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

MHC Automotive Series
Data Sheet

Product Name	MHC Automotive Series
Series	Ferrite Chip Bead
Size	EIAJ 1005 - 4532
Version	A1

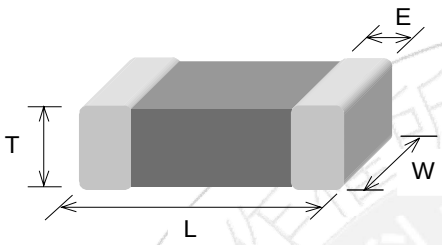
AEC-Q200 ROHS HF

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

High Current Ferrite Chip Bead for Automotive (MHC Series)

Qualified based on AEC-Q200

■ SHAPES AND DIMENSIONS



TYPE	1005 (EIA 0402)	1608_06 (EIA 0603)	1608_08 (EIA 0603)	2012 (EIA 0805)	3216 (EIA 1206)	3225 (EIA 1206)	4516 (EIA 1806)	4532 (EIA 1812)
L	1.00±0.10	1.60±0.15	1.60±0.15	2.00±0.20	3.20±0.20	3.20±0.20	4.50±0.25	4.50±0.25
W	0.50±0.10	0.80±0.15	0.80±0.15	1.25±0.20	1.60±0.20	2.50±0.20	1.60±0.20	3.20±0.25
T	0.50±0.10	0.60±0.15	0.80±0.15	0.90±0.20	1.10±0.20	1.30±0.20	1.60±0.20	1.50±0.25
E	0.25±0.10	0.30±0.20	0.30±0.20	0.50±0.30	0.50±0.30	0.50±0.30	0.60±0.40	0.60±0.40
Unit	mm	mm	mm	mm	mm	mm	mm	mm

■ PART NUMBER CODE

MHC	1005	S	121	M	H	P
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(The unit is in ohm(Ω) at 100MHz)：ex. 600 = 60Ω；121 = 120Ω

5 Rated Current Code

L=1000mA	M=1500mA	N=2000mA	P=2500mA	Q=3000mA
R=4000mA	U=5000mA	W=6000mA	Z=others	

6 Product Type：Z - Automotive Infotainment

H - Automotive Powertrain / Safety

7 Packaging：P - Paper tape, 7" reel.

E - Embossed plastic tape, 7" reel.

■ PART NUMBER AND CHARACTERISTICS TABLE

Part No.	Impedance	Test Freq.	DCR(Ω)	Rated Current (mA)		Thickness T
Infotainment	(Ω)+/-25%	(MHz)	(Max.)	85℃	125℃	(mm)
MHC1005 S series						
MHC1005S100LZP	10±5Ω	100	0.050	1000	1000	0.50
MHC1005S100NZP	10±5Ω	100	0.045	2000	1000	0.50
MHC1005S600PZP	60	100	0.060	2500	1100	0.50
MHC1005S121MZP	120	100	0.090	1500	1000	0.50
MHC1608 S series						
MHC1608S300QZP	30	100	0.025	3000	1000	0.80
MHC1608S330QZP	33	100	0.025	3000	1000	0.80
MHC1608S600LZP	60	100	0.100	1000	1000	0.80
MHC1608S121NZP	120	100	0.050	2000	1000	0.80
MHC1608S181MZP	180	100	0.090	1500	1000	0.80
MHC1608S221MZP	220	100	0.100	1500	1000	0.80
MHC1608S331MZP	330	100	0.150	1500	1000	0.80
MHC1608S471LZP	470	100	0.200	1000	1000	0.80
MHC1608S601LZP	600	100	0.200	1000	1000	0.80
MHC1608S102ZZP	1000	100	0.250	800	800	0.80
MHC1608 P series						
MHC1608P260WZP	26	100	0.007	6000	4000	0.60
MHC1608P300UZP	30	100	0.010	5000	3300	0.60
MHC1608P700ZZP	70	100	0.022	3500	2200	0.60
MHC1608P101QZP	100	100	0.030	3000	1900	0.60
MHC1608P121QZP	120	100	0.030	3000	1900	0.60
MHC1608P221ZZP	220	100	0.050	2200	1500	0.80
MHC1608P331ZZP	330	100	0.080	1700	1200	0.80
MHC1608P471MZP	470	100	0.130	1500	1000	0.80
MHC1608P601ZZP	600	100	0.150	1300	1000	0.80
MHC2012 S series						
MHC2012S300RZP	30	100	0.014	4000	3300	0.90
MHC2012S600RZP	60	100	0.020	4000	2300	0.90
MHC2012S800RZP	80	100	0.020	4000	2300	0.90
MHC2012S101RZP	100	100	0.020	4000	2300	0.90
MHC2012S121QZP	120	100	0.040	3000	1550	0.90
MHC2012S181RZP	180	100	0.020	4000	2300	0.90
MHC2012S221NZP	220	100	0.045	2000	1250	0.90

