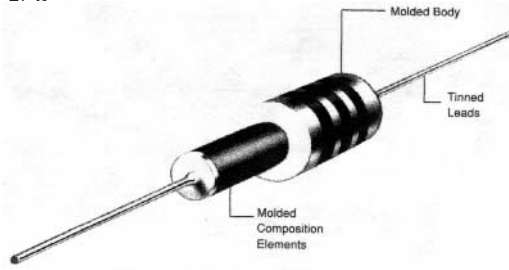


# CARBON COMPOSITION RESISTORS

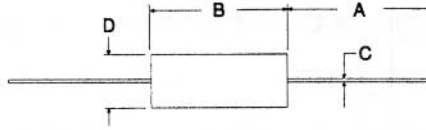


RC 1/4, 1/2



- Meets Performance Standards of EIA RS-172
- Hot Molded Process for Product Uniformity
- Ideal for Pulse-Load Handling
- Non-Inductive Design

**LEADFREE**  
RoHS Compliant



## PERFORMANCE CHARACTERISTICS (Tested per MIL-STD-202)

ELECTRICAL	RC 1/4	RC 1/2
Power Rating (watts) Derated to 0 Load at Rated Continuous Working Voltage (RCWV)	1/4 @ 70°C 130°C PxR or 250V (whichever is less)	1/2 @ 70°C 130°C PR or 350V (whichever is less)
Dielectric Withstand Voltage	500V (325V@3.4"Hg)	700V (450V@3.4"Hg)
Resistance Range	1.0 - 5.6 meg.	1.0 - 20 meg.
Tolerance	±5% & ±10%	±5% & ±10%
Maximum Pulse Voltage	400 volts RMS	700 volts RMS
Insulation Resistance	10,000 meg min.	10,000 meg min.

## ENVIRONMENTAL

Moisture Resistance	±5% typ. (1% to 7% max.)	±4% typ. (1% to 6% max.)
Thermal Shock	±1% typ. (±2% max.)	±1% typ. (±2% max.)
Load Life @ 70°C - 1,000 hrs.	-3% typ. (2% to -5% max.)	-3% typ. (2% to -5% max.)
Vibration (High-Frequency)	±1% max.	±1% max.
Shock (Specified Pulse)	±2% max.	±2% max.
Resistance to Soldering Heat	-0.5% to 2% typ. (±3% max.)	-0.5% to 2% typ. (±3% max.)
Terminal Strength	±1% max.	±1% max.
Low Temperature Operation	±0.5% typ. (±2% max.)	±0.5% typ. (±2% max.)
Voltage Coefficient (1K - 20 meg)	-0.005%/V to -0.032%/V	-0.005%/V to -0.032%/V
Short Time Overload	±0.5% typ. (±2% max.)	±0.5% typ. (±2% max.)

## RESISTANCE TEMPERATURE CHARACTERISTICS

	Resistance Range	-55°C	+105°C
Maximum % resistance change from room temperature (+25°C) value.	under 1K 1K to 9.1K 10K to 91K 100K to 910K 1 meg to 10 meg	+2.0 to +5.0 +5.0 to +9.0 +8.0 to +11.0 +10.0 to +14.0 +13.0 to +20.0	-4.0 to -2.0 -5.0 to -3.0 -7.0 to -5.0 -9.0 to -7.0 -14.0 to -9.0

## DIMENSIONS Inches (mm)

Feature	RC 1/4	RC 1/2
A - Lead Length (typ.)	1.102±.032 (28.0±0.80)	1.024±.032 (26.0±0.80)
B - Body Length	.248±.028 (6.30±0.70)	.374±.032/-0.028 (9.50±0.80/-0.70)
C - Lead Diameter	.024±.002 (0.60±0.05)	.027±.002 (0.7±0.05)
D - Body Diameter	.094±.004 (2.40±0.10)	.142±.008 (3.60±0.20)

## Part Numbering system

RC

1/4

5%

2K2

TR

Type
RC

Rated Power
1/4W 1/2W

Resistance tolerance
±5%
±10%

Nominal Resistance	
Code	Description
2R2	2.2 OHMs
22R	22 OHMs
2K2	2.2X10 <sup>3</sup> OHMs
22K	22X10 <sup>3</sup> OHMs
20M	20X10 <sup>6</sup> OHMs

Packaging	
Code	Description
B	Bulk
TR	Tape & Reel

# CARBON COMPOSITION RESISTORS



**LEADFREE**  
RoHS Compliant

## RC 1/4, 1/2

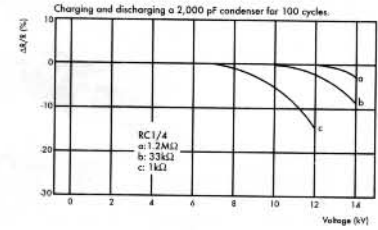
### n Ratings

Description	RC 1/4	RC 1/2
Rated Power at 70°C/element	0.25W	0.5W
Derating Curve		
Rated Voltage	-Rated Power (W) x Nominal Resistance ( ) Vdc or RMS	
Maximum Working Voltage	250V	350V
Maximum Overload Voltage	400V	700V
Resistance Tolerance	J(±5%)	K(10%) M(±20%)
Resistance Range	2.2 ~5.6M	2.2 ~22M
Nominal Resistance	J(±20%):E24 Series M(±20%):E6 Series	K(±10%):E12 Series
Operating Temperature Range	-55°C~+150°C	-55°C~+130°C
Unit Weight	222mg	422mg

