



PRODUCT SPECIFICATION

DOCUMENT NO.				
DESCRIPTION	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
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High Frequency Chip Ceramic Inductor for Automotive Engineering

Specification



Qualified based on AEC-Q200

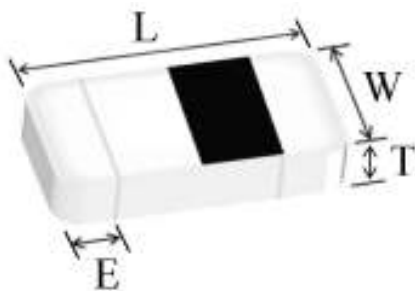
■ FEATURES

- 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	160808 (EIA0603)
L	1.60±0.15
W	0.80±0.15
T	0.80±0.15
E	0.20~0.60
Unit	mm

■ PART NUMBER CODE

<u>MCI</u>	<u>1608</u>	<u>HW</u>	<u>1N0</u>	<input type="checkbox"/>	<u>H</u>	<u>B</u>	<u>P</u>	<u>G0</u>
1	2	3	4	5	6	7	8	9

- 1 Series Name
- 2 Dimensions L*W
- 3 HW : For Automotive
- 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
- 9 INPAQ internal code

■ GENERAL TECHNICAL DATA

Operating temperature range: - 55°C ~ +125°C
 Storage Condition: Less than 40°C and 70% RH
 Storage Time: 12 months Max.
 Soldering method: Reflow

■ TEST INSTRUMENTS CONDITIONS

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

■ PART NUMBER AND CHARACTERISTICS TABLE

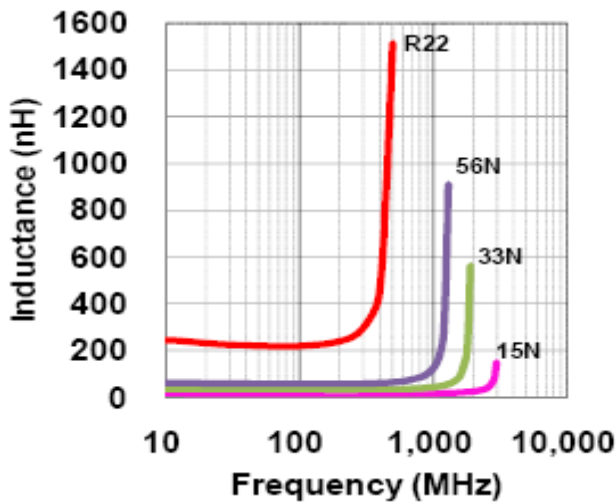
Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
MCI1608HW1N0_HBPG0	1.0	B, S	8	100	0.05	10,000	1,000
MCI1608HW1N2_HBPG0	1.2		8	100	0.05	10,000	1,000
MCI1608HW1N5_HBPG0	1.5		8	100	0.10	10,000	1,000
MCI1608HW1N8_HBPG0	1.8		8	100	0.10	10,000	1,000
MCI1608HW2N2_HBPG0	2.2		8	100	0.10	8,000	1,000
MCI1608HW2N7_HBPG0	2.7		10	100	0.13	7,000	1,000
MCI1608HW3N3_HBPG0	3.3		10	100	0.13	6,000	1,000
MCI1608HW3N9_HBPG0	3.9		10	100	0.15	6,000	1,000
MCI1608HW4N7_HBPG0	4.7		10	100	0.20	5,000	1,000
MCI1608HW5N6_HBPG0	5.6		10	100	0.23	4,000	600
MCI1608HW6N8_HBPG0	6.8	G, J	10	100	0.25	4,000	600
MCI1608HW8N2_HBPG0	8.2		10	100	0.28	3,500	600
MCI1608HW10N_HBPG0	10		12	100	0.30	3,400	600
MCI1608HW12N_HBPG0	12		12	100	0.35	2,600	600
MCI1608HW15N_HBPG0	15		12	100	0.40	2,300	600
MCI1608HW18N_HBPG0	18		12	100	0.45	2,000	600
MCI1608HW22N_HBPG0	22		12	100	0.50	1,600	600
MCI1608HW27N_HBPG0	27		12	100	0.55	1,400	600
MCI1608HW33N_HBPG0	33		12	100	0.60	1,200	600
MCI1608HW39N_HBPG0	39		12	100	0.65	1,100	500
MCI1608HW47N_HBPG0	47	12	100	0.70	900	500	
MCI1608HW56N_HBPG0	56	12	100	0.75	900	500	
MCI1608HW68N_HBPG0	68	12	100	0.85	700	400	
MCI1608HW82N_HBPG0	82	12	100	0.95	600	300	
MCI1608HWR10_HBPG0	100	J	12	100	1.00	600	300
MCI1608HWR12_HBPG0	120		8	50	1.20	500	300
MCI1608HWR15_HBPG0	150		8	50	1.20	500	300
MCI1608HWR18_HBPG0	180		8	50	1.30	400	300
MCI1608HWR20_HBPG0	200		8	50	1.50	400	300
MCI1608HWR22_HBPG0	220		8	50	1.50	400	300
MCI1608HWR27_HBPG0	270		8	50	1.90	400	200

