KOA SPEER ELECTRONICS, INC.

RoHS COMPLIANT

spec sheet

SS-01 R6
AHA 3/15/13

Fixed Resistors

ISO 9001:2008 CERTIFIED
TS-16949 CERTIFIED

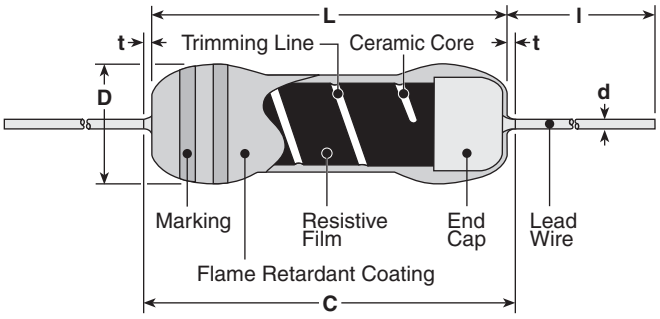
Type RCR16, RCR25, RCR50(+), RCR50EN, RCR60, RCR75 and RCR100

1. Scope of Application

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).

RCR50EN (100kΩ - 33MΩ) and RCR60 (470kΩ - 56MΩ) is approved by EN60065 14.1 safety. There is the case that RCR50EN cannot meet CLASS II depending on a use.

2. 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	.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)	

3. Type Designation

The type designation shall be in the following form:

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+: + RCR50EN: EN Blank: Others	C: SnCu	RCR16: T26, T52 RCR25: T26, T52 RCR50(+, EN): T52 RCR60: T52 RCR75: T52 RCR100: T521, T631 L,M 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%

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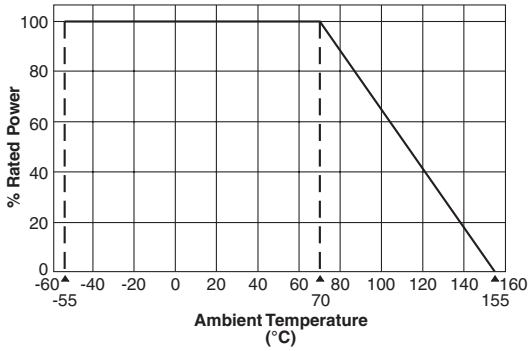
4. Standard Applications

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 - 1MΩ	100kΩ - 5.1MΩ	500V	1000V	-55°C to +155°C
RCR25		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			

5. Derating Curve



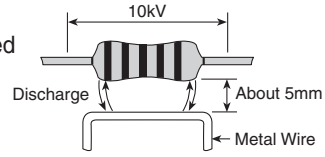
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

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. Peck 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.



6. Markings on Resistor

Resistors shall be coded with color bands in accordance with JIS C 0802. The first and the second color bands shall show 2 effective numbers, the third band shall show a multiplier of 10, the fourth band shall show resistance tolerance, and the fifth band “green” shall show UL1676 approval (on RCR50 values from 1MΩ to 12MΩ).

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7. Performance Characteristics

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

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9. Package

9-1 Package

RCR16	T25A: 5,000 pieces/box T52A: 3,000 pieces/box
RCR25	T25A: 2,000 pieces/box T52A: 2,000 pieces/box T52R: 5,000 pieces/reel
RCR50(+)	T52A: 2,000 pieces/box T52R: 3,000 pieces/reel
RCR60	T52A: 2,000 pieces/box
RCR75	T52: 1,000 pieces/box
RCR100	T521: 500 pieces/box T631: 1,000 pieces/box

9-2 Forming

	Type
RCR16	M-5
RCR25	M-10
RCR50	M-15
RCR60	M-15
RCR100	M-20
RCR75	N17

10. Markings

Marking items for box and tape and reel packaging are as follows:

1	Product name	**2**	Nominal resistance
3	Resistance tolerance	**4**	Quantity
5	Lot number	**6**	Manufacturer's name

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