

SCOPE :

This specification applies to the Pb Free Ceramic Chip Inductors
for MHSC-0402C-SERIES

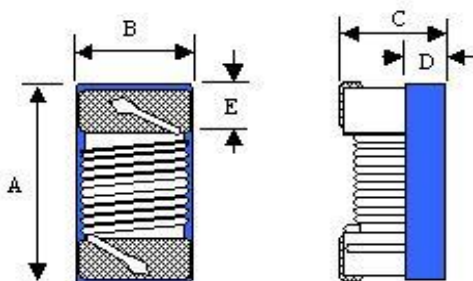
PRODUCT IDENTIFICATION

MHSC -0402 C- 30N J

① ② ③ ④ ⑤

- ① Product Code
- ② Dimensions Code
- ③ Ceramic Material
- ④ Inductance Code
- ⑤ Tolerance Code

(1) SHAPES AND DIMENSIONS



A:	1.27 Max.	mm
B:	0.76 Max.	mm
C:	0.61 Max.	mm
D:	0.15 Typ.	mm
E:	0.23 Typ.	mm

(2) ELECTRICAL SPECIFICATIONS

SEE TABLE 1

TEST INSTRUMENTS

L,Q : HP 4291B IMPEDANCE ANALYZER (or equivalent)

SRF : ENA E5071B NETWORK ANALYZER (or equivalent)

RDC : CHROMA MODEL 16502 MILLIOHMMETER (or equivalent)

(3) CHARACTERISTICS

(3)-1 Operate temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$

(Including self temp. rise)

(3)-2 Storage temperature range $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$



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TABLE 1

MAGLAYERS PT/NO.	Inductance L(nH)	Percent Tolerance	Quality Min.	L,Q Freq. (MHz)	SRF (GHz)Min.	DCR (Ω) Max.	IDC (mA) Max.
MHSC-0402C-1N0□	1.0	K	16	250	12.70	0.045	1360
MHSC-0402C-1N9□	1.9	K	16	250	11.30	0.070	1040
MHSC-0402C-2N0□	2.0	K	16	250	11.10	0.070	1040
MHSC-0402C-2N2□	2.2	K	19	250	10.80	0.070	960
MHSC-0402C-2N4□	2.4	K	15	250	10.50	0.070	790
MHSC-0402C-2N7□	2.7	K	16	250	10.40	0.120	640
MHSC-0402C-3N3□	3.3	K	19	250	7.00	0.066	840
MHSC-0402C-3N6□	3.6	J,K	19	250	6.80	0.066	840
MHSC-0402C-3N9□	3.9	J,K	19	250	5.80	0.066	840
MHSC-0402C-4N3□	4.3	J,K	18	250	6.00	0.091	700
MHSC-0402C-4N7□	4.7	J,K	18	250	4.70	0.130	640
MHSC-0402C-5N1□	5.1	J,K	20	250	4.80	0.083	800
MHSC-0402C-5N6□	5.6	J,K	20	250	4.80	0.083	760
MHSC-0402C-6N2□	6.2	J,K	20	250	4.80	0.083	760
MHSC-0402C-6N8□	6.8	J,K	20	250	4.80	0.083	680
MHSC-0402C-7N5□	7.5	J,K	22	250	4.80	0.104	680
MHSC-0402C-8N2□	8.2	J,K	22	250	4.40	0.104	680
MHSC-0402C-8N7□	8.7	J,K	18	250	4.10	0.200	480
MHSC-0402C-9N0□	9.0	J,K	22	250	4.16	0.104	680
MHSC-0402C-9N5□	9.5	J,K	18	250	4.00	0.200	480
MHSC-0402C-10N□	10	G,J,K	21	250	3.90	0.195	480
MHSC-0402C-11N□	11	G,J,K	24	250	3.68	0.120	640
MHSC-0402C-12N□	12	G,J,K	24	250	3.60	0.120	640
MHSC-0402C-13N□	13	G,J,K	24	250	3.45	0.210	440
MHSC-0402C-15N□	15	G,J,K	24	250	3.28	0.172	560
MHSC-0402C-16N□	16	G,J,K	24	250	3.10	0.220	560
MHSC-0402C-18N□	18	G,J,K	25	250	3.10	0.230	420
MHSC-0402C-19N□	19	G,J,K	24	250	3.04	0.202	480
MHSC-0402C-20N□	20	G,J,K	25	250	3.00	0.250	420
MHSC-0402C-22N□	22	G,J,K	25	250	2.80	0.300	400
MHSC-0402C-23N□	23	G,J,K	24	250	2.72	0.300	400
MHSC-0402C-24N□	24	G,J,K	25	250	2.70	0.300	400
MHSC-0402C-27N□	27	G,J,K	24	250	2.48	0.300	400
MHSC-0402C-30N□	30	G,J,K	25	250	2.35	0.350	400
MHSC-0402C-33N□	33	G,J,K	24	250	2.35	0.350	400
MHSC-0402C-36N□	36	G,J,K	24	250	2.32	0.440	320
MHSC-0402C-39N□	39	G,J,K	25	250	2.10	0.550	200
MHSC-0402C-40N□	40	G,J,K	24	250	2.24	0.500	320
MHSC-0402C-43N□	43	G,J,K	25	250	2.03	0.810	100
MHSC-0402C-47N□	47	G,J,K	25	250	2.10	0.830	150
MHSC-0402C-51N□	51	G,J,K	25	250	1.75	0.820	100
MHSC-0402C-56N□	56	G,J,K	25	250	1.76	0.970	100
MHSC-0402C-68N□	68	G,J,K	22	250	1.62	1.120	100
MHSC-0402C-82N□	82	G,J,K	22	250	1.26	1.550	50
MHSC-0402C-R10□	100	G,J,K	22	250	1.16	2.000	30
MHSC-0402C-R12□	120	G,J,K	20	250	>1.8	2.660	50

