



CTT0213, CTT1213, CTT2213, CTT3213

600V Zero Cross High Power Photo TRIAC

Features

- High isolation 5000 VRMS
- Supports 0.3 A, 0.6 A, 0.9 A and 1.2 A
- RoHS compliant
- REACH compliance
- External creepage > 7.5mm
- Internal creepage > 6.0mm
- Insulation distance > 0.4mm
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

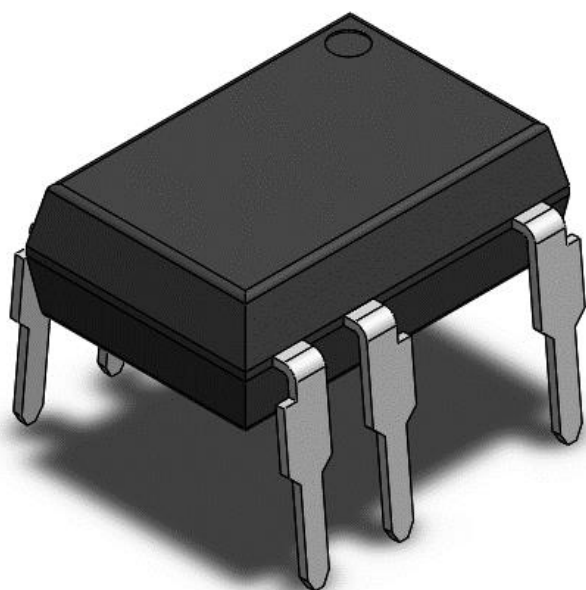
Description

The zero crossing power Triac consists of a Triac and a photo-Triac, which is optically coupled to a gallium arsenide Infrared emitting diode, and house in a 7-lead DIP package. It also comes with different lead forming options.

Applications

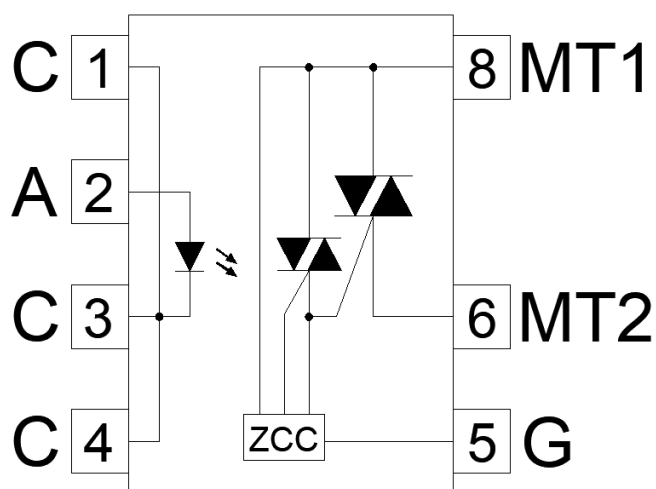
- Home appliances
- Industrial equipment

Package Outline



Note: Different bending options available. See package dimension.

Schematic





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Absolute Maximum Rating at 25°C

Symbol	Parameters		Ratings	Units	Notes
V _{iso}	Isolation voltage		5000	V _{rms}	
T _{OPR}	Operating temperature		-40 ~+85	°C	
T _{STG}	Storage temperature		-40 ~+125	°C	
T _{SOL}	Soldering temperature		260	°C	
	Wave soldering temperature		260	°C	
Emitter					
I _F	LED forward current		50	mA	
V _R	LED reverse voltage		6	V	
I _{FP}	Peak forward current		1	A	
P _{In}	Power dissipation		75	mW	
Detector					
V _{DRM}	Repetitive peak OFF-state voltage		600	V	
I _{T(RMS)}	Continuous Current Load	CTT0213	0.3	A	
		CTT1213	0.6		
		CTT2213	0.9		
		CTT3213	1.2		
I _{TSM}	Peak Current Load	CTT0213	3	A	
		CTT1213	6		
		CTT2213	9		
		CTT3213	12		
P _{out}	Power dissipation		800	mW	
P _T	Total power dissipation		850	mW	



