



## MCI HQ Series

# Specification

<b>Product Name</b>	<b>High Frequency Inductor</b>
<b>Series</b>	<b>MCI HQ Series</b>
<b>Size</b>	<b>EIAJ 0603~1608</b>



## High Frequency Chip Ceramic Inductor (MCI Series) Engineering

### Specification

This product belongs to the 3C and industrial grade standard, not for automotive application. If customer privately uses to automotive parts and results in any consequences, INPAQ is not responsible for after-sales service, thank you!

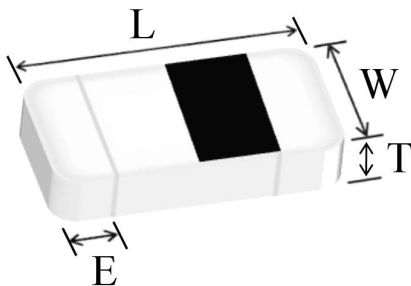
#### ■ FEATURES

- Particular ceramic material and coil structure provide high frequency application range up to 10GHz.
- Small size and low profile.
- Available in various sizes.
- Excellent solderability and heat resistance.

#### ■ APPLICATIONS

RF and wireless communication, information technology equipment which includes computer, telecommunications, radar detectors, automotive electronics, cellular phones, pagers, audio equipment, PDAs, keyless remote system and low-voltage power supply modules.

#### ■ SHAPES AND DIMENSIONS



TYPE	060303 (EIA 0201)	100505 (EIA 0402)	160808 (EIA 0603)
<b>L</b>	0.60±0.03	1.00±0.10	1.60±0.15
<b>W</b>	0.30±0.03	0.50±0.10	0.80±0.15
<b>T</b>	0.30±0.03	0.50±0.10	0.80±0.15
<b>E</b>	0.10~0.20	0.10~0.30	0.20~0.60
<b>Unit</b>	mm		

## ■ PART NUMBER CODE

<u>MCI</u>	<u>0603</u>	<u>HQ</u>	<u>1N0</u>	<input type="checkbox"/>	<u>H</u>	<u>B</u>	<u>P</u>
1	2	3	4	5	6	7	8

- 1 Series Name
- 2 Dimensions L\*W
- 3 HQ : material code
- 4 Inductance(nH) : N means Decimal point , ex : 1.0 nH = 1N0
- 5 Tolerance : B =  $\pm 0.1\text{nH}$  , C =  $\pm 0.2\text{nH}$  , S =  $\pm 0.3\text{nH}$  , G =  $\pm 2\%$  , H =  $\pm 3\%$  , J =  $\pm 5\%$
- 6 Mark : H = 1/8 Mark , M = 1/4 Mark , N = No Mark
- 7 Soldering : Green Parts , B= Lead-Free for whole chip
- 8 Packaging : P - Paper tape, 7" reel

## ■ GENERAL TECHNICAL DATA

Operating temperature range: - 55°C ~ +125°C  
 Storage Condition: Less than 40°C and 70% RH  
 Storage Time: 6 months Max. (Size:0603 、 1005)  
                   12 month Max. (Size:1608)  
 Soldering method: Reflow

## ■ TEST INSTRUMENTS CONDITIONS

Agilent E4991A/B RF Impedance Material Analyzer or equivalent  
 with fixture 16197A or equivalent  
 Agilent 4338B Milliohm meter  
 Test Level : 500mV

