Catalog

产 品 目 录

2026~2027

厚聲電阻



Our Mission:

Create value for customers, business associates and partners by providing reliable products and quality services.

我们的使命：

通过提供可信赖的产品和服务，为顾客、企业成员和合作伙伴创造价值。

Our Vision:

Become an excellent global supplier of passive components.

Be a respectable corporation to customers, business associates and partners.

我们的愿景：

以产品和服务成为电子制造业卓越的全球供货商。

做客户、企业成员、合作伙伴尊敬的企业。



厚声集团・昆山总部 | Uni-Royal Group・Kunshan HQ

UNI-ROYAL Group, invested in Hong Kong, has developed into a resistor manufacturer with a huge annual production capacity of 900 billion pieces. Covering an area up to 350,000 square meters in seven regions of two countries, it has great potential for capacity expansion to meet the growing demand for electronic components in the domestic and international electronics industry. With nearly 50 years of professional experience as well as profound industry insights and innovation capabilities in the electronics industry, UR cultivates deeply the Chinese and Southeast Asian markets, possesses a well-known brand effect and is widely accepted by industry leaders. So far, it has become a pioneer in the global chip resistor and dip resistor industry.

The headquarter of the group is located in Kunshan, Jiangsu, China, with professional resistor R&D team, manufacturing factories, and sales teams and marketing service networks respond to domestic and international demands in Kunshan, Shenzhen, Xiamen, and Southeast Asia (Thailand). The six famous brands under the group, UNI-ROYAL, UNUS,ROYALOHM, UNIOHM, FOSS, and AEON, have established long-term partnerships with numerous well-known domestic and foreign enterprises, and are favored by industry customers both domestically and internationally, with product sales consistently remaining at forefront of the industry.

In its business development, UNI-ROYAL has been successively awarded international system certifications such as quality, environment, occupational health and safety, and hazardous substance management, including ISO9001, ISO14001, TL9000, TS16949, ISO45001, IATF16949, QC080000,CNAS,ISO14064 etc. Its products are widely used in many emerging and high-techfields such as microelectronics, computers, photovoltaics, 5G, new energy and vehicles, etc. at home and abroad.

UNI-ROYAL adheres to cutting-edge technology, excellent products, and meticulous solutions, and is ready to gather strength, looking forward to providing products and services for both domestic and international customers who demand passive components.

厚声集团，由香港投资，已发展为具备年产9000亿只的超大产能，坐拥两个国家、七个地区35万平方米厂区面积，具备深厚的产能扩大潜力以应对国内外电子行业对电子元器件日益增长的需求。厚声凭借近五十年的专业经验，对电子行业拥有深刻的行业洞察与创新能力，并且深耕中国及东南亚市场，具备享誉业界的品牌效应，广泛被行业引领者接受。迄今已经成为晶片电阻和插件电阻行业的前行者。

集团总部位于江苏昆山，在昆山、深圳、厦门与东南亚（泰国）等地拥有专业的电阻研发团队、制造工厂及响应国内外的销售团队和营销服务网络。集团旗下六大著名品牌：UNI-ROYAL、UNUS、ROYALOHM、UNIOHM、FOSS、AEON，已与国内外众多知名企业建立了长期合作伙伴关系，受到国内外行业客户的青睐，产品销量稳居行业前列。

厚声在经营发展中先后荣获质量、环境、职业健康安全、有害物质管理等国际体系认证，包含：ISO9001、ISO14001、TL9000、TS16949、ISO45001、IATF16949、QC080000、CNAS、ISO14064等，产品广泛应用于国内外微电子、计算机、光伏、5G、新能源、车载等众多新兴和高科技领域。

厚声坚持以前沿的技术、出色的产品和缜密的解决方案整装待发、蓄势聚力，期待为国内外被动元器件需求厂商提供产品和服务。



Milestone

1978	Hsinchu, Taiwan	Uniroyal Taiwan
1988	Chachoengsao, Thailand	Royal Electronic Factory (Thailand) Co., Ltd.
1992	Kunshan, China	Uniroyal Electronics Industry Co., Ltd
2003	Kunshan, China	FOSS Electronics Material
2009	Xiamen, China	Aeon Technology Corportation
2014	Kunshan, China	Uniroyal Electronics Industry Co., Ltd - New Area
2016	Huaian, China	Unus Electronics Technology Ltd.
2016	Kunshan, China	Uniroyal Electronics Global Co., Ltd. KS HQ Shenzhen Branch Xiamen Branch

厚声集团沿革

1978	台湾新竹	台湾厚声
1988	泰国北柳	泰国厚声
1992	中国昆山	昆山厚声
2003	中国昆山	昆山福仕电材
2009	中国厦门	厦门翔声科技
2014	中国昆山	昆山厚声 - 新厂区
2016	中国淮安	淮安捷群 - 新厂区
2016	中国昆山	厚声国际贸易：昆山总公司、深圳分公司

泰国厚声工业 (Thailand 1988)





昆山福仕 (Kunshan 2003)

厦门翔声 (Xiamen 2009)





泰国厚声科技 (Thailand 2015)

淮安捷群 (Huaian 2016)





Resistors

Resistors are the most basic components in electronic circuits that control current and voltage, and are widely used in electronic circuits and products. The products of UNI-ROYAL Group include electronic materials, thin film, thick film, power type, automotive grade (conventional & SMT) resistors, and various customized products with special requirements..

电阻器

电阻器是电子线路中控制电流及电压的最基本元件 , 被广泛应用于电子电路及电子产品中。厚声集团的产品包括电子材料、薄膜、厚膜、功率型、车规级(传统&贴片)电阻、以及各种特殊要求的客制化产品。

Electronic materials

UNI-ROYAL Group is one of the world's leading suppliers of high-quality electronic materials. Its products include various raw material rod bodies, such as ceramic rods, capped white rods, component rods, coated rods, etc.; various ceramic shells and iron caps and tin plated iron caps of different sizes, etc.

电子材料

厚声集团是全球主要的优质电子材料供货商之一。其产品包括各种原材料棒体，如瓷棒、压帽白棒、组分棒、电阻着膜棒等; 各类陶瓷外壳及不同尺寸铁帽、镀锡铁帽等。





High precision thin film chip resistors

High precision thin film chip resistors are made by precision thin film sputtering technology, and the resistance layer is sputtered from high-purity alloy targets. The film structure is dense, and the ion arrangement is regular. They have excellent temperature stability, noise coefficient, and reliability. The products can be widely used in medical equipment, precision measuring instruments, communication and precision industrial control equipment.

高精度薄膜晶片电阻器

产品采用精密薄膜溅射技术，电阻层采用高纯度合金靶材溅射而成，膜层结构致密，离子间排列有规则，具有良好的温度稳定性及噪音系数、可靠性高，产品可广泛应用于医疗器材、精密测量仪器、通讯及精密工业控制设备中。

AEC-Q200 qualified chip resistor productions line

The resistors are produced using high-precision thick film printing technology, special materials and production processes. Through unique product design and manufacturing processes, the products have excellent high voltage resistance performance, which is more than twice that of ordinary thick film products. This can reduce the installation space of the circuit board and save product costs, while effectively reducing the final size of the equipment. And the product has excellent corrosion resistance and anti-sulfur performance, widely used in automotive electronics, instrument, mining machinery, farm equipment, and instruments in sulfur-containing environments.



车规级符合AEC-Q200电阻器专线

电阻采用高精密厚膜印刷技术制造，特殊的材料和生产工艺生产而成。通过特有的产品设计及制作工艺, 使产品具有极好的耐高电压性能, 耐高电压特性是常规厚膜产品的2 倍多, 可减小电路板的安装空间及节约产品成本，同时可有效降低设备的最终尺寸。且产品具有优异的耐腐蚀性能和抗硫化能力，广泛应用于汽车电子、仪表、矿山机械、农场设备及含硫环境的仪器中。



Power type resistors

Manufactured by wire winding process and completely flame-retardant materials, power type resistors have excellent seismic resistance and stability. Both multi-terminal and multi-adjustable resistance methods are available. Small size loaded with high power, its resistance value remains unchanged after a long-term application. With excellent seismic resistance and shock absorption, and outstanding resistance to current shock, the products are suitable for startup of frequency converters in harsh environment. They have non-inductive and good resistance to current shock, excellent seismic resistance and stability and excellent instantaneous resistance to current shock.

Application: With excellent seismic resistance and stability, these resistors are widely used in various types of frequency conversion equipment, such as elevators, refrigerators, cranes, elevators, lithium battery pack overload current protection during startup of new energy vehicles, power supply for frequency converters, energy storage equipment, precharges, inverters, etc.

功率型电阻器

绕线工艺，完全阻燃的材料、优异的抗震性和稳定性。多端子和多可调阻方式均可提供。小体型负载大功率、长年使用不变阻值。优异的抗震性和减震性，优良的抗电流冲击能力，适合变频器严苛环境下的启动，可提供无感型良好的耐电流冲击能力、优异的抗震性和稳定性、优良的瞬间电流冲击能力。

应用: 各类变频设备中, 如电梯，冷柜, 起重机, 升降机、新能源汽车启动时锂电池组的过载电流保护、变频器的电源、 优异的抗震性和稳定性、储能设备、预充电、逆变器等。

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Contents 目录

Series 产品系列	Item or Type 规格	Page
电阻材料 Resistor material		
Ceramic Rod 瓷棒	OPD, OSD	**203**
Capped Ceramic Rod 组帽瓷棒	OSC	**205**
Carbon Film Capped Ceramic Rod 碳膜组帽棒	CRC, CRD	**207**
Metal Film Capped Ceramic Rod 金属膜组帽棒	MFC, MFD	**209**
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Chemical Nickel - Plating Film Capped Ceramic Rod 化学沉积膜组帽棒	CNC, CND	**215**
Zero ohm Copper Plated Rod 瓷棒镀铜膜	ZOC	**217**
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Tin-Plated Steel Cap 铁帽	TOC	**219**
Ceramic Case 瓷壳	CK0 , CG0	**220**

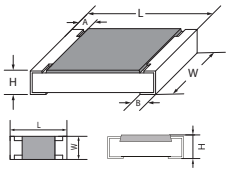
Note: Catalog/website specifications are for general reference only. Detailed Product Specification shall take precedence & is available upon request.
注 : 目录 / 网站參數表仅供一般参考。具体以我司提供的产品规格书为准 , 可根据要求提供所需产品。

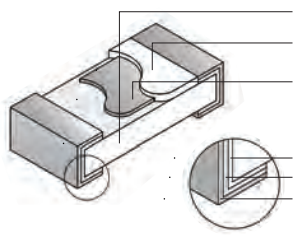
Feature (特性)

- Small size & light weight 短小轻薄
- Reduction of assembly costs and matching with placement machine.
  可降低装置成本及配合机器组装
- Suitable for both wave & re-flow soldering. 适合波峰焊与回流焊
- Applications: Navigator (GPS), Mobile Phone,Telecom, PDA, Digital CATV Receiver, Meter.
  应用于GPS、移动电话、PDA、机顶盒、仪表



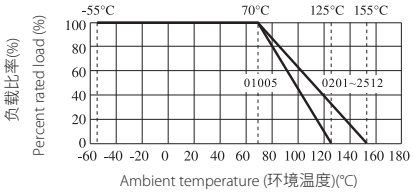
Figures (型状)





1. High purity Alumina substrate (高纯度氧化铝基板)
2. Protective coating (保护层)
3. Resistance element (阻抗元素)
4. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
5. Termination (Between) Ni Barrier [端面(中)镍层]
6. Termination (Outer) Sn [端面(外)锡层(无铅)]

Derating Curve & Specification
降功率曲线及性能



Type 类型	01005	0201	0402	0603	0805	1206	1210	1812	2010	2512
Size 尺寸	0402	0603	1005	1608	2012	3216	3225	4532	5025	6432
Max. Working Voltage 最大工作电压	15V	25V	50V	75V	150V	200V	200V	200V	200V	200V
Max. Overload Voltage 最大过负荷电压	30V	50V	100V	150V	300V	400V	500V	500V	500V	500V
Dielectric withstanding Voltage 绝缘耐压	-	50V	100V	300V	500V	500V	500V	500V	500V	500V
Operating Temperature 工作温度范围	-55~+125°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C

Type 类型		01005	0201	0402	0603	0805	1206	1210	1812	2010	2512
Dimension 尺寸 (mm)	L	0.40±0.02	0.60±0.03	1.00±0.10	1.60±0.15	2.00±0.15	3.10±0.15	3.10±0.10	4.50±0.20	5.00±0.10	6.35±0.10
	W	0.20±0.02	0.30±0.03	0.50±0.05	0.80±0.10	1.25 +0.15 -0.10	1.55 +0.15 -0.10	2.50±0.15	3.20±0.20	2.50±0.20	3.20±0.20
	H	0.13±0.02	0.23±0.03	0.35±0.05	0.45±0.10	0.55±0.10	0.55±0.10	0.55±0.10	0.55±0.20	0.55±0.10	0.55±0.10
	A	0.10±0.03	0.10±0.05	0.20±0.10	0.30±0.20	0.40±0.20	0.45±0.20	0.50±0.25	0.50±0.20	0.60±0.25	0.60±0.25
	B	0.10±0.03	0.15±0.05	0.25±0.10	0.30±0.20	0.40±0.20	0.45±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20
Resistance Value of Jumper 零欧姆电阻阻值		<50mΩ									
Rated Current of Jumper 零欧姆电阻额定电流		0.5A	0.5A	1A	1A	2A	2A	2A	2A	2A	2A
Max.Overload Current of Jumper 零欧姆电阻最大过负荷电流		1A	1A	2A	2A	5A	10A	10A	10A	10A	10A

* Note: The measurement position of the 0Ω resistance value should be based on the positive electrode
*注：0Ω阻值测量位置以正电极为准

Type 类型	01005	0201	0402	0603	0805		1206		1210	1812	2010	2512
Power Rating 额定功率	1/32W	1/20W	1/16W	1/10W	1/8W	1/4W	1/4W	1/3W	1/2W	3/4W	3/4W	1W
Resistance Range of 0.5%(E-96) 0.5% 的阻值范围 (E-96)	-	1Ω~10MΩ	1Ω~10MΩ	1Ω~10MΩ	1Ω~10MΩ	-	1Ω~10MΩ	-	1Ω~10MΩ	1Ω~10MΩ	1Ω~10MΩ	1Ω~10MΩ
Resistance Range of 1%,2%(E-96) 1% ,2% 的阻值范围 (E-96)	1Ω ~ 10MΩ	1Ω~ 10MΩ	0.1Ω~ 10MΩ	0.01Ω~ 10MΩ	0.1Ω≤R ≤10MΩ	0.01Ω ≤R <0.1 Ω	0.1Ω≤R ≤10MΩ	0.01Ω≤R <0.1Ω	0.01Ω~10MΩ			
Resistance Range of 5%(E-24) 5% 的阻值范围 (E-24)	1Ω ~ 10MΩ	1Ω~10MΩ	0.1Ω~ 10MΩ	0.01Ω~ 10MΩ	0.1Ω≤R ≤10MΩ	0.01Ω ≤R <0.1 Ω	0.1Ω≤R ≤10MΩ	0.01Ω≤R <0.1Ω	0.01Ω~10MΩ			

Marking on the Resistors Body (电阻本体字码标示)

- No marking on resistor body due to tiny size in 01005, 0201 and 0402 series.
  01005, 0201, 0402因电阻本体太小，故本体无标示字码
- ±5% tolerance product: the marking is 3 digits, the first 2 digits are the significant of the resistance and the 3rd digit denotes number of zeros following.
  ±5%公差产品字码是三位数，前二位是阻值的有效数，第三位表示有几个 0
- 0805, 1206, 1210, 2010, 2512 ≤±1%: the marking is 4 digits, the first 3 digits are the significant of the resistance and the 4th digit denotes number of zeros following.
  0805, 1206, 1210, 2010, 2512 ≤±1%公差产品字码有四位数，前三位是阻值的有效数，第四位表示有几个 0
- Standard E-96 series values of 0603 ≤±1%: due to the small size of the resistor's body, 3 digits marking will be used to indicate the accurate resistance value by using the following Multiplier & Resistance Code.
  0603 ≤±1%公差 E-96系列标准阻值，因电阻本体太小，采用三位阻值代码（数字）及下列指数代码（字母）配合来指明标准的阻值。



153 = 15000Ω = 15KΩ



Below 10Ω: 6R8 = 6.8Ω
10Ω 以下标示: 6R8 = 6.8Ω



2372 = 23700Ω = 23.7KΩ



Below 10Ω : 3R24 = 3.24Ω
10Ω 以下标示: 3R24 = 3.24Ω

Multiplier Code (for 0603 ≤±1% marking) [指数码 (0603≤±1% 标示)]

Code 代 码	A	B	C	D	E	F	G	H	X	Y	Z
Power 幂	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^{-1}	10^{-2}	10^{-3}

Standard E-96 series Resistance Value code (for 0603≤±1% marking) [E-96系列标准阻值代码 (对0603≤±1%的字码)]

Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码
100	01	**147**	17	**215**	33	**316**	49	**464**	65	**681**	81
102	02	**150**	18	**221**	34	**324**	50	**475**	66	**698**	82
105	03	**154**	19	**226**	35	**332**	51	**487**	67	**715**	83
107	04	**158**	20	**232**	36	**340**	52	**499**	68	**732**	84
110	05	**162**	21	**237**	37	**348**	53	**511**	69	**750**	85
113	06	**165**	22	**243**	38	**357**	54	**523**	70	**768**	86
115	07	**169**	23	**249**	39	**365**	55	**536**	71	**787**	87
118	08	**174**	24	**255**	40	**374**	56	**549**	72	**806**	88
121	09	**178**	25	**261**	41	**383**	57	**562**	73	**825**	89
124	10	**182**	26	**267**	42	**392**	58	**576**	74	**845**	90
127	11	**187**	27	**274**	43	**402**	59	**590**	75	**866**	91
130	12	**191**	28	**280**	44	**412**	60	**604**	76	**887**	92
133	13	**196**	29	**287**	45	**422**	61	**619**	77	**909**	93
137	14	**200**	30	**294**	46	**432**	62	**634**	78	**931**	94
140	15	**205**	31	**301**	47	**442**	63	**649**	79	**953**	95
143	16	**210**	32	**309**	48	**453**	64	**665**	80	**976**	96

So the resistance value are marked as the following examples (阻值标示如下):



1.96KΩ= 196 ×10^1 Ω = 29B



12.4Ω= 124 ×10^{-1} = 10X

- Standard E-24 and not belong to E-96 series values (≤±1%) of 0603 size: the marking is the same as 5% tolerance but marking as underline.
  0603≤±1%公差，在标准 E-24 系列中，但不属 E-96 系列的阻值，标示和5%的公差相同，但是在字码下多加一条线



122 = 1200 = 1.2 KΩ



680 = 68Ω

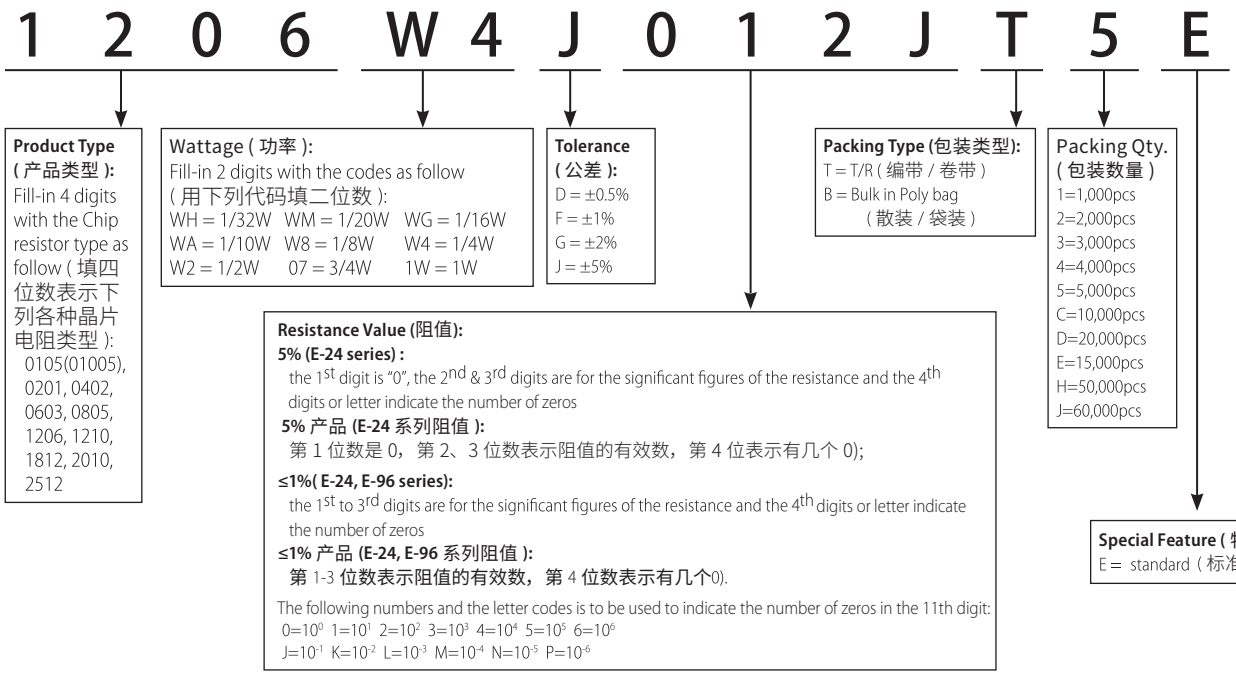
Performance Specifications (性能)

Temperature coefficient	**温度系数**	01005: 1Ω≤R<10Ω: -200~+600ppm/℃ 10Ω≤R<100Ω: ±300ppm/℃ 100Ω≤R≤10MΩ: ±200ppm/℃ 0201: 1Ω≤R≤10Ω: -100~+350ppm/℃ >10Ω: ±200ppm/℃ 0402: 0.1Ω≤R<1Ω:±800ppm/℃ 1Ω≤R≤10Ω: ±200ppm/℃ >10Ω: ±100ppm/℃	0603: 0.01Ω≤R≤0.03Ω:±1500ppm/℃ 0.03Ω<R≤0.05Ω:±1000 ppm/℃ 0.05Ω<R<1Ω:±800ppm/℃ 1Ω≤R≤10Ω: ±200ppm/℃ >10Ω: ±100ppm/℃ 0805, 1206, 1210, 1812, 2010, 2512: 0.01Ω ≤ R ≤0.015Ω: ±1500ppm/℃ 0.015Ω < R ≤0.03Ω:±1000ppm/℃ 0.03Ω < R <1Ω: ±800ppm/℃ 1Ω≤R≤10Ω: ±200ppm/℃ >10Ω: ±100ppm/℃
Short-time overload	**短时间过负荷**	±5%, ± 2%: ±(2.0% + 0.05Ω) ±1%, ± 0.5%: ±(1.0% + 0.05Ω) 01005 ±5% ±1% : ±(2.0% + 0.05Ω)	
Insulation resistance	**绝缘电阻**	≥ 1,000 MΩ	
Dielectric withstanding voltage	**绝缘耐压**	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿 , 飞弧及可见机械性损伤	
Terminal bending	**端子弯曲**	±(1.0% + 0.05Ω)	
Soldering heat	**耐焊接热**	±(1.0% + 0.05Ω)	
Solderability	**可焊性**	Coverage must be over 95%.	
Rapid change of temperature	**温度快速变化**	±5%, ± 2%: ±(1.0% + 0.05Ω) ±1%, ± 0.5%: ±(0.5% + 0.05Ω) 01005 ±5% ±1% : ±(1.0% + 0.05Ω)(-55℃~125℃)	
Humidity (Steady State)	**恒定湿热**	±5%, ± 2%: ±(3.0% + 0.05Ω) ±1%, ± 0.5%: ±(0.5% + 0.05Ω) 01005 ±5% ±1% : ±(2.0% + 0.05Ω)	
Load life in humidity	**湿度寿命**	±5%, ± 2%: ±(3.0% + 0.05Ω) ±1%, ± 0.5%: ±(1% + 0.05Ω) 01005: ±(3.0% + 0.05Ω)	
Load life	**负载寿命**	±5%, ± 2%: ±(3.0% + 0.05Ω) ±1%, ± 0.5%: ±(1% + 0.05Ω) 01005: ±(3.0% + 0.05Ω)	

- The values which are not of standard E-24 series (2% & 5%) and not of E-96 series (1%) could be offered on a case to case basis.
  阻值如不在 E-24 系列 (2% & 5%) 及 E-96 系列 (1%) 可特别提供

Ordering Procedure (Example: 1206 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: 1206 1/4W 5% 1.2 Ω T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

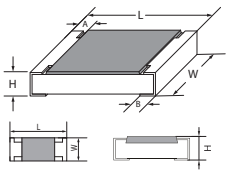
High Ohmic Value Thick Film Chip Resistors
高阻厚膜晶片电阻器

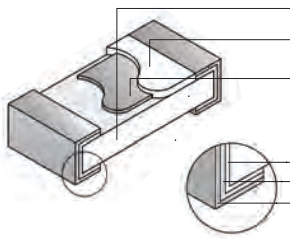
ROYALOHM
www.royalohmcom

Feature (特性)

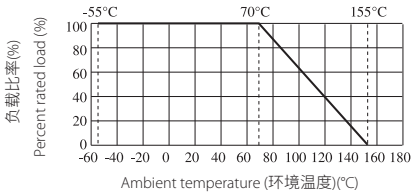
- High Resistance 高阻值
- Suitable for reflow & wave soldering
  适合波峰焊与回流焊
- AV adapters, LCD back-light camera strobe etc. 适用于AV适配器, LCD背光电路, 照相机闸门等.

Figures (型状)





Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature Range 工作温度范围
0402	50V	100V	100V	-55~+155°C
0603	75V	150V	300V	
0805	150V	300V	500V	
1206	200V	400V	500V	
1210	200V	500V	500V	
1812	200V	500V	500V	
2010	200V	500V	500V	
2512	200V	500V	500V	

Type 类型	Size 尺寸	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range (阻值范围) ±1% ±5%
0402	1005	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	10M<R≤100M
0603	1608	1/10W	1.60±0.15	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
0805	2012	1/8W	2.00±0.15	1.25 +0.15 -0.10	0.55±0.10	0.40±0.20	0.40±0.20	
1206	3216	1/4W	3.10±0.15	1.55 +0.15 -0.10	0.55±0.10	0.45±0.20	0.45±0.20	
1210	3225	1/2W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	
1812	4532	3/4W	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.50±0.20	
2010	5025	3/4W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
2512	6432	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	

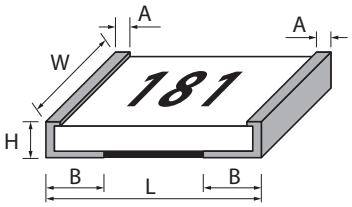
Performance Specification (性能)

Temperature coefficient	温度系数	±200ppm/°C
Short time overload	短时间过负荷	±1%: ±(1.0%+0.05Ω) ±5%: ±(2.0%+0.05Ω)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	Coverage must be over 95%.
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown (无击穿 , 飞弧及可见机械性损伤)
Soldering heat	耐焊接热	±(1.0%+0.05Ω)
Rapid change of temperature	温度快速变化	±1%:±(0.5%+0.05Ω) ±5%:±(1.0%+0.05Ω)
Load Life in humidity	湿度寿命	±1%:±(1%+0.05Ω) ±5%:±(3.0%+0.05Ω)
Load life	负载寿命	±1%:±(1%+0.05Ω) ±5%:±(3.0%+0.05Ω)
Humidity (steady state)	恒定湿热	±1%:±(0.5%+0.05Ω) ±5%:±(3.0%+0.05Ω)
Insulation resistance	绝缘电阻	≥1,000 MΩ

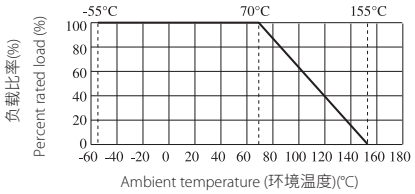
Feature (特性)

- Tolerance 精度为: ±1%~±5%
- Flex LED strip use thick film chip resistor 软灯条专用电阻
- Operating temperature range 工作温度范围为: -55℃ ~+155℃
- Stable electrical capability ,high reliability 电性能稳定,可靠性高
- Suit for reflow 适合于回流焊焊接
- Low assembly cost, suit for automatic SMT equipment 装配成本低,并与自动装贴设备匹配
- Superior mechanical strength and high frequency characteristics 机械强度高、高频特性优越
- According with ROHS standard and Halogen-free 符合ROHS,无卤

Dimension (尺寸) mm



Derating Curve (降功率曲线)



Type 类型	Size 尺寸	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Temperature Coefficient 温度系数	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature Range 工作温度范围
LE05	**0805**	200V	400V	±200PPM/℃	500V	-55~+155℃
LE06	**1206**					

Type 类型	Size 尺寸	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range (阻值范围)
LE05	0805	1/8W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	≤1.0	0.40±0.20	10Ω-820Ω
LE06	1206	1/4W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	≤1.0	0.50±0.20	4.7Ω-1.8K

Performance Specifications (性能)

Temperature coefficient	温度系数	±200ppm/℃
Short time overload	短时间过负荷	±1%: ±(1%+0.1Ω) ±5%: ±(2%+0.1Ω)
Insulation resistance	绝缘电阻	≥ 1,000 MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿 , 飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% + 0.05Ω)
Soldering heat	耐焊接热	±(1.0% + 0.005Ω)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	±1%: ±(1%+0.1Ω) ±5%: ±(3%+0.1Ω)
Humidity (Steady State)	恒定湿热	±1%: ±(0.5%+0.1Ω) ±5%: ±(3%+0.1Ω)
Load life in humidity	湿度寿命	±1%: ±(1%+0.05Ω) ±5%: ±(3%+0.05Ω)
Load life	负载寿命	±1%: ±(1%+0.1Ω) ±5%: ±(3%+0.1Ω)

Ordering Procedure (Example: LE06 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: LE06 1/4W 5% 1.2 Ω T/R-5000)

L E 0 6 | W 4 | J | 0 1 2 J | T | 5 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示下列各种晶片电阻类型):
LE05,LE06

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
W8 = 1/8W
W4 = 1/4W

Tolerance (公差):
F = ±1%
J = ±5%

Resistance Value (阻值):
5% (E-24 series) :
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);

≤1%(E-24, E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0).
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$ $N=10^{-5}$ $P=10^{-6}$

Packing Type (包装类型):
T = T/R (编带 / 卷带)
B = Bulk in Poly bag (散装 / 袋装)

Packing Qty. (包装数量):
5=5,000pcs
C=10,000pcs
D=20,000pcs

Special Feature (特征):
E =standard （ 标准品 ）

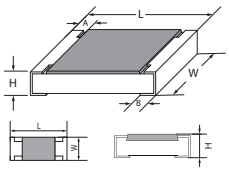
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

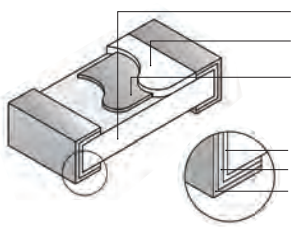
Feature (特性)

- Non-magnetic 无磁性
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Mobile Phone, PDA, Setbox, Meter 适用于移动电话、PDA、机顶盒、仪表

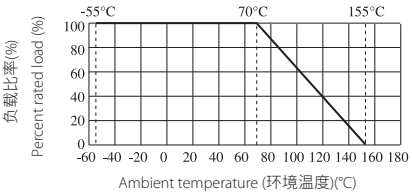


Figures (型状)





Derating Curve (降功率曲线)



Specification (性能)

Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	Max.Overload Current of Jumper 零欧姆电阻最大过负荷电流	Operating Temperature 工作温度范围
NM02	0402 (1005)	50V	100V	100V	<50mΩ	1A	2A	-55~+155°C
NM03	0603 (1608)	75V	150V	300V	<50mΩ	1A	2A	
NM05	0805 (2012)	150V	300V	500V	<50mΩ	2A	5A	
NM06	1206 (3216)	200V	400V	500V	<50mΩ	2A	10A	
NM12	2512 (6432)	200V	500V	500V	<50mΩ	2A	10A	

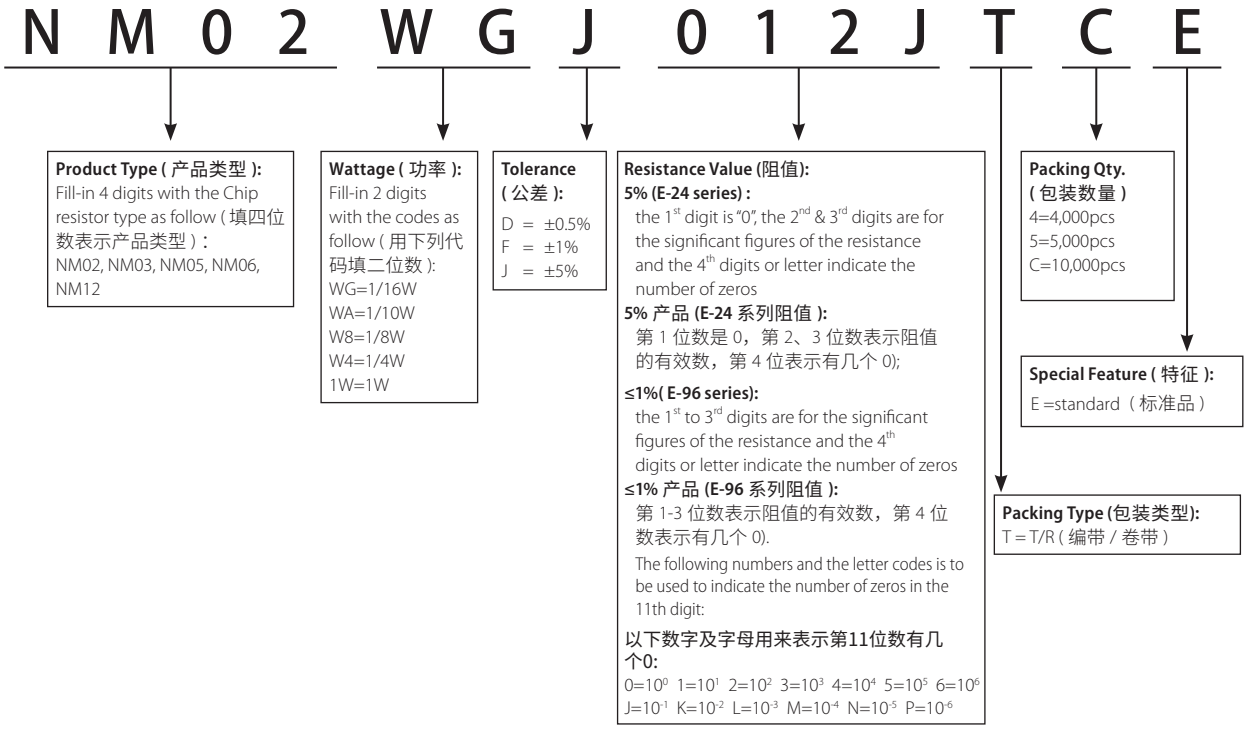
Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
NM02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
NM03	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
NM05	1/8W	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
NM06	1/4W	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	
NM12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	