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Electrical Characteristics $T_A = 25^\circ\text{C}$ (unless otherwise specified)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$	-	-	1.3	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{DRM1}	Peak Blocking Current	$I_F = 0\text{mA}$, $V_{DRM} = 600\text{V}$	-	-	100	μA	
I_{DRM2}	Inhibit Leakage Current	$I_F = \text{Rated } I_{FT}$, $V_{DRM} = 600\text{V}$			500	μA	
V_{INH}	Inhibit Voltage	$I_F = \text{Rated } I_{FT}$	-	-	50	V	
V_{TM}	Peak On-State Voltage	$I_F = \text{Rated } I_{FT}$, $I_{TM} = 100\text{mA}$	-	-	2.5	V	
dv/dt	Critical Rate of Rise off-State Voltage	$V_{PEAK} = \text{Rated } V_{DRM}$	200	-	-	$\text{V}/\mu\text{s}$	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	Terminal Voltage = 3V	-	-	10	mA	
I_H	Holding Current		-	-	25	mA	
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	1×10^{11}	-	-	Ω	
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$	-	0.25	-	pF	



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Typical Characteristic Curves

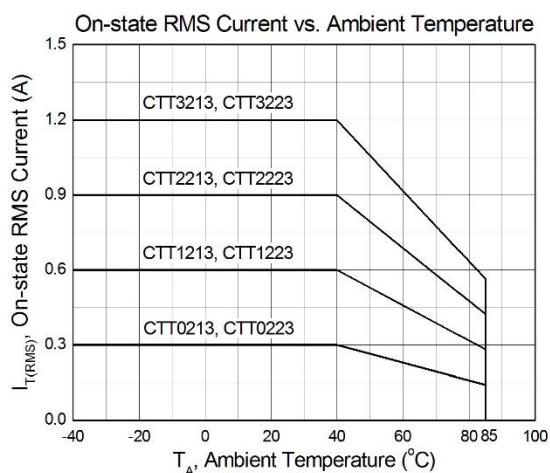


Figure 1

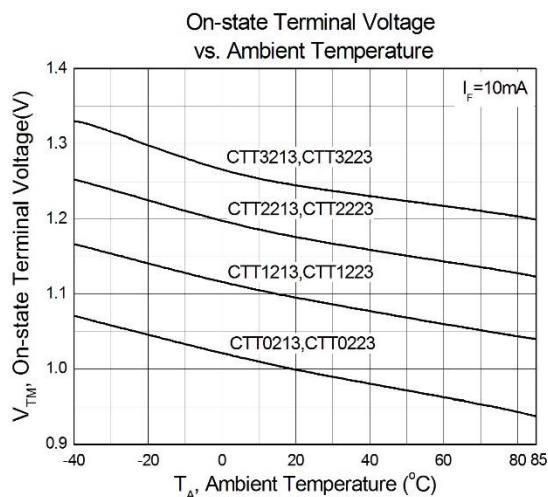


Figure 2

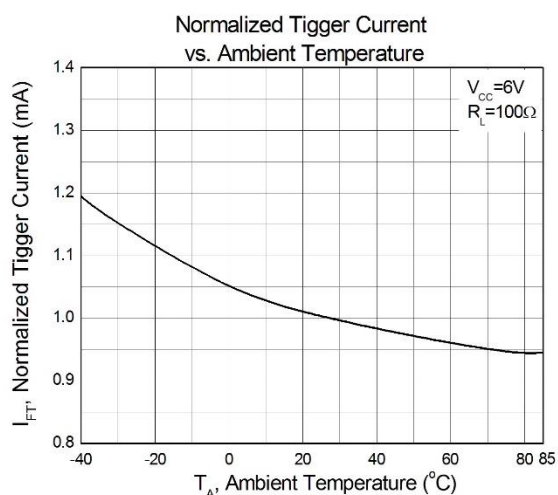


Figure 3

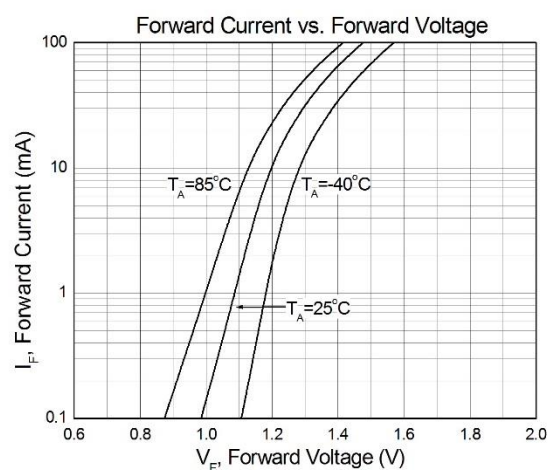


Figure 4

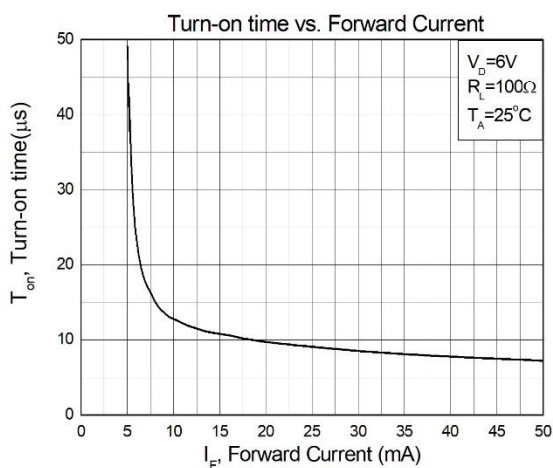


Figure 5

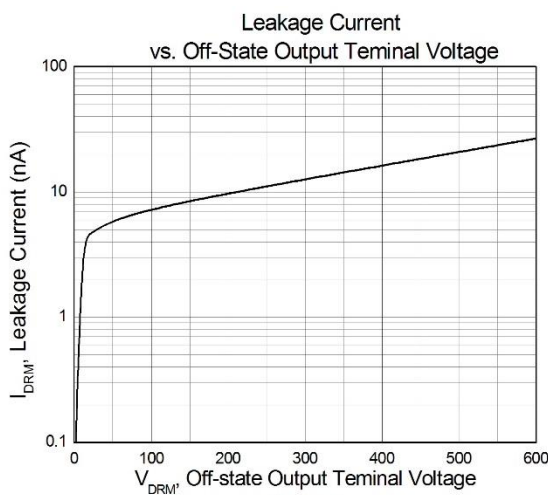
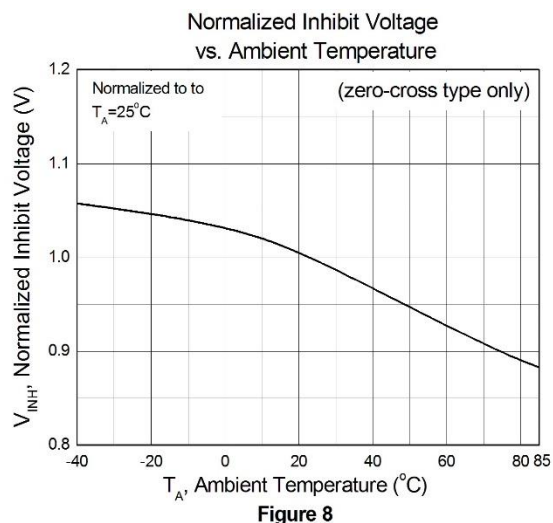
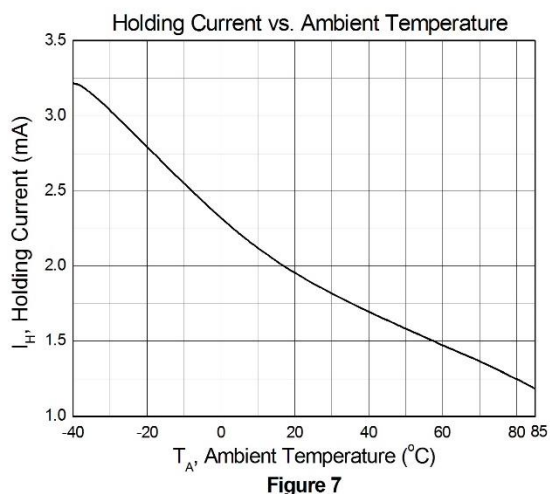


Figure 6



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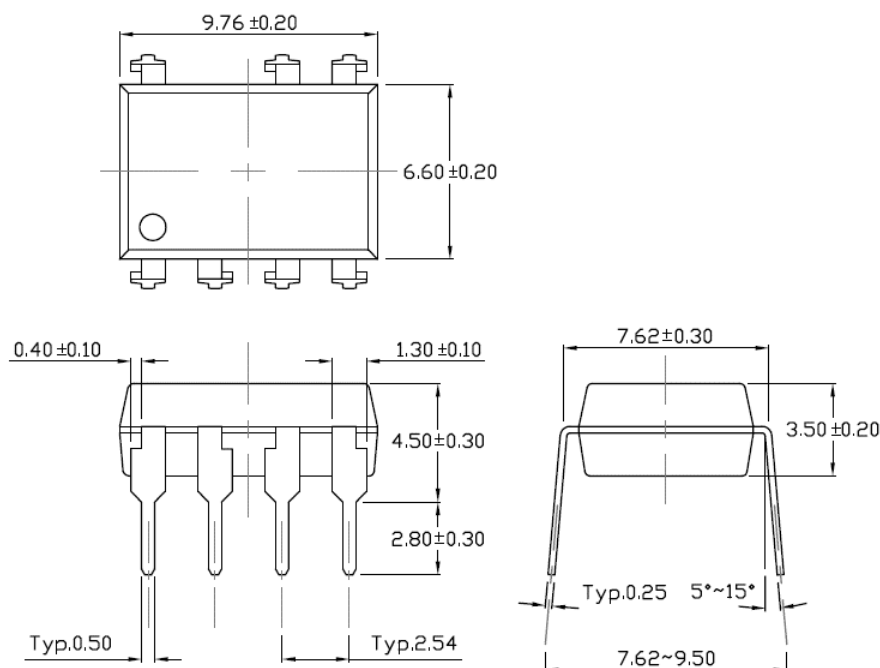


