



炬鹿科技有限公司
RIDEE TECH COMPANY LIMITED

Revision Date : 2023 / 07 / 03

APPROVAL SHEET

Product Name : Metal Strip High Power Current Sensor

Part No. : RHL – Wide Terminal

Description : Size 1225

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For more contact information, please refer to our website: www.rideetech.com



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Metal Strip High Power Current Sensor – RHL-Wide Terminal

Application

- Industrial Product Power Management
- Power Supply
- SWPS (DC-DC Converter, Charger, Adaptor)



RoHS
COMPLIANT
HALOGEN
FREE

Features

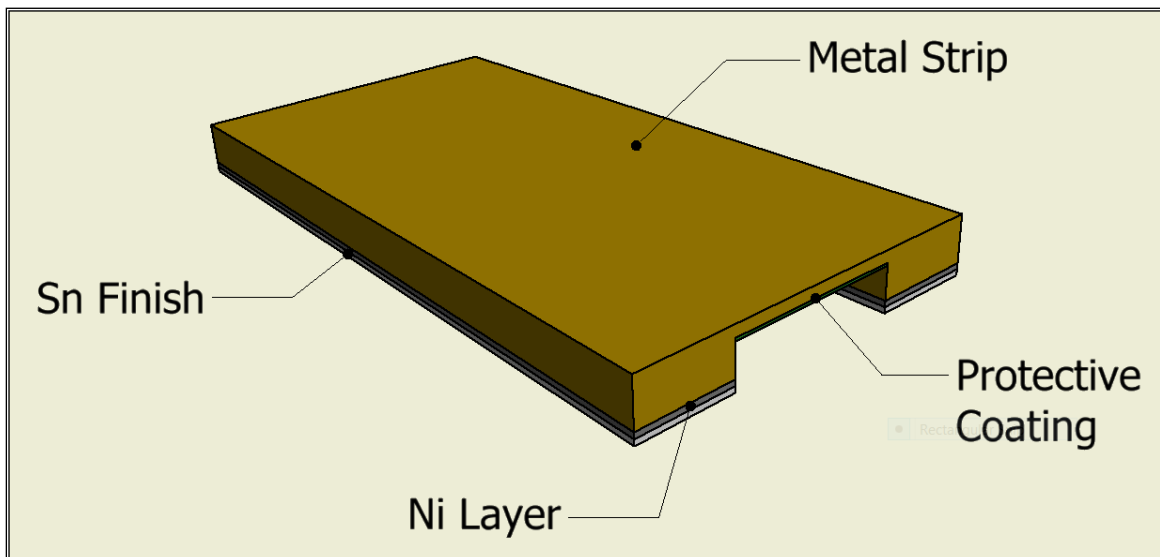
—These specifications cover 1225 sized high power low resistance current sensing metal resistors.

Part Number Explanation

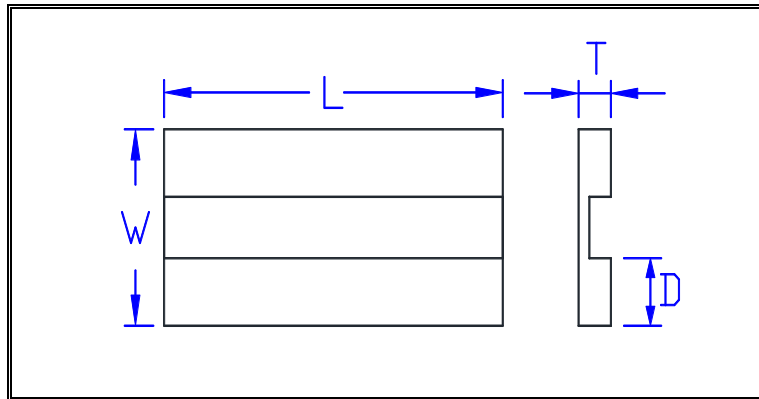
| RHL | 1225 | J | T | R005 | W |
|-------------------------------------|----------|--|-----------------------|---|----------------------|
| Type | Size | Tolerance | Packaging | Resistance | Functional |
| High Power Low Ohmic Resistor | EIA 1225 | F: $\pm 1\%$ H: $\pm 3\%$ J: $\pm 5\%$ | T : 7" Taped & Reeled | M50: 0.0005 Ω R005: 0.005 Ω 1M5: 0.0015 Ω R010: 0.01 Ω | W : Wide Terminal |

