Power Metal Fixed Resistors

1W, 5%

Type Designation:

(EX.)
The type designation shall be in the following form:

Type	Power Rating	Resistance Tolerance	Nominal Resistance
MCPMR 1W-SSS	< 1 Ω : 0.6 W	J	0.56 Ω
	≥ 1 Ω : 1 W		1 Ω

Ratings:

Ratings shall be shown in the table 1

Table 1

Type	MCPMR 1W-SSS	
Rated Power at 70°C	< 1 Ω : 0.6 W	≥ 1 Ω : 1 W
Maximum Working Voltage	350 V	
Maximum Overload Voltage	400 V	
Dielectric Withstanding Voltage	350 V	
Rated Ambient Temperature	70°C	
Operating Temperature Range	-55°C to +155°C	
Resistance Tolerance	±5%	
Resistance Range	0.56 Ω to 1 MΩ	

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 1.

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:

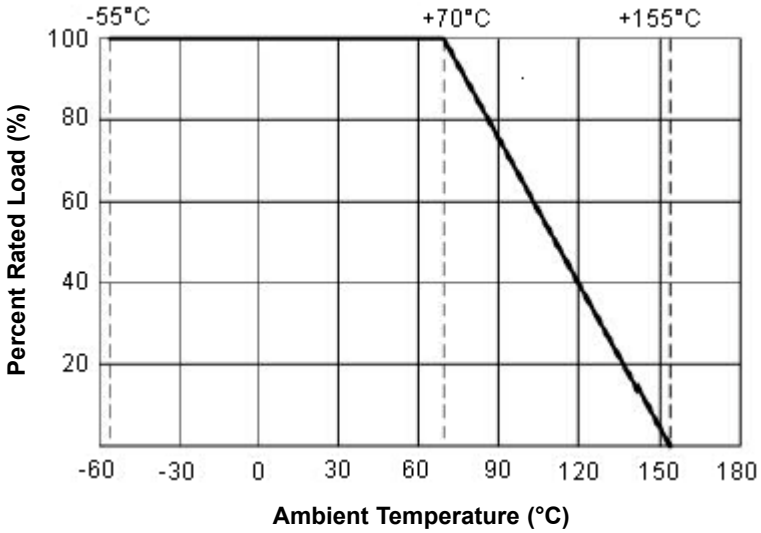
$$RCWV = \sqrt{P \times R}$$

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

P = Power Rating (watt)
R = Nominal Resistance (ohm)

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

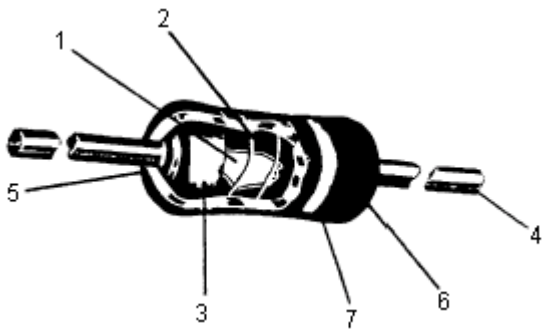
Figure 1



Nominal Resistance :

Effective figures of nominal resistance shall be in accordance with E-96, E-24 series, and resistance tolerance shall be shown by table 1

Construction :



No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Resistance Wire	Cu-Ni Alloy (< 22 Ω)
	Resistance Film	Special Metal Film (≥ 22 Ω)
3	End Cap	Steel (Tin Plated Iron Surface)
4	Lead Wire	Annealed Copper Wire Coated With Tin
5	Joint	By Welding
6	Coating	Insulated and Non-Flame Paint (Colour : Sea-Blue)
7	Colour Code	Non-Flame Epoxy Resin