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

Part No.	Impedance	Test Freq.	DCR(Ω)	Rated Current (mA)		Thickness T
Infotainment	(Ω)+/-25%	(MHz)	(Max.)	85℃	125℃	(mm)
MHC2012 S series						
MHC2012S331MZP	330	100	0.070	1500	1000	0.90
MHC2012S331NZP	330	100	0.060	2000	1000	0.90
MHC2012S601NZP	600	100	0.090	2000	1000	0.90
MHC2012S102MZP	1000	100	0.200	1500	1000	0.90
MHC2012S152LZP	1500	100	0.300	1000	1000	0.90
MHC3216 S series						
MHC3216S500ZZE	50	100	0.015	3500	2300	1.10
MHC3216S121QZE	120	100	0.020	3000	2000	1.10
MHC3216S391NZE	390	100	0.075	2000	1250	1.10
MHC3216S601MZE	600	100	0.080	1500	1000	1.10
MHC3225 S series						
MHC3225S102NZE	1000	50	0.090	2000	1000	1.30
MHC4516 S series						
MHC4516S600WZE	60	100	0.010	6000	3700	1.60
MHC4516S181ZZE	180	100	0.020	3500	2100	1.60
MHC4516S102MZE	1000	100	0.150	1500	1000	1.60
MHC4532 S series						
MHC4532S681RZE	680	100	0.028	4000	3000	1.50

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

PASSIVE SYSTEM ALLIANCE
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Part No.	Impedance	Test Freq.	DCR(Ω)	Rated Current (mA)		Thickness T
Powertrain / Safety	(Ω)+/-25%	(MHz)	(Max.)	85℃	125℃	(mm)
MHC1005 S series						
MHC1005S100LHP	10±5Ω	100	0.050	1000	1000	0.50
MHC1005S100NHP	10±5Ω	100	0.045	2000	1000	0.50
MHC1005S600PHP	60	100	0.060	2500	1100	0.50
MHC1005S121MHP	120	100	0.090	1500	1000	0.50
MHC1608 S series						
MHC1608S300QHP	30	100	0.025	3000	1000	0.80
MHC1608S330QHP	33	100	0.025	3000	1000	0.80
MHC1608S600LHP	60	100	0.100	1000	1000	0.80
MHC1608S121NHP	120	100	0.050	2000	1000	0.80
MHC1608S181MHP	180	100	0.090	1500	1000	0.80
MHC1608S221MHP	220	100	0.100	1500	1000	0.80
MHC1608S331MHP	330	100	0.150	1500	1000	0.80
MHC1608S471LHP	470	100	0.200	1000	1000	0.80
MHC1608S601LHP	600	100	0.200	1000	1000	0.80
MHC1608S102ZHP	1000	100	0.250	800	800	0.80
MHC1608 P series						
MHC1608P260WHP	26	100	0.007	6000	4000	0.60
MHC1608P300UHP	30	100	0.010	5000	3300	0.60
MHC1608P700ZHP	70	100	0.022	3500	2200	0.60
MHC1608P101QHP	100	100	0.030	3000	1900	0.60
MHC1608P121QHP	120	100	0.030	3000	1900	0.60
MHC1608P221ZHP	220	100	0.050	2200	1500	0.80
MHC1608P331ZHP	330	100	0.080	1700	1200	0.80
MHC1608P471MHP	470	100	0.130	1500	1000	0.80
MHC1608P601ZHP	600	100	0.150	1300	1000	0.80
MHC2012 S series						
MHC2012S300RHP	30	100	0.014	4000	3300	0.90
MHC2012S600RHP	60	100	0.020	4000	2300	0.90
MHC2012S800RHP	80	100	0.020	4000	2300	0.90
MHC2012S101RHP	100	100	0.020	4000	2300	0.90
MHC2012S121QHP	120	100	0.040	3000	1550	0.90
MHC2012S181RHP	180	100	0.020	4000	2300	0.90
MHC2012S221NHP	220	100	0.045	2000	1250	0.90
MHC2012S331MHP	330	100	0.070	1500	1000	0.90
MHC2012S331NHP	330	100	0.060	2000	1000	0.90

