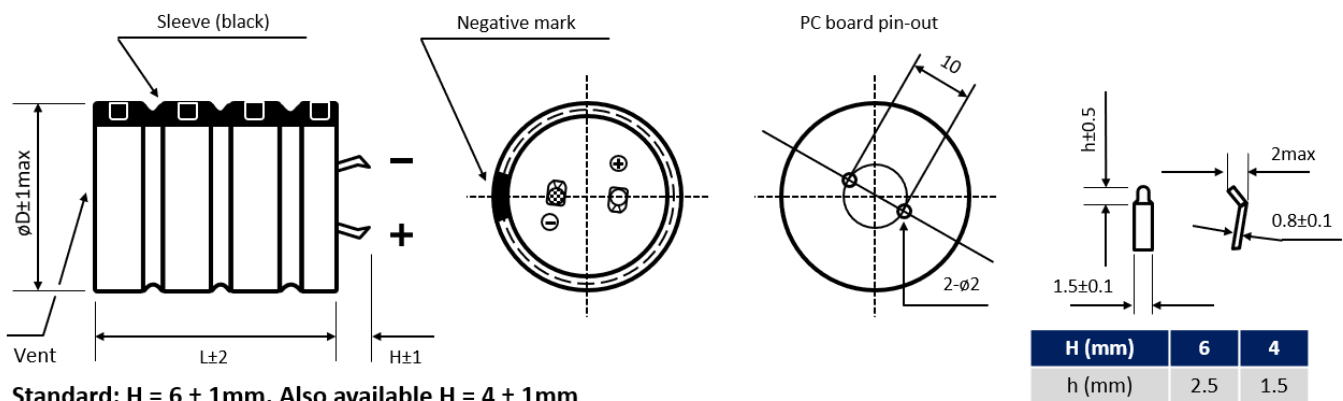
POSSIBLE CAN SIZES ▪ Please consult us to individual requirements

Size with ϕD 20		Size with ϕD 22		Size with ϕD 25		Size with ϕD 30		Size with ϕD 35	
ϕD (mm)	L (mm)	ϕD (mm)	L (mm)	ϕD (mm)	L (mm)	ϕD (mm)	L (mm)	ϕD (mm)	L (mm)
20	30	22	30	25	30	30	30	35	30
20	35	22	35	25	35	30	35	35	35
20	40	22	40	25	40	30	40	35	40
		22	45	25	45	30	45	35	45

- : Enter **P6** for standard type ▪ 6mm pin length
- : Enter **P6X** for standard type ▪ 6mm pin length ▪ AEC-Q200
- : Enter **Z6** for 3-pin type ▪ 6mm pin length
- : Enter **Z6X** for 3-pin type ▪ 6mm pin length ▪ AEC-Q200
- : Enter **Y6** for multi-pin type ▪ 6mm pin length
- : Enter **Y6X** for multi-pin type ▪ 6mm pin length ▪ AEC-Q200

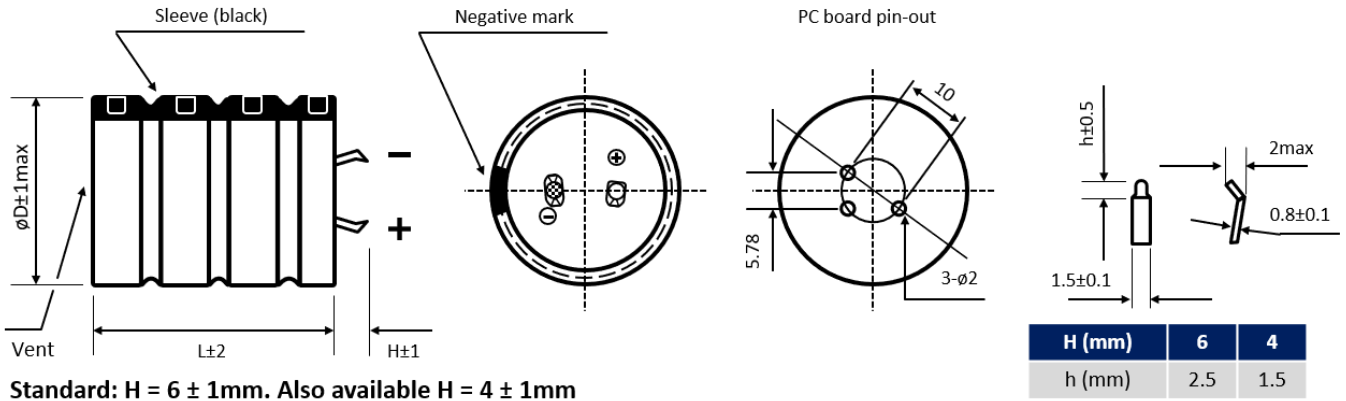
- : Enter **P4** for standard type ▪ 4mm pin length
- : Enter **P4X** for standard type ▪ 4mm pin length ▪ AEC-Q200
- : Enter **Z4** for 3-pin type ▪ 4mm pin length
- : Enter **Z4X** for 3-pin type ▪ 4mm pin length ▪ AEC-Q200
- : Enter **Y4** for multi-pin type ▪ 4mm pin length
- : Enter **Y4X** for multi-pin type ▪ 4mm pin length ▪ AEC-Q200

DIMENSIONS ▪ All dimensions in mm

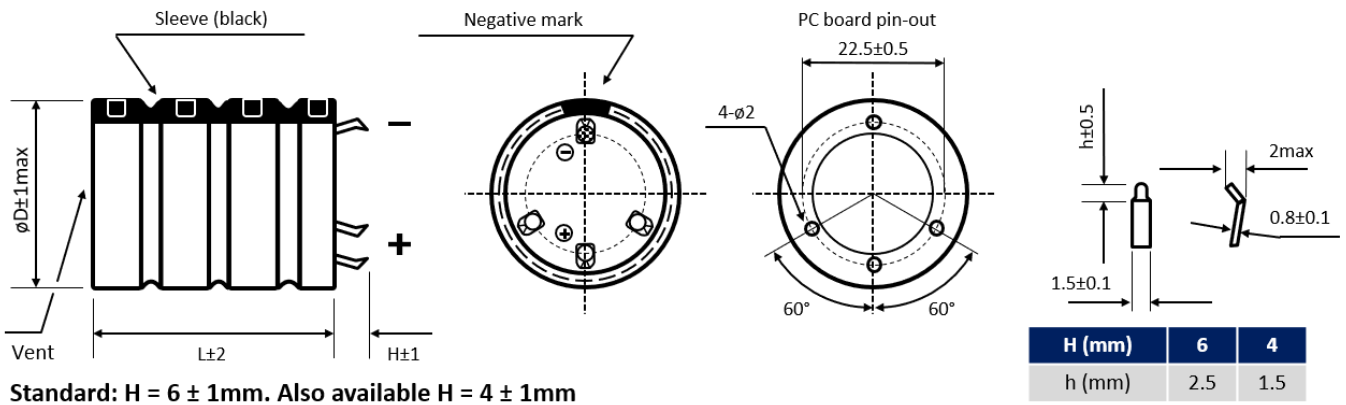
 2-pin version ▪ Diameter ϕD 20 mm to 25 mm ▪ Standard type


DIMENSIONS ▪ All dimensions in mm

3-pin version ▪ Polarity protection ▪ Diameter ϕ D 20 mm to 25 mm



Multipin version ▪ Diameter ϕ D ≥ 30 mm



Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k
$25 \leq V_R \leq 63$	0.56	0.7	0.83	0.92	1

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

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General Precautions and Guidelines Page 258	Packaging Information Liquid Snap-In Page 248

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For further information, please visit our website www.capxongroup.com or contact CapXon directly.

