INPAQ

Global RF/Component Solutions

MCB & MHC W Series

Specification

Product Name	Multilayer Chip Ferrite Bead
Series	MCB & MHC W Series
Size	EIAJ 1005/1608/2012/3216/4516

RoHS

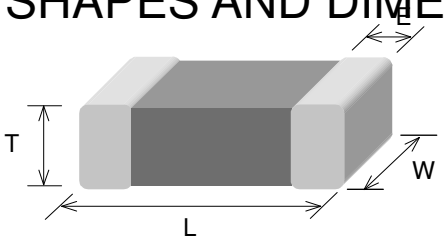
INPAQ

Global RF/Component Solutions

Chip Ferrite Bead for Automotive Engineering Spec.

Qualified based on AEC-Q200

■ SHAPES AND DIMENSIONS



Unit: mm

TYPE	1005 (EIA 0402)	1608 (EIA 0603)	2012 (EIA 0805)	3216 (EIA 1206)	4516 (EIA 1806)
L	1.00±0.10	1.60±0.15	2.00±0.20	3.20±0.20	4.50±0.25
W	0.50±0.10	0.80±0.15	1.25±0.20	1.60±0.20	1.60±0.20
T	0.50±0.10	0.80±0.15	0.90±0.20	1.10±0.20	1.60±0.20
E	0.25±0.10	0.30±0.20	0.50±0.30	0.50±030	0.60±0.40

■ PART NUMBER CODE

MCB	1608	W	12	1	H	B	P	□
1	2	3	4	5	6	7	8	9

1. **Series Name**
2. **Size Code: the first two digitals : length(mm), the last two digitals : width(mm)**
3. **For Automotive**
4. **Impedance(Ω) ± 25%**
5. **Fixed Decimal Point** ┐ **(ex : 121=120Ω)**
6. **Rated Current Code**

7.

A=50mA	B=80mA	C=100mA	D=150mA	E=200mA	F=300mA	G=400mA
G=400mA	H=500mA	I =600mA	J =700mA	K=800mA	L=1000mA	M=1500mA
N=2000mA	P=2500mA	Q=3000mA	R=4000mA	U=5000mA	W=6000mA	

Soldering : Green Parts : B— Lead-Free for whole chip

8 **Packaging: P - Paper tape, 7" reel.**
E - Embossed plastic tape, 7" reel.

9 **Material Code**

■ Chip Ferrite Bead

Part No.	Impedance(Ω) +/-25%	Test Freq. (MHz)	DCR(Ω) (Max.)	Rated Current (mA)
MCB1005 Series				
MCB1005W700IBP	70	100	0.15	600
MCB1005W121HBP	120	100	0.25	500
MCB1005W241FBP	240	100	0.35	300
MCB1005W601EBPB	600	100	0.65	200
MCB1005W102EBP	1000	100	1.00	200
MCB1005W102EBPB	1000	100	0.90	200
MCB1005W182EBPB	1800	100	1.40	200
MCB1608 Series				
MCB1608W121HBP	120	100	0.18	500
MCB1608W221HBP	220	100	0.25	500
MCB1608W471HBP	470	100	0.35	500
MCB1608W601HBP	600	100	0.38	500
MCB1608W102GBP	1000	100	0.50	400
MCB1608W182ABP	1800	100	1.50	50
MCB1608W222ABP	2200	100	1.50	50
MCB1608W252ABP	2500	100	1.50	50
MCB2012 Series				
MCB2012W121EBP	120	100	0.15	200
MCB2012W151EBP	150	100	0.15	200
MCB2012W221EBP	220	100	0.20	200
MCB2012W601EBP	600	100	0.30	200
MCB2012W102EBP	1000	100	0.45	200
MCB3216 Series				
MCB3216W601EBE	600	100	0.90	200

