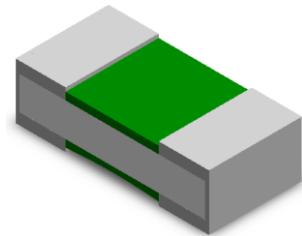


## RL-1005-7 Series Current Sensor Resistor (Lead / Halogen Free)

### Features / Applications :

- Power rating is up to 1/6W
- Low TCR current sensor
- 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 <sup>1</sup>	Feature	
Power Rating <sup>2</sup>	1/6 W	
Resistance Value(mΩ)	20 to 69	70 to 1000
Temperature Coefficient of Resistance(ppm/°C)	0 to 500	± 100
Operation Temperature Range	-55°C to +125°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.

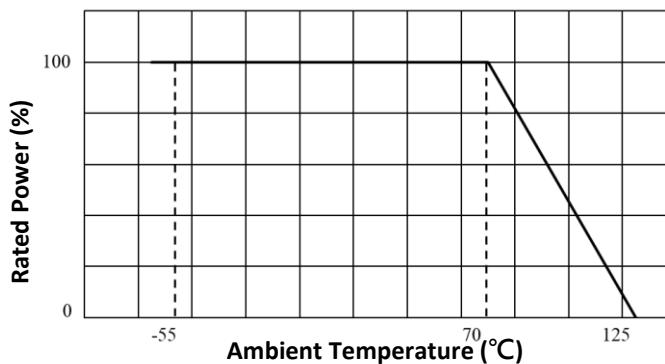
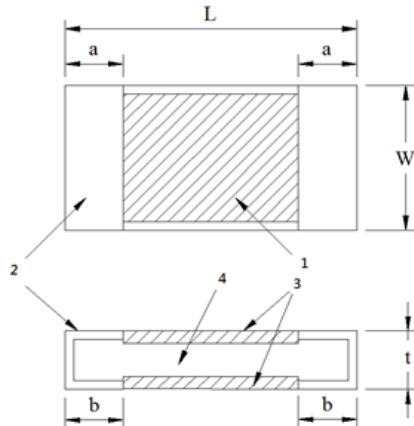


Figure 1. : Power Temperature Derating Curve

## Outline Drawing :

### Dimensions and schematic :



- (1) Resistive element(Under protection film)
- (2) Electrode
- (3) Protection film
- (4) Substrate

Resistance Range(mΩ)	L	W	a	b	t
20 to 1000	1.00±0.10	0.50 ± 0.10	0.25 ± 0.10	0.25 ± 0.10	0.35 <sup>+0.15</sup> <sub>-0.10</sub>

(Unit : mm)

## Type Designation :

R L - 1 0 0 5 - 7 - □□□□ - □NH

(1) (2) (3) (4) (5)

### Note :

- (1) Series No.
- (2) Size
- (3) Power Rating :  $7 = 1/6W$
- (4) Resistance value :  $0R5m = 0.5m\Omega$  ;  $R002 = 2m\Omega$  ;  $R010 = 10m\Omega$
- (5) Tolerance :  $\pm 1\% (F)$ ,  $\pm 2\% (G)$ ,  $\pm 5\% (J)$

## Available standard resistance values :

Resistance Values	Tolerance		
	±1.0%	±2.0%	±5.0%
R020	✓	✓	✓
R025	✓	✓	✓
R040	✓	✓	✓
R050	✓	✓	✓
R060	✓	✓	✓
R068	✓	✓	✓
R070	✓	✓	✓
R075	✓	✓	✓
R100	✓	✓	✓
R150	✓	✓	✓
R180	✓	✓	✓
R200	✓	✓	✓
R220	✓	✓	✓
R240	✓	✓	✓
R250	✓	✓	✓
R300	✓	✓	✓
R333	✓	✓	✓
R400	✓	✓	✓
R425	✓	✓	✓
R470	✓	✓	✓
R475	✓	✓	✓
R500	✓	✓	✓
R510	✓	✓	✓
R549	✓	✓	✓
R600	✓	✓	✓
R620	✓	✓	✓
R680	✓	✓	✓

✓ = available

Further values and tolerances on request.