Part No.	Inductance (nH)	Inductance Tolerance	Q (Min.)	Freq. (MHz)	DCR(Ω) Max.	S.R.F (MHz) Min.	Rated Current (mA) Max.
MCI1608HWR33_HBPG0	330	J	8	50	2.10	350	200
MCI1608HWR39_HBPG0	390		8	50	2.30	350	150
MCI1608HWR47_HBPG0	470		8	50	2.60	300	150

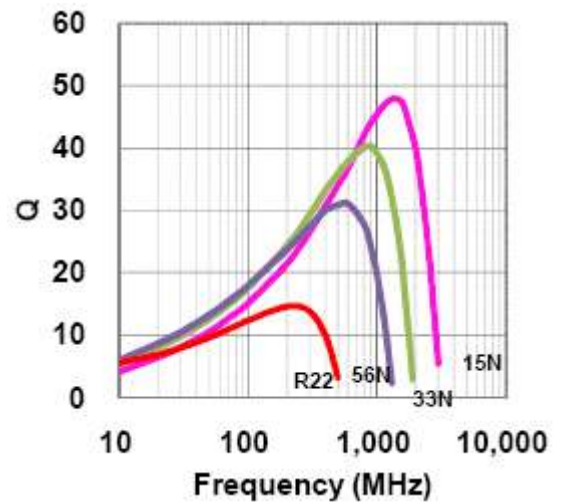
**For special part number which is not shown in the above table, please refer to appendix.

