

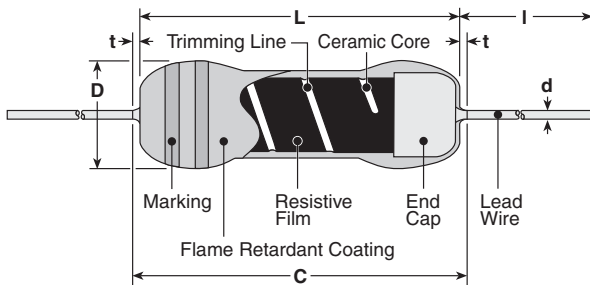
## anti-surge power type leaded resistor



### 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 (100kΩ~33MΩ), RCR50EN (100kΩ - 33MΩ) and RCR60 (100kΩ - 56MΩ) is approved by EN60065 14.1 safety
- 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

### dimensions and construction



\* Lead length changes depending on taping and forming.

Type	Dimensions inches (mm)					
	L	C (max.)	t (max.)	D	d (nom.)	I*
RCR16	.126±.008 (3.2±0.2)	.134 (3.4)	—	.067 <sup>+0.08</sup> <sub>-.004</sub> (1.7 <sup>+0.2</sup> <sub>-.01</sub> )	.018 (0.45)	
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)	.787 Min. (20.0 Min.)
RCR60	.374 <sup>+0.039</sup> <sub>-.004</sub> (9.5 <sup>+1.0</sup> <sub>-.02</sub> )	—	.118 (3.0)	.157±.02 (4.0±0.5)	.031 (0.8)	
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 <sup>+0.039</sup> <sub>-.016</sub> (6.0 <sup>+1.0</sup> <sub>-.04</sub> )	.031 (0.8)	

### ordering information

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 RCR25EN								100kΩ - 9.1MΩ
RCR50	0.5W	700V	3.3Ω - 910kΩ	3.3Ω - 910kΩ	2000V	2500V		
RCR50+				1MΩ - 9.1MΩ				1MΩ - 12MΩ
RCR50EN				100kΩ - 9.1MΩ				100kΩ - 33MΩ
RCR60	1.0W	1000V	100kΩ - 9.1MΩ	100kΩ - 56MΩ	4000V	5000V		
RCR75	2.0W							100kΩ - 9.1MΩ
RCR100	3.0W	1000V	100kΩ - 9.1MΩ	100kΩ - 51MΩ	5000V	5000V		

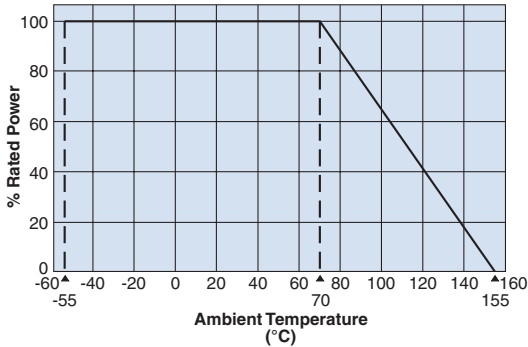
For further information on packaging, please refer to Appendix C.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

11/15/17

## environmental applications

### Derating Curve



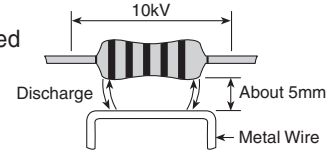
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

### 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 $\Delta R \pm(\% + 0.05\Omega)$ Limit	Typical	Test Method															
Resistance	Within regulated tolerance	—	Measuring points are 10mm $\pm$ 1mm from the end cap															
T.C.R.	Type	T.C.R.	Resistance Range															
	RCR16	$\pm 200\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 5.1M $\Omega$															
	RCR25 (EN)	$\pm 350\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 33M $\Omega$															
	RCR50 (+)	$\pm 500\text{ppm}/^\circ\text{C}$	3.3 $\Omega$ - 91k $\Omega$															
		$\pm 350\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 33M $\Omega$															
	RCR50EN	$\pm 350\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 33M $\Omega$															
	RCR60	$\pm 350\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 56M $\Omega$															
	RCR75	$\pm 350\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 100M $\Omega$															
RCR100	$\pm 200\text{ppm}/^\circ\text{C}$	100k $\Omega$ - 51M $\Omega$																
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 $\pm$ 5°C, 10 seconds $\pm$ 1 second or 350°C $\pm$ 10°C, 3.5 seconds $\pm$ 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 $\pm$ 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 $\pm$ 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/cm <sup>2</sup> , f: 28kHz, Temperature: 35°C $\pm$ 5°C															
Surge Withstanding	10%	2.5%	Discharge test: 2kV - 10kV, 0.01 $\mu$ F capacitor discharge pulse, 10 times (1 pulse/5 seconds maximum)															
			<table border="1"> <thead> <tr> <th>Type</th> <th>RCR16</th> <th>RCR25 RCR25EN</th> <th>RCR50, RCR50+</th> <th>RCR50EN, RCR60, RCR75, RCR100</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Applied Voltage</td> <td rowspan="4">2kV</td> <td rowspan="4">3kV</td> <td>3.3<math>\Omega</math> - 6.2<math>\Omega</math>: 10kV</td> <td rowspan="4">10kV</td> </tr> <tr> <td>6.8<math>\Omega</math> - 10<math>\Omega</math>: 7kV</td> </tr> <tr> <td>11<math>\Omega</math> - 9.1k<math>\Omega</math>: 5kV</td> </tr> <tr> <td>10k<math>\Omega</math> - 91k<math>\Omega</math>: 7kV</td> </tr> <tr> <td></td> <td></td> <td></td> <td>100k<math>\Omega</math> - 33M<math>\Omega</math>: 10kV</td> <td></td> </tr> </tbody> </table>	Type	RCR16	RCR25 RCR25EN	RCR50, RCR50+	RCR50EN, RCR60, RCR75, RCR100	Applied Voltage	2kV	3kV	3.3 $\Omega$ - 6.2 $\Omega$ : 10kV	10kV	6.8 $\Omega$ - 10 $\Omega$ : 7kV	11 $\Omega$ - 9.1k $\Omega$ : 5kV	10k $\Omega$ - 91k $\Omega$ : 7kV		
Type	RCR16	RCR25 RCR25EN	RCR50, RCR50+	RCR50EN, RCR60, RCR75, RCR100														
Applied Voltage	2kV	3kV	3.3 $\Omega$ - 6.2 $\Omega$ : 10kV	10kV														
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EN60065 Test (RCR50EN, RCR60 only)	20%	—	Discharge test: 10kV, 1000pF capacitor discharge pulse, 50 times (1 pulse/5 seconds maximum)															