

SPECIFICATION FOR APPROVAL

1/2W, 0603, Low Resistance Chip Resistor (Lead / Halogen free)

1. Scope

This specification applies to 0.8mm x 1.6mm size 1/2W, fixed metal film chip resistors rectangular type for use in electronic equipment.

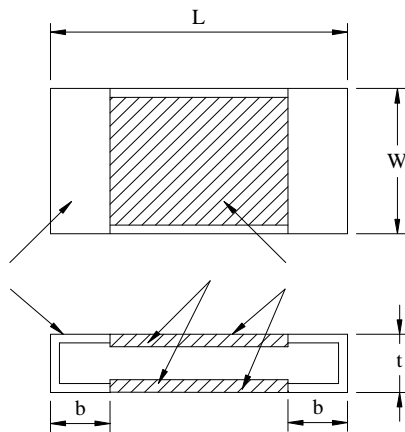
2. Type Designation

RL 0816 — 4 — □□□□ □

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

- Where
- (1) Series No.
 - (2) Power rating
4 = 1/2W
 - (3) Resistance value:
For example—
R010 = 0.01 Ω
 - (4) Resistance tolerance:
F = $\pm 1\%$
G = $\pm 2\%$
J = $\pm 5\%$

3. Construction and Physical Dimensions



Code Letter	Dimensions (mm)
L	1.6 ± 0.2
W	0.8 ± 0.2
t	0.4 ± 0.15
a	0.35 ± 0.15
b	0.35 ± 0.15

NOTE:

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

Figure 1. Structure (No mark)



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4. Ratings

4-1 Specification

Power Rating*	1/2 W	
Resistance Range	0.010Ω~0.020Ω	0.021Ω ~ 1.0Ω
Resistance Tolerance	±1% , ±2% , ±5%	
Temperature Coefficient of Resistance	0~350ppm/°C	0~250ppm/°C

Note*:

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

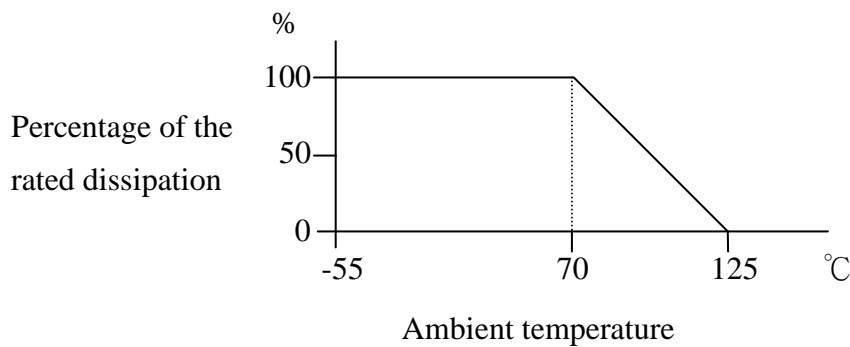


Figure 2 Derating Curve

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



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5. Characteristics

Test Item	Condition of Test	Requirements
Short Time Overload	2.5 * Rated power for 5 seconds	$\Delta R : \pm 0.5\%$ Without significant damage by flashover (spark, arching), burning or breakdown etc.
Insulation Resistance	The resistor shall be cramped in the metal block and tested , as shown below. Test voltage : $100 \pm 15V_{DC}$ for 1 minute Refer to JIS C 5201-1 4.6 Mounting condition G.	Between Electrode and Protection Film $100M\Omega$ or over Between Electrode and Substrate $1,000M\Omega$ or over
Voltage Proof	The voltage : $100V_{AC}$ (rms.) for 1 minute Refer to JIS C 5201-1 4.7	$\Delta R : \pm 0.5\%$ Without damage by flashover, fire or breakdown, as shown below.
Thermal Shock	$-55 \sim 125^{\circ}C$ 5 cycles, 15 min at each extreme condition Refer to JIS C 5201-1 4.19	$\Delta R : \pm 0.5\%$ Without distinct damage in appearance
Low Temperature Storage	Kept at $-55^{\circ}C$, 1,000 hours Refer to JIS C 5201-1 4.23.4	$\Delta R : \pm 1.0\%$ Without distinct damage in appearance
High Temperature Exposure	Kept at $125^{\circ}C$ for 1,000 hours Refer to JIS C 5201-1 4.23.2	$\Delta R : \pm 1.0\%$ Without distinct damage in appearance
Solderability	Temperature of Solder : $245 \pm 5^{\circ}C$ 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
Resistance to Soldering Heat	Dipped into solder at $270 \pm 5^{\circ}C$ for 10 ± 1 seconds Refer to JIS C 5201-1 4.18	$\Delta R : \pm 0.5\%$ Without distinct deformation in appearance

