# APPROVAL SHEET

## WLPN505010 Series
## Shielded SMD Power Inductors

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

## Features

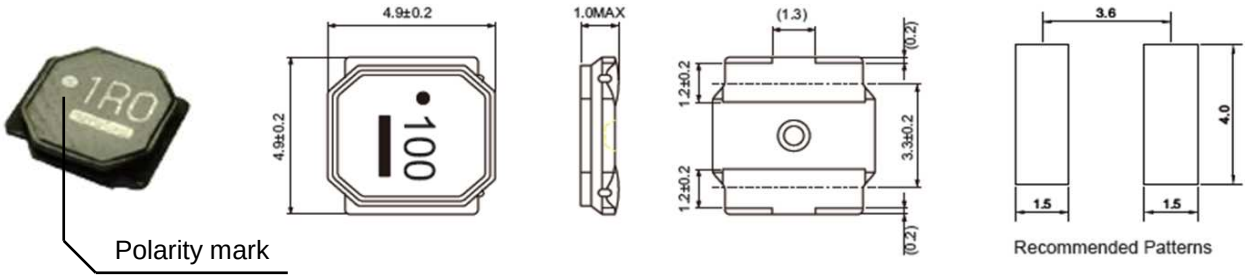
1. Close magnetic loop with magnetic resin shielded.
2. Low profile, High inductance.

## 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




## Ordering Information

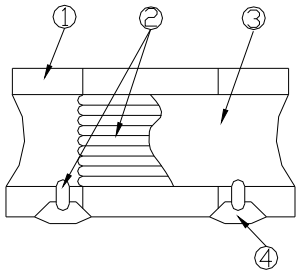
| WL | PN | 5050 | 10 | N | 1R0 | P | B |
|---|---|---|---|---|---|---|---|
| **Product Code**<br>WL: Inductor | **Series**<br>Shielded SMD Power Inductors<br>. | **Dimensions**<br>4.9 * 4.9 mm | **Thickness**<br>1.0 mm | **Tolerance**<br>M: ± 20%<br>N: ± 30% | **Value**<br>1R0 = 1.0uH<br>100 = 10uH | **Packing Code**<br>P=7” Reeled (Embossed Tape) | B:STD |

## Electrical Characteristics

| WLPN404010 Series | L (uH) | Inductance Tolerance | Test Freq (KHz) | DCR (Ω ± 20%) | SRF (MHz)Min | Rated Current (mA) Max | |
|---|---|---|---|---|---|---|---|
| | | | | | | Saturation Current Idc1 | Temperature Rise Current Idc2 |
| WLPN505010N1R0PB | 1.0 | N | 100 | 0.070 | 95 | 2350 | 1750 |
| WLPN505010N2R2PB | 2.2 | N | 100 | 0.105 | 65 | 1500 | 1400 |
| WLPN505010M3R3PB | 3.3 | M | 100 | 0.125 | 42 | 1400 | 1250 |
| WLPN505010M4R7PB | 4.7 | M | 100 | 0.145 | 37 | 1200 | 1150 |
| WLPN505010M6R8PB | 6.8 | M | 100 | 0.185 | 33 | 1000 | 1000 |
| WLPN505010M100PB | 10 | M | 100 | 0.250 | 23 | 850 | 900 |
| WLPN505010M150PB | 15 | M | 100 | 0.400 | 19 | 680 | 650 |
| WLPN505010M220PB | 22 | M | 100 | 0.600 | 15 | 550 | 450 |

