

SPECIFICATION FOR APPROVAL

※ This is a RoHS and REACH compliant product whose related documents are available on request.
 ※ Graphic is only for dimensionally application.

1. Range of application:

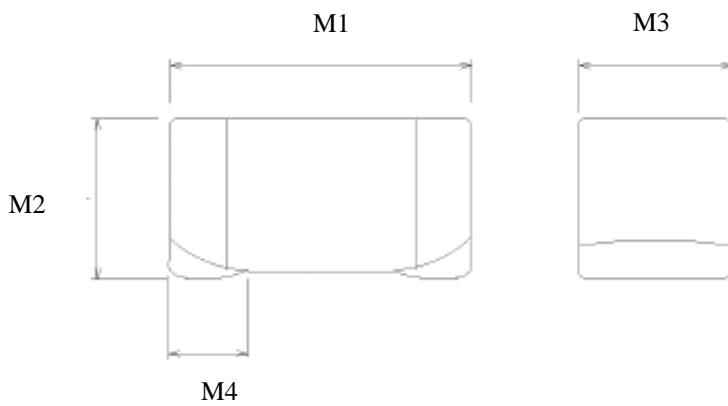
This specifications are applied to SMD Power Inductor, CSMB2512D.

2. Ordering code:

Example: **CSCB** **2512** **D** - **XXX** **X** - □□□
 (1) (2) (3) (4) (5) (6)

- (1) Product Type
- (2) External dimensions
- (3) Solder Type
- (4) Inductance
- (5) Inductance tolerance
- (6) ROHS+HF

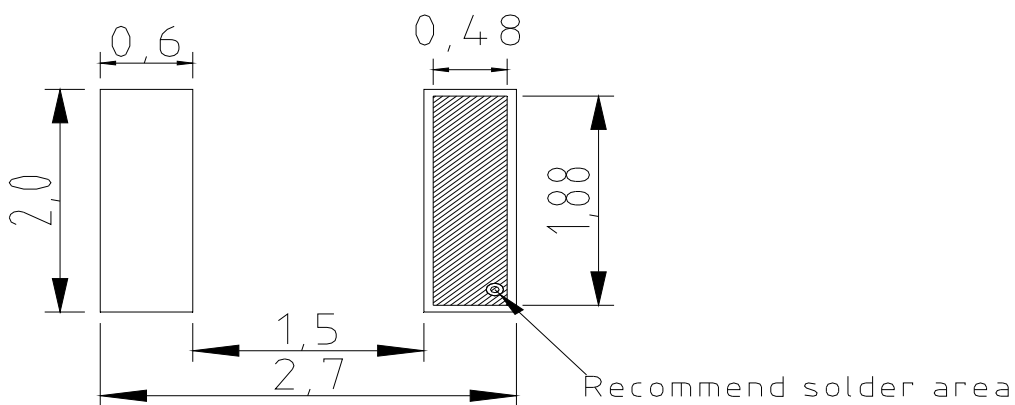
3. Mechanical Dimension:



UNIT : mm

| | DIM. | TOL. |
|-----------|------|------|
| M1 | 2.5 | ±0.2 |
| M2 | 1.2 | MAX |
| M3 | 2.0 | ±0.2 |
| M4 | 0.5 | ±0.2 |

4. Recommended Land-Pattern:



(Unit: mm)

5. Electrical Characteristics:

| Part Number. | Nominal Inductance (uH) | Inductance Tolerance | D.C. Resistance (Ω) | | Typ Current (mA) | | Reted Current (mA) | | Measuring Frequency (MHz) |
|--------------------|-------------------------|----------------------|---------------------|-------|------------------|-------|--------------------|-------|---------------------------|
| | | | Typ | Max | Typ | | Max | | |
| | | | | | Idc 1 | Idc 2 | Idc 1 | Idc 2 | |
| CSCB2512D-R24N-LRH | 0.24 | ±30% | 0.020 | 0.026 | 5200 | 3900 | 4750 | 3500 | 1 |
| CSCB2512D-R47N-LRH | 0.47 | ±30% | 0.035 | 0.042 | 4250 | 2900 | 3900 | 2600 | 1 |
| CSCB2512D-R68N-LRH | 0.68 | ±30% | 0.048 | 0.058 | 3550 | 2400 | 3150 | 2150 | 1 |
| CSCB2512D-1R0M-LRH | 1.0 | ±20% | 0.060 | 0.072 | 2600 | 2050 | 2350 | 1850 | 1 |
| CSCB2512D-1R5M-LRH | 1.5 | ±20% | 0.092 | 0.106 | 2250 | 1700 | 2050 | 1500 | 1 |
| CSCB2512D-2R2M-LRH | 2.2 | ±20% | 0.138 | 0.159 | 1950 | 1400 | 1800 | 1250 | 1 |
| CSCB2512D-3R3M-LRH | 3.3 | ±20% | 0.225 | 0.260 | 1600 | 1050 | 1400 | 970 | 1 |
| CSCB2512D-4R7M-LRH | 4.7 | ±20% | 0.330 | 0.380 | 1300 | 900 | 1150 | 800 | 1 |