HH SERIES ▪ HIGH VOLTAGE, AUTOMOTIVE 125°C TYPE

KEY FEATURES



- **HIGH TEMPERATURE** ▪ Snap-In type
- Useful life: 125°C ▪ 4000 hours
- High reliability and high voltage applications
- Extremely stable dissipation factor and leakage current
- AEC-Q200 version available



SPECIFICATIONS

Items		Performance Characteristics		
Operating Temperature Range		-40 ~ +125°C		
Rated Voltage Range	V_R	400 ~ 450V DC		
Surge Voltage	V_S	$V_S = 1.10 \cdot V_R$		
Capacitance Range	C_R	47 ~ 560μF		
Cap. Tolerance	ΔC	±20% (120Hz ▪ 20°C)		
Leakage Current (20°C ▪ V_R applied)	I_{LEAK}	$\leq 0.02 \cdot C_R \cdot V_R$ ▪ After 5 minutes [I_{LEAK} (μA) ; C_R (μF) ; V_R (V)]		
Dissipation Factor % (20°C ▪ 120Hz)	$\tan\delta$	Not to exceed the values shown in standard ratings		
Self-Resistance (20°C ▪ 120Hz)	ESR	Not to exceed the values shown in standard ratings		
Low Temperature Characteristics at 120Hz	Z ratio max.	V_R (V DC)	400	450
		Z-25°C/Z+20°C	6	6
		Z-40°C/Z+20°C	10	10

Lifetime Test			
Useful Life 125°C (V_R & I_R applied)	Test	4000 hours	
	$\Delta C/C_R$	$\leq \pm 30\%$ of initial measured value	
	$\tan\delta$	$\leq 300\%$ of initial specified value	
	I_{Leak}	\leq the initial specified value	
	Deviation Rate at Useful Life: 100 FIT = 0.01%/1000h with 60% confidence level ▪ parts show higher drift as test criteria		
Endurance 125°C (V_R & I_R applied)	Test	3000 hours	
	$\Delta C/C_R$	$\leq \pm 20\%$ of initial measured value	
	$\tan\delta$	$\leq 200\%$ of initial specified value	
	I_{Leak}	\leq the initial specified value	
Shelf Life 125°C ($V_R = 0$)	Test	1000 hours	
	$\Delta C/C_R$	$\leq \pm 20\%$ of initial measured value	
	$\tan\delta$	$\leq 200\%$ of initial specified value	
	I_{Leak}	\leq the initial specified value	
	Before measurement: Restore capacitor to 20°C, apply V_R for 30 min according JIS-C-5101-4		
Vibration Resistance Test	Max. 10g force, f_{RANGE} 10Hz ... 55Hz, amplitude 0.75mm; X/Y/Z-axis each 2h; capacitor rigidly clamped by body to surface ▪ IEC 60068-2-6		

STANDARD RATINGS

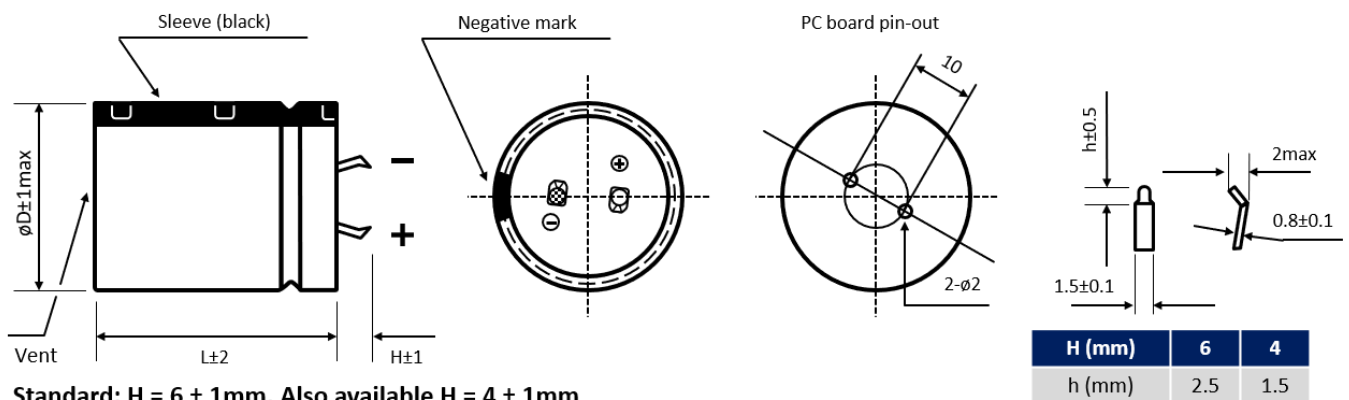
V _R (V)	C _R (μF)	ø D (mm)	L (mm)	I _{LEAK} (μA, 5min)	tanδ +20°C - 120Hz (%)	Max. ESR +20°C - 120Hz (mΩ)	I _r - Max. Ripple Current +125°C - 120Hz (mA rms)	CapXon Part Number
400	47	22	25	376	20	4230	260	HH470M400M250A□□□
	68	22	30	544	20	2930	340	HH680M400M300A□□□
	82	22	30	656	20	2430	380	HH820M400M300A□□□
	100	22	35	800	20	1990	430	HH101M400M350A□□□
	120	22	35	960	20	1660	500	HH121M400M350A□□□
	150	22	40	1200	20	1330	550	HH151M400M400A□□□
	180	22	45	1440	20	1110	640	HH181M400M450A□□□
	220	25	45	1760	20	900	780	HH221M400N450A□□□
	270	25	50	2160	20	740	920	HH271M400N500A□□□
	330	30	45	2640	20	600	1020	HH331M400O450A□□□
	390	30	50	3120	20	510	1160	HH391M400O500A□□□
	470	35	45	3760	20	420	1340	HH471M400P450A□□□
560	35	50	4480	20	360	1560	HH561M400P500A□□□	
450	68	22	30	612	20	2930	380	HH680M450M300A□□□
	82	22	35	738	20	2430	440	HH820M450M350A□□□
	100	22	40	900	20	1990	460	HH101M450M400A□□□
	120	22	45	1080	20	1660	540	HH121M450M450A□□□
	150	22	50	1350	20	1330	620	HH151M450M500A□□□
	180	22	55	1620	20	1110	730	HH181M450M550A□□□
	220	25	50	1980	20	900	870	HH221M450N500A□□□
	270	30	45	2430	20	740	1120	HH271M450O450A□□□
	330	30	50	2970	20	600	1300	HH331M450O500A□□□
	390	35	45	3510	20	510	1480	HH391M450P450A□□□
	470	35	50	4230	20	420	1670	HH471M450P500A□□□

□□□: Enter **P6** for standard type ▪ 6mm pin length
 □□□: Enter **P6X** for standard type ▪ 6mm pin length ▪ AEC-Q200
 □□□: Enter **Z6** for 3-pin type ▪ 6mm pin length
 □□□: Enter **Z6X** for 3-pin type ▪ 6mm pin length ▪ AEC-Q200
 □□□: Enter **Y6** for multi-pin type ▪ 6mm pin length
 □□□: Enter **Y6X** for multi-pin type ▪ 6mm pin length ▪ AEC-Q200

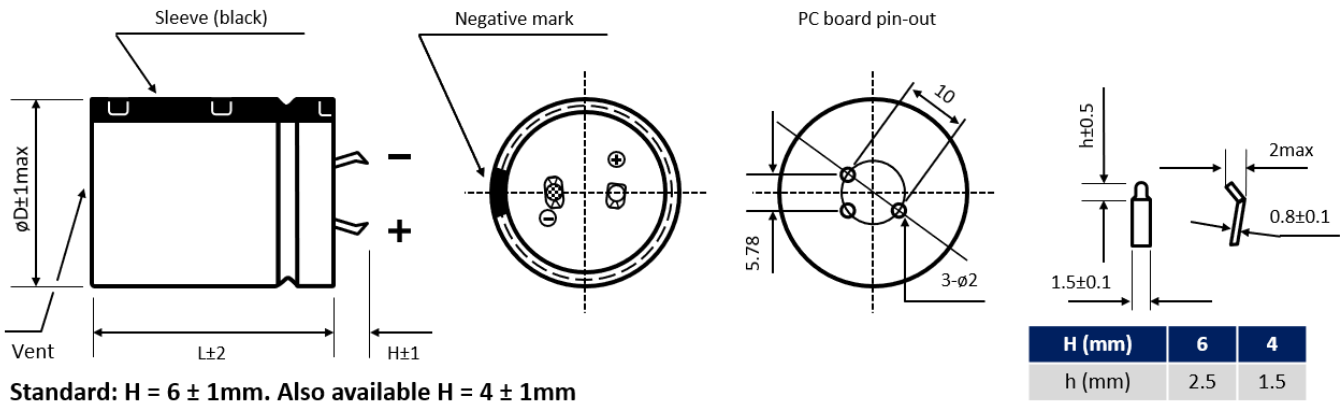
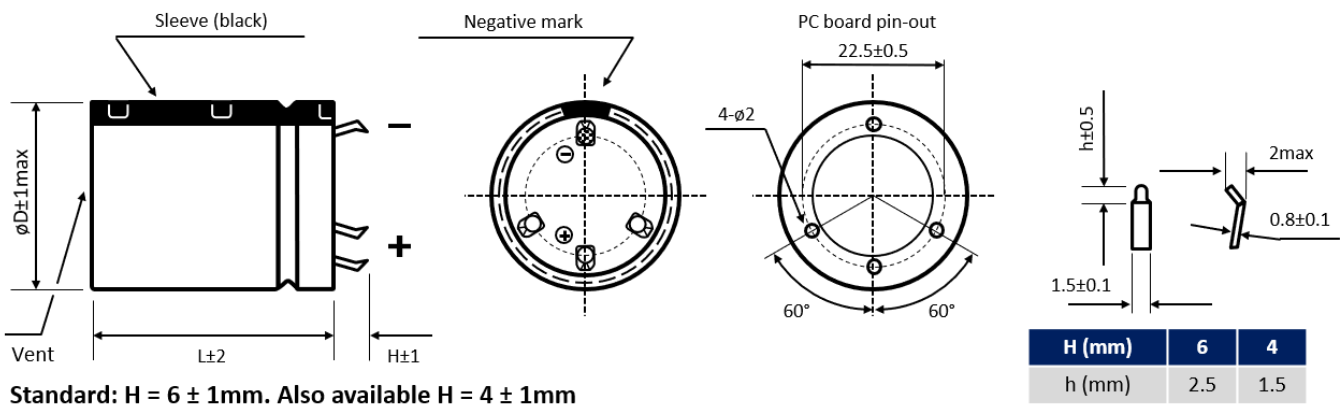
□□□: Enter **P4** for standard type ▪ 4mm pin length
 □□□: Enter **P4X** for standard type ▪ 4mm pin length ▪ AEC-Q200
 □□□: Enter **Z4** for 3-pin type ▪ 4mm pin length
 □□□: Enter **Z4X** for 3-pin type ▪ 4mm pin length ▪ AEC-Q200
 □□□: Enter **Y4** for multi-pin type ▪ 4mm pin length
 □□□: Enter **Y4X** for multi-pin type ▪ 4mm pin length ▪ AEC-Q200

