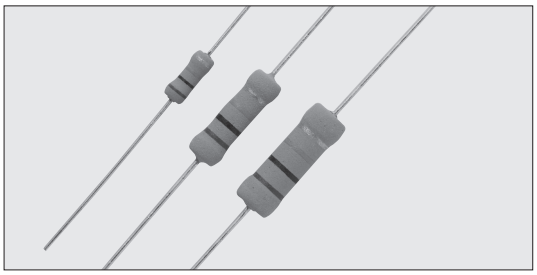
EU RoHS

PCF Ceramic Resistors for Anti Pulse・Surge



Coating color：Light green
Marking：Color code

■Features

- KOA original bulk ceramic resistors.
- Excellent in anti-pulse characteristics.
- Higher reliability against disconnection compared to wirewound resistors and film resistors.
- Products meet EU-RoHS requirements.
- Flame retardant coating. (Equivalent to UL-94 V-0)
- Non-Inductive resistors.
- AEC-Q200 Tested.

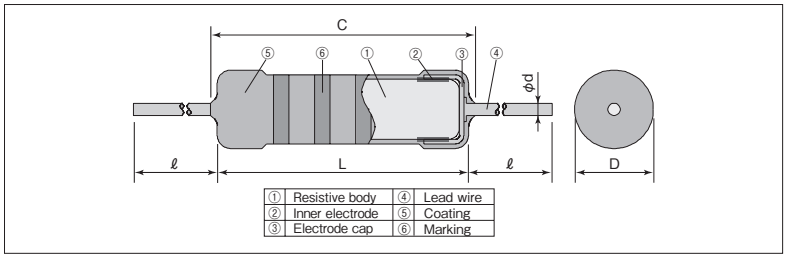
■Applications

- High voltage circuits for X-ray generators and electron microscopes.
- Power supply circuits for machine tools, etc.

■Reference Standards

IEC 60115-1
JIS C 5201-1

■Construction



■Dimensions

Type	Dimensions (mm)					Weight(g) (1000pcs)
	L±1	C max.	D	d(Nominal)	ℓ±3※1	
PCF1/2	9.0	11.1	3.5±0.5	0.7	30.0	450
PCF1	16.5	19.0	5.5±1.0	0.8	38.0	1340
PCF2	19.0	22.5	7.0±1.0			2240

※1 Lead length changes depending on taping type.

■Type Designation

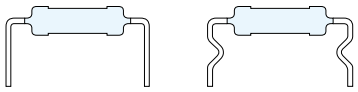
Example

PCF	1	C	T631	R	103	K
Product Code	Power Rating	Terminal Surface Material	Taping	Packaging	Nominal Resistance	Resistance Tolerance
PCF	1/2:0.5W 1:1.0W 2:2.0W	C:SnCu	See table Below	R:REEL Nil:BOX	3 digits	K:±10% M:±20%

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

■Taping

Type	Axial Taping	
	T52	T631
PCF1/2	○	—
PCF1	—	○
PCF2	—	○



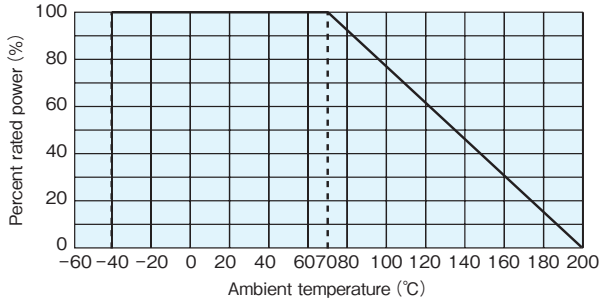
Contact us for lead forming details.

■Ratings

Type	Power Rating	Resistance Range (Ω)		T.C.R. (×10⁻⁶/K)	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Taping & Q'ty/reel (pcs)	
		K:±10% E12	M:±20% E6					T52R	T631R
PCF1/2	0.5W	4.7～100k	4.7～100k	−500～−1300：3.3Ω≦R<10Ω −600～−1500：10Ω≦R<100Ω	200V	400V	500V	2,000	—
PCF1	1.0W	3.3～390k	3.3～390k	−700～−1800：100Ω≦R<1kΩ −900～−1900：1kΩ≦R<100kΩ	300V	600V		—	1,000
PCF2	2.0W			−900～−2000：100kΩ≦R<200kΩ −900～−2200：200kΩ≦R≦390kΩ	400V	800V	700V	—	500