Maximum rated voltage: DC25V

*)The saturation current value (Idc1) is the maximum DC current value having inductance decrease down to 30% (at 20degC)

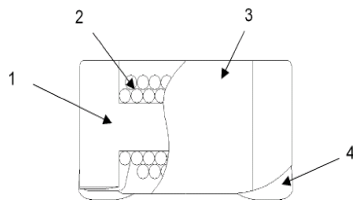
*)The temperature rise current value (Idc2) is the maximum DC current value having temperature increase by 40degC. (at 20degC)

*)The rated current value is following either Idc1 or Idc2. which is the lower one.

※Caution for Temperature Rise.

Temperature rise of this inductor depends on the installed board condition. It shall be confirmed in the actual end product that temperature rise of inductor is within operating temperature.

6. Structural Drawing:



1. Ferrite core

2. Coil material

3. Over-coating resin

4. Electrode

Ni-Zn ferrite

Polyurethane-copper wire

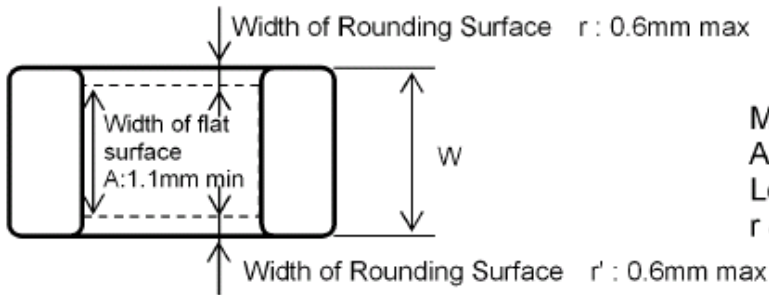
Epoxy resin, containing metal magnetic powder

