



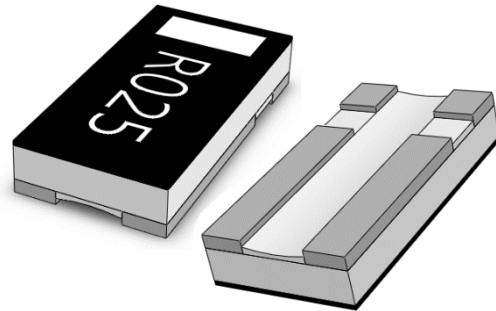
**THE DATASHEET OF
RL1632T4F-0R5M-FNH**



RL1632T4F Series Current Sensor Resistor (Lead / Halogen Free)

Features / Applications :

- Power rating is up to 1W
- Low TCR current sensor
- Low thermal EMF ($< 3 \mu\text{V}/^\circ\text{C}$)
- Resistors are ideal for all types of current sensing
- Metal film construction; Excellent long-term stability
- Moisture sensitivity level: MSL 1
- RoHS compliant



Electrical Specifications :

| Characteristics ¹ | Feature |
|---|---|
| Power Rating ² | 1 W |
| Resistance Value(m Ω) | 10 to 250 |
| Temperature Coefficient of Resistance(ppm/ $^\circ\text{C}$) | ± 200 |
| Operation Temperature Range | -55°C to $+125^\circ\text{C}$ |
| Maximum Working Voltage (V) | $(P \cdot R)^{1/2}$ |

Note :

1. For detailed information see table on page 3
2. For sensors operated at ambient temperature in excess of 70°C , the maximum load shall be derated in accordance with the following curve.

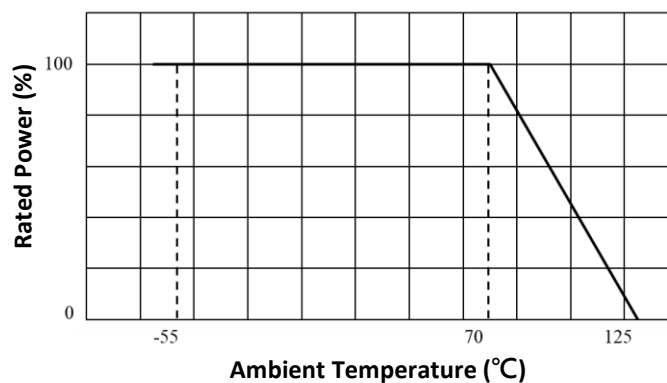
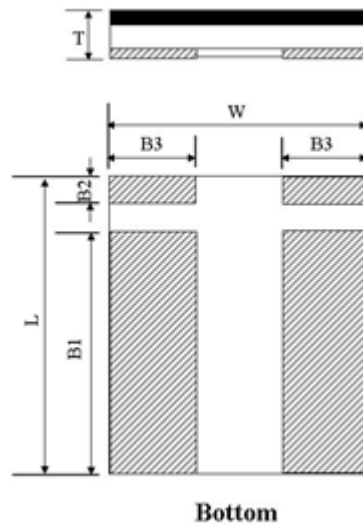


Figure 1. : Power Temperature Derating Curve

Outline Drawing :

Dimensions and schematic :



| Resistance Range(mΩ) | L | W | B1 | B2 | B3 | T |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 10 to 250 | 3.20 ± 0.25 | 1.60 ± 0.25 | 2.05 ± 0.20 | 0.65 ± 0.20 | 0.45 ± 0.20 | 0.50 ± 0.20 |

(Unit : mm)

Type Designation :

RL 1 6 3 2 T 4 F - □□□□ - □NH

(1) (2) (3) (4)

Note :

- (1) Series No.
- (2) Size(T4F = 4 – terminal)
- (3) Resistance value : 0R5m = 0.5mΩ ; R002 = 2mΩ ; R010 = 10mΩ
- (4) Tolerance : ±0.1%(B), ±0.5%(D), ±1%(F), ±2%(G)