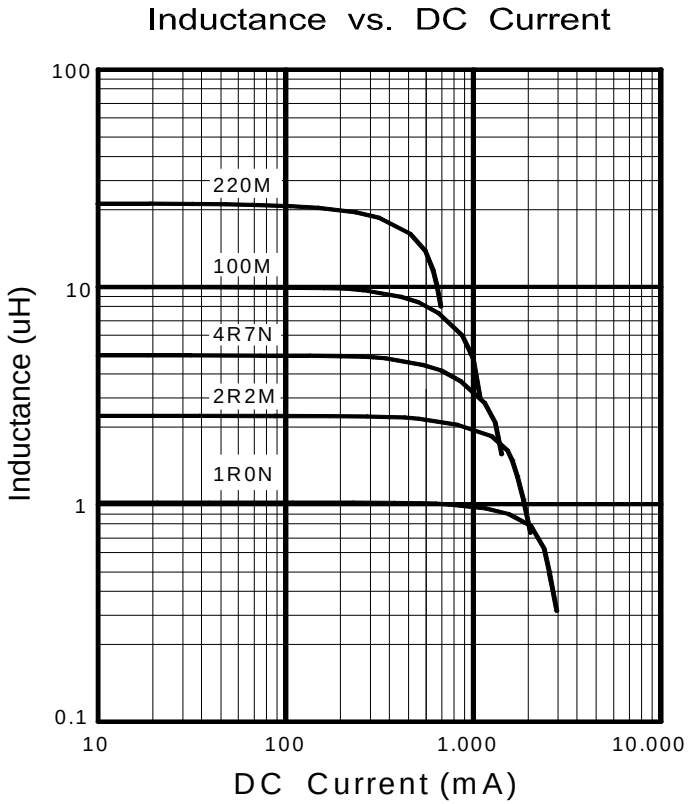
1. Test Frequency: 100KHz.
2. Test Equipment:
   Inductance: Chroma3302+1320+16502 or equivalent.
   DCR: Chroma16502 or equivalent.
   SRF: HP4291B or equivalent.
3. Saturation Current Idc1: The value of current causes a 30% inductance reduction from initial value.
4. Temperature rise current Idc2: 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 +120℃ (Including self-temperature rise).
7. Storage Temp. Range：-40℃ to +85℃.
8. MSL：Level 1.

## Structural Drawing



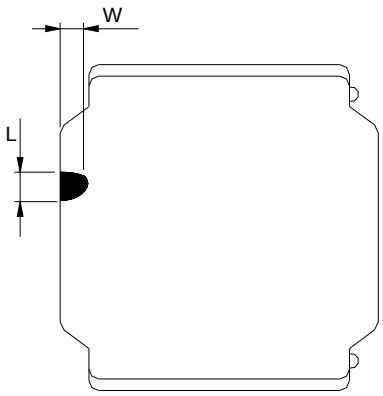

① Ferrite core ：Ni-Zn ferrite.
② Winding wire：Polyurethane-copper wire.
③ Over-coating resin：Epoxy resin, containing ferrite powder.
④ Electrode：External electrode (substrate) Cu.
External electrode (top surface solder coating) Sn-Ag-Cu.