**■ PART NUMBER AND CHARACTERISTICS TABLE**

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
<b>MCI0603HQ Series</b>							
MCI0603HQ0N3_HBP	0.3	B	4	100	0.07	10,000	850
MCI0603HQ0N4_HBP	0.4		4	100	0.07	10,000	850
MCI0603HQ0N5_HBP	0.5		4	100	0.08	10,000	800
MCI0603HQ0N6_HBP	0.6		4	100	0.08	10,000	800
MCI0603HQ0N7_HBP	0.7		4	100	0.09	10,000	750
MCI0603HQ0N8_HBP	0.8		4	100	0.10	10,000	750
MCI0603HQ0N9_HBP	0.9		4	100	0.10	10,000	750
MCI0603HQ1N0_HBP	1.0	B, C, S	4	100	0.14	10,000	600
MCI0603HQ1N1_HBP	1.1		4	100	0.14	10,000	600
MCI0603HQ1N2_HBP	1.2		4	100	0.14	10,000	600
MCI0603HQ1N3_HBP	1.3		4	100	0.14	10,000	600
MCI0603HQ1N4_HBP	1.4		4	100	0.18	10,000	550
MCI0603HQ1N5_HBP	1.5		4	100	0.18	10,000	550
MCI0603HQ1N6_HBP	1.6		4	100	0.18	10,000	500
MCI0603HQ1N7_HBP	1.7		4	100	0.19	10,000	500
MCI0603HQ1N8_HBP	1.8		4	100	0.19	10,000	500
MCI0603HQ1N9_HBP	1.9		4	100	0.20	10,000	450
MCI0603HQ2N0_HBP	2.0		4	100	0.20	10,000	450
MCI0603HQ2N1_HBP	2.1		4	100	0.20	10,000	450
MCI0603HQ2N2_HBP	2.2		4	100	0.22	10,000	450
MCI0603HQ2N3_HBP	2.3		4	100	0.22	10,000	450
MCI0603HQ2N4_HBP	2.4		4	100	0.24	10,000	450
MCI0603HQ2N5_HBP	2.5		4	100	0.24	10,000	450
MCI0603HQ2N6_HBP	2.6		4	100	0.25	10,000	450
MCI0603HQ2N7_HBP	2.7		5	100	0.25	10,000	450
MCI0603HQ2N9_HBP	2.9		5	100	0.28	9,500	450
MCI0603HQ3N0_HBP	3.0		5	100	0.28	9,500	450
MCI0603HQ3N1_HBP	3.1		5	100	0.28	9,500	450
MCI0603HQ3N2_HBP	3.2		5	100	0.30	9,500	450
MCI0603HQ3N3_HBP	3.3		5	100	0.30	9,500	450

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
<b>MCI0603HQ Series</b>							
MCI0603HQ3N4_HBP	3.4	B , C , S	5	100	0.30	8,000	400
MCI0603HQ3N5_HBP	3.5		5	100	0.30	8,000	400
MCI0603HQ3N6_HBP	3.6		5	100	0.30	8,000	400
MCI0603HQ3N7_HBP	3.7		5	100	0.30	8,000	400
MCI0603HQ3N8_HBP	3.8		5	100	0.30	6,500	400
MCI0603HQ3N9_HBP	3.9		5	100	0.30	6,500	400
MCI0603HQ4N3_HBP	4.3		5	100	0.40	6,500	350
MCI0603HQ4N7_HBP	4.7		5	100	0.40	6,500	350
MCI0603HQ5N1_HBP	5.1		5	100	0.40	6,500	350
MCI0603HQ5N6_HBP	5.6		5	100	0.40	6,000	350
MCI0603HQ6N2_HBP	6.2		5	100	0.44	6,000	300
MCI0603HQ6N8_HBP	6.8		H , J	5	100	0.50	5,400
MCI0603HQ7N5_HBP	7.5	5		100	0.53	4,800	300
MCI0603HQ8N2_HBP	8.2	5		100	0.55	4,800	250
MCI0603HQ9N1_HBP	9.1	5		100	0.62	4,500	250
MCI0603HQ10N_HBP	10	5		100	0.65	4,500	250
MCI0603HQ12N_HBP	12	5		100	0.70	3,700	250
MCI0603HQ15N_HBP	15	5		100	0.80	2,200	250
MCI0603HQ18N_HBP	18	5		100	0.90	2,200	200
MCI0603HQ22N_HBP	22	5		100	1.20	2,000	150
MCI0603HQ27N_HBP	27	4		100	1.80	1,800	140
MCI0603HQ33N_HBP	33	J	4	100	2.10	1,700	120
MCI0603HQ39N_HBP	39		4	100	2.40	1,500	120

\*\* For special part number which is not shown in the above table, please refer to appendix.