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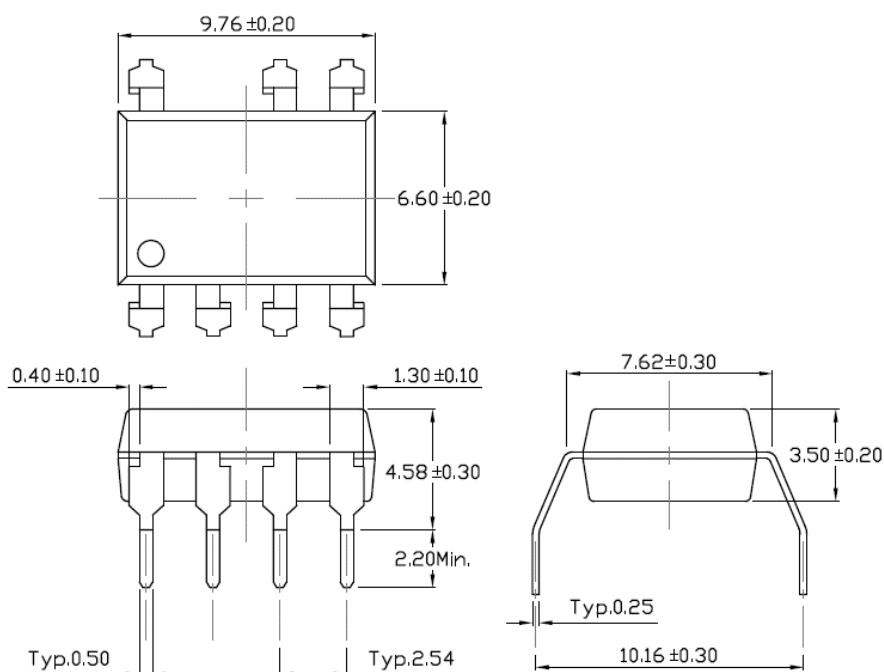
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Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole



Gullwing (400mil) Lead Forming – Through Hole (M Type)

