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

1. Scope

This specification applies to3.2mm 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

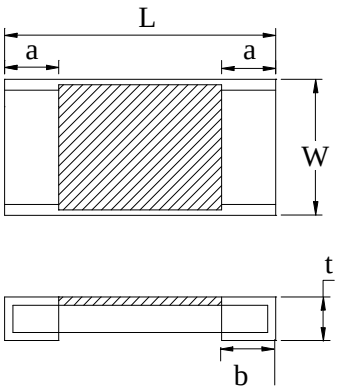
1R00 = 1.0Ω

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. ±	DRAWN BY : connie 4/3/13 DESIGNED BY : CHECKED BY : APPROVED BY : SCALE : X UNIT : X	台達電子工業股份有限公司 *Delta Electronics, Inc.* THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF Delta Electronics, Inc. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
TITLE : The Engineering Specification for RLT1632 1/2W Low Resistance Chip Resistor		DOCUMENT NO.	SRK540000NH PAGE REV. A1

4. Ratings

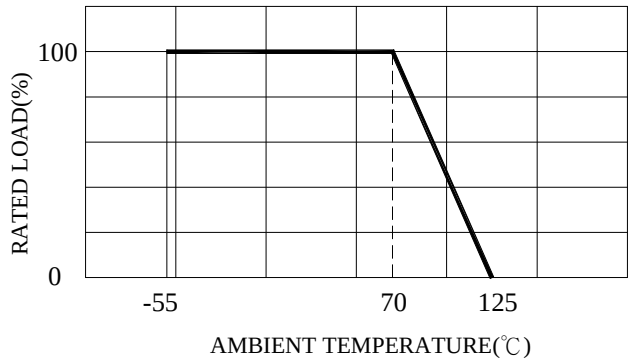
4-1 Specification

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/℃)	0 ~ +250	0 ~ +200

Note*:

Power Rating is based on continuous full load operation at rated ambient temperature of 70℃.
For resistor operated at ambient temperature in excess of 70℃,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℃

5. Marking

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

0.05 ≦ R ＜10Ω , Marking 4 digits

EX) 0.05Ω→ R050 , 0.1Ω → R100

4.7Ω → 4R70 , 10Ω → 10R0

6. Characteristics

6-1 Electrical

Item	Specification and Requirement	Test Method (JIS 5201)
Temperature Coefficient of Resistance(ppm/℃)	As follow table 1.	Room temperature Room temperature +100℃
Short Time Overload	△ R:±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 MΩ on Overcoat layer face up Over 1,000 MΩ 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

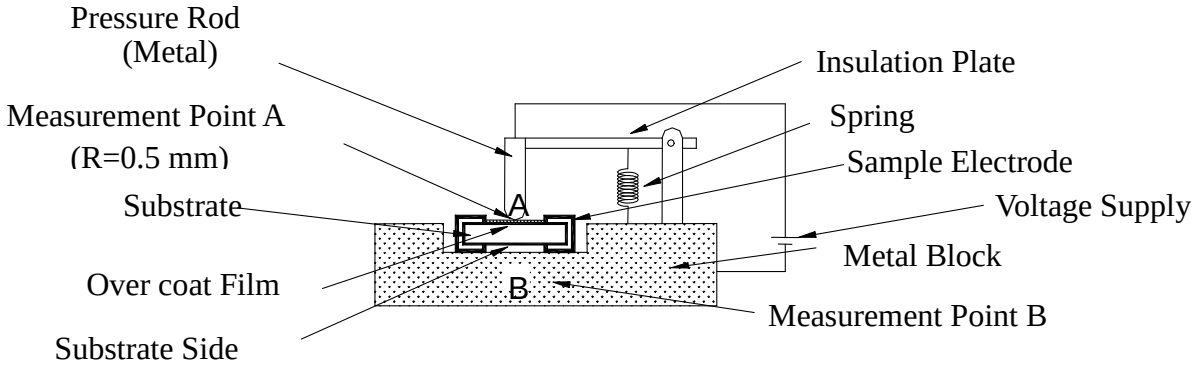


Figure 1 : Measurment Setup

UNLESS OTHERWISE SPECIFIED TOLERANCES ON : X = ± X.X = ± X.XX = ± ANGLES ± HOLE DIA. ±	DRAWN BY : connie 4/3/13 DESIGNED BY : CHECKED BY : APPROVED BY : SCALE : X UNIT : X	台達電子工業股份有限公司 *Delta Electronics, Inc.* THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF Delta Electronics, Inc. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
TITLE : The Engineering Specification for RLT1632 1/2W Low Resistance Chip Resistor		DOCUMENT NO.	SRK540000NH PAGE REV. A1