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
<b>MCI1005HQ Series</b>							
MCI1005HQ0N3_HBP	0.3	B	8	100	0.08	10,000	1000
MCI1005HQ0N4_HBP	0.4		8	100	0.08	10,000	1000
MCI1005HQ0N5_HBP	0.5		8	100	0.08	10,000	1000
MCI1005HQ0N6_HBP	0.6		8	100	0.08	10,000	1000
MCI1005HQ0N7_HBP	0.7		8	100	0.08	10,000	1000
MCI1005HQ0N8_HBP	0.8		8	100	0.08	10,000	1000
MCI1005HQ1N0_HBP	1.0	B, C, S	8	100	0.08	10,000	1000
MCI1005HQ1N1_HBP	1.1		8	100	0.08	10,000	1000
MCI1005HQ1N2_HBP	1.2		8	100	0.09	10,000	1000
MCI1005HQ1N3_HBP	1.3		8	100	0.09	10,000	1000
MCI1005HQ1N5_HBP	1.5		8	100	0.10	10,000	1000
MCI1005HQ1N6_HBP	1.6		8	100	0.10	10,000	1000
MCI1005HQ1N8_HBP	1.8		8	100	0.12	10,000	900
MCI1005HQ2N0_HBP	2.0		8	100	0.12	10,000	900
MCI1005HQ2N2_HBP	2.2		8	100	0.13	10,000	900
MCI1005HQ2N4_HBP	2.4		8	100	0.13	10,000	800
MCI1005HQ2N7_HBP	2.7		8	100	0.16	6,000	800
MCI1005HQ3N0_HBP	3.0		8	100	0.16	6,000	800
MCI1005HQ3N3_HBP	3.3		8	100	0.16	6,000	800
MCI1005HQ3N6_HBP	3.6		8	100	0.20	6,000	700
MCI1005HQ3N9_HBP	3.9		8	100	0.20	6,000	700
MCI1005HQ4N3_HBP	4.3		8	100	0.20	6,000	700
MCI1005HQ4N7_HBP	4.7		8	100	0.20	6,000	700
MCI1005HQ5N1_HBP	5.1		8	100	0.23	5,300	600
MCI1005HQ5N6_HBP	5.6		8	100	0.23	4,500	600
MCI1005HQ6N2_HBP	6.2		8	100	0.25	4,500	600
MCI1005HQ6N8_HBP	6.8	G, H, J	8	100	0.25	4,500	600
MCI1005HQ7N5_HBP	7.5		8	100	0.28	4,200	500
MCI1005HQ8N2_HBP	8.2		8	100	0.28	3,700	500
MCI1005HQ9N1_HBP	9.1		8	100	0.30	3,400	500
MCI1005HQ10N_HBP	10		8	100	0.30	3,400	500
MCI1005HQ12N_HBP	12		8	100	0.45	3,000	400

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
<b>MCI1005HQ Series</b>							
MCI1005HQ15N_HBP	15	G , H , J	8	100	0.55	2,500	400
MCI1005HQ18N_HBP	18		8	100	0.65	2,200	300
MCI1005HQ22N_HBP	22		8	100	0.70	1,900	300
MCI1005HQ27N_HBP	27		8	100	0.80	1,700	300
MCI1005HQ33N_HBP	33		8	100	0.90	1,600	200
MCI1005HQ39N_HBP	39		8	100	1.00	1,200	200
MCI1005HQ47N_HBP	47		8	100	1.10	1,100	200
MCI1005HQ56N_HBP	56		8	100	1.10	1,000	200
MCI1005HQ68N_HBP	68		8	100	1.20	800	200
MCI1005HQ82N_HBP	82	J	8	100	1.30	600	200
MCI1005HQR10_HBP	100		8	100	1.60	600	200
MCI1005HQR12_HBP	120		8	100	1.60	600	150
MCI1005HQR15_HBP	150		8	100	3.20	550	140

\*\* For special part number which is not shown in the above table, please refer to appendix.

