



## I . SCOPE :

This specification applies to the Pb Free high current type SMD inductors for  
MMD-10DZ-SERIES□- □□

### PRODUCT IDENTIFICATION

MMD - 10DZ - 3R3 □ □- □□  
①            ②            ③    ④            ⑤

- ① Product Code
- ② Dimensions Code
- ③ Inductance Code
- ④ Tolerance Code
- ⑤ Inner Control Code

## II . INDEX :

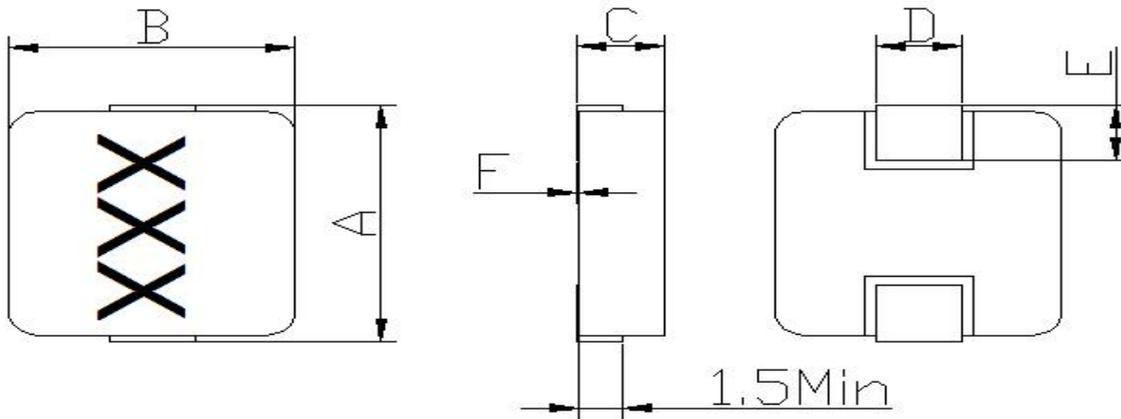
| LISTED ITEM  | ATTACHEMENT & TABLES | PAGE            |
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| 1. SHAPES AND DIMENSIONS   | Please see (1)       | 2/9             |
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| 5. RELIABILITY TEST METHOD   | Please see (4)       | 4/9 , 5/9 , 6/9 |
| 6. LAND DIMENSION (Ref.)   | Please see (5)       | 7/9             |
| 7. PACKAGING   | Please see (6)       | 8/9 , 9/9       |
| 8. STANDARD TEST CONDITIONS<br>Unless otherwise specified, test condition should be Temp. =20±5°C,<br>Humidity=35~85%<br>But if needed, then test condition should be Temp. =20±2°C,<br>Humidity=65±5%   |                      |                 |
| 9. SHELF LIFE<br>Storage Condition:The temperature should be within-40°C ~105°C and humidity should be less than 75%RH. The product should be used within 12 months from the time of delivery.<br>In addition, suggest to use product within 6 months from the time of delivery. |                      |                 |



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## (1) SHAPES AND DIMENSIONS



|             |    |            |    |
|-------------|----|------------|----|
| A: 11.2±0.3 | mm | E: 2.0±0.5 | mm |
| B: 10.2±0.3 | mm |            |    |
| C: 4.0Max.  | mm |            |    |
| D: 3.0 ref  | 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 Operate temperature range ..... -40°C~+125°C  
(Including self temp. rise)

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

## MATERIALS

| NO. | ITEM   | DESCRIPTION & TYPE                    | UL NO.  | MANUFACTURER                              |
|-----|--------|---------------------------------------|---------|---|
| 1   | CORE   | FERRITE                               |         | JIANGXI YUEAN                             |
| 2   | WIRE   | POLYURETHANE ENAMELLED<br>COPPER WIRE | E258243 | ELEKTRISOLA CO., LTD.                     |
|     |        |                                       | E84081  | PACIFIC ELECTRICAL WIRE & CABLE CO., LTD. |
| 3   | SOLDER | Sn99.3%/Cu0.7%                        |         | SOLENT METAL INDUSTRY CO., LTD.           |
|     |        |                                       |         | DONGGUAN ZHONGSHUN                        |
|     |        |                                       |         |   |



