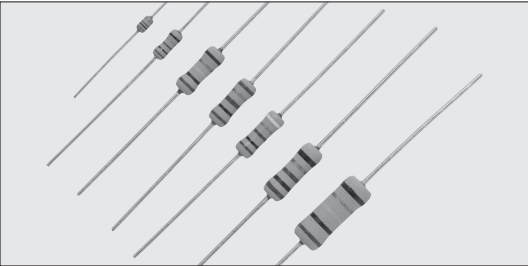


DISCHARGE PATH RESISTOR



RCR Coat-Insulated Fixed Anti Surge Resistors



Coating color : Blue gray
Marking : Excluding RCR16...4 line color codes+5th color code^{※1}
RCR16...4 line color codes
※1 RCR50+, RCR50EN (1MΩ~12MΩ) : Green, RCR60 : White, Others : Black
Please confirm contents on technical specifications about the color code of F grade product.

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 conductive-path and Discharge-path 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 EN62368-1 G.10 safety.
- Products meet EU-RoHS requirement. EU-RoHS regulation is not intended for Pb-glass contained in resistor element.
- Automatic mounting machine is applicable by surface mounted device style lead forming.

Applications

- TV
- Copy machines
- LBP
- Switching power supplies
- AC adapters

Approvals Awarded

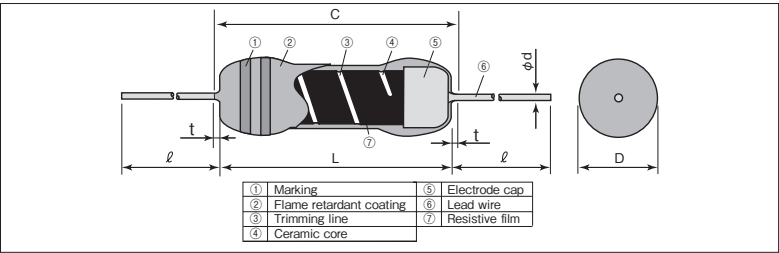
Type	UL1676 & c-UL (CSA-C22.2 No.1-M94)	EN62368-1 G.10
RCR25EN	—	○
RCR50+	—	—
RCR50EN	○ (1MΩ~12MΩ)	—
RCR60	—	○

Ratings

Type	Power Rating	Resistance Range (Ω)		Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Taping & Q'ty/AMMO (pcs)			
		F:±1% (E24・E96)	J:±5% (E24)				T26	T52	T521	T631
RCR16	0.25W	100k~5.1M	100k~5.1M	500V	1000V	300V	5000	3000	—	—
RCR25		100k~9.1M	100k~33M	D.C. 1600V A.C. 1150V	D.C. 2000V A.C. 1500V	700V	2000	2000	—	—
RCR25EN										
RCR50	0.5W	3.3Ω~910k	3.3~910k 13M~33M	2000V	2500V	700V	—	2000	—	—
RCR50+		1M~9.1M	1M~12M							
RCR50EN		100k~9.1M	100k~33M							
RCR60	1W	100k~9.1M	100k~56M	4000V	5000V	700V	—	2000	—	—
RCR75	2W	100k~9.1M	100k~100M	5000V	5000V	700V	—	1000	—	—
RCR100	3W	100k~9.1M	100k~51M	5000V	5000V	1000V	—	—	500	1000

Rated Ambient Temperature : +70℃
Operating Temperature Range : -55℃~+155℃
Rated voltage= $\sqrt{\text{Power Rating} \times \text{Resistance value}}$ or Max. working voltage, whichever is lower.

Construction



Dimensions

Type	Dimensions (mm)						Weight (g) (1000pcs)	
	L	C Max.	t Max.	D	d (Nominal)	ℓ ±2		
RCR16	3.2±0.2	3.4	—	1.7 ^{+0.2} _{-0.2}	0.45	20min.	150	
RCR25	6.3±0.5	7.1	—	2.5±0.5	0.6		240	
RCR25EN							520	
RCR50 (+)	9.5±1.0	—	3.0	3.5±0.4	0.7		520	
RCR50EN							800	
RCR60	9.5 ^{+1.0} _{-0.9}	—	3.0	3.5±0.4	0.7		520	
RCR75	12.0±1.0	—	3.0	4.0±0.5	0.8		800	
RCR100	15.5±1.0	—	3.0	6.0 ^{+1.0} _{-0.8}	0.8		1400	

※2 Lead length changes depending on taping and forming type.