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.	
<b>MCI1608HQ Series</b>								
MCI1608HQ1N0_HBP	1.0	S	8	100	0.05	10,000	1000	
MCI1608HQ1N2_HBP	1.2		8	100	0.05	10,000	1000	
MCI1608HQ1N5_HBP	1.5		8	100	0.10	10,000	1000	
MCI1608HQ1N8_HBP	1.8		8	100	0.10	10,000	1000	
MCI1608HQ2N2_HBP	2.2		8	100	0.10	8,000	1000	
MCI1608HQ2N7_HBP	2.7		10	100	0.13	7,000	1000	
MCI1608HQ3N3_HBP	3.3		10	100	0.13	6,000	1000	
MCI1608HQ3N9_HBP	3.9		10	100	0.15	6,000	1000	
MCI1608HQ4N7_HBP	4.7		10	100	0.20	5,000	1000	
MCI1608HQ5N6_HBP	5.6		10	100	0.23	4,000	700	
MCI1608HQ6N8_HBP	6.8		J	10	100	0.25	4,000	700
MCI1608HQ8N2_HBP	8.2			10	100	0.28	3,500	600
MCI1608HQ10N_HBP	10			12	100	0.30	3,400	600
MCI1608HQ12N_HBP	12			12	100	0.35	2,600	600
MCI1608HQ15N_HBP	15			12	100	0.40	2,300	600
MCI1608HQ18N_HBP	18			12	100	0.45	2,000	600
MCI1608HQ22N_HBP	22	12		100	0.50	1,600	600	
MCI1608HQ27N_HBP	27	12		100	0.55	1,400	600	
MCI1608HQ33N_HBP	33	12		100	0.60	1,200	600	
MCI1608HQ39N_HBP	39	12		100	0.65	1,100	500	
MCI1608HQ47N_HBP	47	12		100	0.70	900	500	
MCI1608HQ56N_HBP	56	12		100	0.75	900	500	
MCI1608HQ68N_HBP	68	12		100	0.85	700	400	
MCI1608HQ82N_HBP	82	12		100	0.95	600	300	
MCI1608HQR10_HBP	100	12		100	1.00	600	300	
MCI1608HQR12_HBP	120	8		50	1.20	500	300	
MCI1608HQR15_HBP	150	8		50	1.20	500	300	
MCI1608HQR18_HBP	180	8		50	1.30	400	300	
MCI1608HQR22_HBP	220	8	50	1.50	400	300		
MCI1608HQR27_HBP	270	8	50	1.90	400	200		
MCI1608HQR33_HBP	330	8	50	2.10	350	200		



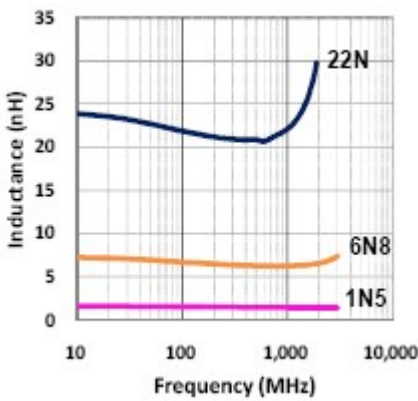
Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR( $\Omega$ ) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
MCI1608HQR39_HBP	390	J	8	50	2.30	350	150
MCI1608HQR47_HBP	470		8	50	2.60	300	150

\*\* For special part number which is not shown in the above table, please refer to appendix.

