

1/4W 1632 LOW RESISTNACE CHIP RESISTOR

1. Scope

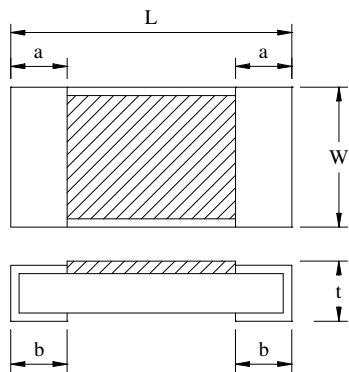
This specification applies to 1.6mm x 3.2mm size 1/4W, fixed metal film low resistance value chip resistors rectangular type.

2. Type Designation

RLT 1632 - 3 - □□□□ - □ N
(1) (2) (3) (4) (5)

- Where
- (1) Size No.
 - (2) Power ranting :
3 = 1/4W
 - (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: refer to paragraph 4-1.
 - (5) N = Sn plating (Lead free , RoHS compliant)

3. Outline Dimensions



Code Letter	Dimension (mm)
	1632
L	$3.20^{+0.05}_{-0.2}$
W	$1.60^{+0.05}_{-0.15}$
t	0.60 ± 0.10
a	0.50 ± 0.25
b	0.50 ± 0.30

Figure 1.

4. Ratings

4-1 Specification

Power Rating*	1/4 W			
Resistance Values	E24 & E96 series		E24 series	
Resistance Tolerance	$\pm 1\%(F)$		$\pm 2\%(G)$, $\pm 5\%(J)$	
Resistance Range	$0.1\Omega \sim < 0.2\Omega$	$0.2\Omega \sim < 10\Omega$	$0.1\Omega \sim < 0.2\Omega$	$0.2\Omega \sim < 10\Omega$
Temperature Coefficient of Resistance (ppm/ $^{\circ}\text{C}$)	± 200	± 100	± 200	± 100

Note*:

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

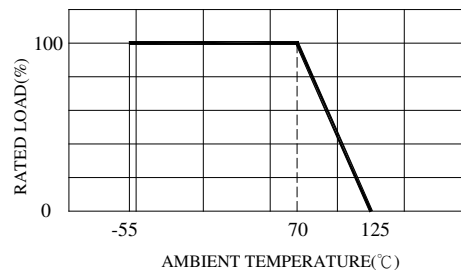


Figure 2 Derating Curve

4-2 Rated Voltage

The rated voltage shall be determined by the following expression.

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

Where V : Rated voltage (V)

R : Nominal resistance value (Ω)

P : Rated dissipation (W)

4-3 Operating and Storage Temperature Range

-55 to $+125^{\circ}\text{C}$

5. Marking

Each resistor is marked with a 3-digit or 4-digits code on the protective coating to designate the nominal resistance value.

(1) $0.1 \leq R < 10$, Marking by 3 or 4 digits

Ex) E-24 $0.47\Omega \rightarrow \boxed{R47}$, $4.7\Omega \rightarrow \boxed{4R7}$,
E-96 $4.99\Omega \rightarrow \boxed{4R99}$

(2) $R < 0.1$, Marking by 4 digits

Ex) E-24 $0.075\Omega \rightarrow \boxed{R075}$

6. Characteristics

6-1 Electrical

6-1-1 Resistance

Resistance value shall be within the tolerance specified in paragraph 4-1

Refer to IEC 60115-1 Sub-clause 4.5.

6-1-2 Temperature Coefficient of Resistance

Not exceed the temperature coefficient of resistance specified in paragraph 4-1

Room temperature \rightarrow Room temperature + 100°C

Refer to IEC 60115-1 Sub-clause 4.13.

6-1-3 Short Time Overload

Resistance Change : $\pm (2.0\% + 0.01\Omega)$

Without significant damage by flashover (spark ,arching),burning or breakdown etc.

Test voltage : 2.5 times the rated voltage.