DIMENSIONS ▪ All dimensions in mm

2-pin version ▪ Diameter ø D 20 mm to 25 mm ▪ Standard type



DIMENSIONS ▪ All dimensions in mm

 3-pin version ▪ Polarity protection ▪ Diameter ϕ D 20 mm to 25 mm

 Multipin version ▪ Diameter ϕ D ≥ 30 mm


Further possible terminal styles can be found in our packaging information liquid snap-in.

MULTIPLIER K_f for RIPPLE CURRENT vs. FREQUENCY

V_R (V) / Frequency (Hz)	50/60	100/120	300	1k	10k	50k
$400 \leq V_R \leq 450$	0.77	1	1.16	1.3	1.41	1.43

PRECAUTIONS, GUIDELINES AND PACKAGING INFORMATION

Unless otherwise agreed in individual specifications, all products are subject to our “General Precautions and Guidelines” as well as our “Packaging Information”. Please refer to the following pages in the table.

General Precautions and Guidelines	Packaging Information Liquid Snap-In
Page 258	Page 248



DISCLAIMER

All product related data (e.g. specification, statements and general information) are subject to change without any notice. It is necessary that the customer observes all product related technical / application information and handling instructions.

CapXon products are designed and manufactured according to severe quality and safety standards. Under no circumstance, CapXon warrants that any CapXon product is suitable for the purposes intended for your application, even CapXon knows the application. It is customer's duty and obligation to check and make sure that CapXon products are suitable for the purposes intended and select the correct and proper CapXon product. Customers are requested to perform a sufficient validation and reliability evaluation to assure needed safety level and reliability performance by suitable designs and to apply proper safeguards (e.g. redundancies, protective circuits).

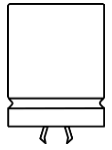
Particular operating conditions (ambient temperature, ripple current, voltage, thermal resistance, etc.) as well as storage, production or assembly may affect the performance and the lifetime of the capacitor. Please consult CapXon for lifetime estimation, failure mode considerations or worst-case scenarios according to the product technology, product tolerances / deviations or change of the characteristics of the capacitor due to shipment, storage, handling, production and usage.

For aerospace or military application, life-saving, life-sustaining, safety critical applications or any application where failure may cause severe personal injury or death, please consult us before design-in the capacitor in your application.

Except for the written expressed warranties, CapXon does not impliedly, by assumption or whatever else, warrant, undertake, promise any other warranty or guaranty for any CapXon product.

For further information, please visit our website www.capxongroup.com or contact CapXon directly.

PRODUCT CODE - SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS



Snap-in type example:

UJ series ▪ 470µF ▪ 450V ▪ ±20% ▪ Ø 30mm ▪ L 45mm ▪ 2-pin ▪ 6mm pin length

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
U	J	4	7	1	M	4	5	0	O	4	5	0	A	P	6	-	-	-	-	
Series		Capacitance			Capacitance tolerance	Voltage			Case Ø (mm)	Height (mm)			Type code	Terminals		Special requirement				
Code		µF		Code		%	Code	Volt		Code	ØD	Code		H	Code		Type	See chapter terminals or lead treatment		Code Special
100		10			H	±5	6R3	6.3	L	20	150	15	A	Without lead treatment	U		PE mat packaging Ø 20 to ≤ 35mm			
220		22			K	±10	010	10	M	22	200	20	E	With lead treatment	X		AEC-Q200			
101		100			S	±15	016	16	N	25	250	25					See datasheet for reference			
561		560			M	±20	025	25	O	30	300	30								
102		1000			N	±30	035	35	P	35	350	35								
472		4700			D	±40	050	50	Q	40	400	40								
103		10000			I	+5 to +20	063	63	V	45	450	45								
683		68000			B	0 to -20	080	80	R	50	550	55								
104		100000			G	0 to +10	100	100			600	60								
					Z	0 to +20	160	160			650	65								
					Y	0 to +30	180	180			700	70								
					X	0 to +40	200	200			750	75								
					A	0 to +50	220	220			800	80								
					J	-5 to +20	250	250			850	85								
					C	-5 to +30	315	315			900	90								
					E	-8 to +5	350	350			950	95								
					V	-10 to +20	385	385			A00	100								
					Q	-10 to +30	400	400			A05	105								
					T	-10 to +50	420	420												
					W	-20 to +10	450	450												
					P	-15 to +20	500	500												
					L	-25 to +20	550	550												
					U	-30 to 0	575	575												
					F	-35 to 0	600	600												
					O	-50 to 0	630	630												

Please consult CapXon for further assistance

MARKING - SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Aluminum Electrolytic Capacitor ▪ Snap-In type

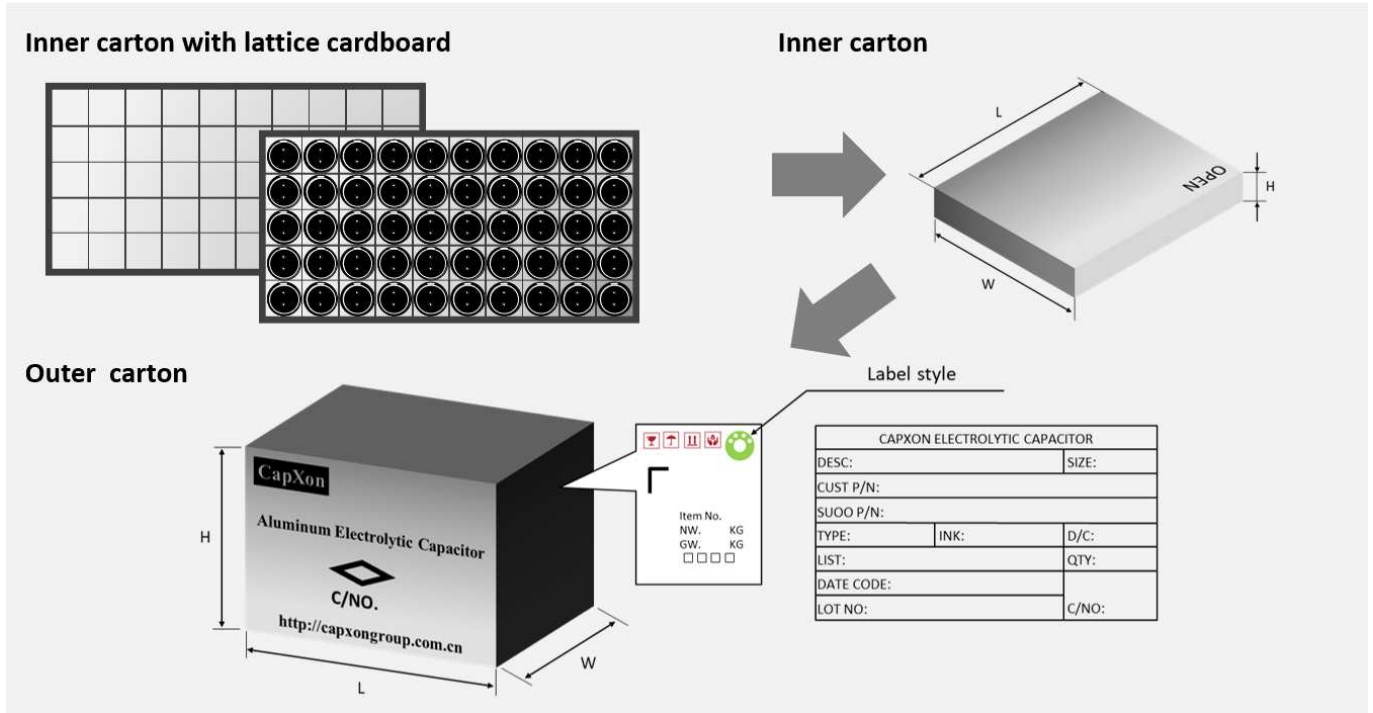
CapXon:	Manufacturer trademark	Front side
470µF:	Nominal capacitance	
450V:	Rated voltage	Back side
	(-) polarity (Cathode indicate)	
UJ:	Series	
VENT:	Safety vent	
105°C:	Maximum operating temperature	
X:	AEC-Q200	
191213:	Production datecode year/month/day (ex. 2019/December/13 th)	