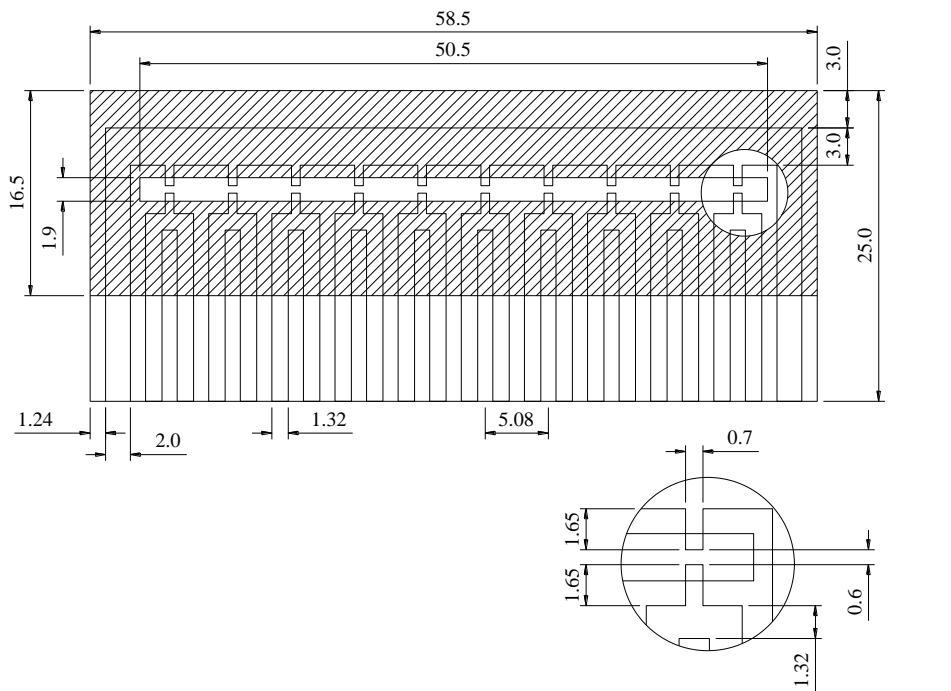
Resistance Values	Tolerance		
	±1.0%	±2.0%	±5.0%
R820	✓	✓	✓
1R00	✓	✓	✓

## Reliability Performance :

Test Item	Condition of Test	Requirements
Short Time Overload	2.5 x Rated power for 5 seconds Refer to JIS C 5201-1 4.13	ΔR : ± 0.5%
Thermal Cycling	-55 to 125°C 100 cycles, 15 min at each extreme condition Refer to JIS C 5201-1 4.19	ΔR : ± 1.0%
Low Temperature Storage	Kept at -55°C, 1000 hours Refer to JIS C 5201-1 4.23.4	ΔR : ± 1.0%
Resistance to Soldering Heat	Dipped into solder at 260 ± 5°C for 10 ± 1 seconds Refer to JIS C 5201-1 4.18	ΔR : ± 1.0%
Load Life	Rated voltage for 1.5 hours followed by a pause 0.5 hour at 70 ± 3°C Cycle repeated 1000 hours Refer to JIS C 5201-1 4.25	ΔR : ± 1.0%
Damp Heat with Load	60 ± 2°C with relative humidity 90% to 95%. D.C. rated voltage for 1.5 hours ON and 30 minutes OFF. Cycle repeated 1,000 hours Refer to JIS C 5201-1 4.24	ΔR : ± 1.0%
High Temperature Exposure	Kept at 125°C for 1000 hours Refer to JIS C 5201-1 4.23.2	ΔR : ± 1.0%
Solderability	Temperature of Solder : 245 ± 5°C Immersion Duration : 3 ± 0.5 second Refer to JIS C 5201-1 4.17	Uniform coating of solder cover minimum of 95% surface being immersed
Mechanical Shock	100 G's for 6 milliseconds. 5 pulses Refer to JIS C 5201-1 4.21	ΔR : ± 0.5%
Substrate Bending	Glass-Epoxy board thickness : 1.6mm Bending width : 2mm Between the fulcrums : 90mm Refer to JIS C 5201-1 4.33	ΔR : ± 0.5%

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

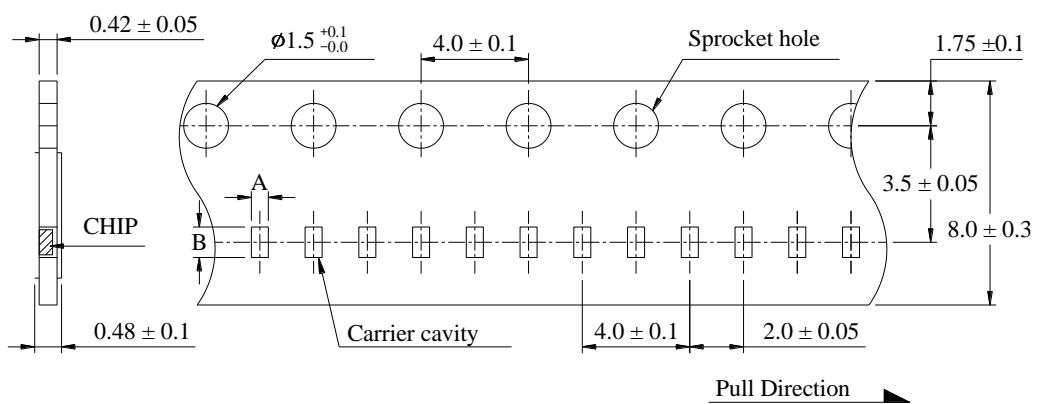
## Recommend Solder Pad Dimensions :



