PSA 佳邦科技股份有限公司
INPAQ TECHNOLOGY CO., LTD.

# MCB S Series
# Data Sheet

| | |
|---|---|
| Product Name | MCB S Series |
| Series | Ferrite Chip Bead |
| Size | EIAJ 1005 - 4516 |
| Version | A18 |

# Ferrite Chip Bead (MCB S Series)

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!

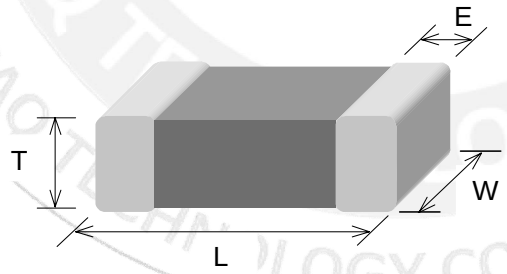
## ■ FEATURES

- 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

## ■ SHAPES AND DIMENSIONS




| TYPE | 1005 (EIA 0402) | 1608 (EIA 0603) | 2012 (EIA 0805) | 3216 (EIA 1206) | 3225 (EIA 1210) | 4516 (EIA 1806) |
|---|---|---|---|---|---|---|
| L | 1.00±0.10 | 1.60±0.15 | 2.00±0.20 | 3.20±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 | 2.50±0.20 | 1.60±0.20 |
| T | 0.50±0.10 | 0.80±0.15 | 0.90±0.20 | 1.10±0.20 | 1.30±0.20 | 1.60±0.20 |
| E | 0.25±0.10 | 0.30±0.20 | 0.50±0.30 | 0.50±0.30 | 0.50±0.30 | 0.60±0.40 |
| Unit | mm | mm | mm | mm | mm | mm |

## ■ PART NUMBER CODE

| MCB | 1005 | S | 60 | 1 | H | B | P |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

*1* Series Name
*2* Size Code: the first two digitals : length(mm), the last two digitals : width(mm)
*3* Material Code
*4* Impedance at 100MHz
*5* Fixed Decimal Point ┐ (ex：121 = 120Ω；600 = 60Ω)
*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─ Soldering Lead-Free；B ─ Lead-Free for whole chip
*8* Packaging：P ─ Paper tape,7" reel.；E─ Embossed plastic tape, 7" reel.

## ■ PART NUMBER AND CHARACTERISTICS TABLE

| Part No. | Impedance(Ω) +/-25% | Test Freq. (MHz) | DCR(Ω) (Max.) | Rated Current (mA) |
|---|---|---|---|---|
| MCB1005-S Series | | | | |
| MCB1005S100HBP | 10 | 100 | 0.10 | 500 |
| MCB1005S200FBP | 20 | 100 | 0.20 | 300 |
| MCB1005S300KBP | 30 | 100 | 0.10 | 800 |
| MCB1005S600KBP | 60 | 100 | 0.15 | 800 |
| MCB1005S700JBP | 70 | 100 | 0.25 | 700 |
| MCB1005S800KBP | 80 | 100 | 0.12 | 800 |
| MCB1005S101HBP | 100 | 100 | 0.25 | 500 |
| MCB1005S121IBP | 120 | 100 | 0.19 | 600 |
| MCB1005S221JBP | 220 | 100 | 0.30 | 700 |
| MCB1005S241GBP | 240 | 100 | 0.40 | 400 |
| MCB1005S301KBP | 300 | 100 | 0.40 | 800 |
| MCB1005S601HBP | 600 | 100 | 0.50 | 500 |
| MCB1005S102FBP | 1000 | 100 | 1.50 | 300 |