Performance Specification (性能)

Temperature coefficient	温度系数	1Ω≤R≤10 Ω: ±400ppm/°C 10Ω<R≤100 Ω: ±200ppm/°C R>100Ω: ±100ppm /°C
Short-time overload	短时间过负荷	±0.5%, ±1%: ±(1.0%+0.1Ω) ±5%:±(2.0%+0.1Ω)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	Coverage must be over 95%.
Soldering heat	耐焊接热	±(1.0%+0.05Ω)
Humidity (Steady State)	恒定湿热	±0.5%, ±1%: ±(0.5%+0.1Ω) ±5%:±(3.0%+0.1Ω)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿，飞弧及可见机械性损伤
Rapid change of temperature	温度快速变化	±0.5%, ±1%: ±(0.5%+0.05Ω) ±5%:±(1.0%+0.05Ω)
Load life	负载寿命	±0.5%, ±1%: ±(1.0%+0.1Ω) ±5%:±(3.0%+0.1Ω)

Ordering Procedure (Example: NM02 1/16W 5% 1.2 Ω T/R-10000)

订购方式 (例如: NM02 1/16W 5% 1.2 Ω T/R-10000)



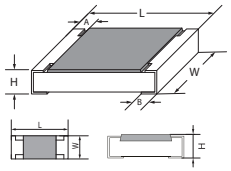
Remark: For more details, please check page 198 , Part No. System. 注：更多细节详见 P198标准料号系统。

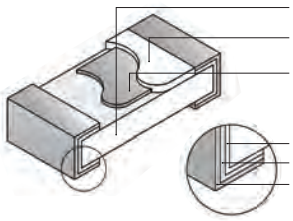
Feature (特性)

- Total Lead Free in whole resistor body　电阻本体完全不含铅
- Small size and light weight　体积小、重量轻
- Reduction of assembly costs and matching with placement machine
  可降低装置成本及配合机器组装
- Suitable for both wave & re-flow soldering 适合波峰焊与回流焊



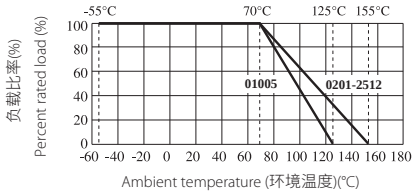
Figures (型状)





1. High purity Alumina substrate (高纯度氧化铝基板)
2. Protective coating (保护层)
3. Resistance element (阻抗元素)
4. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
5. Termination (Between) Ni Barrier [端面(中)镍层]
6. Termination (Outer) Sn [端面(外)锡层(无铅)]

Derating Curve (降功率曲线)



Type 类型	PF0A	PF01	PF02	PF03	PF05	PF06	PF07	PF11	PF10	PF12
Size 尺寸	01005 (0402)	0201 (0603)	0402 (1005)	0603 (1608)	0805 (2012)	1206 (3216)	1210 (3225)	1812 (4532)	2010 (5025)	2512 (6432)
Max. Working Voltage 最大工作电压	15V	25V	50V	75V	150V	200V	200V	200V	200V	200V
Max.Overload Voltage 最大过负荷电压	30V	50V	100V	150V	300V	400V	500V	500V	500V	500V
Dielectric Withstanding Voltage 绝缘耐压	-	50V	100V	300V	500V	500V	500V	500V	500V	500V
Operating Temperature 工作温度范围	-55℃~ +125℃	-55℃~+155℃								

Type 类型		PF0A	PF01	PF02	PF03	PF05	PF06	PF07	PF11	PF10	PF12
Power Rating 额定功率		1/32W	1/20W	1/16W	1/10W	1/8W	1/4W	1/2W	3/4W	3/4W	1W
Dimension 尺寸	L(mm)	0.40±0.02	0.60±0.03	1.00±0.10	1.60±0.10	2.00±0.15	3.10±0.15	3.10±0.10	4.50±0.20	5.00±0.10	6.35±0.10
	W(mm)	0.20±0.02	0.30±0.03	0.50±0.05	0.80±0.10	$1.25^{+0.15}_{-0.10}$	$1.55^{+0.15}_{-0.10}$	2.50±0.15	3.20±0.20	2.50±0.20	3.20±0.20
	H(mm)	0.13±0.02	0.23±0.03	0.35±0.05	0.45±0.10	0.55±0.10	0.55±0.10	0.55±0.10	0.55±0.20	0.55±0.10	0.55±0.10
	A(mm)	0.10±0.05	0.10±0.05	0.20±0.10	0.30±0.20	0.40±0.20	0.45±0.20	0.50±0.25	0.50±0.20	0.60±0.25	0.60±0.25
	B(mm)	0.10±0.03	0.15±0.05	0.25±0.10	0.30±0.20	0.40±0.20	0.45±0.20	0.50±0.20	0.50±0.20	0.50±0.20	0.50±0.20
Resistance Value of Jumper 零欧姆电阻阻值		<50mΩ									
Rated Current of Jumper 零欧姆电阻额定电流		0.5A	0.5A	1A	1A	2A	2A	2A	2A	2A	2A
Max.Overload Current of Jumper 零欧姆电阻最大过负荷电流		1A	1A	2A	2A	5A	10A	10A	10A	10A	10A
Resistance Range of ±0.5%、1% (E-96) ±0.5%、1% 的阻值范围 (E-96)		10Ω~10MΩ	1Ω~10MΩ								
Resistance Range of 5% (E-24) 5% 的阻值范围 (E-24)		1Ω~10MΩ									

Performance Specifications (性能)

Temperature coefficient	温度系数	**PF0A:** 1Ω≤R≤10Ω: -200~600ppm/°C 10Ω<R≤100Ω: ±300ppm/°C >100Ω: ±200ppm/°C **PF01:** 1Ω≤R≤10Ω: -100~350ppm/°C >10Ω: ±200ppm/°C **PF02, PF03, PF05, PF06, PF07, PF10, PF11, PF12:** 1Ω≤R≤10Ω: ±400ppm/°C 10Ω<R≤100Ω: ±200ppm/°C >100Ω: ±100ppm/°C
Short-time overload	短时间过负荷	±5%: ±(2.0% + 0.1Ω) ±1%, ± 0.5%: ±(1.0% + 0.1Ω) PF0A：±(2.0% + 0.1Ω)
Insulation resistance	绝缘电阻	≥ 1,000 MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿，飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% + 0.05Ω)
Soldering heat	耐焊接热	±(1.0% + 0.05Ω)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	±5%: ±(1.0% + 0.05Ω) ±1%, ± 0.5%: ±(0.5% + 0.05Ω) PF0A：±(1.0% + 0.05Ω)
Humidity (Steady State)	恒定湿热	±5%: ±(3.0% + 0.1Ω) ±1%, ± 0.5%: ±(0.5% + 0.1Ω) PF0A：±(3.0% + 0.1Ω)
Load life in humidity	湿度寿命	±5%: ±(3.0% + 0.1Ω) ±1%, ± 0.5%: ±(1% + 0.1Ω) PF0A：±(3.0% + 0.1Ω)
Load life	负载寿命	±5%: ±(3.0% + 0.1Ω) ±1%, ± 0.5%: ±(1% + 0.1Ω) PF0A：±(3.0% + 0.1Ω)

Ordering Procedure (Example: PF02 1/16W 5% 2.2Ω T/R-10000)

订购方式 (例如: PF02 1/16W 5% 2.2Ω T/R-10000)

P F 0 2 W G J 0 2 2 J T C E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示下列各种晶片电阻类型):
01005=PF0A 0201=PF01
0402=PF02 0603=PF03
0805=PF05 1206=PF06
1210=PF07 1812=PF11
2010=PF10 2512=PF12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WH=1/32W
WM=1/20W
WG=1/16W
WA=1/10W
W8=1/8W
W4=1/4W
W2=1/2W
07 = 3/4W
1W=1W

Resistance Value (阻值):
5% (E-24 series) :
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1%产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0).
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty.
(包装数量)
4 =4,000pcs,
5 =5,000pcs
C =10,000pcs
E =15,000pcs
D =20,000pcs

Tolerance (公差):
D = ±0.5% F = ±1%
J = ±5%

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Special Feature (特征):
E =standard （ 标准品 ）

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

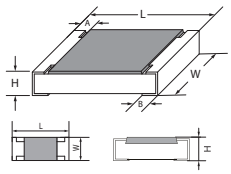
- Thin film NiCr Resistance element
  薄膜镍铬阻抗组件
- Very tight tolerance ±0.1% ~ ±0.5%
  高精密的公差 ±0.1% ~ ±0.5%
- Extremely low TCR ±5ppm~±50ppm
  极低的温度系数 ±5ppm~±50ppm
- Completed Lead-free 完全无铅产品

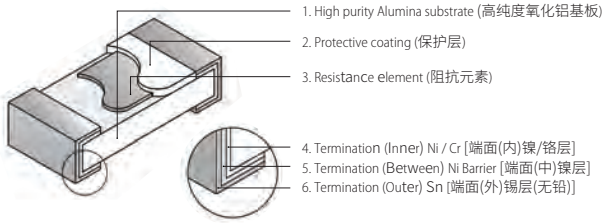
Application (应用)

- Automatic equipment 自动化设备
- Communication & telecom 通信终端及设备
- Industrial 工业电子
- Medical Equipment 医疗器材

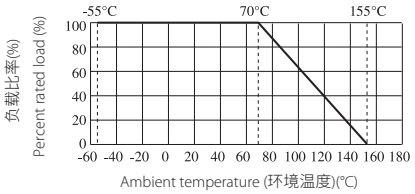


Figures (型状)





Derating Curve (降功率曲线)



Type 类型	Size 尺寸	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TC01	0201 (0603)	0.60±0.05	0.30±0.05	0.23±0.05	0.12±0.05	0.15±0.05
TC02	0402 (1005)	1.00±0.10	0.50±0.05	0.30±0.05	0.20±0.10	0.25±0.10
TC03	0603 (1608)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
TC05	0805 (2012)	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.30±0.20	0.40±0.20
TC06	1206 (3216)	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.45±0.20
TC07	1210 (3225)	3.10±0.10	2.50±0.15	0.55±0.10	0.40±0.20	0.45±0.20
TC10	2010 (5025)	5.00±0.10	2.50±0.20	0.55±0.10	0.50±0.25	0.50±0.20
TC12	2512 (6432)	6.35±0.10	3.20±0.20	0.55±0.10	0.50±0.25	0.50±0.20

Performance Specifications (性能)

Test Item 试验项目	Test Methods 试验方法	Evaluation Criteria 判定标准
Short-time overload 短时间过负荷	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值	ΔR≤±(0.5%+0.05Ω)
Insulation resistance 绝缘电阻	1. Chip Resistor：the measuring voltage shall be, measured with a direct voltage of (100±15)V or a voltage equal to the dielectric withstanding voltage, and appiy for 1 min. 2. Through Hole Resistor: the measuring voltage shall be equal to the dielectric withstanding voltage for resistor with an isolation voltage<500V or (500±50)V DC, for resistors with an isolation voltage≥500V. 1. 贴片电阻：绝缘耐压＜ 100V，测试电压取绝缘耐压的电压；绝缘耐压 ≥100V，测试电压为 100±15VDC，1 分钟后量测阻值。 2. 插件电阻：绝缘耐压 ＜ 500V，测试电压取绝缘耐压的电压 ; 绝缘耐压 ≥500V . 测试电压为 500±50VDC，1 分钟后量测阻值。	≥1,000MΩ
Load life in humidity 湿度寿命	Resistance change after 1000 hours (1.5hours"ON"，0.5hours"OFF") at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2°C and 90~95% RH. 持续时间：1000h (1.5h" 通 "，0.5h" 断 ")；试验温度：40±2°C；相对湿度：90~95% RH；试验电压：额定工作电压或最大工作电压 (取其低者)。	ΔR≤±(0.5%+0.05Ω)
Load life 负载寿命	Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours "ON"，0.5 hour "OFF" at 70±2°C ambient. 持续时间：1000h (1.5h" 通 "，0.5h" 断 ")；试验温度：70±2°C；试验电压：额定工作电压或最大工作电压 (取其低者)。	ΔR≤±(0.5%+0.05Ω)
Humidity (Steady State) 恒定湿热	Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2°C and 90~95% RH. 在 40±2°C 和 90~95% RH 相对湿度条件下，存放 240h 后阻值变化率。	ΔR≤±(0.5%+0.05Ω)
Terminal bending 端子弯曲	(Applicable for CHIP Resisters 适用晶片电阻) Twist of Test Board:Y/X=3/90mm 60 seconds. 测试板弯曲：Y/X=3/90mm 60 秒。	TC01: ΔR≤±(0.5%+0.05Ω) Other:ΔR≤±(0.2%+0.05Ω)
Solderability 可焊性	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Temperature of solder: 245±3°C; Dwell time in solder: 2~3 seconds. 表面光滑、清洁、均匀、有光泽，锡炉温度：245±3°C；浸入时间：2~3 秒。	Coverage must be over 95%.
Soldering heat 耐焊接热	Dip the resistor into a temperature of 260±5°C and hold it for a 10±1 seconds . 将电阻浸入到260±5°C的锡炉中并保持10秒时间。	TC01: ΔR≤±(0.5%+0.05Ω) Other: 0.1%、0.25%: ΔR≤±(0.2%+0.05Ω) 0.5%、±1%: ΔR≤±(0.5%+0.05Ω)

Electrical Data (电气参数)

Type 类型	Power Rating 额定功率	Operating Temperature 工作温度范围	Max.Working Voltage 最大工作电压	Max.Overload Voltage 最大过负荷电压	Dielectric With-standing Voltage 绝缘耐压	Resistance Range 阻值范围		TCR 温度系数
						±0.1% ±0.25%	±0.5% ±1%	
TC01	1/20W	-55℃~+155℃	25V	50V	-	10Ω~5.1KΩ	10Ω~5.1KΩ	±10PPM/℃
						10Ω~5.1KΩ	10Ω~5.1KΩ	±15PPM/℃
						10Ω~82KΩ	10Ω~82KΩ	±25PPM/℃
						10Ω~82KΩ	10Ω~82KΩ	±50PPM/℃
TC02	1/16W	-55℃~+155℃	25V	50V	100V	100Ω~2KΩ	100Ω~2KΩ	±5PPM/℃
						50Ω~12KΩ	50Ω~12KΩ	±10PPM/℃
						10Ω~332KΩ	10Ω~332KΩ	±25PPM/℃
						10Ω~332KΩ	10Ω~332KΩ	±50PPM/℃
TC03	1/10W	-55℃~+155℃	75V	150V	300V	100Ω~4KΩ	100Ω~4KΩ	±5PPM/℃
						10Ω~50KΩ	10Ω~50KΩ	±10PPM/℃
						4.7Ω~1MΩ	1Ω~1MΩ	±25PPM/℃
						4.7Ω~1MΩ	1Ω~1MΩ	±50PPM/℃
TC05	1/8W	-55℃~+155℃	150V	300V	500V	100Ω~15KΩ	100Ω~15KΩ	±5PPM/℃
						10Ω~100KΩ	10Ω~100KΩ	±10PPM/℃
						4.7Ω~2MΩ	1Ω~2MΩ	±25PPM/℃
						4.7Ω~2MΩ	1Ω~2MΩ	±50PPM/℃
TC06	1/4W	-55℃~+155℃	200V	400V	500V	100Ω~15KΩ	100Ω~15KΩ	±5PPM/℃
						10Ω~200KΩ	10Ω~200KΩ	±10PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃
TC07	1/3W	-55℃~+155℃	200V	400V	500V	10Ω~1MΩ	10Ω~1MΩ	±10PPM/℃
						4.7Ω~1.5MΩ	2.49Ω~1.5MΩ	±25PPM/℃
						4.7Ω~1.5MΩ	2.49Ω~1.5MΩ	±50PPM/℃
TC10	1/3W	-55℃~+155℃	200V	400V	500V	100Ω~25KΩ	100Ω~25KΩ	±5PPM/℃
						50Ω~200KΩ	50Ω~200KΩ	±10PPM/℃
	1/2W					4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃
TC12	3/4W	-55℃~+155℃	200V	400V	500V	100Ω~25KΩ	100Ω~25KΩ	±5PPM/℃
						50Ω~200KΩ	50Ω~200KΩ	±10PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃

Ordering Procedure (Example:Thin Film TC06 1/4W 0.1% 25PPM 1KΩ T/R-5000)

订购方式(例如: 薄膜TC06 1/4W 0.1% 25PPM 1KΩ T/R-5000)

T C 0 6 2 5 B 1 0 0 1 T 5 J

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
TC01, TC02, TC03, TC05, TC06, TC07, TC10, TC12

Temperature coefficient (温度系数):
Fill-in 2 digits with the codes as following
(用下列代码填二位数):
05 = 5PPM 10 = 10PPM
15 = 15PPM 25 = 25PPM
50 = 50PPM

Tolerance (公差):
B = ±0.1%
C = ±0.25%
D = ±0.5%
F = ±1%

Resistance Value (阻值):
≤1%(E-24 & E-96 series)
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第4位数表示有几个0
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Type (包装类型):
T = T/R (编带 / 卷带)
B = Bulk in Poly bag (散装 / 袋装)

Packing Qty. (包装数量):
4=4,000pcs,
5=5,000pcs
C=10,000pcs
D=20,000pcs
E= 15,000pcs

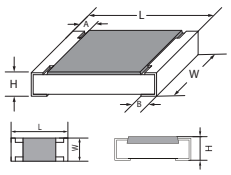
Special Feature (特征):
D=1/20W C=1/16W F=1/10W
G=1/8W J=1/4W K=1/3W
M=1/2W N=3/4W S=Special

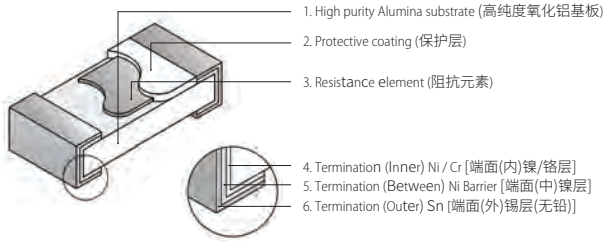
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

Feature (特性)

- Tolerance 精度为:±1%、±5%
- Small size&light weight 短小轻薄
- Suitable for reflow&wave soldering 适合波峰焊与回流焊
- Resistance range 阻值范围为:1Ω~10Ω
- Operating temperature range:-55℃ ~+155℃ 工作温度范围为：-55°C ~+155°C
- Reduction of assembly costs and matching with placement machine. 可降低装置成本及配合机器组装

Figures (型状)

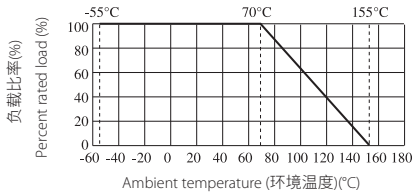




Application (应用)

- Navigator (GPS) GPS
- Mobile Phone,Telecom 移动电话
- PDA
- Digital CATV Receiver 机顶盒
- Meter 仪表

Derating Curve (降功率曲线)



Dimension (尺寸)

Type 类型	Size 尺寸	Resistance Range 阻值范围	Dimension(尺寸)(mm)					Tolerance 精度
			L	W	H	A	B	
TF03	0603(1608)	1Ω≦R≦10Ω	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	±1% ±5%
TF05	0805(2012)	1Ω≦R≦10Ω	2.00±0.15	1.25 +0.15 -0.10	0.55±0.10	0.40±0.20	0.40±0.20	
TF06	1206(3216)	1Ω≦R≦10Ω	3.10±0.15	1.55 +0.15 -0.10	0.55±0.10	0.45±0.20	0.45±0.20	

Type 类型	Power Rating 额定功率	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstand Voltage 绝缘耐压	Operating Temperature Range(℃) 工作温度范围
TF03	1/10W	75V	150V	300V	-55~+155℃
TF05	1/8W	150V	300V	500V	
TF06	1/4W	200V	400V	500V	

Performance Specifications (性能)

Temperature coefficient	温度系数	±200ppm /°C
Short-Time Overload	短时间过负荷	±5%:±(2.0%+0.05 Ω) ;±1%:±(1.0%+0.05 Ω)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	Coverage must be over 95%
Insulation resistance	绝缘电阻	≧1000MΩ
Insulation withstand voltage	绝缘耐压	No evidence of flashover,mechanical damage,arcing or insulation breakdown (无击穿，飞弧及可见机械性损伤)
Soldering heat	绝缘耐压	±(1.0%+0.05Ω)
Rapid change of temperature	温度快速变化	±5%:±(1.0%+0.05Ω) ; ±1%:±(0.5%+0.05Ω)
Load Life in humidity	湿度寿命	±5%:±(3.0%+0.05Ω) ; ±1%:±(1%+0.05Ω)
Load life	负载寿命	±5%:±(3.0%+0.05Ω) ; ±1%:±(1%+0.05Ω)

Ordering Procedure (Example: TF05 1/8W 1% 10Ω T/R-5000)

订购方式 (例如: TF05 1/8W 1% 10Ω T/R-5000)

T F 0 5 W 8 F 1 0 0 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
TF03
TF05
TF06

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WA=1/10W
W8=1/8W
W4=1/4W

Tolerance (公差):
F=±1%
J=±5%

Resistance Value (阻值):

5% (E-24 series):
1st code is zero, 2nd~3rd codes are the significant figures of resistance value, and the rest code is the power of ten.

5% 产品 (E-24系列阻值):
第1位数是“0”；第2和第3位数表示阻值的有效数，第4位数表示有几个0

1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.

1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0

The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:

以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Type (包装类型):
T = T/R (编带 / 卷带)
B = Bulk in poly bag
(散装 / 袋装)

Packing Qty. (包装数量):
5=5000pcs

Special Feature (特征):
E =standard (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

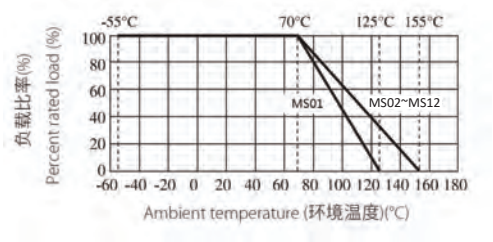
- Able to withstand high power 耐高功率
- Ultra Low sensing resistance 超低感应电阻
- Excellent frequency response 优秀的频率响应
- Excellent temperature coefficient characteristics 优秀的温度系数特性



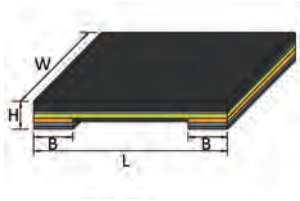
Application (应用)

- Mobile electronic equipment-Cellular phone, NB Tablet PC, GPS,DSC, HDD
  移动电话、平板计算机、GPS、DSC、硬盘驱动器
- DC-DC converter, Adapter, Battery pack and charger
  直流转换器、适配器、电池和充电器
- Switching power supply 开关电源
- Voltage Regulation module 电压调整模块
- Power management applications 电源管理应用

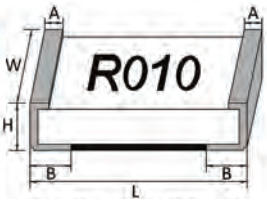
Derating Curve (降功率曲线)



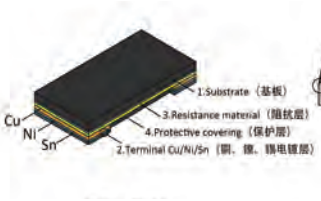
Figures (型状)



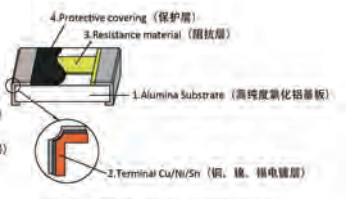
MS01、MS02



MS03、MS05、MS06、MS10、MS12



MS01、MS02



MS03、MS05、MS06、MS10、MS12

Specification (性能)

Type 类型	Power Rating 额定功率	Resistance Range 阻值范围 ±1%	Dimension(尺寸)(mm)					T.C.R. 温度系数 ppm/°C
			L	W	H	A	B	
MS01 (0201)	1/5W	10mΩ , 20mΩ	0.60±0.15	0.30±0.15	0.25±0.10	/	0.15±0.10	±200
MS02 (0402)	1/3W	2.5mΩ , 3mΩ	1.00±0.15	0.55±0.15	0.30±0.10		0.30±0.10	±150
		5~25mΩ					0.23±0.10	±100
	1/4W	26~50mΩ						±100
MS03 (0603)	1/2W	5mΩ	1.60±0.25	0.80±0.25	0.65±0.20	/	0.50±0.20	±75
		6~30mΩ					0.40±0.20	±50
MS05 (0805)	1/2W	5mΩ~9mΩ	2.00±0.30	1.20±0.30	0.60±0.20	≤1.0	0.65±0.15	±100
		12mΩ ~13mΩ					0.57±0.15	±50
		10mΩ、11mΩ、14mΩ ~50mΩ					0.42±0.15	
	3/4W	10mΩ					0.42±0.15	±50
MS06 (1206)	1W	7mΩ	3.10±0.20	1.60±0.30	0.70±0.20	≤1.0	0.86±0.25	±100
		5mΩ~6mΩ,8mΩ~9mΩ					0.76±0.25	
		10mΩ~60mΩ					0.46±0.25	±50
MS10 (2010)	1.5W	10mΩ,25mΩ	5.00±0.20	2.50±0.25	0.70±0.20	≤1.0	1.00±0.30	±50
		50mΩ,80mΩ,100mΩ,150mΩ					0.65±0.30	
MS12 (2512)	2W 3W	5mΩ	6.35±0.20	3.20±0.25	0.70±0.20	≤1.0	1.35±0.30	≥10mΩ:±50 <10mΩ:±100
		6mΩ					1.15±0.30	
		7mΩ~8mΩ					1.75±0.30	
		9mΩ~15mΩ					1.15±0.30	
		16mΩ~100mΩ					0.90±0.30	
	2W	101mΩ~200mΩ	6.35±0.20	3.20±0.25	0.70±0.20	≤1.0	0.90±0.30	

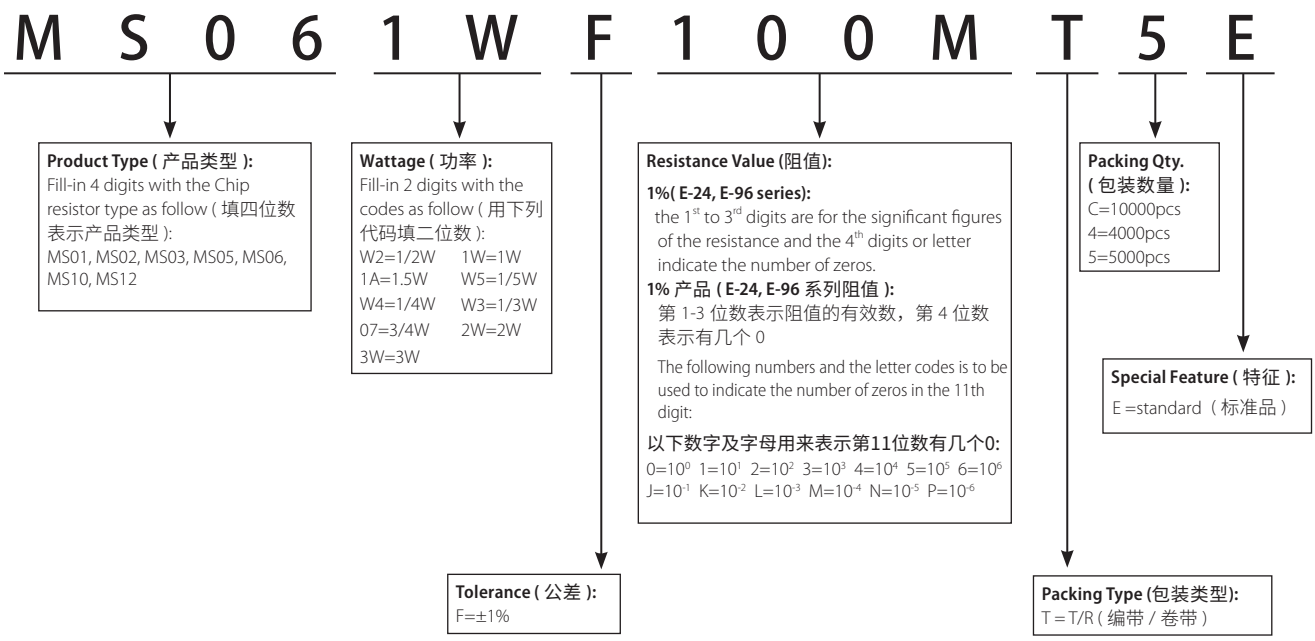
✳ Other sizes and resistor values can be customized on request. 其他规格和阻值可特别提供

Performance Specifications (性能)

Short-time overload	**短时间过负荷**	1% : ±(1%+0.001 Ω) Test method 测试方法 : MS01、MS02、MS03: Runing under 2.5 times of rated power in 5 seconds at room temperature. MS01、MS02、MS03: 2.5倍额定功率、室温，持续工作5秒 MS05、MS06、MS10、MS12 : Runing under 5 times of rated power in 5 seconds at room temperature. MS05、MS06、MS10、MS12 : 5倍额定功率、室温，持续工作5秒
Solderability	**可焊性**	Coverage must be over 95%.
Low Temperature Storage	**低温放置**	±(1%+0.001 Ω)
High Temperature Exposure	**高温放置**	±(1%+0.001 Ω)
Soldering heat	**耐焊接热**	±(1%+0.005Ω)
Load life in humidity	**湿度寿命**	1% : ±(2%+0.001 Ω)
Load life	**负载寿命**	1% : ±(2%+0.001 Ω)

Ordering Procedure (Example: MS06 1W 1% 10mΩ T/R-5000)

订购方式 (例如: MS06 1W 1% 10mΩ T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Metal Foil Wide Terminal Current Sensing Chip Resistors - MW

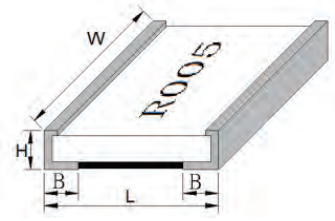
合金箔宽电极电流检测电阻器 - MW系列

Feature (特性)

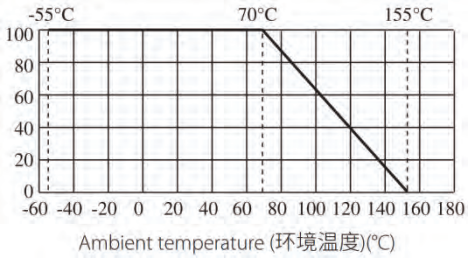
- Long side terminal,ultra high power 长边电极，超高功率
- Resistance layer of alloy material,temperature coefficient as low as 50ppm, 合金材料电阻层，温度系数低至50PPM
- Application in cell phone battery BMS and PC 应用于手机电池BMS及PC



Figures (型状)



Derating Curve (降功率曲线)



Type 类型	Power Rating 额定功率	Resistance Range 阻值范围	L (mm)	W (mm)	H (mm)	B (mm)
MW08(0508)	1W	1~100mΩ	1.35±0.20	2.10±0.20	0.65±0.20	0.43±0.20
MW12(0612)	1.5W	1mΩ	1.60±0.25	3.20±0.25	0.65±0.20	0.50±0.30
		2mΩ~100mΩ				0.40±0.20
MW15(0815)	2W	1~20mΩ	2.20±0.20	3.80±0.20	0.65±0.20	0.61±0.20
MW25(1225)	3W	1~100mΩ	3.20±0.30	6.40±0.30	0.65±0.20	0.60±0.20

Type 类型	Power Rating 额定功率	T.C.R.(ppm/°C) 温度系数	Max.Rating Current 最大额定电流	Max.Overload Current 最大过载电流	Resistance Range 阻值范围 ±0.5%	±1%	±2%	Operating Temperature Range(°C) 工作温度范围
MW08(0508)	**1W**	±100	31.62A	50A	/	/	1mΩ	-55~+155
		±100	22.36A	35.35A	/	2mΩ~9mΩ	/	
		±50	10A	15.81A	10mΩ~100mΩ	10mΩ~100mΩ	/	
MW12(0612)	**1.5W**	±100	38.72A	61.23A	/	/	1mΩ	
		±100	27.38A	43.30A	/	2mΩ~9mΩ	/	
		±50	12.24A	19.36A	10mΩ~100mΩ	10mΩ~100mΩ	/	
MW15(0815)	**2W**	±100	44.72A	70.71A	/	/	1mΩ	
		±100	31.62A	50A	/	2mΩ~9mΩ	/	
		±50	14.14A	22.36A	10mΩ~20mΩ	10mΩ~20mΩ	/	
MW25(1225)	**3W**	±100	54.77A	86.60A	/	1mΩ~9mΩ	/	
		±50	17.32A	27.38A	10mΩ~100mΩ	10mΩ~100mΩ	/	