■ Chip Ferrite Bead For High Speed

Part No.	Impedance(Ω) +/-25%	Test Freq. (MHz)	DCR(Ω) (Max.)	Rated Current (mA)
MCB1005 Series				
MCB1005W750FBPH	75	100	0.40	300
MCB1005W121FBPH	120	100	0.55	300
MCB1608 Series				
MCB1608W750HBPH	75	100	0.30	500
MCB1608W121EBPH	120	100	0.40	200
MCB1608W241EBPH	240	100	0.45	200
MCB1608W601EBPH	600	100	0.65	200
MCB1608W102CBPH	1000	100	0.85	100
MCB2012 Series				
MCB2012W121EBPH	120	100	0.25	200
MCB2012W151EBPH	150	100	0.25	200
MCB2012W221EBPH	220	100	0.25	200
MCB2012W601EBPH	600	100	0.35	200
MCB2012W222EBPH	2200	100	0.60	200

■ High Current Chip Ferrite Bead

Part No.	Impedance(Ω) +/-25%	Test Freq. (MHz)	DCR(Ω) (Max.)	Rated Current (mA)
MHC1005 Series				
MHC1005W100LBP	10	100	0.05	1000
MHC1005W121MBP	120	100	0.09	1500
MHC1608 Series				
MHC1608W300LBP	30	100	0.05	1000
MHC1608W600LBP	60	100	0.10	1000
MHC1608W121NBP	120	100	0.05	2000
MHC1608W181MBP	180	100	0.09	1500
MHC1608W221MBP	220	100	0.10	1500
MHC1608W301MBP	300	100	0.15	1500
MHC1608W471LBP	470	100	0.20	1000
MHC1608W601LBP	600	100	0.20	1000
MHC2012 Series				
MHC2012W310QBP	31	100	0.015	3000
MHC2012W600QBP	60	100	0.026	3000
MHC2012W221NBP	220	100	0.050	2000
MHC2012W331MBP	330	100	0.090	1500
MHC2012W601NBP	600	100	0.090	2000
MHC3216 Series				
MHC3216W500QBE	50	100	0.025	3000
MHC3216W121QBE	120	100	0.025	3000
MHC3216W601MBE	600	100	0.090	1500
MHC4516 Series				
MHC4516W600WBE	60	100	0.010	6000
MHC4516W102MBE	1000	100	0.150	1500

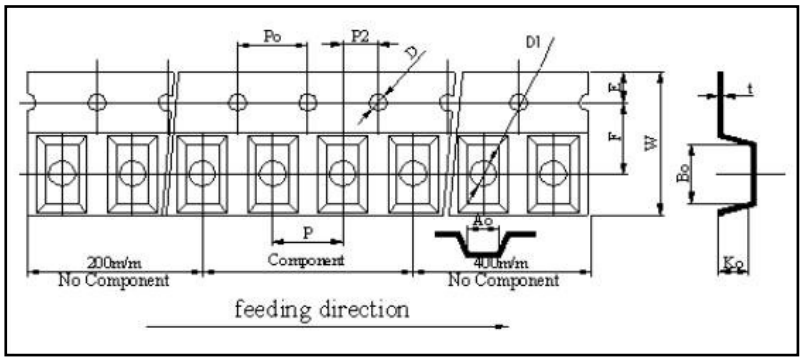
** Above For special part number which is not shown in the above table, please refers to appendix.