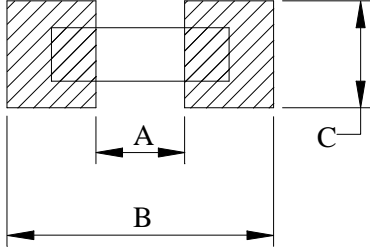
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Test Item	Condition of Test	Requirements
Load Life	Rated voltage for 1.5 hours followed by a pause 0.5 hour at $70 \pm 2^{\circ}\text{C}$. Cycle repeated 1000 hours Refer to JIS C 5201-1 4.25	$\Delta R : \pm 1.0\%$ Without distinct damage in appearance
Damp Heat with Load	$40 \pm 2^{\circ}\text{C}$ 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	$\Delta R : \pm 1.0\%$ Without distinct damage in appearance
Mechanical Shock	100 G's for 6 milliseconds. 5 pulses Refer to JIS C 5201-1 4.21	$\Delta R : \pm 0.5\%$ Without mechanical damage such as break
Bending Test	Glass-Epoxy board thickness : 1.6mm Bending width : 2mm Between the fulcrums : 90mm Refer to JIS C 5201-1 4.33	$\Delta R : \pm 0.5\%$ Without mechanical damage such as break



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6. Recommend Land Pattern Dimensions