Performance Specifications (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Short-time overload 短时间过负荷	JIS C 5201-1 clause 4.13	2.5 time of rated power Rating power duration:5 secs 2.5 倍额定功率 5S	±(1.0%+0.5mΩ)
High Temperature Exposure 高温暴露	JIS C 5201-1 clause 4.23.2	1000H at +155℃±2℃	±(1.0%+0.5mΩ)
Low Temp. Storage 低温存放	JIS C 5201-1 clause 4.23.4	1000hrs at -55℃±2℃	±(1.0%+0.5mΩ)
Temperature Cycling 温度循环	JIS C 5201-1 clause 4.19	-55℃ to +155℃,100 cycles	±(1.0%+0.5mΩ)
Load Life in humidity 湿度寿命	JIS C 5201-1 clause 4.24	40±2℃,90~95% RH,Rated power or Max. working current whichever is less for 1000H with 1.5H"ON" and 0.5H"OFF" 在40±2℃，90~95%RH 下额定功率或最大额定电压（取其低）试验1.5H“ON” and 0.5H“OFF”1000H	±(2.0%+0.5mΩ)
Soldering Heat 耐焊接热	JIS C 5201-1 clause 4.18	260±5℃ for 10±1 senconds	±(1.0%+0.5mΩ)
Load Life (Endurance) 负载寿命	JIS C 5201-1 clause 4.25	70±2℃,Rated power or Max. working voltage whichever is less for 1000H with 1.5H"ON" and 0.5H"OFF" 70±2℃，额定功率或最大工作电流（取其低）试验1.5H“ON”and 0.5H“OFF” 1000H	±(2.0%+0.5mΩ)

Ordering Procedure (Example: MW12(0612) 1.5W±1% 3mΩ T/R=5000)

订购方式 (例如: MW12(0612) 1.5W±1% 3mΩ T/R=5000)

M W 1 2 | 1 A | F | 3 0 0 N | T | 5 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
MW08
MW12
MW15
MW25

Wattage (功率):
1W=1W
1A=1.5W
2W=2W
3W=3W

Tolerance (公差):
D=±0.5%
F=±1%
G=±2%

Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0;

1%(E-24, E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0

The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
J=10^{-1} K=10^{-2} L=10^{-3}
M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量):
4=4000pcs
5=5000pcs

Special Feature (特征):
E =standard （标准品）

Packing Type (包装类型):
T = T/R (编带 / 卷带)

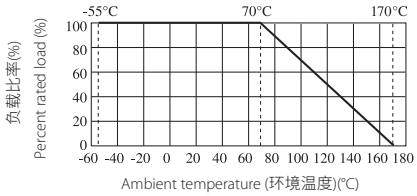
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198 标准料号系统。

Feature (特性)

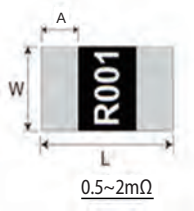
- High power rating up to 3 watts 高功率可达 3W
- Low T.C.R until ±50PPM 较低的温度系数 ±50PPM
- Low resistance values, from 1mΩ to 350mΩ 阻值低 1mΩ~350mΩ
- low inductance 低电感
- Tolerance: ±1%, ±2%, ±5% 精度：±1%, ±2%, ±5%
- RoHS complaint 符合欧盟 ROHS 标准
- AEC-Q200 qualified 符合AEC-Q200相关条款

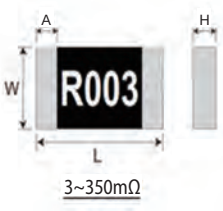


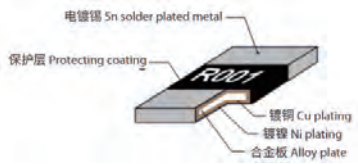
Derating Curve (降功率曲线)



Figures (型状)







Type 类型	Power Rating 额定功率	Resistance Range(mΩ) 阻值范围	Tolerance 公差	T.C.R PPM/ °C	Operating Temperature Range(°C) 工作温度	Dimension(mm) 尺寸			
						L	W	H	A
LR06	1W	2~30mΩ	±1% ±2% ±5%	±50	-55~+170℃	3.20±0.25	1.60±0.25	0.65±0.25	0.70±0.30
	1.5W	2~5mΩ							
LR12	2W	0.5mΩ		±75		6.35±0.25	3.18±0.25	0.90±0.25	2.50±0.25
		1~2mΩ		±50				0.70±0.25	2.20±0.25
		3~25mΩ							0.90±0.25
		26~350mΩ						0.90±0.25	0.65±0.25
	3W	0.5mΩ		±75				0.90±0.25	2.50±0.25
		1~2mΩ		±50					2.20±0.25
		3~9mΩ							0.90±0.25
		10~350mΩ							0.65±0.25

*表中未列入规格请联系工厂 Please contact the UNI-ROYAL if the specifications are not listed in the table.

Performance Specifications (性能)

Short-time overload	**短时间过负荷**	±(0.5%+0.0005Ω) Test method 测试方法 : LR06、LR12 2W:Runing under 5 times of rated power in 5 seconds at room temperature LR06、LR12 2W: 5倍额定功率、室温，持续工作5秒 LR12 3W :Runing under 4 times of rated power in 5 seconds at room temperature LR12 3W: 4倍额定功率、室温，持续工作5秒
Soldering heat	**耐焊接热**	±(0.5%+0.0005Ω)
Solderability	**可焊性**	Coverage must be over 95%.
Temperature Cycling	**温度循环**	±(0.5%+0.0005Ω)
Load life	**负载寿命**	± (1%+0.0005Ω)

Ordering Procedure (Example:LR12 2W 1% 5mΩ T/R-4000)

订购方式 (例如: LR12 2W 1% 5mΩ T/R-4000)

L R 1 2 | 2 W | F | 5 0 0 N | T | 4 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
LR06=1206
LR12=2512

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
1W=1W 1A=1.5W
2W=2W 3W=3W

Tolerance (公差):
F=±1%
G=±2%
J=±5%

Resistance Value (阻值):
1%(E-24, E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量):
4=4000pcs
5=5000pcs

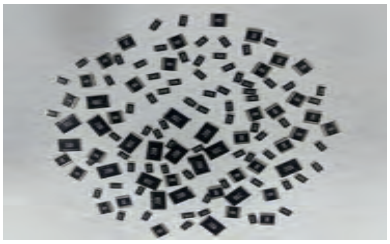
Packing Type (包装类型):
T = T/R (编带 / 卷带)

Special Feature (特征):
E =standard （ 标准品 ）

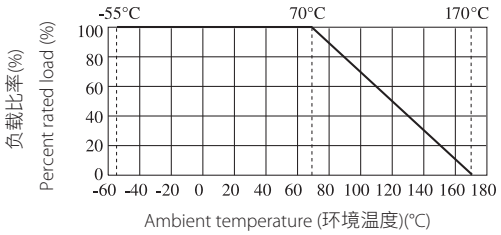
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

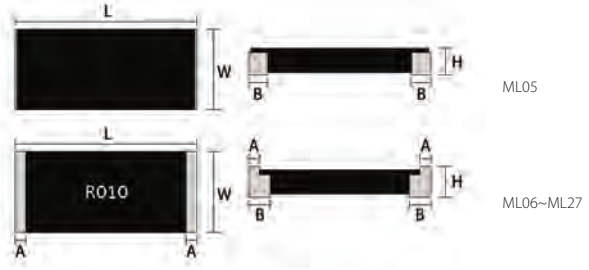
- Low Resistance / Low TCR 低阻值 /低温度系数
- Excellent long term stability 优秀的长期稳定性
- RoHS compliant and halogen free. 符合RoHS标准，不含卤素
- Lead free. 无铅
- High precision current sensing and voltage division. 高精度电流检测和电压划分



Derating Curve (降功率曲线)



Figures (型状)



Type 类型	Power Rating 额定功率	T.C.R PPM/ °C	Resistance Range(mΩ) 阻值范围		Dimension(mm) 尺寸					Operating Temperature Range (℃) 工作温度范围
			0.5%(D)	1.0%(F) 2.0%(G) 5.0%(J)	L	W	H	A	B	
ML05 (0805)	1/2W	±100	---	0.5~1	2.05±0.25	1.30±0.30	Depends on value 由阻值决定	Depends on value 由阻值决定	Depends on value 由阻值决定	-55℃ ~+170℃
		±75	---	1.5~2						
		±50	7~13	2.5~13						
	1W	±100	---	0.5~1						
		±75	---	1.5~2						
		±50	7~13	2.5~13						
ML06 (1206)	1W	±50	5~50	1~50	3.20±0.25	1.65±0.25				
	1.5W	±50	5~10	1~10						
ML12 (2512)	2W	±75	---	0.5~0.75	6.35±0.25	3.05±0.25				
		±50	5~450	101~450						
	3W	±75	---	0.5~0.75						
		±50	5~100	1,1.5,3~9						
ML25 (2725)	4W	±100	---	0.2	6.90±0.25	6.35±0.25				
		±50	---	0.25~0.8						
		±50	---	1~3	6.80±0.25					
ML28 (2728)	4W	±50	7~450	4~450	6.60±0.25	6.70±0.25				
ML27 (4527)	3W	±75	---	0.5	11.30±0.50	6.60±0.50				
		±50	7~60	1~60						
	5W	±75	---	0.5						
		±50	7~500	1~500						

Jumper Specifications （0Ω规格）

Type 类型	Power Rating 额定功率	Resistance (mΩ) 阻值范围	L	W	H	A	B
ML05 (0805)	1/2W 1W	≤0.2mΩ	2.05±0.25	1.30±0.30	0.45±0.20	0.40±0.20	/
ML06 (1206)	1W	≤0.2mΩ	3.20±0.25	1.65±0.25	0.65±0.25	0.50±0.30	0.50±0.30
ML12 (2512)	2W 3W	≤0.2mΩ	6.35±0.25	3.05±0.25	0.65±0.25	1.15±0.25	1.10±0.25

Performance Specifications (性能)

Short-time overload	短时间过负荷	±(0.5%+0.0005Ω) Test method 测试方法 : Runing under 3 times /4 times/5 times of rated power in 5 seconds at room temperature. 3倍/4倍/5倍额定功率、室温，持续工作5秒 See the specification for details (具体详见产品规格书)
Soldering heat	耐焊接热	±(0.5%+0.0005Ω)
Solderability	可焊性	Coverage must be over 95%.
Thermal Shock	热冲击	±(0.5%+0.0005Ω)
Load life	负载寿命	± (1%+0.0005Ω) ML27:±(2%+0.0005)

Ordering Procedure (Example:ML12 2W 1% 200mΩ T/R-4000)

订购方式 (例如: ML12 2W 1% 200mΩ T/R-4000)

M L 1 2 | 2 W | F | 2 0 0 L | T | 4 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
ML05
ML06
ML12
ML25
ML28
ML27

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
W2=1/2W 1W=1W
2W=2W 3W=3W
4W=4W 5W=5W
1A=1.5W

Tolerance (公差):
D=±0.5%
F=±1%
G=±2%
J=±5%,and for 0Ω jumper

Resistance Value (阻值):
5%(E-24 series):
The 1st digit will be"0",the 2nd &3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
1%(E-96 series):
The 1st to 3rd digits are for the significant figures of the resistance and 4th digits or letter indicate the number of zeros
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}
0000=for 0Ω jumper

Packing Type (包装类型):
T = T/R (编带 / 卷带)

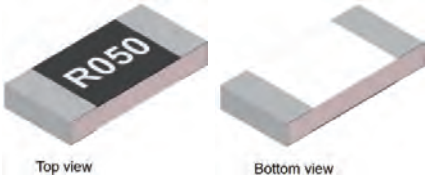
Packing Qty. (包装数量):
1=1000pcs
2=2000pcs
4=4000pcs
5=5000pcs
A=500pcs

Special Feature (特征):
E =standard （ 标准品 ）

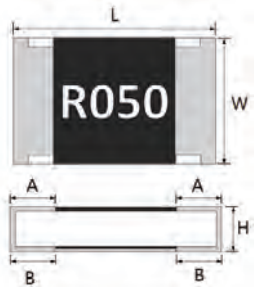
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

Feature (特性)

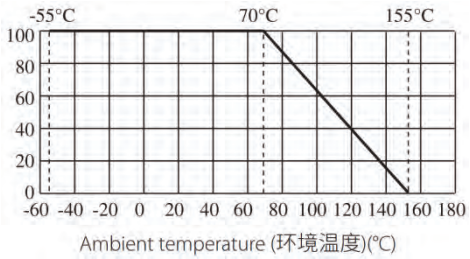
- Withstand high power 耐高功率
- Excellent temperature coefficient characteristics
  优秀的温度系数特性
- Low Resistance / TCR /Inductance 低电阻值、低电感值
- RoHS compliant 符合欧盟ROHS指令，无卤
- 应用于开关电源、驱动电源、白色家电
- AEC-Q200 Qualified 符合AEC-Q200相关条款



Figures (型状)



Derating Curve (降功率曲线)



Type 类型	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TL01(0201)	0.60±0.03	0.30±0.03	0.26±0.05	0.15±0.05	0.15±0.05
TL02(0402)	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
TL03(0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.25±0.15	0.30±0.15
TL05(0805)	2.00±0.10	1.25±0.10	0.55±0.10	0.35±0.20	0.40±0.20
TL06(1206)	3.10±0.10	1.60±0.10	0.55±0.10	0.40±0.20	0.45±0.20
TL07(1210)	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.20	0.50±0.20
TL10(2010)	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.60±0.25
TL12(2512)	6.30±0.20	3.20±0.20	0.55±0.10	0.65±0.25	0.65±0.25
TL12(2512-3W)	6.30±0.20	3.20±0.20	0.70±0.15	0.65±0.25	0.65±0.25

Type 类型	Power Rating 额定功率	Resistance Range & TCR. 0.5%(D),1.0%(F),2%(G),5%(J) 阻值范围 & 温度系数	Max.Rating Current 最大额定电流	Max.Overload Current 最大过载电流
TL01(0201)	1/10W	50mΩ≤R<100mΩ:±100PPM/℃ 100mΩ≤R≤10Ω:±50PPM/℃	1.41A	3.16A
TL02(0402)	1/8W		1.58A	3.54A
	1/4W		2.24A	5.00A
TL03(0603)	1/5W		2.00A	4.47A
	2/5W		2.83A	6.32A
TL05(0805)	1/4W	39mΩ≤R<50mΩ:±150PPM/℃ 50mΩ≤R<100mΩ:±100PPM/℃ 100mΩ≤R≤10Ω:±50PPM/℃	2.53A	5.66A
	1/2W		3.58A	8.00A
TL06(1206)	1/2W		3.58A	8.00A
	1W		5.06A	11.32A
TL07(1210)	1W		5.06A	11.32A
TL10(2010)	1.5W	100mΩ≤R≤10Ω:±50PPM/℃	3.87A	8.66A
TL12(2512)	2W		4.47A	10.00A
	3W		5.48A	12.25A

Performance Specifications (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteri 判定标准
Short-time overload 短时间过负荷	JIS C 5201-1 clause 4.13	5 times rated power whichever is less for 5 seconds. 5倍额定功率5S	±(1.0%+0.001Ω)
Insulation Resistance 绝缘阻值	JIS C 5201-1 clause 4.6	100V for 1 minute	≥10GΩ
Solderability 可焊性	JIS C 5201-1 clause 4.17	245°C±5°C for 3±0.5secs.	>95% Coverage No Visual damage 无明显外观损伤
Soldering Heat 耐焊接热	JIS C 5201-1 clause 4.18	1.Molten solder, 260±5°C,10±1 seconds immersion time2 焊料260±5°C,浸润时间10±1秒 2. IR reflow, refer to solder reflow temperature condition 回流焊，参考回流焊曲线	±(1.0%+0.001Ω) No Visual damage 无明显外观损伤
Temperature Cycling 温度循环	JIS C 5201-1 clause 4.19	-55°C to +155°C , 300 cycles	±(1.0%+0.001Ω) No Visual damage
Load Life in Humidity 湿度寿命	JIS C 5201-1 clause 4.24	40±2°C , 90~95% RH.， Rated power or Max. working current whichever is less for 1000 hrs with 1.5Hr"ON"and 0.5Hr"OFF"。 持续时间: 1000H (1.5H "通", 0.5H "断")；试验温度:40±2°C； 相对湿度：90~95%RH；额定功率或最大工作电流(取其低)	±(1.0%+0.001Ω)
Load Life (Endurance) 负载寿命	JIS C 5201-1 clause 4.25	70±2°C, Rated power, or Max. working current whichever is less for 1000Hrs with 1.5Hr"ON" and 0.5Hr"OFF" 70±2°C额定功率或最大工作电流(取其低)1000H，1.5H "通" 0.5H "断"	±(1.0%+0.001Ω)

Ordering Procedure (Example: TL06(1206) 1W±1%0.15Ω T/R=5000)

订购方式 (例如: TL06(1206) 1W±1% 0.15Ω T/R=5000)

T L 0 6 | 1 W | F | 1 5 0 L | T | 5 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follows:
TL01
TL02
TL03
TL05
TL06
TL07
TL10
TL12

Wattage (功率):
1W=1W
1A=1.5W
2W=2W
04=2/5W
07=3/4W
W2=1/2W
W4=1/4W
W5=1/5W
W8=1/8W
WA=1/10W
3W=3W

Tolerance (公差):
D=±0.5%
F=±1%
G=±2%
J=±5%

Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0;

1%(E-24, E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.