■ TYPICAL ELECTRICAL CHARACTERISTIC

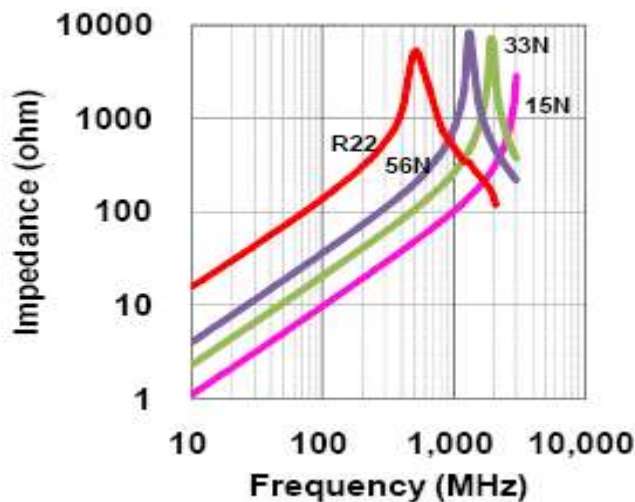
L vs. Frequency



Q vs. Frequency

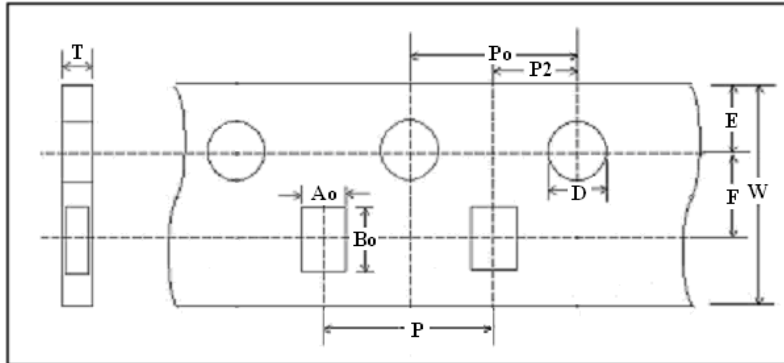


Z vs. Frequency



■ **PACKAGING SPECIFICATIONS**

➤ **Type : Paper Carrier**

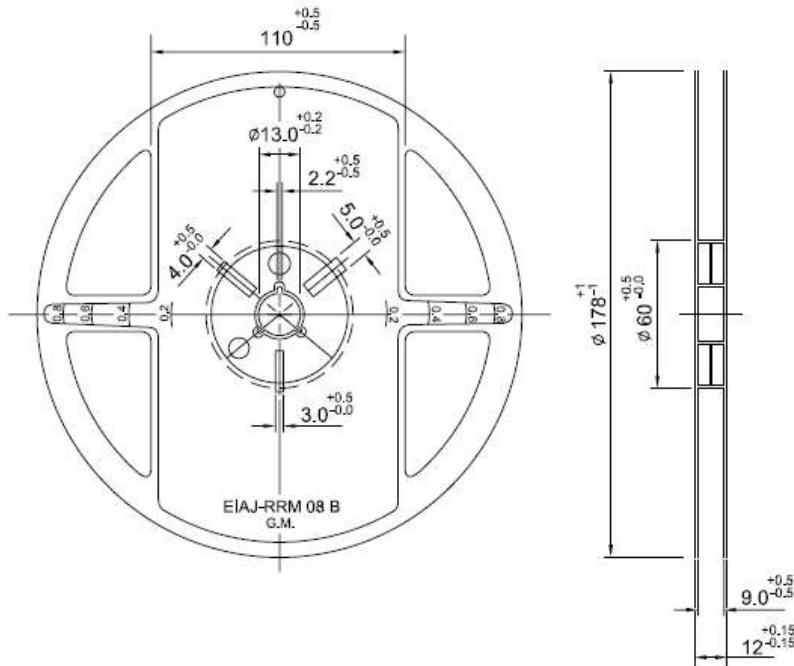


➤ **Taping Dimension**

(mm)	1608
Symbol	PAPER
W	8.00±0.10
P	4.00±0.10
E	1.75±0.10
F	3.50±0.10
D	1.56±0.10
Po	4.00±0.10
P2	2.00±0.10
Ao	1.05±0.05
Bo	1.85±0.05
Ko (T)	0.95±0.05