Base material : Ag

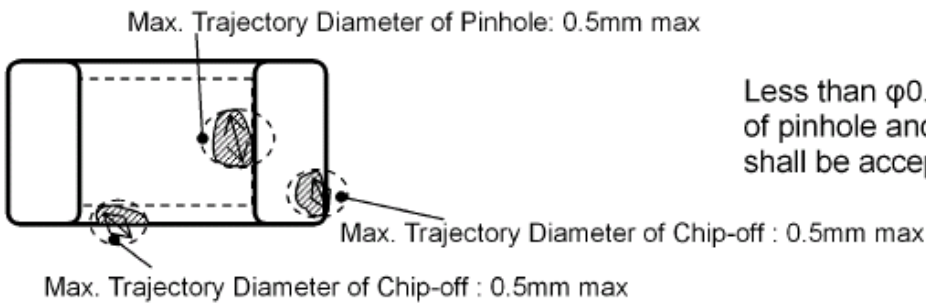
Foundation plating : Ni

Surface plating : Sn

7. Appearance Criteria for Chip-off Mode :

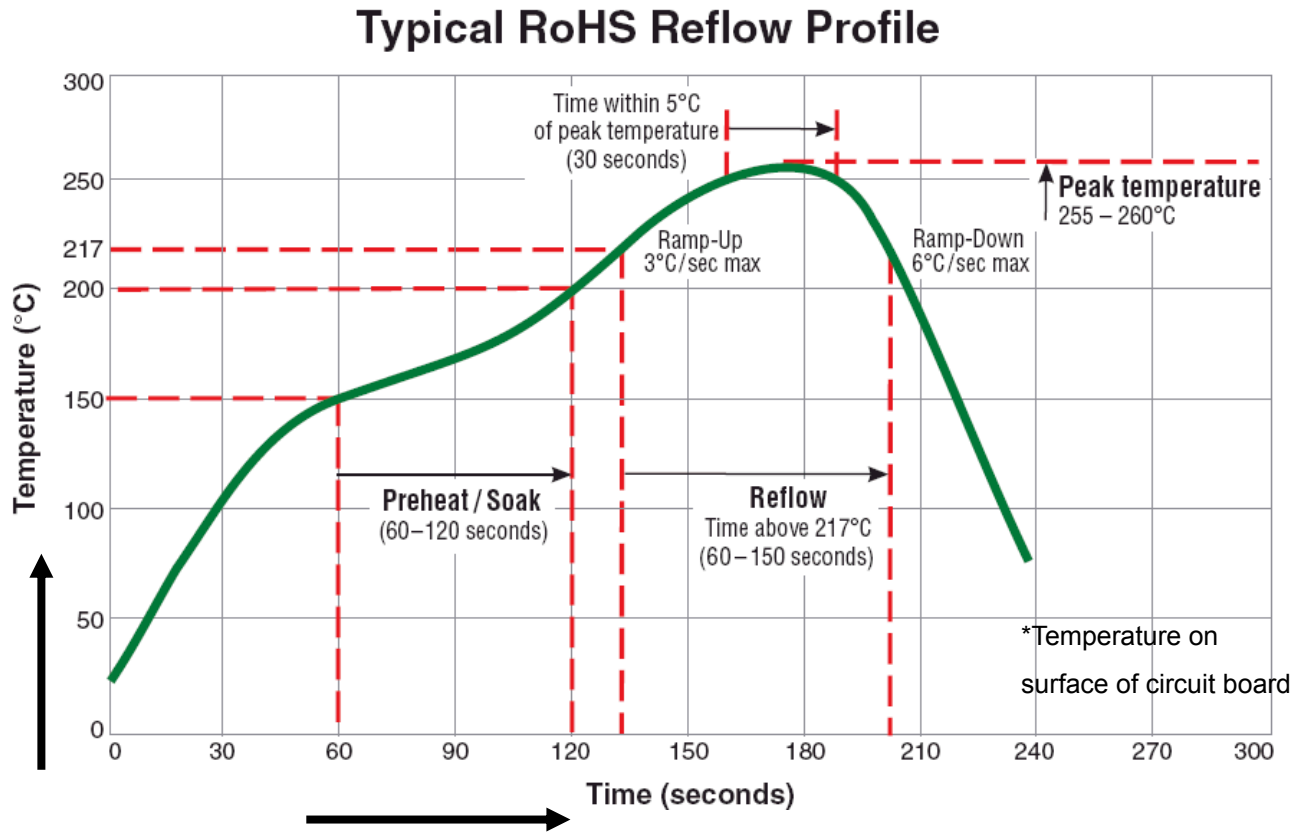


More than 1.1mm width of flat surface
A shall be acceptable.
Less than 0.6mm width of rounding surface
 r & r' shall be acceptable.



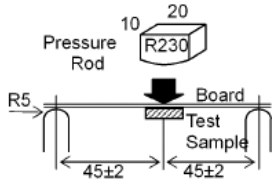
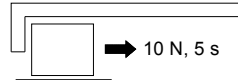
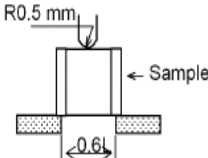
Less than $\phi 0.5\text{mm max}$. trajectory diameter
of pinhole and / or chip-off of whole surface
shall be acceptable.

8. Reflow Profile Chart (Reference):



The products may be exposed to reflow soldering process of above profile up to two times.

9. Mechanical Performance /Environmental Test Performance Specifications:

| | Test Item | Standard | Test method |
|----------------------------|---------------------------------|----------------|--|
| MECHANICAL CHARACTERISTICS | Resistance to Flexure substrate | No damage. | <p>The test samples shall be soldered to the testing board and by reflow soldering conditions as show in Page5 Reflow Profile Chart. Apply pressure in the direction of the arrow until bent width reaches 2 mm.</p>  <p style="text-align: right;">Unit : mm</p> <p>Substrate size:100*40*1.0 Substrate material:glass epoxy-resin Solder cream thickness :0.1 (Land size refer to recommended Land Pattern Dimensions of "Precaution:)</p> |
| | Adhesion of Terminal Electrode | No abnormality | <p>The test samples shall be soldered to the testing board and by reflow soldering conditions as shown Page5 Reflow Profile Chart.</p>  <p>Applied force:10 N to X and Y directions Duration:5 s. Solder cream thickness:0.1mm (Land size refer to recommended Land Patten Defined in "Precaution")</p> |
| | Body strength | No damage | <p>Applied force :10 N Duration :10 s</p>  |