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

Part No.	Impedance	Test Freq.	DCR(Ω)	Rated Current (mA)		Thickness T
Powertrain / Safety	(Ω)+/-25%	(MHz)	(Max.)	85℃	125℃	(mm)
MHC2012 S series						
MHC2012S601NHP	600	100	0.090	2000	1000	0.90
MHC2012S102MHP	1000	100	0.200	1500	1000	0.90
MHC2012S152LHP	1500	100	0.300	1000	1000	0.90
MHC3216 S series						
MHC3216S500ZHE	50	100	0.015	3500	2300	1.10
MHC3216S121QHE	120	100	0.020	3000	2000	1.10
MHC3216S391NHE	390	100	0.075	2000	1250	1.10
MHC3216S601MHE	600	100	0.080	1500	1000	1.10
MHC3225 S series						
MHC3225S102NHE	1000	50	0.090	2000	1000	1.30
MHC4516 S series						
MHC4516S600WHE	60	100	0.010	6000	3700	1.60
MHC4516S181ZHE	180	100	0.020	3500	2100	1.60
MHC4516S102MHE	1000	100	0.150	1500	1000	1.60
MHC4532 S series						
MHC4532S681RHE	680	100	0.028	4000	3000	1.50

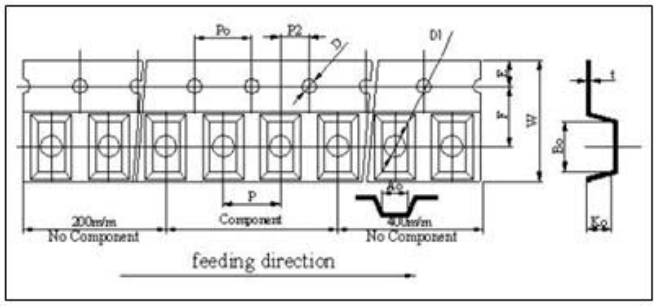
** Above For special part number which is not shown in the above table, please refers to appendix.

■ TEST INSTRUMENTS

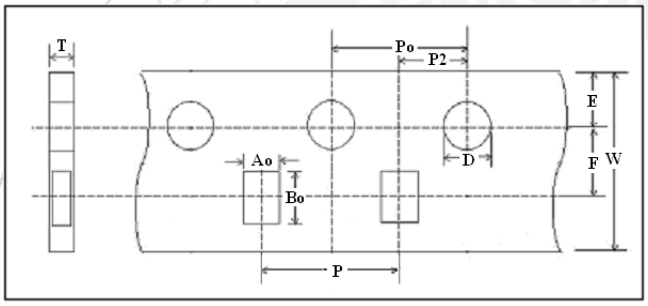
- TEST LEVEL: 250 mV
- Agilent E4991A/B RF IMPEDANCE MATERIAL ANALYZER or EQUIVALENT
- Agilent 4338B MILLIOHMMETER
- Agilent E5071C ENA SERIES NETWORK ANALYZER
- HP6632B SYSTEM DC POWER SUPPLY

■ TAPE AND REEL SPECIFICATIONS

PLASTIC CARRIER



PAPER CARRIER

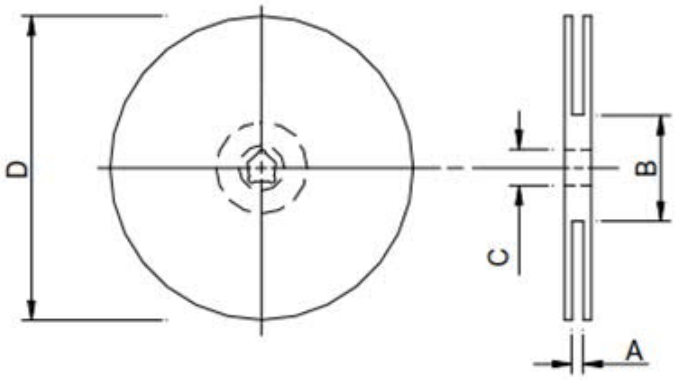


■ TAPING DIMENSIONS

Unit：mm

Size	4532	4516	3225	3216	2012	1608_08	1608_06	1005
Symbol	PLASTIC	PLASTIC	PLASTIC	PLASTIC	PAPER	PAPER	PAPER	PAPER
W	12.0±0.10	11.7~12.3	7.70~8.30	7.90~8.30	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.10
P	8.00±0.10	4.00±0.10	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±0.10	1.75±0.10	1.75±0.05
F	5.50±0.05	5.50±0.05	3.50±0.05	3.50±0.05	3.50±0.10	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	1.55±0.05	1.56±0.10	1.56±0.10	1.56±0.10	1.55±0.05
D1	1.50~1.75	1.50~1.75	0.95~1.20	0.95~1.20	NA	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	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	40.0±0.20	NA	NA	NA
P2	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.05	2.00±0.10	2.00±0.10	2.00±0.10	2.00±0.05
Ao	3.66±0.10	1.83±0.10	2.57±0.10	1.85±0.10	1.50±0.05	1.05±0.05	0.97±0.05	0.62±0.03
Bo	4.95±0.10	4.85±0.10	3.40±0.10	3.43±0.10	2.30±0.05	1.85±0.05	1.80±0.05	1.12±0.03
Ko(T)	1.83±0.10	1.83±0.10	1.32±0.10	1.22±0.10	0.95±0.05	0.95±0.05	0.75±0.05	0.60±0.03
t	0.23±0.10	0.29±0.10	0.25±0.10	0.25±0.10	NA	NA	NA	NA

