



Features

- Excellent overall stability
- Tight tolerance down to $\pm 0.1\%$
- Extremely low TCR down to ± 10 PPM/ $^{\circ}\text{C}$
- High power rating up to 1 Watt

Applications

- Telecommunication
- Medical Equipment
- Measurement/Testing Equipment

Standard Electrical Specifications

Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range	TCR (PPM/ $^{\circ}\text{C}$)
1/2W	-55°C to +155°C	300V	600V	10Ω to 1MΩ	± 50

High Power Rating Electrical Specifications

Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range $\pm 0.1\%$	TCR (PPM/ $^{\circ}\text{C}$)
1W	-55°C to +155°C	350V	700V	10Ω to 1MΩ	± 50

Environmental Characteristics

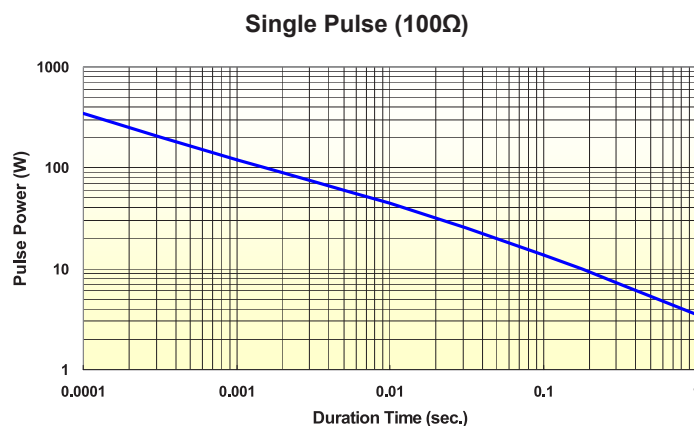
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Specification:	JIS-C-5201-1 4.8 IEC-60115-1 4.8 -55°C~+125°C, 25°C is the reference temperature
Short Time Overload	$\pm(0.15\%+0.05\Omega)$	JIS-C-5201-1 4.13 IEC-60115-1 4.13 RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	$\geq 10\text{G}$	JIS-C-5201-1 4.6 IEC-60115-1 4.6 Max. Overload Voltage for 1 minute
Endurance	$\pm(0.5\%+0.05\Omega)$	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 70 $\pm 2^{\circ}\text{C}$, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Damp Heat with Load	$\pm(1.0\%+0.05\Omega)$	JIS-C-5201-1 4.24 IEC-60115-1 4.24 40 $\pm 2^{\circ}\text{C}$, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"

Item	Requirement	Test Method
Dry Heat	$\pm(1.0\%+0.05\Omega)$	JIS-C-5201-1 4.23 IEC-60115-1 4.23.2 at +155°C for 1000 hrs
Bending Strength	$\pm(0.5\%+0.05\Omega)$	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending once for 5 seconds with 2mm
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 4.17 245 \pm 5°C for 3 seconds
Resistance to Soldering Heat	$\pm(0.5\%+0.05\Omega)$	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260 \pm 5°C for 10 seconds
Voltage Proof	No breakdown or flashover	JIS-C-5201-1 4.7 IEC-60115-1 4.7 1.42 times Max. Operating Voltage for 1 minute
Leaching	Individual leaching area \leq 5% Total leaching area \leq 10%	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1 260 \pm 5°C for 30 seconds
Rapid Change of Temperature	$\pm(0.5\% +0.05\Omega)$	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +155°C, 5 cycles

Storage Temperature : 15°C to 28°C
Humidity : < 80%RH

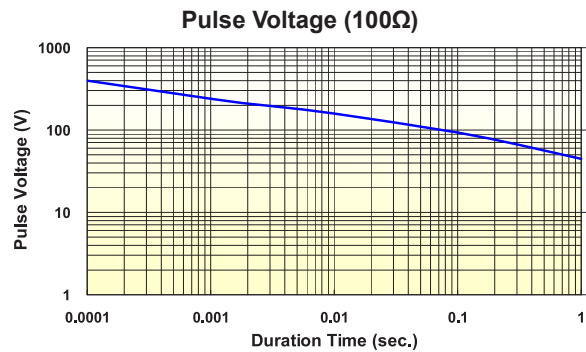
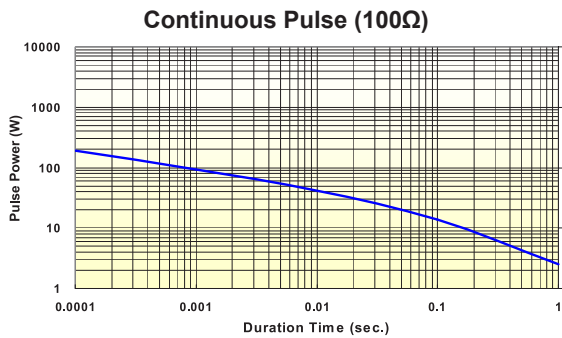
Pulse withstanding capacity

The single impulse graph is the result of 50 impulses of rectangular shape applied at one-minute intervals. The limit of acceptance was a shift in resistance of less than 1% from the initial value. The power applied was subject to the restrictions of the maximum permissible impulse voltage graph shown.



