



## Chip Ferrite Bead (MCB-S Series) Engineering Spec.

### ■ FEATURES

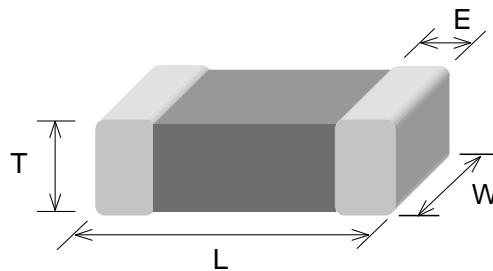
- Monolithic inorganic material construction
- Closed magnetic circuit avoids crosstalk
- SMD Type & suitable for reflow and wave soldering
- Available in various sizes
- Excellent solderability and heat resistance
- High reliability
- Effectively filtering capability over a wide range of frequency

### ■ APPLICATIONS

Filtering between analog and digital circuitry, clock generation circuitry, I/O interconnects, isolation between RF noisy circuits and logic devices susceptible to functional degradation, power supply filtering to prevent conducted RF energy from corrupting the power generation circuitry, high frequency EMI prevention of computer, printers, VCRs, TVs and portable telephones.

This product belongs to the industrial grade standard, not the vehicle gauge product!  
Cannot use auto parts, if the customer is not expressly informed and privately used to auto parts, produce any consequences, the original is not responsible for after-sales service, thank you!

### ■ SHAPES AND DIMENSIONS



Unit: mm

TYPE	1005 (EIA0402)	1608 (EIA0603)	2012 (EIA0805)	3216 (EIA1206)	3225 (EIA1210)	4516 (EIA1806)	4532 (EIA1812)
L	1.00±0.10	1.6±0.15	2.00±0.2	3.2±0.20	3.2±0.20	4.5±0.25	4.5±0.25
W	0.50±0.10	0.8±0.15	1.25±0.2	1.6±0.20	2.5±0.20	1.6±0.20	3.2±0.25
T	0.50±0.10	0.8±0.15	0.90±0.2	1.1±0.20	1.3±0.20	1.6±0.20	1.5±0.25
E	0.25±0.10	0.3±0.20	0.50±0.3	0.5±0.30	0.5±0.30	0.6±0.40	0.6±0.40



## ■ PART NUMBER CODE

MCB 1608   S   60   1   E   A  
 1      2      3      4      5      6      7

- 1 Series Name
- 2 Size Code : the first two digitals : length(mm), the last two digitals : width(mm)
- 3 Material Code
- 4 Impedance( $\Omega$ ) + 25% } (ex : 600=60 $\Omega$  ; 121=120 $\Omega$ )
- 5 Fixed Decimal Point }
- 6 Rated Current Code

A=50mA	B=80mA	C=100mA	D=150mA	E=200mA	F=300mA
G=400mA	H=500mA	I=600mA	J=700mA	K=800mA	

7 Soldering : Green Parts : A— Lead-Free.

## ■ PART NUMBER AND CHARACTERISTICS TABLE

### 1. MCB1005-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB1005S100FA	10	100	0.10	300
MCB1005S200FA	20	100	0.20	300
MCB1005S300FA	30	100	0.25	300
MCB1005S400FA	40	100	0.30	300
MCB1005S600FA	60	100	0.35	300
MCB1005S700FA	70	100	0.35	300
MCB1005S121FA	120	100	0.40	300
MCB1005S241EA	240	100	0.70	200
MCB1005S301EA	300	100	0.80	200
MCB1005S471EA	470	100	1.00	200
MCB1005S601EA	600	100	1.00	200
MCB1005S102EA	1000	100	1.50	200



## 2. MCB1608-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB1608S100IA	10	100	0.05	600
MCB1608S300IA	30	100	0.08	600
MCB1608S600IA	60	100	0.10	600
MCB1608S800IA	80	100	0.10	600
MCB1608S121IA	120	100	0.15	600
MCB1608S181FA	180	100	0.30	300
MCB1608S221FA	220	100	0.30	300
MCB1608S301FA	300	100	0.35	300
MCB1608S471FA	470	100	0.40	300
MCB1608S601EA	600	100	0.45	200
MCB1608S102CA	1000	100	0.60	100
MCB1608S182CA	1800	100	0.70	100

