



Chip Ferrite Bead for High Current (MHC-S Series) Engineering Spec.

■ FEATURES

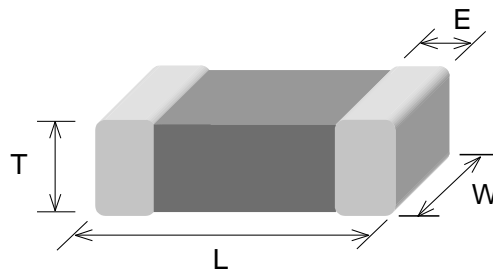
- Combination of high frequency noise suppression with capability of handing high current
- The current rating up to 6 Amps with low DCR

■ APPLICATION

- High current DC power lines
- Circuits where a stable ground is unavailable

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	0603 (EIA 0201)	1005 (EIA 0402)	1608 (EIA 0603)	2012_08 (EIA 0805)	2012_12 (EIA 0805)	3216 (EIA 1206)	3225 (EIA 1210)	4516 (EIA 1806)	4532 (EIA 1812)
L	0.60±0.03	1.00±0.10	1.60±0.15	2.00±0.20	2.00±0.20	3.20±0.20	3.20±0.20	4.50±0.25	4.50±0.25
W	0.30±0.03	0.50±0.10	0.80±0.15	1.25±0.20	1.25±0.20	1.60±0.20	2.50±0.20	1.60±0.20	3.20±0.25
T	0.30±0.03	0.50±0.10	0.80±0.15	0.90±0.20	1.25±0.20	1.10±0.20	1.30±0.20	1.60±0.20	1.50±0.25
E	0.15±0.05	0.25±0.10	0.30±0.20	0.50±0.30	0.50±0.30	0.50±0.30	0.50±0.30	0.60±0.40	0.60±0.40



■ PART NUMBER CODE

MHC 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(Ω) + 25% } (ex : 600=60 Ω ; 121=120 Ω)
- 5 Fixed Decimal Point }
- 6 Rated Current Code

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

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

■ PART NUMBER AND CHARACTERISTICS TABLE

Part No.	Impedance (Ω) +/-25%	Test Freq. (MHz)	DCR(Ω) (Max.)	Rated Current (mA)
MHC0603 Series				
MHC0603S220LA	22	100	0.065	1000
MHC0603S330JA-751	33	100	0.090	750
MHC1005 Series				
MHC1005S100NA	10	100	0.09	2000
MHC1005S330QA	33	100	0.04	3000
MHC1005S600PA	60	100	0.07	2500
MHC1005S121MA	120	100	0.15	1500
MHC1608 Series				
MHC1608S300QA	30	100	0.04	3000
MHC1608S600QA	60	100	0.04	3000
MHC1608S800QA	80	100	0.04	3000
MHC1608S121PA	120	100	0.07	2500
MHC1608S221NA	220	100	0.09	2000
MHC1608S301NA	300	100	0.09	2000
MHC1608S471LA	470	100	0.20	1000
MHC1608S601LA	600	100	0.20	1000
MHC1608S102KA	1000	100	0.25	800



Part No.	Impedance (Ω) +/-25%	Test Freq. (MHz)	DCR(Ω) (Max.)	Rated Current (mA)
MHC2012 Series				
MHC2012S310WA	31	100	0.015	6000
MHC2012S400RA	40	100	0.03	4000
MHC2012S600QA	60	100	0.04	3000
MHC2012S800UA	80	100	0.02	5000
MHC2012S121UA	120	100	0.02	5000
MHC2012S181RA	180	100	0.03	4000
MHC2012S221QA	220	100	0.04	3000
MHC2012S301NA	300	100	0.09	2000
MHC2012S331NA	330	100	0.09	2000
MHC2012S601NA	600	100	0.09	2000
*MHC2012S102NA	1000	100	0.09	2000
MHC2012S152LA	1500	100	0.30	1500
MHC3216 Series				
MHC3216S300WA	30	100	0.015	6000
MHC3216S500WA	50	100	0.015	6000
MHC3216S800RA	80	100	0.03	4000
MHC3216S121WA	120	100	0.015	6000
MHC3216S601PA	600	100	0.07	2500
MHC3216S122LA	1200	100	0.20	1000
MHC3225 Series				
MHC3225S600MA	60	100	0.15	1500
MHC3225S102NA	1000	50	0.09	2000
MHC4516 series				
MHC4516S600WA	60	100	0.015	6000
MHC4516S181QA-352	180	100	0.02	3500
MHC4516S851MA	850	100	0.15	1500
MHC4516 Series				
MHC4532S121WA	120	100	0.015	6000
MHC4532S601QA	600	50	0.04	3000
MHC4532S132QA	1300	60	0.04	3000