Standard type	AEC-Q200 type
CapXon 470µF - 450V UJ VENT 105°C ● - NEG	CapXon 470µF - 450V UJ VENT-X 105°C ● - NEG
191213 191213 191213 191213 191213	191213 191213 191213 191213 191213

PACKAGING • SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

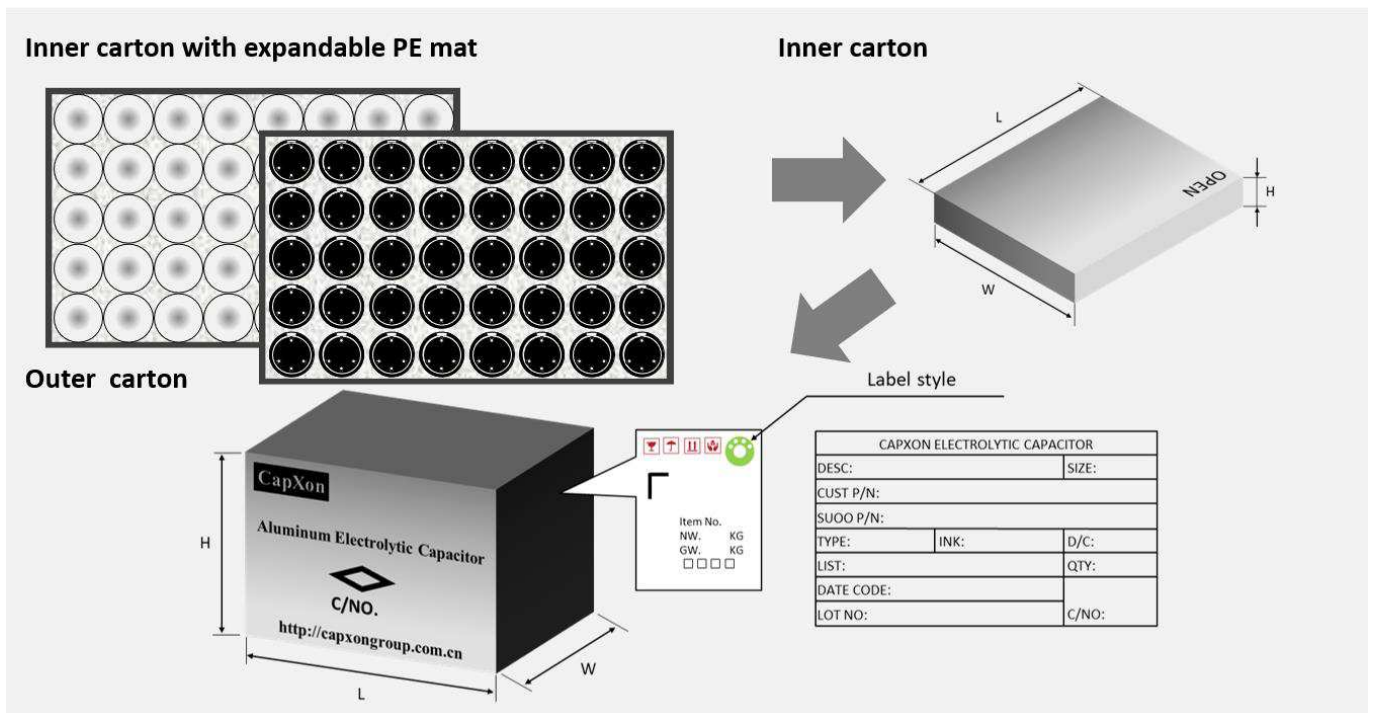
Inner carton with lattice cardboard. Standard for diameter 20mm, 22mm, 25mm, 30mm and 35mm.

Packaging method: Lattice cardboard in the inner carton, covered with an aluminum foil layer on the products to discharge the electrolytic capacitors. Cardboard box cover on top.

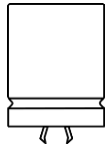


Inner carton with expandable PE mat. Standard for diameter 40mm, 45mm and 50mm*.

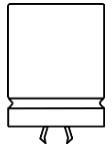
Packing method: Expandable PE mat in the inner carton, covered with an aluminum foil layer on the products to discharge the electrolytic capacitors. Expandable PE layer on top to avoid product shaking.



* For smaller diameters, see ordering information "special requirement" in the product code.

PACKAGING • SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Inner carton with lattice cardboard.

∅ D (mm)	Length L (mm)	Terminal length H (mm)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
20	≤ 25		120	268 x 265 x 38	720	560 x 280 x 135	China	85322200
	27 to 35	< 6 (L=35)	120	268 x 265 x 48	720	560 x 275 x 167	China	85322200
	35	≥ 6	120	268 x 265 x 64	720	560 x 275 x 208	China	85322200
	40 to 51		120	268 x 265 x 64	720	560 x 275 x 208	China	85322200
22	≤ 25		100	268 x 265 x 38	600	560 x 280 x 135	China	85322200
	27 to 35	< 6 (L=35)	100	268 x 265 x 48	600	560 x 275 x 167	China	85322200
	35	≥ 6	100	268 x 265 x 64	600	560 x 275 x 208	China	85322200
	40 to 51		100	268 x 265 x 64	600	560 x 275 x 208	China	85322200
	52 to 61		100	268 x 265 x 90	400	560 x 275 x 208	China	85322200
	62 to 75		100	268 x 265 x 90	400	560 x 275 x 208	China	85322200
25	≤ 25		100	295 x 293 x 38	500	310 x 308 x 211	China	85322200
	26 to 35	< 6 (L=35)	100	295 x 293 x 48	500	315 x 313 x 258	China	85322200
	35	≥ 6	100	295 x 293 x 64	500	310 x 308 x 340	China	85322200
	40 to 51		100	295 x 293 x 64	500	310 x 308 x 340	China	85322200
	52 to 60		100	295 x 293 x 72	500	310 x 308 x 383	China	85322200
	61 to 75		100	295 x 293 x 90	400	310 x 308 x 383	China	85322200
30	≤ 25		50	344 x 173 x 38	400	375 x 361 x 175	China	85322200
	26 to 35	< 6 (L=35)	50	344 x 173 x 48	400	375 x 361 x 220	China	85322200
	35	≥ 6	50	344 x 173 x 64	300	375 x 361 x 200	China	85322200
	40 to 51		50	344 x 173 x 64	300	375 x 361 x 220	China	85322200
	52 to 65		50	344 x 173 x 80	300	375 x 361 x 260	China	85322200
	70 to 85		50	344 x 173 x 100	200	375 x 361 x 220	China	85322200
35	≤ 25		50	392 x 195 x 48	300	405 x 407 x 164	China	85322200
	26 to 35	< 6 (L=35)	50	392 x 195 x 48	300	405 x 407 x 164	China	85322200
	35	≥ 6	50	392 x 195 x 64	300	405 x 407 x 212	China	85322200
	36 to 44		50	392 x 195 x 64	300	405 x 407 x 212	China	85322200
	45 to 52		50	392 x 195 x 64	200	410 x 210 x 280	China	85322200
	56 to 65		50	392 x 195 x 80	200	405 x 407 x 175	China	85322200
	66 to 75		50	392 x 195 x 90	200	405 x 407 x 212	China	85322200
	80 to 85		50	392 x 195 x 100	200	405 x 407 x 220	China	85322200
	90 to 100		50	392 x 195 x 115	100	405 x 407 x 130	China	85322200

PACKAGING - SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Inner carton with expandable PE mat.

