Ⅰ. SCOPE：

This specification applies to the Pb Free Ceramic Chip Inductors

for MHSC-292821-SERIES

PRODUCT INDENTIFICATION

MHSC- 292821 - 12N J

① ② ③ ④

① Product Code

② Dimensions Code

③ Inductance Code

④ Tolerance Code

Ⅱ. INDEX：

9.STANDARD TEST CONDITIONS

Unless otherwise specified, test condition should be Temp.＝20±5℃,

Humidity＝35～85%

But if needed, then test condition should be Temp.＝20±2℃,

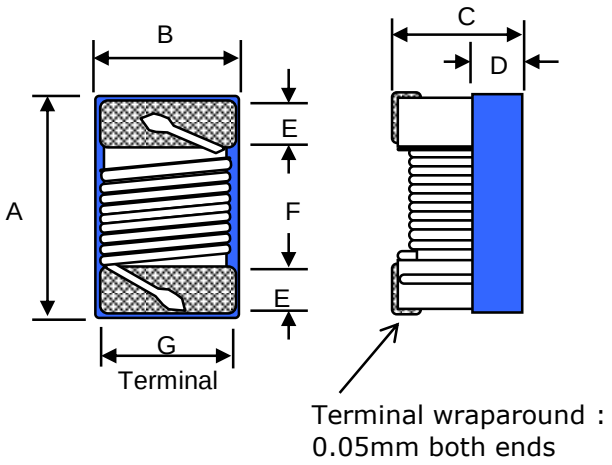
Humidity＝65±5%

10.SHELF LIFE

Storage Condition:The temperature should be within-40℃ ~105℃ and humidity should be less than 75%RH. The product should be used within 12 months from the time of delivery.

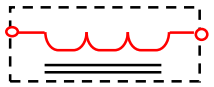
In addition, suggest to use product within 6 months from the time of delivery.

(1) SHAPES AND DIMENSIONS(mm)



A:	2.92	Max.
B:	2.79	Max.
C:	2.10	Max.
D:	1.16	Typ.
E:	0.51	Typ.
F:	1.52	Typ.
G:	2.03	Typ.

Equivalent circuit



No Polarity

(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℃～＋125℃

(Including self temp. rise)