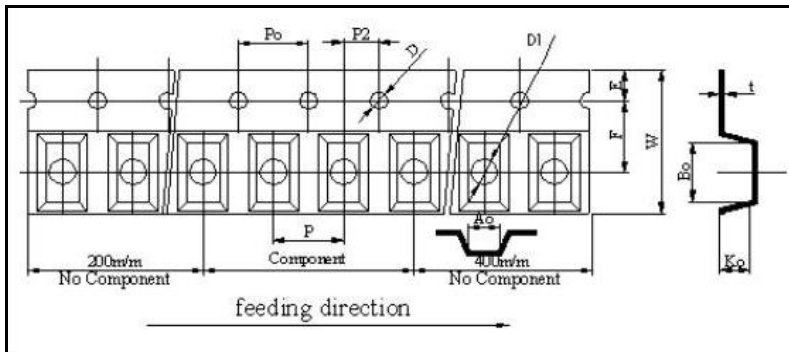
Test Instruments	<ul style="list-style-type: none"> •Test Level : 250 mV •HP4291B RF IMPEDANCE / MATERIAL ANALYZER •HP4338A/B MILLIOHMMETER •Agilent 8720ES S-PARAMETER NETWORK ANALYZER •HP6632B SYSTEM DC POWER SUPPLY
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*1 : For special part number which is not shown in the above table, please refer to appendix.

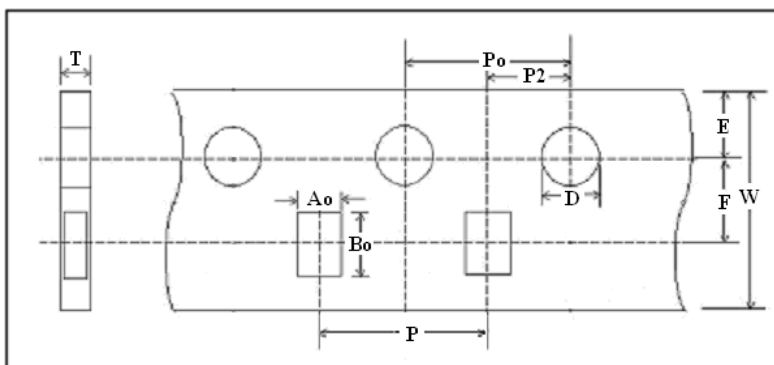
*2 : " * " The thickness 1.25±0.20mm

■ TAPE AND REEL SPECIFICATIONS

1. Plastic carrier



2. Paper carrier





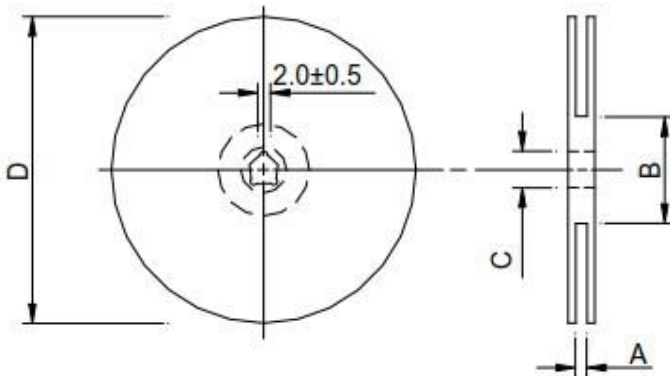
TAPING DIMENSIONS

Unit: mm

Size	4532	4516	3225	3216	2012_12	2012_08	1608	1005	0603
Symbol	PLASTIC	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	7.90~8.30	8.00±0.10	8.00±0.10	8.00±0.10	8.00±0.30
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	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	1.75±0.10
F	5.50±0.05	5.50±0.05	3.50±0.05	3.50±0.05	3.50±0.05	3.50±0.10	3.50±0.10	3.50±0.05	3.50±0.05
D	1.55±0.05	1.55±0.05	1.55±0.05	1.55±0.05	1.50±0.05	1.56±0.10	1.56±0.10	1.55±0.05	1.50±0.1/-0
D1	1.50~1.75	1.50~1.75	0.95~1.20	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	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	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±0.05	2.00±0.10	2.00±0.10	2.00±0.05	2.00±0.05
Ao	3.66±0.10	1.83±0.10	2.57±0.10	1.85±0.10	1.42±0.10	1.50±0.05	1.05±0.05	0.62±0.03	0.40±0.06
Bo	4.95±0.10	4.85±0.10	3.40±0.10	3.43±0.10	2.26±0.10	2.30±0.05	1.85±0.05	1.12±0.03	0.70±0.06
Ko(T)	1.83±0.10	1.83±0.10	1.32±0.10	1.22±0.10	1.30±0.10	0.95±0.05	0.95±0.05	0.60±0.03	0.45 max.
t	0.23±0.10	0.29±0.10	0.25±0.10	0.25±0.10	0.23±0.10	NA	NA	NA	NA