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TABLE 1

| MAGLAYERS<br>PT/NO. | Inductance<br>L( $\mu$ H) | Percent<br>Tolerance | L Test<br>Frequency |  | Resistance<br>RDC( $m\Omega$ )MAX | Rated DC Current |         |
|---------------------|---------------------------|----------------------|---------------------|--|-----------------------------------|------------------|---------|
|                     |                           |                      |                     |  |                                   | Idc(A)           | Isat(A) |
| MMD-10DZ-R22□□- □□  | 0.22                      | M, N                 | 100KHz/0.25V        |  | 1.80                              | 30.000           | 50.000  |
| MMD-10DZ-R36□□- □□  | 0.36                      | M, N                 | 100KHz/0.25V        |  | 2.10                              | 28.000           | 45.000  |
| MMD-10DZ-R68□□- □□  | 0.68                      | M, N                 | 100KHz/0.25V        |  | 2.70                              | 21.000           | 30.000  |
| MMD-10DZ-1R0□□- □□  | 1.00                      | M, N                 | 100KHz/0.25V        |  | 4.50                              | 18.000           | 25.000  |
| MMD-10DZ-1R2□□- □□  | 1.20                      | M, N                 | 100KHz/0.25V        |  | 5.00                              | 15.000           | 23.000  |
| MMD-10DZ-2R2□□- □□  | 2.20                      | M, N                 | 100KHz/0.25V        |  | 8.00                              | 12.000           | 18.000  |
| MMD-10DZ-2R7□□- □□  | 2.70                      | M, N                 | 100KHz/0.24V        |  | 10.00                             | 11.000           | 16.000  |
| MMD-10DZ-3R3□□- □□  | 3.30                      | M, N                 | 100KHz/0.25V        |  | 12.00                             | 11.000           | 16.000  |
| MMD-10DZ-4R7□□- □□  | 4.70                      | M, N                 | 100KHz/0.25V        |  | 18.00                             | 9.000            | 14.000  |
| MMD-10DZ-5R6□□- □□  | 5.60                      | M, N                 | 100KHz/0.25V        |  | 22.00                             | 7.000            | 12.000  |
| MMD-10DZ-8R2□□- □□  | 8.20                      | M, N                 | 100KHz/0.26V        |  | 30.00                             | 5.500            | 8.000   |
| MMD-10DZ-220□□- □□  | 22.00                     | M, N                 | 100KHz/0.25V        |  | 80.00                             | 4.500            | 7.000   |
| MMD-10DZ-330□□- □□  | 33.00                     | M, N                 | 100KHz/0.25V        |  | 91.00                             | 4.440            | 5.050   |
| MMD-10DZ-470□□- □□  | 47.00                     | M, N                 | 100KHz/0.25V        |  | 155.00                            | 1.500            | 2.500   |
|                     |                           |                      |                     |  |                                   |                  |         |
|                     |                           |                      |                     |  |                                   |                  |         |
|                     |                           |                      |                     |  |                                   |                  |         |

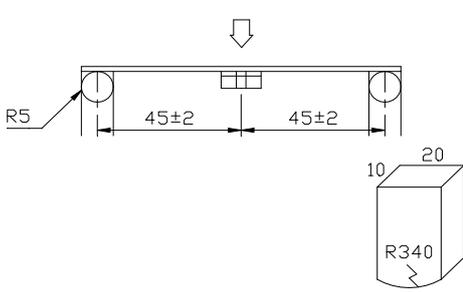
※ □ specify the inductance tolerance , M( $\pm$ 20%) , N( $\pm$ 30%)

※ Isat : Based on inductance change ( $\Delta$ L/Lo : drop 30% Max.) @ ambient temp. 25°C

Idc : Based on temperature rise ( $\Delta$ T : 40°C Typ.)



