KOA SPEER ELECTRONICS, INC.

RCR

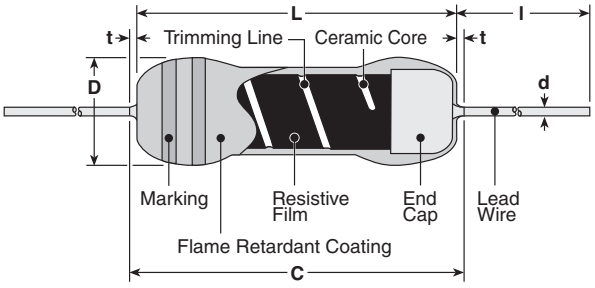
anti-surge power type leaded resistor

features

- Excellent anti-surge characteristics
- Stable characteristics of moisture resistance up to high resistance range
- RCR50 +(1MΩ - 12MΩ), RCR50EN (1MΩ - 12MΩ) and RCR60 (1MΩ - 12MΩ) are discharge resistors recognized by UL1676 and c-UL(CSA-C22.2 No.1-M94)
- RCR25EN (100Ω~33MΩ), RCR50EN (100kΩ - 33MΩ) and RCR60 (470kΩ - 56MΩ) is approved by EN60065 14.1 safety
- Marking: Blue-gray body color with color-coded bands
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- Surface mount style "N" forming is suitable for automatic mounting

EU RoHS COMPLIANT

dimensions and construction



* Lead length changes depending on taping and forming.

Type	Dimensions inches (mm) L	C (max.)	t (max.)	D	d (nom.)	l*
RCR16	.126±.008 (3.2±0.2)	.134 (3.4)	—	.067 +.008 -.004 (1.7 +0.2 -0.1)	.018 (0.45)	.787 Min. (20.0 Min.)
RCR25 RCR25EN	.248±.02 (6.3±0.5)	.28 (7.1)	—	.098±.02 (2.5±0.5)	.024 (0.6)	
RCR50(+) RCR50EN	.374±.039 (9.5±1.0)	—	.118 (3.0)	.138±.016 (3.5±0.4)	.028 (0.7)	
RCR60	.374 +.039 -.004 (9.5 +1.0 -0.2)					
RCR75	.472±.039 (12±1.0)	—	.118 (3.0)	.157±.02 (4.0±0.5)	.031 (0.8)	
RCR100	.610±.039 (15.5±1.0)	—	.118 (3.0)	.236 +.039 -.016 (6.0 +1.0 -0.4)	.031 (0.8)	

ordering information

New Part #

RCR	50	EN	C	T52	A	105	J
Type	**Power Rating**	**Safety Appr. Marking**	**Termination Material**	**Taping and Forming**	**Packaging**	**Nominal Resistance**	**Tolerance**
RCR	16: 0.25W 25: 0.25W 50: 0.5W 60: 1W 75: 2W 100: 3W	RCR50+: + RCR25EN, RCR50EN: EN Blank: Others	C: SnCu	RCR16: T26, T52 RCR25, RCR25EN: T26, T52 RCR50(+, EN): T52 RCR60: T52 RCR75: T52 RCR100: T521, T631 L, M, N Forming	A: Ammo R: Reel TEB: Plastic embossed: N forming	2 significant figures + 1 multiplier for ±5% 3 significant figures + 1 multiplier for ±1%	F: ±1% J: ±5%

applications and ratings

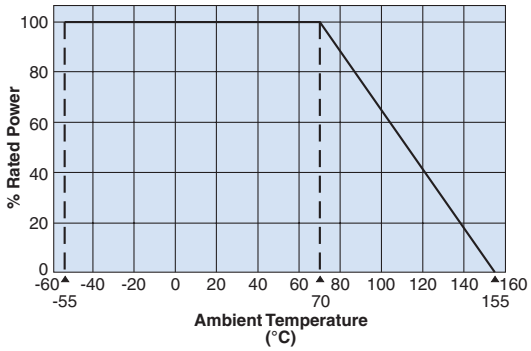
Part Designation	Power Rating @ 70°C	Minimum Dielectric Withstanding Voltage	Resistance Range E-24, E-96 (F±1%)	Resistance Range E-24 (J±5%)	Absolute Maximum Working Voltage	Absolute Maximum Overload Voltage	Operating Temperature Range
RCR16	0.25W	300V	100kΩ - 5.1MΩ	100kΩ - 5.1MΩ	500V	1000V	-55°C to +155°C
RCR25 NEW RCR25EN		700V	100kΩ - 9.1MΩ	100kΩ - 33MΩ	DC 1600V AC 1150V	DC 2000V AC 1500V	
RCR50	0.5W		3.3Ω - 910kΩ	3.3Ω - 910kΩ	2000V	2500V	
				13MΩ - 33MΩ			
RCR50+			1MΩ - 9.1MΩ	1MΩ - 12MΩ			
RCR50EN			100kΩ - 9.1MΩ	100kΩ - 33MΩ			
RCR60	1.0W		100kΩ - 9.1MΩ	100kΩ - 56MΩ	4000V	5000V	
RCR75	2.0W		100kΩ - 9.1MΩ	100kΩ - 100MΩ	5000V		
RCR100	3.0W	1000V	100kΩ - 9.1MΩ	100kΩ - 33MΩ			

