



### 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 3 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*	Operating Temperature Range
HPC1/2	0.5W	—	10Ω - 390KΩ (+10%)	K: ±10% M: ±20%	-900±300: R<100Ω	200V	400V	8kV	-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	—	3.3Ω - 330KΩ (+20%)		-1200±300: R≥100Ω	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	
PCF2	2.0W				700V		400V	800V	

\* 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 above 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 above 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±300x10 <sup>-6</sup> /K; R<100Ω -1200±300x10 <sup>-6</sup> /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%	—	<p>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.</p> 	
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, 1000h, 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.	

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

1/05/13