1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0

The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:

以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量):
4=4000pcs
5=5000pcs
C=10000pcs

Special Feature (特征):
E =standard (标准品)

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198 标准料号系统。

Feature (特性)

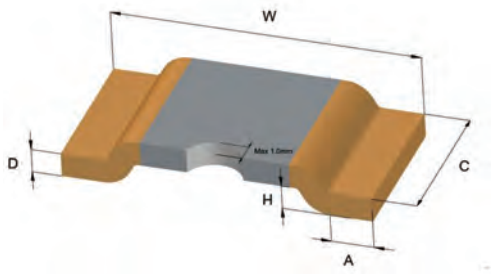
- Electron beam welding 电子束焊接结构
- Ideal for pulse application 耐冲击
- RoHS Compliant 符合RoHS要求
- AEC-Q200 qualified 符合AEC-Q200相关条款



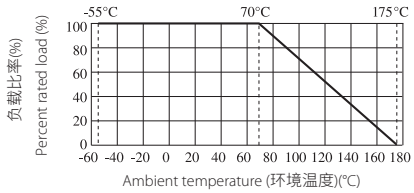
Application (应用)

- Frequency conversion drive, servo drive system 变频驱动、伺服驱动系统
- High current battery management system 大电流电池管理系统
- Automobile electronic control unit automobile oil pump drive
  汽车电子控制单元、汽车油泵驱动
- DC/DC, DC/AC power modules DC/DC，DC/AC电源模块
- Automatic control system 自动化控制系统
- Industrial instrument and equipment 工业仪器设备

Dimension (尺寸) mm



Derating Curve (降功率曲线)



Type 类型	Power Rating 额定功率	Resistance Range 阻值范围 (mΩ) ±0.5%、±1%、±5%	T.C.R. 温度系数	Dimension(尺寸)(mm)					Operating Temperature 工作温度
				D±0.1	W	A	C	H	
RA12 (2512)	6W	0.2	±175	1.4	6.3±0.2	1.2±0.2	3.1±0.3	0.5±0.1	-65°C~170°C
	6W	0.3	±175	1.5					
	6W	0.5	±115	0.93					
	6W	1	±100	0.45					
	6W	1.2	±70	1.08					
	6W	1.5	±70	0.86					
	6W	2	±70	0.65					
	4W	2.5	±70	0.5					
	4W	3	±70	0.43					
	4W	4	±70	0.31					
	3W	5	±70	0.28					
RA20 (3920)	12W	0.2	±200	1.64	10±0.2	2.2±0.2	5.1±0.4	0.5±0.1	
	10W	0.3	±150	1.37					
	9W	0.4	±100	0.97					
	9W	0.5	±70	0.83					
	8W	0.7	±70	0.55					
	7W	1	±50	0.4					
	8W	1	±50	1.16					
	6W	1.5	±50	0.75					
	6W	2	±50	0.60					
	5W	2.5	±50	0.47					
	5W	3	±50	0.37					
	5W	4	±50	0.28					
	5W	5	±50	0.28					
RA30 (5930)	15W	0.1	±200	2.0	15±0.3	4.2±0.3	7.6±0.4	0.5±0.1	
	15W	0.2	±100	1.5					
	12W	0.25	±100	1.2					
	10W	0.3	±100	0.98					
	10W	0.35	±100	0.83					
	10W	0.4	±100	0.75					
	10W	0.5	±75	0.6					
	10W	0.6	±75	0.5					
	10W	0.75	±75	0.41					
	9W	1	±50	0.86					

Type 类型	Power Rating 额定功率	Resistance Range 阻值范围 ±0.5%、±1%、±5%	T.C.R. 温度系数	Dimension(尺寸)(mm) D±0.1	W	A	C	H	Operating Temperature 工作温度
RA30 (5930)	8W	1.5	±50	0.61	15±0.3	4.2±0.3	7.6±0.4	0.5±0.1	-65℃~170℃
	7W	2	±50	0.4					
	7W	2.5	±50	0.34					
	7W	3	±50	0.29					

*TCR（ppm/°C）： Test conditions at 20°C~120°C. 试验条件在20°C~120°C。

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Short Time Overload 短时间过负荷	MIL-STD-202 Method 301	5 times of rated power for 5 s 5倍额定功率，5s	±0.5%
Temperature Cycling 温度循环	JESD22 Method JA-104	-55°C~155°C, 1000Cycles -55°C~155°C, 1000个循环	±0.5%
High Temperature Exposure 高温存储	MIL-STD-202 Method 108	1000hrs .@T=170°C , Unpowered 170°C,不通电，1000小时	±0.5%
Biased Humidity 偏置湿度	MIL-STD-202 Method 103	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85 °C，湿度85% 的条件下放置1000 小时。 注意: 指定条件: 工作功率的10%，试验结束后24±4 小时内进行测试。	±0.5%
Operational Life 工作寿命	MIL-STD-202 Method 108	Condition D Steady State TA=125°C at rated power.Measurement at 24±4 hours after test conclusion. 条件D，稳定状态TA=125°C，额定功率。实验结束后24±4 小时内进行测试。	±0.5%
Solderability 可焊性	J-STD-002C	245°C±5°C,5s±0.5s	95% Coverage Min 95%覆盖率
Resistance to Soldering Heat 耐焊接热	MIL-STD-202 Method 210	250°C±5°C,30s±5s	±0.5%
Board Flex 板弯曲	AEC-Q200-005 REV A	Bending 2mm.for 60 ±5 Sec. 弯曲2mm保持60 ±5秒	±0.5%

Ordering Procedure (Example: RA20 5W ±1% 3mΩ T/R-2500)

订购方式 (例如: RA20 5W ±1% 3mΩ T/R-2500)

R A 2 0 | 5 W | F | 3 0 0 N | T | B | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
RA12,RA20,RA30

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
3W=3W
4W=4W
5W=5W
6W=6W
7W=7W
8W=8W
9W=9W
AW=10W
CW=12W
FW=15W

Tolerance (公差):
D=±0.5% F=±1% J=±5%

Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0;
≤1% (E-96 series):
The 1st to 3rd digits are for the significant figures of the resistance and 4th digits or letter indicate the number of zeros.
≤1% 产品(E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Qty. (包装数量):
P=1500pcs
1=1000pcs
2=2000pcs
B=2500pcs
3=3000pcs

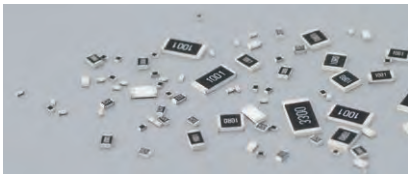
Special Feature (特征):
E =standard （ 标准品 ）

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

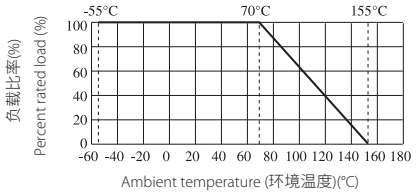
- Anti-sulfurized performance 具有抗硫化性能
- Stable electrical capability, high reliability 电性能稳定，可靠性高
- Suitable for reflow & wave soldering 适合于回流焊或波峰焊接
- RoHS complaint 符合欧盟ROHS 标准



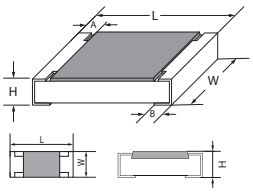
Application (应用)

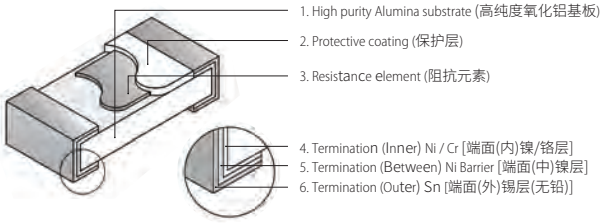
- Intelligent home appliances 智能家电产品
- High-end computer 电脑终端
- Precision instruments 精密仪表
- Medical equipment 医疗设备
- Industrial equipment 工业设备
- Industrial control circuits 工业控制电路
- Precision machine tool electric control 精密机床电控
- Outdoor electronic application 电子门禁

Derating Curve 降功率曲线



Figures (型状)





Dimension (尺寸) mm

TYype	L	W	H	A	B
CM01 (0201)	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05
CM02 (0402)	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
CM03 (0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
CM05 (0805)	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20
CM06 (1206)	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20
CM07 (1210)	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20
CM10 (2010)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
CM12 (2512)	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

Specification (性能)

Type 类型	Power Rating 额定功率	Tolerance 精度	Resistance Range 阻值范围	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric With-standing Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	Max. Current of Jumper 零欧姆电阻最大电流	Operating Temperature Range 工作温度范围
CM01(0201)	1/20W	±0.5% ±1% ±5%	0Ω 1Ω~10MΩ	25V	50V	50V	<50mΩ	0.5A	1A	-55~+155℃
CM02(0402)	1/16W			50V	100V	100V	<50mΩ	1A	2A	
CM03(0603)	1/10W			75V	150V	300V	<50mΩ	1A	2A	
CM05(0805)	1/8W			150V	300V	500V	<50mΩ	2A	5A	
CM06(1206)	1/4W			200V	400V	500V	<50mΩ	2A	10A	
CM07(1210)	1/2W			200V	500V	500V	<50mΩ	2A	10A	
CM10(2010)	3/4W			200V	500V	500V	<50mΩ	2A	10A	
CM12(2512)	1W			200V	500V	500V	<50mΩ	2A	10A	

Performance Specification (性能)

Temperature coefficient	温度系数	CM01:1Ω≤R≤10Ω:-100~+350PPM/℃ >10Ω: ±200PPM/℃ CM02~CM12:1Ω≤R≤10Ω: ±200PPM/℃ >10Ω: ±100PPM/℃
Short-time Overload	短时间过负荷	±0.5%, ±1%: ±(1.0%+0.05Ω) ±5%: ±(2.0%+0.05Ω)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿，飞弧及可见机械性损伤
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	±0.5%, ±1%: ±(0.5%+0.05Ω) ±5%: ±(1.0%+0.05Ω)
Soldering heat	耐焊接热	±(1.0%+0.05Ω)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Insulation resistance	绝缘电阻	≥1,000 MΩ
Load life in humidity	湿度寿命	±0.5%, 1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Load life	负载寿命	±0.5%, 1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Anti-Sulfurzed test	硫化测试	Reference standard参考标准：ASTMB-809-95 Test condition测试条件： Sulfur (Saturated vapor) 硫（饱和蒸汽） Test temp. 测试温度：60±2℃ Relative humidity 相对湿度：86~90%RH Test time 测试时长：1000H Evaluation Criteria判定标准：±(1.0%+0.05Ω)

Ordering Procedure (Example: CM06 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: CM06 1/4W 5% 1.2 Ω T/R-5000)

C M 0 6 W 4 J 0 1 2 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示下列各种晶片电阻类型)：
CM01, CM02, CM03, CM05, CM06, CM07, CM10 , CM12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WM = 1/20W WG = 1/16W
WA = 1/10W W8 = 1/8W
W4 = 1/4W W2 = 1/2W
07 = 3/4W 1W=1W

Tolerance (公差):
D= ±0.5%
F = ±1%
J = ±5%

Resistance Value (阻值):
2%, 5%(E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个0).
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
C=10,000pcs
E=15,000pcs

Special Feature (特征):
E =standard （ 标准品 ）

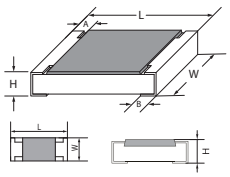
Packing Type (包装类型):
T = T/R (编带 / 卷带)

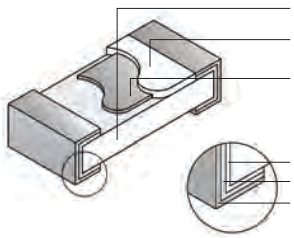
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

Feature (特性)

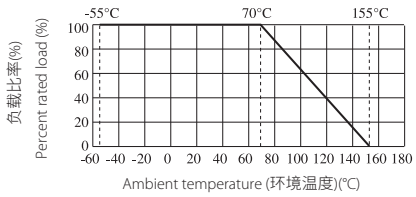
- High power in standard size
  标准尺寸，高功率
- Suitable for both wave & re-flow soldering
  适合波峰焊与回流焊
- Application: AV adapters, LCD back-light, camera strobe etc. 适用于AV适配器, LCD背光电路，照相机闸门等
- AEC-Q200 qualified
  符合AEC-Q200相关条款

Figures (型状)





Derating Curve & Specification (降功率曲线及性能)



Type 类型	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)
HP02 (0402)	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
HP03 (0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
HP05 (0805)	2.00±0.15	1.25 +0.15 -0.10	0.55±0.10	0.40±0.20	0.40±0.20
HP06 (1206)	3.10±0.15	1.55 +0.15 -0.10	0.55±0.10	0.45±0.20	0.45±0.20
HP07 (1210)	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20
HP10 (2010)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
HP11 (1812)	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.50±0.20
HP12 (2512)	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

*Special offered 特别提供： HP12 B:1.80±0.25mm

Type 类型	Size 尺寸	Power Rating 额定功率	Resistance Range of 0.5%&1% & 5% 0.5% &1% & 5%的阻值范围	Max. Working Voltage/Current 最大工作电压/电流	Max. Overload Voltage/Current 最大过负荷电压/电流	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
HP02	0402	1/10W	1Ω~10M	50V	100V	100V	-55℃~155℃
			0Ω(≤10mΩ)	3A	6A		
HP03	0603	1/5W	0.1Ω~10M	75V	150V	300V	-55℃~155℃
			0Ω(≤8mΩ)	5A	10A		
HP05	0805	1/3W	0.01Ω~10M	150V	300V	500V	-55℃~155℃
			0Ω(≤5mΩ)	6A	12A		
HP06	1206	1/2W	0.01Ω~10M	200V	400V	500V	-55℃~155℃
			0Ω(≤5mΩ)	10A	20A		
HP07	1210	3/4W	0.1Ω~10M	200V	500V	500V	-55℃~155℃
			0Ω(≤4mΩ)	12A	24A		
HP10	2010	1W	0.01Ω~10M	200V	500V	500V	-55℃~155℃
			0Ω(≤5mΩ)	12A	24A		
HP11	1812	1.25W	0.1Ω~10M	200V	500V	500V	-55℃~155℃
			0Ω(≤5mΩ)	12A	24A		
HP12	2512	2W	0.01Ω~10M	300V	500V	500V	-55℃~155℃
			0Ω(≤5mΩ)	16A	32A		

Performance Specifications (性能)

Temperature coefficient 温度系数

HP02: 1Ω≤R ≤ 10Ω: ±400 ppm/℃
10Ω<R ≤100Ω: ±200 ppm/℃
100Ω<R ≤10M : ±100 ppm/℃

HP05: 10mΩ≤R≤15mΩ: ±800ppm/℃
15mΩ<R≤25mΩ: ±600ppm/℃
25mΩ<R≤50mΩ: ±400ppm/℃
50mΩ<R<0.1Ω: ±200ppm/℃
0.1Ω≤R≤10M: ±100ppm/℃