(3)-2 Storage temperature range ..... －40℃～＋125℃

MATERIALS

NO.	ITEM	DESCRIPTION & TYPE
1	CORE	Ceramic
2	WIRE	Copper wire
3	Epoxy	UV Epoxy

TABLE 1

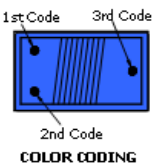
MAGLAYERS PT/NO.	Inductance L(nH)	Percent Tolerance	offset value(nH)	L/Q Freq. (MHz)	Quality Min.	SRF (MHz)Min.	DCR (Ω) Max.	Irms (mA) Max.	Color Coding		
									1st	2nd	3rd
MHSC-292821-10N□	10	G,J,K	-0.4	50/500	50	4100	0.08	1000	BRN	BLK	BLK
MHSC-292821-12N□	12	G,J,K	-0.6	50/500	50	3300	0.09	1000	BRN	RED	BLK
MHSC-292821-15N□	15	G,J,K	-0.9	50/500	50	2500	0.10	1000	BRN	GRN	BLK
MHSC-292821-18N□	18	G,J,K	-0.4	50/350	50	2500	0.11	1000	BRN	GRY	BLK
MHSC-292821-22N□	22	G,J,K	-0.9	50/350	55	2400	0.12	1000	RED	RED	BLK
MHSC-292821-27N□	27	G,J,K	-1.0	50/350	55	1600	0.13	1000	RED	VIO	BLK
MHSC-292821-33N□	33	G,J,K	-1.3	50/350	60	1600	0.14	1000	ORN	ORN	BLK
MHSC-292821-39N□	39	G,J,K	-1.4	50/350	60	1500	0.15	1000	ORN	WHT	BLK
MHSC-292821-47N□	47	G,J,K	-1.0	50/350	65	1500	0.16	1000	YEL	VIO	BLK
MHSC-292821-56N□	56	G,J,K	-3.5	50/350	65	1300	0.18	1000	GRN	BLU	BLK
MHSC-292821-68N□	68	G,J,K	-3.5	50/350	65	1300	0.20	1000	BLU	GRY	BLK
MHSC-292821-82N□	82	G,J,K	-3.6	50/350	60	1000	0.22	1000	GRY	RED	BLK
MHSC-292821-R10□	100	G,J,K	-6.0	25/350	60	1000	0.56	650	BRN	BLK	BRN
MHSC-292821-R12□	120	G,J,K	-5.0	25/350	60	950	0.63	650	BRN	RED	BRN
MHSC-292821-R15□	150	G,J,K	-5.0	25/100	45	850	0.70	580	BRN	GRN	BRN
MHSC-292821-R18□	180	G,H,J,K	-2.0	25/100	45	750	0.77	620	BRN	GRY	BRN
MHSC-292821-R20□	200	G,J,K	0	25/100	45	700	0.84	500	RED	BLK	BRN
MHSC-292821-R22□	220	G,J,K	-15	25/100	45	700	0.84	500	RED	RED	BRN
MHSC-292821-R27□	270	G,J,K	-15	25/100	45	600	0.91	500	RED	VIO	BRN
MHSC-292821-R33□	330	G,J,K	-20	25/100	45	570	1.05	450	ORN	ORN	BRN
MHSC-292821-R39□	390	G,J,K	-25	25/100	45	500	1.12	470	ORN	WHT	BRN
MHSC-292821-R47□	470	G,J,K	-35	25/100	45	450	1.19	470	YEL	VIO	BRN
MHSC-292821-R56□	560	G,J,K	-32	25/100	45	415	1.33	400	GRN	BLU	BRN
MHSC-292821-R62□	620	G,J,K	-40	25/100	45	375	1.40	300	BLU	RED	BRN
MHSC-292821-R68□	680	G,J,K	-50	25/100	45	375	1.47	400	BLU	GRY	BRN
MHSC-292821-R75□	750	G,J,K	-50	25/100	45	360	1.54	360	VIO	GRN	BRN
MHSC-292821-R82□	820	G,J,K	-55	25/100	45	350	1.61	400	GRY	RED	BRN
MHSC-292821-R91□	910	G,J,K	-80	25/50	35	320	1.68	380	WHT	BRN	BRN
MHSC-292821-1R0□	1,000	G,J,K	-80	25/50	35	290	1.75	370	BRN	BLK	RED
MHSC-292821-1R2□	1,200	G,J,K	-17.8	7.9/50	35	250	2.00	310	BRN	RED	RED
MHSC-292821-1R5□	1,500	G,J,K	-29.3	7.9/50	28	200	2.30	330	BRN	GRN	RED
MHSC-292821-1R8□	1,800	G,J,K	-42.2	7.9/50	28	160	2.60	300	BRN	GRY	RED
MHSC-292821-2R2□	2,200	G,J,K	-89.6	7.9/50	28	160	2.80	280	RED	RED	RED
MHSC-292821-2R7□	2,700	G,J,K	-75	7.9/25	22	140	3.20	290	RED	VIO	RED
MHSC-292821-3R3□	3,300	G,J,K	-145.6	7.9/25	22	110	3.40	290	ORN	ORN	RED
MHSC-292821-3R9□	3,900	G,J,K	-155.5	7.9/25	20	100	3.60	260	ORN	WHT	RED
MHSC-292821-4R7□	4,700	G,J,K	-227.7	7.9/25	20	90	4.00	260	YEL	VIO	RED
MHSC-292821-5R6□	5,600	G,J,K	0	7.9/7.9	18	45	4.00	240	GRN	BLU	RED
MHSC-292821-6R8□	6,800	G,J,K	0	7.9/7.9	18	40	4.90	200	BLU	GRY	RED
MHSC-292821-8R2□	8,200	G,J,K	0	7.9/7.9	18	25	6.00	170	GRY	RED	RED
MHSC-292821-100□	10,000	G,J,K	0	2.52/7.9	18	25	8.00	150	BRN	BLK	ORN
MHSC-292821-150□	15,000	G,J,K	0	2.52/7.9	15	20	11.00	100	BRN	GRN	ORN

※ 1. Please specify the inductance tolerance, G(±2%),H(±3%),J(±5%),K(±10%)

2. Irms for a 15℃ temperature rise from 25℃ ambient with current

3. Color coding is not necessarily same position,

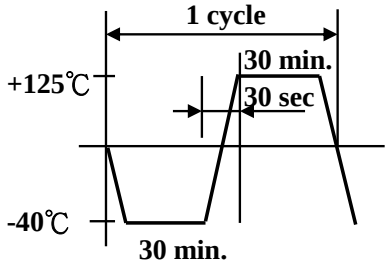
and Color coding non-directional printing.