## 3. MCB2012-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB2012S300KA	30	100	0.05	800
MCB2012S400KA	40	100	0.05	800
MCB2012S600KA	60	100	0.15	800
MCB2012S800KA	80	100	0.15	800
MCB2012S121KA	120	100	0.15	800
MCB2012S221HA	220	100	0.20	500
MCB2012S301HA	300	100	0.20	500
MCB2012S601HA	600	100	0.30	500
MCB2012S102FA	1000	100	0.35	300
MCB2012S202EA	2000	100	0.50	200



#### 4. MCB3216-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB3216S310KA	31	100	0.05	800
MCB3216S500KA	50	100	0.08	800
MCB3216S700KA	70	100	0.10	800
MCB3216S121IA	120	100	0.15	600
MCB3216S601HA	600	100	0.30	500

#### 5. MCB3225-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB3225S600KA	60	100	0.30	800
MCB3225S900KA	90	100	0.30	800

#### 6. MCB4516-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB4516S800KA	80	100	0.10	800
MCB4516S151KA	150	100	0.30	800



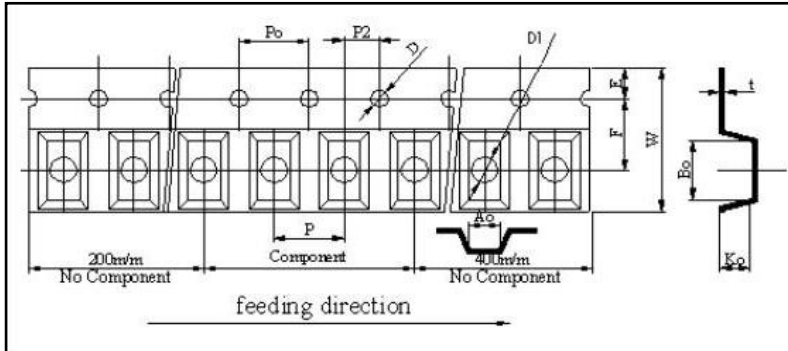
## 7. MCB4532-S Series

Part No.	Impedance( $\Omega$ ) +/-25%	Test Freq.(MHz)	DCR( $\Omega$ ) (max)	Rated Current (mA)
MCB4532S700KA	70	100	0.40	800
MCB4532S800KA	80	100	0.40	800
MCB4532S121KA	120	100	0.40	800
<b>Test Instruments</b>	<ul style="list-style-type: none"> <li>•Test Level : 250 mV</li> <li>•HP4291B RF IMPEDANCE / MATERIAL ANALYZER</li> <li>•HP4338A/B MILLIOHMMETER</li> <li>•Agilent 8720ES S-PARAMETER NETWORK ANALYZER</li> <li>•HP6632B SYSTEM DC POWER SUPPLY</li> </ul>			