## Characteristic Curve



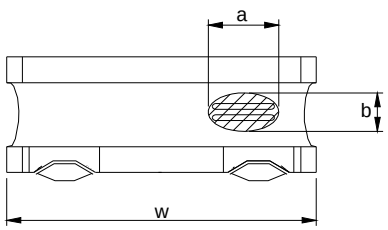

## Core Chipping:

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



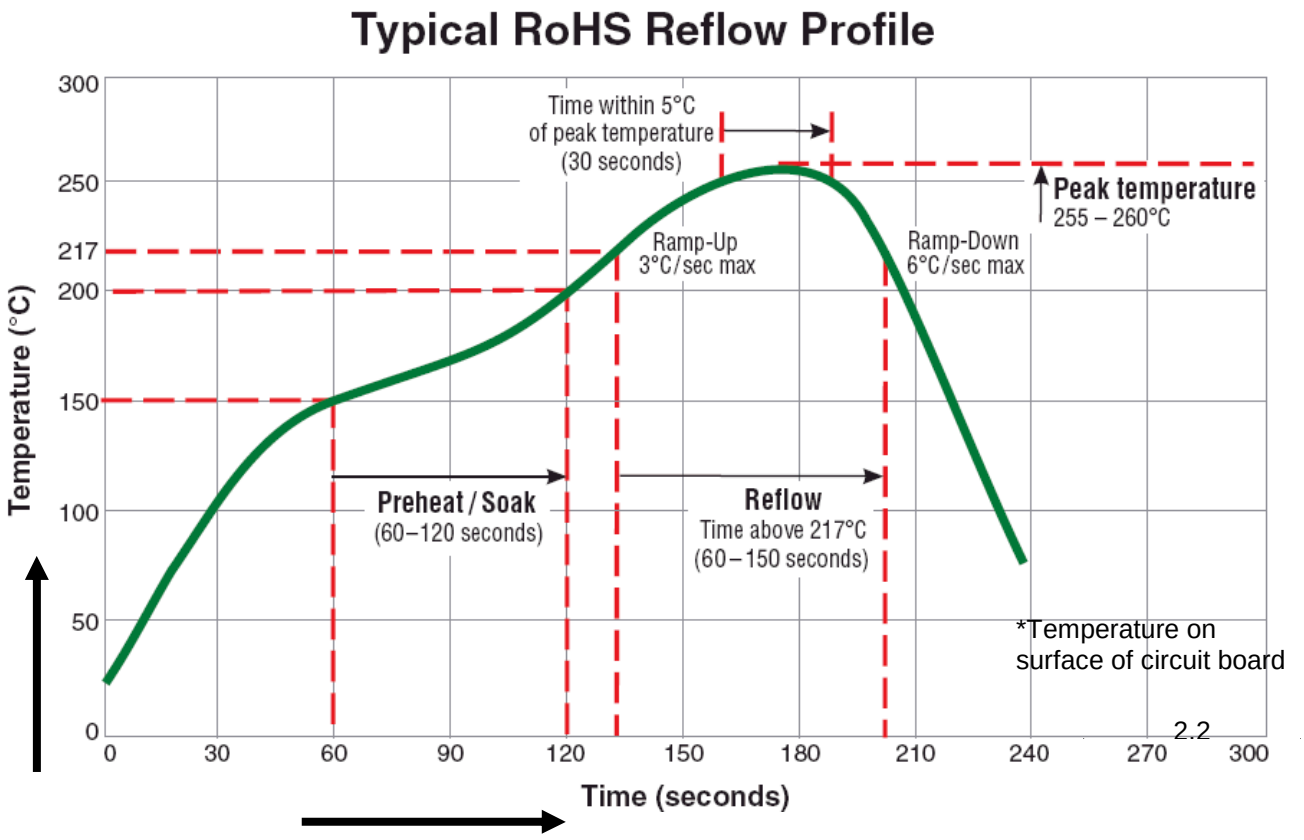

| L | W |
|---|---|
| 1.5mmMax. | 1.5mmMax. |

**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.

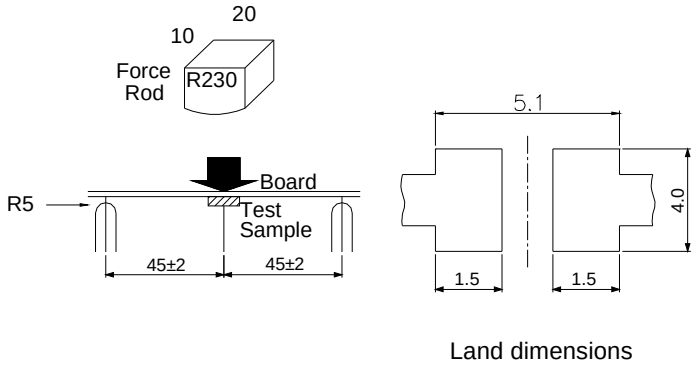
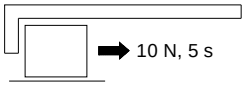
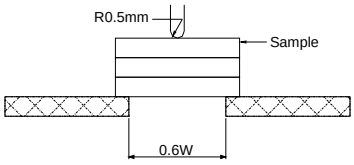
**Reflow Profile Chart (Reference):**




