

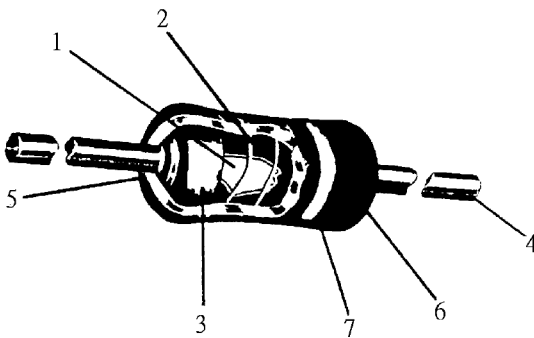
**RoHS
Compliant**



Specifications

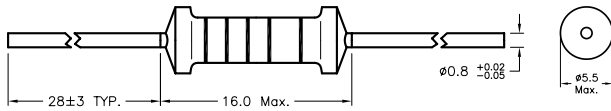
Rated Power	: 2W at 70°C
Max. Working Voltage	: 500V
Max. Overload Voltage	: 1000V
Dielectric Withstanding Voltage	: 1000V
Rated Ambient Temp.	: 70°C
Operating Temp. Range.	: -55°C to +155°C
Resistance Tolerance	: ±5%

Construction



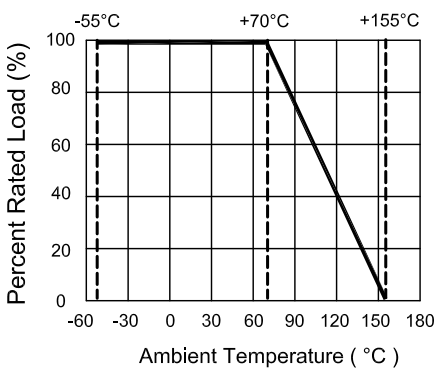
No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Resistance Film	Carbon Film
3	End Cap	Steel (Tin plated iron surface)
4	Lead Wire	Annealed copper wire (Electrosolder plated surface) Pb Free
5	Joint	By welding
6	Coating	Insulated resin (Colour : Beige)
7	Colour Code	Epoxy Resin

Dimension



Dimensions : Millimetres

Derating Curve



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

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Characteristics	Limits		Test Methods (JIS C 5201-1)															
Temperature coefficient	Resistance Range	TCR (PPM/°C)	Natural resistance change per temperature degree centigrade. $\frac{R_2 - R_1}{R_1(t_2 - t_1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (t1) R2: Resistance value at room temperature plus 100°C (t2)															
	≤10Ω	0 to ±350																
	11Ω to 99K	0 to -450																
	100K to 1M	0 to -700																
	1.1M to 10M	0 to -1500																
Short time overload	Resistance change rate is ±(1 % + 0.05Ω) max. with no evidence of mechanical damage		Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds															
Insulation resistance	Insulation resistance is 10,000MΩ Minimum.		Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at DC potential respectively specified in above list for 60+10/-0 seconds															
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 and shall be tested at AC potential respectively specified in table '1'. for 60+10/-0 seconds															
Terminal strength	No evidence of mechanical damage		Direct load: Resistance to a 2.5kg direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist test: Terminal leads shall be bent through 90° at a 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															
Resistance to soldering heat	Resistance change rate is ±(1% + 0.05Ω) maximum with no evidence of mechanical damage		Permanent resistance change when leads immersed to 3.2 to 4.8mm from the body in 350°C ±10°C solder for 3 ±0.5 seconds															
Solderability	95% coverage minimum		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 seconds															
Temperature cycling	Resistance change rate is ±(1% + 0.05Ω) max. with no evidence of mechanical damage		Resistance change after continuous 5 cycles for duty shown below: <table border="1" style="margin-left: 20px;"> <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 minutes</td> </tr> <tr> <td>2</td> <td>Room temperature</td> <td>10 to 15 minutes</td> </tr> <tr> <td>3</td> <td>+155°C ±2°C</td> <td>30 minutes</td> </tr> <tr> <td>4</td> <td>Room temperature</td> <td>10 to 15 minutes</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C ±3°C	30 minutes	2	Room temperature	10 to 15 minutes	3	+155°C ±2°C	30 minutes	4	Room temperature	10 to 15 minutes
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Carbon Film Resistors



RCWV = Rated continuous working Voltage = $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$

Part Number Table

Description	Resistance	Part Number	Description	Resistance	Part Number
Carbon Film Resistors	4.7Ω	MCCFR02SJ047JA19	Carbon Film Resistors	2.2kΩ	MCCFR02SJ0222A19
	10Ω	MCCFR02SJ0100A19		3.3kΩ	MCCFR02SJ0332A19
	15Ω	MCCFR02SJ0150A19		4.7kΩ	MCCFR02SJ0472A19
	22Ω	MCCFR02SJ0220A19		6.8kΩ	MCCFR02SJ0682A19
	33Ω	MCCFR02SJ0330A19		8.2kΩ	MCCFR02SJ0822A19
	47Ω	MCCFR02SJ0470A19		10kΩ	MCCFR02SJ0103A19
	51Ω	MCCFR02SJ0510A19		12kΩ	MCCFR02SJ0123A19
	68Ω	MCCFR02SJ0680A19		15kΩ	MCCFR02SJ0153A19
	100Ω	MCCFR02SJ0101A19		18kΩ	MCCFR02SJ0183A19
	110Ω	MCCFR02SJ0111A19		20kΩ	MCCFR02SJ0203A19
	150Ω	MCCFR02SJ0151A19		22kΩ	MCCFR02SJ0223A19
	180Ω	MCCFR02SJ0181A19		33kΩ	MCCFR02SJ0333A19
	200Ω	MCCFR02SJ0201A19		47kΩ	MCCFR02SJ0473A19
	220Ω	MCCFR02SJ0221A19		68kΩ	MCCFR02SJ0683A19
	330Ω	MCCFR02SJ0331A19		100kΩ	MCCFR02SJ0104A19
	390Ω	MCCFR02SJ0391A19		120kΩ	MCCFR02SJ0124A19
	470Ω	MCCFR02SJ0471A19		150kΩ	MCCFR02SJ0154A19
	680Ω	MCCFR02SJ0681A19		180kΩ	MCCFR02SJ0184A19
	1kΩ	MCCFR02SJ0102A19		220kΩ	MCCFR02SJ0224A19
	1.2kΩ	MCCFR02SJ0122A19		330kΩ	MCCFR02SJ0334A19
1.5kΩ	MCCFR02SJ0152A19	470kΩ	MCCFR02SJ0474A19		
1.8kΩ	MCCFR02SJ0182A19	680kΩ	MCCFR02SJ0684A19		
2kΩ	MCCFR02SJ0202A19	1MΩ	MCCFR02SJ0105A19		

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