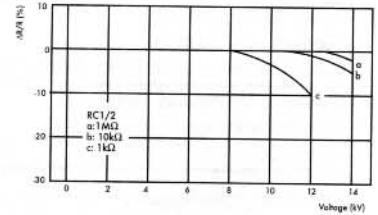
### n Characteristic Performance

Description	Requirements	Test method JIS C 5202																		
Resistance Value	Within specified tolerance	Clause 5.1																		
Resistance Temperature Coefficient	<table border="1"> <thead> <tr> <th>Resistance range</th> <th>at -55°C(%)</th> <th>at +100°C(%)</th> </tr> </thead> <tbody> <tr> <td>R&lt;=1k</td> <td>+6.5~0</td> <td>+1~-5</td> </tr> <tr> <td>R&lt;=10k</td> <td>+10~0</td> <td>0~-6</td> </tr> <tr> <td>R&lt;=100k</td> <td>+13~0</td> <td>0~-7.5</td> </tr> <tr> <td>R&lt;=1M</td> <td>+15~0</td> <td>0~-10</td> </tr> <tr> <td>R&gt;1M</td> <td>+20~0</td> <td>0~-15</td> </tr> </tbody> </table>	Resistance range	at -55°C(%)	at +100°C(%)	R<=1k	+6.5~0	+1~-5	R<=10k	+10~0	0~-6	R<=100k	+13~0	0~-7.5	R<=1M	+15~0	0~-10	R>1M	+20~0	0~-15	Clause 5.2 Condition A Test temperature +20/-15/-55/+20/ +60/+100°C
Resistance range	at -55°C(%)	at +100°C(%)																		
R<=1k	+6.5~0	+1~-5																		
R<=10k	+10~0	0~-6																		
R<=100k	+13~0	0~-7.5																		
R<=1M	+15~0	0~-10																		
R>1M	+20~0	0~-15																		
Voltage Coefficient	Within ±0.035%/V	Clause 5.3 Measurement Method 1																		
Short Time Overload	Within ±2.5% No major visible damage	Clause 5.5 Condition A Rated voltage x2.5, 5seconds																		
Insulation Resistance	At least 1,000M	Clause 5.6 Condition A 1/4W 100V 1 min., 1/2 W 500V 1 min.																		
Withstanding Voltage	No flashover, scorching or insulation breakdown.	Clause 5.7 Condition A Max. operating voltage x2, 1min.																		
Terminal Strength	<table border="1"> <thead> <tr> <th>Pulling</th> <th>Twist</th> </tr> </thead> <tbody> <tr> <td>Lead is not cut</td> <td>Terminal is not loose</td> </tr> </tbody> </table>	Pulling	Twist	Lead is not cut	Terminal is not loose	Clause 6.1.2(1) 1/4W 10N(1.02kgf) 1/2W 25N(2.55kgf) Clause 6.1.2(4) 5N(0.51kgf)														
Pulling	Twist																			
Lead is not cut	Terminal is not loose																			
Resistance to Vibration	Within ±1% No mechanical damage	Clause 6.3 10-55Hz 3 directions 2 hours each																		
Solder Heat Resistance	Within ±3% No major damage visible	Clause 6.4 1/4W 300°C, 1/2 W 350°C 3mm from the body 3 seconds																		
Solderability	At least 90% of the dipping surface must be covered by new solder	Clause 6.5 230°C 2mm from the body 5 seconds																		
Temperature Cycle	Within ±2% No mechanical damage	Clause 7.4 -55°C/+85°C for 5 cycles																		
Humidity (Normal Condition)	Within ±3%. No major visible damage. Markings legible	Clause 7.5 40°C 95% RH 240 hours																		
Load Life in Moisture	1/4W within ±5%, 1/2W within ±8%, No major visible damage. Markings legible	Clause 7.9 Rated voltage 1.5 hrs. "ON" 0.5 hrs "OFF" 40°C 95% RH for 500 hours																		
Load Life	1/4W within ±6%, 1/2W within ±8%, No major visible damage. Markings legible	Clause 7.10 Rated voltage 1.5 hrs. "ON" 0.5hrs. "OFF" 70°C for 1,000 hrs.																		

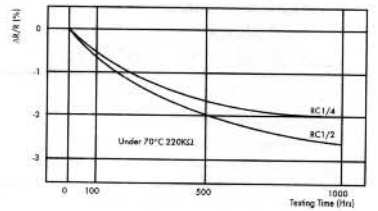
### Surge Resistance Characteristics



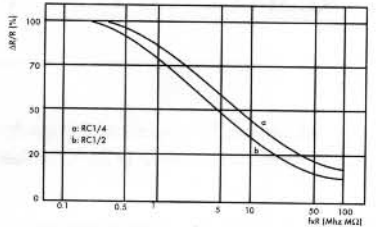
### Load Life (Rated Load)



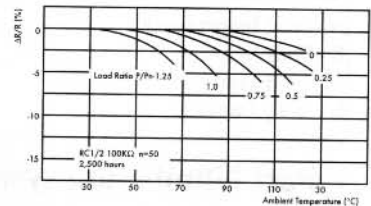
### Load Life (Rated Load)



### Frequency Characteristics



### Relationship Between Load Ratio and Ambient Temperature



### Variation with Time