Continuous Pulse

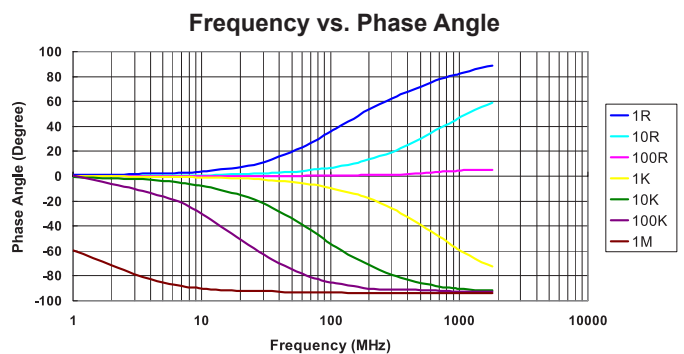
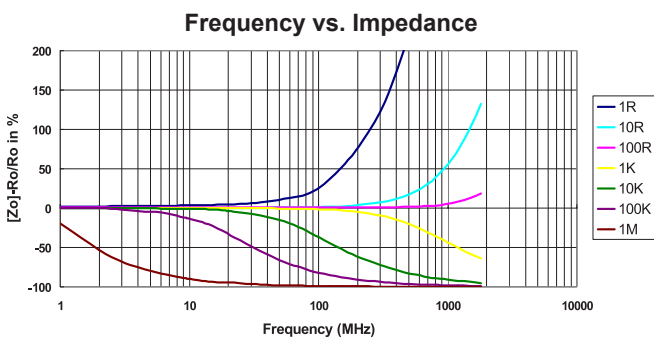
The continuous load graph was obtained by applying repetitive rectangular pulses where the pulse period was adjusted so that the average power dissipated in the resistor was equal to its rated power at 70°C. Again the limit of acceptance was a shift in resistance of less than 1% from the initial value.



Frequency Behaviour

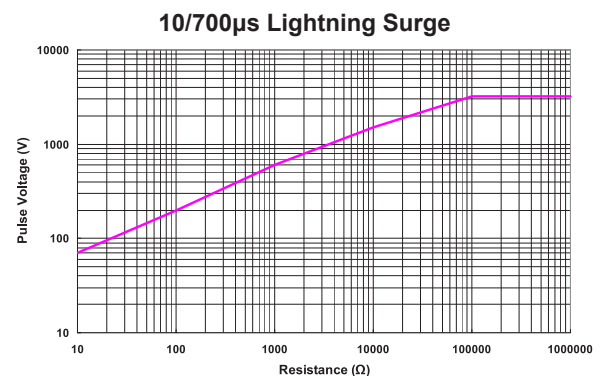
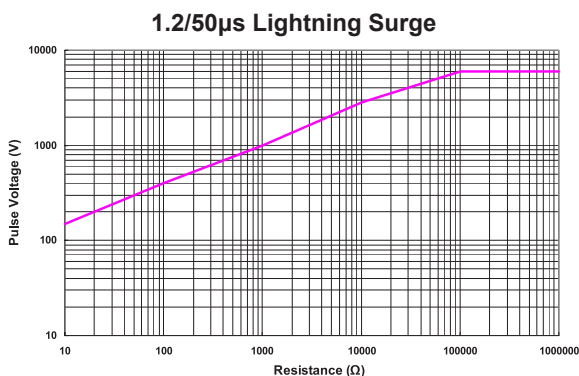
Resistors are designed to function according to ohmic laws. This is basically true of resistors for frequencies up to 100kHz. At higher frequencies, there is an additional contribution to the impedance by an ideal resistor switched in series with a coil and both switched parallel to a capacitor. The values of the capacitance and inductance are mainly determined by the dimensions of the terminations and the conductive path length.

The environment surrounding components has a large influence on the behavior of the component on the printed-circuit board.

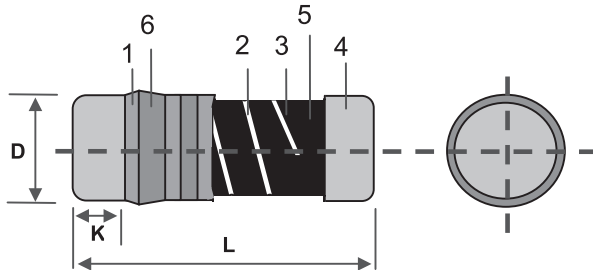


Lightning Surge

Resistors are tested in accordance with IEC 60 115-1 using both 1.2/50us and 10/700us pulse shapes. The limit of acceptance is a shift in resistance of less than 0.5% from the initial value.