COLOR CODING

(4) RELIABILITY TEST METHOD

Item	Specifications	Test conditions
Solderability	The metalized area must have 90% minimum solder coverage.	Dip pads in flux and dip in solder pot (96.5 Sn/3.5 Ag solder) at 260°C ±5°C.
Resistance to soldering heat	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be reflowed onto a PC board using 96.5 Sn/3.5 Ag solder paste. Solder process shall be at a maximum temperature of 260°C. For 96.5 Sn/3.5 Ag solder paste:>217°C for 90 seconds
Vibration	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Solder specimen inductor on the test printed circuit board. Apply vibrations in each of the x,y and z directions for 2 house for a total of 6 hours. Frequency : 10～50 Hz Amplitude : 1.5 mm
High temperature resistance	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to temperature 125±2℃ for 500±12 hours. Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.
Static Humidity	Inductors must not have a shorted or open winding.	Inductors shall be subjected to temperature 85±2℃ and 90 to 95%RH. for ten 24-hours. Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.
Component adhesion (push test)	Inductors shall be subjected to 1.0Kg	Inductors shall be reflow soldered (260°C ±5°C for 10 seconds) to a tinned copper substrate. A force gauge shall be applied to the side of the component. The device must withstand the stated force without a failure of the termination.

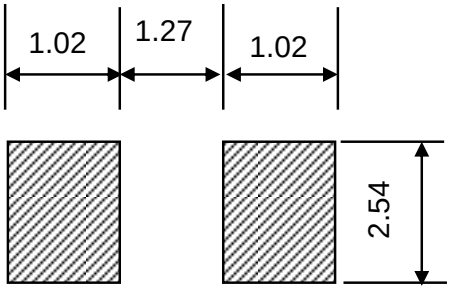
Item	Specifications	Test conditions
Low temperature storage	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to temperature -40±2℃ for 48±12 hours. Measure the test items after leaving the inductors at room temperature and humidity for 1 to 2 hours.
Resistance to solvent	There must be no case deformation, change in dimensions, or obliteration of marking.	Inductors must withstand 6 minutes of alcohol or water.
Thermal shock	There must be no case deformation or change in dimensions. Inductance must not change more than the stated tolerance.	Inductors shall be subjected to 10 cycles to the the following temperature cycle:  Measure the test items after leaving the inductors at room temperature and humidity for 2 hours.

(5) RECOMMENDED SOLDERING CONDITIONS

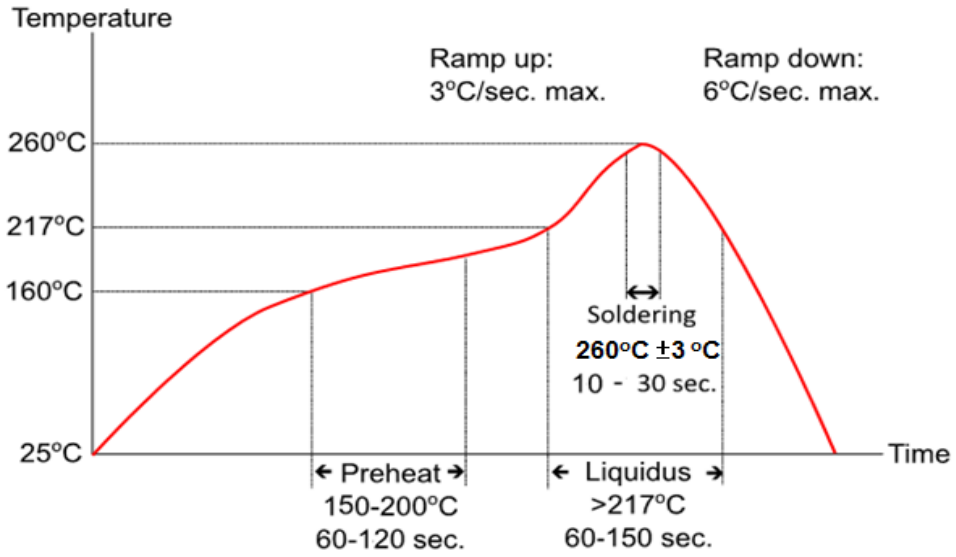
(Please use this product by reflow soldering)