NOTE: Parts shall not be marked. Coding is for ordering purpose

CONFIGURATION



■ DIMENSIONS



| Values | L (mm) ± 0.25 | W (mm) ± 0.2 | D (mm) ± 0.25 | T (mm) ± 0.2 | Alloy |
|----------|----------------------|---------------------|----------------------|---------------------|-------------|
| M10~M25 | 6.35 | 3.0 | 1.0 | 1.0 | Manganin-C2 |
| M30~M40 | | | 0.5 | 1.0 | Manganin-C2 |
| M50~R001 | | | 0.5 | 0.6 | Manganin |
| 1M5 | | | 1.0 | 0.6 | Kanthal |
| R002 | | | 0.8 | 0.6 | Kanthal |
| 2M5~R003 | | | 0.5 | 0.6 | Kanthal |

*Dimensions are for reference only.



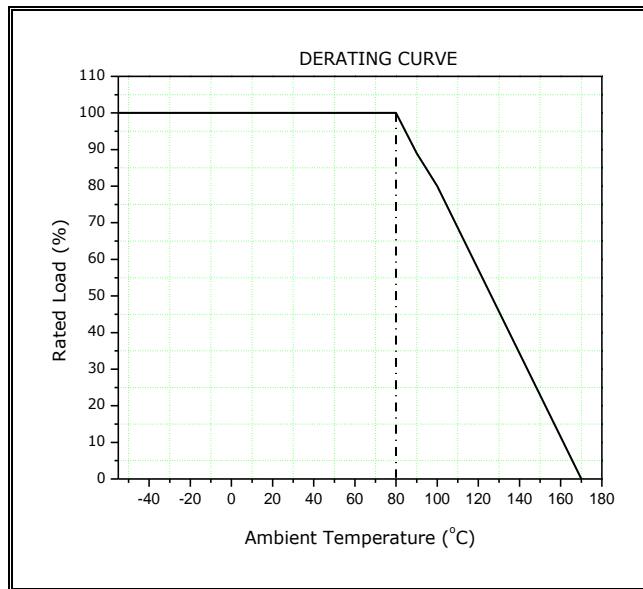
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■ ELECTRICAL DATA

| Resistance | Power Rating at 80°C | Max. Dielectric Voltage | Operating Temp. (°C) |
|------------|----------------------|-------------------------|----------------------|
| 0.1mΩ~3mΩ | 4W | 200V | -55°C ~ 170°C |

■ POWER TEMPERATURE DERATING CURVE

Power ratings are based on continuous full load operation at rated ambient temperature of 80°C. For resistors operated at ambient temperature in excess of 80°C, the maximum load shall be derated in accordance with the following curve.



■ RATED VOLTAGE

The direct or alternating voltage for the rated power can be calculated from the following formula but must not exceed the maximum voltage.

| | |
|-------------------------|--|
| $V = \sqrt{P \times R}$ | Where, V=rated voltage (V) P=rated power (W) R=rated resistance (Ω) |
|-------------------------|--|



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■ TEMPERATURE COEFFICIENT OF RESISTANCE (TCR)

| | |
|--|---|
| $TCR \text{ (ppm/}^\circ\text{C)} = \left[\frac{(R_2 - R_1)}{R_1(T_2 - T_1)} \right] \times 10^6$ | <p>Where,</p> <p>R₁=resistance at room temperature</p> <p>R₂=resistance at -55°C or 125°C</p> <p>T₁=room temperature</p> <p>T₂=-55°C or 125°C</p> |
|--|---|

| Range (mΩ) | M10 | M30 | M50 | R001 | R003 |
|---------------------------|--------|------|------|------|------|
| Max. Working Current (A) | 200 | 116 | 89 | 63 | 36 |
| Max. Overload Current (A) | 447 | 258 | 200 | 141 | 81 |
| TCR (ppm) (20°C to 60°C) | ±500 | ±350 | ±300 | ±250 | ±100 |
| Power Rating (W) | 4 | | | | |
| Tolerance (%) | ±1,3,5 | | | | |



