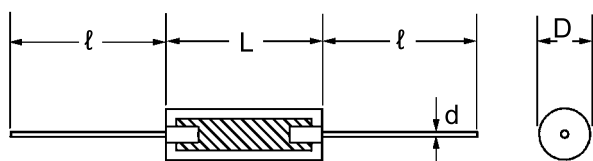


Carbon Composition Resistor

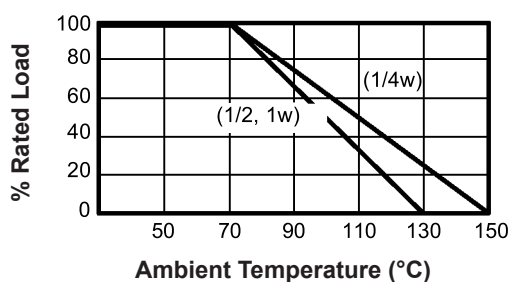
RoHS
Compliant



Dimensions



Derating Curve



Ratings and Dimensions

Rated Power (W)	Dimensions in mm				Max. Rated Voltage (V)	Max. Overload Voltage (V)	Resistance Range (Ω)	Resistance Tolerance (%)
	L	D	l	d				
0.25	6.3 \pm 0.7	2.4 \pm 0.1	30 \pm 3	\pm 0.06 0.02	250	400	2.2 Ω - 22M Ω	\pm 5/ \pm 10
0.5	9.5 $^{+0.8}_{-0.7}$	3.6 \pm 0.2	25 \pm 1	\pm 0.7 \pm 0.02	350	700	2.2 Ω - 22M Ω	\pm 5/ \pm 10
1	14.3 \pm 0.07	5.7 \pm 0.3	30 \pm 3	\pm 0.92 0.02	500	1,000	2.2 Ω - 22M Ω	\pm 10

1 Watt

DC Resistance	DC resistance value must be within the specified tolerance	DC resistance value measured at the test voltage specified below:	
		Nominal Resistance	DC test voltage
		99 Ω and lower	0.5V to 1V
		10 Ω to 999 Ω	2.5V to 3V
		1,000 Ω to 9,999 Ω	8V to 10V
		10,000 Ω to 99,999 Ω	24V to 30V
		100,000 Ω and higher	80V to 100V

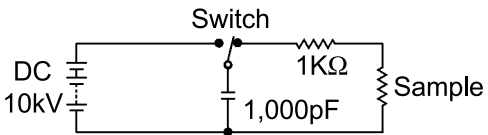
Carbon Composition Resistor

1 Watt

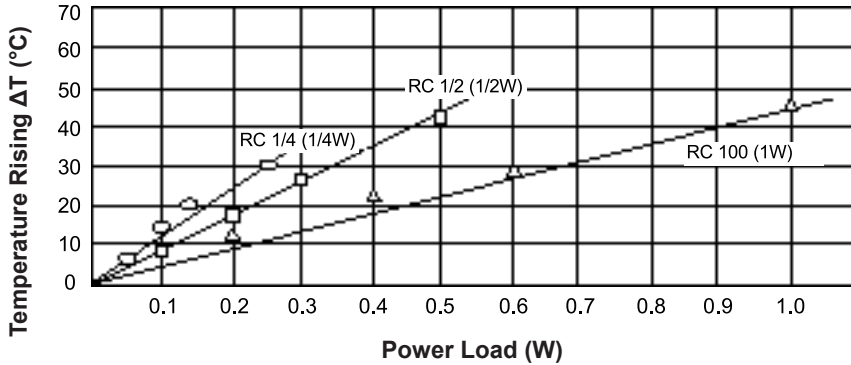
Resistance THumidity (Steady State)	Nominal Resistance	Test Temperature at -55°C	Test Temperature at 100°C	$\frac{R2 - R1}{R1} \times 100 (\%)$ <p>R1: Resistance value at reference temperature R2 : Resistance value at test temperature Sequence of temp. : -25°C, -15°C, -55°C, 25°C, 60°C, 100°C</p>															
	1KΩ and under	6.5 to -3%	5 to 4%																
	1.1KΩ to 10KΩ	10 to -3%	6 to 5%																
	11KΩ to 100KΩ	13 to -3%	7.5 to 6%																
	110KΩ to 1MΩ	15 to -3%	10 to 7%																
	1.1MΩ to 10MΩ	20 to -3%	10 to 7%																
11 MΩ and over	25 to -3%	10 to 7%																	
Voltage Coefficient (Application for 1KΩ min.)	A total resistance change of 2% maximum or chart below			Instantaneous change in resistance per volt based on: $\frac{R - r}{r} \times \frac{100}{0.9 \times RCWV} (\% / V)$															
	Rated Power	Coefficient Voltage																	
	1 Watt	-0.02 % / V																	
Dielectric Withstanding Voltage	No evidence of flashover, mechanical damage, arcing or insulation breakdown			Resistors shall be clamped in the trough of a 90° metallic V-block and shall be tested at AC potential respectively specified in the above list for 5 s															
Insulation Resistance	10,000MΩ Minimum			Resistors shall be clamped in the trough of a 90° metallic V-block and shall be measured at DC 100 V for 1/4 W and DC 500 V for 1/2 W and 1 W															
Temperature Cycling	±4% Maximum with no evidence of mechanical damage			Resistance change after continuous five cycles for duty cycle specified below															
				<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time (minute)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>25°C</td> <td>10 to 15</td> </tr> <tr> <td>2</td> <td>85°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>25°C</td> <td>10 to 15</td> </tr> </tbody> </table>	Step	Temperature	Time (minute)	1	-55°C	30	2	25°C	10 to 15	2	85°C	30	4	25°C	10 to 15
				Step	Temperature	Time (minute)													
				1	-55°C	30													
				2	25°C	10 to 15													
2	85°C	30																	
4	25°C	10 to 15																	
Humidity (Steady State)	± (2.5% + 0.05Q) Maximum with no evidence of arcing, burning, or charring			Permanent resistance change after the application of a potential of 2.5 time RCWV, or the maximum overload voltage respectively specified in the above list, whichever is less for 5 s															
Load Life in Humidity	±20% Maximum with no evidence of mechanical damage			500 hours exposure in a humidity test chamber controlled at 40° ±2°C and 90 to 95 relative humidity															
Load Life	Resistance Change			Permanent resistance change after 1,000 hours operating at RCWV, or maximum RCWV, whichever is less with a duty cycle of 1.5 hours "ON", 0.5 hour "OFF" at 70° ±2°C ambient															
	Average	±6%																	
	Maximum	±10%																	