Duration : 2 seconds

Refer to IEC 60115-1 Sub-clause 4.13.

6-1-4 Insulation Resistance

(1) Between Electrode and Protection Film

100M Ω or over

(2) Between Electrode and Substrate

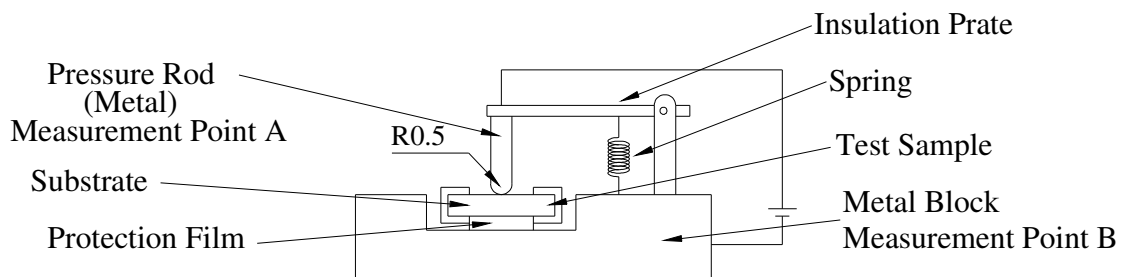
1,000M Ω or over

The resistor shall be cramped in the metal block and tested , as shown below.

Test voltage : 100V_{DC} \pm 15V_{DC}

Test time : 1 minute

Refer to IEC 60115-1 Sub-clause 4.6.



6-1-5 Voltage Proof

Resistance Change : \pm (2.0% + 0.01 Ω)

Without damage by flashover, fire or breakdown, as shown below.

The resistor shall be tested as shown in paragraph 4-1

The voltage : 400V_{AC} (rms.) for 1 minute

Refer to IEC 60115-1 Sub-clause 4.7.

6-2 Mechanical

6-2-1 Terminal Strength

Resistance Change : $\pm (1.0\% + 0.01\Omega)$

Without mechanical damage such as breaks.

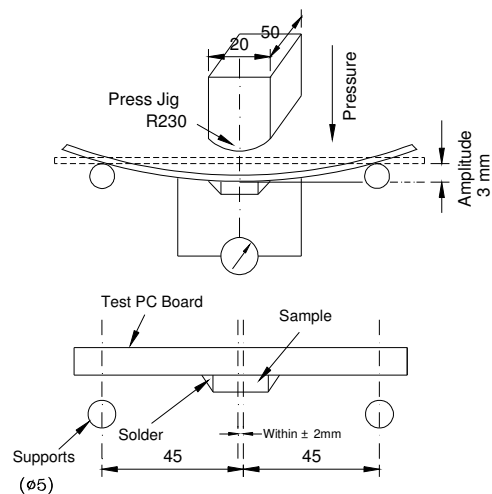
Electrical characteristics shall be satisfied.

If there are electrodes on both surfaces, it shall satisfy the above specifications on whichever surface may be fixated.

Bending Amplitude : 3 mm

Holding time : 10 ± 1 seconds

Refer to IEC 60115-1 Sub-clause 4.33.



Refer to EIAJ RC-2530

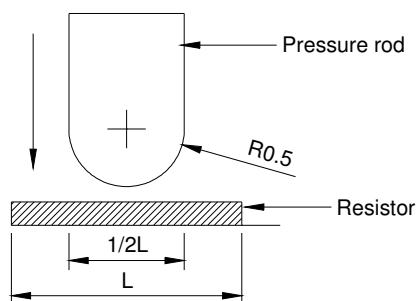
Unit : mm

6-2-2 Body Strength

Resistance Change : $\pm(1.0\% + 0.01\Omega)$

Without mechanical damage such as breaks.

A load of 5N using a R0.5 pressure rod shall be applied to the center in the direction of the arrow and held for 10 seconds.



Unit : mm

6-2-3 Solderability

A new uniform coating of solder shall cover minimum of 95% of the surface being immersed.