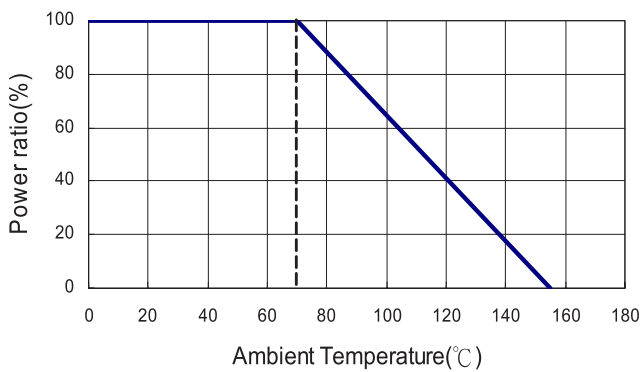
Construction & Dimension



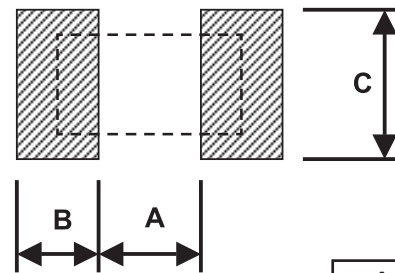
1	Insulation Coating
2	Trimming Line
3	Ceramic Rod
4	Electrode Cap
5	Resistor Layer
6	Marking

L (mm)	D (mm)	K (mm)	Weight 1,000EA (g)
5.9 ±0.2	2.2 ±0.2	1.3 ±0.1	80.9

Derating Curve

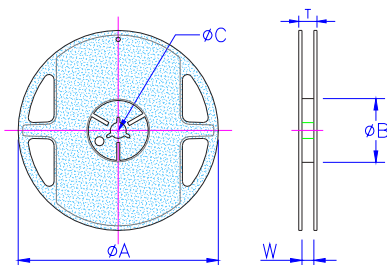


Recommend Land Pattern



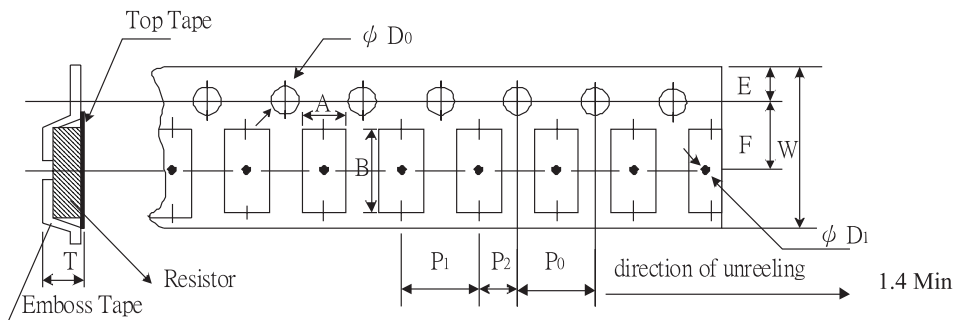
A (mm)	B (mm)	C (mm)
3	1.7	2.4

Packaging



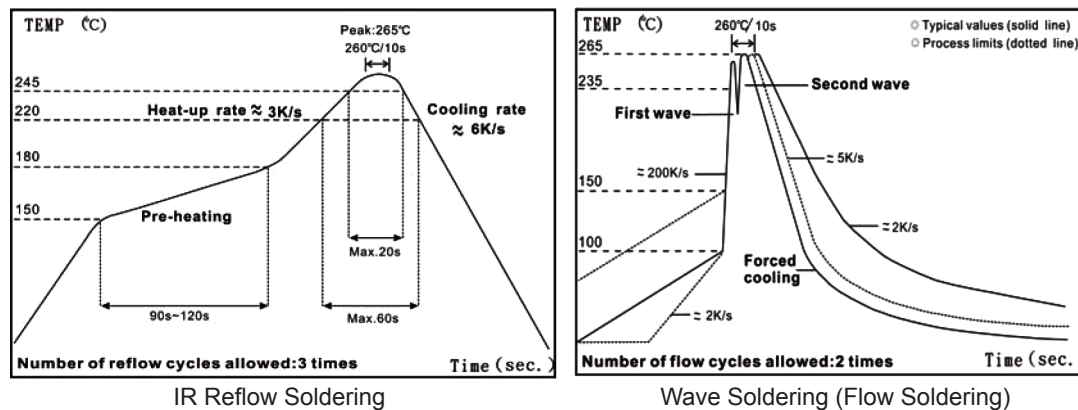
Packaging Quantity & Reel Specifications

Reel Diameter	A (mm)	B (mm)	C (mm)	W (mm)	T (mm)	Emboss Plastic Tape (EA)
7 inch	178.5 ±1.5	60 +1	13 ±0.5	13 ±0.5	15.5 ±0.5	2,000



A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
2.4 ±0.1	6.15 ±0.1	12 ±0.1	1.75 ±0.1	5.5 ±0.05	4 ±0.1	4 ±0.1	2 ±0.05	1.5 ±0.1	2.7 ±0.1

Soldering Condition



- (1) Time of IR reflow soldering at maximum temperature point 260°C : 10s
- (2) Time of wave soldering at maximum temperature point 260°C : 10s
- (3) Time of soldering iron at maximum temperature point 410°C : 5s

Part Number Table

Description	Part Number
Surface Mount MELF Resistor, 390kΩ, 300V, 500mW, ±0.1%, MCCR Series, Metal Film	MCCSR0207BTDU3903

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