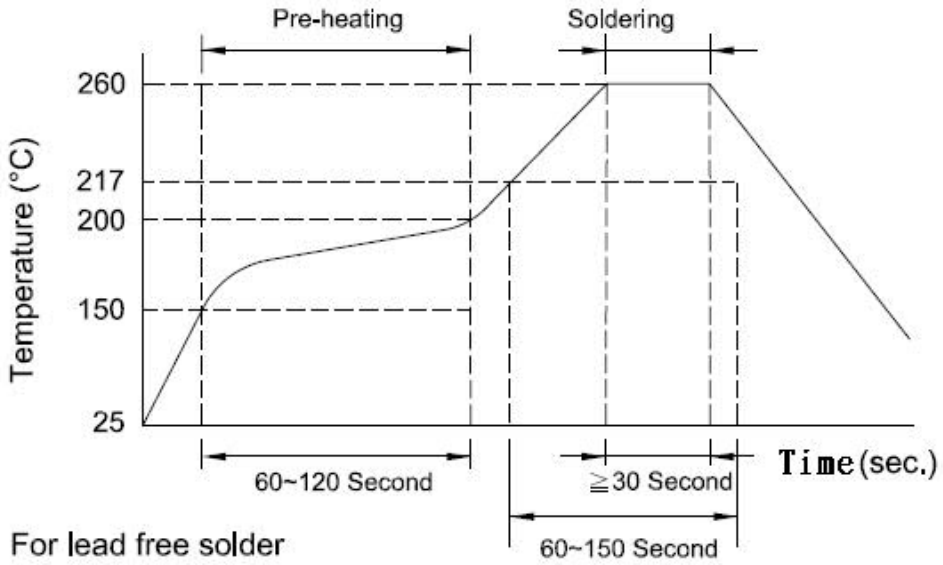
■ REEL DIMENSIONS



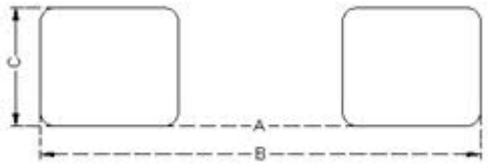
Type	7"
A(mm)	10±1.5
B(mm)	50 or more
C(mm)	13.2±1.0
D(mm)	178±2.0

7" Reel Packaging Quantity							
PART SIZE (EIA SIZE)	**1005 (0402)**	**1608 (0603)**	**2012 (0805)**	**3216 (1206)**	**3225 (1210)**	**4516 (1806)**	**4532 (1812)**
Qty.(pcs)	10,000	4,000	4,000	3,000	2,000	2,000	1,000
BOX	5 reels / inner box	5 reels / inner box	5 reels / inner box	5 reels / inner box	5 reels / inner box	4 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 (0.016)	1.2 ~ 1.4 (0.047 ~ 0.055)	0.5 (0.020)
1608	0.7 (0.028)	1.8 ~ 2.0 (0.071 ~ 0.079)	0.7 (0.028)
2012	1.2 (0.047)	3.0 ~ 4.0 (0.118 ~ 0.157)	1.0 (0.039)
3216	2.0 (0.079)	4.2 ~ 5.2 (0.165 ~ 0.205)	1.2 (0.047)
3225	2.0 (0.079)	4.2 ~ 5.2 (0.165 ~ 0.205)	3.4 (0.134)
4516	3.0 (0.118)	5.5 ~ 6.5 (0.217 ~ 0.256)	1.2 (0.047)
4532	3.0 (0.118)	5.5 ~ 6.5 (0.217 ~ 0.256)	4.22 (0.166)

■ 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
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
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
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
Operational Life	1. Temperature : 85℃ ± 5℃ (Operating temperature should be 125 °C if the rated current of parts not exceed 1A) 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
Mechanical Shock	Condition F：1500g's/0.5ms/Half sine	1. No mechanical damage 2. 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>Resistance to Solder Heat</td><td>1. Solder temperature : 260 ± 5℃
2. Flux : Rosin
3. DIP time : 10 ± 1 sec</td><td>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</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>