(4) RELIABILITY TEST METHOD  
MECHANICAL

| TEST ITEM         | SPECIFICATION  | TEST DETAILS   |
|-------------------|--|--|
| Substrate bending | $\Delta L/L_0 \leq \pm 5\%$<br><br>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)<br/>           PCB dimension shall the page 7/9</p> <p style="text-align: center;">F(Pressurization)</p>  <p style="text-align: center;"><b>PRESSURE ROD</b><br/>figure-1</p>                        |
| Vibration         | $\Delta L/L_0 \leq \pm 5\%$<br><br>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<br>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;"><b>Temperature profile of reflow soldering</b></p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time.<br/>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.<br>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  | $\Delta L/L20^\circ\text{C} \leq \pm 10\%$<br>0~2000 ppm/ $^\circ\text{C}$ | The test shall be performed after the sample has stabilized in an ambient temperature of -20 to +85 $^\circ\text{C}$ , and the value calculated based on the value applicable in a normal temperature and normal humidity shall be $\Delta L/L20^\circ\text{C} \leq \pm 10\%$ . |



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## ENVIROMENT CHARACTERISTICS

| TEST ITEM  | SPECIFICATION  |   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
|--|--|---|--|-------------|----------|---|--|---------|---|----------------------|-----------|---|---|---------|---|----------------------|-----------|
| High temperature storage   | $\Delta L/Lo \leq \pm 5\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $125^\circ\text{C}$ and a normal humidity.<br><br>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  | $\Delta L/Lo \leq \pm 5\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $-25 \pm 3^\circ\text{C}$ .<br><br>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  | $\Delta L/Lo \leq \pm 5\%$<br><br>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.<br><br><div style="text-align: center;">                         table 2<br/> <table border="1" data-bbox="678 913 1193 1276"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-25 \pm 3^\circ\text{C}</math><br/>(Thermostat No.1)</td> <td>30 min.</td> </tr> <tr> <td>2</td> <td>Standard atmospheric</td> <td>No.1→No.2</td> </tr> <tr> <td>3</td> <td><math>85 \pm 2^\circ\text{C}</math><br/>(Thermostat No.2)</td> <td>30 min.</td> </tr> <tr> <td>4</td> <td>Standard atmospheric</td> <td>No.2→No.1</td> </tr> </tbody> </table> </div> |  | Temperature | Duration | 1 | $-25 \pm 3^\circ\text{C}$<br>(Thermostat No.1) | 30 min. | 2 | Standard atmospheric | No.1→No.2 | 3 | $85 \pm 2^\circ\text{C}$<br>(Thermostat No.2) | 30 min. | 4 | Standard atmospheric | No.2→No.1 |
|  | Temperature  | Duration  |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
| 1  | $-25 \pm 3^\circ\text{C}$<br>(Thermostat No.1)                               | 30 min.   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
| 2  | Standard atmospheric   | No.1→No.2   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
| 3  | $85 \pm 2^\circ\text{C}$<br>(Thermostat No.2)                                | 30 min.   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
| 4  | Standard atmospheric   | No.2→No.1   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |
| Moisture storage   | $\Delta L/Lo \leq \pm 5\%$<br><br>There shall be no mechanical damage.       | The sample shall be left for $96 \pm 4$ hours in a temperature of $40 \pm 2^\circ\text{C}$ and a humidity(RH) of 90~95%.<br><br>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 :<br><br>The sample shall be reflow soldered onto the printed circuit board in every test. |  |   |  |             |          |   |  |         |   |                      |           |   |   |         |   |                      |           |



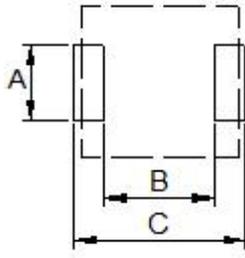
## (5) LAND DIMENSION (Ref.)