(5)-1 RECOMMENDED FOOTPRINT

Unit: mm



(5)-2 RECOMMENED REFLOW PATTERN



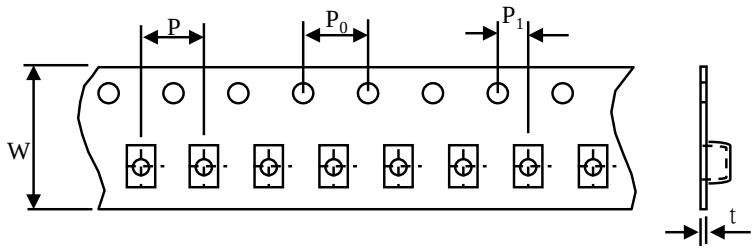
(5)-3 IRON SOLDERING

Use a solder iron of less than 30W when soldering ,do not allow the soldering iron tip directly touch the Ceramic body outside of terminal electrode.

3 seconds max. at 260℃.

(6) PACKAGING

(6)-1 CARRIER TAPE DIMENSIONS (mm)

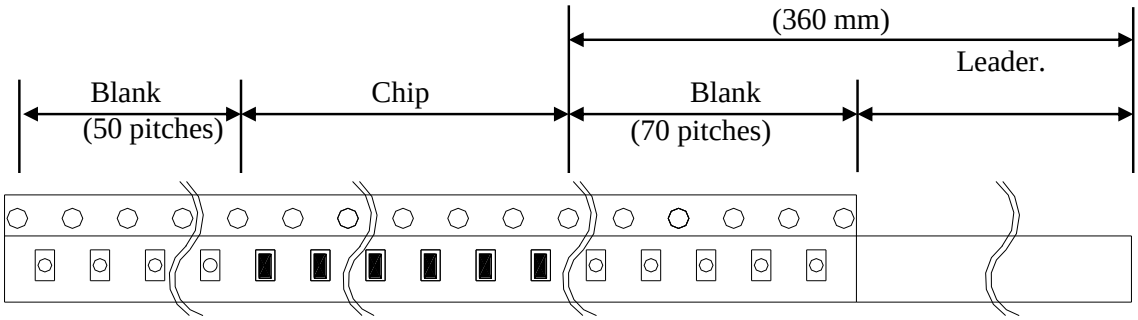


W : 8.0 mm
P : 4.0 mm
P0 : 4.0 mm
P1 : 2.0 mm
t : 0.23 mm

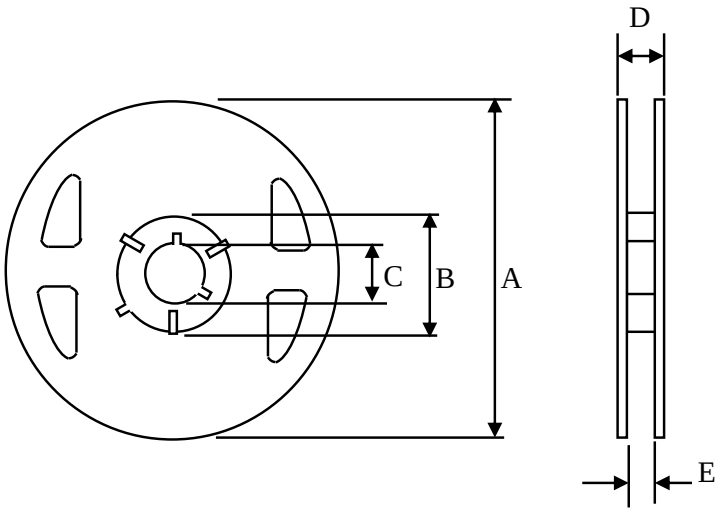
(6)-2 TAPING DIMENSIONS (mm)