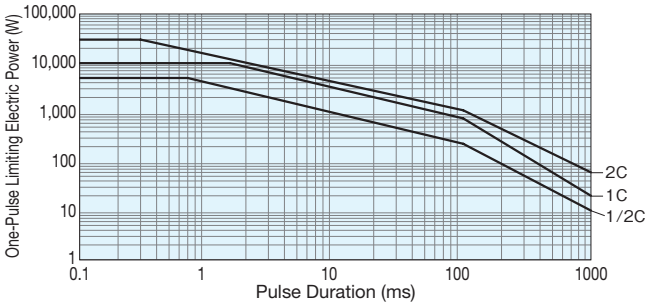
Rated Ambient Temperature：+70℃
Operating Temperature Range：−40℃～+200℃
Rated voltage=$\sqrt{\text{Power Rating}\times\text{Resistance value}}$ or Max. working voltage, whichever is lower.

■Derating Curve



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

■One-Pulse Limiting Electric Power

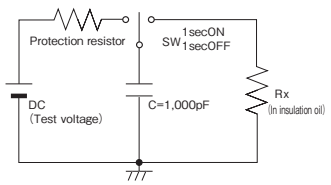


※The maximum applicable voltage is equal to the max. overload voltage.
Please ask us about the resistance characteristic of continuous applied pulse.
The pulse endurance values are not assured values,so be sure to check the products on actual equipment when you use them.

■Performance

Test Items	Performance Requirements ΔR±(%+0.05Ω)		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	25℃ Resistance / Measuring voltage 3.3Ω≦R<10Ω / 0.3V 10Ω≦R<100Ω / 1.0V 100Ω≦R≦390kΩ / 3.0V
T.C.R.	−500～−1300：3.3Ω≦R<10Ω −600～−1500：10Ω≦R<100Ω −700～−1800：100Ω≦R<1kΩ −900～−1900：1kΩ≦R<100kΩ −900～−2000：100kΩ≦R<200kΩ −900～−2200：200kΩ≦R≦390kΩ	—	+25℃/−40℃、+25℃/+75℃ and +25℃/+125℃
Voltage coefficient (Apply for 1kΩ or over)	0～−0.20%/V	—	Rated voltage and rated voltage×10%
Overload (Short time)	2	0.4	Rated voltage×2.5 or Max. overload vol., whichever is lower, for 5s.
Resistance to pulse	Refer to the right table	—	The resistor mounted on to the test circuit as below is applied with high voltage impulse 10000 cycles.
Resistance to soldering heat	2	0.8	350℃±10℃、3.5s±0.5s
Rapid change of temp.	2	0.4	−40℃ (30min.) /+85℃ (30min.) 5 cycles
Moisture resistance	5	0.6	40℃±2℃, 90%～95%RH, 1000h 1.5h ON/0.5h OFF cycles
Load life	5	0.4	70℃±2℃, 1000h 1.5h ON/0.5h OFF cycles
Resistance to solvent	No abnormality in appearance. Marking shall be easily legible.	—	Dipping in IPA or Xylene for 3 min. and leaving for 10 min.after removing drops, then brushing 10 times.

Type	Test voltage	Performance Requirements ΔR±(%+0.05Ω)
PCF1/2	10kV：4.7Ω≦R<10kΩ	5
	10kV：10kΩ≦R<33kΩ	10
	10kV：33kΩ≦R≦100kΩ	25
	4kV：10kΩ≦R≦100kΩ	5
PCF1	14kV：3.3Ω≦R<30kΩ	5
	14kV：30kΩ≦R≦390kΩ	10
	7kV：30kΩ≦R≦390kΩ	5
PCF2	20kV：3.3Ω≦R<10kΩ	5
	20kV：10kΩ≦R≦390kΩ	10
	11kV：10kΩ≦R≦390kΩ	5



■Precautions for Use

- Under the environment where surge like thunders etc. is apt to happen, the resistors used for open circuit, resistors connected directly to input, output or ground, and resistors used for the circuit pulse applied to, may be destructed by surge or pulse. Therefore, the resistors need to be selected after sufficient check on the supposition of the worst condition against possible surge and pulse.
- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Pleasewash 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 coatingfilm of resistors for 20 minutes afterdrying. Especially no PC boards shall be piled up.
- When overload is impressed continuously by the trouble of the circuit part because this product is hard to be snapped, a resistor body continues being overheated and emits smoke from a resistor and neighboring flammable materials and may catch fire. In a steady use state and heterology, please design the circuit so that the surface temperature of this product is not as above 200 degrees Celsius.