∅ D (mm)	Length L (mm)	Inner box quantity (pcs)	Inner box size L x W x H (mm)	Outer box quantity (pcs)	Outer box size L x W x H (mm)	Country of origin	Tariff number
20	≤ 30	120	295 x 295 x 48	720	615 x 310 x 167	China	85322200
	35 to 47	120	295 x 295 x 64	720	615 x 310 x 210	China	85322200
	50 to 65	120	295 x 295 x 80	480	615 x 310 x 180	China	85322200
22	≤ 30	100	295 x 295 x 48	600	615 x 310 x 167	China	85322200
	35 to 47	100	295 x 295 x 64	600	615 x 310 x 210	China	85322200
	50 to 65	100	295 x 295 x 80	400	615 x 310 x 180	China	85322200
	70 to 80	100	295 x 295 x 95	400	615 x 310 x 210	China	85322200
25	≤ 30	100	325 x 325 x 48	500	345 x 345 x 260	China	85322200
	35 to 47	100	325 x 325 x 64	500	345 x 345 x 340	China	85322200
	50 to 65	100	325 x 325 x 80	400	345 x 345 x 340	China	85322200
	70 to 80	100	325 x 325 x 95	400	345 x 345 x 400	China	85322200
30	≤ 30	50	410 x 215 x 48	300	450 x 430 x 164	China	85322200
	35 to 47	50	410 x 215 x 64	300	450 x 430 x 210	China	85322200
	50 to 65	50	410 x 215 x 80	200	450 x 430 x 180	China	85322200
	70 to 80	50	410 x 215 x 95	200	450 x 430 x 210	China	85322200
	85 to 95	50	410 x 215 x 110	200	450 x 430 x 240	China	85322200
35	≤ 30	50	447 x 230 x 48	300	480 x 470 x 164	China	85322200
	35 to 47	50	447 x 230 x 64	300	480 x 470 x 212	China	85322200
	50 to 65	50	447 x 230 x 80	200	480 x 470 x 180	China	85322200
	70 to 80	50	447 x 230 x 96	150	467 x 250 x 308	China	85322200
	85 to 95	50	447 x 230 x 110	100	467 x 250 x 240	China	85322200
40	26 to 55	40	383 x 245 x 80	120	400 x 265 x 265	China	85322200
	60 to 75	40	383 x 245 x 90	120	400 x 265 x 295	China	85322200
	80 to 105	40	383 x 245 x 120	80	400 x 265 x 265	China	85322200
45	35 to 65	35	390 x 285 x 80	70	590 x 410 x 100	China	85322200
	70 to 80	35	390 x 285 x 95	70	590 x 410 x 115	China	85322200
	85 to 105	35	390 x 285 x 115	70	590 x 410 x 130	China	85322200
50	50 to 59	NA	NA	70	510 x 340 x 180	China	85322200
	60 to 65	NA	NA	70	510 x 340 x 200	China	85322200
	70 to 100	NA	NA	35	510 x 340 x 120	China	85322200

AVAILABLE TERMINALS ▪ SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Snap-In type ▪ PP version ▪ 2-pin ▪ standard type ▪ $\varnothing D = 20$ to 45mm

H (mm)	6	4
h (mm)	2.5	1.5
Type / Terminal code	A P6	A P4

Standard: H = 6 mm. Also available H = 4 mm

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	P 6	- -
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement

Snap-In type ▪ ZP version ▪ 3-pin ▪ polarity protection ▪ $\varnothing D = 20$ to 45mm

H (mm)	6	4
h (mm)	2.5	1.5
Type / Terminal code	A Z6	A Z4

Standard: H = 4 mm. Also available H = 6 mm

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	Z 4	- -
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement

AVAILABLE TERMINALS • SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Snap-In type • YP version • Multi-pin • polarity protection • $\varnothing D = 30$ to 45mm

Standard: H = 6 mm. Also available H = 4 mm

H (mm)	6	4
h (mm)	2.5	1.5
Type / Terminal code	A Y6	A Y4

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	Y 6	- -
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement

Snap-In type • LP version • slim terminal • $\varnothing D = 20$ to 45mm

Standard: H = 9.5 mm. Also available H = 4 mm

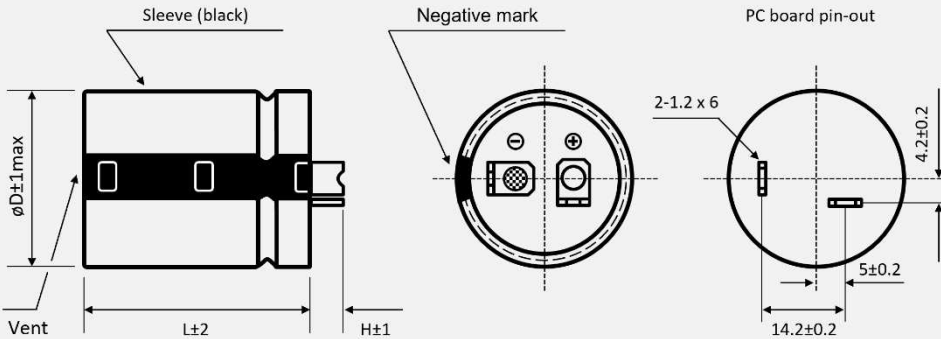
H (mm)	9.5	4
Type / Terminal code	A L9	A L4

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	L 9	- -
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement

AVAILABLE TERMINALS • SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Snap-In type • **CP** version • lug type • T type • $\varnothing D = 30$ to 45mm



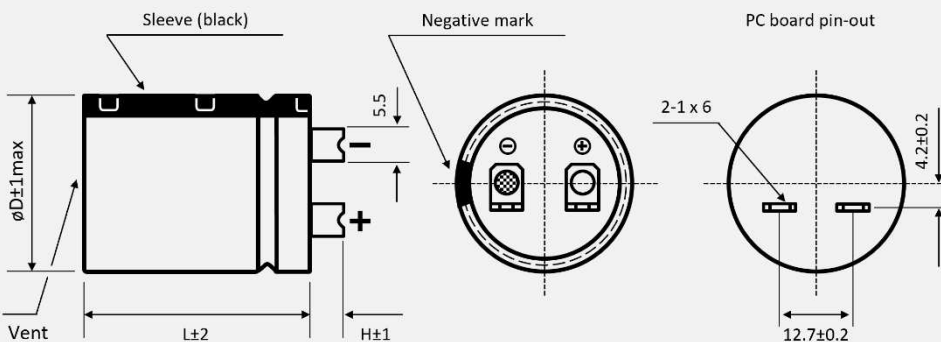
Standard: H = 4.5 mm. Also available H = 5.5 mm

H (mm)	5.5	4.5
Type / Terminal code	A C5	A C4

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	C 4	-	-
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement	

Snap-In type • **HP** version • lug type • U type • $\varnothing D = 30$ to 45mm



Standard: H = 6 mm

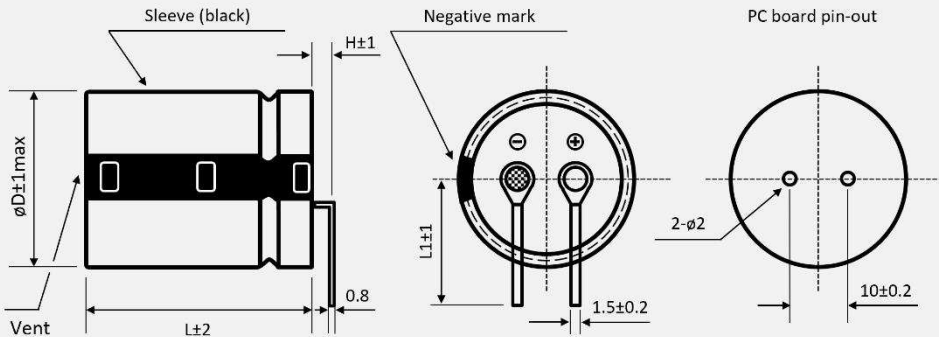
H (mm)	6
Type / Terminal code	A H6

Example

U J	4 7 1	M	4 5 0	O	4 5 0	A	H 6	-	-
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement	

AVAILABLE TERMINALS • SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Snap-In type • **TP** version • long terminal • cathode right side • $\varnothing D = 20$ to 45 mm



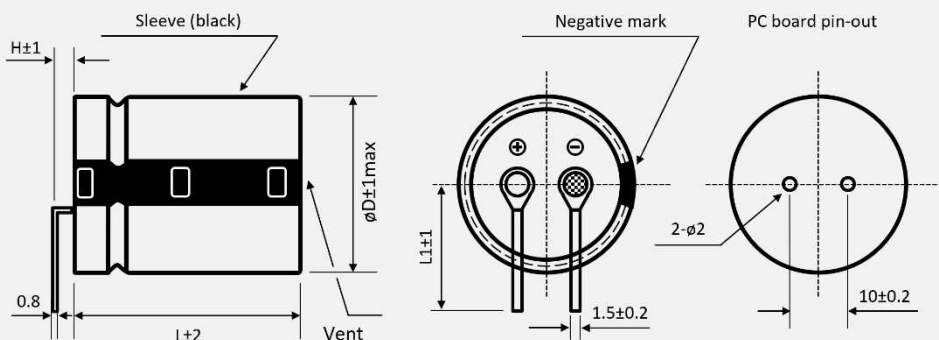
Standard: $H = 2.5$ mm

H (mm)	2.5
Type / Terminal code	E CR

Example

U J	4 7 1	M	4 5 0	O	4 5 0	E	C R	-	-
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement	

Snap-In type • **TP** version • long terminal • cathode left side • $\varnothing D = 20$ to 45 mm



Standard: $H = 2.5$ mm

H (mm)	2.5
Type / Terminal code	E CL

Example

U J	4 7 1	M	4 5 0	O	4 5 0	E	C L	-	-
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement	

AVAILABLE TERMINALS ▪ SNAP-IN ALUMINUM ELECTROLYTIC CAPACITORS

Snap-In type ▪ VP version ▪ lug type ▪ $\varnothing D = 20$ to 45mm

Standard: H = 8 mm.

