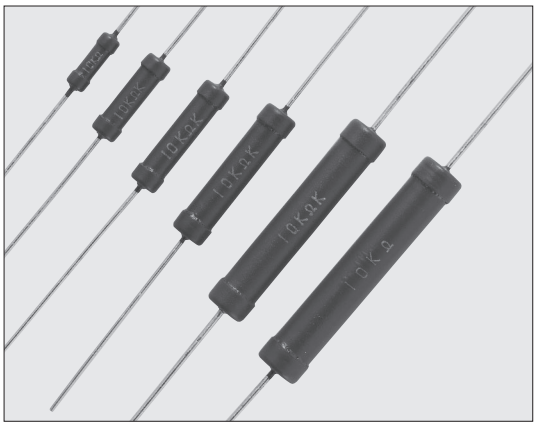
RESISTANCE TO POWER SURGE

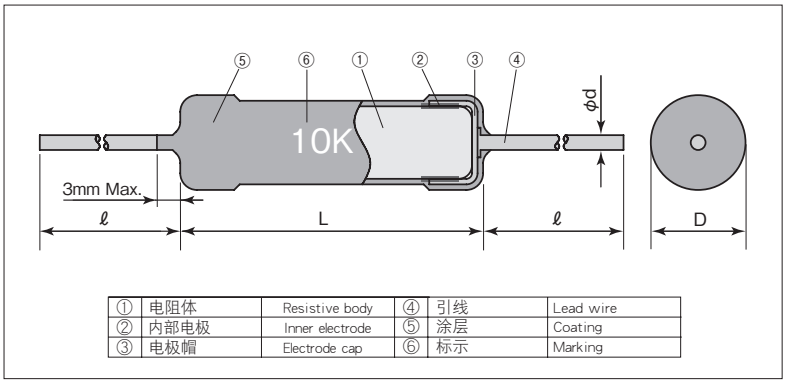
EU RoHS

HPC 耐脉冲 • 耐浪涌用陶瓷电阻器
Ceramic Resistors for Anti Pulse • Surge



外观颜色：红茶色　Coating color：Reddish brown
表示：文字表示　Marking：Alphanumeric

■ 结构图　Construction



①	电阻体	Resistive body	④	引线	Lead wire
②	内部电极	Inner electrode	⑤	涂层	Coating
③	电极帽	Electrode cap	⑥	标示	Marking

■ 特点　Features

- 这是KOA公司独家的陶瓷体电阻器。
- 冲击耐受电压特性出色。
- 比卷线和保护膜电阻，加强了不会断线。
- 符合欧盟RoHS。
- 无感应型电阻器。
- AEC-Q200相关数据已取得。
- KOA original bulk ceramic resistors.
- Excellent in anti-pulse characteristics.
- Higher reliability against disconnection compared to wire wound resistors and film resistors.
- Products meet EU-RoHS requirements.
- Non-Inductive resistors.
- AEC-Q200 qualified.

■ 特点　Features

- 用于X光装置、电子显微镜等的高压电路。
- 用于回扫变压器。
- 用于机床等的电源电路。
- High voltage circuits for X-ray generators and electron microscopes.
- Flyback transformers.
- Power supply circuits for machine tools, etc.

■ 参考标准　Reference Standards

IEC 60115-1
JIS C 5201-1

■ 外形尺寸　Dimensions

型号 Type	尺寸　Dimensions（mm）				Weight (g) (1000pcs)
	L±2	D±1	d (Nominal)	ℓ±3※	
HPC1/2	11	3.5	0.8	38	690
HPC1	16	4.5			1260
HPC2	21	5.0			1780
HPC3	26	6.0			2830
HPC4	38	7.0	1.0		5880
HPC5	44	7.5			7930

※导线长度因编带而异。
※Lead length changes depending on taping type.

■ 品名构成　Type Designation

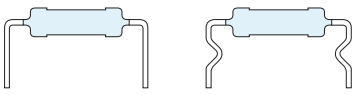
实例　Example

HPC	1	C	T631	R	103	K
品种 Product Code	额定功率 Power Rating	端子表面材质 Terminal Surface Material	二次加工 Taping	包装 Packaging	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance
	1/2：0.5W 1：1.0W 2：2.0W 3：3.0W 4：4.0W 5：5.0W	C：SnCu	参照下述 See table Below	A：AMMO包装 A：AMMO R：卷 R：Reel 空栏：箱子 Nil:BOX	3 digits	K：±10% M：±20%

欲知关于此产品含有的环境负荷物质详情（除EU-RoHS以外），请与我们联系。
编带细节请参考卷末附录C。
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.