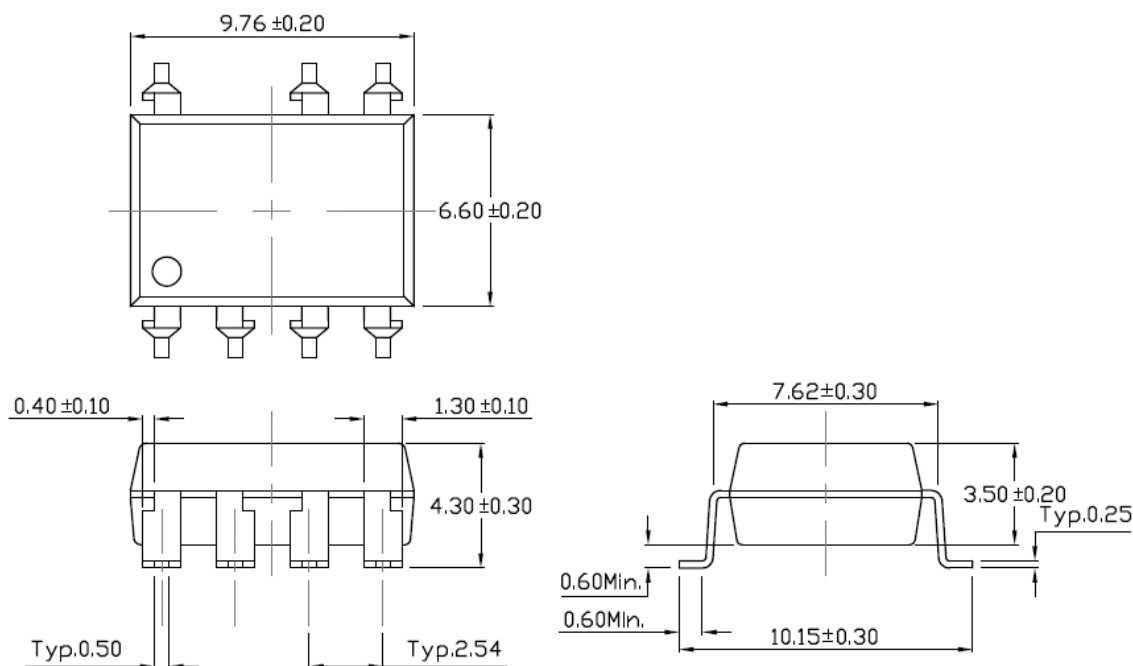




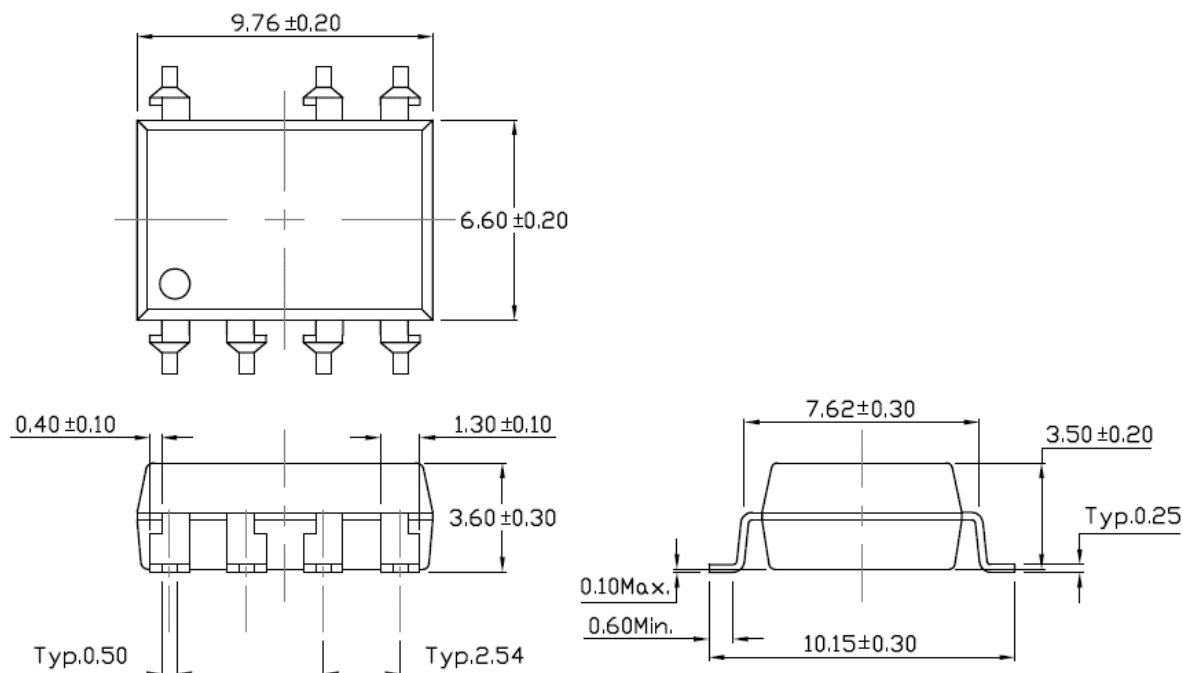
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Surface Mount Lead Forming (S Type)



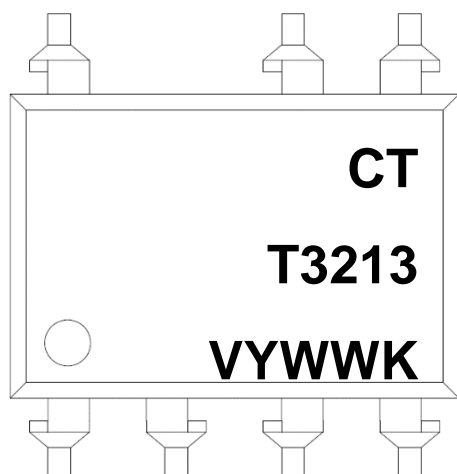
Surface Mount (Low Profile) Lead Forming (SL Type)





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Device Marking



Note:

CT : Denotes “CT Micro”
T3213 : Product Number
V : VDE Safety Mark (option)
Y : Fiscal Year
WW : Work Week
K : Production Code