Unit : mm

## Packaging :

### Tape packaging dimensions :

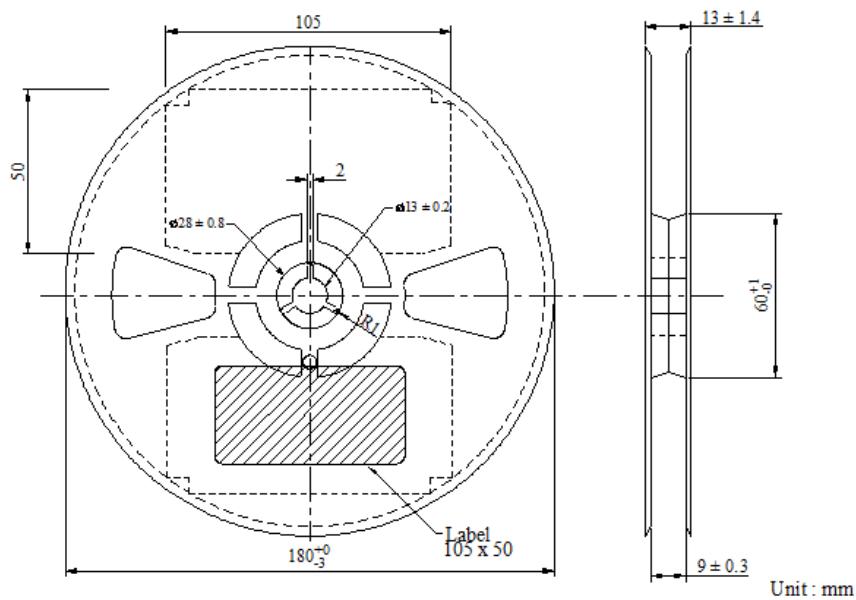


※ Pre-empted holes : 150 holes (or 30cm) or more.

Code letter	a	b
Dimension	$0.68 \pm 0.05$	$1.18 \pm 0.05$

Unit : mm

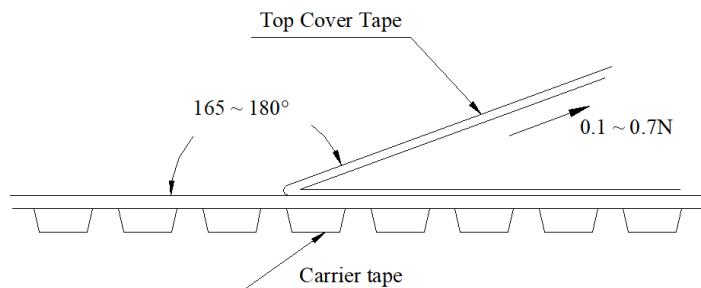
## Reel dimensions :



## 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 :

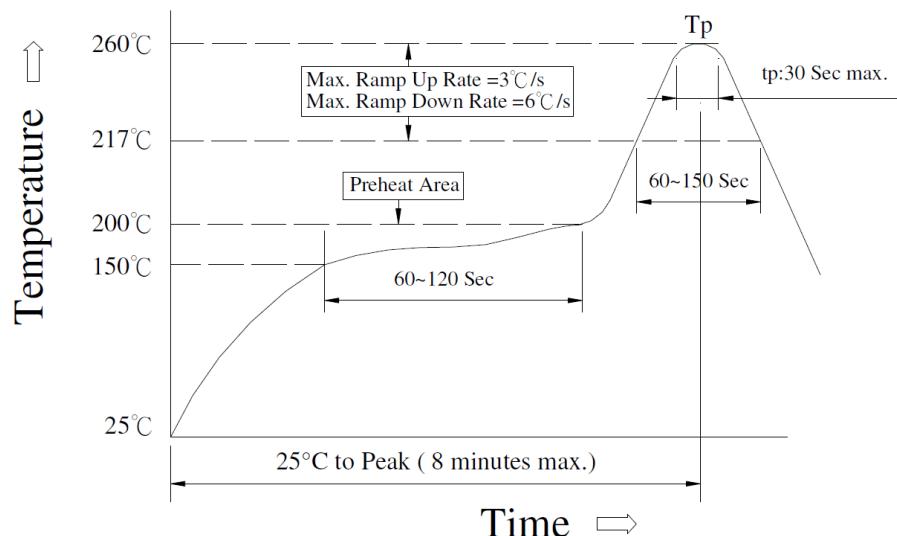
10,000 pieces / reel

## 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.