

# RCC Fixed Carbon Composition Resistors



Solid carbon resistors designed for high energy dissipation. These small leaded resistors are non inductive and combine high pulse characteristics with excellent stability



- Power Dissipation 0.25 watts or 0.5 watts
- Value Range 1R to 22M
- Tolerance Options 5%, 10%, 20%
- Maximum Voltage 500 and 700 Vdc
- Dielectric Strength Peak pulse voltage is 6kv on 0.25 watt size and 10kv on 0.5 watt
- RoHS Compliant

## Characteristics

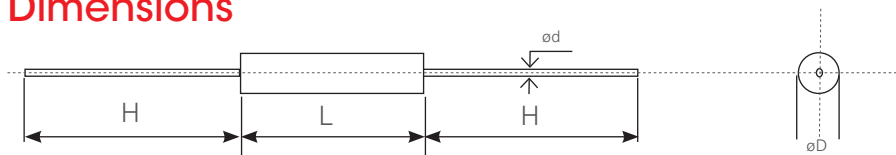
Type	Rated dissipation at 70C W	Limiting element voltage V	Rated resistance range	Combination of rated resistance and TCR			Tolerance & preferred number series	Isolation voltage V	Category temperature range
				TCR %		Rated resistance range			
				at -55°C	at +125°C				
RCC025	0.25	250	1R - 5M6	+6.5 / 0	+1 / -5	1R - 1K	J (±5%) E24 series K (±10%) E12 series M (±20%) E6 series	100	-55 ~ +125
				+10 / 0	0 / -6	1K1 - 10K			
				+13 / 0	0 / -7.5	11K - 100K			
RCC050	0.5	350	1R - 22M	+15 / 0	0 / -10	110K - 1M	500		
				+20 / 0	0 / -15	1M1 - 22M			

Rated Voltage =  $\sqrt{(\text{Rated dissipation}) \times (\text{Rated Resistance})}$  (d.c or r.m.s Voltage)

Limiting Element Voltage can only be applied to resistors when the resistance is equal to or higher than the critical resistance value.

Critical resistance value is the resistance value at which the rated voltage is equal to the limiting element voltage.

## Dimensions



Type	L	D	H	d	Weight/pc
RCC025	6.3±0.7	2.4±0.1	30±3	0.6±0.05	222mg
RCC050	9.5±0.8	3.6±0.2	28±3	0.7±0.07	422mg

## Ordering Procedure

Standard Resistor: Series, Resistance and Tolerance Code.

Packaging options: Standard packaging Bulk. Tape and Reel (TR)

Taped Ammo (TA) available on request

e.g. RCC025 10K J

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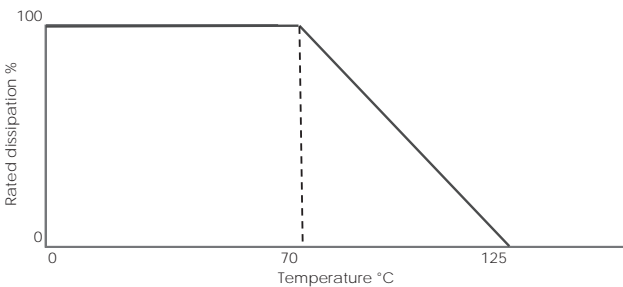
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## Electrical Specifications

Description	Requirements	Test Methods
Voltage proof	No breakdown or flashover	RCC025 100Va.c, 60s RCC050 500Va.c, 60s
Variation of resistance with temperature	See ratings table	Measuring temperature: +20°C/-55°C/+20°C/+125°C/+20°C
Overload	$\Delta R \leq \pm (2\% + 0.1 \text{ ohm})$ No visible damage, legible marking	The applied voltage shall be 2.5 times of the rated voltage or twice of the limiting element voltage, whichever is the less severe, 5s
Robustness of terminations	Tensile	$\Delta R \leq \pm (2\% + 0.1 \text{ ohm})$ no visible damage 10N for 5-10s
	Bending	$\Delta R \leq \pm (2\% + 0.1 \text{ ohm})$ no visible damage 5N twice
	Torsion	$\Delta R \leq \pm (2\% + 0.1 \text{ ohm})$ no visible damage 180°C, 2 rotation
Solderability	In accordance with clause 4.17.4.5	235°C, 5s
Resistance to soldering heat	$\Delta R \leq \pm (3\% + 0.1 \text{ ohm})$ No visible damage, legible marking	After immersion into the flux, the immersion into solder shall be carried out 4mm from the body at 350°C for 3.5s
Rapid change of temperature	$\Delta R \leq \pm (2\% + 0.1 \text{ ohm})$ no visible damage	5 cycles between -55°C and +125°C
Climatic sequence	$\Delta R \leq \pm (10\% + 0.5 \text{ ohm})$ Insulation resistance: $R \geq 100M \text{ ohm}$ , no visible damage	Dry/damp heat (12+12h cycle), first cycle Cold/damp heat (12+12h cycle), remaining cycle D.C. load
Damp test, steady state	$\Delta R \leq \pm (10\% + 0.5 \text{ ohm})$ Insulation resistance: $R \geq 100M \text{ ohm}$ , no visible damage, legible marking	40°C, 95% R.H, 56 days, test a), b), c) of clause 4.24.2.1
Endurance at 70°C	$\Delta R \leq \pm (10\% + 0.5 \text{ ohm})$ No visible damage Insulation resistance $R \geq 1G \text{ ohm}$	Rated voltage 1.5h "ON", 0.5h "OFF" 70°C, 1000h
Endurance at the upper category temperature	$\Delta R \leq \pm (10\% + 0.5 \text{ ohm})$ No visible damage Insulation resistance $R \geq 1G \text{ ohm}$	125°C, no load, 1000h