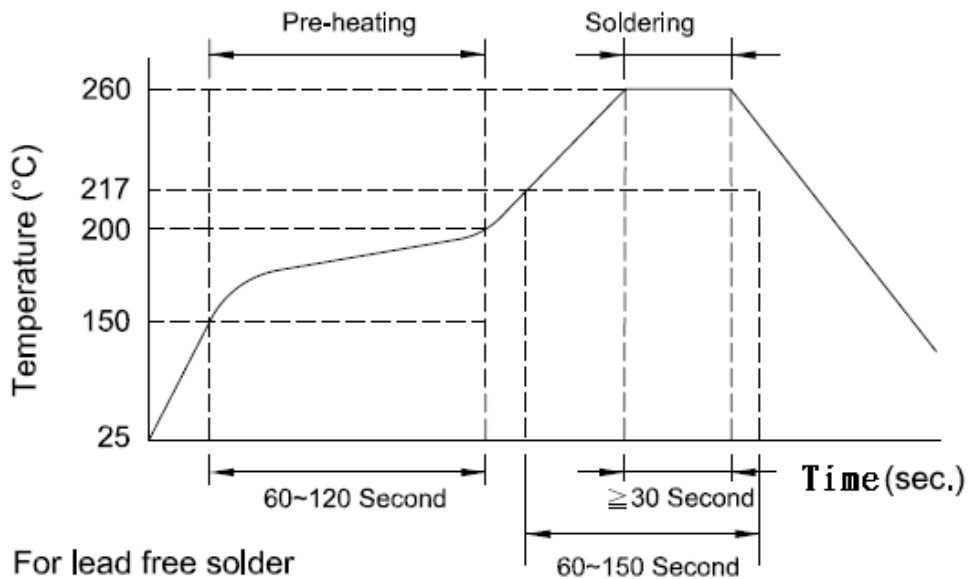
■ REEL DIMENSION

Unit : mm



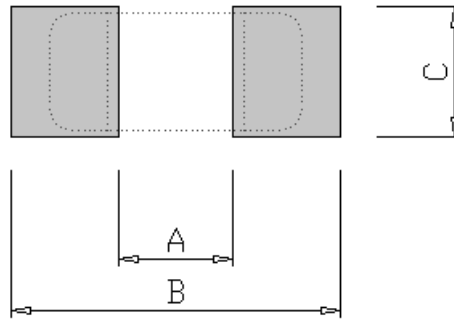
7" Reel Packaging Quantity	
PART SIZE (EIA SIZE)	1608 (0603)
Qty.(pcs)	4,000
BOX	5 reels / inner box

■ RECOMMENDED SOLDERING CONDITIONS



■ LAND PATTERNS REFLOW SOLDERING

Solder land information :



Size(mm)	A	B	C
1608 (EIA 0603)	0.5 ~ 0.7 (0.019 ~ 0.027)	2.1 ~ 3.1 (0.083 ~ 0.122)	0.65 ~ 0.95 (0.026 ~ 0.037)

■ RELIABILITY AND TEST CONDITION

Item	Test Condition	Requirements
High Temperature Exposure	1. Temperature : 125°C ± 5°C 2. Test time : 1000 hrs 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 variation within 20%
Temperature Cycle	1. Temperature : -55 ~ +125°C 2. Cycle : 1000 cycles 3. Dwell time : 30minutes 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 variation within 20%.
Biased Humidity	1. Temperature : 85°C ± 2°C 2. Humidity : 85 % RH 3. Test time : 1000 hrs 4. Apply current : full rated current 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 variation within 20%

Item	Test Condition	Requirements
Operational Life	1. Temperature : $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 2. Test time : 1000 hrs 3. Apply current : full rated current Measurement : at ambient temperature 24 hrs after test completion	1. No mechanical damage 2. Inductance value should be within $\pm 10\%$ of the initial value 3. Q variation within 20%.
Mechanical Shock	Condition F: 1500g's/0.5ms/Half sine	1. No mechanical damage 2. Inductance value should be within $\pm 10\%$ of the initial value 3. Q variation within 20%
Vibration Test	5g's for 20 minutes, 12cycles each of 3 orientations Test from 10-2000Hz., 12cycles each of 3 orientations	1. No mechanical damage 2. Inductance value should be within $\pm 10\%$ of the initial value 3. Q variation within 20%
Resistance to Solder Heat	1. Solder temperature : $260 \pm 5^{\circ}\text{C}$ 2. Flux : Rosin 3. DIP time : 10 ± 1 sec	1. More than 95 % of terminal electrode should be covered with new solder 2. No mechanical damage 3. Inductance value should be within $\pm 10\%$ of the initial value 4. Q variation within 20%
ESD	Classification Levels 1C	1. No mechanical damage 2. Inductance variation within 10%. 3. Q variation within 20%.
Solderability Test	1. Solder temperature : $235 \pm 5^{\circ}\text{C}$ 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

Item	Test Condition	Requirements						
Board Flex	Epoxy-PCB(1.6mm) Deflection 2mm(min) 60s minimum holding time	No mechanical damage.						
Terminal Strength	<table border="1" data-bbox="408 456 1002 564"> <thead> <tr> <th data-bbox="408 456 564 510">Size</th> <th data-bbox="564 456 807 510">Apply Force(F)</th> <th data-bbox="807 456 1002 510">Test Time</th> </tr> </thead> <tbody> <tr> <td data-bbox="408 510 564 564">1608</td> <td data-bbox="564 510 807 564">10 N</td> <td data-bbox="807 510 1002 564">10 \pm1 sec.</td> </tr> </tbody> </table>	Size	Apply Force(F)	Test Time	1608	10 N	10 \pm 1 sec.	No mechanical damage
Size	Apply Force(F)	Test Time						
1608	10 N	10 \pm 1 sec.						

■ **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.