

# APPROVAL SHEET

## **WLCM1608Z1 Multi-Layer Ceramic High Frequency Inductors**

\*Contents in this sheet are subject to change without prior notice.

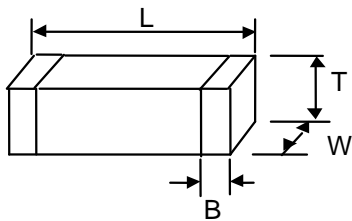
## FEATURES

1. Ceramic structure provides high reliability · high productivity.
2. Exceptionally high Q and SRF characteristics for RF application.
3. Wide range inductance and various tolerance options.
4. RoHS compliance.

## APPLICATIONS

1. Communication system front-end circuit: GSM/3G/LTE, Wi-Fi, GPS.
2. Cabel/Terrestrial/BS Tuner, Bluetooth, Wireless Audio, Remote control.
3. M2M: ZigBee, Proprietary wireless.
4. EMI solution in high frequency circuits.

## SHAPE and DIMENSION



Unit: mm (inches)

WLCM Series	L	W	T	B	Packing Quantity (pcs/reel)
WLCM1608Z1 (EIA 0603)	1.6±0.15 (0.063±.006)	0.8±0.15 (0.031±.006)	0.8±0.15 (0.031±.006)	0.2~0.6	4,000

## Ordering Information

WL	CM	1608	Z1	S	1N2	T	B
<b>Product Code</b> WL: Inductor	<b>Series</b> Ceramic multilayer inductor.	<b>Dimensions</b> 1608:EIA 0603	<b>Series extension</b> Z1	<b>Tolerance</b> S: ± 0.3nH J: ± 5%	<b>Value</b> 1N2 =1.2nH 12N =12nH R12 = 120nH	<b>Packing Code</b> T=7" Reeled (Paper tape)	B:STD

## Electrical Characteristics

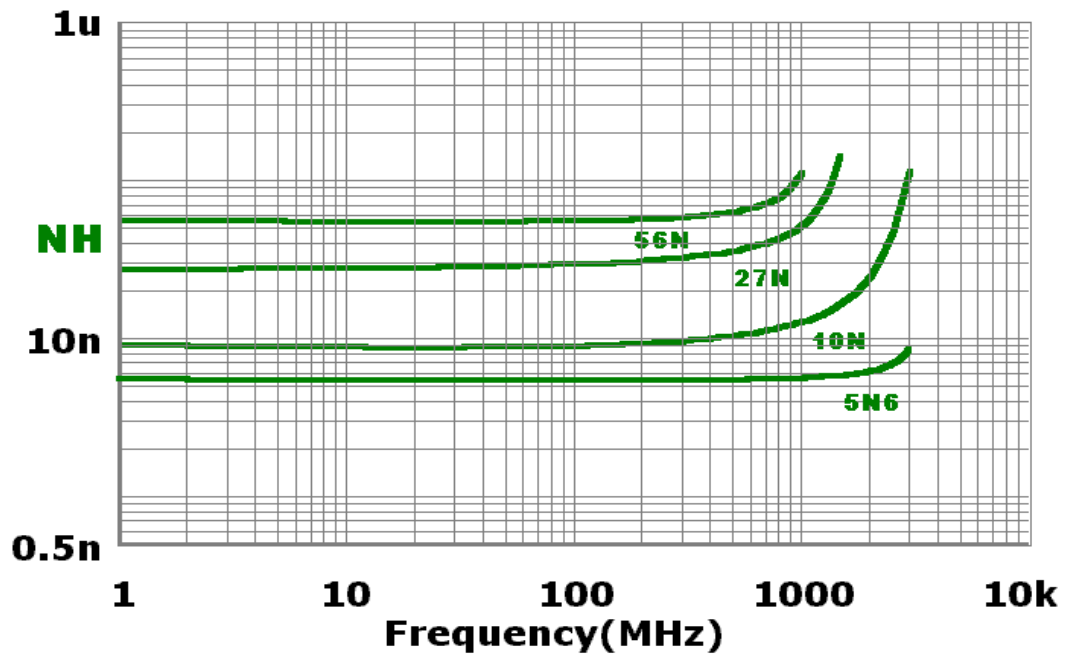
- WLCM1608Z1 series (EIA 0603)