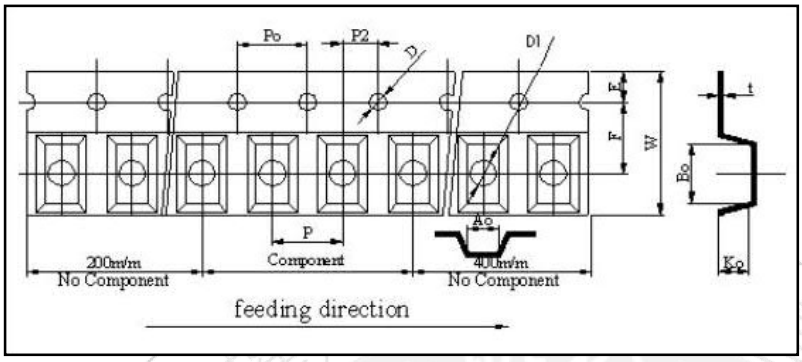
| Part No. | Impedance(Ω) +/-25% | Test Freq. (MHz) | DCR(Ω) (Max.) | Rated Current (mA) |
|---|---|---|---|---|
| MCB1608-S Series | | | | |
| MCB1608S100IBP | 10 | 100 | 0.05 | 600 |
| MCB1608S300IBP | 30 | 100 | 0.08 | 600 |
| MCB1608S600IBP | 60 | 100 | 0.10 | 600 |
| MCB1608S800IBP | 80 | 100 | 0.10 | 600 |
| MCB1608S101IBP | 100 | 100 | 0.15 | 600 |
| MCB1608S121KBP | 120 | 100 | 0.10 | 800 |
| MCB1608S181IBP | 180 | 100 | 0.30 | 600 |
| MCB1608S221JBP | 220 | 100 | 0.25 | 700 |
| MCB1608S301IBP | 300 | 100 | 0.35 | 600 |
| MCB1608S471HBP | 470 | 100 | 0.35 | 500 |
| MCB1608S601IBP | 600 | 100 | 0.40 | 600 |
| MCB1608S102IBP | 1000 | 100 | 0.50 | 600 |
| MCB1608S152HBP | 1500 | 100 | 0.60 | 500 |
| MCB1608S182FBP | 1800 | 100 | 0.70 | 300 |
| MCB1608S222EBP | 2200 | 100 | 0.70 | 200 |
| MCB1608S252EBP | 2500 | 100 | 0.70 | 200 |
| MCB2012-S Series | | | | |
| MCB2012S300KBP | 30 | 100 | 0.05 | 800 |
| MCB2012S400KBP | 40 | 100 | 0.05 | 800 |
| MCB2012S600KBP | 60 | 100 | 0.15 | 800 |
| MCB2012S800KBP | 80 | 100 | 0.15 | 800 |
| MCB2012S121KBP | 120 | 100 | 0.15 | 800 |
| MCB2012S221HBP | 220 | 100 | 0.20 | 500 |
| MCB2012S301JBP | 300 | 100 | 0.20 | 700 |
| MCB2012S601JBP | 600 | 100 | 0.20 | 700 |
| MCB2012S102HBP | 1000 | 100 | 0.35 | 500 |
| MCB2012S152HBP | 1500 | 100 | 0.40 | 500 |
| MCB2012S202HBP | 2000 | 100 | 0.30 | 500 |
| MCB3216-S Series | | | | |
| MCB3216S500KBE | 50 | 100 | 0.08 | 800 |
| MCB3216S700KBE | 70 | 100 | 0.10 | 800 |

| Part No. | Impedance(Ω) +/-25% | Test Freq. (MHz) | DCR(Ω) (Max.) | Rated Current (mA) |
|---|---|---|---|---|
| MCB3216-S Series | | | | |
| MCB3216S121KBE | 120 | 100 | 0.15 | 800 |
| MCB3216S601HBE | 600 | 100 | 0.30 | 500 |
| MCB3216S122HBE | 1200 | 100 | 0.40 | 500 |
| MCB3216S152EBE | 1500 | 50 | 0.50 | 200 |
| MCB3216S202EBE | 2000 | 30 | 0.50 | 200 |
| MCB3225-S Series | | | | |
| MCB3225S600KBE | 60 | 100 | 0.30 | 800 |
| MCB3225S900KBE | 90 | 100 | 0.30 | 800 |
| MCB4516-S Series | | | | |
| MCB4516S800KBE | 80 | 100 | 0.10 | 800 |
| | •Test Level：250 mV | | | |
| **Test Instruments：** | • Agilent E4991A/B RF IMPEDANCE / MATERIAL ANALYZER or EQUIVALENT<br>•HP4338A/B MILLIOHMMETER<br>•Agilent E5071C ENA SERIES NETWORK ANALYZER<br>•HP6632B SYSTEM DC POWER SUPPLY | | | |