REEL DIMENSIONS

Unit: mm

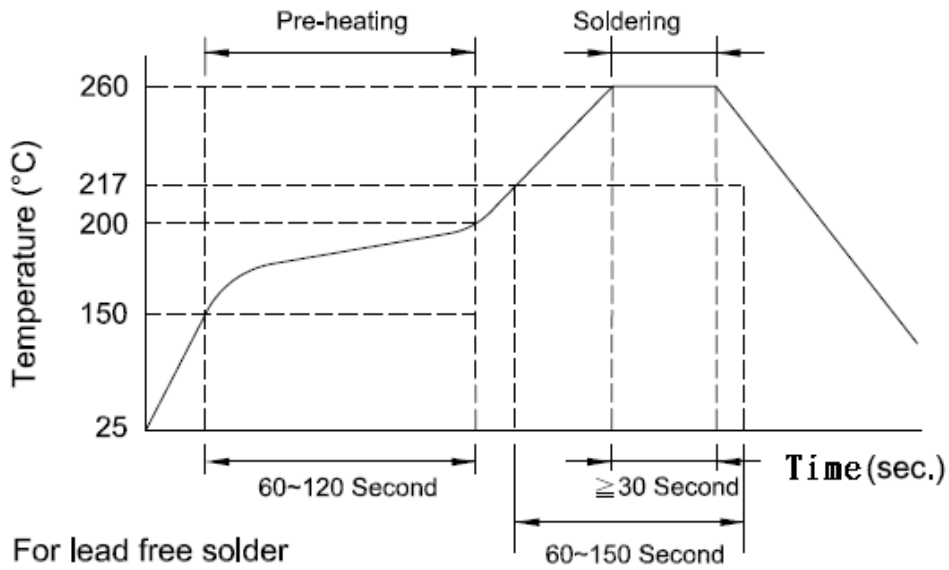


Type	7"
A(mm)	10.0±1.50
B(mm)	50 or more
C(mm)	13.0±0.50
D(mm)	178.0±2.0

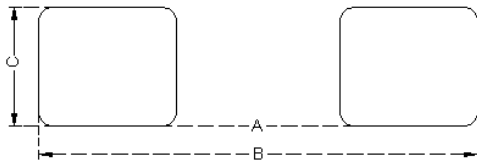
7" Reel Packaging Quantity									
PART SIZE (EIA SIZE)	0603 (0201)	1005 (0402)	1608 (0603)	2012_0 8 (0805)	2012_1 2 (0805)	3216 (1206)	3225 (1210)	4516 (1806)	4532 (1812)
Qty.(pcs)	15,000	10,000	4,000	4,000	3,000	3,000	2,000	2,000	1,000



RECOMMENDED SOLDERING CONDITIONS



1. Land Patterns for Reflow Soldering





2. Solder Land Information

Unit: mm (inches)

Size	A	B	C
0603	0.2 ~ 0.3 (0.008 ~ 0.012)	0.75 ~ 1.05 (0.030 ~ 0.041)	0.3 (0.012)
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)

■ RELIABILITY AND TEST CONDITION

Test item	Test Condition	Criteria
Temperature Cycle	1. Temperature: -40 ~ 85°C 2. Cycle: 100 cycles 3. Dwell time: 30 minutes 4. Measurement: at ambient temperature 24 hours after test completion	1. No mechanical damage 2. Impedance value should be within $\pm 20\%$ of the initial value
Operational Life	1. Temperature: 125 $\pm 5^\circ\text{C}$ 2. Test time: 1000 hrs 3. Applied current: Full rated current 4. Measurement: at ambient temperature 24 hours after test completion	1. No mechanical damage 2. Impedance value should be within $\pm 20\%$ of the initial value



Rated Current Test	Apply current : full rated current / 5min	Temperature rise should be less than 40°C
Biased Humidity	<ol style="list-style-type: none"> 1. Temperature: 40°C ±2°C 2. Humidity: 90-95 % RH 3. Testing time: 1000 hrs 4. Applied current: Full rated current 5. Measurement: at ambient temperature 24 hours after test completion 	<ol style="list-style-type: none"> 1.No mechanical damage 2.Impedance value should be within ±20% of the initial value
Resistance to Solder Heat	<ol style="list-style-type: none"> 1. Solder temperature: 265 ±5°C 2. Flux: Rosin 3. Dip time: 10 ±1 sec 	<ol style="list-style-type: none"> 1. More than 95% of terminal electrode should be covered with new solder. 2.No mechanical damage 3.Impedance value should be within ±20% of the initial value
Adhesive Test	<ol style="list-style-type: none"> 1. Reflow temperature : 245°C It shall be Soldered on the substrate applying direction parallel to the substrate 2. Apply force(F) : 5 N (Size:0603: 2N) 3. Test time : 10 sec 	<ol style="list-style-type: none"> 1. No mechanical damage 2. Soldering the products on PCB after the pulling test force > 5 N (Size:0603: 2N)
Steam Aging Test	<ol style="list-style-type: none"> 1. Temperature: 93°C 2. Test time: 4 hrs(MHC0603、1005) Others: 8 hrs 3.Solder temperature.:235 ±5°C 4.Flux: Rosin 5.Dip time:5 ±1 sec 	More than 90% of the terminal electrode should be covered with new solder



■ GENERAL TECHNICAL DATA

Operating temperature range : - 55°C ~ +125°C
Storage Condition : Less than 40°C and 70% RH
Storage Time: 6 months (Size:0603 ~ 1005)
12 months (Size:1608 above)
Soldering method: Reflow