■ TEST INSTRUMENTS

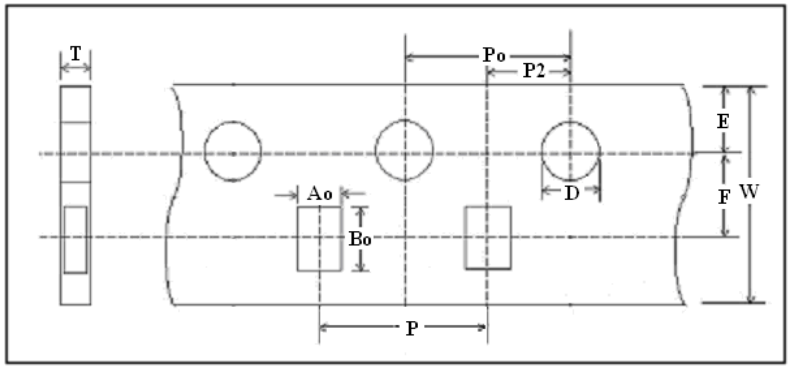
- TEST LEVEL: 250 mV
- Agilent 4291B RF IMPEDANCE / MATERIAL ANALYZER
- Agilent 4338B MILLIOHMMETER
- Agilent 8720ES S-PARAMETER NETWORK ANALYZER
- HP6632B SYSTEM DC POWER SUPPLY