Ordering Information

CTTX213(V)(Y)(Z)

CT = Denotes “CT Micro”
TX213 = Product Number (Current Rating Option X=0, 1, 2, or 3)
V = VDE safety mark option (V, or none)
Y = Lead form option (S, SL, M or none)
Z = Tape and reel option (T1, T2 or none)

Option	Description	Quantity
None	Standard 8 Pin Dip	40 Units/Tube
M	Gullwing (400mil) Lead Forming	40 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1000 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming– With Option 2 Taping	1000 Units/Reel

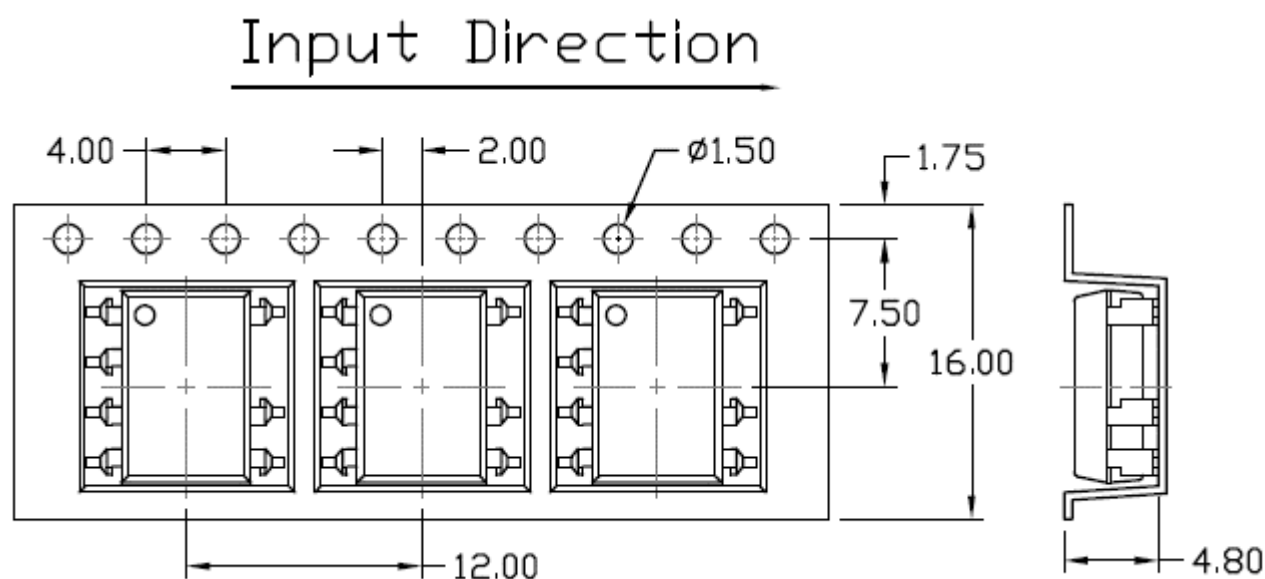


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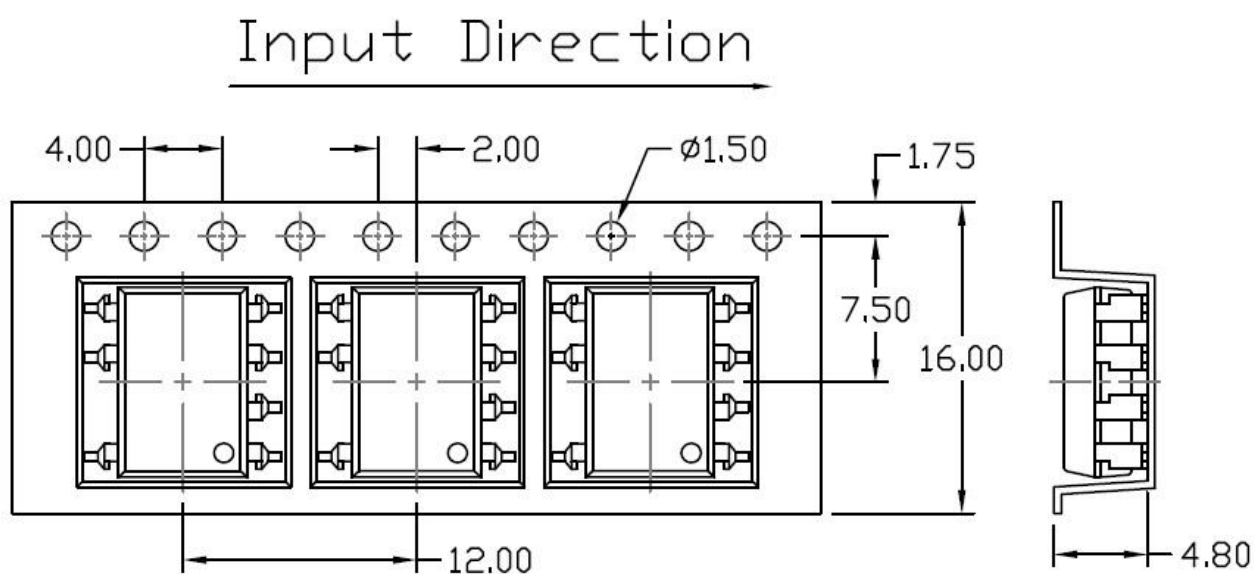
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Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)



