# APPROVAL SHEET

## WLPN404018 Series
## Shielded SMD Power Inductors

*Contents in this sheet are subject to change without prior notice.



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## Features

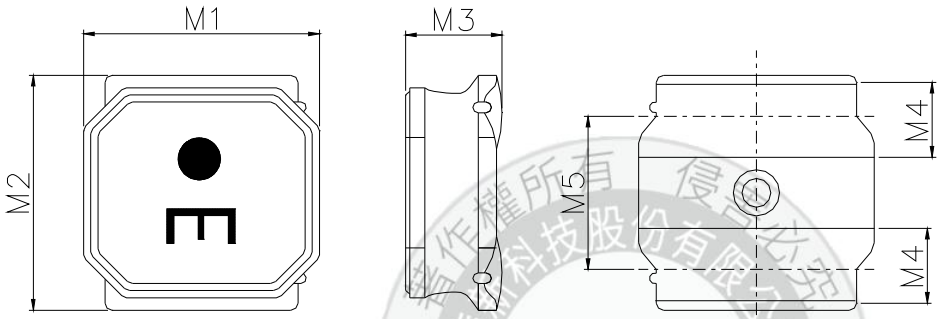
1. Close magnetic loop with magnetic resin shielded.
2. Low profile, High inductance.

## Applications

1. General propose power inductor in DC power system.
2. Inductor in DC/DC converter.
3. Low profile for portable and wearable device.
4. LC filter in Audio D class Amplifier.

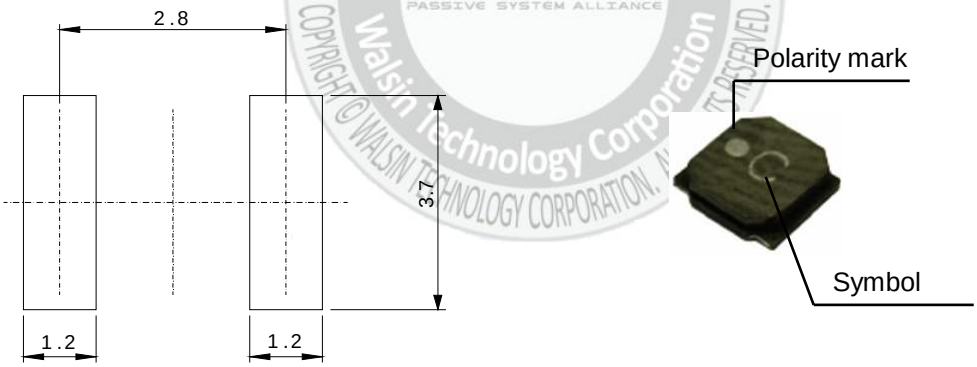
## Shape and Dimension

**Unit: mm**




| | DIM. | TOL. |
|---|---|---|
| M1 | 4.0 | ±0.2 |
| M2 | 4.0 | ±0.2 |
| M3 | 1.8 | MAX. |
| M4 | 1.1 | ±0.2 |
| M5 | 2.5 | ±0.2 |

**Recommended Land-Pattern**




## Ordering Information

| WL | PN | 4040 | 18 | N | 1R0 | L | B |
|---|---|---|---|---|---|---|---|
| **Product Code** | **Series** | **Dimensions** | **Thickness** | **Tolerance** | **Value** | **Packing Code** | |
| WL: Inductor | Shielded SMD Power Inductors | 4.0 * 4.0 mm | 1.8 mm | M: ± 20%<br>N: ± 30% | 1R0 = 1.0uH<br>100 = 10uH | L=13" Reeled (Embossed Tape) | B:STD |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## Electrical Characteristics

