

1. PRODUCT

High voltage pulse Ceramic Resistors

产品:抗浪涌陶瓷电阻器,

FEATURES

- Advanced high voltage pulse ceramic technology
- Suitable for noise suppression of engine ignition system
- Reliable in pulse/transient applications
- TCR: <100R -600ppm/°C~-1500ppm/°C;
 ≥100R -600ppm/°C~-1900ppm/°C
 ≥100k -600ppm/°C~-2200ppm/°C
- Excellent overall stability: Class 5.0
- Very low noise and voltage coefficient
- Flame proof

APPLICATIONS

- Power supply with high reliability
- High voltage circuits of electron microscope and X-ray equipment
- Compliant to RoHS directive 2011/65/EU
- Compliant to REACH (EC No. 1907/2006)) (last updated: 27/06/2018)
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2. PART NUMBER: Part number of the wire wound resistor is identified by the series name, power rating, tolerance, temperature coefficient, packing type and resistance value.

Example:

HPC	16	K	0	B	124
Series	Power	Tolerance	TCR	Packing	Resistance

(1) Series name: HPC SERIES CERAMIC RESISTORS

(2) Power Rating: 15=1/2W; 16=1W; 17=2W

(3) Tolerance: J=±5%; K=±10%; M=±20%;

(4) T.C.R.: see characters

(5) Packaging Type: B = BULK/BOX

(6) Resistance Value: 124=120kΩ; 102=1kΩ; 101=100 Ω; 500=50Ω;

3. MARKING:

The standard color code per IEC EN 60062:2005 is as follows

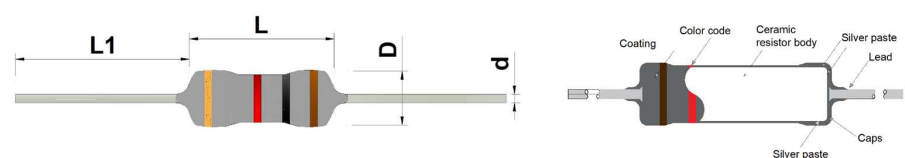
COLOR	1st	2nd	Multiple	tolerance
black	0	0	1	
brown	1	1	10	
red	2	2	10 ²	G(±2.0%)
orange	3	3	10 ³	
yellow	4	4	10 ⁴	
green	5	5	10 ⁵	
blue	6	6	10 ⁶	
purple	7	7		
gray	8	8		
white	9	9		
golden			10 ⁻¹	J(±5.0%)
silver			10 ⁻²	K(±10%)

M(±20%) no marking at all.

Digital marking including power rating, resistance, tolerance;

Customer's marking is available upon request.

4. ELECTRICAL CHARACTERISTICS

THUNDER type		HPC15	HPC16	HPC17		盛雷城型号
Cross to KOA's		PCF1/2	PCF1	PCF2		对应KOA型号
Rated dissipation	P_{70}	1/2W	1W	2W	P_{70}	70℃ 以下额定功率
Max working voltage	U_{max}	200V	300V	400V	U_{max}	最大工作电压
Max Short time overload voltage	$2U_{max}$	400V	600V	800V	$2U_{max}$	最大短时间过负荷电压
Resistance range		5Ω to 100kΩ	5Ω to 200kΩ	5Ω to 330kΩ		标准阻值范围
Tolerance		J=±5%; K=±10%; M=±20%;				电阻精度范围
Temperature coefficient		-600~-2100ppm/°C	-600~-2100ppm/°C	-600~-2100ppm/°C		温度系数范围
Insulation voltage		>500V	>500V	>700V		绝缘耐压
Operating Temperature range		-55°C to 200°C				工作环境温度范围
Dimension	±1(mm)	L=11, D=4	L=15, D=5.5	L=19, D=7	±1(mm)	外形尺寸
	±0.1(mm)	d=0.8	d=0.8	d=0.8	±0.1(mm)	
Outlines						

* Unless otherwise specified, all values are tested at the following condition:
 Temperature: 21°C to 25°C; Relative humidity: 45% to 70%;

* Rated Continuous Working Voltage (RCWV)= $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$

* Resistance out of range is available upon request.

5. ENVIRONMENTAL CHARACTERISTICS

(1) Insulation Resistance

IEC 60115-1, 4.6: in V-block for 60 seconds, the test resistance should be high than 10,000 M Ohm.