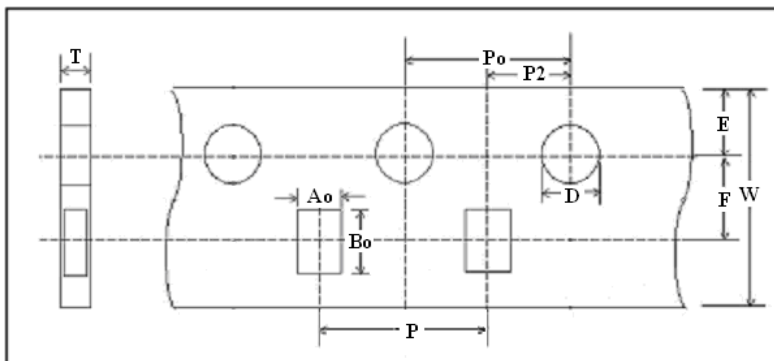


## ■ TAPE AND REEL SPECIFICATIONS

### 1. plastic carrier



### 2. Paper carrier



## TAPING DIMENSIONS

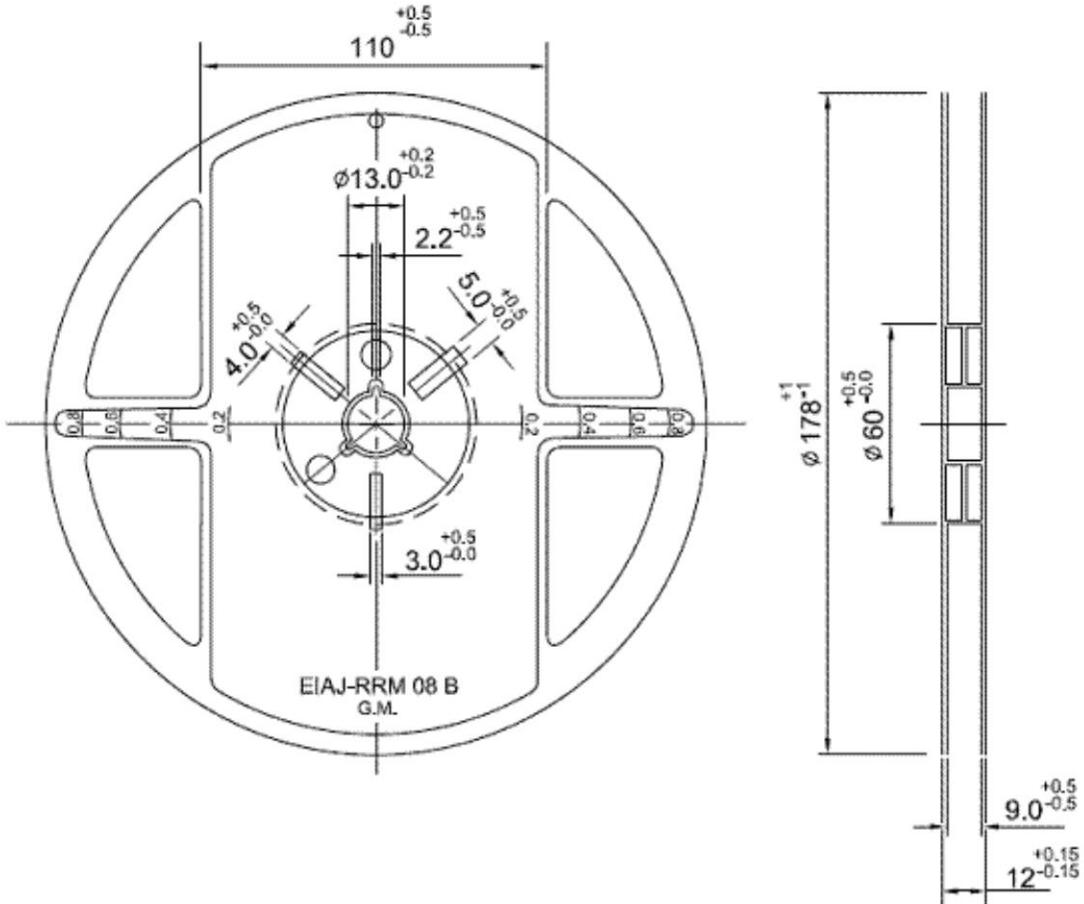
Unit: mm

	4532	4516	3225	3216	2012	1608	1005
Symbol	PLASTIC	PLASTIC	PLASTIC	PLASTIC	PAPER	PAPER	PAPER
W	12 ±0.1	11.7~12.3	7.7~8.3	7.9~8.3	8.0 ±0.1	8.0 ±0.1	8.0 ±0.1
P	8.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	2.0 ±0.05
E	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.1	1.75 ±0.10	1.75 ±0.05
F	5.5 ±0.05	5.5 ±0.05	3.5 ±0.05	3.5 ±0.05	3.5 ±0.1	3.5 ±0.1	3.5 ±0.05
D	1.55 ±0.05	1.55 ±0.05	1.55 ±0.05	1.55 ±0.05	1.56 ±0.10	1.56 ±0.10	1.55 ±0.05
D1	1.5~1.75	1.5~1.75	0.95~1.20	0.95~1.20	NA	NA	NA
Po	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1	4.0 ±0.1