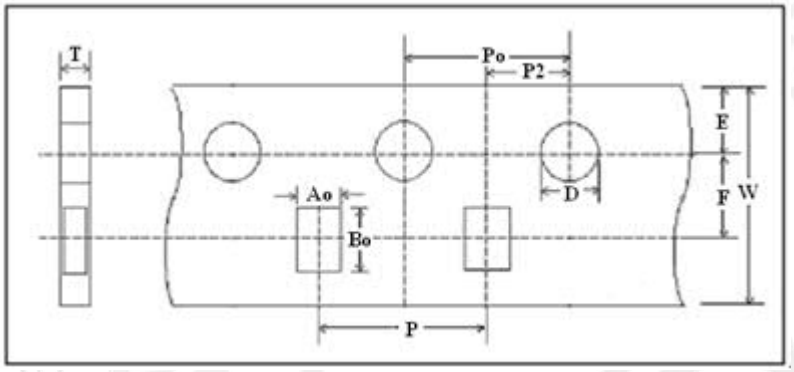
** For special part number which is not shown in the above table, please refer to appendix.

## ■ TAPE AND REEL SPECIFICATIONS

### PLASTIC CARRIER




### PAPER CARRIER

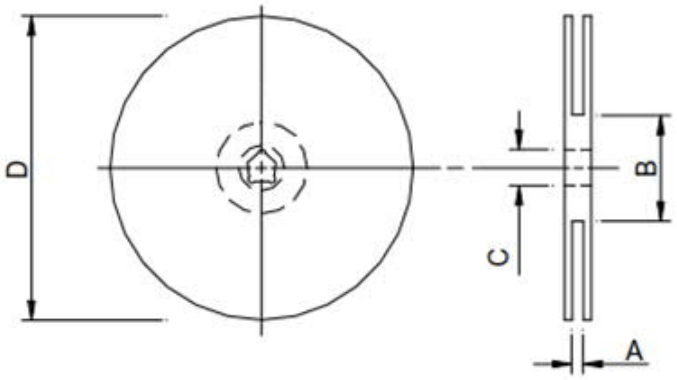



## ■ TAPING DIMENSIONS

Unit: mm

| Size | 4516 | 3225 | 3216 | 2012 | 1608 | 1005 |
|---|---|---|---|---|---|---|
| Symbol | PLASTIC | PLASTIC | PLASTIC | PAPER | PAPER | PAPER |
| W | 11.7~12.3 | 7.70~8.30 | 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 | 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±0.10 | 1.75±0.05 |
| F | 5.50±0.05 | 3.50±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 | 1.55±0.05 | 1.56±0.10 | 1.56±0.10 | 1.55±0.05 |
| D1 | 1.50~1.75 | 0.95~1.20 | 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 | 4.00±0.10 |
| Po10 | 40.0±0.20 | 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±0.05 | 2.00±0.10 | 2.00±0.10 | 2.00±0.05 |
| Ao | 1.83±0.10 | 2.57±0.10 | 1.85±0.10 | 1.50±0.05 | 1.05±0.05 | 0.62±0.03 |
| Bo | 4.85±0.10 | 3.40±0.10 | 3.43±0.10 | 2.30±0.05 | 1.85±0.05 | 1.12±0.03 |
| Ko(T) | 1.83±0.10 | 1.32±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 | 0.25±0.10 | NA | NA | NA |

