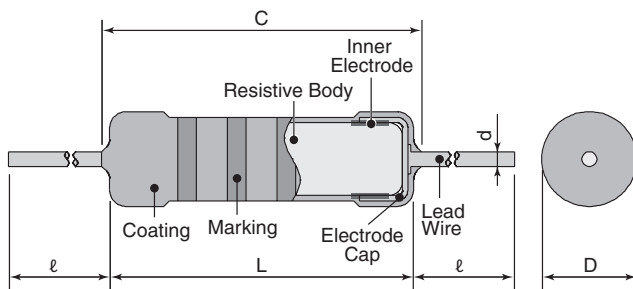


features

- KOA original bulk ceramic resistors
- Coated with UL94V0 flameproof material
- Excellent in anti-pulse characteristics
- Non-inductive resistors
- Products with lead-free terminations meet EU RoHS requirements. RoHS regulation is not intended for Pb-glass contained in the electrode.
- Higher reliability against disconnection compared to wirewound resistors and film resistors
- AEC-Q200 Qualified

leaded resistors

dimensions and construction



| Type | Dimensions inches (mm) | | | | |
|--------|-------------------------|----------------|------------------------|---------------|-------------------------|
| | L | C (max.) | D | d (nom.) | I* |
| PCF1/2 | .354±.039 (9.0±1.0) | .437 (11.1) | .138±.02 (3.5±0.5) | .028 (0.7) | 1.18±.118 (30.0±3.0) |
| PCF1 | 0.65±.039 (16.5±1.0) | .748 (19.0) | .217±.039 (5.5±1.0) | .031 (0.8) | 1.50±.118 (38.0±3.0) |
| PCF2 | .748±.039 (19.0±1.0) | .886 (22.5) | .276±.039 (7.0±1.0) | | |

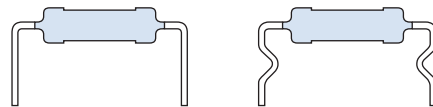
* Lead length changes depending on taping type

ordering information

| | | | | | | |
|------------|-----------------------------|----------------------|--------------------------------|-----------|--------------------------------------|--------------------|
| PCF | 1 | C | T631 | R | 103 | K |
| Type | Power Rating | Termination Material | Taping | Packaging | Nominal Resistance | Tolerance |
| PCF | 1/2: 0.5W 1: 1W 2: 2W | C: SnCu | 1/2: T52 1: T631 2: T631 | R: Reel | 2 significant figures + 1 multiplier | K: ±10% M: ±20% |

taping

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



Contact us for lead forming details.

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

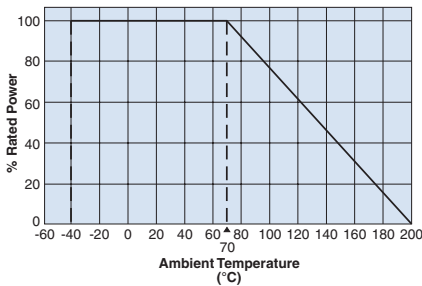
applications and ratings

| Part Designation | Power Rating @ 70°C | Resistance Range (Ω) | | T.C.R. (x10 ⁻⁶ /K) | Maximum Working Voltage | Maximum Overload Voltage | Dielectric Withstanding Voltage | Rated Ambient Temp. | Operating Temp. Range |
|------------------|---------------------|----------------------|-------------|--|-------------------------|--------------------------|---------------------------------|---------------------|-----------------------|
| | | K: ±10% E-12 | M: ±20% E-6 | | | | | | |
| PCF1/2 | 0.5W | 4.7 - 100K | 4.7 - 100K | -500 ~ -1300: 3.3Ω≤R<10Ω -600 ~ -1500: 10Ω≤R<100Ω | 200V | 400V | 500V | +70°C | -40°C to +200°C |
| PCF1 | 1.0W | 3.3 - 390K | 3.3 - 390K | -700 ~ -1800: 100Ω≤R<1kΩ -900 ~ -1900: 1kΩ≤R<100kΩ | 300V | 600V | | | |
| PCF2 | 2.0W | | | -900 ~ -2000: 100kΩ≤R<200kΩ -900 ~ -2200: 200kΩ≤R<390kΩ | 400V | 800V | 700V | | |

Rated Voltage = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$ or Maximum Working Voltage, whichever is lower.

