



### Specifications:

Rated Power	: 2W at 70°C
Max. Working Voltage	: 500V
Max. Overload Voltage	: 600V
Dielectric Withstanding Voltage	: 350V
Rated Ambient Temp.	: 70°C
Operating Temp. Range	: -55°C to +155°C
Resistance Tolerance	: ± 5%
Resistance value	: 1MΩ

### Power Rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C. For temperature in excess of 70°C , the load shall be derated as shown in the figure

### Voltage Rating:

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating , as determined from the following formula:

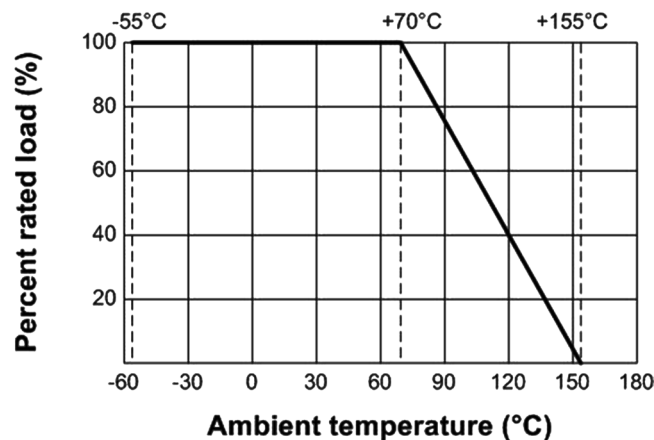
$$RCWV = \sqrt{P \times R}$$

Were : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power Rating (W)

R = Nominal Resistance (Ω)

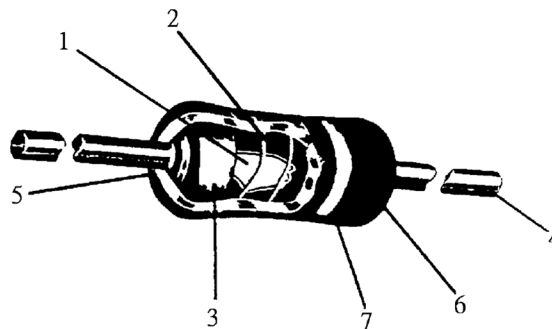
In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value



## Nominal Resistance:

Effective figures of nominal resistance shall be in accordance with E-24 series, and resistance tolerance shall be shown by table.

## Construction:



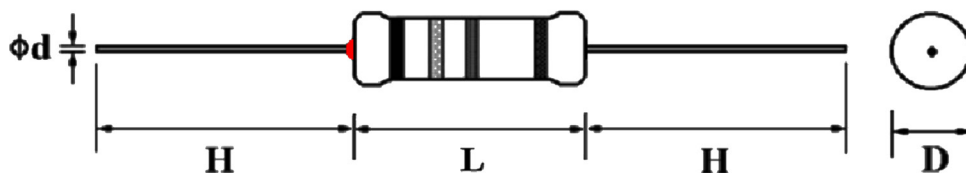
No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Resistance Film	Special metal film
3	End Cap	Steel (Tin plated iron surface)
4	Lead Wire	Annealed copper wire coated with tin
5	Joint	By welding
6	Coating	Insulated & Non-Flame Paint (Colour : Sea-Blue )
7	Colour Code	Non-Flame epoxy resin

Power Metal Fixed Resistors		
Characteristics:		
Characteristics	Limits	Test Methods (JIS C 5201-1)
DC. Resistance	Must be within the specified tolerance	The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance (Sub-clause 4.5)
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	Resistors shall be clamped in the trough of a 90° metallic V-block or foil method use a metal foil shall be wrapped closely around the body of the resistor. After that shall be tested at AC potential respectively specified in the table 1. for 60 +10/-0 secs. (Sub-clause 4.7)

Characteristics	Limits	Test Methods (JIS C 5201-1)															
Temperature coefficient	± 400PPM/°C	Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R <sub>1</sub> : Resistance value at room temperature (t <sub>1</sub> ) R <sub>2</sub> : Resistance value at room temp. plus 100 °C (t <sub>2</sub> ) (Sub-clause 4.8)															
Short time overload	Resistance change rate is ± (2% + 0.05Ω) Max. with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV or the max. overload voltage respectively specified in the above list, whichever less for 5 seconds (Sub-clause 4.13)															
Terminal strength	With no evidence of mechanical damage	<b>Direct Load:</b> Resistance to a 2.5kgs direct load for 10 secs. in the direction of the longitudinal axis of the terminal leads  <b>Twist Test:</b> Terminal leads shall be bent through 90° at point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations (Sub-clause 4.16)															
Solderability	95% coverage Min.	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 245°C ± 3°C Dwell time in solder : 2 ~ 3 seconds (Sub-clause 4.17)															
Resistance to soldering heat	Resistance change rate is ± (1% + 0.05Ω) Max. with no evidence of mechanical damage	Permanent resistance change when leads immersed to 3.2mm to 4.8mm from the body in 350°C ± 10°C solder for 3 ± 0.5 seconds (Sub-clause 4.18)															
Temperature cycling	Resistance change rate is ± (2% + 0.05Ω) Max. with no evidence of mechanical damage	Resistance change after continuous 5 cycles for duty shown below:															
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C ± 3°C</td> <td>30 mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10 to 15 mins</td> </tr> <tr> <td>3</td> <td>+155°C ± 3°C</td> <td>30 mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10 to 15 mins</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C ± 3°C	30 mins	2	Room temp.	10 to 15 mins	3	+155°C ± 3°C	30 mins	4	Room temp.	10 to 15 mins
		Step	Temperature	Time													
		1	-55°C ± 3°C	30 mins													
		2	Room temp.	10 to 15 mins													
3	+155°C ± 3°C	30 mins															
4	Room temp.	10 to 15 mins															
(Sub-clause 4.19)																	
Load life in humidity	<b>Resistance value</b>	<b>ΔR/R</b>															
	1MΩ	± 10 %															
		Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40 °C ± 2 °C and 90 to 95 % relative humidity (Sub-clause 4.24.2.1)															

Characteristics	Limits		Test Methods (JIS C 5201-1)
Load life	Resistance value	$\Delta R/R$	Permanent resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70°C $\pm$ 2°C ambient (Sub-clause 4.25.1)
	1M $\Omega$	$\pm$ 10 %	
Resistance to solvent	No deterioration of protective coatings and markings		Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic (Sub-clause 4.30)
Pulse overload	Resistance change rate is $\pm$ (5% + 0.05 $\Omega$ ) Max. with no evidence of mechanical damage		Resistance change after 10,000 cycles (1 second "on", 25 seconds "off" ) at 4 times RCWV or the max. pulse overload voltage (Sub-clause 5.8)

### Dimension:



Type	Power Rating	D (Max.)	L (Max.)	$d \pm 0.05$	$H \pm 3$
PMR	2 W-S	4mm	11mm	0.75mm	25mm

### Part Number Table

Description	Part Number
Resistor, Axial, Small, 1M, 5%, 2W	MCPMR02SJ0105A10

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