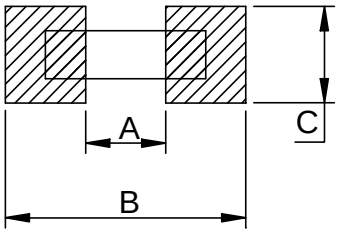
6-2 Mechanical

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 ± 5℃ molten solder bath for 2 ± 0.5 seconds
Resistance to Solder Heat	△ R: ± 1.0% Without distinct deformation in appearance	(1) Pre-heat: 100~110℃ for 30 seconds (2) Immersed at solder bath of 270 ± 5℃ for 10 ± 1 seconds (3) Measuring resistance 1 hour after test
Bending Test	△ R: ± 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

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℃,30minutes) →(Room temperature, 2~3 minutes) →(+125 ± 2℃,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℃,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℃ (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℃ 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℃ for total 1,000 + 48 / - 0 hours (2) Measuring resistance 1 hour after test

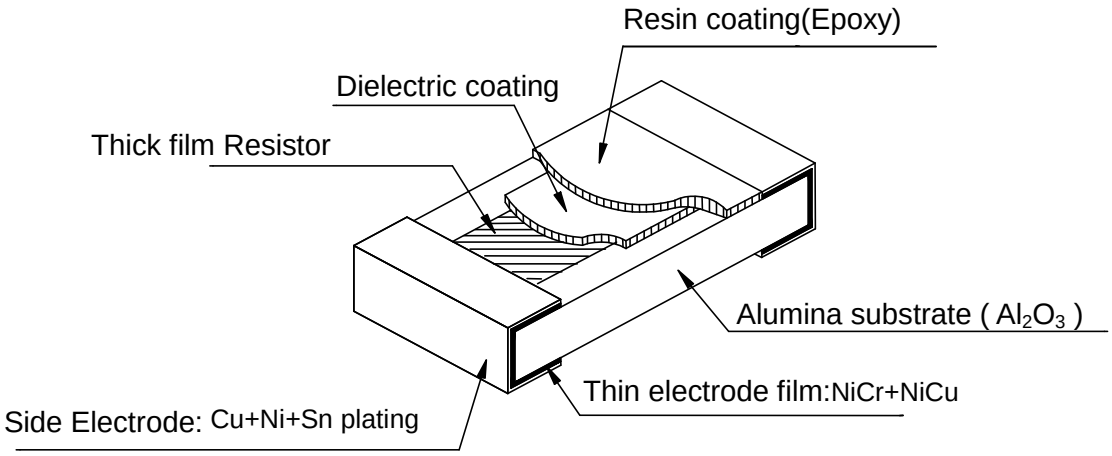
7. Recommend Land Pattern Dimensions



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

Unit : mm

8. Construction Drawing

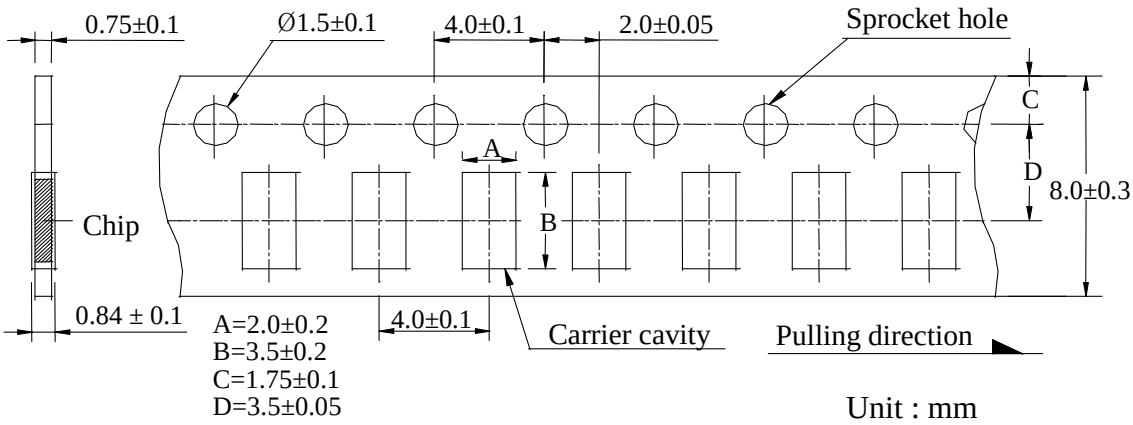


UNLESS OTHERWISE SPECIFIED TOLERANCES ON : X = ± X.X = ± X.XX = ± ANGLES ± HOLE DIA. ±	DRAWN BY : connie 4/3/13 DESIGNED BY : CHECKED BY : APPROVED BY : SCALE : X UNIT : X	台達電子工業股份有限公司 *Delta Electronics, Inc.* THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF Delta Electronics, Inc. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
TITLE : The Engineering Specification for RLT1632 1/2W Low Resistance Chip Resistor		DOCUMENT NO.	SRK540000NH PAGE REV. A1