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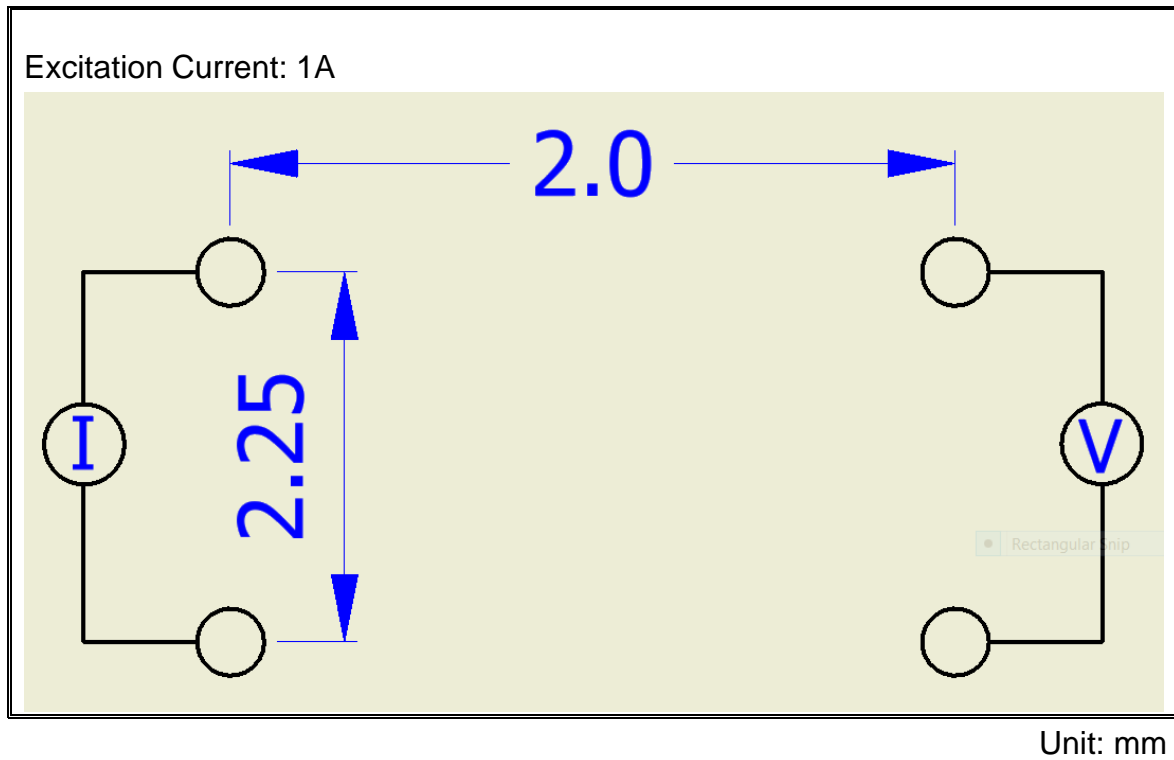
■ PERFORMANCE DATA

| AEC-Q200 Rev.D Table 7 | Test | Reference | Conditions | ΔR +0.5mΩ |
|------------------------------|------------------------------|-------------------------|---|--------------|
| Item 3 | High Temperature Storage | MIL-STD-202 Method 108 | 1000hrs. T=125C. Unpowered. Measurement at 24±4hrs after test conclusion | 1% |
| Item 4 | Temperature Cycling | JESD22 Method JA-104 | 1000 cycles (-55C to +125C). Measurement at 24±4hrs after test conclusion. 30 m max., dwell time at each temp extreme, transition time 1m max. | |
| Item 7 | Bias Humidity | MIL-STD-202 Method 103 | 1000hrs. 85C/85%RH. 10% of operating power. Measurement at 24±4hrs after test conclusion. | |
| Item 8 | Operating Life | MIL-STD-202 Method 108 | Condition D (1000hrs) Steady State TA=125C at rated power. Measurement at 24±4hrs after test conclusion. | |
| Item 9 | External Visual | MIL-STD-883 Method 2009 | Electrical test not required. Inspect device construction, marking and workmanship | |
| Item 10 | Physical Dimension | JESD22 Method JB-100 | Verify physical dimensions to the applicable device detail specification. Electrical test not required | User Spec. |
| Item 12 | Resistance to Solvents | MIL-STD-202 Method 215 | Aqueous wash chemical-OKEM Clean or equivalent Do not use banned solvents. | 1% |
| Item 13 | Mechanical Shock | MIL-STD-202 Method 213 | Figure 1 of Method 213. Condition C | |
| Item 14 | Vibration | MIL-STD-202 Method 204 | 5g's for 20min., 12 cycles each of 3 orientations. Use 8"*5" PCB .031" thick 7 secure points on one long side and secure points at corners of opposite sides. Parts mounted within 2"from any secure point. Test from 10-2000Hz | |
| Item 15 | Resistance to Soldering heat | MIL-STD-202 Method 210 | Condition B. No pre-heat of samples. Single Wave Solder-Procedure 2 for SMD | |
| Item 18 | Solderability | J-STD-002 | Electrical test not required. Magnification 50 X. SMD Conditions: a) Method B, 4hrs @155C dry heat @235C b) Method B @215C category 3. c) Method D category 3@260C. | |
| Item 19 | Electrical Characterization | User Spec. | Parametrically test per lot and sample size requirements, summary to show min, max, mean and standard deviation at room as well as min and max operating temperatures. | User Spec. |
| Item 21 | Board Flex | AEC Q200-005 | Appendix 2 Note: 2mm (Min) | 1% |
| Item 22 | Terminal strength (SMD) | AEC Q200-006 | Appendix 1 Note: Force of 1.8kg for 60 seconds | |