■二次加工对应表　Taping

型　号 Type	轴向编带 Axial Taping	
	T52	T631
HPC1/2	○	—
HPC1	—	○



有关各种成形的二次加工方法，　请与我们联系。
Contact us for lead forming details.

■ 额定值　Ratings

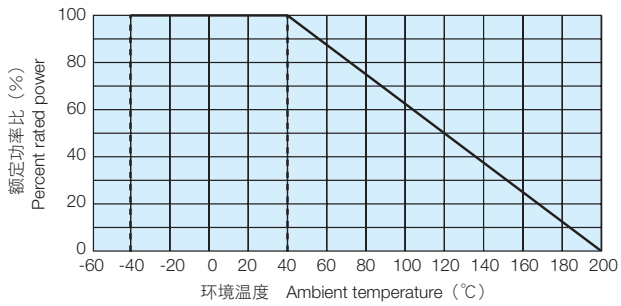
型　号 Type	额定功率 Power Rating	电阻值范围（Ω） Resistance Range		电阻温度系数 T.C.R.（×10⁻⁶/K）	最高使用电压 Max. Working Voltage	最高过载电压 Max. Overload Voltage	额定环境温度 Rated Ambient Temperature	使用温度范围 Operating Temp. Range
		K: ±10% E12	M: ±20% E6					
HPC1/2	0.5W	10～390k	3.3～330k	−500～−1300: 3.3Ω≤R<10Ω −600～−1500: 10Ω≤R<100Ω −700～−1800: 100Ω≤R<1kΩ −900～−1900: 1kΩ≤R<100kΩ −900～−2000: 100kΩ≤R<200kΩ −900～−2200: 200kΩ≤R≤390kΩ	200V	400V	+40℃	−40℃～+200℃
HPC1	1W				300V	600V		
HPC2	2W				400V	800V		
HPC3	3W				450V	900V		
HPC4	4W				500V	1000V		
HPC5	5W				550V	1100V		

额定电压是$\sqrt{\text{额定功率}\times\text{公称电阻值}}$所算出的值或表中最高使用电压两者中小的值为额定电压。
Rated voltage = $\sqrt{\text{Power Rating}\times\text{Resistance value}}$ or Max. working voltage, whichever is lower.

高电压用电阻器 High Voltage Type Resistors

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■ 负荷减轻特性曲线　Derating Curve

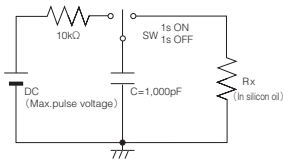


在环境温度40℃以上使用时，应按照左图负荷减轻特性曲线，减小额定功率。
For resistors operated at the ambient temperature of 40℃ or higher, the power rating shall be derated in accordance with the left derating curve.

■ 性能　Performance

试验项目 Test Items	标准值　Performance Requirements ΔR±（%+0.05 Ω） 保证值　Limit	代表值　Typical	试验方法 Test Methods
电阻值 Resistance	在规定的允许偏差内 Within specified tolerance	–	25℃ 电阻值　Resistance：测定电压　Measuring voltage 3.3Ω≤R＜10Ω：0.3V 10Ω≤R＜100Ω：1.0V 100Ω≤R≤390kΩ：3.0V
电阻温度系数 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℃ and +25℃/+125℃
电压系数（在1KΩ以上适用） Voltage coefficient （Apply for 1kΩor over）	0～−0.2%/V（HPC1/2） 0～−0.1%/V（HPC1） 0～−0.05%/V（HPC2,3,4,5）	–	额定电压和额定电压×10% Rated voltage and rated voltage ×10%
过载（短时间） Overload（Short time）	2	0.4	额定电压×2.5倍或最高过载电压中低的一方施加5秒 Rated voltage ×2.5 or Max. overload vol., whichever is lower, for 5s.
高压脉冲 Resistance to pulse	见右表 Refer to the right table	–	在试验电路中，从最高脉冲电压上充电的电容器，以1秒ON、1秒OFF，向10000循环电阻施加高压脉冲 The resistor mounted on to the test circuit as below is applied with high voltage impulse 10,000 cycles.