| WLPN404018 Series | L (uH) | Symbol | Inductance Tolerance | DCR (Ω±20%) | SRF (MHz)Min | Rated Current (mA) Max | |
|---|---|---|---|---|---|---|---|
| | | | | | | Saturation Current Idc1 | Temperature Rise Current Idc2 |
| WLPN404018N1R0LB | 1.0 | A | ±30% | 0.027 | 90 | 4000 | 3200 |
| WLPN404018N1R5LB | 1.5 | B | ±30% | 0.037 | 75 | 3300 | 2400 |
| WLPN404018M2R2LB | 2.2 | C | ±20% | 0.042 | 60 | 3000 | 2200 |
| WLPN404018M3R3LB | 3.3 | E | ±20% | 0.055 | 45 | 2300 | 2000 |
| WLPN404018M4R7LB | 4.7 | H | ±20% | 0.070 | 35 | 2000 | 1700 |
| WLPN404018M6R8LB | 6.8 | I | ±20% | 0.098 | 30 | 1600 | 1450 |
| WLPN404018M100LB | 10 | K | ±20% | 0.150 | 25 | 1300 | 1200 |
| WLPN404018M150LB | 15 | M | ±20% | 0.210 | 18 | 1100 | 850 |
| WLPN404018M220LB | 22 | N | ±20% | 0.290 | 15 | 900 | 720 |
| WLPN404018M330LB | 33 | P | ±20% | 0.460 | 12 | 700 | 550 |
| WLPN404018M470LB | 47 | S | ±20% | 0.650 | 10 | 600 | 440 |
| WLPN404018M680LB | 68 | T | ±20% | 1.000 | 8.3 | 520 | 320 |
| WLPN404018M101LB | 100 | V | ±20% | 1.450 | 6.5 | 420 | 280 |
| WLPN404018M151LB | 150 | W | ±20% | 2.300 | 5.5 | 340 | 220 |
| WLPN404018M221LB | 220 | X | ±20% | 3.800 | 4.0 | 275 | 170 |

1. Test Frequency: 100KHz
2. Test Equipment:
   Inductance: Chroma3302+1320 or equivalent.
   DCR: Chroma16502 or equivalent.
   SRF: HP4291B or equivalent.
3. Saturation Current Idc1: The value of current causes a 30% inductance reduction from initial value.
4. Temperature rise current Idc2: The value of current causes a 40℃ temperature rise.
5. Rated Current: Either Idc1 or Idc2 whichever is smaller.
6. Operating Temperature Range:-25℃ to +125℃ (Including self-temperature rise)
7. Storage Temp. Range：-40℃ to +85℃.
8. MSL：Level 1


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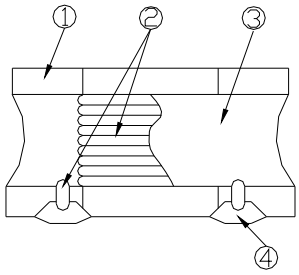
## Structural Drawing




(Magnetic Shielded Type)

① Ferrite core ：Ni-Zn ferrite
② Winding wire：Polyurethane-copper wire
③ Over-coating resin：Epoxy resin, containing ferrite powder
④ Electrode：External electrode (substrate) Ag
External electrode (base plating) Ni-Sn
External electrode (top surface solder coating) Sn-Ag-Cu

