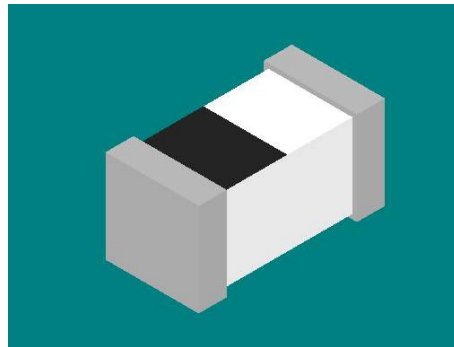


The background features a vertical column of overlapping geometric shapes on the left side, including squares, octagons, and polygons, some filled with diagonal hatching and others with solid gray. The rest of the page is a light gray gradient.

MLCI 1608(0603) Series
Approval sheet

MLCI 1608 Series Approval Sheet

Multi-layer Chip Inductor



ORDERING CODE



High Frequency MLCI Series

HI 1608 15N J T
 ① ② ③ ④ ⑤

① Product ID

Code	Definition
HI	High Frequency Inductor (Lead Free)

③ Inductance

Code	Design
1N5	1.5nH
12N	12nH
R12	120nH

⑤ Packaging

Code	Packaging
B	Bulk
T	Tape

② Dimension(LXW)

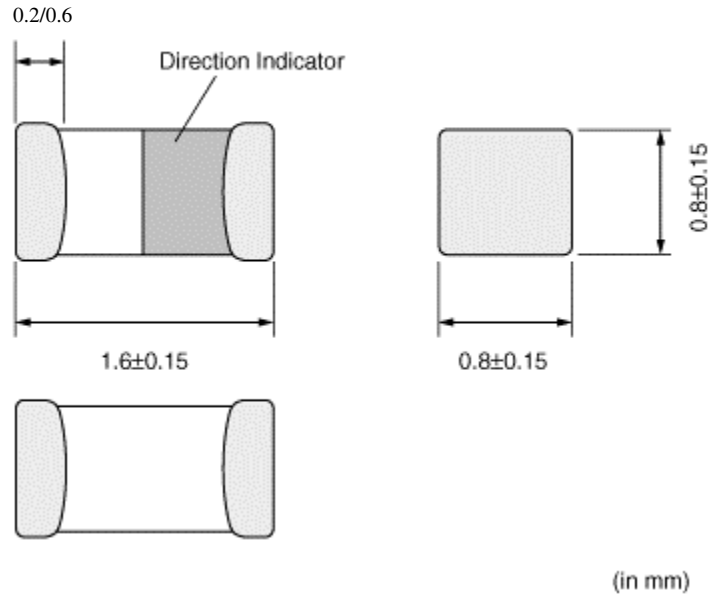
Code	Dimension(L x W)	EIA
0603	0.6x0.3 mm	0201
1005	1.0x0.5 mm	0402
1608	1.60X0.8mm	0603

④ Tolerance Code

Code	Tolerance
D	+/- 0.1nH
C	+/- 0.2nH
S	+/- 0.3nH
G	+/- 2%
H	+/- 3%
J	+/- 5%
K	+/- 10%

HI 1608 Specifications

1. SHAPE AND SIZE (mm)



2. SPECIFICATION

2.1 Dimension and Inductance tolerance

DIMENSION CODE (EIA CODE)	AVAILABLE INDUCTANCE	RATINGS	NORMAL TOLERANCE	Available Tolerance on Request
1608 (0603)	1.0 nH ~ 470 nH	1.0 nH ~ 5.6 nH	S: ±0.3 nH	C: ±0.2 nH
		6.8 nH ~ 470 nH	J: ±5%	G: ±2%