※ 1.□ Specify the inductance tolerance, B(±0.2nH),S(±0.3nH),G(±2%),J(±5%),K(±10%)

2.IDC:Based on temperature rise(ΔT:20℃ Typ.)



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(4) RELIABILITY TEST METHOD

Mechanical Characteristics

Item	Specifications	Test conditions
Inductance And Tolerance	Within Specified Tolerance	Measuring Frequency : As shown in Product Table
Quality Factor		Measuring Temperature :+ 25°C
Insulation Resistance	1000 mega ohms minimum	Measured at 100V DC between inductor terminals and center of case.
Dielectric Withstanding Voltage	No damage occurs when the test voltage is applied.	Measured at 500V AC between inductor terminals and center of case. for a maximum of 1 minute.
Temperature Coefficient of Inductance(TCL)	+ 25 to 500 ppm /°C $TCL = \frac{L1 - L2}{L1(T1-T2)} \times 10^6 (\text{ppm /}^\circ\text{C})$	Over- 40°C to + 125°C at frequency specified in Product Table.

Electrical Characteristics

Item	Specifications	Test conditions
Component Adhesion (Push Test)	1005 series - 350g 1608 series - 1.0Kg Other series - 2012 ~ 3225 Minimum 1Kg for Pd/Ag termination and 2Kg for Mo/Mn termination	The component shall be reflow soldered onto a P. C. Board (260°C ± 5°C for 10 seconds). Then a dynamometer force gauge shall be applied to any side of the component.
Drop Test	Change In Inductance: No more than 5%	The inductor shall be dropped two times on the concrete floor or the vinyl tile from 1M naturally.
Thermal Shock Test	Change In Q: No more than 10% Change In Appearance: Without distinct damage	Each cycle shall consist of 30 minutes at -40°C followed by 30 minutes at +85°C with a 20-second maximum transition time between temperature extremes. Test duration is 5 cycles.