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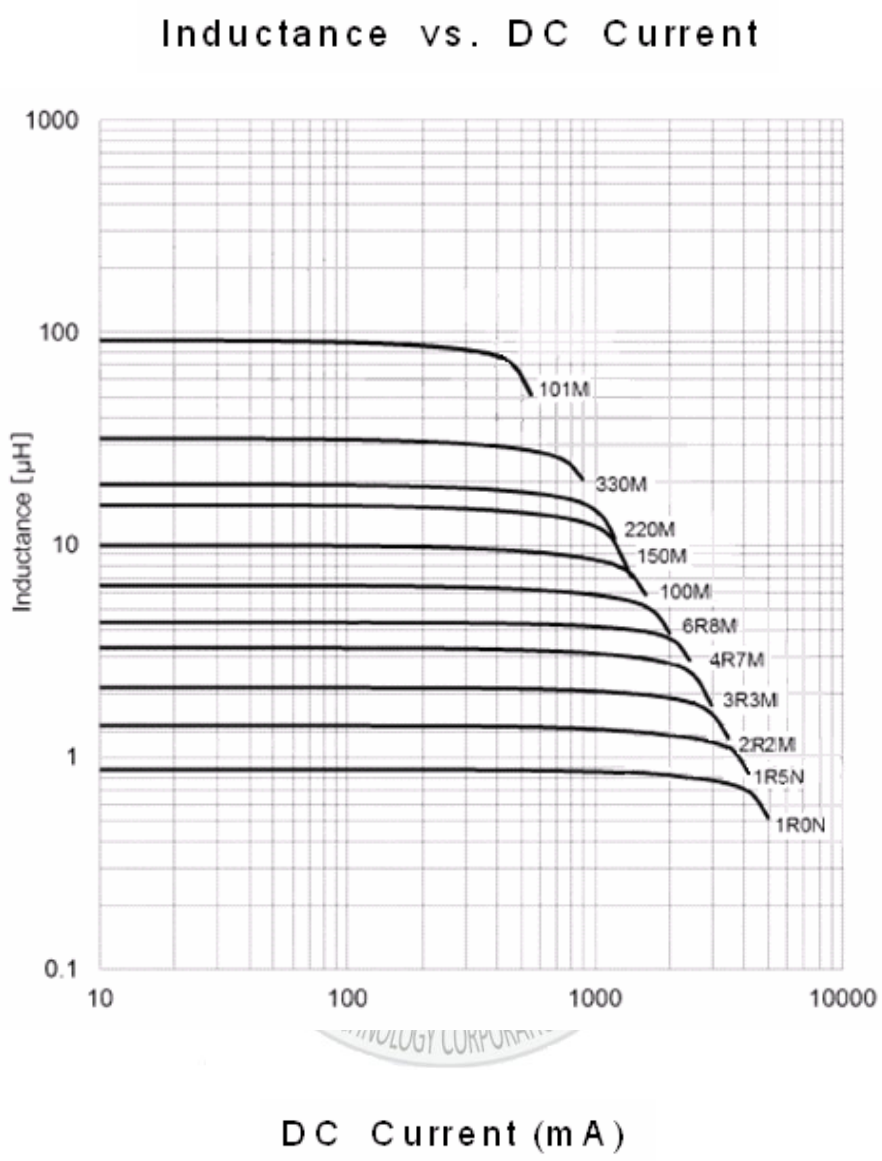
## Characteristic Curve





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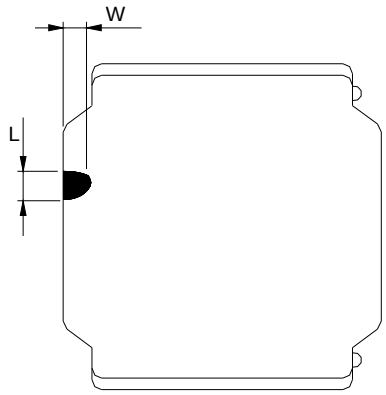
## Core Chipping:

The appearance standard of the chipping size in top side, of bottom side ferrite Core is following dimension.




| L | W |
|---|---|
| 1.0mmMax. | 1.0mmMax. |

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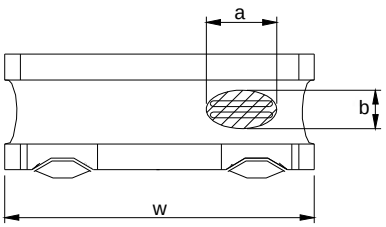
**Exposed wire tolerance limit of coating resin part on product side**