■ MEASUREMENTS

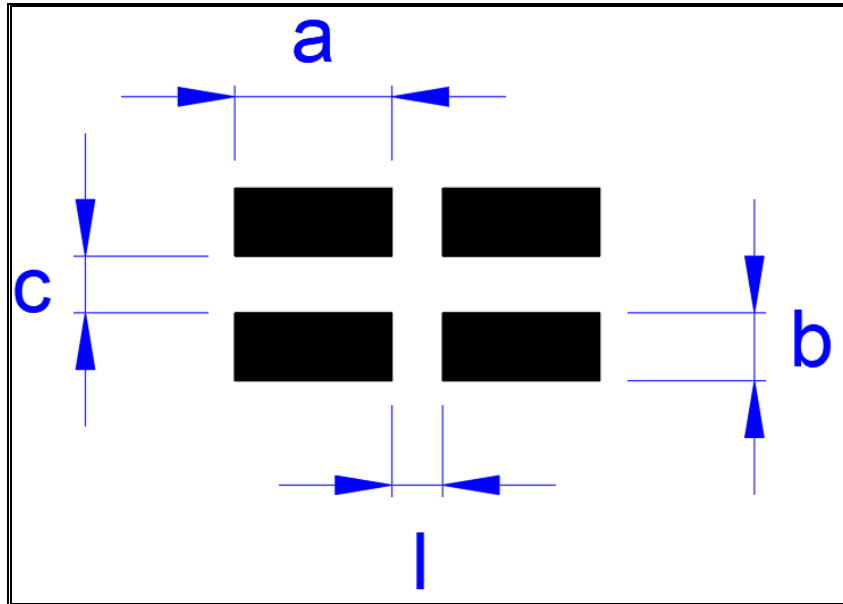
■ 4-WIRE PRECISION MEASUREMENT

Equipment : ADEX AX-1152D DC Low Ohm Meter



4-WIRE PAD LAYOUT

Note: No circuits between pads to avoid short circuit



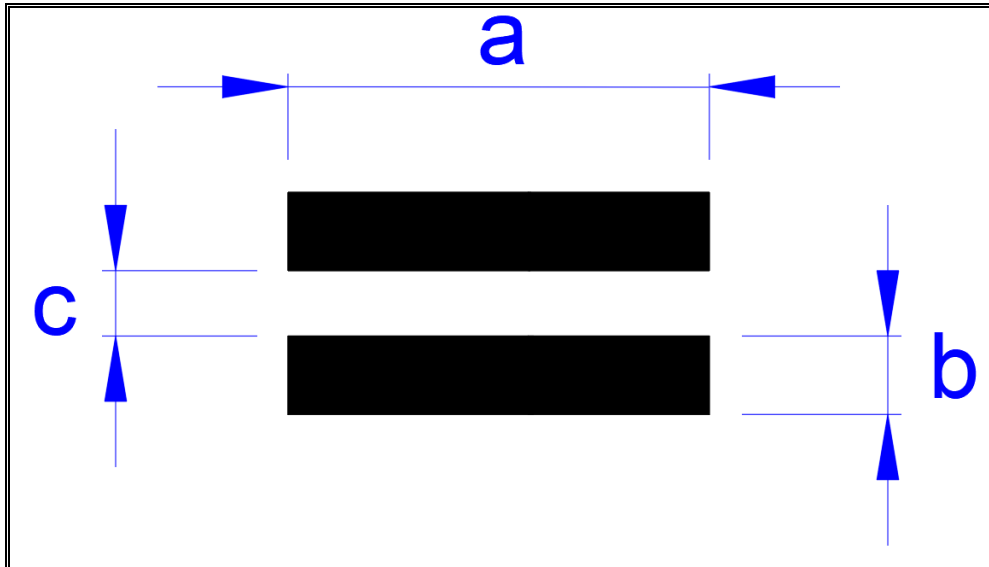
Unit: mm

| TYPE | a (mm) | b (mm) | c (mm) | l (mm) |
|--------------|--------|--------|--------|--------|
| 0.1mΩ~0.25mΩ | 3.0 | 1.4 | 0.6 | 0.8 |
| 0.3mΩ~0.4mΩ | 3.0 | 0.9 | 1.6 | 0.8 |
| 0.5mΩ~1mΩ | 3.0 | 0.9 | 1.6 | 0.8 |
| 1.5mΩ | 3.0 | 1.4 | 0.6 | 0.8 |
| 2mΩ | 3.0 | 1.2 | 1.0 | 0.8 |
| 2.5mΩ~3mΩ | 3.0 | 0.9 | 1.6 | 0.8 |

*Dimensions are for reference only.