2.2 ELECTRICAL SPECIFICATIONS {1608 (0603) SERIES}

Ordering Code	Inductance (nH)	Available Tolerance	Q	L, Q Measureing Frequency (MHz)	Self-Resonance Frequency (MHz)		DC Resistance (Ω)		Rated Current (mA)	Packing Amount of 7" reel Pcs
					Min.	typ.	Max.	typ.		
HI16081N0□T	1.0	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	8	100	10000	>13000	0.05	0.01	1000	4,000
HI16081N2□T	1.2	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	8	100	10000	>13000	0.05	0.02	1000	
HI16081N5□T	1.5	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	8	100	10000	>13000	0.10	0.03	1000	
HI16081N8□T	1.8	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	8	100	10000	>13000	0.10	0.04	1000	
HI16082N2□T	2.2	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	8	100	6000	11690	0.10	0.05	1000	
HI16082N7□T	2.7	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	10	100	6000	8930	0.13	0.06	1000	
HI16083N3□T	3.3	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	10	100	6000	6440	0.13	0.07	1000	
HI16083N9□T	3.9	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	10	100	6000	7280	0.15	0.08	1000	
HI16084N7□T	4.7	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	10	100	4000	6470	0.20	0.09	1000	
HI16085N6□T	5.6	$\pm 0.3\text{nH}, \pm 0.2\text{nH}, \pm 0.1\text{nH}$	10	100	4000	5230	0.23	0.10	600	
HI16086N8□T	6.8	$\pm 5\%, \pm 2\%$	10	100	4000	5470	0.25	0.11	600	
HI16088N2□T	8.2	$\pm 5\%, \pm 2\%$	10	100	3500	4460	0.28	0.14	600	
HI160810N□T	10	$\pm 5\%, \pm 2\%$	12	100	3200	4360	0.30	0.15	600	
HI160812N□T	12	$\pm 5\%, \pm 2\%$	12	100	2600	3480	0.35	0.17	600	
HI160815N□T	15	$\pm 5\%, \pm 2\%$	12	100	2300	3310	0.40	0.19	600	
HI160818N□T	18	$\pm 5\%, \pm 2\%$	12	100	2000	3080	0.45	0.21	600	
HI160822N□T	22	$\pm 5\%, \pm 2\%$	12	100	1600	2670	0.50	0.29	600	
HI160827N□T	27	$\pm 5\%, \pm 2\%$	12	100	1400	2270	0.55	0.27	600	
HI160833N□T	33	$\pm 5\%, \pm 2\%$	12	100	1200	1970	0.60	0.36	600	
HI160839N□T	39	$\pm 5\%, \pm 2\%$	12	100	1100	1830	0.65	0.37	500	
HI160847N□T	47	$\pm 5\%, \pm 2\%$	12	100	900	1670	0.70	0.47	500	
HI160856N□T	56	$\pm 5\%, \pm 2\%$	12	100	900	1530	0.75	0.46	500	
HI160868N□T	68	$\pm 5\%, \pm 2\%$	12	100	700	1360	0.85	0.51	400	
HI160882N□T	82	$\pm 5\%, \pm 2\%$	12	100	600	1290	0.95	0.57	300	
HI1608R10□T	100	$\pm 5\%, \pm 2\%$	12	100	600	1090	1.00	0.69	300	
HI1608R12□T	120	$\pm 5\%, \pm 2\%$	8	50	500	1030	1.20	0.74	300	
HI1608R15□T	150	$\pm 5\%, \pm 2\%$	8	50	500	820	1.20	0.78	300	
HI1608R18□T	180	$\pm 5\%, \pm 2\%$	8	50	400	690	1.30	0.92	300	
HI1608R22□T	220	$\pm 5\%, \pm 2\%$	8	50	400	630	1.50	1.19	300	
HI1608R27□T	270	$\pm 5\%, \pm 2\%$	8	50	400	520	1.90	1.19	150	
HI1608R33□T	330	$\pm 5\%, \pm 2\%$	8	50	350	450	2.10	1.50	150	
HI1608R39□T	390	$\pm 5\%, \pm 2\%$	8	50	350	400	2.30	1.80	150	
HI1608R47□T	470	$\pm 5\%, \pm 2\%$	8	50	300	360	2.60	2.04	150	