品名 Type	试验电压 Test voltage	标准值 Performance Requirements ΔR±（%+0.05Ω）
HPC1/2	8kV：3.3Ω≤R＜30kΩ	5
	8kV：30kΩ≤R≤390kΩ	10
	5kV：30kΩ≤R≤390kΩ	5
HPC1	15kV：3.3Ω≤R＜30kΩ	5
	15kV：30kΩ≤R≤390kΩ	10
	7kV：30kΩ≤R≤390kΩ	5
HPC2	25kV：3.3Ω≤R＜30kΩ	5
	25kV：30kΩ≤R≤390kΩ	10
	15kV：30kΩ≤R≤390kΩ	5
HPC3,HPC4,HPC5	25kV	5



耐焊接热 Resistance to soldering heat	2	0.8	350℃±10℃, 3.5s±0.5s
温度突变 Rapid change of temperature	2	0.4	−40℃（30min.）/+85℃（30min.）5 cycles
耐湿负荷 Moisture resistance	5	0.6	40℃±2℃, 90%～95%RH, 1000h 1.5小时ON、0.5小时OFF的周期　1.5h ON/0.5h OFF cycle
额定负荷 Load life	5	0.4	40℃±2℃, 1000h 1.5小时ON、0.5小时OFF的周期　1.5h ON/0.5h OFF cycle
高温放置 High temperature exposure	5	1.7	+200℃, 1000h
耐溶剂性 Resistance to solvent	应外观无异常，表示可以容易地辨认 No abnormality in appearance. Marking shall be easily legible.	–	在异丙醇或二甲苯中浸3分钟，除去滴液后放置10分钟后，刷10次 Dipping in IPA or Xylene for 3 min. and leaving for 10 min.after removing drops, then brushing 10 times.

■ 使用注意事项　Precautions for Use

- 在容易发生雷击等浪涌的环境中，在开放电路中使用的电阻器，直接连接输入、输出、接地的电阻器，在施加了脉冲的电路中使用的电阻器，由于电阻器有可能为浪涌和脉冲所破坏，因而，对有可能性的浪涌和脉冲，需要设想最坏状态，进行充分检验后，选定电阻器。
- 给该产品上涂层可以使其标志更加明显，另外，不具有任何电子性能（绝缘介电强度等）。该产品的涂层易被损坏，因此，在运输盖的时候，盖上的涂层可能会脱落。请认准那些即使在涂层上有脱落、磨损或针孔出现但其标志仍然十分清晰的产品，这些产品为非缺陷产品。
- 清洗应在最小限度，由于被清洗液清洗后，涂层膜会变弱，因此，在充分干燥前在涂层膜上不要施加外力。由于干燥后才返回原来的强度，因此应注意在清洗后约20分钟内，不施加外力到电阻的涂层膜上。
- 本产品因为难断线，根据电路零部件的故障等过载若一直持续，电阻体持续过度加热会造成电阻器和周围的可燃性物质发烟，有引燃的可能性。通常使用中，及对异常发生时，电路设计时本产品表面温度不得超过200℃。
- 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.
- The coating of this product is used to make the marking easy to see,and there is no electric characteristic（dielectric withstanding voltage etc,）. The coating of this product is weak to an external impact. So, the coating of the cap might peel off while transporting it. Please judge the product which reads the marking easily even if there are peeling off, a bruise,and a pinhole in the coating to be a non-defective unit.
- Be careful to handle these resistors because coating are weak to outer shock.please wash 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. Please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying.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.

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RK73H1ETTP5491F RK73H1JTTD1182F RS73F1JTTD3243B MF1/4DCT52R24R3F MF1/4DCT52R4752F MOSX1CT528RR10J RK73B2ATTD201J RS73F2ATTD4992B RK73H2ATTD47R5F RK73H3ATTE3R92F RK73B1ETTP333J RK73H1JTTD1622F RK73H2ATTD4872F RK73H2ATTD6491F RK73H2ATTD7501F RS73F1JTTD7501B RS73F2ATTD2000B SPR2CT521R471J MOSX1CT528R1R0J RK73H1JTTD3741F RN73H1JTTD1803B25 RK73H1ETTP3603F RK73H1ETTP43R0F RK73H1ETTP5603F RK73H2ATTD7500F RK73H2BTTD1103F RK73H2BTTD4R99F RK73H1ETTP1431F RK73H1JTTD11R3F RK73H2BTTD5R60F