

1/2W, 1206, Low Resistance Chip Resistor (Lead free / Halogen Free)

1. Scope

This specification applies to 3.2mm x 1.6mm size 1/2W, fixed thick film low resistance value chip resistors rectangular type.

2. Type Designation

RLT1632 - 4 -

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

Where

(1) Size No.

(2) Power Rating:

4 = 1/2W

(3) Resistance value: Refer to paragraph 4-1

For example --

Four digits of number

R100 = 0.1Ω

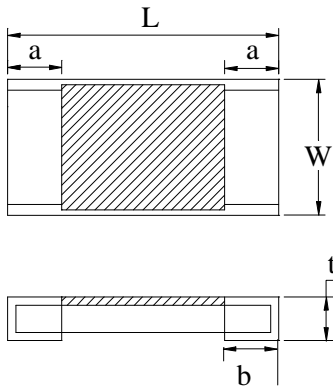
1R00 = 1.0Ω

The "R" shall be used as a decimal point

(4) Resistance tolerance:

F = ±1.0%, G = ±2%, J = ±5%

3. Outline Dimensions



| Code Letter | Dimension |
|-------------|-------------|
| L | 3.20 ± 0.20 |
| W | 1.60 ± 0.20 |
| t | 0.60 ± 0.10 |
| a | 0.50 ± 0.25 |
| b | 0.50 ± 0.25 |

Unit : mm

UNLESS OTHERWISE SPECIFIED
TOLERANCES ON :
X = ±
X.X = ±
X.XX = ±
ANGLES ± HOLE DIA. ±

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4. Ratings

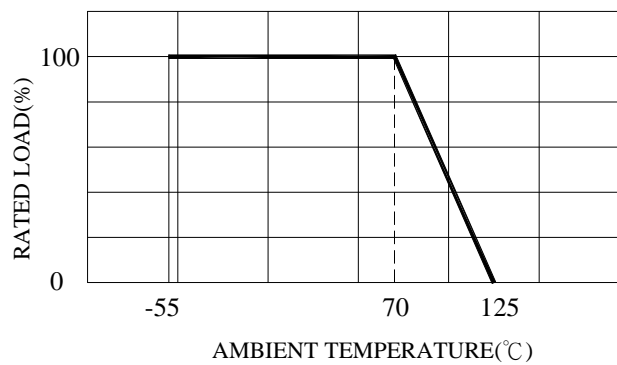
4-1 Specification

Table 1

| | | |
|---|---------------------|-------------|
| Power Rating* | 1/2 W | |
| Resistance Tolerance | 1%(F), 2%(G), 5%(J) | |
| Resistance Range | 0.05Ω ~ <0.1Ω | 0.1Ω ~ <10Ω |
| Temperature Coefficient of Resistance(ppm/°C) | 0 ~ +250 | 0 ~ +200 |

Note*:

Power Rating is based on continuous full load operation at rated ambient temperature of 70°C. For resistor operated at ambient temperature in excess of 70°C, the maximum load shall be derated in accordance with the following curve.



4-2 Rated Voltage

The d.c. or a.c. r.m.s. voltage shall be calculated from the following expression

$$V = \sqrt{P \times R}$$

Where V : Rated voltage (V)

P : Rated power (W)

R : Nominal resistance (Ω)

4-3 Operating and Storage Temperature Range

-55 to +125°C

| | | | |
|---|--------------------------|--------------|--|
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5. Marking

Each Resistor is marked with 4 digits code on the protective coating to designate to the nominal resistance value.

$0.05 \leq R < 10\Omega$, Marking 4 digits

EX) $0.05\Omega \rightarrow \boxed{R050}$, $0.1\Omega \rightarrow \boxed{R100}$
 $4.7\Omega \rightarrow \boxed{4R70}$, $10\Omega \rightarrow \boxed{10R0}$

6. Characteristics

6-1 Electrical

| Item | Specification and Requirement | Test Method (JIS 5201) |
|---|--|--|
| Temperature Coefficient of Resistance(ppm/°C) | As follow table 1. | Room temperature Room temperature +100°C |
| Short Time Overload | $\Delta R: \pm 1.0\%$ Without damage by flashover, spark, arcing, burning or breakdown | (1) Applied voltage: 2.5 x rated voltage (2) Test time: 5 seconds |
| Insulation Resistance | Over 100 M Ω on Overcoat layer face up Over 1,000 M Ω on Substrate side face up | (1) Setup as figure 1 (2) Test voltage: 100V _{DC} ±15V _{DC} (3) Test time: 60 + 10 / - 0 seconds |
| Voltage Proof | Resistance range:±1.0% Without damage by flashover, spark, arcing, burning or breakdown | (1) Setup as figure 1 (2) Test voltage: 400V _{AC} (rms.) (3) Test time: 60 + 10 / - 0 seconds |