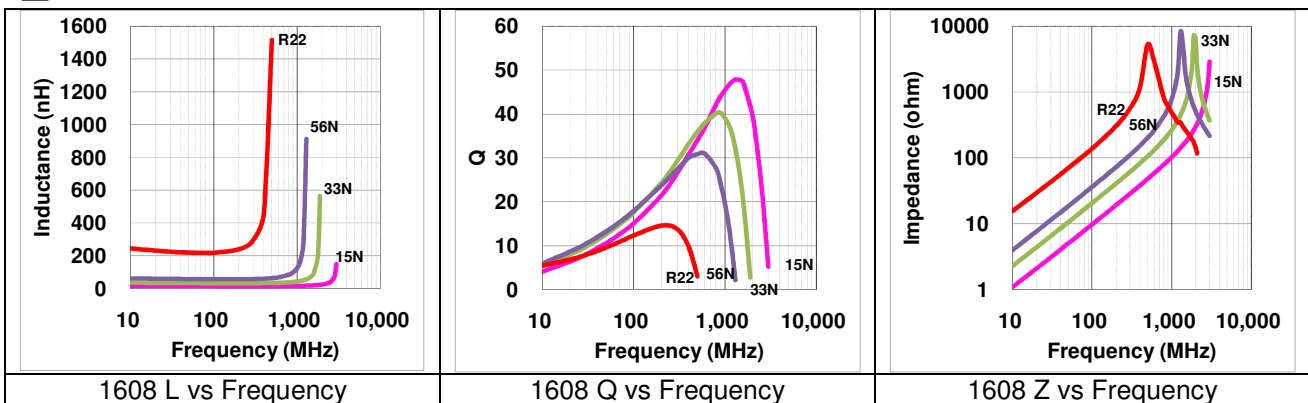
**□ Tolerance: D= $\pm 0.1\text{nH}$, C= $\pm 0.2\text{nH}$, S= $\pm 0.3\text{nH}$, G= $\pm 2\%$, J= $\pm 5\%$, K= $\pm 10\%$

- MEASURING EQUIPMENT: HP4291B+16192A ● MEASURING TEMPERATURE: 25 +/- 3 °C
- OPERATING TEMPERATURE RANGE: -40 °C TO +85 °C