**Size of exposed wire occurring to coating resin is specified below.**




① Width direction (dimension a): Acceptable when a<=w/2
Nonconforming when a>w/2
② Length direction (dimension b): Dimension b is not specified.
③ When total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, that is acceptable.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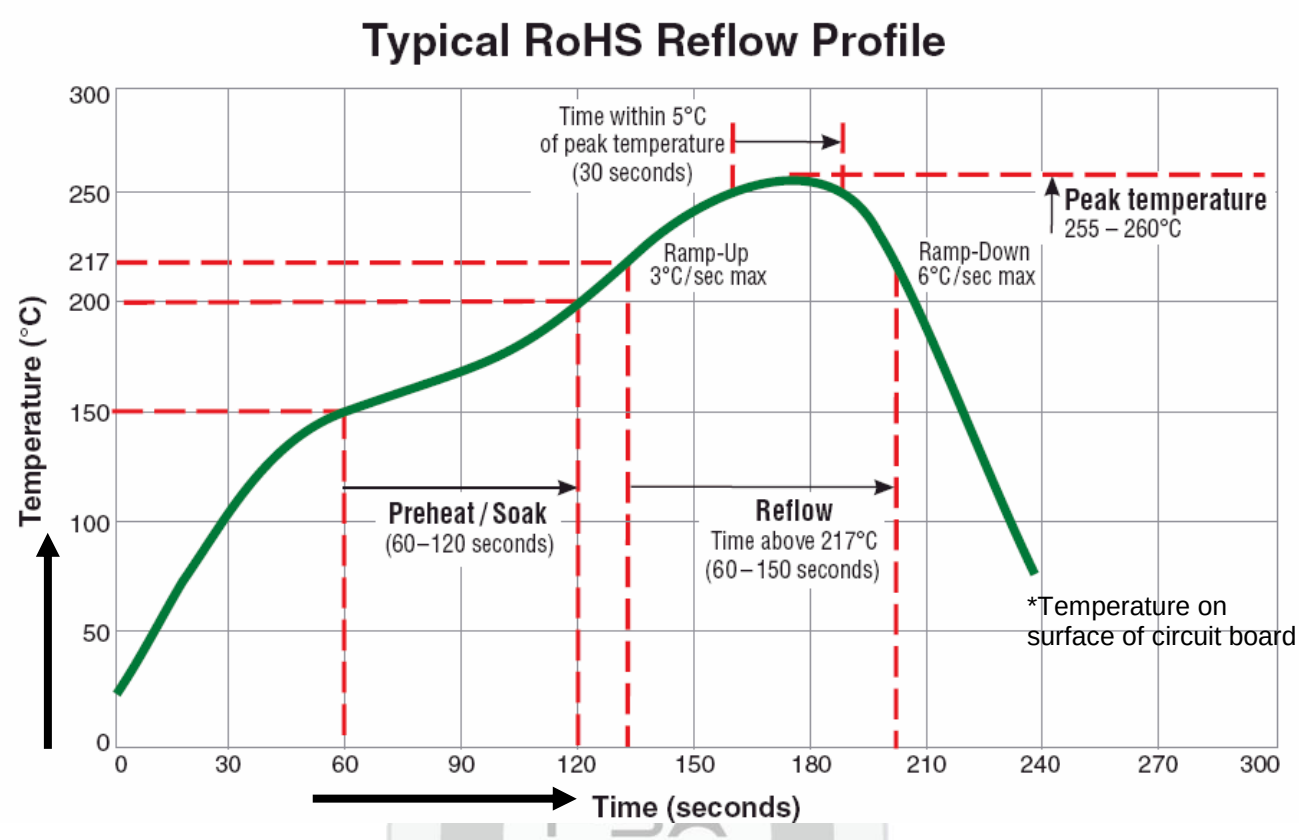
**Reflow Profile Chart (Reference):**




**(Table 1)**

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

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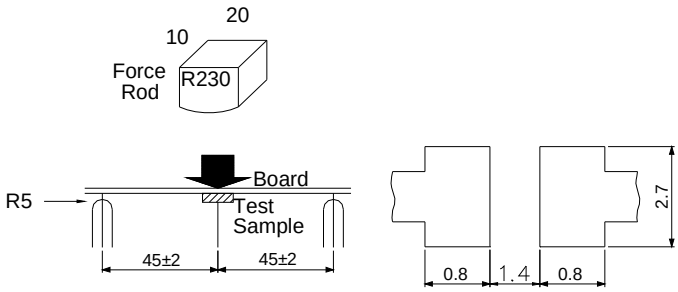
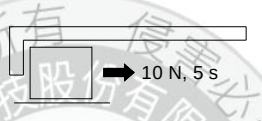
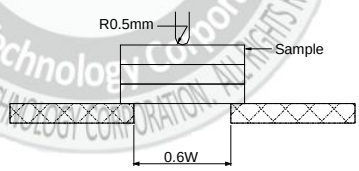
**Mechanical Performance /Environmental Test Performance Specifications: (WLPN404018 series)**