9. Packaging

9-1 Dimensions

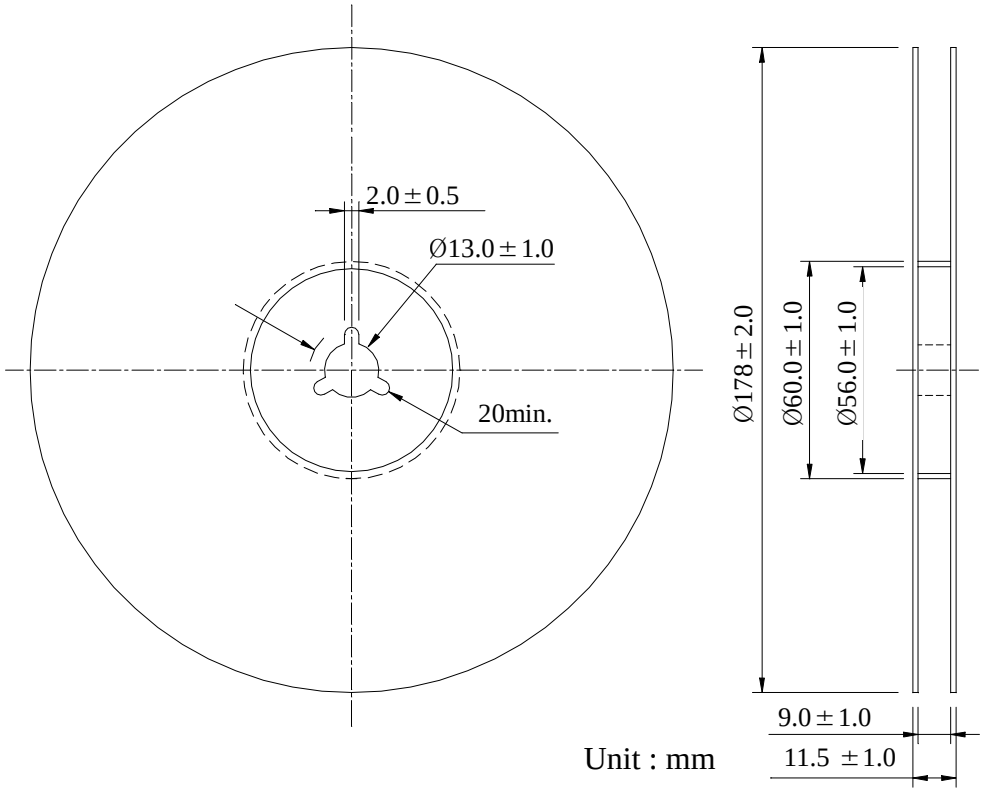
9-1-1 Tape packaging dimensions



Unit : mm

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

9-1-2 Reel dimensions



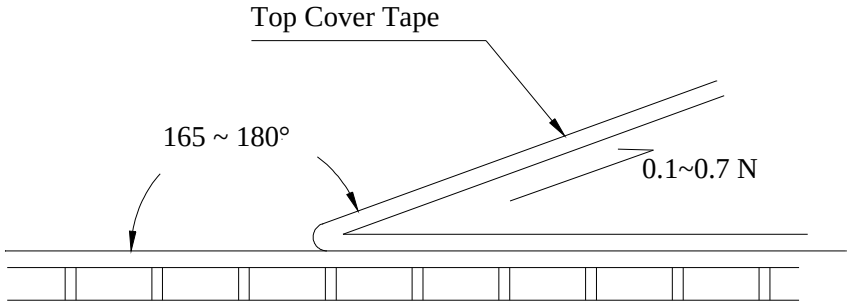
Unit : mm

UNLESS OTHERWISE SPECIFIED TOLERANCES ON : X = ± X.X = ± X.XX = ± ANGLES ± HOLE DIA. ±	DRAWN BY : connie 4/3/13	台達電子工業股份有限公司 *Delta Electronics, Inc.*	
	DESIGNED BY :		
	CHECKED BY :		
	APPROVED BY :	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF Delta Electronics, Inc. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
	SCALE : X UNIT : X		
TITLE : The Engineering Specification for RLT1632 1/2W Low Resistance Chip Resistor		DOCUMENT NO.	SRK540000NH
			PAGE REV. A1

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

UNLESS OTHERWISE SPECIFIED TOLERANCES ON : X = ± X.X = ± X.XX = ± ANGLES ± HOLE DIA. ±	DRAWN BY : connie 4/3/13 DESIGNED BY : CHECKED BY : APPROVED BY : SCALE : X UNIT : X	台達電子工業股份有限公司 *Delta Electronics, Inc.* THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF Delta Electronics, Inc. AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION	
TITLE : The Engineering Specification for RLT1632 1/2W Low Resistance Chip Resistor		DOCUMENT NO.	SRK540000NH PAGE REV. A1

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℃, 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.