L, Q vs. FREQUENCY CHARACTERISTICS

Ordering Code	Typical Inductance(nH)							Typical Q						
	100MHz	500MHz	800MHz	900MHz	1.8GHz	2.0GHz	2.4GHz	100MHz	500MHz	800MHz	900MHz	1.8GHz	2.0GHz	2.4GHz
HI16081N0□T	1.0	1.1	1.1	1.1	1.1	1.1	1.0	14	40	53	60	93	32	174
HI16081N2□T	1.2	1.2	1.2	1.2	1.2	1.2	1.1	14	38	49	54	84	32	143
HI16081N5□T	1.5	1.6	1.6	1.6	1.6	1.5	1.5	12	31	39	43	62	33	88
HI16081N8□T	1.8	1.8	1.8	1.8	1.8	1.8	1.7	13	34	42	46	68	37	97
HI16082N2□T	2.2	2.2	2.2	2.2	2.2	2.2	2.2	14	36	46	50	73	42	101
HI16082N7□T	2.7	2.7	2.7	2.7	2.7	2.7	2.7	14	36	47	45	72	45	94
HI16083N3□T	3.3	3.3	3.3	3.3	3.5	3.5	3.6	14	37	47	50	67	47	77
HI16083N9□T	3.9	3.9	3.9	3.9	4.0	4.0	4.1	15	36	46	49	66	48	81
HI16084N7□T	4.7	4.6	4.6	4.7	4.9	4.9	5.1	15	39	50	53	70	53	80
HI16085N6□T	5.6	5.5	5.6	5.6	6.1	6.3	6.7	15	39	50	54	67	52	69
HI16086N8□T	6.8	6.7	6.7	6.8	7.3	7.5	7.9	15	38	49	52	66	53	66
HI16088N2□T	8.2	8.1	8.2	8.3	9.5	9.9	11.0	16	37	48	50	59	49	54
HI160810N□T	10.0	9.9	10.1	10.2	11.7	12.3	13.9	16	39	49	52	60	50	52
HI160812N□T	12.0	12.2	12.6	12.8	16.6	18.4	24.4	16	36	46	48	47	39	31
HI160815N□T	15.0	15.1	15.6	15.9	21.0	23.4	31.9	17	40	50	52	49	41	31
HI160818N□T	18.0	18.1	18.9	19.3	27.7	32.2	52.2	17	39	48	50	43	35	21
HI160822N□T	22.0	22.3	23.8	24.6	45.7	63.5	521.1	17	39	46	47	29	19	1
HI160827N□T	27.0	27.8	30.3	31.6	85.8	191.2	-	18	39	45	46	19	8	-
HI160833N□T	33.0	34.9	38.8	40.9	-	-	-	18	39	43	43	-	-	-
HI160839N□T	39.0	41.3	47.7	51.2	-	-	-	19	36	39	37	-	-	-
HI160847N□T	47.0	50.0	58.9	64.0	-	-	-	17	34	36	34	-	-	-
HI160856N□T	56.0	62.0	77.7	87.5	-	-	-	19	35	34	31	-	-	-
HI160868N□T	68.0	76.8	103.2	121.7	-	-	-	18	33	29	25	-	-	-
HI160882N□T	82.0	96.5	145.3	187.2	-	-	-	19	32	25	20	-	-	-
HI1608R10□T	100.0	123.7	222.4	343.5	-	-	-	18	30	19	12	-	-	-
HI1608R12□T	120.0	156.0	355.0	-	-	-	-	19	28	14	-	-	-	-
HI1608R15□T	150.0	227.9	-	-	-	-	-	18	21	-	-	-	-	-
HI1608R18□T	180.0	336.8	-	-	-	-	-	17	17	-	-	-	-	-
HI1608R22□T	220.0	520.7	-	-	-	-	-	16	13	-	-	-	-	-
HI1608R27□T	270.0	-	-	-	-	-	-	16	-	-	-	-	-	-
HI1608R33□T	330.0	-	-	-	-	-	-	14	-	-	-	-	-	-
HI1608R39□T	390.0	-	-	-	-	-	-	14	-	-	-	-	-	-
HI1608R47□T	470.0	-	-	-	-	-	-	13	-	-	-	-	-	-

TYPICAL ELECTRICAL CHARACTERISTICS



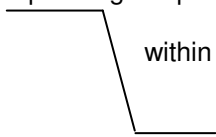
3. TESTING CONDITION AND REQUIREMENTS

Item	Test Condition	Requirements
Inductance	a. Temperature: 25 +/- 3°C b. Relative Humidity: 45 to 75%RH c. Measuring equipment and fixture: 1608(0603) HP 4291+16192A	Within specified tolerance.
Q Value	a. Temperature: 25 +/- 3°C b. Relative Humidity: 45 to 75%RH c. Measuring equipment and fixture: 1608(0603) HP 4291+16192A	In accordance with electrical specification.
DC Resistance	a. Temperature: 25 +/- 3°C b. Relative Humidity: 45 to 75%RH c. Measuring equipment: HP 4338	In accordance with electrical specification.