Option S(T2) & SL(T2)





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Wave soldering (JEDEC22A111 compliant)

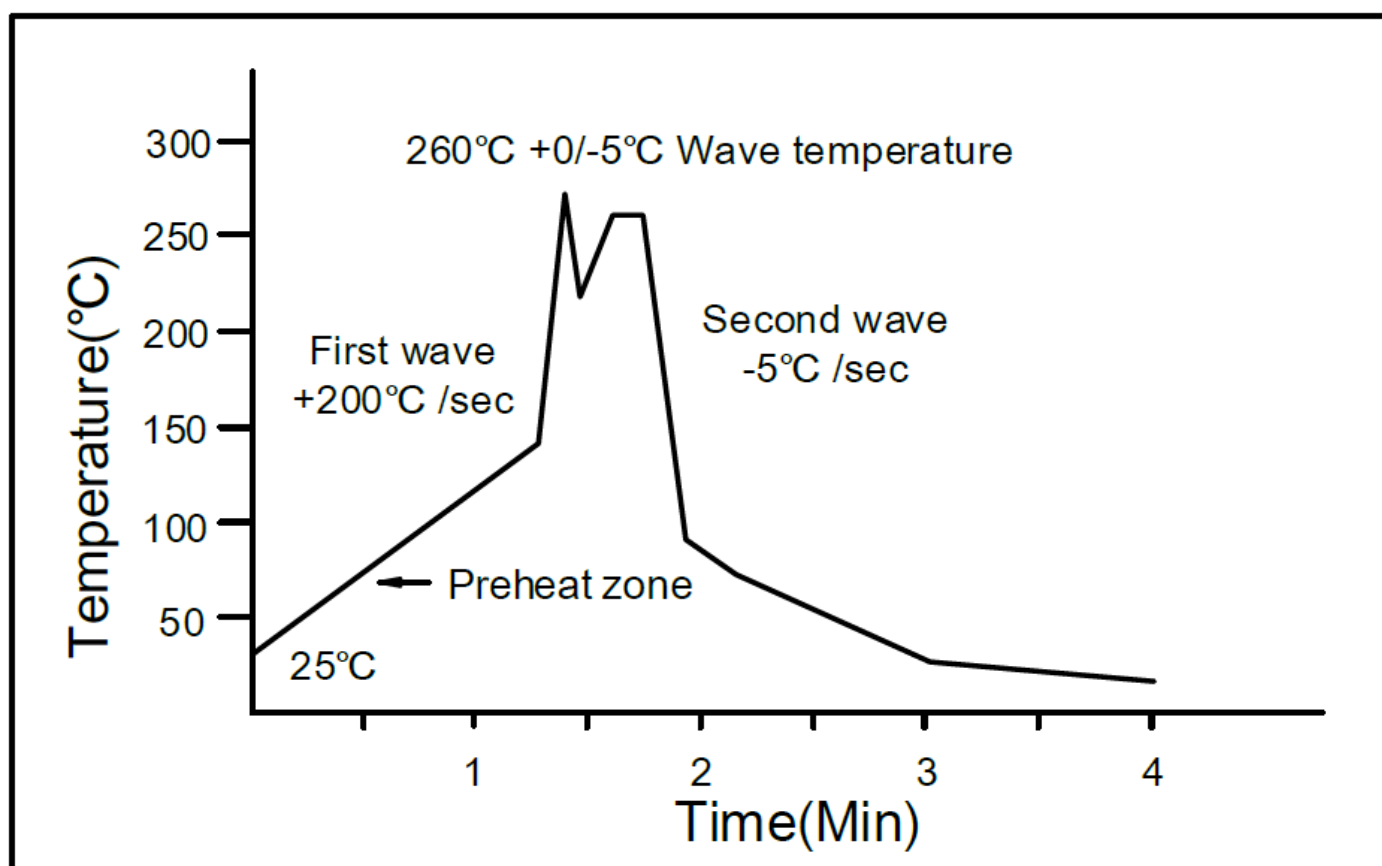
One time soldering is recommended within the condition of temperature.