■ TAPE AND REEL SPECIFICATIONS

PLASTIC CARRIER



PAPER CARRIER



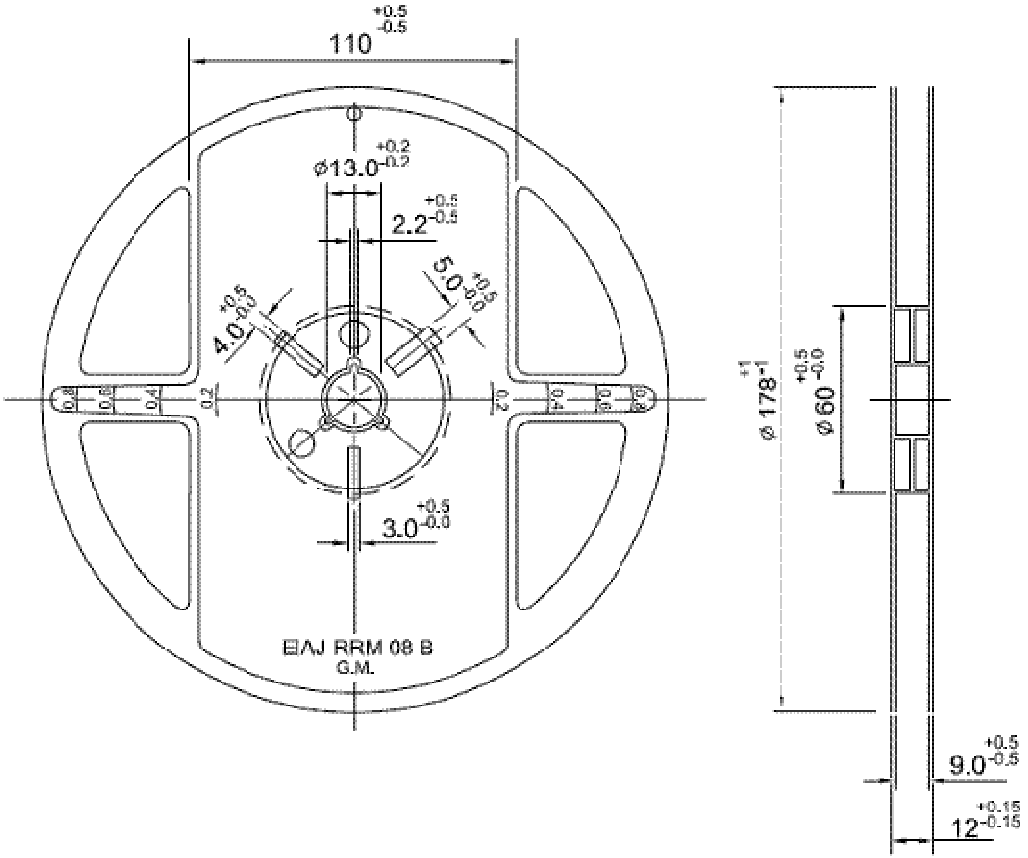
■ TAPING DIMENSIONS

Unit: mm

Size	4516	3216	2012	1608	1005
Symbol	PLASTIC	PLASTIC	PAPER	PAPER	PAPER
W	11.7~12.3	7.90~8.30	8.00±0.10	8.00±0.10	8.00±0.10
P	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	2.00±0.05
E	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.10	1.75±0.05
F	5.50±0.05	3.50±0.05	3.50±0.10	3.50±0.10	3.50±0.05
D	1.55±0.05	1.55±0.05	1.56±0.10	1.56±0.10	1.55±0.05
D1	1.50~1.75	0.95~1.20	NA	NA	NA
Po	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10	4.00±0.10
Po10	40.0±0.20	40.0±0.20	40.0±0.20	NA	NA
P2	2.00±0.05	2.00±0.05	2.00±0.10	2.00±0.10	2.00±0.05
Ao	1.83±0.10	1.85±0.10	1.50±0.05	1.05±0.05	0.62±0.03
Bo	4.85±0.10	3.43±0.10	2.30±0.05	1.85±0.05	1.12±0.03
Ko(T)	1.83±0.10	1.22±0.10	0.95±0.05	0.95±0.05	0.60±0.03
t	0.29±0.10	0.25±0.10	NA	NA	NA

■ REEL DIMENSIONS

Unit: mm

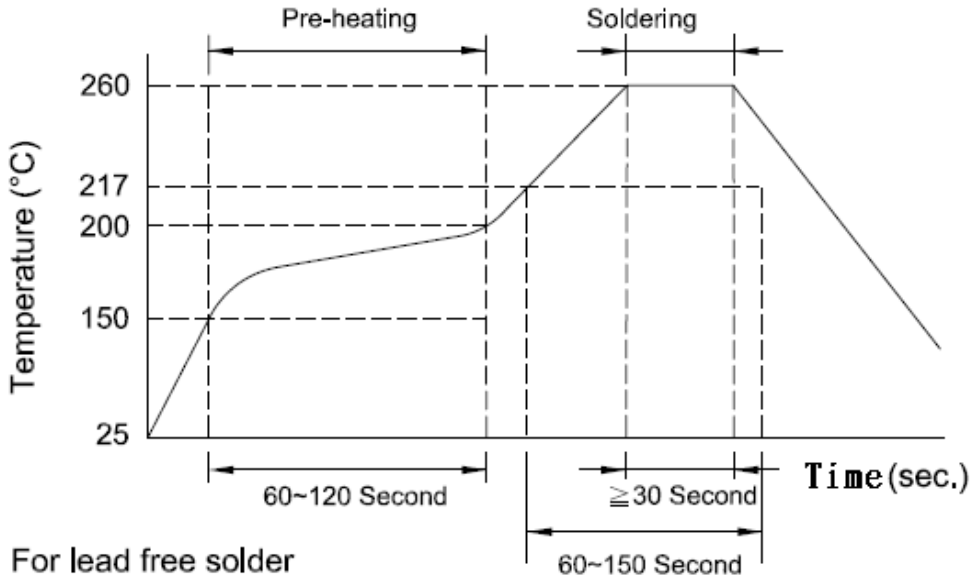


Reel Packaging Quantity						
PART SIZE (EIA SIZE)		**1005 (0402)**	**1608 (0603)**	**2012 (0805)**	**3216 (1206)**	**4516 (1806)**
7" REEL	Qty. (pcs)	10,000	4,000	4,000	3,000	2,000

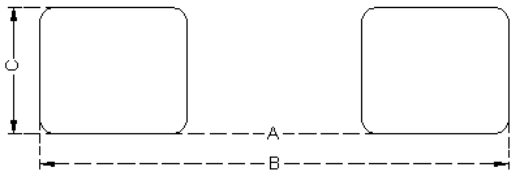
The Contents of a box：

4516 (1806): 4 reels / inner box ;
3216 (1206): 5 reels / inner box ;
2012 (0805): 5 reels / inner box ;
1608 (0603): 5 reels / inner box ;
1005 (0402): 5 reels / inner box .