(2) Dielectric Withstanding Voltage

IEC 60115-1 4.7: Place resistors in V-block for 60 Seconds, no breakdown or flashover.

(3) Temperature Coefficient Test

IEC 60115-1, 4.8: Test of resistors at room temperature and 60°C or 100°C on request above room temperature. Then measure the resistance. The Temperature Coefficient is calculated by the following equation and its value should be within the range requested.

$$\text{Resistor Temperature Coefficient} = \frac{R - R_0}{R_0} \times \frac{1}{t - t_0} \times 10^6$$

R = Resistance value under the testing temperature

R₀ = Resistance value at the room temperature

t = the 2nd testing temperature

t₀ = Room temperature

(4) Short Time Overload Test

IEC60115-1 4.13: At 10 times rated voltage or 2 times the maximum working voltage whichever is lower for 5 seconds, the resistor should be free from defects. The change of the resistance value should be within ±(1%+0.05 Ω) as compared with the value before the test.

(5) Resistance to soldering heat:

IEC 60115-1, 4.18: 260±3°C for 10±1 Seconds, immersed to a point 3±0.5mm from the body. The change of the resistance value should be within ±(1%+0.05 Ω) as compared with the value before the test.

(6) Climatic sequence

IEC 60115-1, 4.19: -55°C to Room Temp. to +155°C to Room Temp. (5 cycles). The change of the resistance value shall be within±(5.0%+0.05 Ω) as compared with the value before the test.

(7) Damp Heat Steady State

IEC 60115-1, 4.24: $40\pm 2^{\circ}\text{C}$, 90-95% RH for 56 days, loaded with 0.1 times RCWV or the maximum working voltage whichever is lower. The change of the resistance value should be within $\pm(5\%+0.05\ \Omega)$ for normal tolerance as compared with the value before the test.

(8) Load Life Test

IEC 60115-1, 4.25: $70\pm 2^{\circ}\text{C}$ at RCWV or the maximum working voltage whichever is lower for 1,000+48/-0 Hr. (1.5Hr. on, 0.5Hr. off). The resistors shall be arranged not much effected mutually by the temperature of others and the excessive ventilation shall not be performed. The change of the resistance value should be within $\pm(5+0.05\ \Omega)$ as compared with the value before the test.

(9) Resistance to Solvent

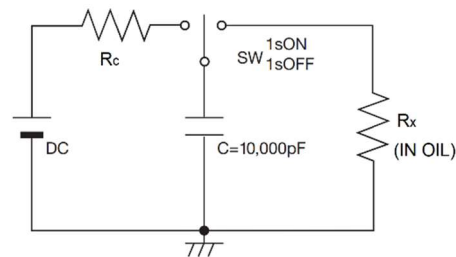
IEC 60115-1, 4.30: IPA for 5 ± 0.5 Min. with ultrasonic. No deterioration of coating and color code occurred.

(10) High voltage high pulse overload

Apply 10 pulses with 10 times rated voltage to the resistor, the pulses parameter is $10\mu\text{s}/700\mu\text{s}$. The change of the resistance shall be within $\pm(1.0\%+0.05\ \Omega)$ for normal tolerance as compared with the value before the load.

(11) High voltage high pulse overload

Type	Resistance range	Voltage applied	Requirement
PCF1/2	5 Ω ~10k Ω	10kV	$\pm 5\%+0.05\ \Omega$
	10k Ω ~33k Ω	10kV	$\pm 10+0.05\ \Omega$
	33k Ω ~100k Ω	10kV	$\pm 25+0.05\ \Omega$
	10k Ω ~100k Ω	4kV	$\pm 5\%+0.05\ \Omega$
PCF1	5 Ω ~10k Ω	14kV	$\pm 5\%+0.05\ \Omega$
	10k Ω ~330k Ω	14kV	$\pm 10+0.05\ \Omega$
	10k Ω ~330k Ω	7kV	$\pm 5\%+0.05\ \Omega$
PCF2	5 Ω ~10k Ω	20kV	$\pm 5\%+0.05\ \Omega$
	10k Ω ~330k Ω	20kV	$\pm 10+0.05\ \Omega$
	10k Ω ~330k Ω	11kV	$\pm 5\%+0.05\ \Omega$



Apply 10 pulses with the voltage listed in the table above to the resistor, the change of the resistance shall be within the requirement range as compared with the value before the load.

Disclaimer

All products, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

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