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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 resistance tolerance of specification (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 s (Sub-clause 4.7)
Temperature coefficient	Within the temperature coefficient specified below: 0.56 Ω to 100 KΩ ≤ ±350 PPM/°C 101 KΩ to 470 KΩ ≤ ±400 PPM/°C 471 KΩ to 1 MΩ ≤ ±800 PPM/°C	Natural resistance change per temperature degree centigrade $\frac{R_2 - R_1}{R_1 (t_2 - t_{1)}} \times 10^6$ (PPM/°C) R_1: Resistance value at room temperature (t_1) R_2 : Resistance value at room temperature plus 100°C (t_2) (Sub-clause 4.8)
Short time overload	Resistance change rate is ± (2% + 0.05 Ω) Maximum with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV or the maximum overload voltage respectively specified in the above list, whichever less for 5 s (Sub-clause 4.13)
Terminal strength	With no evidence of mechanical damage	**Direct load:** Resistance to a 2.5 kgs direct load for 10 s in the direction of the longitudinal axis of the terminal leads **Twist test:** Terminal leads shall be bent through 90°at point of about 6 mm 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 temperature of solder : 245°C ±3°C Dwell time in solder : 2 to 3 s (Sub-clause 4.17)
Resistance to soldering heat	Resistance change rate is ± (1% + 0.05 Ω) Max. with no evidence of mechanical damage	Permanent resistance change when leads immersed to 3.2 mm to 4.8 mm from the body in 350°C ±10°C solder for 3 ±0.5 s (Sub-clause 4.18)

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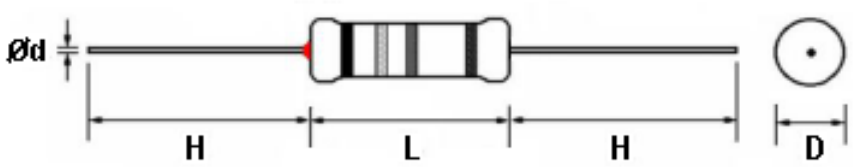
Characteristics

<table>
<tr><th>Characteristics</th><th>Limits</th><th>Test Methods (JIS C 5201-1)</th></tr>
<tr><td>Temperature cycling</td><td>Resistance change rate is
± (2% + 0.05 Ω) Maximum
with no evidence of mechanical damage</td><td>Resistance change after continuous 5 cycles for duty shown below:
<table><tr><th>Step</th><th>Temperature</th><th>Time</th></tr><tr><td>1</td><td>-55°C ±3°C</td><td>30 mins</td></tr><tr><td>2</td><td>Room Temperature</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 Temperature</td><td>10 to 15 mins</td></tr></table>(Sub-clause 4.19)</td></tr>
<tr><td>Load life in humidity</td><td><table><tr><th>Resistance Value</th><th>Δ R/R</th></tr><tr><td>Less than 100 KΩ</td><td>±5%</td></tr><tr><td>100 KΩ or more</td><td>±10%</td></tr></table></td><td>Resistance change after 1,000 hrs
(1.5 hrs "on", 0.5 hr "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)</td></tr>
<tr><td>Load life</td><td><table><tr><th>Resistance Value</th><th>Δ R/R</th></tr><tr><td>Less than 100 KΩ</td><td>±5%</td></tr><tr><td>100 KΩ or more</td><td>±10%</td></tr></table></td><td>Permanent resistance change after 1,000 hrs
operating at RCWV with duty cycle of (1.5 hrs "on", 0.5 hr "off") at 70°C ±2°C ambient (Sub-clause 4.25.1)</td></tr>
<tr><td>Resistance to solvent</td><td>No deterioration of protective coatings and markings</td><td>Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic
(Sub-clause 4.3)</td></tr>
<tr><td>Pulse overload</td><td>Resistance change rate is
± (5% + 0.05Ω) Maximum with no evidence of mechanical damage</td><td>Resistance change after 10,000 cycles
(1 s "on", 25 s "off") at 1 times
RCWV or the maximum pulse overload voltage
(Sub-clause 5.8)</td></tr>
</table>

Dimension:



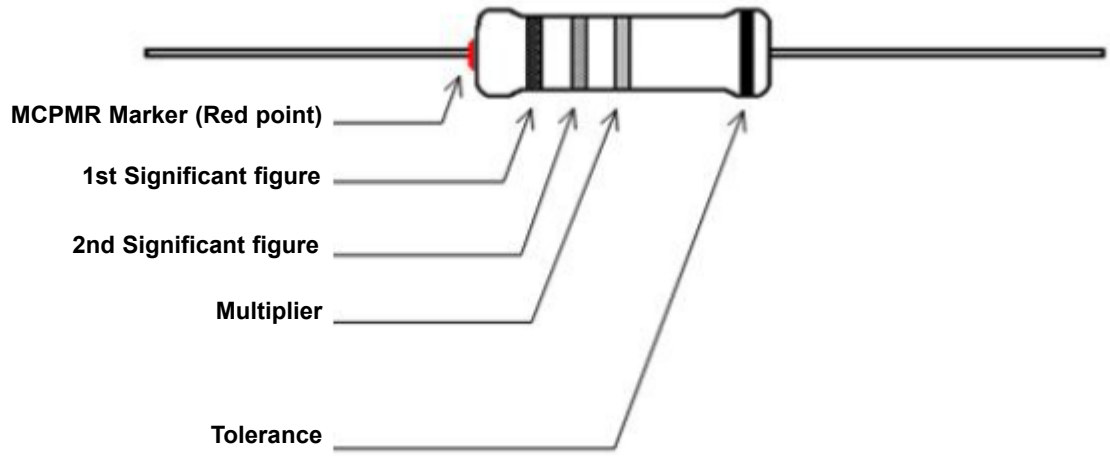
Type	Power Rating	D (Maximum)	L (Maximum)	d ±0.05	H ±3
MCPMR	1 W-SSS	2.5 mm	6.5 mm	0.54 mm	25 mm