■ RECOMMENDED SOLDERING CONDITIONS



■ LAND PATTERNS FOR REFLOW SOLDERING



■ SOLDER LAND INFORMATION

Unit: mm (inches)

Size	A	B	C
1005	0.4 ~ 0.6 (0.015 ~ 0.023)	1.6 ~ 2.6 (0.063 ~ 0.102)	0.4 ~ 0.7 (0.016 ~ 0.027)
1608	0.5 ~ 0.7 (0.019 ~ 0.027)	2.1 ~ 3.1 (0.083 ~ 0.122)	0.65 ~ 0.95 (0.026 ~ 0.037)
2012	1.0 ~ 1.2 (0.039 ~ 0.047)	3.0 ~ 4.0 (0.118 ~ 0.157)	0.8 ~ 1.1 (0.031 ~ 0.043)
3216	2.0 ~ 2.4 (0.079 ~ 0.094)	4.2 ~ 5.2 (0.165 ~ 0.204)	1.0 ~ 1.4 (0.039 ~ 0.055)
4516	3.4 ~ 3.7 (0.133 ~0.145)	6.3 ~ 7.3 (0.248 ~ 0.287)	1.3 ~ 1.7 (0.51 ~ 0.067)

■ RELIABILITY AND TEST CONDITION

Test item	Test condition	Criteria
Temperature Cycle	1. Temperature : -55 ~ +125℃ 2. Cycle : 1000 cycles 3. Dwell time : 30minutes Measurement : at ambient temperature 24 hrs after test completion	1. No mechanical damage 2. Impedance value should be within ± 30 % of the initial value
Operational Life	1. Temperature : 125℃ ± 5℃ 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. Impedance value should be within ± 30 % of the initial value
Biased Humidity	1. Temperature : 85℃ ± 2℃ 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. Impedance value should be within ± 30 % of the initial value
High Temperature Exposure	1. Temperature : 125℃ ± 5℃ 2. Test time : 1000 hrs Measurement: at ambient temperature 24 hrs after test completion	1. No mechanical damage 2. Impedance value should be within ± 30 % of the initial value
Resistance to Solder Heat	1. Solder temperature : 260 ± 5℃ 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. Impedance value should be within ± 30 % of the initial value
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. Impedance value should be within ± 30 % of the initial value

<table>
<tr><th>Test item</th><th>Test condition</th><th>Criteria</th></tr>
<tr><td>Mechanical Shock</td><td>Condition F:1500g's/0.5ms/Half sine</td><td>1. No mechanical damage
2. Impedance value should be within ± 30 % of the initial value</td></tr>
<tr><td>ESD</td><td>Classification Levels 1C
1000 V (DC) to < 2000 V (DC)</td><td>1. No mechanical damage
2. Impedance value should be within ± 30 % of the initial value</td></tr>
<tr><td>Solderability Test</td><td>1. Solder temperature : 235 ± 5℃
2. Flux : Rosin
3. DIP time : 5 ± 1 sec</td><td>1. More than 95 % of terminal electrode should be covered with new solder
2. No mechanical damage</td></tr>
<tr><td>Board Flex</td><td>Epoxy-PCB(1.6mm)
Deflection 2mm(min)
60s minimum holding time</td><td>No mechanical damage.</td></tr>
<tr><td>Terminal Strength</td><td><table><tr><td>Size</td><td>Apply Force(F)</td><td>Test Time</td></tr><tr><td>1005</td><td>5N</td><td>10 ±1 sec</td></tr><tr><td>1608</td><td>10 N</td><td>10 ±1 sec</td></tr><tr><td>≧2012</td><td>17.7 N</td><td>60 ±1 sec</td></tr></table></td><td>No mechanical damage</td></tr>
</table>

■ GENERAL TECHNICAL DATA

Operating temperature range: - 55℃ ~ +125℃

Storage Condition: Less than 40℃ and 70% RH

Storage Time: 6 months (Size: 1005)

12 months (Size: 1608 above)

Soldering method: Reflow