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| | Test Item | Standard | Test method | | | | | | | | | | | | | | | |
|--------------------|--|---|--|--------------------|-------------|-------------------|--|-----------------|------------------------------|------|---------------------------------------|----------|---|------------|------|---|-----------|----------|
| | Resistance to vibration | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to testing jip as shown in under table.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Frequency range</td> <td>10Hz~55Hz</td> </tr> <tr> <td>Overall Amplitude</td> <td>1.5mm(Shall not exceed acceleration 196 m/S²)</td> </tr> <tr> <td>Sweeping Method</td> <td>10 to 55 to 10 Hz for 1 min.</td> </tr> <tr> <td>Time</td> <td>2 hours each in X,Y, and Z Direction.</td> </tr> </table> | Frequency range | 10Hz~55Hz | Overall Amplitude | 1.5mm(Shall not exceed acceleration 196 m/S ²) | Sweeping Method | 10 to 55 to 10 Hz for 1 min. | Time | 2 hours each in X,Y, and Z Direction. | | | | | | | |
| Frequency range | 10Hz~55Hz | | | | | | | | | | | | | | | | | |
| Overall Amplitude | 1.5mm(Shall not exceed acceleration 196 m/S ²) | | | | | | | | | | | | | | | | | |
| Sweeping Method | 10 to 55 to 10 Hz for 1 min. | | | | | | | | | | | | | | | | | |
| Time | 2 hours each in X,Y, and Z Direction. | | | | | | | | | | | | | | | | | |
| | Resistance to Soldering | Inductance change. Within±10% No abnormality observed in appearance. | <p>3 time of reflow oven at 230 degC min for 40 sec max. With peak temperature at 260+0/-5 degC for 5 sec max. Substrate thickness. 1.0mm Substrate material:glass epoxy-resin</p> | | | | | | | | | | | | | | | |
| | Solder ability | At least 90% of Terminal electrode is covered by new Solder.. | <p>The test samples shall be submerged molten solder as shown in under table. Flux. methanol solution with 25% of rosin or equivalent. { Pb free solder: Sn-3Ag-0.5Cu}</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Solder Temperature</td> <td>245±deg C</td> </tr> <tr> <td>Time</td> <td>5±0.5 s.</td> </tr> <tr> <td>Immersing Speed</td> <td>25 mm/s</td> </tr> </table> | Solder Temperature | 245±deg C | Time | 5±0.5 s. | Immersing Speed | 25 mm/s | | | | | | | | | |
| Solder Temperature | 245±deg C | | | | | | | | | | | | | | | | | |
| Time | 5±0.5 s. | | | | | | | | | | | | | | | | | |
| Immersing Speed | 25 mm/s | | | | | | | | | | | | | | | | | |
| | Temperature Characteristics | Inductance change. Within±15% No abnormality. Observed in appearance. | <p>Measurement shall be taken in a temperature range of -40 degC to +105 degC and the value at +20 degC was used as the standard value.</p> | | | | | | | | | | | | | | | |
| | Thermal shock | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to testing jip and by reflow soldering conditions as shown in Page5 Reflow Profile Chart. The test samples shall be left for the specified time at each of temperature in steps from 1 to 4. as shown in under table in sequence. The temperature cycles shall be repeated 100 cycled in the Method. Conditions for 1 cycle.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time(min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±3 deg C</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temp</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>85±2 deg C</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temp</td> <td>Within 3</td> </tr> </tbody> </table> | Step | Temperature | Time(min) | 1 | -40±3 deg C | 30±3 | 2 | Room Temp | Within 3 | 3 | 85±2 deg C | 30±3 | 4 | Room Temp | Within 3 |
| Step | Temperature | Time(min) | | | | | | | | | | | | | | | | |
| 1 | -40±3 deg C | 30±3 | | | | | | | | | | | | | | | | |
| 2 | Room Temp | Within 3 | | | | | | | | | | | | | | | | |
| 3 | 85±2 deg C | 30±3 | | | | | | | | | | | | | | | | |
| 4 | Room Temp | Within 3 | | | | | | | | | | | | | | | | |
| | Low Temperature life Test | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to testing jip and by reflow soldering conditions as shown in Page5 Reflow Profile Chart. And after that proceed the test as shown condition under table.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Temperature</td> <td>-40±2 deg C</td> </tr> <tr> <td>Time</td> <td>1000+24h</td> </tr> </table> | Temperature | -40±2 deg C | Time | 1000+24h | | | | | | | | | | | |
| Temperature | -40±2 deg C | | | | | | | | | | | | | | | | | |
| Time | 1000+24h | | | | | | | | | | | | | | | | | |