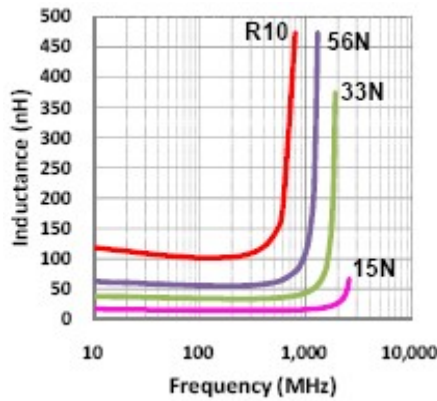
## ■ TYPICAL ELECTRICAL CHARACTERISTIC

### L vs. Frequency

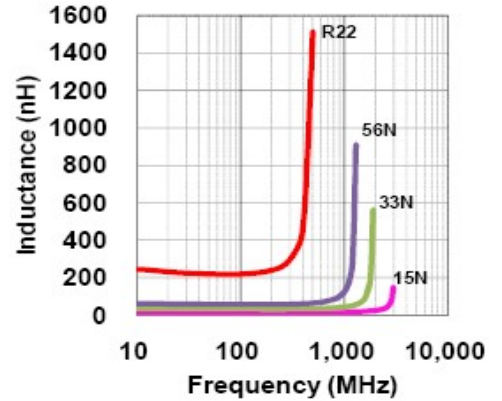
MCI 0603HQ Series



MCI 1005HQ Series

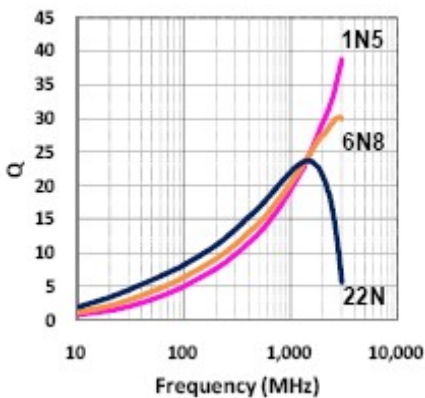


MCI 1608HQ Series

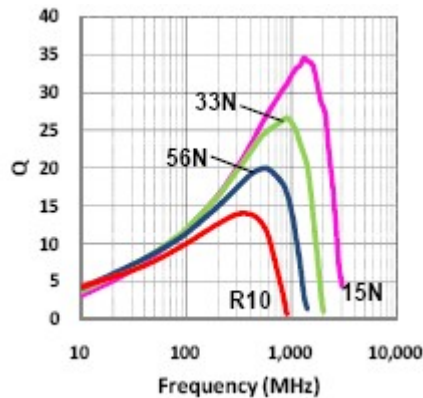


### Q vs. Frequency

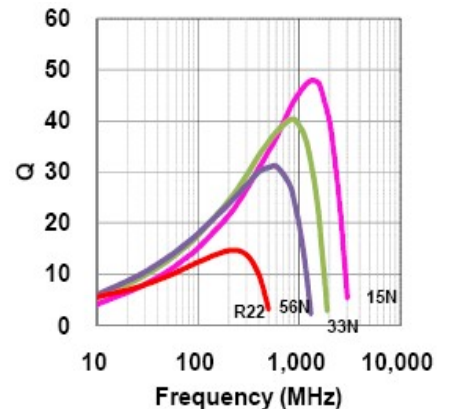
MCI 0603HQ Series



MCI 1005HQ Series

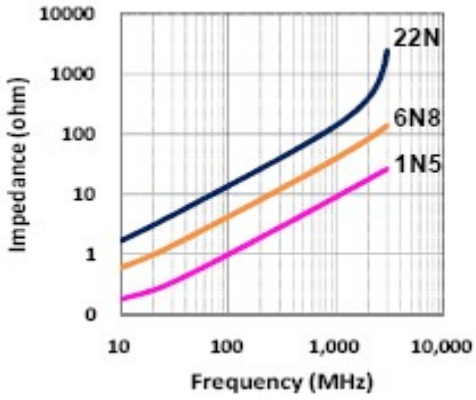


MCI 1608HQ Series

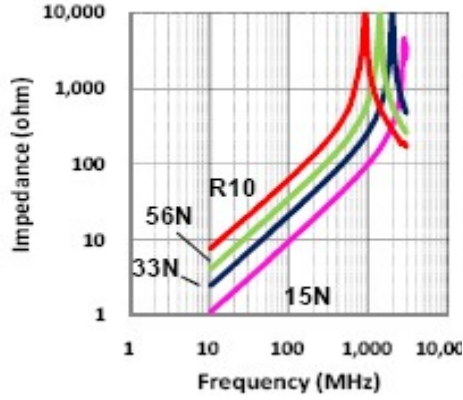


**Z vs. Frequency**

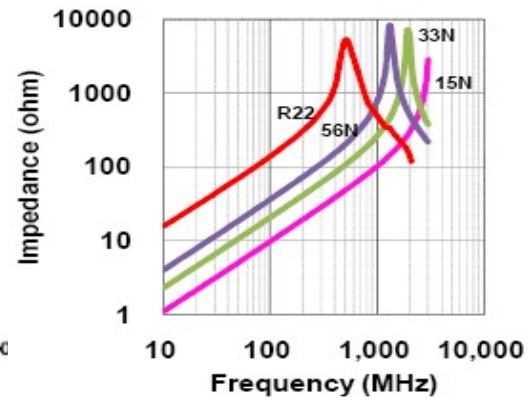