Temperature of solder : $245 \pm 5^{\circ}\text{C}$

Immersion duration : 3 ± 0.5 seconds

Refer to IEC 60115-1 Sub-clause 4.17.

6-2-4 Resistance to Soldering Heat

Resistance Change : $\pm (1.0\% + 0.01\Omega)$

Electrical characteristics shall be satisfied.

Without distinct deformation in appearance.

(1) Solder bath method

Pre-heat : 100 to 110°C 30 seconds

Temperature : $270 \pm 5^{\circ}\text{C}$ 10 ± 1 seconds

(2) Reflow Soldering method

Peak temperature : $260 \pm 5^{\circ}\text{C}$ 10 seconds or less

Temperature : $220 \pm 5^{\circ}\text{C}$ 60 seconds max.

The heating apparatus shall be the upper-heated oven and temperature shall be the board surface temperature.

(3) Soldering iron method

Bit temperature : $350 \pm 5^{\circ}\text{C}$ $3 \pm 1/0$ seconds

The resistor shall be stored at standard atmospheric conditions for 1 hour, after which the measurements shall be made.

Refer to IEC 60115-1 Sub-clause 4.18.

6-2-5 Resistance to Solvent

Without mechanical damage and distinct damage in appearance.

Immersion cleaning

At normal temperature 300 seconds in Isopropyl Alcohol.

Refer to IEC 60115-1 Sub-clause 4.29.

6-3 Endurance

6-3-1 Rapid Change of Temperature

Resistance Change : $\pm (1.0\% + 0.01\Omega)$

Without distinct damage

Resistance shall be subjected to 5 cycles of the temperature cycle as following :

$-55 \pm 2^{\circ}\text{C}$, 30 minutes \rightarrow room temperature, 2 ~ 3 minutes

$\rightarrow +125 \pm 2^{\circ}\text{C}$, 30 minutes \rightarrow room temperature, 2 ~ 3 minutes

Refer to IEC 60115-1 Sub-clause 4.19.

6-3-2 Dump Heat with Load

Resistance Change : $\pm (1.0\% + 0.01\Omega)$

Without distinct damage

$60 \pm 2^{\circ}\text{C}$ with relative humidity of 90 to 95%

DC rated voltage for 1.5 hours on 0.5 hour off

1,000 + 48 / - 0 hours

6-3-3 Endurance at 70°C

Resistance Change : $\pm (3.0\% + 0.01\Omega)$

Without distinct damage

$70 \pm 3^{\circ}\text{C}$

DC rated voltage for 1.5 hours on 0.5 hour off

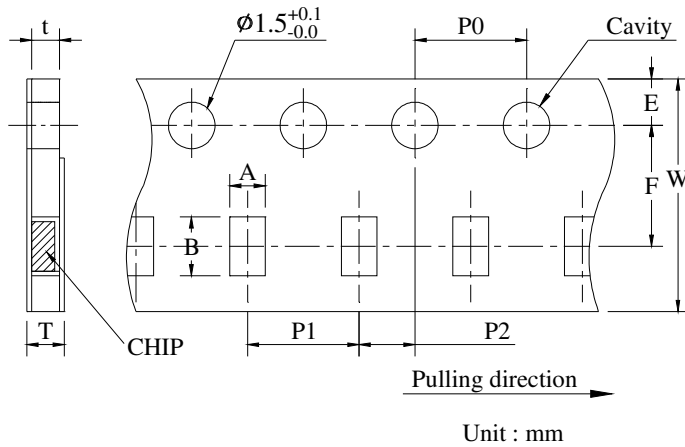
1,000 + 48 / - 0 hours

Refer to IEC 60115-1 Sub-clause 4.25.