TEST CONDITIONS AND REQUIREMENTS

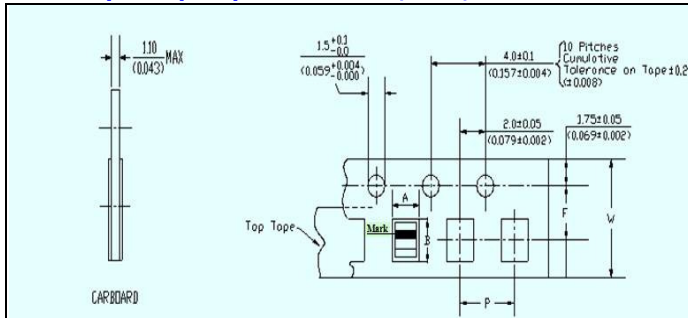
Item	Test Condition	Requirements
Appearance	Inductors shall be visually inspected for visible evidence of defect.	In accordance with specification.
Dimension	Dimension shall be measured with caliper or micrometer	In accordance with dimension specification.
Solderability	Immerse a test sample into a methanol solution containing rosin and immerse into molten solder of 230+/-5°C for 5+/-1 seconds.	More than 75% of the terminal electrode part shall be covered with fresh solder.
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> <div style="text-align: center;"> <p>Mounting Samples</p> </div>	<ol style="list-style-type: none"> 1. No mechanical damage shall be observed. 2. Rdc-value: to meet the initial Spec.
Resistance to Soldering Heat	Immerse a test sample into a methanol solution containing resin, preheat it at 120 to 150°C for 1 minutes and immerse into molten solder of 270+/-5°C for 10+/-1 second so that both terminal electrodes are completely submerged.	No visible damage Inductance variation within 10% Q variation within 20%

■ Reliability

Item	Test Condition	Requirements
<p>Thermal Shock</p>	<p>Solder a test sample to printed circuit board, and conduct 5 cycles of test under the conditions shown as below.</p> <p>0603 & 1005 operating temp. range: -55~125°C 1608 operating temp. range: -40~85°C</p> <p>Cycle: Maximum operating temp. (30+/-3min)</p>  <p>Minimum operating temp. (30+/-3min)</p>	<p>No visible damage Inductance variation within 10% Q variation within 20%</p>
<p>High Humidity State Life Test</p>	<p>Keep a test sample in an atmosphere with a temperature of 40+/-2°C, 90~95%RH for 500+/-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. Inductance variation within 10%. Q variation within 20%.</p>
<p>High Humidity Load Life Test</p>	<p>Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 40+/-2°C, 90~95%RH for 500+/-12 hours while supplying the rated current. 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. Inductance variation within 10%. Q variation within 20%.</p>
<p>High Temperature State Life Test</p>	<p>Keep a test sample in an atmosphere with a temperature of 85+/-2°C for 500+/-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. Inductance variation within 10%. Q variation within 20%.</p>
<p>High Temperature Load</p>	<p>Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 85+/-2°C for 500+/-12 hours while supplying the rated current. 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. Inductance variation within 10%. Q variation within 20%.</p>

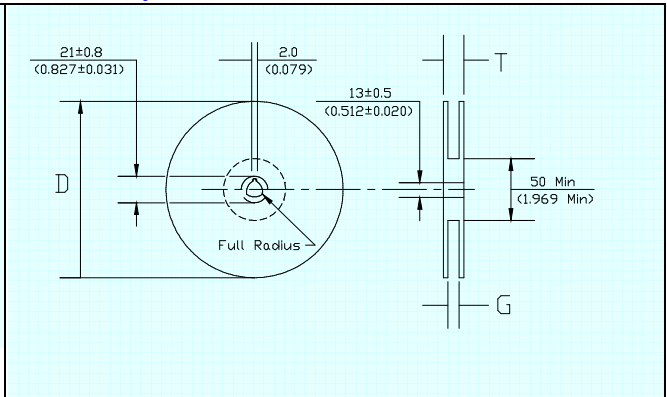
PACKAGING

Paper tape specifications(1608)



SYMBOL	1608	
	Size (mm)	Tolerance (mm)
A	0.975	+/-0.2
B	1.8	+/-0.2
F	3.5	+/-0.05
P	4.0	+/-0.10
W	8.0	+/-0.20

Reel specifications

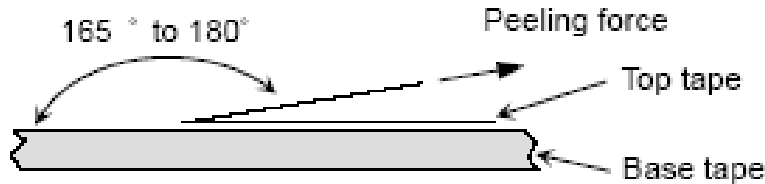


Tape Width (mm)	G (mm)	T MAX(mm)	D (mm)
8	10.0+/-1.5	14.5	180

Peel strength of top cover tape

The peel speed shall be about 300 mm/min.