A	0.8
B	2.2
C	0.6~1.0

Unit : mm

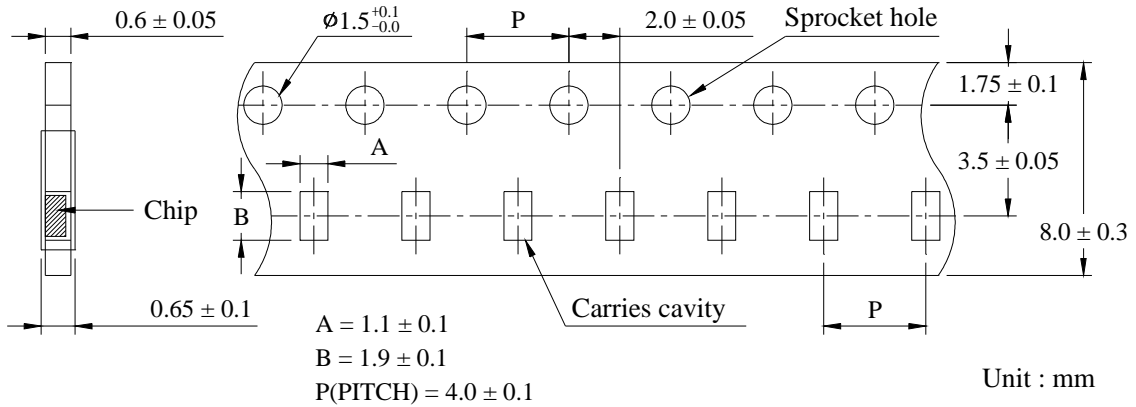


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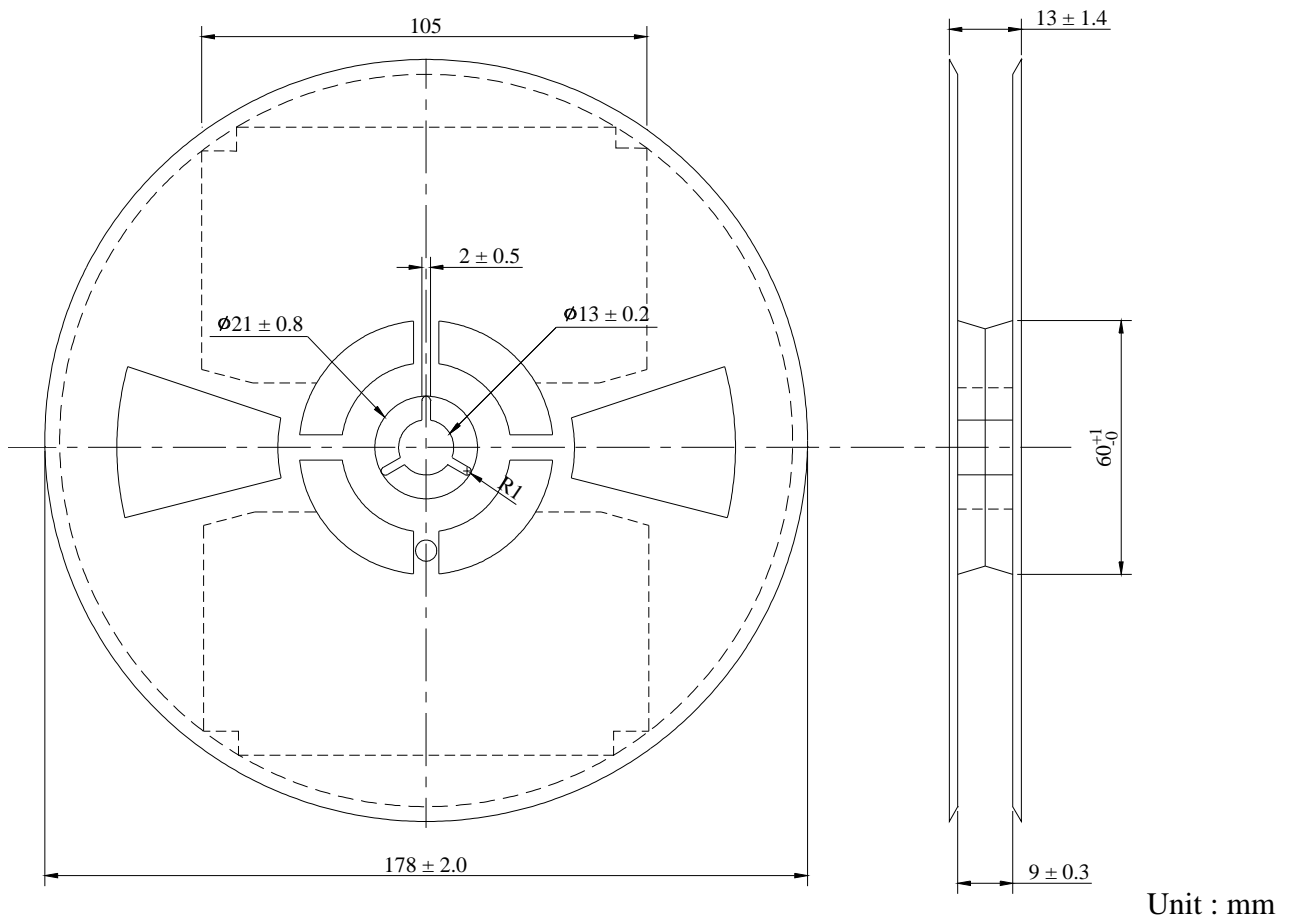
7. Packaging

7-1 Dimensions

7-1-1 Tape packaging dimensions



7-1-2 Reel Dimensions

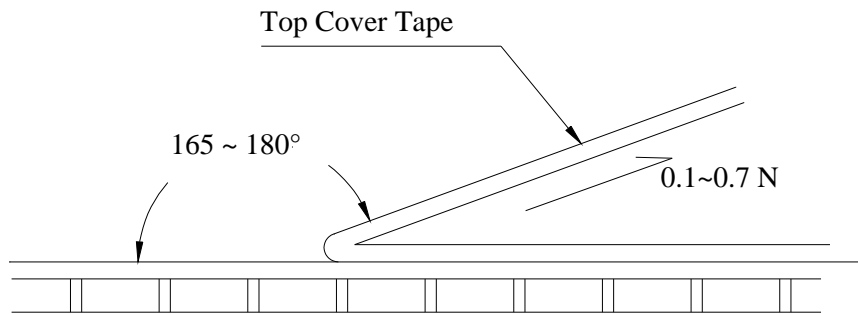


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7-2 Peel force of top cover tape

The peel speed shall be about 300 mm / min.

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



7-3 Numbers of taping

5,000 pieces / reel

7-4 Making

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