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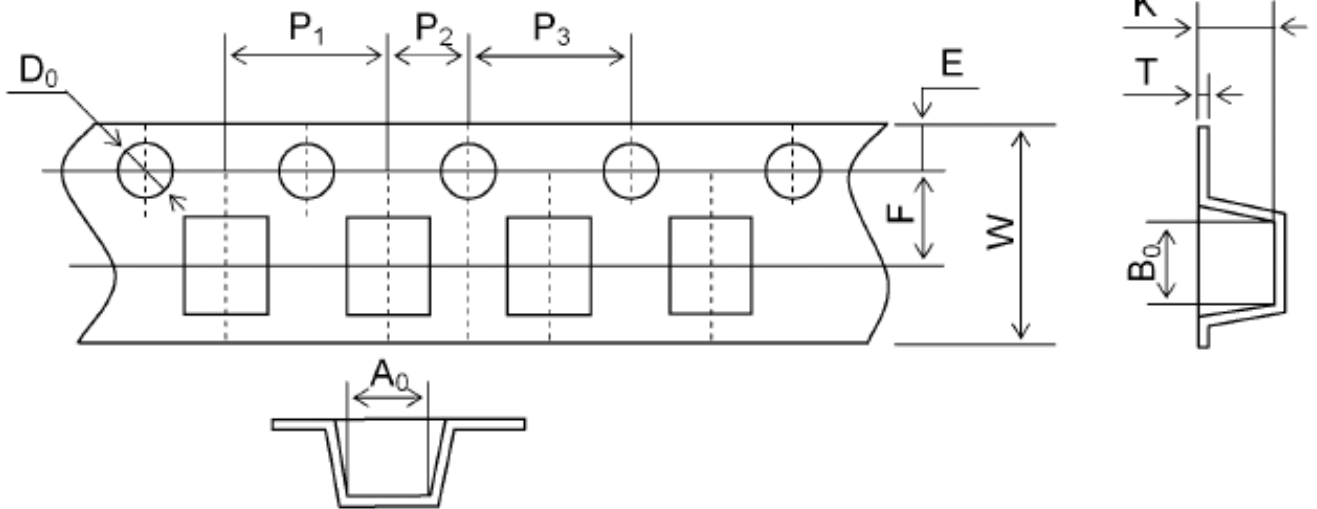
| | Test Item | Standard | Test method | | | | | | | |
|-----------------------------------|--|--|---|-------------|------------|----------|-----------------|------------------|------|-----------|
| ENVIRONMENT TESTS | High Temperature life Test | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to testing jip and by reflow soldering conditions as shown in Page5 Reflow Profile Chart. And after that proceed the test as shown condition under table.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Temperature</td> <td style="text-align: center;">85±2 deg C</td> </tr> <tr> <td style="text-align: center;">Time</td> <td style="text-align: center;">1000+24h</td> </tr> </table> | Temperature | 85±2 deg C | Time | 1000+24h | | | |
| | Temperature | 85±2 deg C | | | | | | | | |
| | Time | 1000+24h | | | | | | | | |
| Damp heat life test | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to the testing jip and by reflow soldering conditions as shown in Page5 Reflow Profile Chart. The test samples shall be put in thermostatic oven set at temperature with humidity as shown in under table.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Temperature</td> <td style="text-align: center;">60±2 deg C</td> </tr> <tr> <td style="text-align: center;">Humidity</td> <td style="text-align: center;">90~95%RH</td> </tr> <tr> <td style="text-align: center;">Time</td> <td style="text-align: center;">1000+24 h</td> </tr> </table> | Temperature | 60±2 deg C | Humidity | 90~95%RH | Time | 1000+24 h | | |
| Temperature | 60±2 deg C | | | | | | | | | |
| Humidity | 90~95%RH | | | | | | | | | |
| Time | 1000+24 h | | | | | | | | | |
| Loading under Damp heat life test | Inductance change. Within±10% No abnormality observed in appearance. | <p>The test samples shall be soldered to testing jip and by reflow soldering conditions as shown in Page5 Reflow Profile Chart. The test samples shall be put in thermostatic oven set at temperature with humidity , as shown in under table and with the rated current continuously applied.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Temperature</td> <td style="text-align: center;">60±2 deg C</td> </tr> <tr> <td style="text-align: center;">Humidity</td> <td style="text-align: center;">90~95%RH</td> </tr> <tr> <td style="text-align: center;">Applied current</td> <td style="text-align: center;">Refer to Table 1</td> </tr> <tr> <td style="text-align: center;">Time</td> <td style="text-align: center;">1000+24 h</td> </tr> </table> | Temperature | 60±2 deg C | Humidity | 90~95%RH | Applied current | Refer to Table 1 | Time | 1000+24 h |
| Temperature | 60±2 deg C | | | | | | | | | |
| Humidity | 90~95%RH | | | | | | | | | |
| Applied current | Refer to Table 1 | | | | | | | | | |
| Time | 1000+24 h | | | | | | | | | |