**MCI 0603HQ Series**



**MCI 1005HQ Series**

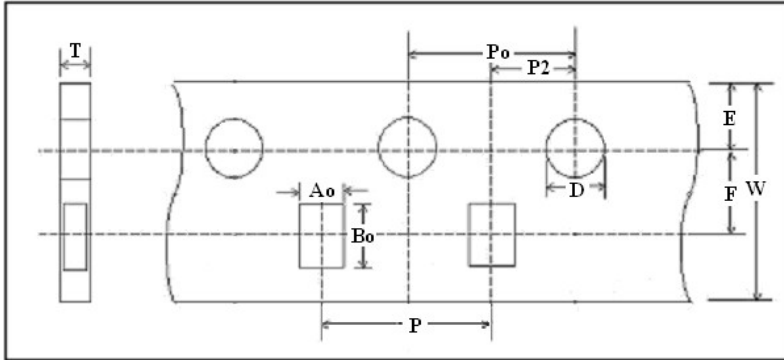


**MCI 1608HQ Series**



■ **PACKAGING SPECIFICATIONS**

➤ **Type : Paper Carrier**

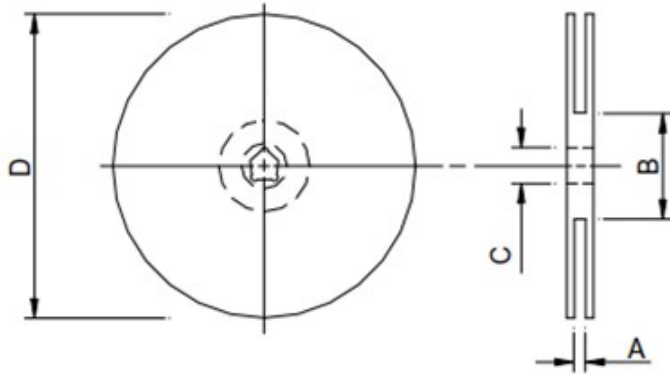


➤ **Taping Dimension**

Unit : mm

TYPE	0603	1005	1608
Symbol	PAPER	PAPER	PAPER
W	8.00 ± 0.10	8.00±0.10	8.00±0.10
P	2.00 ± 0.05	2.00±0.05	4.00±0.10
E	1.75 ± 0.05	1.75±0.05	1.75±0.05
F	3.50 ± 0.05	3.50±0.05	3.50±0.05
D	1.55 ± 0.05	1.55±0.05	1.55±0.05
P0	4.00 ± 0.10	4.00±0.10	4.00±0.10
P2	2.00 ± 0.05	2.00±0.05	2.00±0.05
Ao	0.36 ± 0.02	0.60±0.03	0.98±0.03
Bo	0.66 ± 0.02	1.12±0.03	1.80±0.05
T	0.42 ± 0.02	0.60±0.03	0.95±0.05

