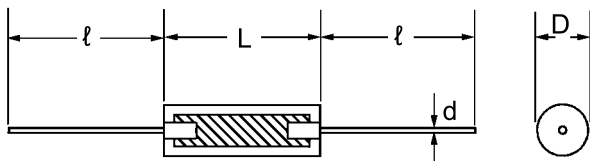


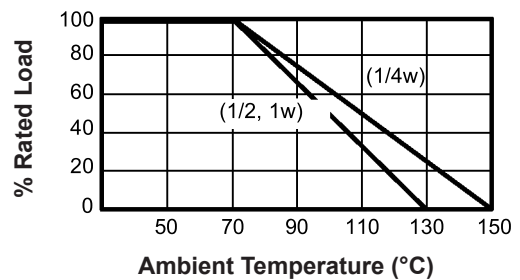
RoHS  
Compliant



## 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 ±0.7	2.4 ±0.1	30 ±3	±0.06 0.02	250	400	2.2Ω 22MΩ	±5/ ±10
0.5	9.5 <sup>+0.8</sup> -0.7	3.6 ±0.2	25 ±1	±0.7 ±0.02	350	700	2.2Ω 22MΩ	±5/ ±10
1	14.3 ±0.07	5.7 ±0.3	30 ±3	±0.92 0.02	500	1,000	2.2Ω 22MΩ	±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	0.5 V to 1 V
		10 Ω to 999 Ω	2.5 V to 3 V
		1,000 Ω to 9,999 Ω	8 V to 10 V
		10,000 Ω to 99,999 Ω	24 V to 30 V
		100,000 Ω and higher	80 V to 100 V

# Carbon Composition Resistor



## 1 Watt

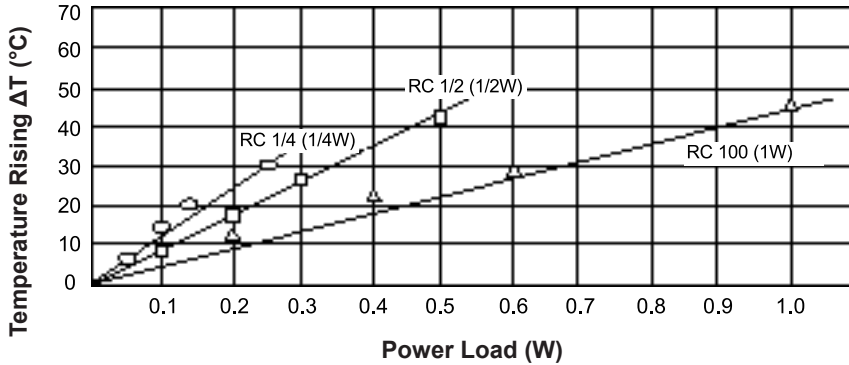
Resistance THumidity (Steady State)	<b>Nominal Resistance</b>	<b>Test Temperature at -55°C</b>	<b>Test Temperature at 100°C</b>	$\frac{R2 - R1}{R1} \times 100 (\%)$ <p>R1: Resistance value at reference temperature R2 : Resistance value at test temperature Sequence of temp. : -25°C, -15°C, -55°C, 25°C, 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:  $\frac{R - r}{r} \times \frac{100}{0.9 \times RCWV} (\% / V)$															
	<b>Rated Power</b>	<b>Coefficient Voltage</b>																	
	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	<b>Resistance Change</b>			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															
	<b>Average</b>	±6%																	
	<b>Maximum</b>	±10%																	



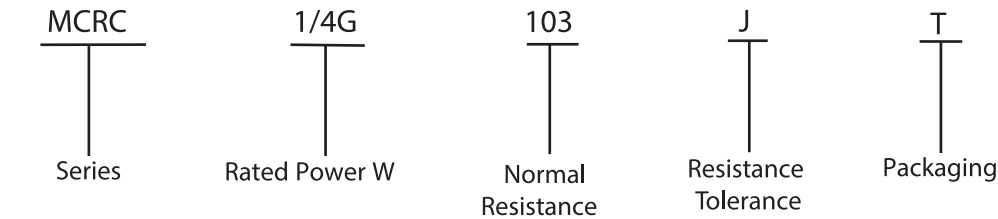
## 1 Watt

Terminal Strength	$\pm (1\% + 0.05\Omega)$ Maximum with no evidence of mechanical damage	<p><b>Direct load:</b> 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><b>Twist test:</b> 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> <pre> graph LR     DC[DC 10kV] --- Switch[Switch]     Switch --- C[1,000pF]     C --- R1[1KΩ]     R1 --- Sample[Sample]     </pre>

## 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 =  $\pm 5\%$   
T =  $\pm 10\%$
- Packaging : B = Bulk  
T = Tape and Reel

### Part Number Table

Description	Part Number
Carbon Composition Resistor	MCRC1/4G103JT-RH

**Important Notice :** This data sheet and its contents (the "Information") belong to the members of the AVNET group of companies (the "Group") or are licensed to it. No licence is granted for the use of it other than for information purposes in connection with the products to which it relates. No licence of any intellectual property rights is granted. The Information is subject to change without notice and replaces all data sheets previously supplied. The Information supplied is believed to be accurate but the Group assumes no responsibility for its accuracy or completeness, any error in or omission from it or for any use made of it. Users of this data sheet should check for themselves the Information and the suitability of the products for their purpose and not make any assumptions based on information included or omitted. Liability for loss or damage resulting from any reliance on the Information or use of it (including liability resulting from negligence or where the Group was aware of the possibility of such loss or damage arising) is excluded. This will not operate to limit or restrict the Group's liability for death or personal injury resulting from its negligence. Multicomp Pro is the registered trademark of Premier Farnell Limited 2019.