Endurance Characteristics

Item	Specifications	Test conditions
Solderability	A minimum of 80% of the metalized area must be covered with solder.	Dip pads in flux and dip in solder pot containing lead free solder at $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 3 seconds
Resistance to soldering heat	<p>Change In Inductance: No more than 5%</p> <p>Change In Q: No more than 10%</p> <p>Change In Appearance : Without distinct damage</p>	Dip the components into flux and dip into solder pot containing lead free solder at $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 5 ± 2 seconds.
Vibration (Random)		Inductors shall be randomly vibrated at amplitude of 1.5mm and frequency of 10 - 55 Hz: 0.04 G / Hz for a minimum of 15 minutes per axis for each of the three axes.
Cold Temperature Storage		Inductors shall be stored at temperature of $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 1000hrs (+ 48 -0 hrs.) Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.
High temperature Storage		Inductors shall be stored at temperature of $125^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 96 ± 2 hrs Then inductors shall be subjected to standard atmospheric conditions for 1 hour. After that, measurement shall be made.
Moisture Resistance	Inductors must not have a shorted or open winding.	Inductors shall be stored in the chamber at 45°C at 90 - 95 R. H. for 1000 hours. Then inductors are to be tested after 2 hours at room temperature.
High Temperature with Loaded		Inductors shall be stored in the chamber at $+85^{\circ}\text{C}$ for 1000 hours with rated current applied. Inductors shall be tested at the beginning of test at 500 hours and 1000 hours. Then inductors are to be tested after 1 hour at room temperature.

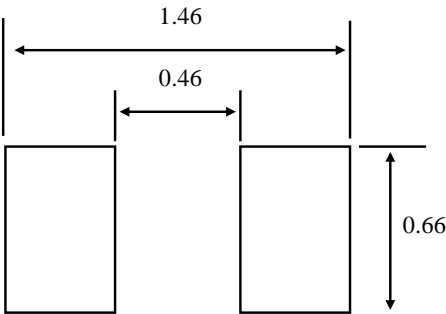


(5) RECOMMENDED SOLDERING CONDITIONS

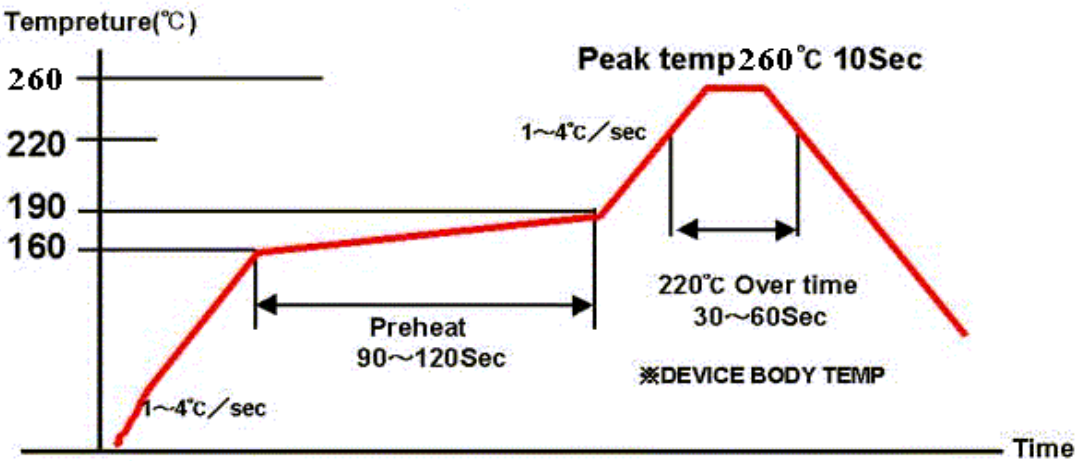
(Please use this product by reflow soldering)