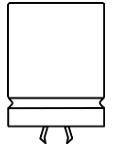
Consult CapXon for further lug heights.
If terminals of other lengths are needed, the corresponding size parameters are also different

Example

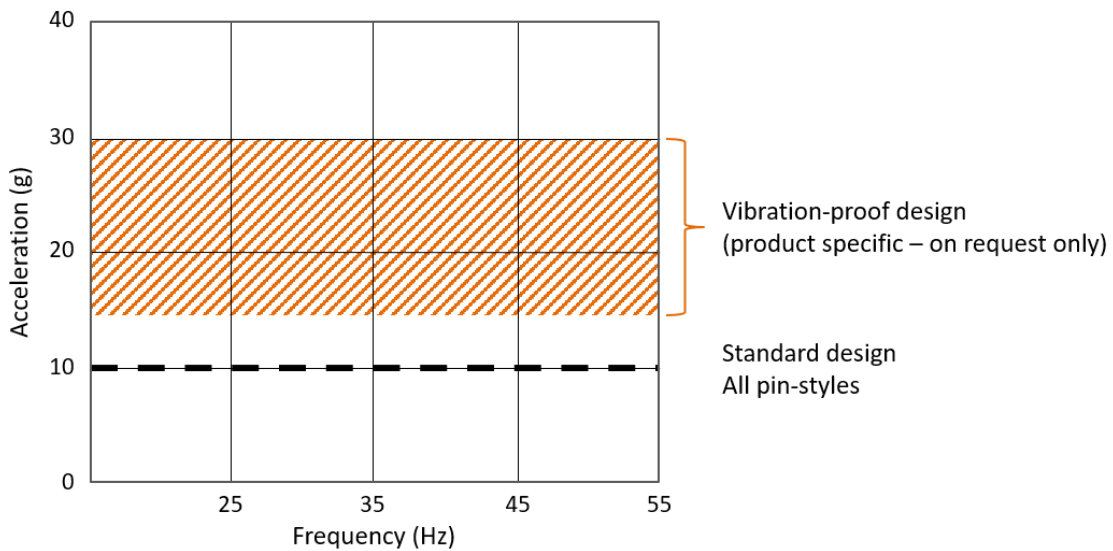
U J	4 7 1	M	4 5 0	0	4 5 0	A	V 8	- -
Series	Capacitance	Tolerance	Voltage	$\varnothing D$ (mm)	Height (mm)	Type code	Terminals	Special requirement

H ± 0.5	$\varnothing D$	L1 ± 0.1	L2 ± 0.2	W ± 0.2	W1 ± 0.2	W2 ± 0.2	d ± 0.1
8	25	3.5	1	4.6	3.7	2	0.8
	30	3.5	1	4.6	3.7	2	0.8
	35	3.5	1	4.6	3.7	2	0.8
	40	3.5	1	4.6	3.7	2	0.8
	45	3.5	1	4.6	3.7	2	0.8

VIBRATION SPECIFICATION - STANDARD AND VIBRATION PROOF DESIGN



Package	Test Standard	Condition	Determinant Standard
Standard design all pin-styles	IEC 60384-1 IEC 60384-4 IEC 60068-2-6 MIL-STD 202 Method 204	<ol style="list-style-type: none"> 1. Frequency range: 10Hz ~ 55Hz 2. Amplitude (single peak): 0.75 mm 3. Acceleration: 100m/s² (10g at 10 ~ 55Hz) 4. X, Y, Z directions, 2 hours per direction, total 6 hours 	<ol style="list-style-type: none"> 1. $\Delta C/C \leq \pm 5\%$ of initial value 2. $DF \leq$ stated limit 3. $LC \leq$ stated limit 4. No visible damage 5. No leakage of electrolyte
Vibration-proof design		<ol style="list-style-type: none"> 1. Consult CapXon for test details 	<ol style="list-style-type: none"> 1. Consult CapXon for test details



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1. GENERAL PRECAUTIONS & GUIDELINES

In the following Precautions and Guidelines, CapXon provides instructions and requirements to assure a proper handling and desired performance of capacitors. Firstly, all general information is given, which applies to all technologies. The following chapters provides additional instructions specifically about technology and mounting style, which completes the full set of instructions.

1.1. GENERAL - ALL TYPES -

1.1.1. POLARITY

All conventional Electrolytic Capacitors have a polarity due to the internal construction. This polarity is marked on the component by printing on the top of component or on the sleeve of Aluminum Electrolytic Capacitors, including Radial, Snap-In and Screw types.

Any reverse voltage can cause short circuit breakdown of capacitor or leakage of electrolyte. Electrolytic Capacitors isn't designed for AC-voltage supply and only meant for DC-voltage applications.

For an application where polarity in circuit can be reversed or unknown, specific bi-polar aluminium electrolytic capacitors shall be used. We offer such components within our product range.

1.1.2. OVERVOLTAGE

Overvoltage can damage the capacitor and can cause a drastic increase in leakage current, which possibly shortens the lifetime of the capacitor. In a worst case, short circuit failure mode can happen. As a result, do not apply any continuous or temporary overvoltage.

The applied operating voltage, which is applied to the capacitor, should not exceed the rated voltage of the capacitor.

1.1.3. OPERATING TEMPERATURE

Only operate the capacitor within the limits of allowed temperature range, which is specified by datasheet. Be aware that the sum of thermal stress by ambient condition plus electrical stress is the main driving factor for aging. As the thermal stress level gets higher, the expected capacitor lifetime would be lower.

A drop in applied temperature, ambient condition or cooling within application can enlarge the expected lifetime of

the capacitor. For details, please see further documentation of lifetime estimation.

1.1.4. RIPPLE CURRENT

The applied ripple current shall not exceed the stated max. ripple current I_R on the datasheet at the specific frequency.

When capacitors are overstressed by ripple, it can generate massive heat inside the capacitor, which can result in deterioration, vent operation or capacitor breakage.

1.1.5. CHARGE AND DISCHARGING

Frequent and quick charge / discharge generates heat inside the capacitor and can cause possible increase of leakage current, reduction of the expected lifetime, decrease of capacitance, vent operation or breakage.

For such applications please see design rules or consult our technical support for assistance.

1.1.6. SOLDERING CONDITIONS

For recommended reflow solder profile, please see additional information at Section 2. Soldering Instructions.

Soldering by vapor phase for SMD types or any hand soldering are not recommended. No permission is released by CapXon side either. In case of such a usage, customer need to validate solder result and applied component stress within their own manufacturing process.

1.1.7. MSL – MOISTURE SENSITIVE LEVEL (ONLY FOR SMD TYPES)

Our standard SMD components are rated according to JEDEC J-STD020 with MSL1. Construction of this part does not include hygroscopic critical materials and are not prone to delamination or popcorn effects. Only SMD MLPC types of the Solid Conductive Polymer components have MSL3. Moreover, only this type requires additional actions or specific handling in factory floor by customer such as handling or storing the goods after opening the package in accordance to JEDEC J-STD020.

1.1.8. RESISTANCE TO CHEMICALS AND SOLVENTS FOR WASHING, GLUING, FILLING AND COATING

Due to the wide variety of suppliers and different chemical formulas of washing, gluing, filling and coating materials, the individually used material and appliance process need to be validated by customer itself. It is not possible to provide any global material usage approval from our side.

CapXon can provide additional information, including combination of chemicals which could be critical to the component behavior and can support measurements of component performance after appliance of washing, gluing, filling or coating materials. For specific support, please kindly contact our technical support for further advices.