2-WIRE PAD LAYOUT

Note: No circuits between pads to avoid short circuit



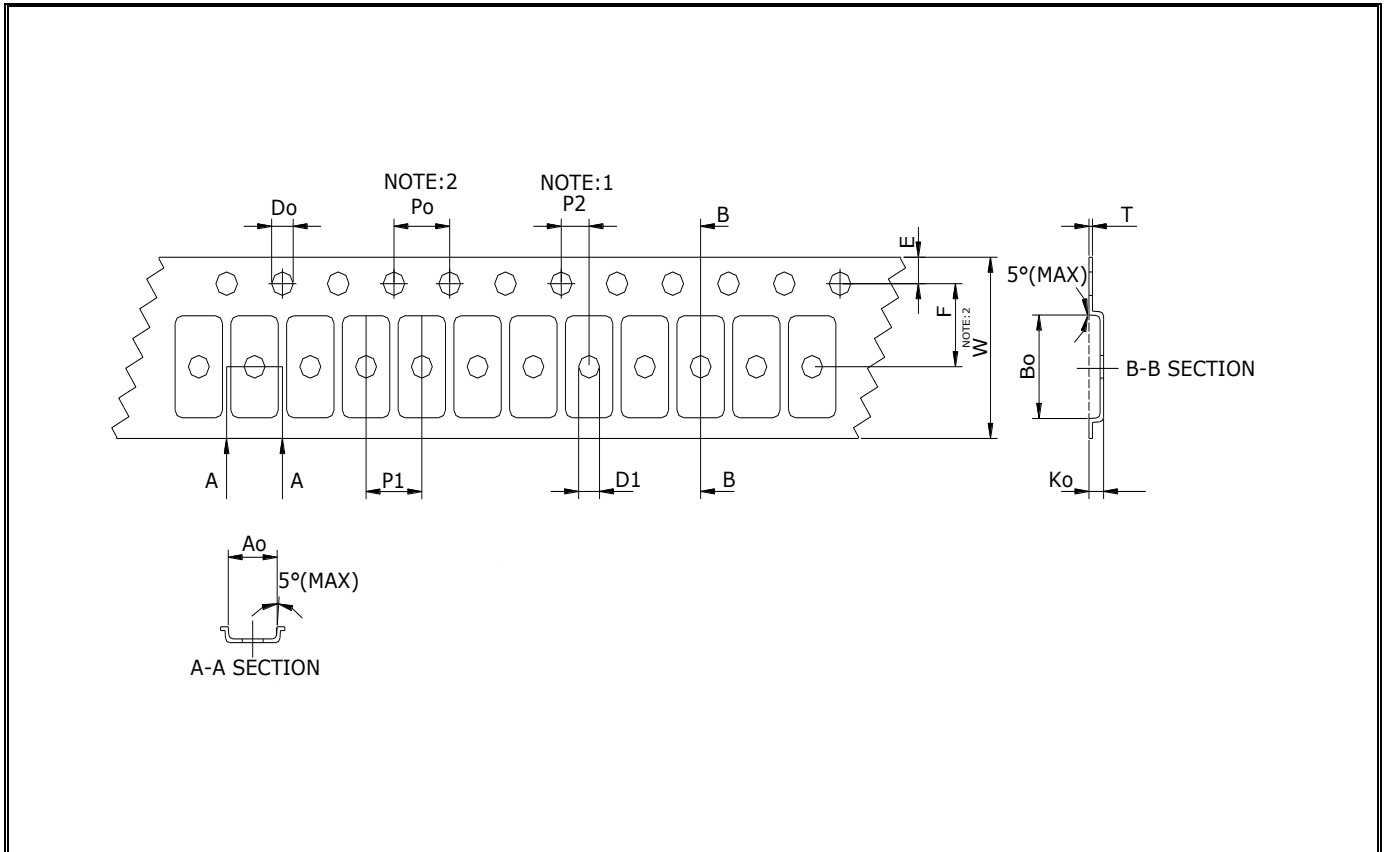
Unit: mm

| TYPE | a (mm) | b (mm) | c (mm) |
|--------------|--------|--------|--------|
| 0.1mΩ~0.25mΩ | 6.8 | 1.4 | 0.6 |
| 0.3mΩ~0.4mΩ | 6.8 | 0.9 | 1.6 |
| 0.5mΩ~1mΩ | 6.8 | 0.9 | 1.6 |
| 1.5mΩ | 6.8 | 1.4 | 0.6 |
| 2mΩ | 6.8 | 1.2 | 1.0 |
| 2.5mΩ~3mΩ | 6.8 | 0.9 | 1.6 |

*Dimensions are for reference only.