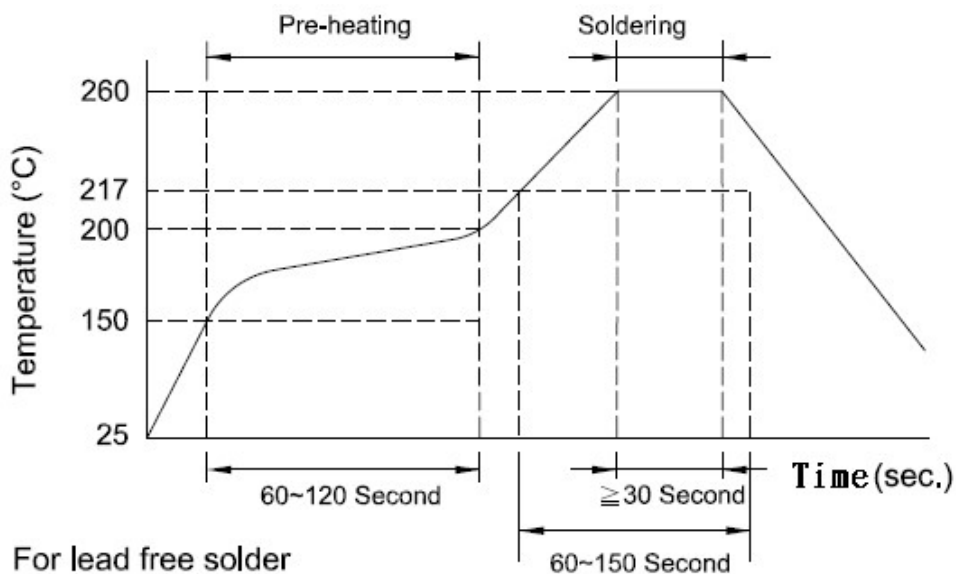
■ REEL DIMENSION



Type	7"
A(mm)	10±1.5
B(mm)	50 or more
C(mm)	13.2±1.0
D(mm)	178±2.0

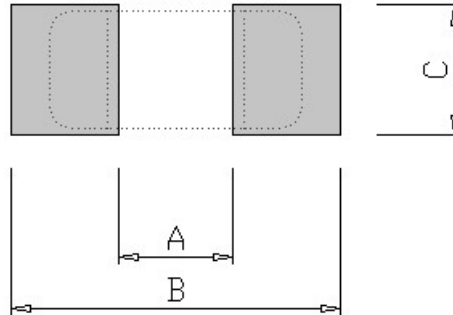
7" Reel Packaging Quantity			
PART SIZE (EIA SIZE)	<b>0603 (0201)</b>	<b>1005 (0402)</b>	<b>1608 (0603)</b>
Qty.(pcs)	15,000	10,000	4,000
BOX	5 reels / inner box		

■ RECOMMENDED SOLDERING CONDITIONS



■ **LAND PATTERNS REFLOW SOLDERING**

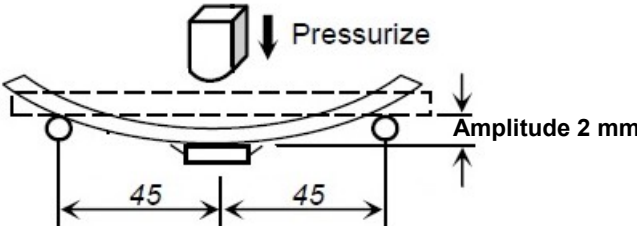
Solder land information :



TYPE (mm)	A	B	C
0603 (EIA 0201)	0.2 ~ 0.3 (0.008 ~ 0.012)	0.8 ~ 0.9 (0.031 ~ 0.035)	0.2 ~ 0.3 (0.008 ~ 0.012)
1005 (EIA 0402)	0.4 (0.016)	1.4 ~ 1.5 (0.055 ~ 0.059)	0.5 ~ 0.6 (0.020 ~ 0.024)
1608 (EIA 0603)	0.7 (0.028)	1.9 ~ 2.3 (0.075 ~ 0.091)	0.6 ~ 0.8 (0.024 ~ 0.031)

■ **RELIABILITY AND TEST CONDITION**

Item	Test Condition	Requirements
<b>Thermal Shock</b>	<ol style="list-style-type: none"> <li>1. Temperature : -55 ~ +125°C</li> <li>2. Cycle : 100 cycles</li> <li>3. Dwell time : 30minutes</li> <li>4. Measurement : at ambient temperature 24 hrs after test completion</li> </ol>	<ol style="list-style-type: none"> <li>1. No mechanical damage</li> <li>2. Inductance value should be within ± 10 % of the initial value</li> <li>3. Q value should be within ± 20% of the initial value</li> </ol>
<b>Operational Life</b>	<ol style="list-style-type: none"> <li>1. Temperature: 85 ± 5°C</li> <li>2. Testing time: 1000 hrs</li> <li>3. Applied current: Full rated current</li> <li>4. Measurement: At ambient temperature 24 hours after test completion</li> </ol>	<ol style="list-style-type: none"> <li>1. No mechanical damage</li> <li>2. Inductance value should be within ± 10 % of the initial value</li> <li>3. Q value should be within ± 20% of the initial value</li> </ol>

Item	Test Condition	Requirements
<b>Biased Humidity</b>	1. Temperature : 40°C ± 2°C 2. Humidity : 90 ~ 95 % RH 3. Test time : 1000 hrs 4. Apply current : full rated current 5. Measurement : at ambient temperature 24 hrs after test completion	1. No mechanical damage 2. Inductance value should be within ± 10 % of the initial value 3. Q value should be within ± 20% of the initial value
<b>Resistance to Solder Heat</b>	1. Solder temperature : 260 ± 5°C 2. Flux : Rosin 3. DIP time : 10 ± 1 sec	1. More than 95 % of terminal electrode should be covered with new solder 2. Inductance value should be within ± 10 % of the initial value 3. Q value should be within ± 20% of the initial value
<b>Solderability</b>	1. Solder temperature : 235 ± 5°C 2. Flux : Rosin 3. DIP time : 5 ± 1 sec	1. More than 95 % of terminal electrode should be covered with new solder 2. No mechanical damage
<b>Bending Strength</b>	1. Solder the chip to test jig then apply a force in the direction shown in below. 2. 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. <div style="text-align: center; margin-top: 10px;">  </div>	No mechanical damage

■ **NOTE**

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 solderability will be affected.