1.1.9. CLEANING AND WASHING

Do not wash the assembled capacitors with the following cleaning agents:

- **Xylene**
 - can cause deterioration of the rubber seal material
- **Halogenated solvents**
 - can cause corrosion and electrical failure modes
- **Petroleum based solvents**
 - can cause degeneration of the rubber seal material
- **Alkali based solvents**
 - can cause corrosion and dissolving of aluminum can
- **Acetone**
 - component marking possibly dissolve

After finishing cleaning and washing, the below points need to be verified by customer:

Dry all solvents properly from PCB as well as capacitor surface sufficiently and apply air blower or air knife, with temperatures within the temperature range of the product specification, if needed.

Monitor pH value, conductivity, specific gravity and water content of cleaning solvents to be sure of possible contaminations and pollution. Contaminations can negatively affect the performance of the capacitor.

1.1.10. GLUING, FILLING OR COATING

It is not allowed to use any gluing (adhesives), filling or coating materials, which contains halogenated solvents. Halogen ions are critical, because they can diffuse or creep in the capacitor through rubber sealing and can possibly damage the internal capacitor element /structure result in serious failure modes for the capacitor.

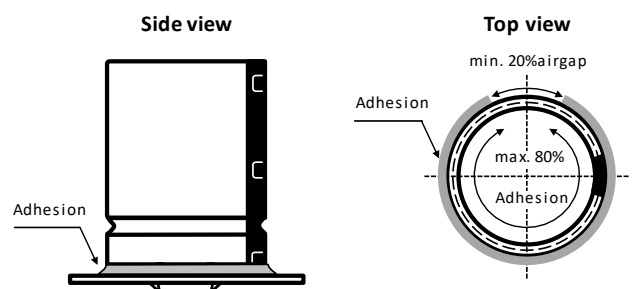
Additionally, please pay attention to the following points:

- Make sure that the surface of capacitor and the area between component bottom / rubber sealant is dry and clean before appliance of gluing, filling or coating material. It is important to avoid any contamination with chemical residues (e.g. flux residues, cleaning).
- Please follow and meet the stated gluing, coating, filling, heating and curing instructions from manufacturer or supplier of such materials. Be aware of possi-

ble shrinkage of such materials. Verify that the hardening was properly done and that no solvents / agents do remain.

- There should be no excessive heat nor mechanical pressure /stress at any stages from the production on customer side. Be aware of the possible material shrinkage of used material. High material shrinkage which leads to damage on capacitor is not CapXon's responsibility.
- The used materials of gluing, coating or filling can possibly react with the marking of component and this can change optical appearance such as the appearance and legibility.
- If the rubber seal surface is fully covered by gluing, filling or coating material, it is no longer possible to have a natural diffusion of gas between the inside of the capacitor and the ambient. So, to avoid such situation, it's strongly recommended to block maximum 80% of the sealed section on the bottom side of the capacitor.

Please find the example below of how gluing could be applied on Radial and Snap-In types.



Gluing reference example of a Snap-In capacitor

1.1.11. OPERATION AND ENVIRONMENT

As long as the application is powered, in operation and cap is not discharged, the user is never permitted to touch the electric terminals of the capacitor directly or to bridge the terminals by hand or any other conductive liquid or solid material. Otherwise, a short circuit of terminals can happen and a hard discharge can damage capacitor / application as well as it can harm the operator.

Within operation, please avoid the following environmental conditions to assure proper capacitor operation:

- high vibration, shocks or mechanical stress. For tested and allowed conditions, please see available references or contact us for details
- avoid direct sunlight, ozone and any kind of radiation or ultraviolet rays
- corrosive or toxic gases (e.g. ammonium, chlorine)

and compounds, bromine and compounds, hydrogen sulfide, sulfuric acid)

- ambient with high amount of damp condensation, water or types of oil

1.1.12. MECHANICAL STRESS

Best possible, avoid mechanical stress for the capacitor and do not apply any excessive mechanical stress to the lead wire pins or terminal.

After mounting, do not lift nor carry the PCB assembly by just grabbing the capacitor to pick up the board.

1.1.13. STORAGE

In case of long-term storage without applying voltage to the capacitor, leakage current tends to increase.

By applying the rated voltage before usage, the dielectric layer of aluminium oxide and leakage current can be stabilized.

If the capacitor is for more than 12 months, it is recommended to apply the DC rated voltage V_R for 30 minutes through 1k Ω protective series resistor.

The storage conditions for storage on customer side should be monitored and controlled to a temperature of 5°C up to 35°C and less than 75% rel. humidity.

1.1.14. DISPOSAL

Please follow your local governmental and organizational restrictions for disposal and if needed, contact your local responsible for correct handling.

In case of incineration, punch holes in the aluminum can in advanced to avoid explosion of capacitor and then burn with at least 800°C, otherwise it can result toxic gas.

1.2. ALUMINUM ELECTROLYTIC & HYBRID CONDUCTIVE POLYMER CAPACITORS - ALL MOUNTING STYLES -

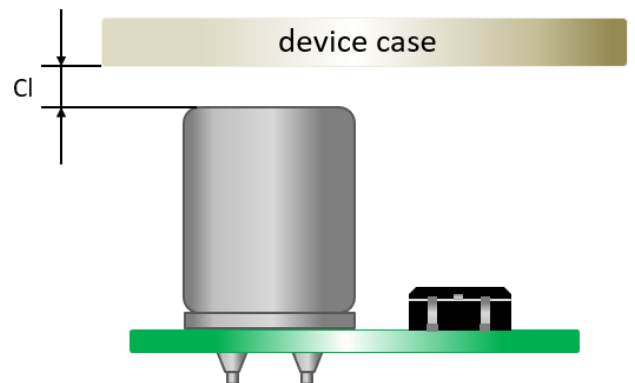
1.2.1. VENT & VENT OPERATION AT EMERGENCY

As a safety feature, most our regular electrolytic capacitors have a so-called vent, which is a pre-determined breaking point. In case of overstressed component, it can lead to internal gassing and due to this an internal overpressure will

result in vent operation. So, the vent will open to release such pressure and gas can become visible. If user detects vent operation or gassing out of the capacitor when operating, disconnect the application immediately from power supply to turn it off directly. If it can't be turned off, the capacitor or the conductive liquid / gas of electrolyte can result in short-circuits, which can dramatically damage the application.

Please notice to avoid being near with body or face above or in direction of capacitors vent when powered. When the running application is overstressed, gas leakage by vent is possible. By this gas with temperatures higher than 100°C can occur and can hurt human body and face. In such an event, if contact with skin, wash it immediately with plenty of water and soap. If contact with eyes, rinse immediately (e.g. eye shower) with plenty of water. If gas is inhaled, gargle right away with plenty of water. For all three cases, please consult a doctor for medical advices.

For proper operation of vent, consider space between the vent and covering surfaces (e.g. housing) as stated at the table below, it is strongly recommended for your mechanical construction / build-up of your product:



Minimum distance to be observed for the safe operation of the capacitor

Case diameter ϕ	Clearance distance Cl
6.3mm to 16mm	Min. 2mm
18mm to 35mm	Min. 3mm
≥ 40 mm	Min. 5mm

Recommended minimum clearance distance between topline capacitor and device case

If such a space is not provided, the vent will not operate completely or even cannot open in case of overpressure.

Case sizes which are smaller than 6.3mm in diameter have no vent on top, for these no space need to be considered.

1.2.2. SLEEVE MATERIAL (NOT FOR SMD)

The standard sleeve material for the majority of our Radial, Snap-In and Screw mounting capacitors is PET and for some series PVC is used as sleeve material. When sleeve is exposed to xylene, toluene or similar and afterwards exposed to high heat, the sleeve may be cracked or damaged.

The sleeve is not used as insulating material or layer and does not insulate capacitor to surroundings. For needed insulation, further actions need to be considered by customer and please follow our recommended design rules.

Sleeves are applied for all Aluminum Electrolytic Capacitors with Radial, Snap-In or Screw mounting and if desired for further customized solutions.

1.3. ALUMINUM ELECTROLYTIC - RADIAL TYPE -

1.3.1. PIN CUTTING & BENDING

Please take absolute care when cutting or bending pins, that the pin is fixed mechanically in direction of rubber sealant. It is necessary that the mechanical force while cutting and bending, which results in pulling or pressing force on pin, does not stress the inner construction of capacitor element or to damage the rubber sealant. Excessive pulling or pressing force on the pin with missing fixation can result in damage of internal pin to capacitor element connection and also the sealing can be weakened. So, please take care to assure appropriate cutting and bending. Do not pre-damage the capacitors and shorten their lifetime performance by incorrect handling.

1.3.2. SOLDERING

For recommended wave solder profile, please see additional solder instruction at section 2.5.

Improper soldering conditions may shrink or break the sleeve. Additionally, excessive heat can damage the internal capacitor element as terminals and lead wires conduct heat into the capacitor.