**(Table 1)**

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

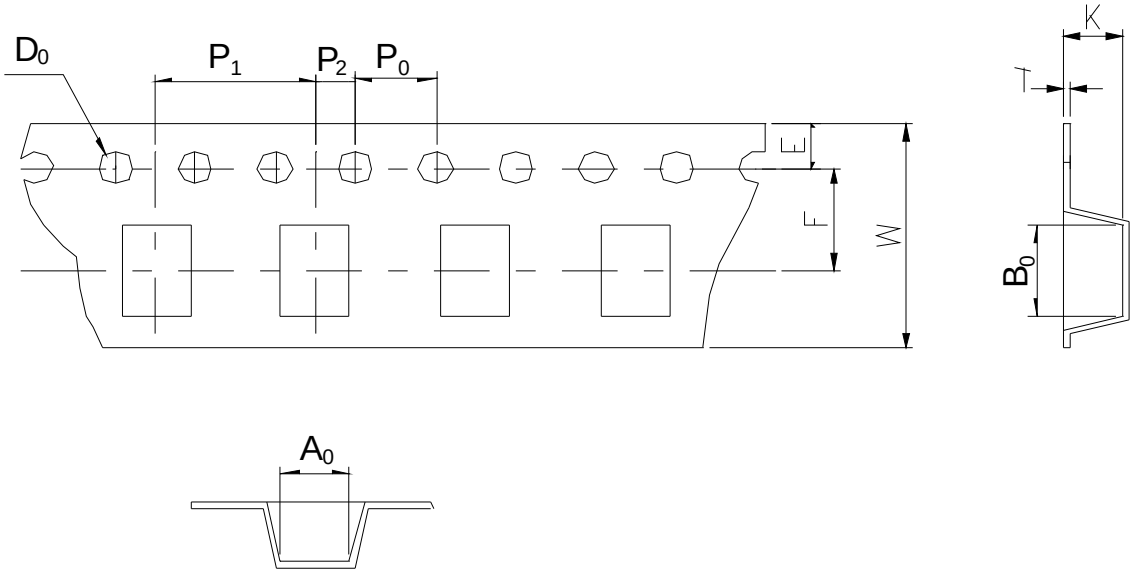
**Mechanical Performance /Environmental Test Performance Specifications: (WLPN505010 series)**

| 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>Test board size :100×40×10 Unit: mm<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 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 the reflow soldering conditions shown in Table 1.Then 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. |

<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%<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 in appearance</td><td>Measurement of inductance shall be taken at temperature rnge 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 in appearance.</td><td>The test samples shall be soldered to test board by the reflow soldering conditions shown in Table 1.<br>The test samples shall be placed at specified shown in below table in sequence.<br>The temperature cycle shall be repeated 100 cycles.<br><br>Conditions of steps for 1 cycle<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 in appearance.</td><td>The test samples shall be soldered to the test board by the reflow soldering conditions shown in Table 1.<br>After that, the test samples shall be placed at test conditions as shown in below table.<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.<table><tr><td>Temperature</td><td>85±2 deg C</td></tr><tr><td>Applied current</td><td>Rated current<br>(Refer to Page 2)</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.<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.<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 2)</td></tr><tr><td>Time</td><td>500+24/-0 h</td></tr></table></td></tr>
</table>

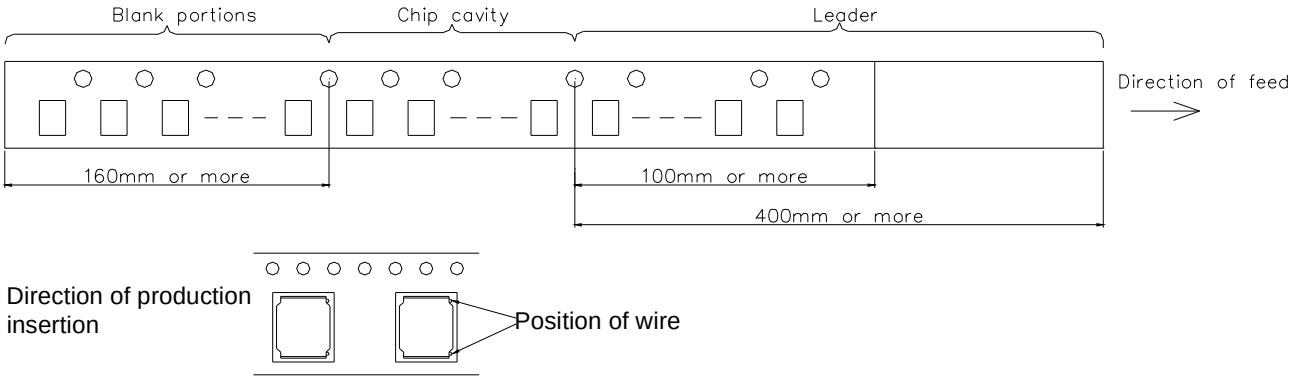
## Tape & Reel Packaging Dimensions:

Dimensions Unit: mm

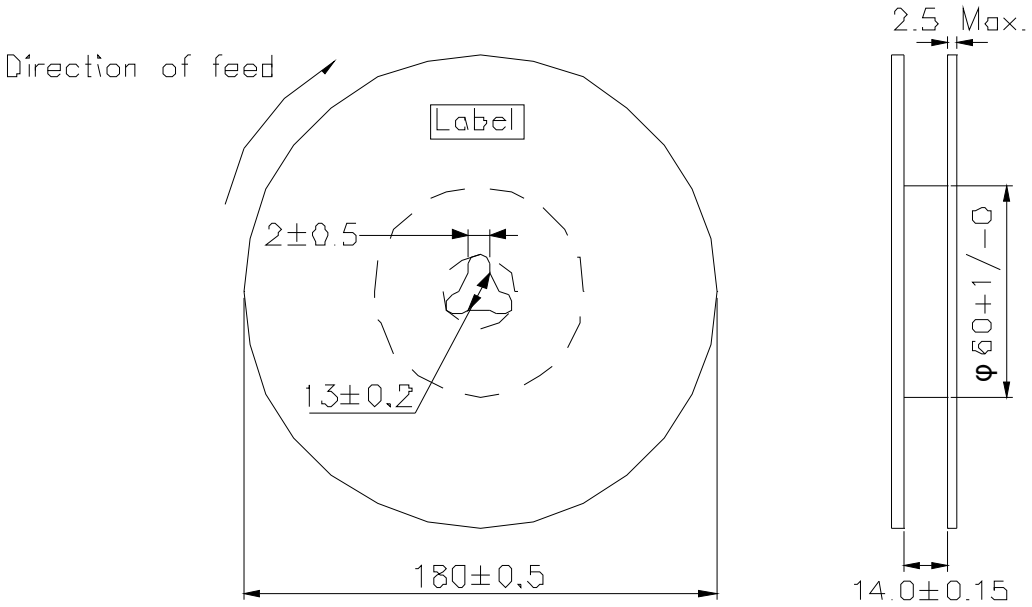



| $A_0$ | $B_0$ | W | F | E | $P_1$ | $P_2$ | $P_0$ | $D_0$ | T | K |
|---|---|---|---|---|---|---|---|---|---|---|
| 5.25 ±0.1 | 5.25 ±0.1 | 12.0 ±0.3 | 5.5 ±0.1 | 1.75 ±0.1 | 8.0 ±0.1 | 2.0 ±0.1 | 4.0 ±0.1 | Φ1.5 +0.1 -0 | 0.3 ±0.1 | 1.4 ±0.1 |

## Direction of rolling

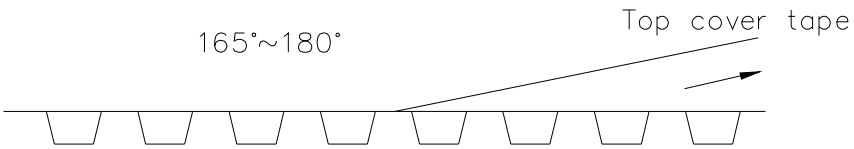


## Reel




Label position:on the opposite sie of sprocket holes side of reel

## Top tape strength




Peel-off strength: 0.1N~1.3N

Peel-off angle:165°~180°

Peel-off speed: 300mm/mm

**Quantity per reel：1K pcs**

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