HP07, HP11: ±100 ppm/℃

HP12: 10mΩ≤R<20mΩ: 0~+800ppm/℃
20mΩ≤R≤50mΩ: 0~+400ppm/℃
50mΩ<R≤10M: ±100ppm/℃

HP03: 0.1Ω≤R<0.2Ω: ±200ppm/℃
0.2Ω≤R≤10M: ±100ppm/℃

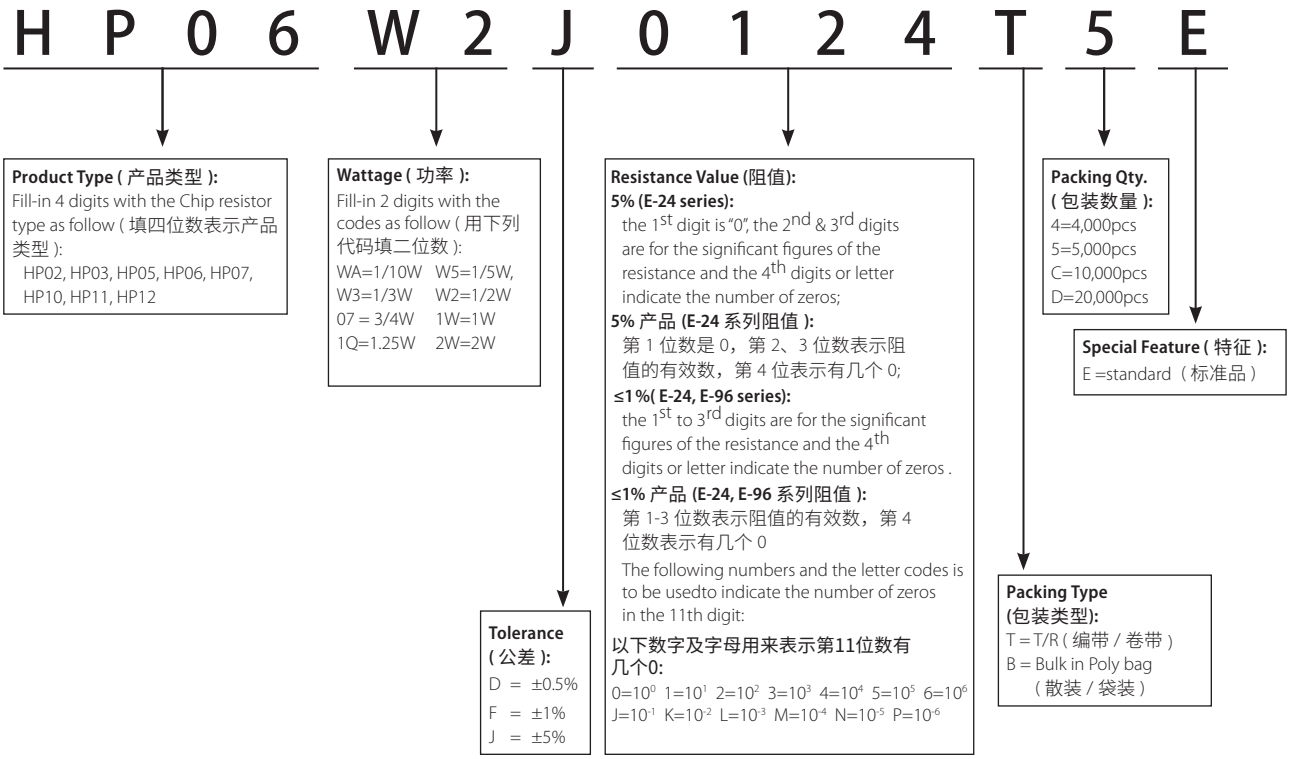
HP06: 10mΩ≤R<15mΩ: ±700 ppm/℃
15mΩ≤R<30mΩ: ±400 ppm/℃
30mΩ≤R<50mΩ: ±300 ppm/℃
50mΩ≤R<0.1Ω: ±150 ppm/℃
0.1Ω≤R≤10M:±100 ppm/℃

HP10: 10mΩ≤R<15mΩ: 0~+800 ppm/℃
15mΩ≤R<50mΩ: 0~+600 ppm/℃
50mΩ≤R<10M: ±100 ppm/℃

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±0.5%,±1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%,±1%: ±(1%+0.1Ω) ±5%: ±(3%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.05Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)

Ordering Procedure (Example: High Power HP06 1/2W 5% 120KΩ T/R-5000)

订购方式 (例如: 高功率 HP06 1/2W 5% 120KΩ T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Ultra High Power Thick Film Chip Resistors - SP

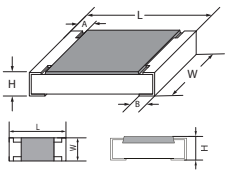
超高功率厚膜晶片电阻器 - SP系列

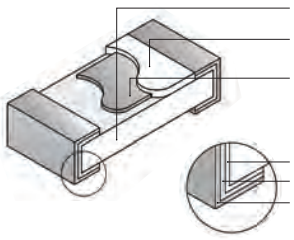
ROYALOHM
www.royalohm.com

Feature (特性)

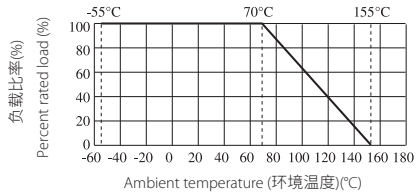
- High power rating up to 6 watts
  高功率可达6W
- Suitable for both wave & re-flow soldering
  适合波峰焊与回流焊
- Application LED lamps, Intelligent home appliances, Medical equipment, Kinds of industrial control devices & Industrial supplies
  适用于LED 灯具、智能家电产品、医疗设备、各种工业控制装置及工业电源等
- AEC-Q200 qualified
  符合AEC-Q200相关条款

Figures (型状)





Derating Curve & Specification (降功率曲线及性能)



Type 类型	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)
SP10 (2010)	5.00 ± 0.10	2.50 ± 0.15	1.10 ± 0.10	0.60 ± 0.25	0.50 ± 0.20
SP12 (2512)	6.35 ± 0.10	3.20 ± 0.15	1.10 ± 0.10	0.60 ± 0.25	1.80 ± 0.20
SP17 (2817)	7.10 ± 0.20	4.20 ± 0.20	1.10 ± 0.10	0.60 ± 0.20	1.80 ± 0.20
SP20 (4320)	11.00 ± 0.30	5.00 ± 0.25	1.10 ± 0.10	0.80 ± 0.20	2.40 ± 0.20
SP27 (4527)	11.60 ± 0.30	6.85± 0.25	1.10 ± 0.10	1.00 ± 0.20	2.50 ± 0.20

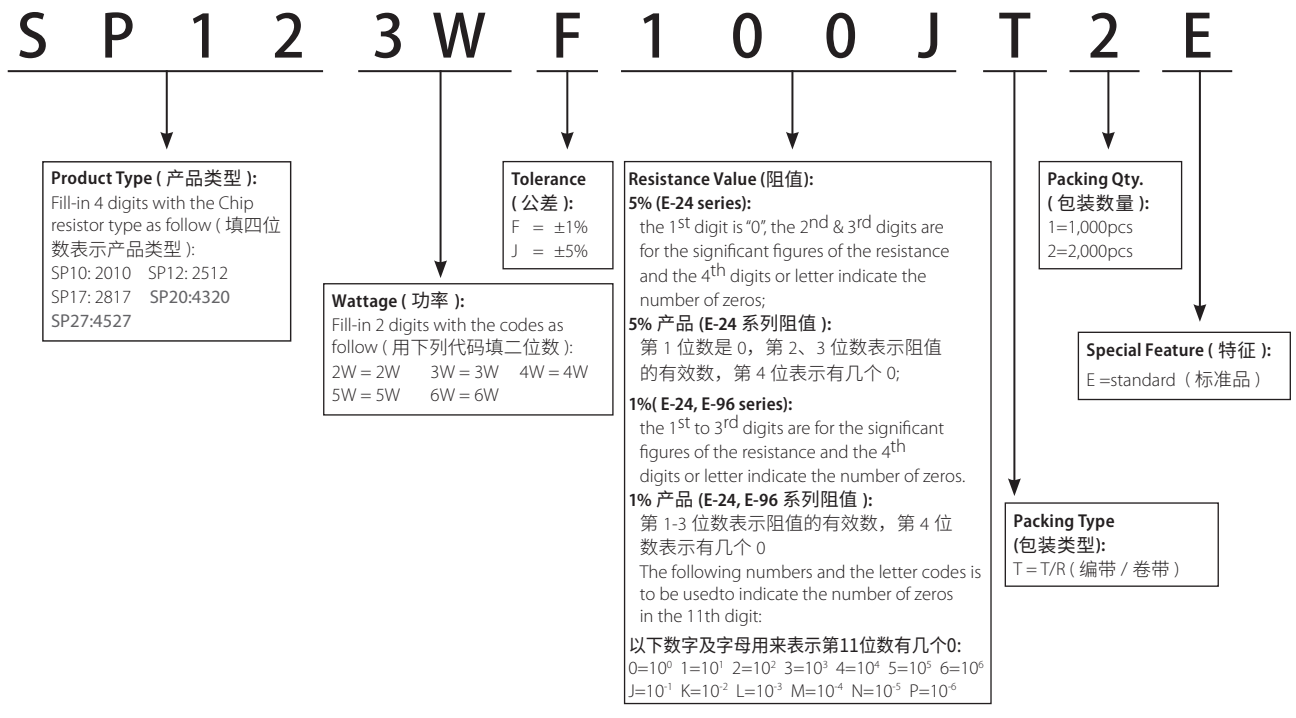
Type 类型	Size 尺寸	Power Rating 额定功率	Resistance Range of 1% & 5% 1% & 5% 的阻值范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
SP10	2010 (5025)	2W	1Ω ~ 10MΩ	200V	500V	500V	-55℃~155℃
SP12	2512 (6432)	3W		250V	500V	500V	
SP17	2817 (7142)	4W		250V	500V	500V	
SP20	4320 (1150)	5W		300V	600V	600V	
SP27	4527 (1267)	6W		300V	600V	600V	

Performance Specifications (性能)

Test Item 试验项目	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature coefficient 温度系数	Measure between -55℃ ~+125℃ 测定范围：-55℃ ~+125℃	1Ω~10Ω ≤± 200PPM/℃ 10.1Ω~10MΩ ≤± 100PPM/℃
Short-time overload 短时间过负荷	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	± 5% (2.0% + 0.1Ω) ± 1% (1.0% + 0.1Ω)
Terminal Bending 端子弯曲	Bending Distance 3mm, Duration: 60s±5s, then check the resistance. 弯曲距离：3mm，保持时间：60s±5s，然后测试阻值。	± (1.0% + 0.05Ω)
Solderability 可焊性	Temperature of solder: 245±3℃; Dwell time in solder: 2~3seconds. 锡炉温度 : 245±3℃；浸入时间 : 2~3 秒。	Coverage must be over 95%. 覆盖率 ≥95%
Soldering heat 耐焊接热	Condition K: Reflow test time above217℃ is 60s-150s,time above 250±5C is30±5s 条件K: 217℃以上回流试验时间60s-150s， 250±5℃以上回流试验时间30±5s	± (1.0%+0.05Ω)
Dielectric withstanding voltage 绝缘耐压	The resistors are fixed in a parallel groove using the parallel clamp method, with different AC voltages specified for different products, lasting for 60 ± 5 seconds. 电阻固定在平行槽中，采用平行夹法，根据不同产品规定交流电压，持续60±5秒。	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿 , 飞弧及可见机械性损伤
Rapid change of temperature 温度快速变化	30 min at -55 ℃ and 30 min at 155 ℃; 100 cycles -55 ℃ 温度放置 30min, 155 ℃ 温度放置 30min, 100 个循环；	± 5% (1.0% + 0.1Ω). ± 1% (0.5% + 0.1Ω).
Load life 负载寿命	70℃ rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70℃额定功率，1000H（1.5小时 "开" ，0.5小时 "关" ）。	± 5% (3.0% + 0.1Ω). ± 1% (1.0% + 0.1Ω).
Humidity (Steady State) 恒定湿热	Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2℃ and 90~95% RH. 在 40±2℃ 和 90~95% RH 相对湿度条件下，存放 240h 后阻值变化率	± 5% (3.0% + 0.1Ω) . ± 1% (0.5% + 0.1Ω)
Load life in humidity 湿度寿命	Resistance change after 1000 hours (1.5hours"ON"，0.5hours"OFF") at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2℃ and 90~95% RH. 持续时间：1000h (1.5h" 通 "，0.5h" 断 ")；试验温度：40±2℃；相对湿度：90~95% RH；试验电压：额定工作电压或最大工作电压 (取其低者)。	± 5% (3.0% + 0.1Ω) . ± 1% (1.0% + 0.1Ω)

Ordering Procedure (Example: SP12 3W (2512) ±1% 10Ω T/R-2,000)

订购方式 (例如: SP12 3W (2512) ±1% 10Ω T/R-2,000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High-Voltage Thick Film Chip Resistors - HV

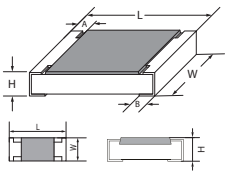
高压厚膜晶片电阻器 - HV系列

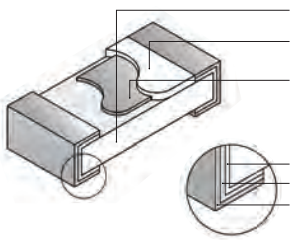
ROYALOHM
www.royalohm.com

Feature (特性)

- Superiority in Max. Working Voltage performance than general thick film Chip Resistors. 在最大工作电压上优于普通厚膜晶片电阻
- Suitable for both wave & re-flow soldering 适合波峰焊及回流焊
- Application: AV adapter, LCD Backlight, Flash Light of camera 适用于AV适配器、LCD背光电路、照相机的闪光灯等
- AEC-Q200 qualified 符合AEC-Q200相关条款

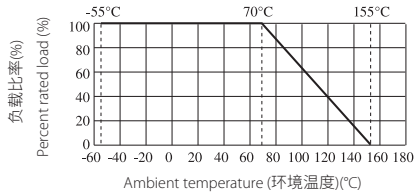
Figures (型状)





1. High purity Alumina substrate (高纯度氧化铝基板)
2. Protective coating (保护层)
3. Resistance element (阻抗元素)
4. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
5. Termination (Between) Ni Barrier [端面(中)镍层]
6. Termination (Outer) Sn [端面(外)锡层(无铅)]

Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
HV03	200V	400V	300V	-55°C~155°C
HV05	400V	800V	500V	
HV06	500V	1000V	500V	
HV07	800V	1500V	500V	
HV10	2000V	3000V	500V	
HV12	3000V	4000V	500V	

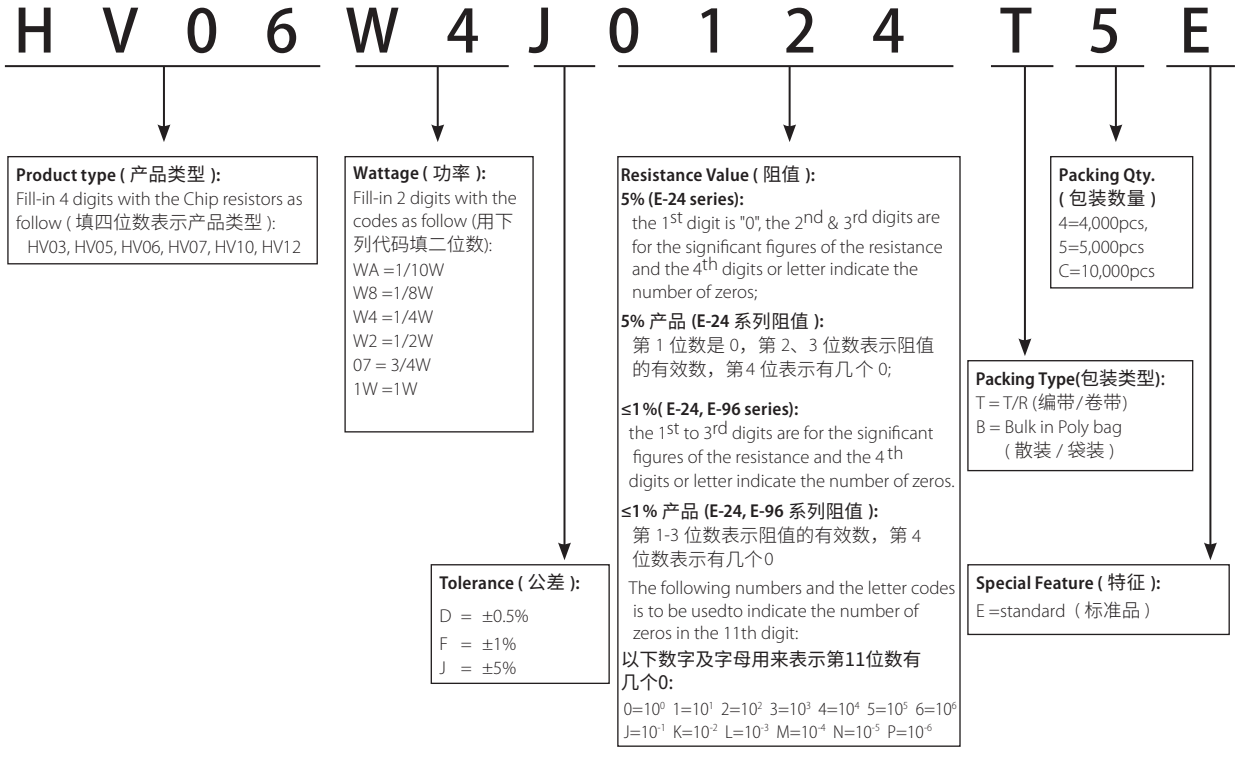
Type 类型	Size 尺寸	Power Rating 额定功率	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
HV03	0603 (1608)	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30± 0.20	47Ω~10MΩ
HV05	0805 (2012)	1/8W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40± 0.20	47Ω~20MΩ
HV06	1206 (3216)	1/4W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	47Ω~33MΩ
HV07	1210 (3225)	1/2W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	47Ω~10MΩ
HV10	2010 (5025)	3/4W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	47Ω~10MΩ
HV12	2512 (6432)	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	47Ω~10MΩ

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	±100PPM/°C
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±(3.0%+0.1Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±(3.0%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1%+0.1Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.1Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.1Ω)