PACKAGING

EMBOSS PLASTIC TAPE SPECIFICATIONS



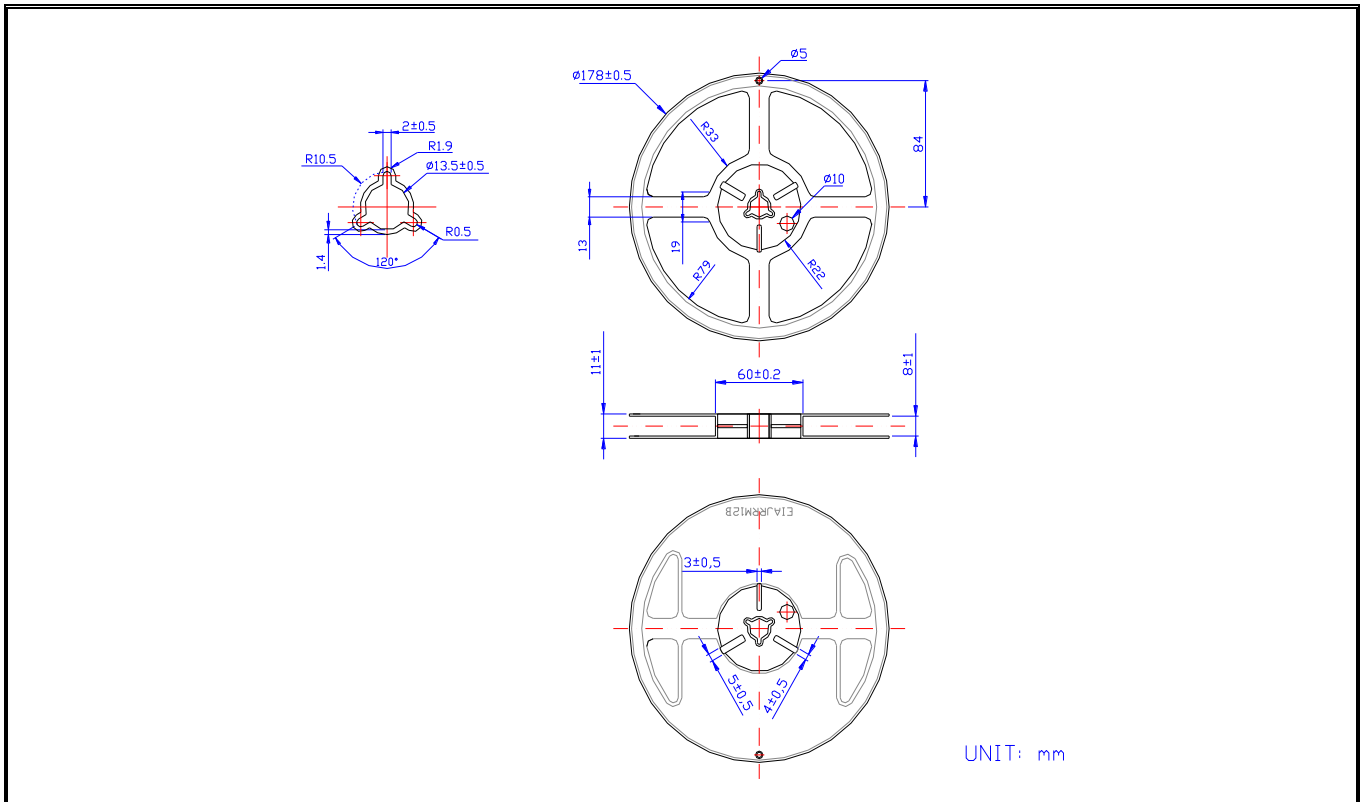
Unit : mm

| | | | | | | | |
|--------|----------|----------|-----------|-----------|----------|----------|----------|
| Symbol | Ao | Bo | Ko | Po | P1 | P2 | T |
| Spec. | 3.4±0.1 | 6.75±0.1 | 0.80±0.1* | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 0.25±0.1 |
| Symbol | E | F | Do | D1 | W | 10Po | |
| Spec. | 1.75±0.1 | 5.5±0.05 | 1.55±0.05 | 1.5 (min) | 12.0±0.3 | 40.0±0.2 | |

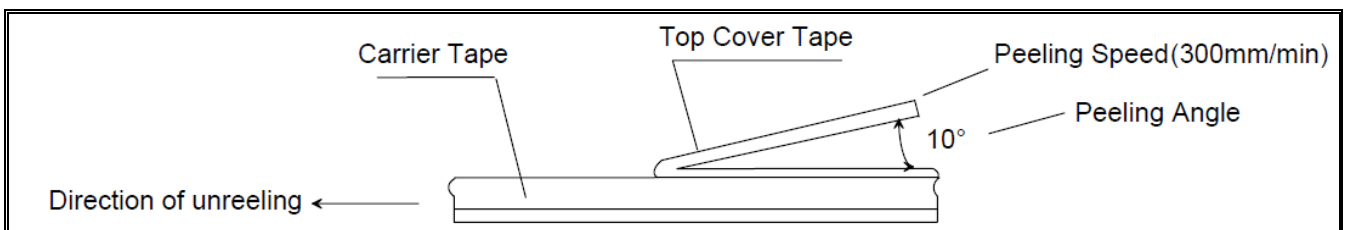
Note:

1. * For 0.1mΩ~0.4mΩ, Ko=1.4mm±0.1
2. The cumulative tolerance of 10 sprocket hole pitch is ±0.12mm.
3. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
4. Ao & Bo measured 0.3mm from the bottom of the packet to top surface of carrier
5. Ko measured at a point on the inside bottom of the packet to the top surface of the carrier.
6. Pocket position relative to sprocket hole is measured as the true position of the pocket and not the pocket hole
7. Material: Conductive Polystyrene. Color: Transparent

REEL SPECIFICATIONS



PEEL FORCE



The cover tape shall have a total peel strength of from 0.1N to 1.3N (10g to 130g calibrated scale reading) for 8mm carrier tapes and the direction of pull shall be opposite the direction of carrier tape travel such that the cover tape makes an angle of between 165 and 180 degrees with the top of the carrier tape. The cover tape, shall be pulled with a velocity of 300mm±10 mm/min, relative to the carrier tape, during peeling, which results in the cover/carrier tape seal being separated at a rate of 150mm/min.

STORAGE NOTES

Ideal storage conditions are from 10 to 30°C, avoiding temperature changes greater than 10°C in a 24 hour period, and 30 to 60% RH. Chemical fumes, sulphur-bearing gases and particulate air pollution should not be present. Original packaging should remain intact until first use. It is recommended that solderability and resistance be checked after a year in storage.