

SCOPE :

This specification applies to the Pb Free high current type SMD inductors for
MSCDRI-3D16LD-SERIES

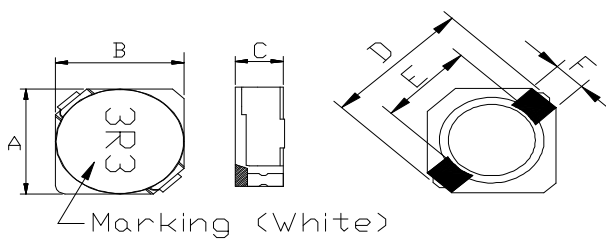
PRODUCT IDENTIFICATION

MSCDRI - 3D16LD - 100 M

① ② ③ ④

- ① Product Code
- ② Dimensions Code
- ③ Inductance Code
- ④ Tolerance Code

(1) SHAPES AND DIMENSIONS



- A: 3.80±0.2 mm
- B: 3.80±0.2 mm
- C: 1.80 Max. mm
- D: 5.40 Max. mm (1R2~4R7)
5.20 Max. mm (5R6~561)
- E: 2.80 Typ. mm
- F: 1.10 Typ. mm

(2) ELECTRICAL SPECIFICATIONS

SEE TABLE 1

TEST INSTRUMENTS

- L : HP 4284A PRECISION LCR METER (or equivalent)
- RDC : CHROMA MODEL 16502 MILLIOHM METER (or equivalent)

(3) CHARACTERISTICS

- (3)-1 Ambient temperature +60°C Max.
- (3)-2 Operate temperature range -40°C ~ +125°C
(Including self temp. rise)
- (3)-3 Storage temperature range -40°C ~ +125°C



MAG.LAYERS

TABLE 1

| MAGLAYERS PT/NO. | Inductance L(μ H) | Percent Tolerance | Test Frequency | Resistance RDC(Ω)Max. | Rated DC Current | | Marking |
|---------------------|---------------------------|----------------------|-------------------|-----------------------------------|------------------|---------|---------|
| | | | | | IDC1(A) | IDC2(A) | |
| MSCDRI-3D16LD-1R2□ | 1.2 | N | 100kHz/0.25V | 33m | 1.5 | 3.00 | 1R2 |
| MSCDRI-3D16LD-3R3□ | 3.3 | N | 100kHz/0.25V | 66m | 0.80 | 2.00 | 3R3 |
| MSCDRI-3D16LD-3R9□ | 3.9 | N | 100kHz/0.25V | 81m | 0.75 | 1.75 | 3R9 |
| MSCDRI-3D16LD-4R7□ | 4.7 | N | 100kHz/0.25V | 91m | 0.68 | 1.72 | 4R7 |
| MSCDRI-3D16LD-5R6□ | 5.6 | N | 100kHz/0.25V | 0.102 | 0.62 | 1.64 | 5R6 |
| MSCDRI-3D16LD-6R8□ | 6.8 | N | 100kHz/0.25V | 0.130 | 0.58 | 1.30 | 6R8 |
| MSCDRI-3D16LD-8R2□ | 8.2 | N | 100kHz/0.25V | 0.140 | 0.51 | 1.28 | 8R2 |
| MSCDRI-3D16LD-100□ | 10 | M,N | 100kHz/0.25V | 0.190 | 0.46 | 1.07 | 100 |
| MSCDRI-3D16LD-120□ | 12 | M,N | 100kHz/0.25V | 0.205 | 0.42 | 0.98 | 120 |
| MSCDRI-3D16LD-150□ | 15 | M,N | 100kHz/0.25V | 0.272 | 0.38 | 0.87 | 150 |
| MSCDRI-3D16LD-180□ | 18 | M,N | 100kHz/0.25V | 0.327 | 0.34 | 0.76 | 180 |
| MSCDRI-3D16LD-220□ | 22 | M,N | 100kHz/0.25V | 0.356 | 0.31 | 0.66 | 220 |
| MSCDRI-3D16LD-270□ | 27 | M,N | 100kHz/0.25V | 0.470 | 0.28 | 0.60 | 270 |
| MSCDRI-3D16LD-330□ | 33 | M,N | 100kHz/0.25V | 0.560 | 0.26 | 0.55 | 330 |
| MSCDRI-3D16LD-390□ | 39 | M,N | 100kHz/0.25V | 0.700 | 0.24 | 0.47 | 390 |
| MSCDRI-3D16LD-470□ | 47 | M,N | 100kHz/0.25V | 0.775 | 0.21 | 0.45 | 470 |
| MSCDRI-3D16LD-561□ | 560 | M,N | 100kHz/0.25V | 13.0 | 0.07 | 0.13 | 561 |