Po10	40 ±0.2	40 ±0.2	40 ±0.2	40 ±0.2	40 ±0.2	NA	NA
P2	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05	2.0 ±0.05	2.0 ±0.1	2.0 ±0.1	2.0 ±0.05
Ao	3.66 ±0.1	1.83 ±0.1	2.57 ±0.1	1.85 ±0.1	1.50 ±0.05	1.05 ±0.05	0.62 ±0.03
Bo	4.95 ±0.1	4.85 ±0.1	3.4 ±0.1	3.43 ±0.1	2.30 ±0.05	1.85 ±0.05	1.12 ±0.03
Ko(T)	1.83 ±0.1	1.83 ±0.1	1.32 ±0.1	1.22 ±0.1	0.95 ±0.05	0.95 ±0.05	0.60 ±0.03
t	0.23 ±0.1	0.29 ±0.1	0.25 ±0.1	0.25 ±0.1	NA	NA	NA



## ■ REEL DIMENSIONS

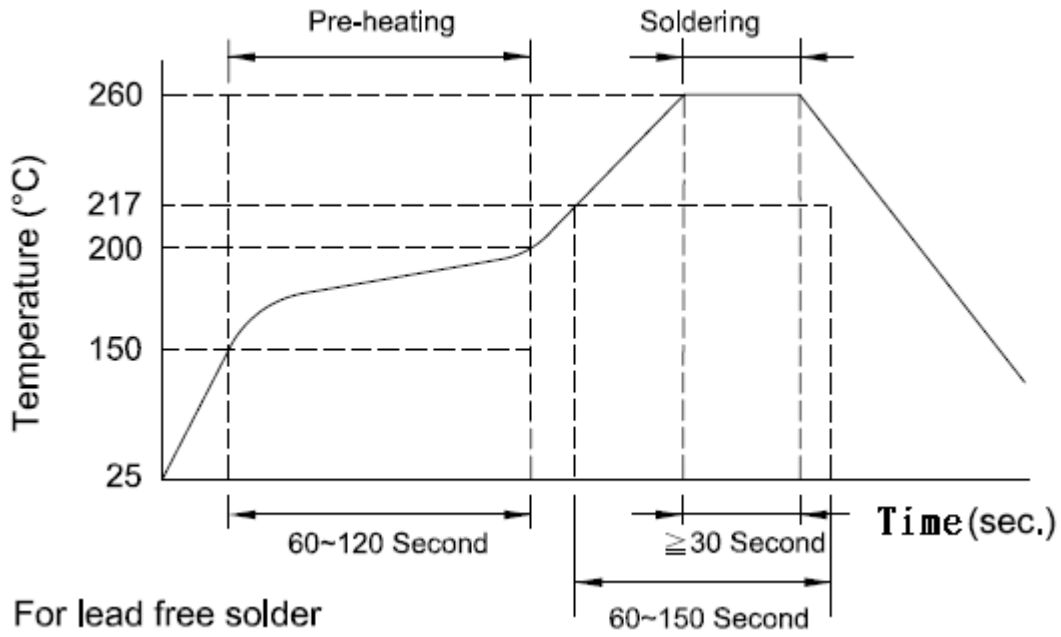
Unit: mm



Reel Packaging Quantity								
PART SIZE (EIA SIZE)		1005 (0402)	1608 (0603)	2012 (0805)	3216 (1206)	3225 (1210)	4516 (1806)	4532 (1812)
7" REEL	Qty. (pcs)	10,000	4,000	4,000	3,000	2,000	2,000	1,000