Temperature: $260 \pm 5^\circ\text{C}$.

Time: 10 sec.

Preheat temperature: 25 to 140°C .

Preheat time: 30 to 80 sec.



Hand soldering by soldering iron

Allow single lead soldering in every single process.

One time soldering is recommended. Temperature: $350 \pm 5^\circ\text{C}$

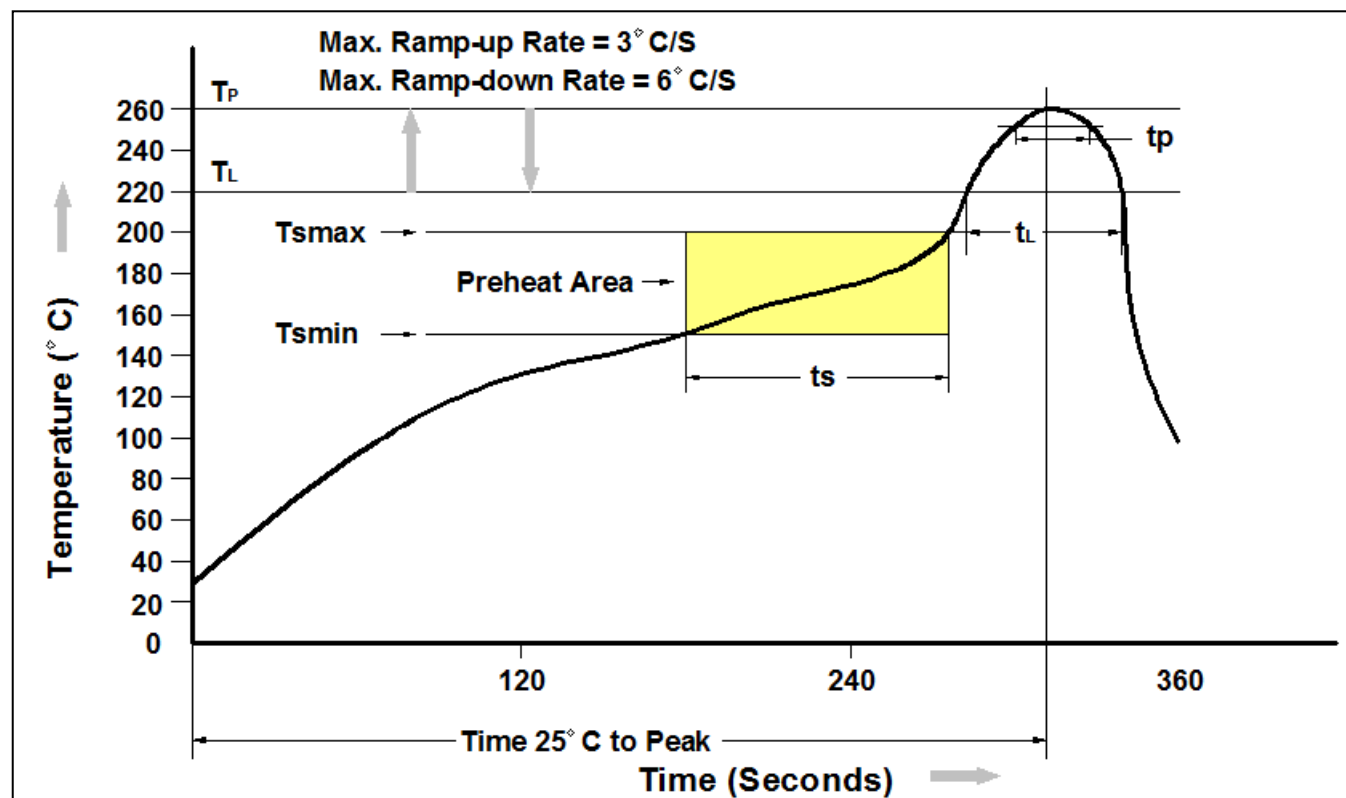
Time: 3 sec max.



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Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak Body Package Temperature	260°C +0°C / -5°C
Time (t_P) within 5°C of 260°C	30 seconds
Ramp-down Rate (T_P to T_L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.



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