※ □ specify the inductance tolerance, M(\pm 20%), N(\pm 30%)

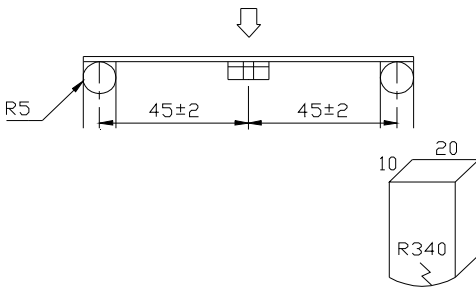
※ IDC1 : Based on inductance change (Δ L/Lo : \leq drop 35%) @ ambient temperature 25°C

IDC2 : Based on temperature rise (Δ T : 40°C TYP.)

Rated DC Current : The less value which is IDC1 or IDC2.



(4) RELIABILITY TEST METHOD MECHANICAL

| TEST ITEM | SPECIFICATION | TEST DETAILS |
|-------------------|--|--|
| Substrate bending | $\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage or electrical damage. | <p>The sample shall be soldered onto the printed circuit board in figure 1 and a load applied until the figure in the arrow direction is made approximately 3mm.(keep time 30 seconds) PCB dimension shall the page 7/9</p> <p style="text-align: center;">F(Pressurization)</p>  <p style="text-align: center;">PRESSURE ROD figure-1</p> |
| Vibration | $\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage. | <p>The sample shall be soldered onto the printed circuit board and when a vibration having an amplitude of 1.52mm and a frequency of from 10 to 55Hz/1 minute repeated should be applied to the 3 directions (X,Y,Z) for 2 hours each. (A total of 6 hours)</p> |
| Solderability | New solder More than 90% | <p>Flux (rosin, isopropyl alcohol{JIS-K-1522}) shall be coated over the whole of the sample before hard, the sample shall then be preheated for about 2 minutes in a temperature of 130~150°C and after it has been immersed to a depth 0.5mm below for 3±0.2 seconds fully in molten solder M705 with a temperature of 245±5°C.</p> <p>More than 90% of the electrode sections shall be covered with new solder smoothly when the sample is taken out of the solder bath.</p> |



MECHANICAL

| TEST ITEM | SPECIFICATION | |
|---|---------------------------------------|---|
| Resistance to Soldering heat (reflow soldering) | There shall be no damage or problems. | <p style="text-align: center;">Temperature profile of reflow soldering</p> <p>The graph shows the temperature profile for reflow soldering. The y-axis is 'Soldering temperature (°C)' ranging from 50 to 300. The x-axis represents time. The profile starts at 50°C, rises to 150°C in 2 minutes, and remains at 150-180°C for pre-heating. It then rises to a peak of 260±3°C for 10 seconds (soldering), followed by a 30-second minimum dwell at 230±0°C. Finally, it shows a slow cooling phase to room temperature.</p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time.</p> <p>The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.</p> |

ELECTRICAL

| TEST ITEM | SPECIFICATION | TEST DETAILS |
|------------------------------|--|--|
| Insulation resistance | There shall be no other damage or problems. | DC 100V voltage shall be applied across this sample of top surface and the terminal. The insulation resistance shall be more than $1 \times 10^8 \Omega$. |
| Dielectric withstand voltage | There shall be no other damage or problems. | AC 100V voltage shall be applied for 1 minute across the top surface and the terminal of this sample |
| Temperature characteristics | $\Delta L/L20^\circ C \leq \pm 10\%$ $0 \sim 2000 \text{ ppm}/^\circ C$ | The test shall be performed after the sample has stabilized in an ambient temperature of -20 to $+85^\circ C$, and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L20^\circ C \leq \pm 10\%$. |