Operating Temperature range: -55°C to 125°C

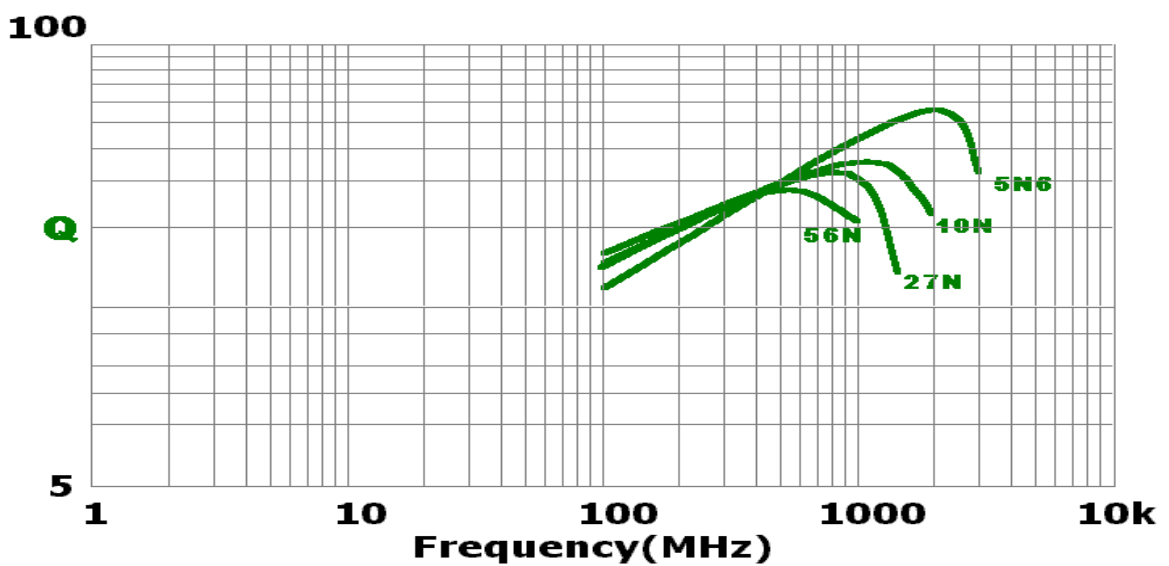
Walsin Part Number	L(nH)	Tolerance	Q Min.	Q Measuring Frequency (MHz)	SRF Minimum. (MHz)	RDC Maximum (Ω)	Rated Current Max.(mA)
WLCM1608Z1□1N0TB	1.0	S	8	100	10000	0.04	1000
WLCM1608Z1□1N2TB	1.2	S	8	100	10000	0.04	1000
WLCM1608Z1□1N5TB	1.5	S	8	100	6000	0.06	1000
WLCM1608Z1□1N8TB	1.8	S	8	100	6000	0.06	1000
WLCM1608Z1□2N2TB	2.2	S	8	100	6000	0.07	1000
WLCM1608Z1□2N7TB	2.7	S	10	100	6000	0.08	1000
WLCM1608Z1□3N3TB	3.3	S	10	100	6000	0.10	1000
WLCM1608Z1□3N9TB	3.9	S	10	100	6000	0.14	1000
WLCM1608Z1□4N7TB	4.7	S	10	100	4000	0.15	1000
WLCM1608Z1□5N6TB	5.6	S	10	100	4000	0.16	600
WLCM1608Z1□6N8TB	6.8	J	10	100	4000	0.16	600
WLCM1608Z1□8N2TB	8.2	J	10	100	3500	0.18	600
WLCM1608Z1□10NTB	10	J	12	100	3400	0.20	600
WLCM1608Z1□12NTB	12	J	12	100	2600	0.20	600
WLCM1608Z1□15NTB	15	J	12	100	2300	0.28	600
WLCM1608Z1□18NTB	18	J	12	100	2000	0.35	600
WLCM1608Z1□22NTB	22	J	12	100	1600	0.40	600
WLCM1608Z1□27NTB	27	J	12	100	1400	0.40	600
WLCM1608Z1□33NTB	33	J	12	100	1200	0.50	600
WLCM1608Z1□39NTB	39	J	12	100	1100	0.50	600
WLCM1608Z1□47NTB	47	J	12	100	900	0.65	600
WLCM1608Z1□56NTB	56	J	12	100	900	0.65	600
WLCM1608Z1□68NTB	68	J	12	100	700	0.65	600
WLCM1608Z1□82NTB	82	J	12	100	600	0.95	300
WLCM1608Z1□R10TB	100	J	12	100	600	1.00	300
WLCM1608Z1□R12TB	120	J	8	50	500	1.20	300
WLCM1608Z1□R15TB	150	J	8	50	500	1.20	300
WLCM1608Z1□R18TB	180	J	8	50	400	1.30	300
WLCM1608Z1□R22TB	220	J	8	50	400	1.50	300
WLCM1608Z1□R27TB	270	J	8	50	400	1.9	300