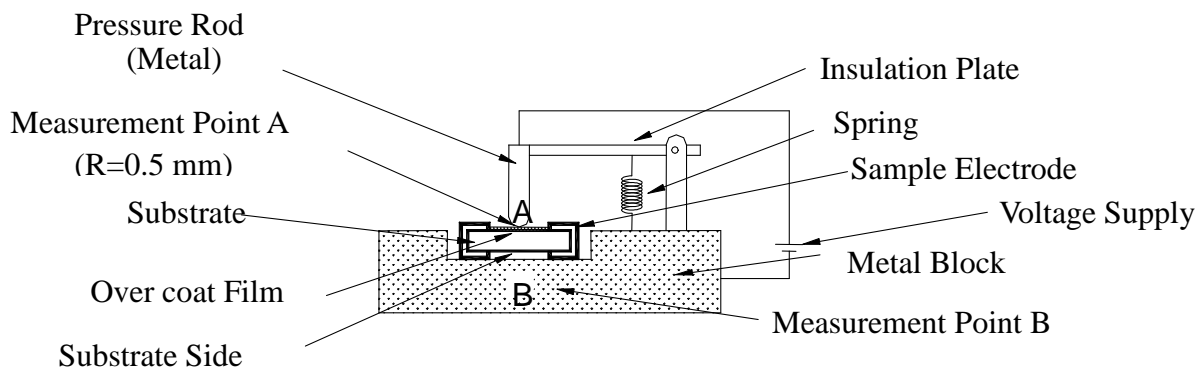


Figure 1 : Measurement Setup

| | | | |
|---|--------------------------|-------------|--|
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6-2 Mechanical

| Item | Specification and Requirement | Test Method (JIS 5201) |
|---------------------------|---|---|
| Solderability | The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder | Solder bath: After immersing in flux, dip in $245 \pm 5^{\circ}\text{C}$ molten solder bath for 2 ± 0.5 seconds |
| Resistance to Solder Heat | Δ R: $\pm 1.0\%$ Without distinct deformation in appearance | (1) Pre-heat: $100\sim 110^{\circ}\text{C}$ for 30 seconds (2) Immersed at solder bath of $270 \pm 5^{\circ}\text{C}$ for 10 ± 1 seconds (3) Measuring resistance 1 hour after test |
| Bending Test | Δ R: $\pm 1.0\%$ Without mechanical damage such as break | Bending value: 3 mm for 30 ± 1 seconds |
| Solvent Resistance | Without mechanical and distinct damage in appearance | (1) Solvent: Trichloroethane or Isopropyl alcohol (2) Immersed in solvent at room temperature for 300 seconds |

| | | | |
|---|--------------------------|--|---------------------------------------|
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6-3 Endurance

| Item | Specification and Requirement | Test Method (JIS 5201) |
|-----------------------------|--|--|
| Rapid Change of Temperature | △ R:±1.0% Without distinct damage in appearance | (1) Repeat 5 cycle as follow: (-55 ± 3°C, 30minutes) →(Room temperature, 2~3 minutes) →(+125 ± 2°C, 30minutes) →(Room temperature 2~3 minutes) (2) Measuring resistance 1 hour after test |
| Moisture with Load | △ R: ±5.0% Without distinct damage in appearance | (1) Environment condition: 40 ± 2°C, 90~95% RH (2) Applied Voltage: rated voltage (3) Test period: (1.5 hour ON) →(0.5 hour OFF) cycled for total 1,000 + 48 / - 0 hours (4) Measuring resistance 1 hour after test |
| Load Life | △ R: ±5.0% Without distinct damage in appearance | (1) Test temperature: 70 ± 3°C (2) Applied Voltage: rated voltage (3) Test period: (1.5 hour ON) →(0.5 hour OFF) cycled for total 1,000 + 48 / - 0 hours (4) Measuring resistance 1 hour after test |
| Low Temperature Store | △ R: ± 5.0% Without distinct damage in appearance | (1) Store temperature: -55 ± 3°C for total 1,000 + 48 / - 0 hours (2) Measuring resistance 1 hour after test |
| High Temperature Store | △ R: ± 5.0% Without distinct damage in appearance | (1) Store temperature: +125 ± 2°C for total 1,000 + 48 / - 0 hours (2) Measuring resistance 1 hour after test |