1.4. ALUMINUM ELECTROLYTIC CAPACITORS - SCREW TYPE -

1.4.1. MAINTENANCE

A regular inspection is recommended when screw capacitors are used at industrial applications. Before inspection, make sure to turn off the power, discharge screw capacitors carefully and do not apply mechanical force or pressure to the terminal to avoid damage. Inspection items are as stated below:

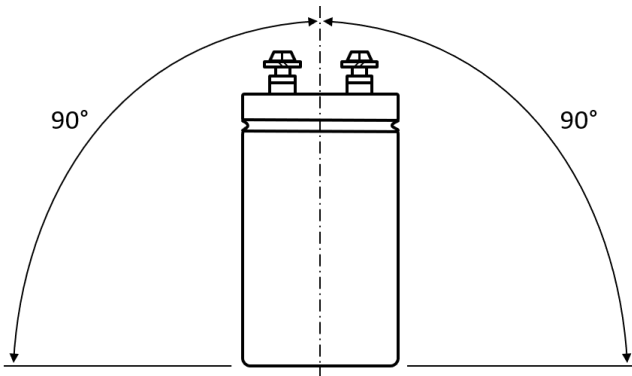
- Check on outer damage, deformation and electrolyte leakage
- Check electrical performance: leakage current, capacitance, DF value and other product specifications. If there is any abnormality detected, make sure a capacitor replacement will be done and handled properly

1.4.2. MOUNTING & INSTALLATION

Make sure capacitors rated capacitance, rated voltage and polarity is according to spec before installation. Please confirm that capacitors and circuit board terminal pitch is consistent to each other before installation. It may cause stress to internal capacitor element through the terminal. If the pitch is different, mounting was done nevertheless and strong mechanical stress was applied. In such case, this can cause short-circuit and other failure modes. Machine automated force and lead torque strength must be controlled properly when mounting happens with automated machine.

1.4.3. MOUNTING DIRECTION OF SCREW TYPE CAPACITORS

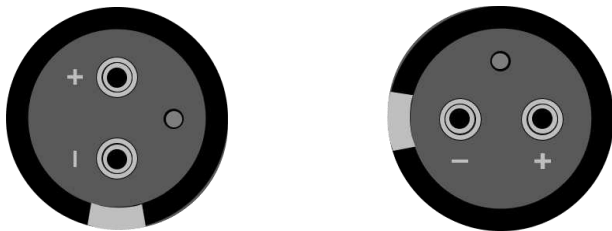
To avoid screw capacitor breakage / explosion, it is not allowed to be mounted with the safety vent downwards to ground, because vent can't function properly when mounted with vent to bottom side and existing gas pressure cannot release properly. Recommended mounting method is shown as figure below, to avoid any safety vent downwards installation. So, capacitor should be mounted with screw terminals up as shown below:



Recommended mounting direction

1.4.4. HORIZONTAL MOUNTING

For horizontal mounting following mounting is strongly recommended. Anode terminal in upper position with safety vent in horizontal position as figure below on left side or safety vent in upper position with anode and cathode terminal in horizontal as figure below on right side.



Recommended mounting position, also in accordance to EIAJ RCR-2367C

It may not damage capacitors directly, but an electrolyte leakage may happen, if installed by other mounting method in horizontal direction.

1.5. SOLID CONDUCTIVE POLYMER CAPACITORS

1.5.1. APPLICATION RESTRICTIONS

The leakage current of Solid Conductive Polymer Capacitors may vary which depends on thermal stress.

Please don't use Solid Conductive Polymer Capacitors in the following types of applications / circuits:

- High-impedance circuits - which are meant to sustain voltages
- Coupling circuits

- Time constant circuits - in addition to the leakage current fluctuation, capacitance may also fluctuate, which depends on operational temperature and humidity. The fluctuation of the capacitance may cause problems, if it is used as a time constant capacitor, which is extremely sensitive to the fluctuation of the capacitance. So, do not use it as a time constant capacitor.
- Other circuits - which are significantly affected by leakage current. If you want to use 2 or more capacitors in a series connection, please contact us before usage.

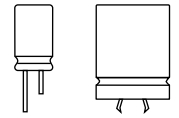
1.5.2. SUDDEN CHARGE AND DISCHARGE

Do not use the capacitor in circuits when capacitor is repetitively charged and discharged rapidly. If repetitively and rapid charging and discharging stresses the capacitor, it can result in reduction of capacitance or may cause further damage due to internal heating. The usage of a protective circuit is recommended to ensure reliability, when rush currents exceeds 10 times of capacitors allowed max. ripple current I_R , but never more than max. 10A. When measuring the leakage current, a protective resistor (1 k Ω) must be inserted to the circuit during the charge and discharge.

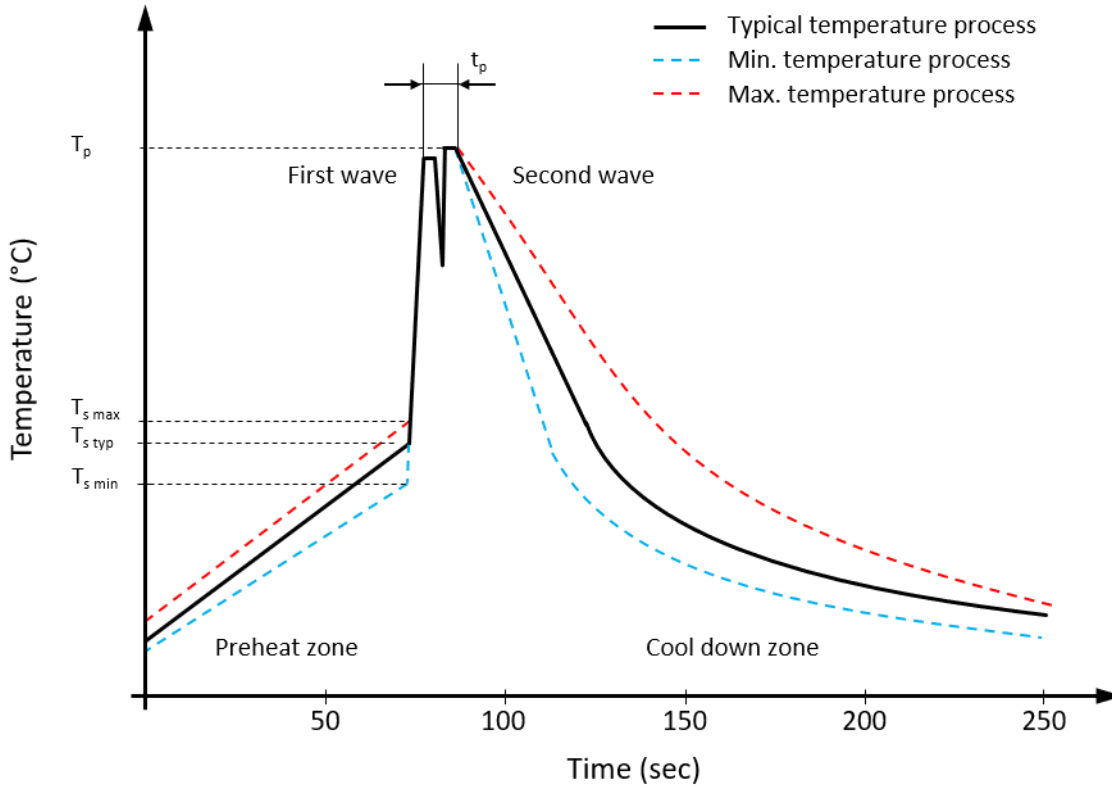
2. SOLDERING INSTRUCTIONS

In the following sections CapXon’s leadfree solder profiles are stated in detail.

2.1. WAVE SOLDERING - ALL RADIAL & SNAP-IN CAPACITORS



Recommended wave soldering conditions



Classification wave soldering profile - Refer to EN 61760-1: 2006

Profile Features		Value - Pb-free Assembly	Value - Sn-Pb Assembly
Preheat temperature min.	$T_{s\ min}$	100 °C	100 °C
Preheat temperature typical	$T_{s\ typ}$	120 °C	120 °C
Preheat temperature max.	$T_{s\ max}$	130 °C	130 °C
Preheat time t_s from $T_{s\ min}$ to $T_{s\ max}$	t_s	70 seconds	70 seconds
Peak temperature	T_p	245 °C ~ 260 °C	235 °C ~ 260 °C
Time of actual peak temperature	t_p	Max. 10 seconds Max. 5 second each wave	Max. 10 seconds Max. 5 second each wave
Ramp-down date min.		~ 2 °C/second	~ 2 °C/second
Ramp-down rate typical		~ 3.5 °C/second	~ 3.5 °C/second
Ramp-down rate max.		~ 5 °C/second	~ 5 °C/second
Time 25°C to 25°C		4 minutes	4 minutes

CAPXON

IATF 16949

AEC-Q200

ISO 9001

ISO 14001

QC 080000



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