| No. | Item | Test condition | Requirements |
|---|---|---|---|
| 1 | Resistance to Deflection | No damage. | The test samples shall be soldered to the test board by the reflow soldering conditions show in Table 1.<br>As illustrated below, apply force in the direction of the Arrow indicating until deflection of the test board Reaches to 2 mm.<br>  <br>Land dimensions<br>Unit: mm<br>Test board size :100×40×10<br>Test board material l: glass epoxy-resin<br>Solder cream thickness:0.1 |
| 2 | Adhesion of Terminal Electrode | Shall not come off PC board | The test samples shall be soldered to the test board<br>By the reflow soldering conditions shown in Table 1.<br>  <br>Applied force: 10 N to X and Y directions Duration: 5 s.<br>Solder cream thickness:0.1 mm<br>(Refer to recommended Land Pattern Dimensions Defined in "Precaution") |
| 3 | Body strength | No damage | Applied force :20 N<br>Duration :10 s<br>  |
| 4 | Resistance to Vibration | △L/L:within±10%<br>No abnormality observed In appearance | The test samples shall be soldered to the test board by<br>The reflow soldering conditions shown in Table 1.Then<br>It shall be submitted to below test conditions<br>Frequency range: 10Hz~55Hz<br>Total Amplitude: 1.5mm(May not exceed acceleration 196 m/S2)<br>Sweeping Method: 10Hz to 55Hz to 10 Hz for 1 min.<br>Time: For 2 hours on each X, Y, and Z axis. |
| 5 | Resistance to Soldering heat (Reflow) | △L/L:within±10%<br>No abnormality observed In appearance | The test sample shall be exposed to reflow oven at 230±5 deg C for 40 seconds, with peak temperature at 260±5 deg C for 5 seconds, 2 times.<br><br>Test board thickness:1.0 mm<br>Test board material :glass epoxy-resin |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<table>
<tr><td>6</td><td>Solder ability</td><td>At least 90% of surface of terminal electrode is covered by new solder.</td><td>The test samples shall be dipped in flux, and then Immersed in molten solder as shown in below table.<br>Flux: Methanol solution containing rosin 25%<br><table><tr><td>Solder Temperature</td><td>245±deg C</td></tr><tr><td>Time</td><td>5±1.0 S.</td></tr><tr><td>Immersing Speed</td><td>25 mm/s</td></tr></table></td></tr>
<tr><td>7</td><td>Temperature Characteristics</td><td>△L/L:within±20%<br>No abnormality observed<br>In appearance</td><td>Measurement of inductance shall be taken at temperature Range within -25 deg C to +85 deg C.<br>With reference to inductance value at +20 deg C, change Rate shall be calculated.</td></tr>
<tr><td>8</td><td>Thermal shock</td><td>△L/L:within±10%<br>No abnormality observed<br>In appearance</td><td>The test samples shall be soldered to test board<br>By the reflow soldering conditions shown in Table 1.<br>The test samples shall be placed at specified<br>Shown in below table in sequence.<br>The temperature cycle shall be repeated 100 cycles.<br><br>Conditions of steps for 1 cycle<br><table><tr><td>Step</td><td>Temperature</td><td>Time(min)</td></tr><tr><td>1</td><td>-40±3 deg C</td><td>30±3</td></tr><tr><td>2</td><td>Room Temp</td><td>3 maximum</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>3 maximum</td></tr></table></td></tr>
<tr><td>9</td><td>Low Temperature life Test</td><td>△L/L:within±10%<br>No abnormality observed<br>In appearance</td><td>The test samples shall be soldered to the test board by<br>The reflow soldering conditions shown in Table 1.<br>After that, the test samples shall be placed at test<br>Conditions as shown in below table.<br><table><tr><td>Temperature</td><td>-40±2 deg C</td></tr><tr><td>Time</td><td>500 +24/-0 h</td></tr></table></td></tr>
<tr><td>10</td><td>Loading at high temperature life test</td><td>△L/L:within±10%<br>No abnormality observed in appearance.</td><td>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table 1.<br>The test samples shall be placed in thermostatic oven set at specified temperature and applied the rated current continuously as shown in below table.<br><table><tr><td>Temperature</td><td>85±2 deg C</td></tr><tr><td>Applied current</td><td>Rated current<br>(Refer to Page 3)</td></tr><tr><td>Time</td><td>500+24/-0 h</td></tr></table></td></tr>
<tr><td>11</td><td>Damp heat life test</td><td>△L/L:within±10%<br>No abnormality observed in appearance.</td><td>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table 1.<br>The test samples shall be placed in thermostatic oven set at specified temperature and humidity as shown in below table.<br><table><tr><td>Temperature</td><td>60±2 deg C</td></tr><tr><td>Humidity</td><td>90~95%RH</td></tr><tr><td>Time</td><td>500+24/-0 h</td></tr></table></td></tr>
<tr><td>12</td><td>Loading under Damp heat life test</td><td>△L/L:within±10%<br>No abnormality observed in appearance.</td><td>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table 1.<br>The test samples shall be placed in thermostatic oven set at specified temperature and humidity and applied the rated current continuously as shown in below table.<br><table><tr><td>Temperature</td><td>60±2 deg C</td></tr><tr><td>Humidity</td><td>90~95%RH</td></tr><tr><td>Applied current</td><td>Rated current (Refer to Page 3)</td></tr><tr><td>Time</td><td>500+24/-0 h</td></tr></table></td></tr>
</table>