| | |
|------------------------------|--|
| Standard measuring condition | Unless otherwise specified,at least 2 hrs of recovery under the room Temperature and normal humidity after the test. Followed by the measurement. Within-48 hrs |
|------------------------------|--|

10. Tape & Reel Packaging Dimensions:

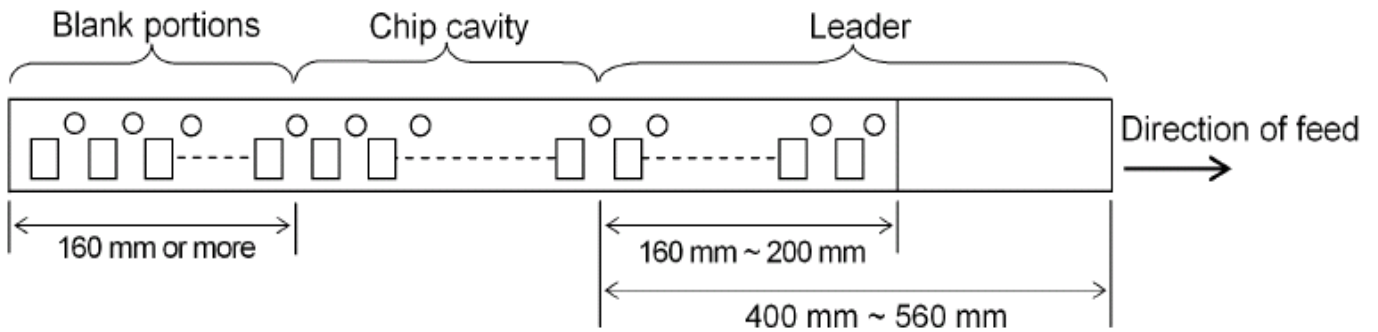
10-1 Dimensions

Unit: mm

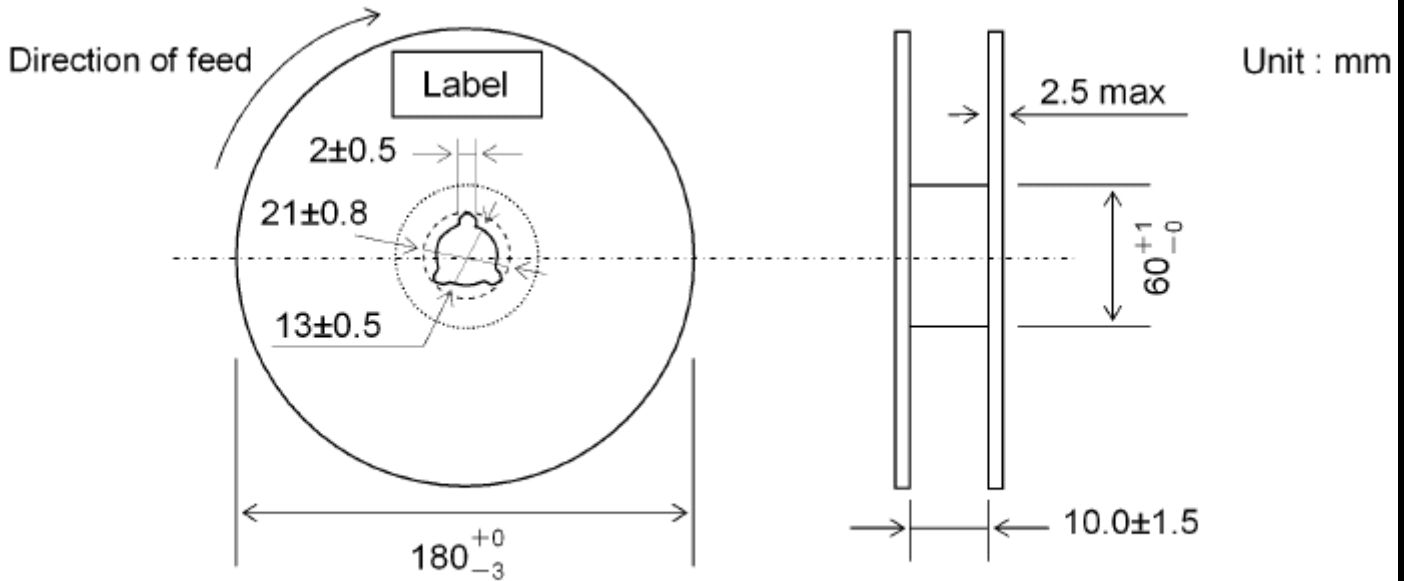


| A_0 | B_0 | W | F | E | P_1 | P_2 | P_0 | D_0 | T | K |
|-------|-------|------------------|-------------------|-------------------|------------------|------------------|------------------|------------------------------|-------------------|-------------|