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

### (5)-1 LAND PATTERN DIMENSIONS

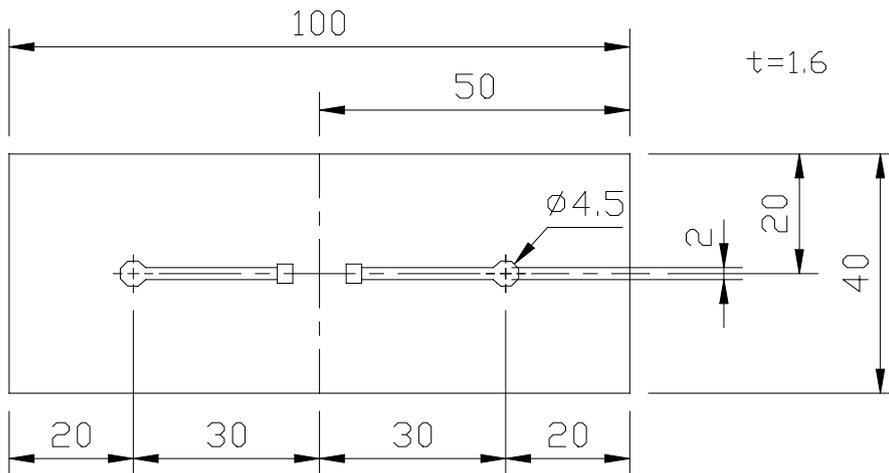
(STANDARD PATTERN)

unit : mm



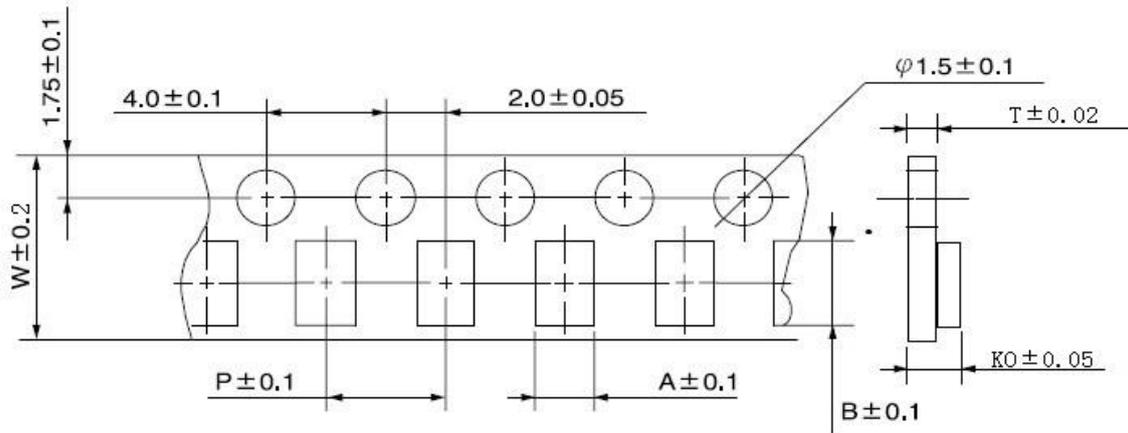
| A   | B   | C    |
|-----|-----|------|
| 4.1 | 5.4 | 13.5 |