The peel strength of top cover tape shall be between 0.1 to 1.0N.



Quantity per reel

1608 (0603): 4,000 pieces / reel

The contents of a box

1608 (0603): 5 reels / box

Marking

The following item shall be marked on the reel.

- Manufactures parts number.
- Manufacturing date code.
- Manufacturer name.
- Manufactures lot number.
- Quantity.

CAUTIONS

■ Storage

1. The chip inductor shall be packaged in carrier tapes.
2. To keep storage place temperature from +5 to 35°C, humidity from 45 to 70% RH.
3. The storage atmosphere must be free of gas containing sulfur and chlorine. Also, avoid exposing the product to saline moisture. If the product is exposed to such atmospheres, the terminals will oxidize and solder-ability will be affected.
4. The solder-ability is assured for 12 months from our final inspection date if the above storage condition is followed.

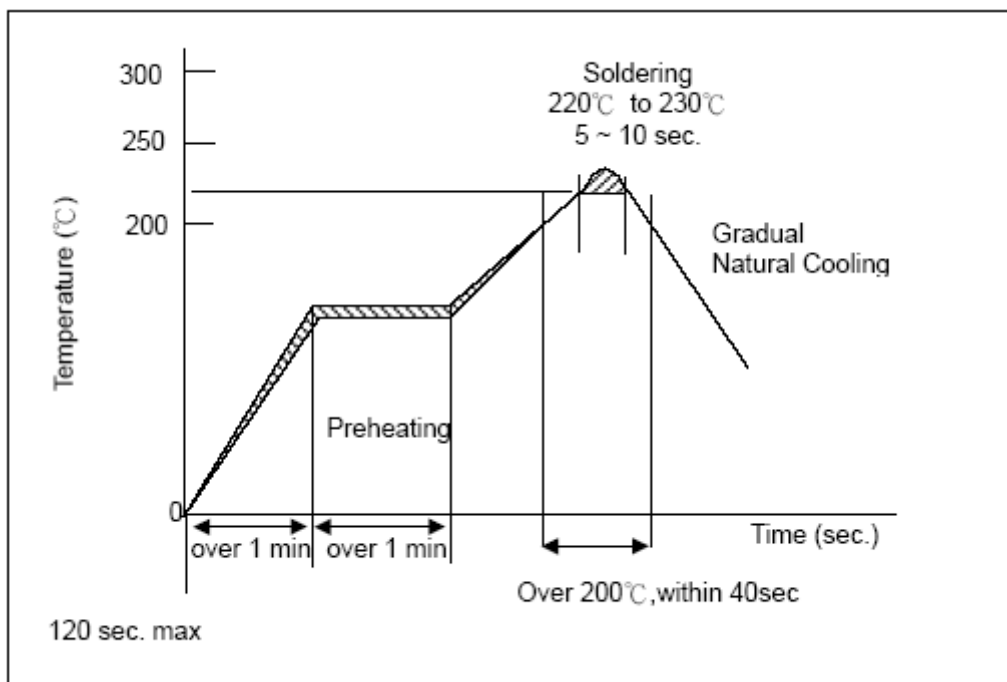
■ Handling

Chip inductor should be handled with care to avoid contamination or damage. The use of vacuum pick-up or plastic tweezers is recommended for manual placement. Tape and reeled packages are suitable for automatic pick and placement machine.