Available standard resistance values :

| Resistance Values | Tolerance | | | |
|-------------------|-----------|-------|-------|-------|
| | ±0.1% | ±0.5% | ±1.0% | ±2.0% |
| R010 | | ✓ | ✓ | ✓ |
| R014 | | ✓ | ✓ | ✓ |
| R015 | | ✓ | ✓ | ✓ |
| R020 | | ✓ | ✓ | ✓ |
| R025 | | ✓ | ✓ | ✓ |
| R030 | | ✓ | ✓ | ✓ |
| R040 | | ✓ | ✓ | ✓ |
| R050 | | ✓ | ✓ | ✓ |
| R060 | | ✓ | ✓ | ✓ |
| R075 | | ✓ | ✓ | ✓ |
| R100 | ✓ | ✓ | ✓ | ✓ |
| R200 | | ✓ | ✓ | ✓ |
| R250 | | ✓ | ✓ | ✓ |

✓ = available

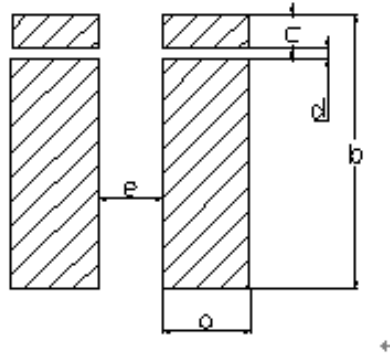
Further values and tolerances on request.

Reliability Performance :

| Test Item | Condition of Test | Requirements |
|---------------------------|--|---|
| Short Time Overload | 2.5 * rated power for 5 seconds Refer to JIS C 5201-1 4.13 | $\Delta R : \pm 1.0\%$ |
| Thermal Shock | -55 ~125°C 5 cycles, 15 min at each extreme condition Refer to JIS C 5201-1 4.19 | $\Delta R : \pm 2.0\%$ |
| Low Temperature Storage | Kept at -55°C, 1,000 hours Refer to JIS C 5201-1 4.23.4 | $\Delta R : \pm 2.0\%$ |
| High Temperature Exposure | Kept at 125°C for 1,000 hours Refer to JIS C 5201-1 4.23.2 | $\Delta R : \pm 2.0\%$ |
| Solderability | Temperature of Solder : 245 ± 5°C Immersion Duration : 3 ± 0.5 seconds Refer to JIS C 5201-1 4.17 | Uniform coating of solder cover minimum of 95% surface being immersed |
| Load Life | Rated voltage for 1.5hours followed by a pause 0.5hour at 70 ± 3°C. Cycle repeated 1000 hours Refer to JIS C 5201-1 4.25 | $\Delta R : \pm 2.0\%$ |
| Damp Heat with Load | 40 ± 2°C with relative humidity 90% to 95%. Cycle repeated 1,000 hours Refer to JIS C 5201-1 4.24 | $\Delta R : \pm 2.0\%$ |
| Mechanical Shock | 100 G's for 6milliseconds. 5 pulses Refer to JIS C 5201-1 4.21 | $\Delta R : \pm 0.5\%$ |
| Bending Test | Glass-Epoxy board thickness : 1.6mm Bending width : 2mm Between the fulcrums : 90mm Refer to JIS C 5201-1 4.33 | $\Delta R : \pm 0.5\%$ |
| Short Time Overload | 2.5 * rated power for 5 seconds Refer to JIS C 5201-1 4.13 | $\Delta R : \pm 1.0\%$ |

Note : Measurement at 24±4 hours after test conclusion for all reliability tests-parts.