※MSL : LEVEL 1

INDUCTANCE VS FREQUENCY CHARACTERISTICS

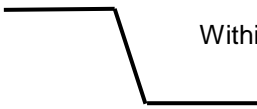


Q VS FREQUENCY CHARACTERISTICS



Test condition & Requirements

No.	Item	Test condition	Requirements																
1	Appearance	Inductors shall be visually inspected for visible evidence of defect.	No harmful defect for piratical use.																
2	Inductance	a. Temperature: 25+/- 3°C b. Relative Humidity: 45 to 75%RH c. Measurement Voltage: 250mV d. Measuring equipment and fixture: 1608(0603) HP 4286A	Within specified tolerance																
3	Q Value	a. Temperature: 25 ± 3°C b. Relative Humidity: 45 to 75%RH c. Measurement Voltage: 250mV d. Measuring equipment and fixture: 1608(0603) HP 4286A	In accordance with electrical specification																
4	DC Resistance	a. Temperature: 25 ± 3°C b. Relative Humidity: 45 to 75%RH c. Measuring equipment: HP 4338	In accordance with electrical specification																
5	Dimension	Dimension shall be measured with calliper or micrometer	In accordance with dimension specification.																
6	Solder-ability	Immerse a test sample into a methanol solution containing rosin and immerse into Sn-3Ag-0.5Cu solder of 245±5 for 3±1 seconds.	90% of the termination is to be soldered evenly and continuously.																
7	Resistance to Soldering Heat	Immerse a test sample into a methanol solution containing resin, preheat it at 100 to 150°C for 1 minutes and immerse into molten solder of 265 ± 3 °C for 6 ± 1 second so that both terminal electrodes are completely submerged.	No visible damage. Inductance variation within 10% Q variation within 20%																
8	Bending Strength	<p>Solder the chip to test jig then apply a force in the direction shown in below. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.</p> <p>t : 1.6mm(0.8mm for 0603&amp;1005 size) Fig. a.</p> <p>Fig. b.</p> <table border="1"> <thead> <tr> <th>Size</th> <th>a</th> <th>b</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>0.3</td> <td>0.9</td> <td>0.3</td> </tr> <tr> <td>1005</td> <td>0.4</td> <td>1.5</td> <td>0.5</td> </tr> <tr> <td>1608</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> </tbody> </table>	Size	a	b	C	0603	0.3	0.9	0.3	1005	0.4	1.5	0.5	1608	1.0	3.0	1.2	No mechanical damage shall be observed. Rdc-value : to meet the initial Spec.
Size	a	b	C																
0603	0.3	0.9	0.3																
1005	0.4	1.5	0.5																
1608	1.0	3.0	1.2																