■ MLCI Soldering Profile

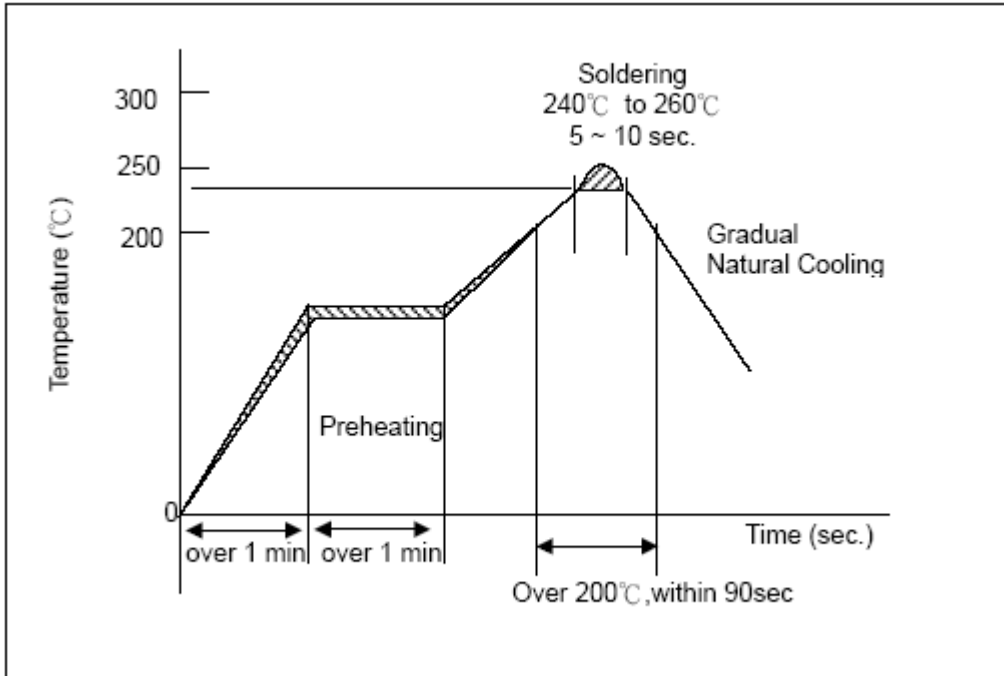
■ Soldering Profile for SMT Process with SnPb Solder Paste.

The rate of preheat should not exceed 4°C/sec and a target of 2°C/sec is preferred. Ceramic chip components should be preheated to within 100 to 130 °C of the soldering.

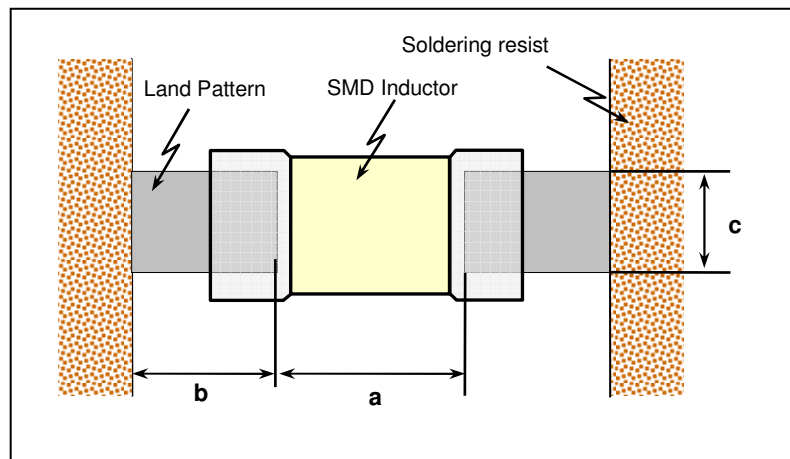


■ Soldering Profile for SMT Process with Lead Free Solder Paste.

The rate of preheat should not exceed 4°C/sec and a target of 2°C/sec is preferred. Ceramic chip components should be preheated to within 100 to 130 °C of the soldering.



■ Recommended pad dimensions



Size mm (EIA)	L x W (mm)	a (mm)	b (mm)	c (mm)
1608 (0603)	1.6*0.8	0.7 to 1.0	0.6 to 0.8	0.7 to 0.8