Type Designation

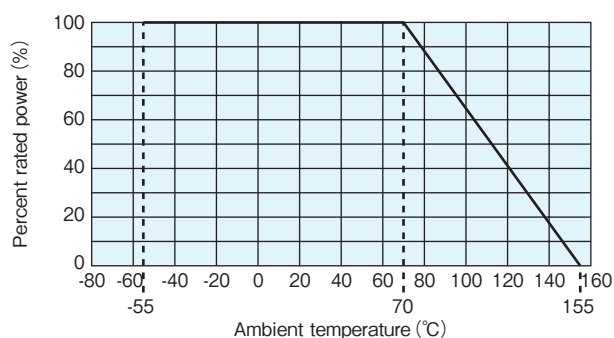
Example	RCR	50	EN	C	T52	A	106	J
Product Code	RCR	50	EN	C	T52	A	106	J
Power Rating		16:0.25W 25:0.25W 50:0.5W 60:1W 75:2W 100:3W	Safety Approvals Marking + : RCR50+ EN : RCR25EN, RCR50EN Nil : Others	Terminal Surface Material C:SnCu	Taping & Forming See table below	Packaging Forming A:AMMO R:REEL TEB:TEG:Plastic embossed (N forming) Nil:BOX	Nominal Resistance F:4 digits J:3 digits	Resistance Tolerance F:±1% J:±5%

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS. For further information on taping and forming, please refer to APPENDIX C on the back pages.

Taping & Forming Matrix

Type	Axial Taping				L Forming			M Forming				N Forming	
	T26	T52	T521	T631	L15A	L20A	L25A	M5	M10	M15	M20	N17	N20
RCR16	○	○	—	—	—	—	—	M5F	—	—	—	—	—
RCR25	○	○	—	—	—	—	—	—	M10F	—	—	—	—
RCR25EN	○	○	—	—	—	—	—	—	M10F	—	—	—	—
RCR50	—	○	—	—	○	—	—	—	—	M15F	—	—	—
RCR50+	—	○	—	—	○	—	—	—	—	M15F	—	—	—
RCR50EN	—	○	—	—	○	—	—	—	—	M15F	—	—	—
RCR60	—	○	—	—	○	—	—	—	—	M15F	—	—	—
RCR75	—	○	—	—	○	—	—	—	—	—	—	○	—
RCR100	—	—	○	○	—	○	○	—	—	—	M20E	—	○

Derating Curve



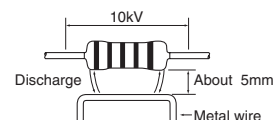
For resistors operated at an ambient temperature of 70°C or higher, the power shall be derated in accordance with the above derating curve.

Notice on 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. You are kind by requested to contact to us 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

As the fig. below for instance when a metal wire is placed at 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