### (5)-2 SUBSTRATE BENDING TEST BENDING TEST BOARD

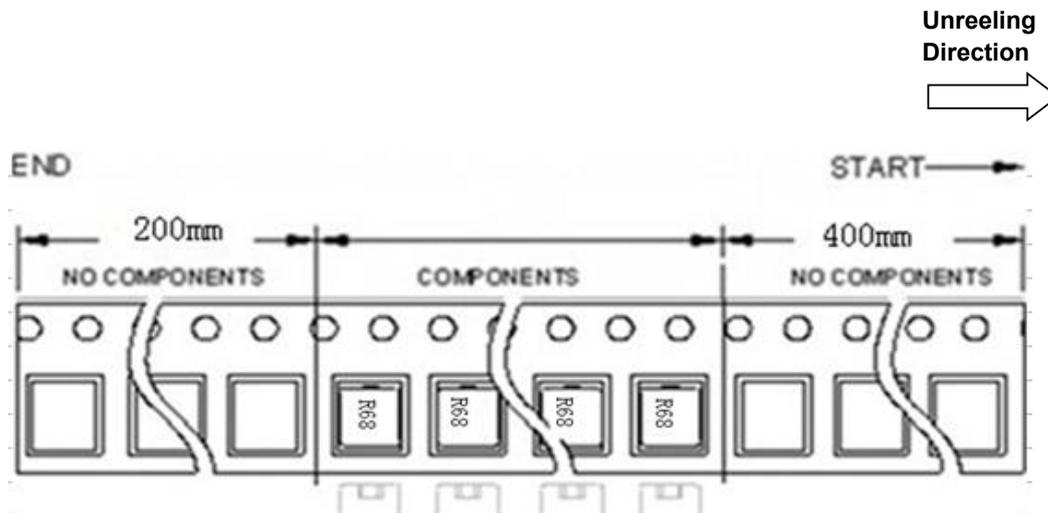


## (6) PACKAGING

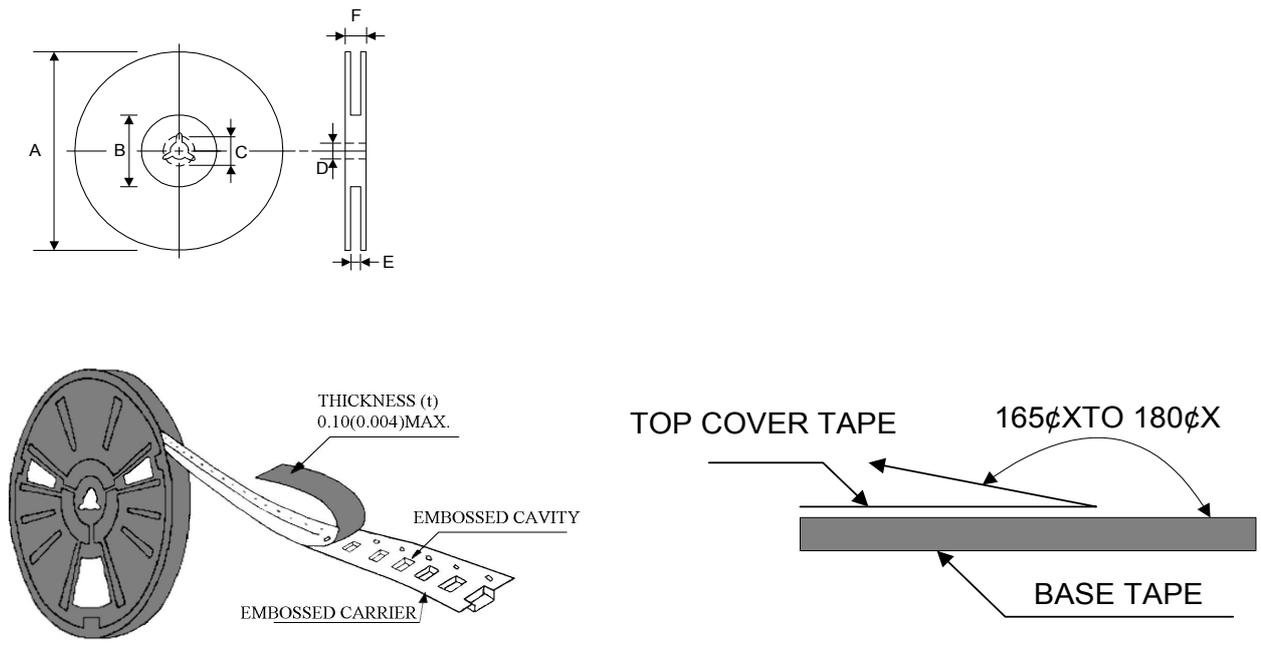
### (6)-1 CARRIER TAPE DIMENSIONS (mm)



### (6)-2 TAPING DIMENSIONS (mm)



### (6)-3 REEL DIMENSIONS (mm)



### (6)-4 QUANTITY

500 pcs/Reel

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