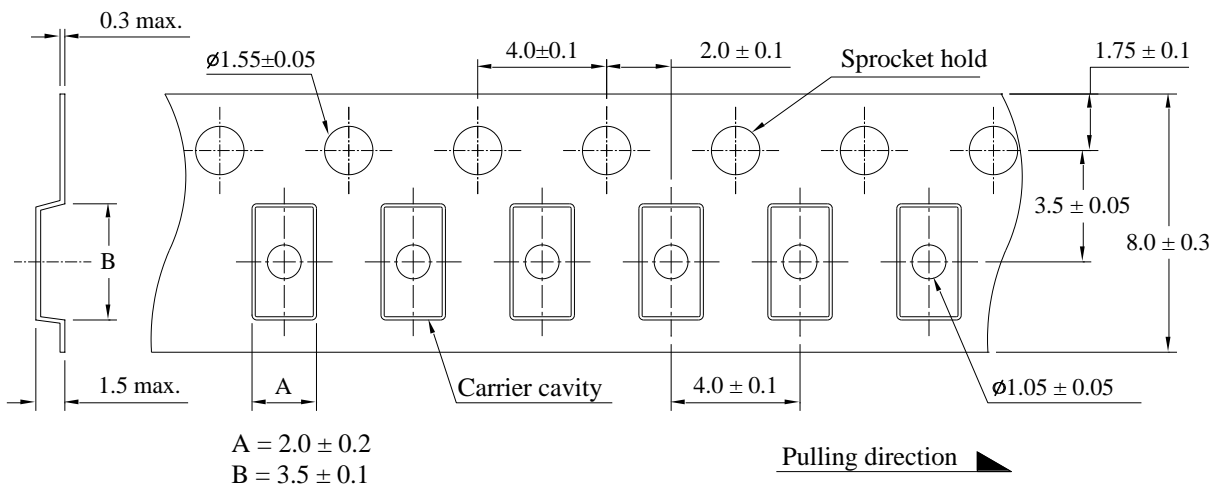
Recommend Solder Pad Dimensions :



| Dimensions (mm) | a | b | c | d | e |
|-----------------|-----|-----|-----|------|------|
| 10 to 250 mΩ | 1.0 | 3.5 | 0.8 | 0.38 | 0.75 |

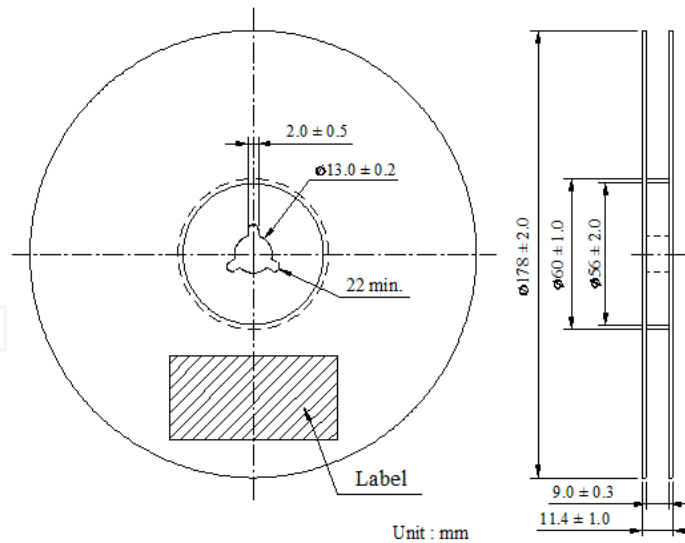
Packaging :

Tape packaging dimensions :



Unit : mm

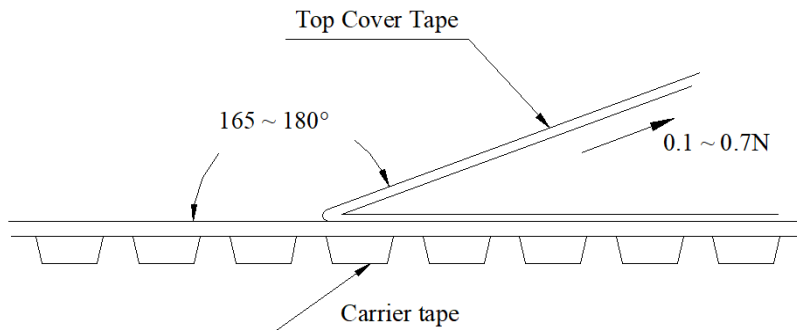
Reel dimensions :



Peel Strength of Top Cover Tape :

The peel speed shall be about 300mm/min.