(5)-1 RECOMMENDED FOOTPRINT

Unit: mm

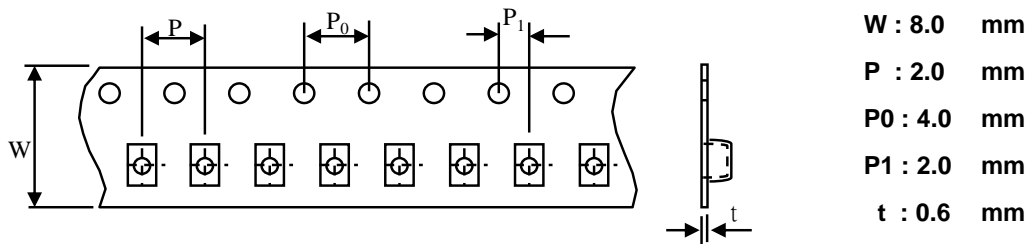


(5)-2 RECOMMENDED REFLOW PATTERN



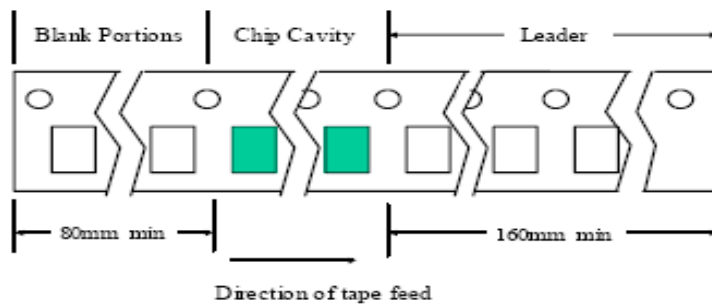
(6) PACKAGING

(6)-1 CARRIER TAPE DIMENSIONS (mm)

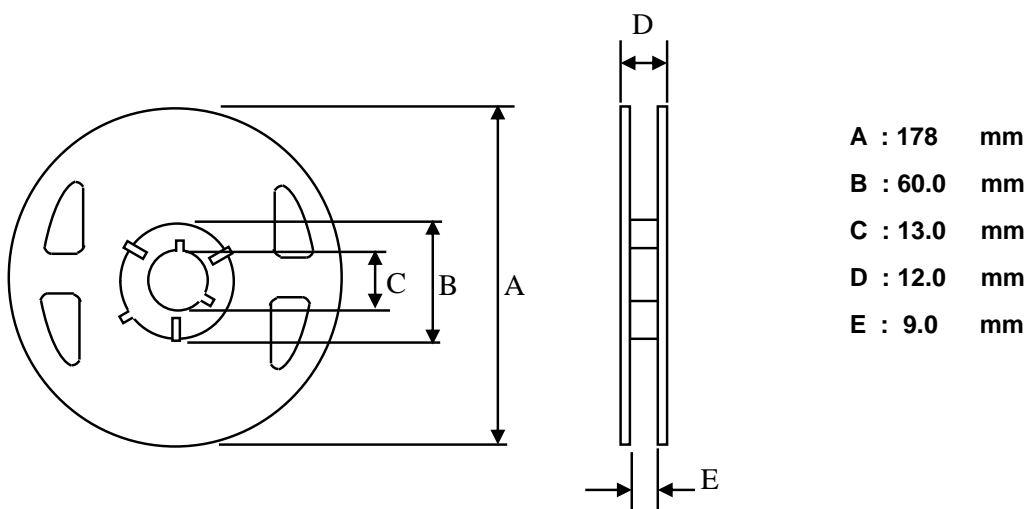


(6)-2 TAPING DIMENSIONS (mm)

There shall not continuation more than two vacancies of the product.



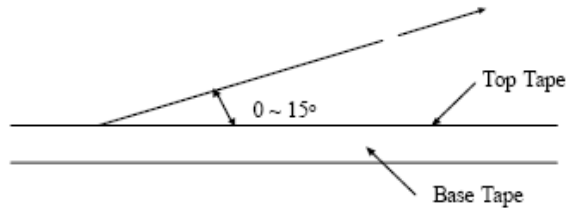
(6)-3 REEL DIMENSIONS



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(6)-4 TOP TAPE PEEL STRENGTH

The top tape requires a peel-off force of 0.2 to 0.7N in the direction of the arrow as illustrated below.



(6)-5 QUANTITY

4000 pcs/Reel

(6)-6 The products are packaged so that no damage will be sustained.

(7) ATTENTION IN CASE OF USING

In case of using product ,please avoid following matters:

Splashing water or salt water

Dew condenses

Toxic gas (Hydrogen sulfide, Sulfurous acid ,Chlorine, Ammonia)

Vibrations or shocks which exceed the specified condition

Please be careful for the stress to this product by board flexure or something after the mounting.

Please note that the contents may change without any prior notice due to reasons such as upgrading.



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