For further information on packaging, please refer to Appendix C.

1/03/14

environmental applications

Derating Curve



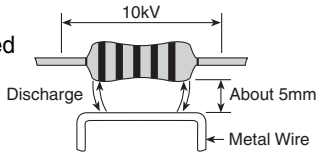
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

Notice of Surge Load

Surge withstanding load voltage for the resistors cannot be guaranteed when the undermentioned 4 items get to a remarkable overload in comparison with the conditions shown by surge withstanding voltage in Anti-surge characteristics. Please contact KOA in advance if such a case is anticipated.

1. Peak voltage to be applied
2. Pulse width
3. Conditions of protecting insulation around the resistor
4. Situation of proximity conductivity object

For example: In the figure, a metal wire is placed less than 5mm away from the resistor body, there is such a case that causes an electric discharge by a surge load 10kV and then destroys the outer coating.



Performance Characteristics

Parameter	Requirement Δ R ±(% + 0.05Ω) Limit	Typical	Test Method
Resistance	Within regulated tolerance	—	Measuring points are 10mm ± 1mm from the end cap
T.C.R.	Type / T.C.R. / Resistance Range: RCR16: ±200ppm/°C: 100kΩ - 5.1MΩ RCR25 (EN): ±350ppm/°C: 100kΩ - 33MΩ RCR50 (+): ±500ppm/°C: 3.3Ω - 91kΩ; ±350ppm/°C: 100kΩ - 33MΩ RCR50EN: ±350ppm/°C: 100kΩ - 33MΩ RCR60: ±350ppm/°C: 100kΩ - 56MΩ RCR75: ±350ppm/°C: 100kΩ - 100MΩ RCR100: ±200ppm/°C: 100KΩ - 33MΩ	—	Room temperature/100°C up
Overload	1%	0.5%	Rated voltage x 2.5 or maximum overload voltage for 5 seconds, whichever is less
Resistance to Solder Heat	1%	0.5%	260°C ± 5°C, 10 seconds ± 1 second or 350°C ± 10°C, 3.5 seconds ± 0.5 seconds
Terminal Strength	No mechanical damage	—	Twist 360°, 5 times
Rapid Change of Temperature	1%	0.5%	-55°C (30 minutes)/+155°C (30 minutes), 5 cycles
Moisture Resistance	5%	2.5%	40°C ± 2°C, 90-95% RH, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle RCR16, 25, 50 (+), 60: W; RCR75, 100: Wx0.1
Endurance @ 70°C	5%	2.5%	70°C ± 2°C, 1000 hours, 1.5 hr ON, 0.5 hr OFF cycle
Resistance to Solvent	No visible damage to protective coating and marking	—	Isopropyl alcohol with ultrasonic washing, 2 minutes Power: 0.3W/cm², f: 28kHz, Temperature: 35°C ± 5°C
Surge Withstanding	10%	2.5%	Discharge test: 2kV - 10kV, 0.01μF capacitor discharge pulse, 10 times (1 pulse/5 seconds maximum) Type / RCR16 / RCR25 RCR25EN / RCR50, RCR50+ / RCR50EN, RCR60, RCR75, RCR100 Applied Voltage / 2kV / 3kV / 3.3Ω - 6.2Ω: 10kV; 6.8Ω - 10Ω: 7kV; 11Ω - 9.1kΩ: 5kV; 10kΩ - 91kΩ: 7kV; 100kΩ - 33MΩ: 10kV / 10kV
EN60065 Test (RCR50EN, RCR60 only)	20%	—	Discharge test: 10kV, 1000pF capacitor discharge pulse, 50 times (1 pulse/5 seconds maximum)