Dimensions : Millimetres

Marking:

Resistor:

Resistors shall be marked with colour coding
Colours shall be in accordance with JIS C 0802



Part Number Table

Description	Part Number
Resistor, Axial, Xsmall, 4R7, 5%, 1W	MCPMR01TJ047JA50
Resistor, Axial, Xsmall, 10R, 5%, 1W	MCPMR01TJ0100A50
Resistor, Axial, Xsmall, 39R, 5%, 1W	MCPMR01TJ0390A50
Resistor, Axial, Xsmall, 47R, 5%, 1W	MCPMR01TJ0470A50
Resistor, Axial, Xsmall, 1K5, 5%, 1W	MCPMR01TJ0152A50
Resistor, Axial, Xsmall, 3K3, 5%, 1W	MCPMR01TJ0332A50
Resistor, Axial, Xsmall, 15K, 5%, 1W	MCPMR01TJ0153A50
Resistor, Axial, Xsmall, 18K, 5%, 1W	MCPMR01TJ0183A50
Resistor, Axial, Xsmall, 56K, 5%, 1W	MCPMR01TJ0563A50
Resistor, Axial, Xsmall, 100K 5%, 1W	MCPMR01TJ0104A50
Resistor, Axial, Xsmall, 120K 5%, 1W	MCPMR01TJ0124A50
Resistor, Axial, Xsmall, 150K 5%, 1W	MCPMR01TJ0154A50
Resistor, Axial, Xsmall, 470K 5%, 1W	MCPMR01TJ0474A50
Resistor, Axial, Xsmall, 680K 5%, 1W	MCPMR01TJ0684A50

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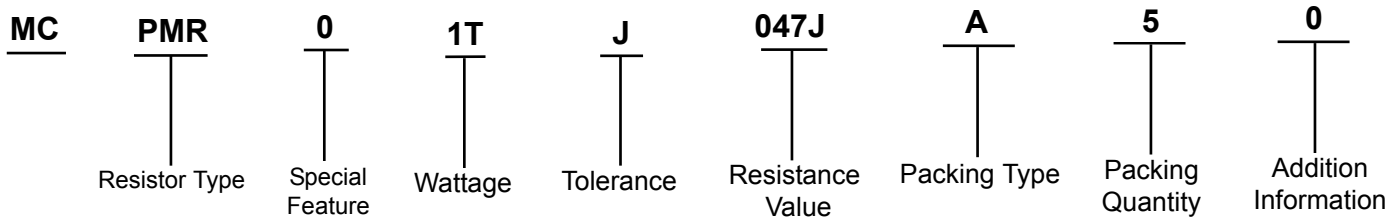
Part Number Explanation:



Resistor Type : PMR = Power Metal Fixed Resistor
Special Feature : 0 = Standard Product
Wattage : Extra Small size : 1T = 1W-SSS
Tolerance : J to ± 5%
Resistance Value : **E-24** series: the 1st digit is "0", the 2nd and 3rd digits are for the significant figures of the resistance and the 4th indicate the number of zeros following:
"J" to 0.1 "K" to 0.01
Ex.: 4.7 Ω to 47J, 4.7 KΩ to 472
E-96 Series: the 1st to 3rd digits are significant figures of resistance and the fourth one denotes number of zeros following:
Ex.: 1.33 KΩ = 1331
Packing Type : A = Tape / Box
Packing Quantity : 1 = 1,000 pieces, B = 2,500 pieces and 0 = for Bulk / Box Packing
Addition Information : 0 = PT-52 mm