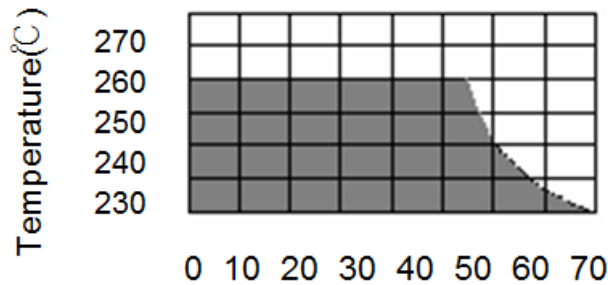
No.	Item	Test condition	Requirements
9	Thermal Shock	<p>Solder a test sample to printed circuit board, and conduct 5 cycles of test under the conditions shown as below.</p> <p>1608 (0603 operating temp. range: -55~125°C</p> <p>Cycle:</p> <p>Maximum operating temp. (30+/-3min)</p>  <p>Minimum operating temp. (30+/-3min)</p>	<p>No visible damage.</p> <p>Inductance variation within 10% Q variation within 20%</p>
10	High Humidity State Life Test	<p>Keep a test sample in an atmosphere with a temperature of 40±2°C, 90~95% RH for 500+24/-0 hours.</p> <p>After the removal from the chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs recovery under standard condition.</p>	<p>No visible damage.</p> <p>Inductance variation within 10% Q variation within 20%</p>
11	High Humidity Load Life Test	<p>Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 40±2, 90~95%RH for 500+24/-0 hours while supplying the rated current.</p> <p>After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.</p>	<p>No visible damage.</p> <p>Inductance variation within 10% Q variation within 20%</p>
12	High Temperature State Life Test	<p>Keep a test sample in an atmosphere with a temperature of 125±2°C for 1000±12 hours. After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.</p>	<p>No visible damage.</p> <p>Inductance variation within 10% Q variation within 20%</p>
13	High Temperature Load	<p>Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 125±2°C for 1000±12 hours while supplying the rated current.</p> <p>After the removal from test chamber, 2 to 3 hours of recovery under standard condition, and measurement shall be made after 24±2 hrs of recovery under standard condition.</p>	<p>No visible damage.</p> <p>Inductance variation within 10% Q variation within 20%</p>

Reflow soldering conditions

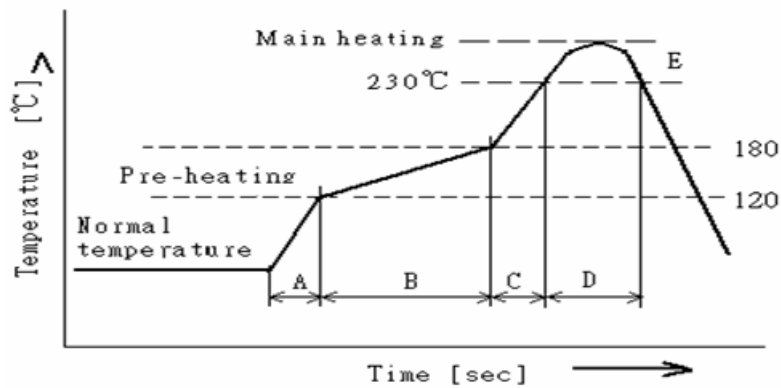
Pre-heating should be in such a way that the temperature difference between solder and ferrite surface is limited to 150°C max. Also cooling into solvent after soldering should be in such a way that the temperature difference is limited to 100°C max.

Insufficient pre-heating may cause cracks on the ferrite, resulting in the deterioration of product quality.

Products should be soldered within the following allowable range indicated by the slanted line. The excessive soldering conditions may cause the corrosion of the electrode, when soldering is repeated, allowable time is the accumulated time.



Temperature Profile



A	Slope of temp. rise	1 ~ 5	°C/sec
B	Heat time	50 ~ 150	sec
	Heat temperature	120 ~ 180	°C
C	Slope of temp. rise	1 ~ 5	°C/sec
D	Time over 230°C	90 ~ 120	sec
E	Peak temperature	255~260	°C
	Peak hold time	10 max.	sec
No. of mounting		3	Items

## Reworking with soldering iron

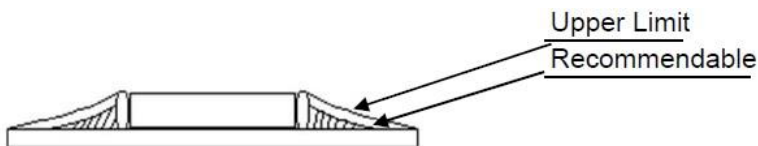
Preheating	150°C, 1 minute
Tip temperature	280°C max.
Soldering time	3 seconds max.
Soldering iron output	30w max.
End of soldering iron	f 3mm max.

- Reworking should be limited to only one time.