Carbon Composition Resistor

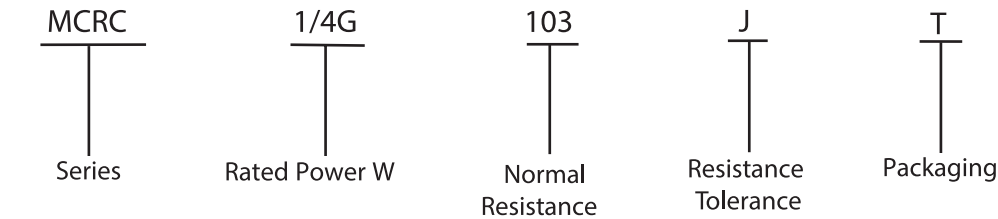
1 Watt

Terminal Strength	$\pm (1\% + 0.05\Omega)$ Maximum with no evidence of mechanical damage	<p>Direct load: Resistance to a 2.5 kgf (25N) direct load for 5 seconds in the direction of the longitudinal axis of the terminal leads</p> <p>Twist test: Terminal leads shall be bent through 90° at a point of 6.35mm 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</p>
Resistance to Soldering Heat	$\pm (3\% + 0.05 \Omega)$ Maximum with no evidence of mechanical damage	Permanent resistance change when leads immersed 4 \pm 0.8 mm from the body in 350° \pm 10°C, solder for 3 \pm 0.5 s
Vibration	$\pm (1\% + 0.05\Omega)$ Maximum with no evidence of mechanical, electrical damage and electrical discontinuity	A single vibration having an amplitude for 1.6mm. for 2 hours in each X, Y, Z, direction. One minute between 10 and 55 Hz
Low Temperature Operation	$\pm 3\%$ Maximum with no evidence of mechanical damage	Resistor shall be placed in a cold chamber at room temperature, the temperature shall be gradually decreased to -65 + 10/-5°C. After 1 hour of stabilization at this temperature, RCWV or maximum RCWV, whichever less shall be applied for 45 minutes. Return to room temperature. Resistance change measured 24 hours after the test
Solderability	95% coverage Minimum	Test temperature of solder: 230 \pm 5°C, Dwell time in solder: 3 \pm 0.5 s
Resistance to Solvents	No deterioration of colour code paints	Colour code paints must resist the solvent
Overload Test	$\pm 10\%$ Maximum with no evidence of mechanical damage	In room temperature, 1,350 V ac in 1 second or 1,000 V AC in 1 minute shall be applied
High Voltage Pulse	$\pm 50\%$ Maximum with no evidence of mechanical damage	<p>The resistors are subjected to 50 discharges at a maximum rate of 12 per minute, from a 1,000 pF capacitor charged to 10 kV, in test circuit as shown below</p> 

Hot-Spot Temperature Due to Rate of Power Dissipation



Part Number Explanation:



- Series : MCRC
- Rated Power W : 1/4G = 1/4W
1/2G = 1/2W
100G = 1W
- Normal Resistance : 5%
3 Digits
e.g. 2R2 = 2.2 to
e.g. 102 = 1K to
- Resistance Tolerance : J = $\pm 5\%$
K = $\pm 10\%$
- Packaging : B = Bulk
T = Tape and Reel

Part Number Table

Description	Part Number
Carbon Composition Resistor	MCRC100G102KB-RH

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