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X = ±
X.X = ±
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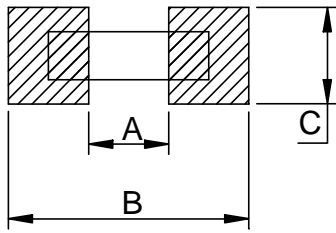
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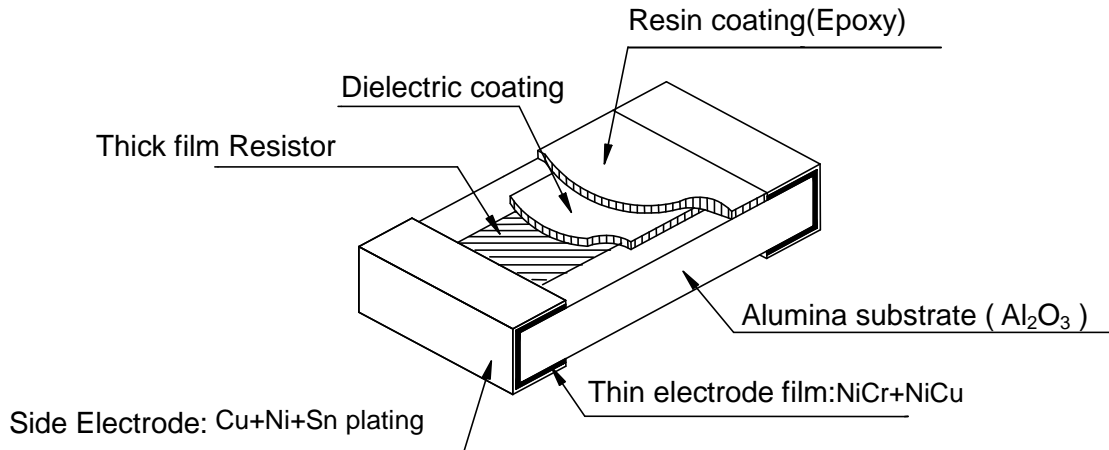
7. Recommend Land Pattern Dimensions



| | |
|---|---------|
| A | 2.2~2.6 |
| B | 4.4~4.8 |
| C | 1.8~2.4 |

Unit : mm

8. Construction Drawing



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 TOLERANCES ON :
 X = ±
 X.X = ±
 X.XX = ±
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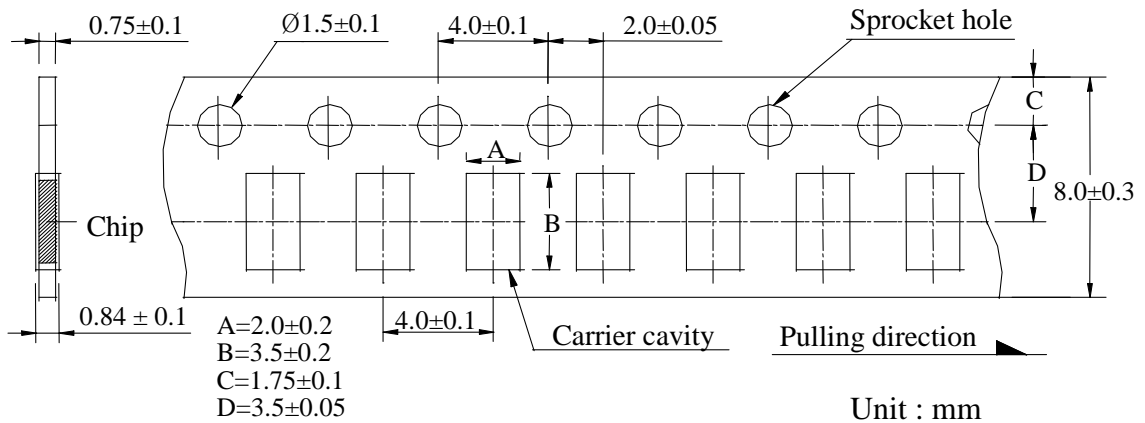
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9. Packaging