ENVIROMENT CHARACTERISTICS

| TEST ITEM | SPECIFICATION | | | | | | | | | | | | | | | | |
|--|--|--|--|-------------|----------|---|--|---------|---|----------------------|-----------|---|---|---------|---|----------------------|-----------|
| High temperature storage | $\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage. | The sample shall be left for 96 ± 4 hours in an atmosphere with a temperature of $85 \pm 2^\circ\text{C}$ and a normal humidity. Upon completion of the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour. | | | | | | | | | | | | | | | |
| Low temperature storage | $\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage. | The sample shall be left for 96 ± 4 hours in an atmosphere with a temperature of $-25 \pm 3^\circ\text{C}$. Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour. | | | | | | | | | | | | | | | |
| Change of temperature | $\Delta L/Lo \leq \pm 5\%$ There shall be no other damage of problems | The sample shall be subject to 5 continuous cycles, such as shown in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made. <div style="text-align: center;"> table 2 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Temperature</th> <th style="text-align: center;">Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">$-25 \pm 3^\circ\text{C}$ (Thermostat No.1)</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">No.1→No.2</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">$85 \pm 2^\circ\text{C}$ (Thermostat No.2)</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">No.2→No.1</td> </tr> </tbody> </table> </div> | | Temperature | Duration | 1 | $-25 \pm 3^\circ\text{C}$ (Thermostat No.1) | 30 min. | 2 | Standard atmospheric | No.1→No.2 | 3 | $85 \pm 2^\circ\text{C}$ (Thermostat No.2) | 30 min. | 4 | Standard atmospheric | No.2→No.1 |
| | Temperature | Duration | | | | | | | | | | | | | | | |
| 1 | $-25 \pm 3^\circ\text{C}$ (Thermostat No.1) | 30 min. | | | | | | | | | | | | | | | |
| 2 | Standard atmospheric | No.1→No.2 | | | | | | | | | | | | | | | |
| 3 | $85 \pm 2^\circ\text{C}$ (Thermostat No.2) | 30 min. | | | | | | | | | | | | | | | |
| 4 | Standard atmospheric | No.2→No.1 | | | | | | | | | | | | | | | |
| Moisture storage | $\Delta L/Lo \leq \pm 5\%$ There shall be no mechanical damage. | The sample shall be left for 96 ± 4 hours in a temperature of $40 \pm 2^\circ\text{C}$ and a humidity(RH) of 90~95%. Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity more than 1 hour. | | | | | | | | | | | | | | | |
| Test conditions : The sample shall be reflow soldered onto the printed circuit board in every test. | | | | | | | | | | | | | | | | | |

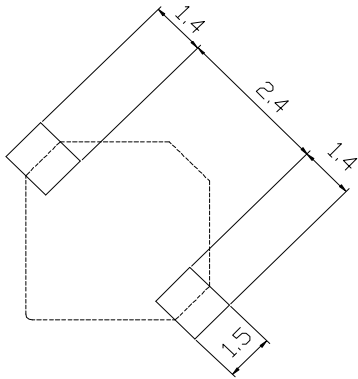


(5) LAND DIMENSION (Ref.)