## Derating Curve



The derated values of dissipation for temperatures in excess of 70°C shall be indicated by the curve above

## Climatic Category

55/125/56  
 Lower category temperature -55°C  
 Upper category temperature +125°C  
 Duration of the damp heat, steady state test 56 days

## Storage Recommendations

Carbon composition resistors are sensitive to moisture and should be stored in a controlled environment at a temperature of 20°C ± 15°C, humidity 60%RH max. Inventory should always be used on a first-in, first-out basis. Generally, any moisture absorbed during storage will be "baked out" during the soldering operation. If stored correctly, the resistance shift during soldering will be minimal at less than 3%

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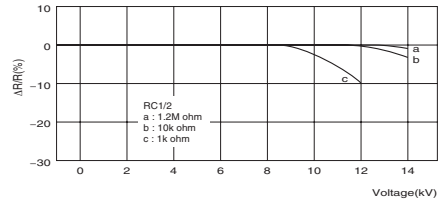
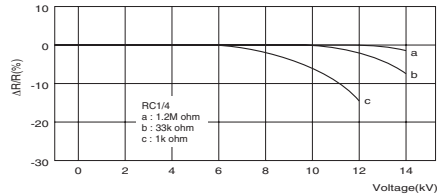
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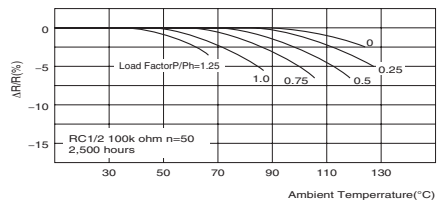
## Typical Characteristics (indicate the mean values of $\Delta R/R$ etc)

### •Surge Resistance Characteristics

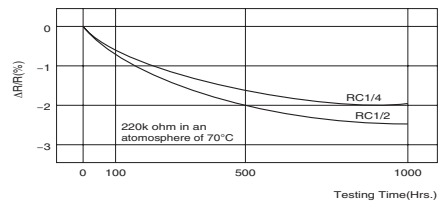
Charging and discharging a 2,000 pF capacitor for 100 cycles.



### •Relationship between Load Ratio and Category Temperature

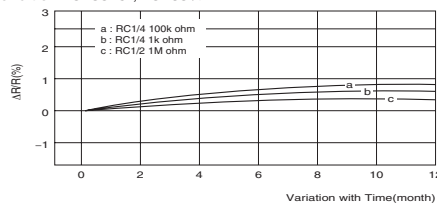


### •Endurance at 70°C

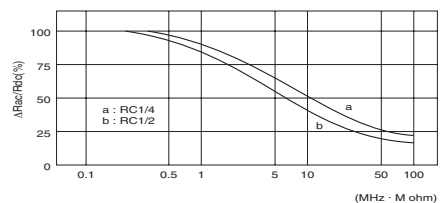


### •Variation with Time

Condition : 5-35°C , 45-85% R.H.



### •Frequency Characteristics



## Reliability Test

Endurance in humidity

Samples: RCC025 100R, 1K, 10K, 100K x150 each. Total 2,400

Condition: Direct current voltage equivalent to the following load ratings in cycles on "ON" for 1.5h and "OFF" for 0.5h for a total of 5,000h in an atmosphere of 40°C, 90 to 95%RH

Criterion (%)	Load ratio P/Pn (%)	Total Testing Time T (Hrs)	Number of failure r (pcs)	Failure Ratio		Average Lifetime (60% reliability level) (Hrs)	
				$\lambda$	$\lambda_{CL}$ (60%)		
$\Delta R/R$	$\pm 5$	0	2.984x10 <sup>6</sup>	6	0.201	0.244	4.098x10 <sup>5</sup>
		20	2.990x10 <sup>6</sup>	4	0.134	0.176	5.682x10 <sup>5</sup>
		60	2.997x10 <sup>6</sup>	2	0.067	0.104	9.615x10 <sup>5</sup>
		100	2.992x10 <sup>6</sup>	3	0.100	0.139	7.194x10 <sup>5</sup>
		Total	1.196x10 <sup>6</sup>	15	0.125	0.138	7.209x10 <sup>5</sup>
	$\pm 10$	Total	1.20x10 <sup>7</sup>	0	0.055	0.007	1.299x10 <sup>7</sup>

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