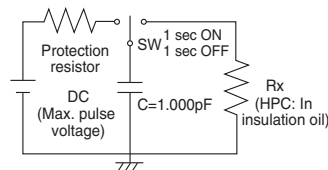
environmental applications

Derating Curve



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

Performance Characteristics

| Parameter | Requirement $\Delta R \pm(\% + 0.05\Omega)$ | | Test Method | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|---|------|--------------|--|--------|------------------|---|------------------|----|-------------------|----|------|------------------|---|------------------|---|-------------------|----|------|------------------|---|------------------|---|-------------------|----|-------------------|---|---|---|
| | Limit | Typical | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance | Within regulated to tolerance | — | Resistance 3.3Ω=<R<10Ω 10Ω=<R<100Ω 100Ω=<R=<390kΩ | Measurement voltage 0.3V 1.0V 3.0V | 25°C | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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°C/-40°C, +25°C/+75°C and +25°C/+125°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage Coefficient (Apply for over 1kΩ) | 0~0.2%/V | — | Rated voltage and rated voltage x 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Overload | 2% | 0.4% | Rated voltage x 2.5 or maximum overload voltage for 5s, whichever less | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to pulse | Refer to the table on the right | — | <table border="1"> <thead> <tr> <th>Type</th> <th>Test Voltage</th> <th>Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$</th> </tr> </thead> <tbody> <tr><td rowspan="3">PCF1/2</td><td>10kV:4.7Ω≤R<10kΩ</td><td>5</td></tr> <tr><td>10kV:10kΩ≤R<33kΩ</td><td>10</td></tr> <tr><td>10kV:33kΩ≤R<100kΩ</td><td>25</td></tr> <tr><td rowspan="3">PCF1</td><td>4kV:10kΩ≤R<100kΩ</td><td>5</td></tr> <tr><td>14kV:3.3Ω≤R<30kΩ</td><td>5</td></tr> <tr><td>14kV:30kΩ≤R<390kΩ</td><td>10</td></tr> <tr><td rowspan="3">PCF2</td><td>7kV:30kΩ≤R<390kΩ</td><td>5</td></tr> <tr><td>20kV:3.3Ω≤R<10kΩ</td><td>5</td></tr> <tr><td>20kV:10kΩ≤R<390kΩ</td><td>10</td></tr> <tr><td>11kV:10kΩ≤R<390kΩ</td><td>5</td></tr> </tbody> </table> | | Type | Test Voltage | Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$ | PCF1/2 | 10kV:4.7Ω≤R<10kΩ | 5 | 10kV:10kΩ≤R<33kΩ | 10 | 10kV:33kΩ≤R<100kΩ | 25 | PCF1 | 4kV:10kΩ≤R<100kΩ | 5 | 14kV:3.3Ω≤R<30kΩ | 5 | 14kV:30kΩ≤R<390kΩ | 10 | PCF2 | 7kV:30kΩ≤R<390kΩ | 5 | 20kV:3.3Ω≤R<10kΩ | 5 | 20kV:10kΩ≤R<390kΩ | 10 | 11kV:10kΩ≤R<390kΩ | 5 |  | The resistor mounted to the test circuit as below is applied with high voltage impulse 10,000 cycles. |
| Type | Test Voltage | Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCF1/2 | 10kV:4.7Ω≤R<10kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10kV:10kΩ≤R<33kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10kV:33kΩ≤R<100kΩ | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCF1 | 4kV:10kΩ≤R<100kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14kV:3.3Ω≤R<30kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 14kV:30kΩ≤R<390kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCF2 | 7kV:30kΩ≤R<390kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 20kV:3.3Ω≤R<10kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 20kV:10kΩ≤R<390kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11kV:10kΩ≤R<390kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to soldering heat | 2% | 0.8% | 350°C±10°C, 3.5s±0.5s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rapid change of temperature | 2% | 0.4% | -40°C (30 min.)/+85°C (30 min.), 5 cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture resistance | 5% | 0.6% | 40°C±2°C, 90%~95%RH, 1000 hours, 1.5h ON/0, 5h OFF cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Load life | 5% | 0.4% | 70°C±2°C, 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 minutes and leaving for 10 minutes after removing drops, then brushing 10 times. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

12/19/17

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