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

***Marking non-directional printing**



(6)-3 REEL DIMENSIONS



A : 178 mm
B : 60.0 mm
C : 13.0 mm
D : 12.0 mm
E : 8.4 mm

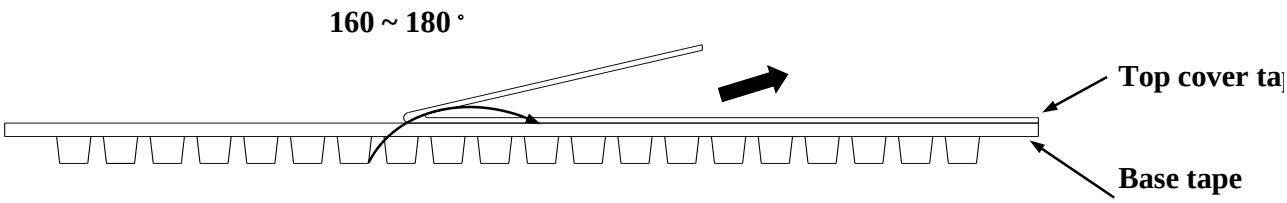
(6)-4 TOP TAPE PEEL STRENGTH

The force for tearing off cover tape is 0.1~0.6(N) in the arrow direction at the following conditions:

Temperature : 5 ~ 35℃

Humidity : 45 ~ 85%

Atmospheric pressure : 860 ~ 1060 hpa



(6)-5 QUANTITY

2000 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)

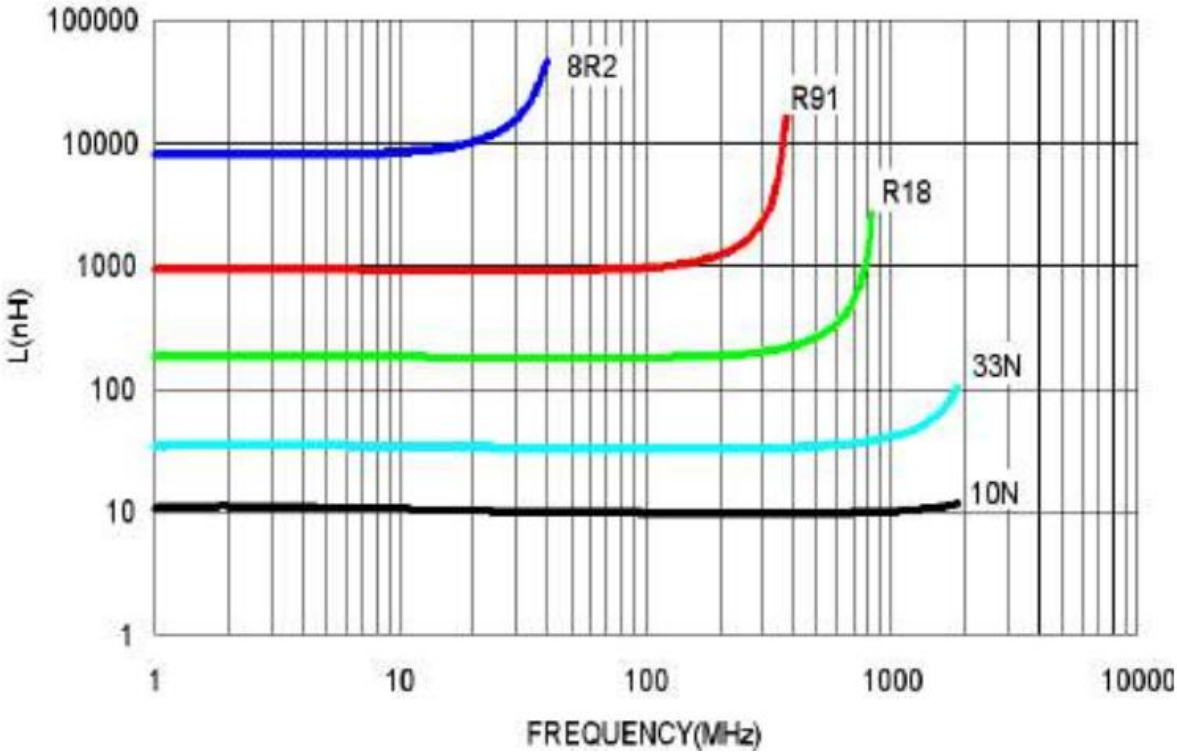
Vibrations or shocks which exceed the specified condition

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.

TYPICAL ELECTRICAT CHARACTERISTICS

L VS. Frequency



Q VS. Frequency