7. Packaging

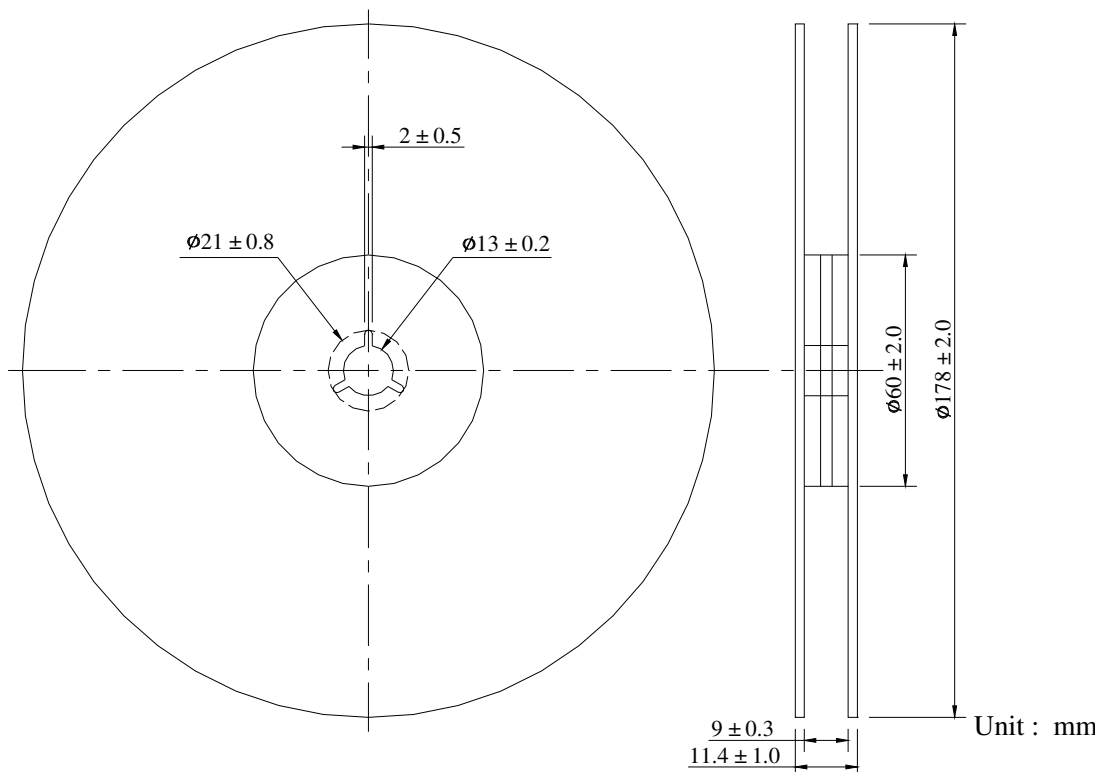
7-1 Dimensions

7-1-1 Tape packaging dimensions



Code	Dimensions (mm)
A	2.00 ± 0.20
B	3.50 ± 0.20
E	1.75 ± 0.1
F	3.5 ± 0.05
W	8.0 ± 0.3
P0	4.0 ± 0.1
P1	4.0 ± 0.1
P2	2.0 ± 0.05
T	1.40 max.
t	1.00 max.

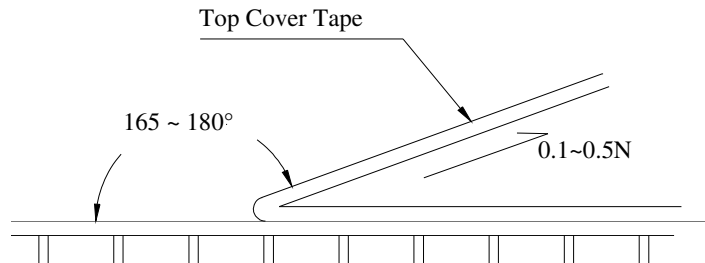
7-1-2 Reel Dimensions



7-2 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 0.5 N.



7-3 Numbers of taping

5,000 pieces/reel

7-4 Label marking

The following items shall be marked on single of the reel.

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