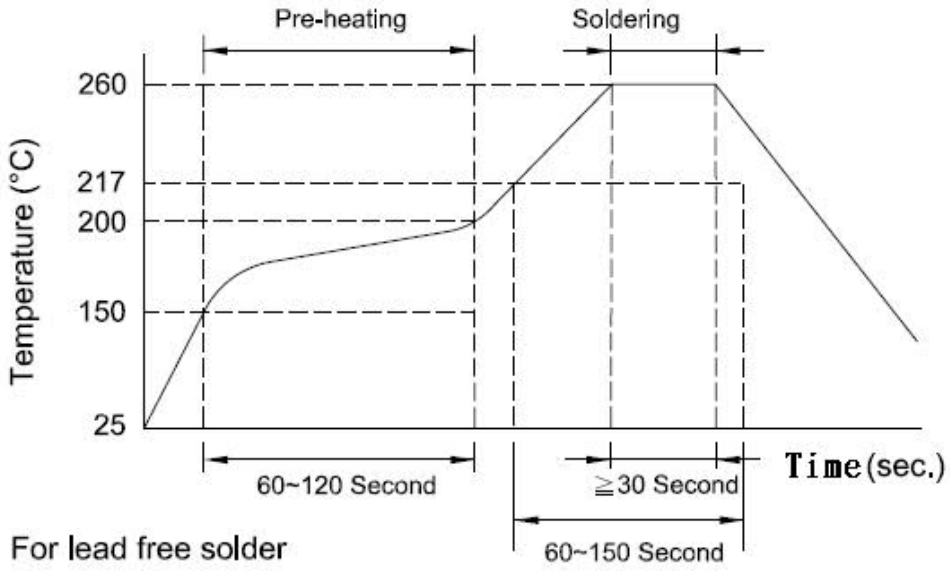
## ■ REEL DIMENSIONS



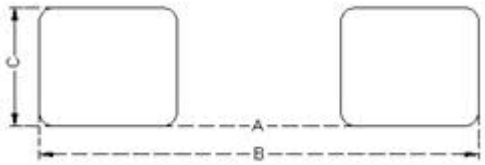

| Type | 7" |
|---|---|
| A(mm) | 10±1.5 |
| B(mm) | 50 or more |
| C(mm) | 13.2±1.0 |
| D(mm) | 178±2.0 |

| 7" Reel Packaging Quantity | | | | | | |
|---|---|---|---|---|---|---|
| PART SIZE (EIA SIZE) | **1005 (0402)** | **1608 (0603)** | **2012 (0805)** | **3216 (1206)** | **3225 (1210)** | **4516 (1806)** |
| Qty.(pcs) | 10,000 | 4,000 | 4,000 | 3,000 | 2,000 | 2,000 |
| BOX | 5 reels / inner box | 5 reels / inner box | 5 eels / inner box | 5 reels / inner box | 5 reels / inner box | 4 reels / inner box |

## ■ RECOMMENDED SOLDERING CONDITIONS



## ■ LAND PATTERNS FOR REFLOW SOLDERING




## ■ SOLDER LAND INFORMATION

Unit: mm (inches)

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

## ■ GENERAL TECHNICAL DATA

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

## ■ RELIABILITY AND TEST CONDITION

| Test item | Test condition | Criteria |
|---|---|---|
| **Thermal Shock** | a. Temperature : -55℃ ~ +125℃<br>b. Cycle : 100 cycles<br>c. Dwell time : 30minutes<br>d. Measurement : at ambient temperature 24 hrs after test completion | a. No mechanical damage<br>b. Impedance value should be within ± 20 % of the initial value |
| **Operational Life** | a. Temperature : 125℃ ± 5℃<br>b. Test time : 1000 hrs<br>c. Apply current : full rated current<br>d. Measurement : at ambient temperature 24 hrs after test completion | a. No mechanical damage<br>b. Impedance value should be within ± 20 % of the initial value |
| **Biased Humidity** | a. Temperature : 40℃ ± 2℃<br>b. Humidity : 90 ~ 95 % RH<br>c. Test time : 1000 hrs<br>d. Apply current : full rated current<br>e. Measurement : at ambient temperature 24 hrs after test completion | a. No mechanical damage<br>b. Impedance value should be within ± 20 % of the initial value |
| **Resistance to Solder Heat** | a. Solder temperature : 260 ± 5℃<br>b. Flux : Rosin<br>c. DIP time : 10 ± 1 sec | a. More than 95 % of terminal electrode should be covered with new solder<br>b. No mechanical damage<br>c. Impedance value should be within ± 20 % of the initial value |
| **Adhesive Test** | a. Reflow temperature : 245℃ It shall be Soldered on the substrate<br>applying direction parallel to the substrate<br>b. Apply force(F) : 5 N<br>c. Test time : 10 sec | a. No mechanical damage<br>b. Soldering the products on PCB after the pulling test force > 5 N |

| Test item | Test condition | Criteria |
|---|---|---|
| **Steam Aging Test** | a. Temperature : 93℃<br>b. Test time : 4 hrs(MCB1005)<br>Others : 8 hrs<br>c. Solder temperature : 235 ± 5℃<br>d. Flux : Rosin<br>e. DIP time : 5 ± 1 sec | More than 95 % of terminal electrode should be covered with new solder |
| **Rated Current Test** | a. Apply current : full rated current / 5min | Temperature rise should be less than 25℃ |