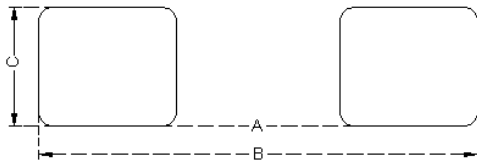


## RECOMMENDED SOLDERING CONDITIONS



For lead free solder

### 1. Land Patterns for Reflow Soldering







## 2. Solder Land Information

Unit: mm (inches)

Size	A	B	C
<b>1005</b>	0.4 (0.016)	1.2 ~ 1.4 (0.047 ~ 0.055)	0.5 (0.020)
<b>1608</b>	0.7 (0.028)	1.8 ~ 2.0 (0.071 ~ 0.079)	0.7 (0.028)
<b>2012</b>	1.2 (0.047)	3.0 ~ 4.0 (0.118 ~ 0.157)	1.0 (0.039)
<b>3216</b>	2.0 (0.079)	4.2 ~ 5.2 (0.165 ~ 0.205)	1.2 (0.047)
<b>3225</b>	2.0 (0.079)	4.2 ~ 5.2 (0.165 ~ 0.205)	3.4 (0.134)
<b>4516</b>	3.0 (0.118)	5.5 ~ 6.5 (0.217 ~ 0.256)	1.2 (0.047)
<b>4532</b>	3.0 (0.118)	5.5 ~ 6.5 (0.217 ~ 0.256)	4.22 (0.166)

## ■ RELIABILITY AND TEST CONDITION

Test item	Test Condition	Criteria
<b>Temperature Cycle</b>	<ol style="list-style-type: none"> <li>1. Temperature: -55°C ~ 125°C</li> <li>2. Cycle: 100 cycles</li> <li>3. Dwell time: 30 minutes</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.Impedance value should be within ±20% of the initial value</li> </ol>
<b>Operational Life</b>	<ol style="list-style-type: none"> <li>1. Temperature: 125 ±5°C</li> <li>2. Test 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.Impedance value should be within ±20% of the initial value</li> </ol>
<b>Biased Humidity</b>	<ol style="list-style-type: none"> <li>1. Temperature: 40°C ±2°C</li> <li>2. Humidity: 90-95 % RH</li> <li>3. Testing time: 1000 hrs</li> <li>4. Applied current: Full rated current</li> <li>5. Measurement: at ambient temperature 24 hours after test</li> </ol>	<ol style="list-style-type: none"> <li>1.No mechanical damage</li> <li>2.Impedance value should be within ±20% of the initial value</li> </ol>



	completion	
<b>Resistance to Solder Heat</b>	<ol style="list-style-type: none"> <li>1. Solder temperature: 265 ±5°C</li> <li>2. Flux: Rosin</li> <li>3. Dip time: 10 ±1 sec</li> </ol>	<ol style="list-style-type: none"> <li>1. More than 95% of terminal electrode should be covered with new solder.</li> <li>2.No mechanical damage</li> <li>3.Impedance value should be within ±20% of the initial value</li> </ol>
<b>Adhesive Test</b>	<ol style="list-style-type: none"> <li>1. Reflow temperature : 245°C It shall be Soldered on the substrate applying direction parallel to the substrate</li> <li>2. Apply force(F) : 5 N</li> <li>3. Test time : 10 sec</li> </ol>	<ol style="list-style-type: none"> <li>1. No mechanical damage</li> <li>2. Soldering the products on PCB after the pulling test force &gt; 5 N</li> </ol>
<b>Steam Aging Test</b>	<ol style="list-style-type: none"> <li>1. Temperature: 93°C</li> <li>2. Test time: 4 hrs(Size:1005) Others: 8 hrs</li> <li>3.Solder temperature.:235 ±5°C</li> <li>4.Flux: Rosin</li> <li>5.Dip time:5 ±1 sec</li> </ol>	More than 95% of the terminal electrode should be covered with new solder
<b>Rated Current Test</b>	Apply current : full rated current / 5min	Temperature rise should be less than 25°C



## ■ GENERAL TECHNICAL DATA

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