The peel force of top cover tape shall between 0.1 to 0.7N



Number of Taping :

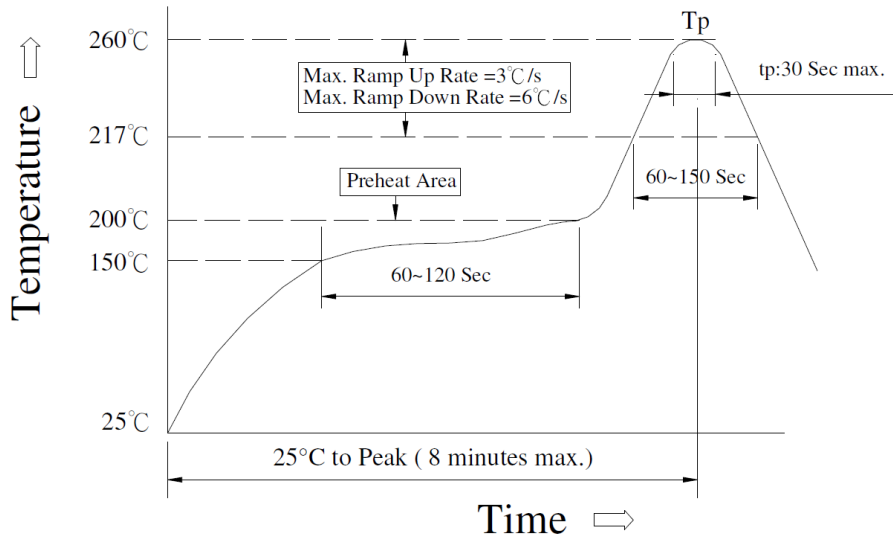
4,000 pieces / reel

Label Marking :

The following items shall be marked on the reel.

- (1) Type designation
- (2) Quantity
- (3) Manufacturing date code
- (4) Manufacturer's name
- (5) The country of origin

Recommend Soldering Conditions:



Meet JEDEC-020D

(1) Reflow Soldering Method :

| | |
|-------------------------------|---------------------------------------|
| Reflow Soldering | Tp:255 to 260°C Max.30 seconds (Tp) |
| | 217°C 60 to 150 seconds |
| Pre-Heat | 150 to 200°C 60 to 120 seconds |
| Time 25°C to peak temperature | 8 minutes max |

(2) Soldering Iron Method : 350± 5°C max.3 seconds

Care Note :

Care note for storage

- (1) Current sensor shall be stored in a environment where temperature and humidity must be controlled (temperature 5 to 40°C, humidity 30 to 80% RH) . However, the humidity should be maintained as low as possible.
- (2) Current sensor shall not be stored under direct sunlight.
- (3) Current sensor shall be stored in condition without moisture, dust, any material defect solderability, or hazardous gas (i.e. Chlorination hydrogen, sulfurous acid gas, and sulfuration hydrogen)
- (4) The sensor can be stored for at least one year under the condition mentioned above.

Care note for operating and handling

- (1) It is necessary to protect the edge and protection coat of resistors from mechanical stress.
- (2) Handle with care when printing circuit board (PCB) is divided or fixed on support body, because bending of printing circuit board (PCB) mounting will make mechanical stress for resistors.
- (3) Resistors shall be used with in rated range shown in specification. Especially, if voltage more than specified value will be loaded to resistor, there is a case it will make damage for machine because of temperature rise depending on generating of heat, and increase resistance value or breaks.
- (4) In case that resistor is loaded a rated voltage, it is necessary to confirms temperature of a resistor and to reduce a load power according to load reduction curve, because a temperature rise of a resistor depends on influence of heat from mounting density and neighboring element.
- (5) Observe Limiting element voltage and maximum overload voltage specified in each specification
- (6) If there is possibility that a large voltage (pulse voltage, shock voltage) charge to resistor, it is necessary that operating condition shall be set up before use.

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