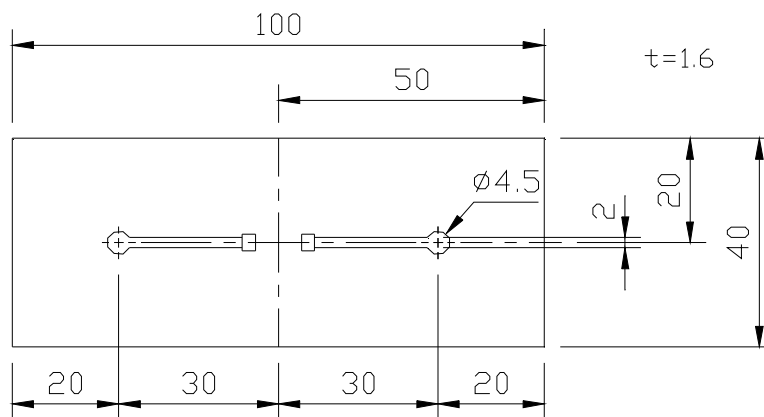
PCB: GLASS EPOXY $t=1.6\text{mm}$

(5)-1 LAND PATTERN DIMENSIONS

(STANDARD PATTERN) Unit : mm

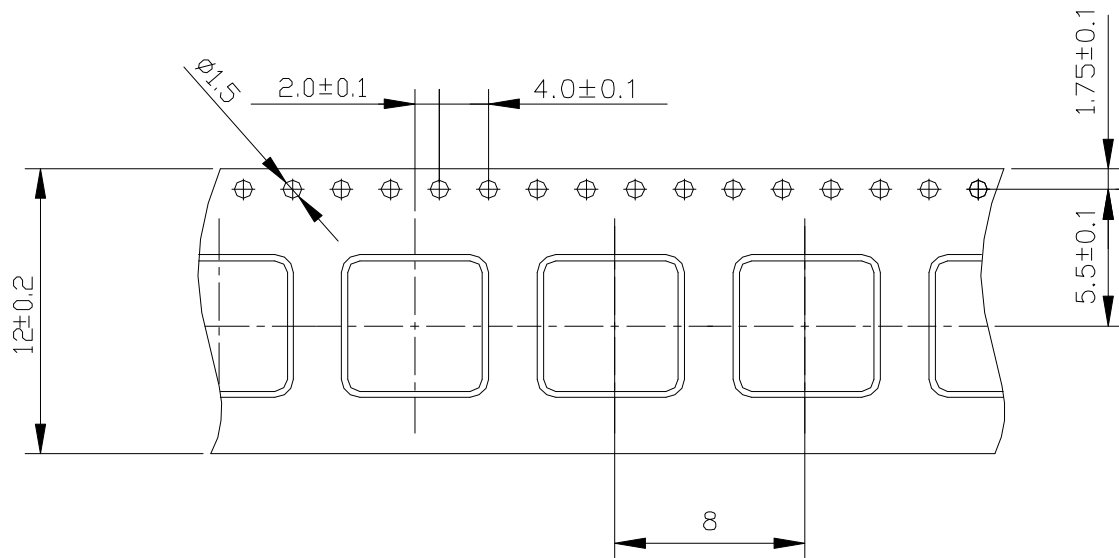


(5)-2 SUBSTRATE BENDING TEST BENDING TEST BOARD

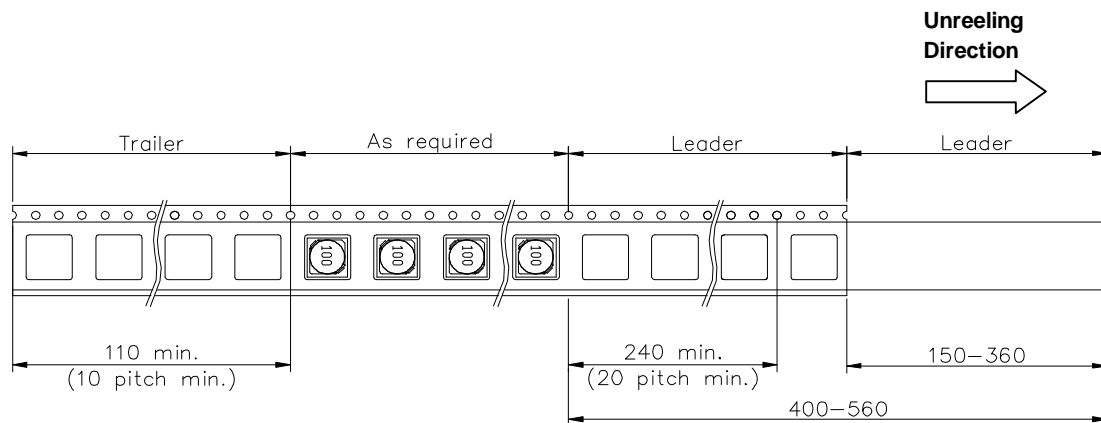


(6) PACKAGING

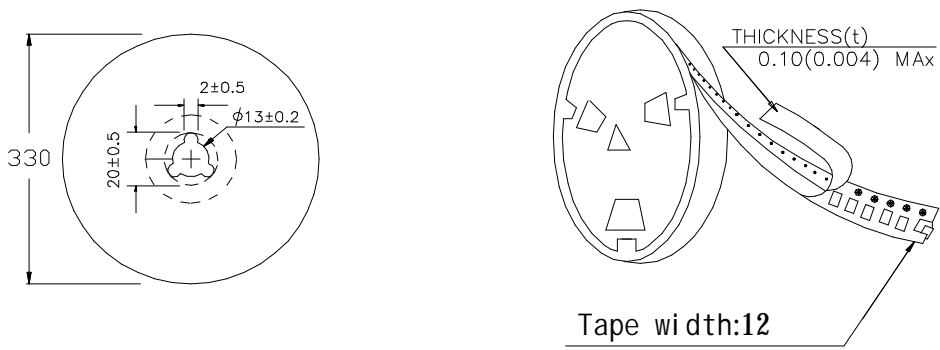
(6)-1 CARRIER TAPE DIMENSIONS (mm)



(6)-2 TAPING DIMENSIONS (mm)



(6)-3 REEL DIMENSIONS (mm)



(6)-4 QUANTITY

3500pcs/Reel

The products are packaged so that no damage will be sustained.