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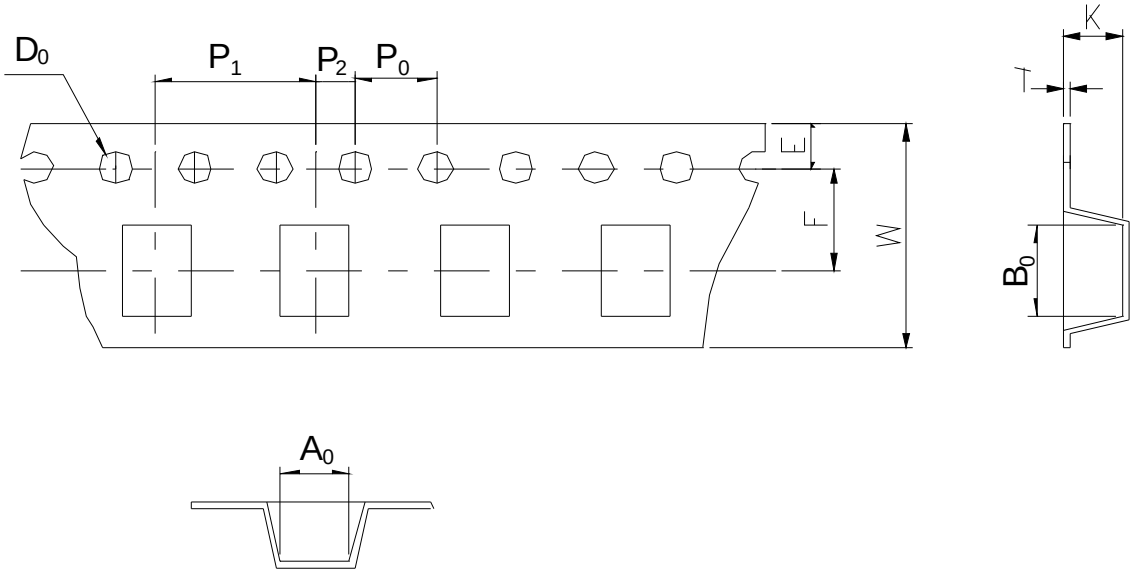
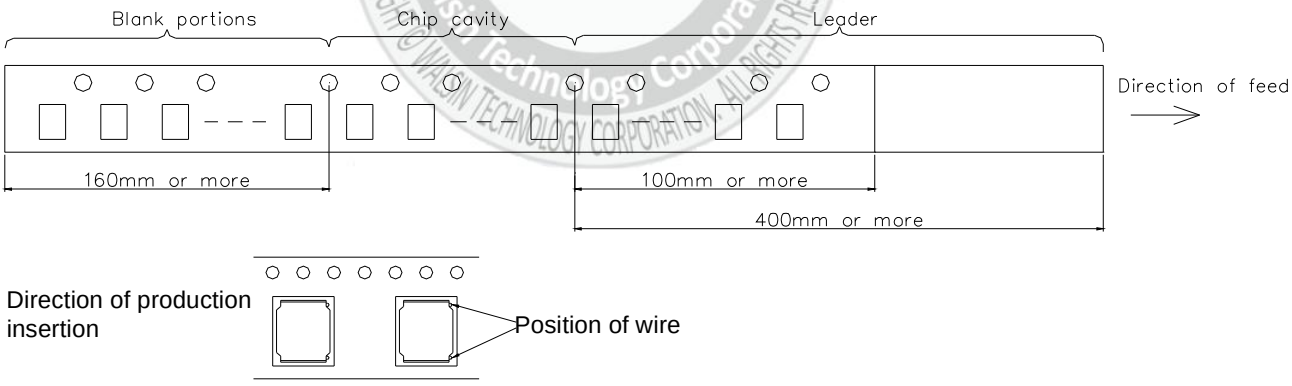
## Tape & Reel Packaging Dimensions:

Dimensions Unit: mm




| $A_0$ | $B_0$ | W | F | E | $P_1$ | $P_2$ | $P_0$ | $D_0$ | T | K |
|---|---|---|---|---|---|---|---|---|---|---|
| 4.3 ±0.1 | 4.3 ±0.1 | 12.0 ±0.3 | 5.5 ±0.1 | 1.75 ±0.1 | 8.0 ±0.1 | 2.0 ±0.1 | 4.0 ±0.1 | Φ1.5 +0.1 -0 | 0.3 ±0.05 | 2.1 ±0.1 |

## Direction of rolling



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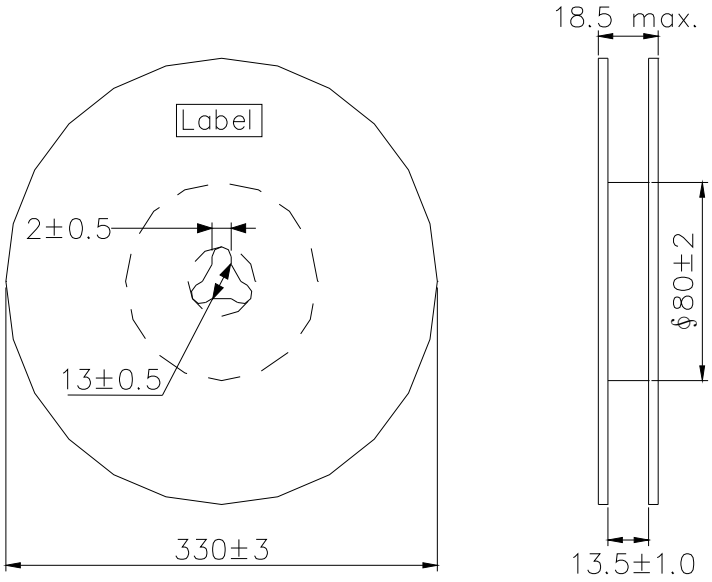
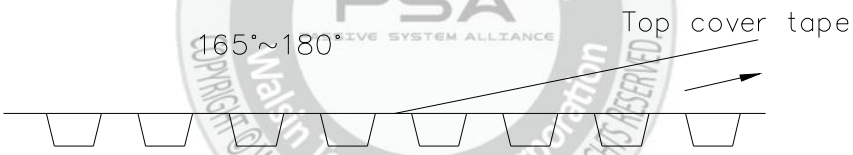
**Reel**




**Top tape strength**




Peel-off strength: 0.1N~1.3N

Peel-off angle:165˚~180˚

Peel-off speed: 300mm/mm

**Quantity per reel：3.5K pcs (3500 pcs)**



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