KOA SPEER ELECTRONICS, INC.

RoHS COMPLIANT

spec sheet

SS-01 R5
AHA 6/20/07

Fixed Resistors

ISO 9001:2000 CERTIFIED
TS-16949 CERTIFIED

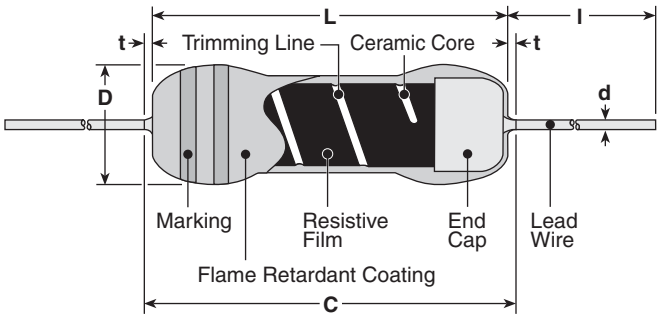
Type RCR16, RCR25, RCR50(+), RCR60, RCR75 and RCR100

1. Scope of Application

This specification applies to RCR16, RCR25, RCR50(+), RCR60, RCR75 and RCR100 type coat-insulated fixed surge resistant resistors produced by KOA corporation.

Values from 1MΩ to 12MΩ are approved to UL 1676, RCR50+ and RCR60 only (discharge path resistor spec, File No. E159326).

2. Dimensions and Construction



	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 RCR50+	.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)					
NEW	RCR75	.472±.039 (12±1.0)	—	.118 (3.0)	.157±.02 (4.0±0.5)	.031 (0.8)	
NEW	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	C	T52	A	105	J
Type	Power Rating	Termination Material	Taping and Forming	Packaging	Nominal Resistance	Tolerance
RCR RCR50+	16: 0.25W 25: 0.25W 50: 0.5W 60: 1W **NEW** 75: 2W **NEW** 100: 3W	C: SnCu (Other termination styles available, contact factory for options)	RCR16: T26, T52 RCR25: T26, T52 RCR50(+): T52 RCR60: T52 RCR75: T52 RCR100: T521, T631	A: Ammo R: Reel	2 significant figures + 1 multiplier for ±5% 3 significant figures + 1 multiplier for ±1%	F: ±1% J: ±5%

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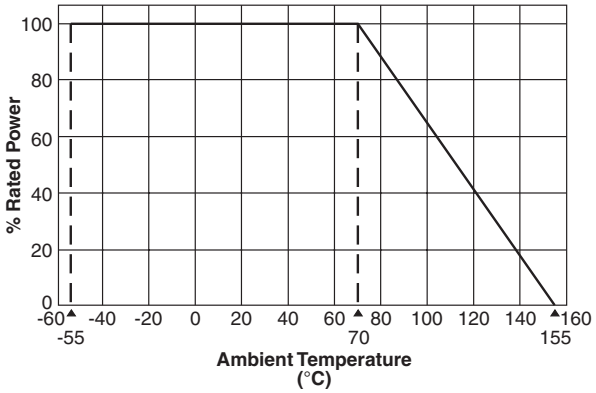
4. Standard Applications

	Part Designation	Power Rating @ 70°C	Minimum Dielectric Withstanding Voltage	Resistance Range E-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 - 33MΩ	DC 1600V AC 1150V	DC 2000V AC 1500V	
	RCR50	0.5W			3.3Ω - 910kΩ	2000V	2500V	
					13MΩ - 33MΩ			
	RCR50+				1MΩ - 12MΩ			
	RCR60	1.0W			100kΩ - 56MΩ	4000V	5000V	
NEW	RCR75	2.0W			100kΩ - 100MΩ	5000V		
	RCR100	3.0W	1000V		470kΩ - 33MΩ			

5. Derating Curve

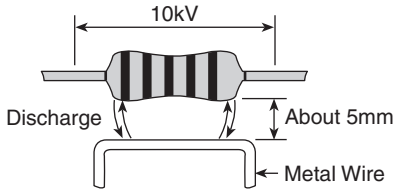


Notice of Surge Load

Surge withstanding load voltage for the resistors cannot be guarantee 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 rowspan="2">Parameter</th><th colspan="2">Requirement Δ R ±(% + 0.05Ω)
Limit</th><th>Typical</th><th>Test Method</th></tr>
<tr><td colspan="2">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 colspan="2"><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>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>±350ppm/°C</td><td>470kΩ - 33MΩ</td></tr></table></td><td>—</td><td>Room temperature/100°C up</td></tr>
<tr><td>Overload</td><td colspan="2">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 colspan="2">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 colspan="2">No mechanical damage</td><td>—</td><td>Twist 360°, 5 times</td></tr>
<tr><td>Rapid Change of Temperature</td><td colspan="2">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 colspan="2">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</td></tr>
<tr><td>Endurance @ 70°C</td><td colspan="2">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 colspan="2">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 colspan="2">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>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 (RCR60 only)</td><td colspan="2">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

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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