



features

- PCF series: Coated with UL94V0 flameproof material
- Suitable for automatic machine insertion
- Able to replace carbon composition resistors in most applications
- Marking: HFC size: Reddish brown body color with alpha-numeric marking, PCF size: Light green body color with color-coded bands
- Products with lead-free terminations meet EU RoHS requirements
- Higher reliability against disconnection compared to wirewound resistors and film resistors
- AEC-Q200 Qualified: HPC only

dimensions and construction

HPC



PCF



| Type | Dimensions inches (mm) | | | | |
|--------|--------------------------|----------------|------------------------|---------------|-------------------------|
| | L | C (max.) | D | d (nom.) | I |
| HPC1/2 | .433±.039 (11.0±2.0) | — | .138±.039 (3.5±1.0) | .031 (0.8) | 1.50±.118 (38.0±3.0) |
| HPC1 | 0.630±.039 (16.0±2.0) | — | .177±.039 (4.5±1.0) | | |
| HPC2 | .827±.039 (21.0±2.0) | — | .197±.039 (5.0±1.0) | | |
| HPC3 | 1.02±.039 (26.0±2.0) | — | .236±.039 (6.0±1.0) | | |
| HPC4 | 1.50±.039 (38.0±2.0) | — | .276±.039 (7.0±1.0) | | |
| HPC5 | 1.73±.039 (44.0±2.0) | — | .295±.039 (7.5±1.0) | .039 (1.0) | 1.18±.118 (30.0±3.0) |
| PCF1/2 | .354±.039 (9.0±1.0) | .437 (11.1) | .138±.02 (3.5±0.5) | .028 (0.7) | |
| PCF1 | 0.65±.039 (16.5±1.0) | .748 (19.0) | .217±.039 (5.5±1.0) | .031 (0.8) | |
| PCF2 | .748±.039 (19.0±1.0) | .886 (22.5) | .276±.039 (7.0±1.0) | | |

ordering information

| Part # | PCF | 1/2 | C | T631 | R | 102 | K |
|--------|------------|--------------------------------------------------------|----------------------|---------------------|--------------------|--------------------------------------|--------------------|
| Type | HPC PCF | Power Rating | Termination Material | Taping | Packaging | Nominal Resistance | Tolerance |
| | | 1/2: 0.5W 1: 1W 2: 2W 3: 3W 4: 4W 5: 5W | C: SnCu | 1/2: T52 1: T631 | A: Ammo R: Reel | 2 significant figures + 1 multiplier | K: ±10% M: ±20% |

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

applications and ratings

| Part Designation | Power Rating @ 70°C | Minimum Dielectric Withstanding Voltage | Resistance Range E-12 (±10%) E-6 (±20%) | Resistance Tolerance | T.C.R. (ppm/°C) | Absolute Maximum Working Voltage | Absolute Maximum Overload Voltage | Absolute Maximum Pulse Voltage* | Rated Ambient Temp. | Operating Temp. Range |
|------------------|---------------------|-----------------------------------------|-----------------------------------------------|----------------------|---------------------------------------------|----------------------------------|-----------------------------------|---------------------------------|---------------------|-----------------------|
| HPC1/2 | 0.5W | — | 10Ω - 390KΩ (+10%) 3.3Ω - 330KΩ (+20%) | K: ±10% M: ±20% | -900±300: R<100Ω -1200±300: R≥100Ω | 200V | 400V | 8kV | +40°C | -40°C to +200°C |
| HPC1 | 1.0W | — | | | | 300V | 600V | 15kV | | |
| HPC2 | 2.0W | — | | | | 400V | 800V | 25kV | | |
| HPC3 | 3.0W | — | | | | 450V | 900V | 25kV | | |
| HPC4 | 4.0W | — | | | | 500V | 1000V | 25kV | | |
| HPC5 | 5.0W | — | 550V | | 1100V | 25kV | | | | |
| PCF1/2 | 0.5W | 500V | 4.7Ω - 100KΩ | | -900±300: R<100Ω | 200V | 400V | 10kV | | |
| PCF1 | 1.0W | | 3.3Ω - 390KΩ | | -1300±300: R≥100Ω | 300V | 600V | 14kV | | |
| PCF2 | 2.0W | 700V | 3.3Ω - 390KΩ | | -1300±300: R≥100Ω | 400V | 800V | 20kV | | |

* Resistance to pulse: change shall be ±5% of the pre-test values. 1 sec. ON, 1 second OFF, 10,000 cycles. The voltage is applied with maximum pulse voltage.

environmental applications

Derating Curve

PCF



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

HPC



For resistors operated at an ambient temperature of 40°C or above, a power rating shall be derated in accordance with the derating curve.

Performance Characteristics

| Parameter | Requirement Δ R ±(% + 0.05Ω) | | Test Method | |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| | Limit | Typical | | |
| Resistance | Within regulated to tolerance | — | Resistance | Measurement voltage |
| | | | 3.3Ω~8.2Ω | 0.3V |
| | | | 10Ω~82Ω | 1.0V |
| | | | 100Ω~390kΩ | 3.0V |
| T.C.R | HPC: -900±300×10 ⁻⁶ /K; R<100Ω -1200±300×10 ⁻⁶ /K;R≥100Ω PCF: -900±300;R<100Ω -1300±300;R>100Ω | — | HPC: +25°C/-40°C and +25°C/+125°C PCF: +25°C/-40°C, +25°C/+75°C and +25°C/+125°C | |
| Voltage Coefficient (Apply for over 1kΩ) | 0~0.2%/V (HPC1/2, PCF) 0~0.1%/V (HPC1) 0~0.05%/V (HPC2,3,4,5) | — | 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 | 5% | — | The resistor mounted to the test circuit as below. 1 sec. ON and 1 sec. OFF. 10,000 cycles. The voltage is applied with maximum pulse voltage. |  |
| Resistance to soldering heat | 2% | 0.8% | 350°C±10°C, 3.5s±0.5s | |
| Rapid change of temperature | 2% | 0.4% | -40°C(30min.)/+85°C(30min.), 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% | HPC: 40°C±2°C, 1000h, 1.5h ON/0, 5h OFF cycles PCF: 70°C±3°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. | |
| High Temperature Exposure | HPC only: 5% | HPC only: 1.7% | HPC only: +200°C, 1000 hours | |