| 2.30 | 2.80 | 8.0 ± 0.3 | 3.5 ± 0.05 | 1.75 ± 0.1 | 4.0 ± 0.1 | 2.0 ± 0.1 | 4.0 ± 0.1 | $\Phi 1.5$ $+0.1$ -0 | 0.3 ± 0.05 | 1.45 MAX |

10-2 Direction of rolling

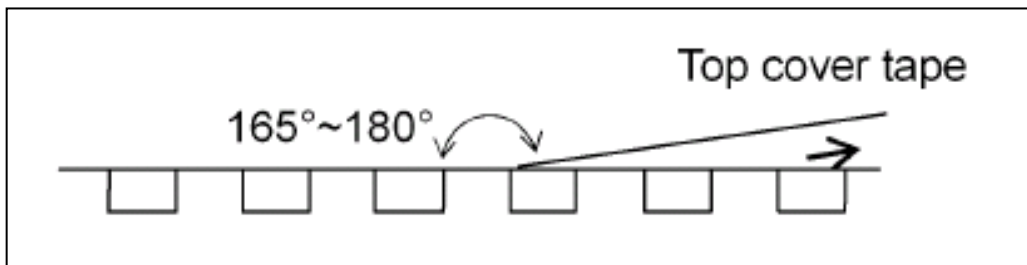


10-3 Reel



Label position : the opposite side of pilot holes

10-4 Top tape strength

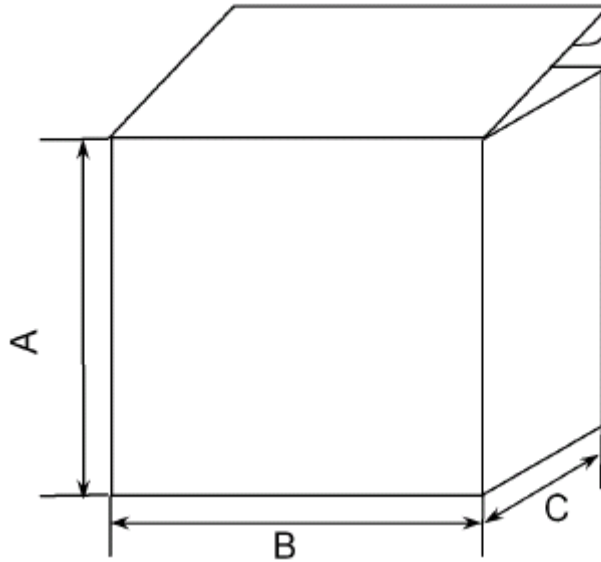


Peel-off strength: 0.2N~0.7N

Peel-off angle: $165^{\circ} \sim 180^{\circ}$

Peel-off speed: 300mm/min

10-5 Dimensions of packing box (for Tape & Reel package)



| Code | A | B | C | Standard Quantity |
|------|-----|-----|-----|-------------------|
| Size | 190 | 185 | 75 | 15,000 pcs. max |
| | | | 140 | 30,000 pcs. max |

[Unit : mm]