Note : Do not directly touch the products with the tip of the soldering iron in order to prevent the crack on the ferrite material due to the thermal shock.

- Solder Volume

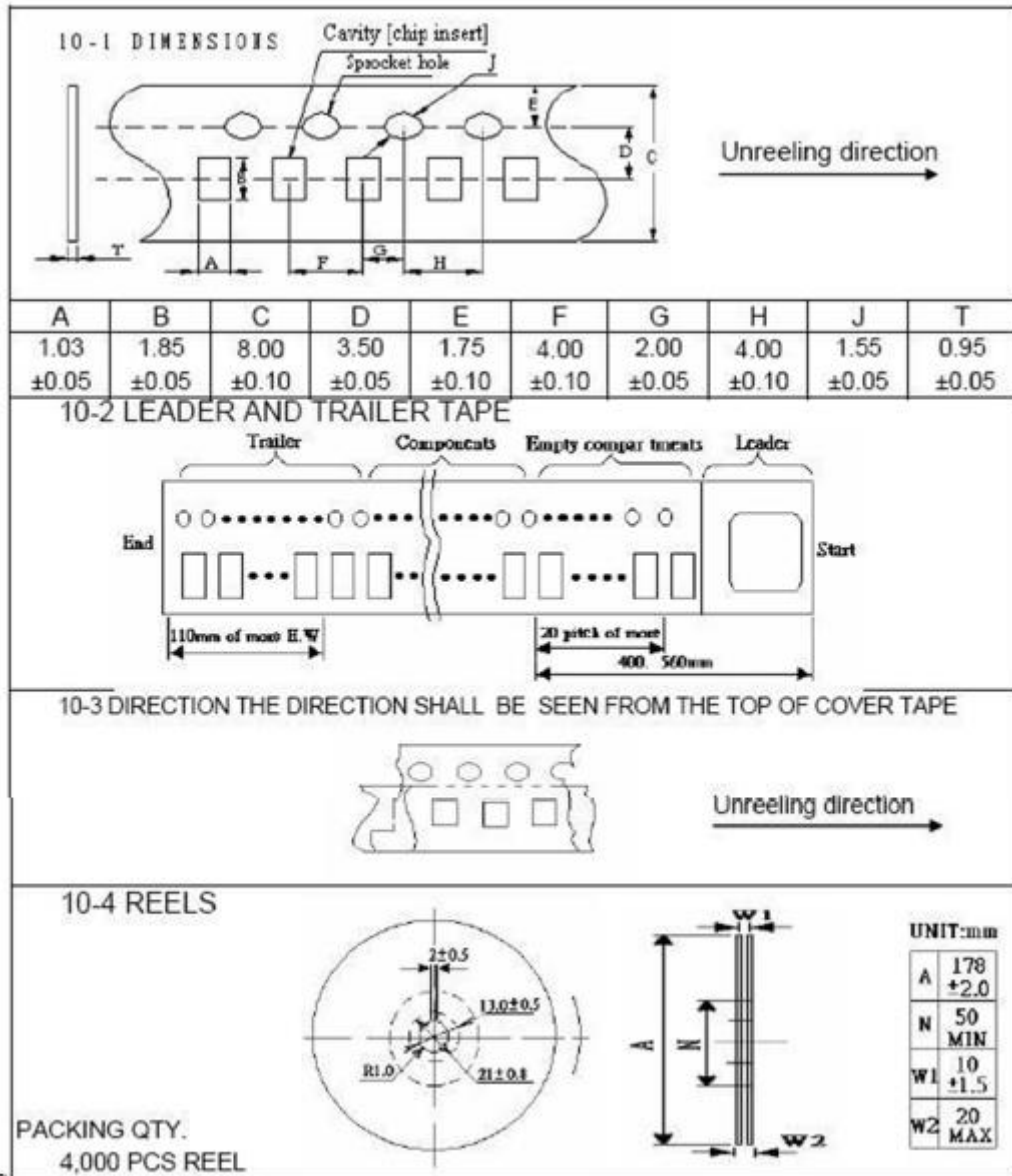
Solder shall be used not to be exceed the upper limits as shown below.



Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance.



PAPER CARRIER TYPE PACKING



**Quantity per reel**

WLCM1608Z1 Series : 4K pcs