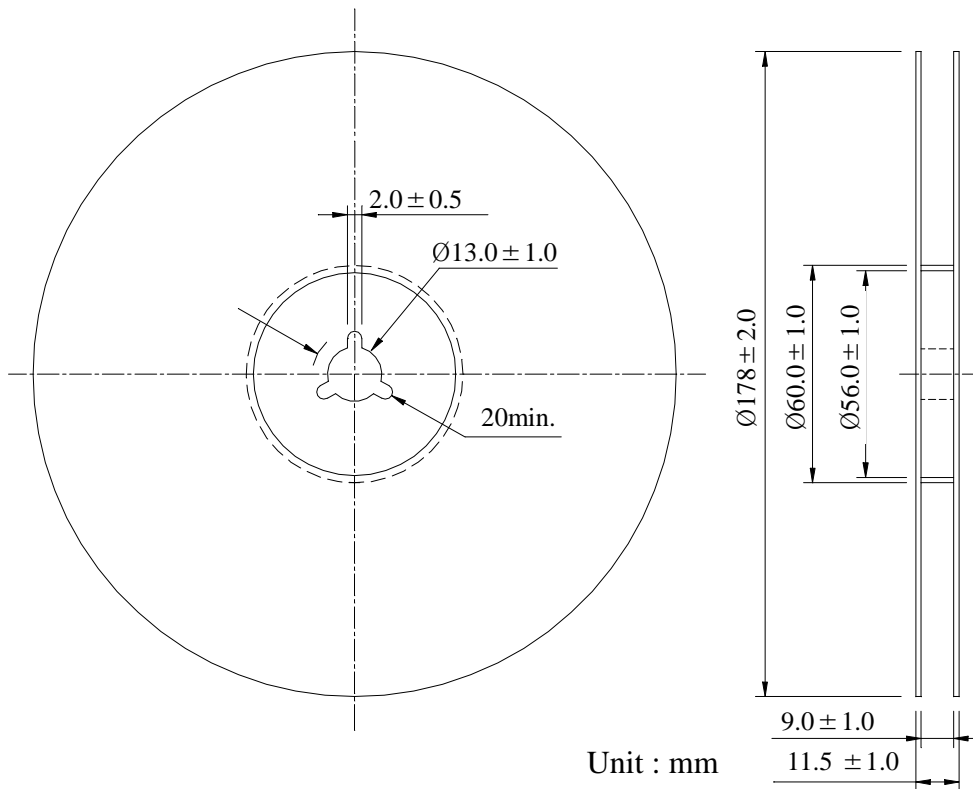
9-1 Dimensions

9-1-1 Tape packaging dimensions



Remark: Leader tape length \geq 30 cm(150 Hollow carrier cavity)

9-1-2 Reel dimensions



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X = \pm
X.X = \pm
X.XX = \pm
ANGLES \pm HOLE DIA. \pm

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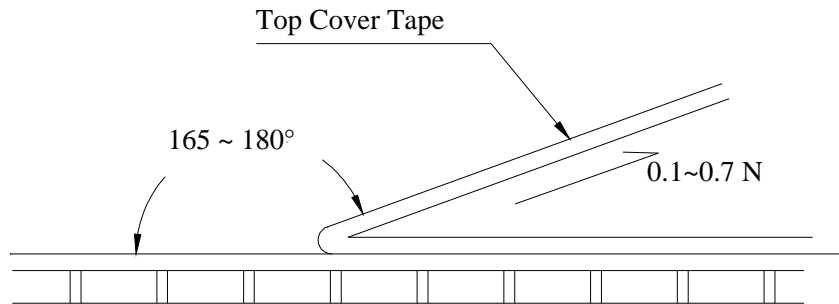
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9-2 Peel force of top cover tape

The peel speed shall be about 300 mm/min.

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



9-3 Numbers of taping 5,000 pieces /reel

9-4 Label making

The following items shall be marked on the reel.

- (1) Type designation.
- (2) Quantity
- (3) Manufacturing date code
- (4) Manufacturer's name

| | | | |
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10. Carenote

10-1 Care note for storage

- (1) Chip resistor shall be stored in a room where temperature and humidity must be controlled. (temperature 5 to 35°C, humidity 45 to 85% RH) However, a humidity keep it low, as it is possible.
- (2) Chip resistor shall be stored as direct sunshine doesn't hit on it.
- (3) Chip resistor shall be stored with no moisture, dust, a material that will make solderability inferior, and a harmful gas (Chloridation hydrogen, sulfurous acid gas, and sulfuration hydrogen)

10-2 Carenote 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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