Test Items	Performance Requirements ΔR± (%+0.05Ω)		Test Methods																											
	Limit	Typical																												
Resistance	Within specified	—	Measuring points are at 10mm±1mm from the end cap.																											
T.C.R.	<table><tr><td>Type</td><td>T.C.R.</td><td>Resistance Range</td></tr><tr><td>RCR16</td><td>±200×10⁻⁶/K</td><td>100kΩ~5.1MΩ</td></tr><tr><td>RCR25</td><td>±350×10⁻⁶/K</td><td>100kΩ~33MΩ</td></tr><tr><td>RCR25EN</td><td>±500×10⁻⁶/K</td><td>3.3Ω~91kΩ</td></tr><tr><td>RCR50 (+)</td><td>±350×10⁻⁶/K</td><td>100kΩ~33MΩ</td></tr><tr><td>RCR50EN</td><td>±350×10⁻⁶/K</td><td>100kΩ~33MΩ</td></tr><tr><td>RCR60</td><td>±350×10⁻⁶/K</td><td>100kΩ~56MΩ</td></tr><tr><td>RCR75</td><td>±350×10⁻⁶/K</td><td>100kΩ~100MΩ</td></tr><tr><td>RCR100</td><td>±200×10⁻⁶/K</td><td>100kΩ~51MΩ</td></tr></table>	Type	T.C.R.	Resistance Range	RCR16	±200×10 ⁻⁶ /K	100kΩ~5.1MΩ	RCR25	±350×10 ⁻⁶ /K	100kΩ~33MΩ	RCR25EN	±500×10 ⁻⁶ /K	3.3Ω~91kΩ	RCR50 (+)	±350×10 ⁻⁶ /K	100kΩ~33MΩ	RCR50EN	±350×10 ⁻⁶ /K	100kΩ~33MΩ	RCR60	±350×10 ⁻⁶ /K	100kΩ~56MΩ	RCR75	±350×10 ⁻⁶ /K	100kΩ~100MΩ	RCR100	±200×10 ⁻⁶ /K	100kΩ~51MΩ	—	+25℃/+125℃
Type	T.C.R.	Resistance Range																												
RCR16	±200×10 ⁻⁶ /K	100kΩ~5.1MΩ																												
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RCR100	±200×10 ⁻⁶ /K	100kΩ~51MΩ																												
Overload (Short time)	1	0.5	Rated voltage×2.5 or Max. overload vol., whichever is lower, for 5s																											
Resistance to soldering heat	1	0.5	260℃±5℃, 10s±1s or 350℃±10℃, 3.5s±0.5s																											
Terminal strength	No lead-coming off and loose terminals	—	Twist 360° , 5 times																											
Rapid change of temperature	1	0.5	—55℃ (30min.) /+155℃ (30min.) 5 cycles																											
Moisture resistance	5	2.5	40℃±2℃, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle RCR16, 25, 50 (+), 60 : Rated Voltage RCR75, 100 : Power Rating×0.1																											
Endurance at 70℃	5	2.5	70℃±2℃, 1000h, Rated Voltage 1.5h ON/0.5h OFF cycle																											
Resistance to solvent	No abnormality in appearance. Marking shall be easily legible.	—	Ultrasonic washing with Isopropyl alcohol for 2 min. Power : 0.3W/cm², f : 28kHz, Temp. : 35℃±5℃																											
Anti-surge characteristics	10	2.5	Discharge test : 2kV~10kV 0.01 μF capacitor discharge pulse 10 times. (1pulse/5s max.) <table><tr><td>Type</td><td>RCR16</td><td>RCR25・RCR25EN</td><td>RCR50・RCR50+</td><td>RCR50EN</td><td>RCR60</td><td>RCR75</td><td>RCR100</td></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><td rowspan="5">10kV</td><td rowspan="5">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>	Type	RCR16	RCR25・RCR25EN	RCR50・RCR50+	RCR50EN	RCR60	RCR75	RCR100	Applied voltage	2kV	3kV	3.3Ω~6.2Ω : 10kV	10kV	10kV	10kV	10kV	6.8Ω~10Ω : 7kV	11Ω~9.1kΩ : 5kV	10kΩ~91kΩ : 7kV	100kΩ~33MΩ : 10kV							
Type	RCR16	RCR25・RCR25EN	RCR50・RCR50+	RCR50EN	RCR60	RCR75	RCR100																							
Applied voltage	2kV	3kV	3.3Ω~6.2Ω : 10kV	10kV	10kV	10kV	10kV																							
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			100kΩ~33MΩ : 10kV																											
EN60065 test (RCR50EN, RCR60 Only)	20	—	Discharge test : 10kV 1000pF capacitor discharge pulse 50 times. (1pulse/5s max.)																											

Precautions for Use

- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Please wash them to a minimum. No external force is given to the coating films until they are well dried because the coating films become weaker right after washing. The original strength will be returned after they are dried, so please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying. Especially no PC boards shall be piled up.
- Do not touch the resistors with high-resistance value by hand to prevent surface-leakage current.
- Consult with us when there are electric conductors near to because it may cause corona and short-circuit by discharge.
- Please do not apply resistors under such bad conditions as high temperature, high humidity, and foul adhesion, or with resin molding, because it may cause the change of resistance value.
- The resistance film of less than RCR50 100k Ω is different. Therefore, the characteristic might decrease when it is polluted by a remarkable moisture environment and the ionic material so inquire of our company beforehand, please.