Ordering Procedure (Example: High Voltage HV06 1/4W 5% 120KΩ T/R-5000)

订购方式 (例如: 高压 HV06 1/4W 5% 120KΩ T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High-voltage anti-sulfurized thick film chip resistors-VS

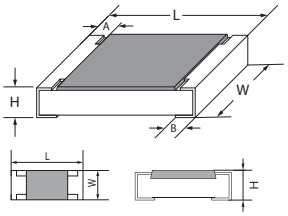
高压抗硫化厚膜晶片电阻 器-VS系列

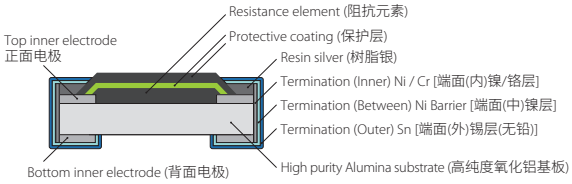
ROYALOHM
www.royalohm.com

Feature (特性)

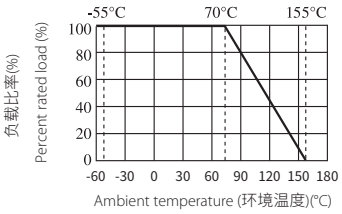
- Superior Max. Working Voltage: Max. 3000V 耐高电压：最高可达3000V
- Stable electrical capability ,high reliability 电性能稳定，可靠性高
- Excellent Anti-sulfurized performance 抗硫化性能强：硫磺成份3.5%含工业油，105°C±3°C,500H，ΔR≤±5%
- Low assembly cost, suit for automatic SMT equipment 装配成本低，并与自动装贴设备匹配
- According with ROHS standard and Halogen-free 符合ROHS指令，无卤
- AEC-Q200 Qualified 符合AEC-Q200相关条款

Dimension (尺寸)





Derating Curve (降功率曲线)



Type 类型	Size 尺寸	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)
VS05	0805(2012)	2.00±0.15	1.25±0.15/-0.10	0.55±0.10	0.40±0.20	0.40±0.20
VS06	1206(3216)	3.10±0.15	1.55±0.15/-0.10	0.55±0.10	0.45±0.20	0.45±0.20
VS10	2010(5025)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
VS12	2512(6432)	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

Specification (性能)

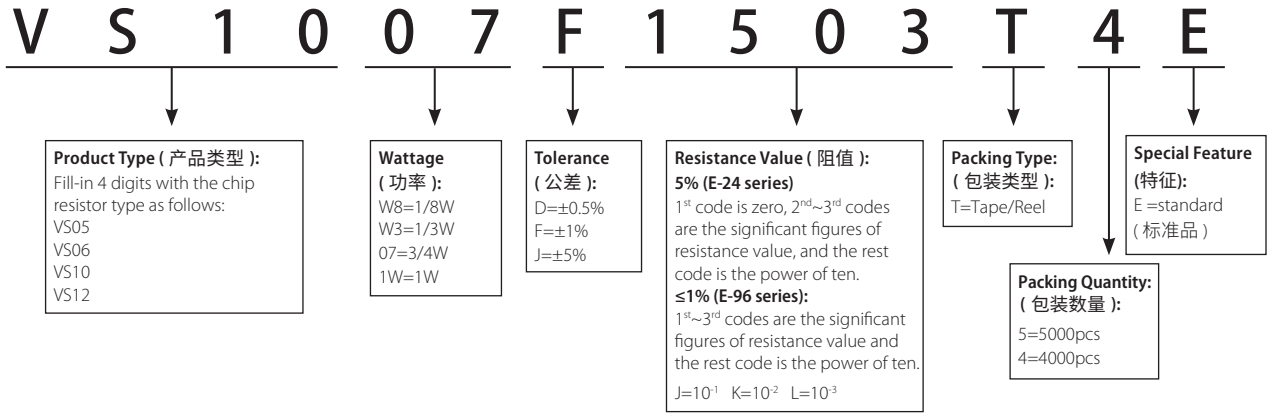
Type 类型	Power Rating 额定功率	Resistance 阻值范围	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围	Tolerance 公差
VS05	1/8W	100KΩ~10MΩ	400V	800V	500V	-55~+155℃	±0.5% ±1% ±5%
VS06	1/3W	100KΩ~10MΩ	1000V	1500V	1000V		
VS10	3/4W	50KΩ~10MΩ	2000V	3000V	500V		
VS12	1W	39KΩ~10MΩ	3000V	4000V	500V		

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 ℃ and +25/+125 ℃ 测试温度：+25/ -55℃和+25/+125℃	±100PPM/℃
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85℃/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±(3.0%+0.1Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70℃ rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70℃额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±(3.0%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55℃ to +155℃). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.1Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°Cis 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.1Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155℃ dry heat, the dip in bath with 245±3℃,5±0.5s. b) Method D: at 260±3℃, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155℃干燥4H后，245±3℃,5±0.5秒浸锡 b)方法D：在260±3℃下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.1Ω)
Anti-Sulfurized test 硫化测试		Soaked in industrial oil with sulfur substance 3.5% contained 105℃ ±3℃ 500h 工业用油含硫磺成份 3.5%，105℃±3℃, 500H	±(5%+0.05Ω)
Anti-Sulfurized test 硫化测试	**ASTMB-809-95**	Sulfur (Saturated vapor) 硫 (饱和蒸汽) • Test temp. 测试温度 : 105℃ • Test time 测试时长 : 1000h	±(3%+0.05Ω)

Ordering Procedure (Example: VS10 3/4W ±1% 150KΩ T/R-4000)

订购方式 (例如: VS10 3/4W ±1% 150KΩ T/R-4000)



Anti-Surge Thick Film Chip Resistors - AS

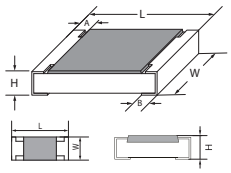
抗浪涌厚膜晶片电阻器 - AS系列

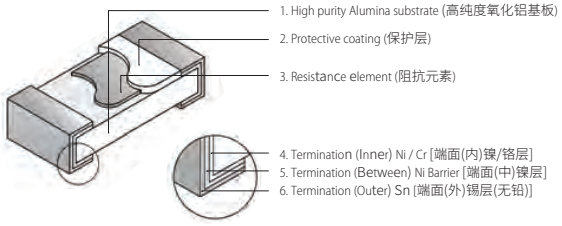
ROYALOHM
www.royalohm.com

Feature (特性)

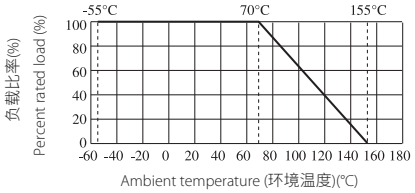
- Superior Anti-Surge Voltage performance. 优越的抗浪涌电压特性
- Suitable for both wave & re-flow soldering 适合波峰焊与回流焊
- Application AV adapters, LCD back-light camera strobe etc. 适用于AV适配器、LCD背光电路、照相机的闸门等
- AEC-Q200 qualified 符合AEC-Q200相关条款

Figures (型状)

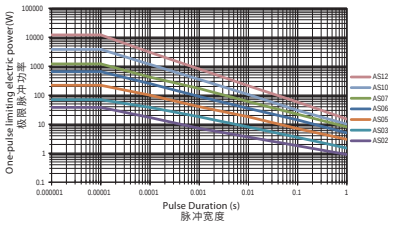




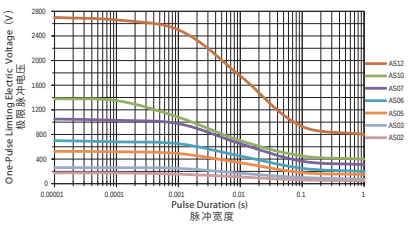
Derating Curve (降功率曲线)



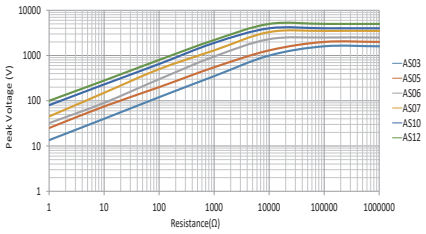
Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



1.2/50us Lightning Surge (1.2/50us 脉冲曲线)



Specification (规格)

Type 类型	Size 尺寸	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
AS02	0402 (1005)	50V	100V	100V	-55~+155°C
AS03	0603 (1608)	75V	150V	300V	
AS05	0805 (2012)	150V	300V	500V	
AS06	1206 (3216)	200V	400V	500V	
AS07	1210 (3225)	200V	500V	500V	
AS10	2010 (5025)	400V	800V	500V	
AS12	2512 (6432)	500V	1000V	500V	

Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围	Tolerance 公 差
AS02	1/8W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M	±5% ±10% ±20%
AS03	1/4W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20		
AS05	1/2W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20		
AS06	0.6W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20		
AS07	3/4W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20		
AS10	1.5W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20		
AS12	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20		

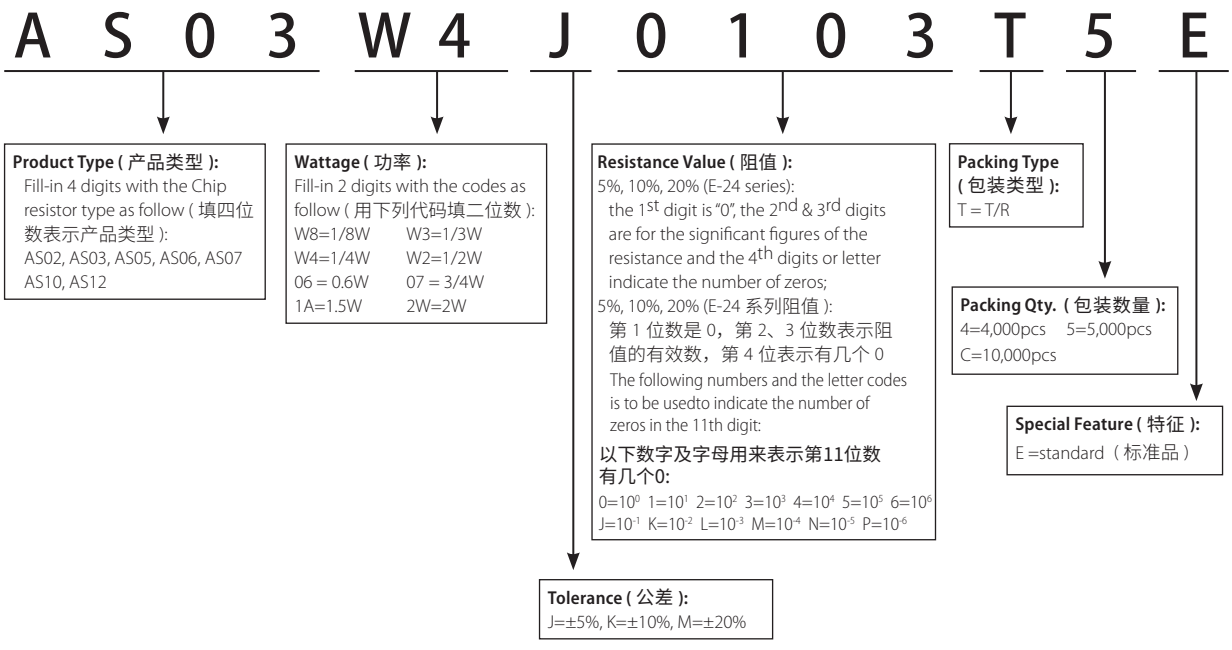
*Special offered 特别提供： AS12 B:1.80±0.25mm

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	1Ω≦R≤10Ω:±400PPM/°C 10Ω<R≤10M: ±100PPM/°C
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±(1.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±(3.0%+0.1Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±(3.0%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.05Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)
Single pulse 单脉冲	**GB/T 5729 4.27**	Reference pulse curve 参考脉冲曲线	±(1.0%+0.1Ω)

Ordering Procedure (Example: Anti-surge AS03 1/4W 5% 10KΩ T/R-5000)

订购方式 (例如: 抗浪涌 AS03 1/4W 5% 10KΩ T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High-Precision Anti-Surge Thick Film Chip Resistors - PS

高精度抗浪涌厚膜晶片电阻器 - PS系列

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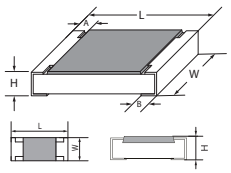
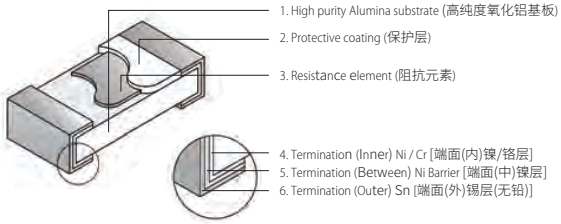
Feature (特性)

- High-Precision, high-power, anti-pulse 高精度、高功率、抗脉冲
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application monitors, power supplies, camcorder, laptop computer
  适用于显示器、电源、手提电脑
- AEC-Q200 qualified 符合AEC-Q200相关条款

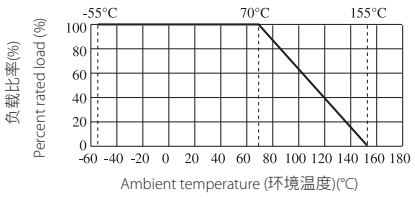


Figures (型状)

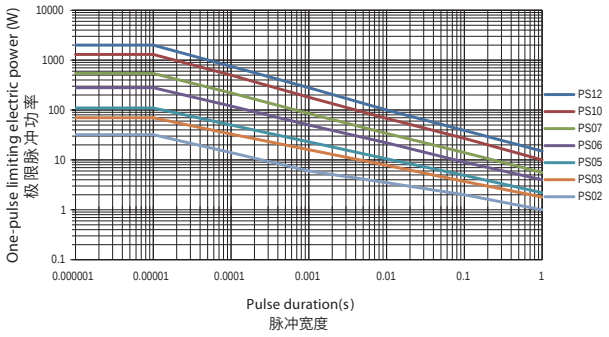




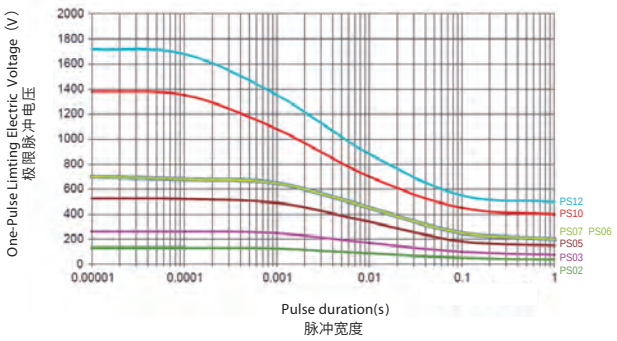
Derating Curve (降功率曲线)



Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



Specification (性能)

Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
PS02	0402 (1005)	50V	100V	100V	-55~+155℃
PS03	0603 (1608)	75V	150V	300V	
PS05	0805 (2012)	150V	300V	500V	
PS06	1206 (3216)	200V	400V	500V	
PS07	1210 (3225)	200V	500V	500V	
PS10	2010 (5025)	400V	800V	500V	
PS12	2512 (6432)	500V	1000V	500V	

Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
PS02	1/8W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
PS03	1/4W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
PS05	1/3W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
PS06	1/2W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	0.1Ω~10M
PS07	3/4W	3.10±0.10	2.50±0.15	0.55±0.10	0.55±0.25	0.50±0.20	
PS10	1.25W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	1Ω~10M
PS12	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	0.1Ω~10M

*Special offered 特别提供：PS12 B:1.80±0.25mm

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	PS02: 1Ω≤R≤10Ω:±400PPM/°C 10Ω<R≤100Ω:±200PPM/°C >100Ω:±100PPM/°C PS03,PS05,PS06,PS07,PS10,PS12: ±100PPM/°C
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.1Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)
Single pulse 单脉冲	**GB/T 5729 4.27**	Reference pulse curve 参考脉冲曲线	±(1.0%+0.1Ω)

Ordering Procedure (Example: PS05 1/3W 5% 120KΩ T/R-5000)

订购方式 (例如: PS05 1/3W 5% 120KΩ T/R-5000)

P S 0 5 W 3 J 0 1 2 4 T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型)：
PS02, PS03, PS05, PS06, PS07, PS10, PS12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
W2=1/2W
W3=1/3W
W4=1/4W
W8=1/8W
07=3/4W
1Q=1.25W
2W=2W

Tolerance (公差):
D = ±0.5%
F = ±1%
J = ±5%

Resistance Value (阻值):
5% (E-24 series) :
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
1% 产品 (E96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0).
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$ $N=10^{-5}$ $P=10^{-6}$

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
c=10,000pcs

Special Feature (特征):
E =standard (标准品)

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High-Power Anti-Surge Thick Film Chip Resistors - HS

高功率抗浪涌厚膜晶片电阻器 - HS系列

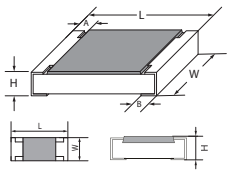
ROYALOHM
www.royalohm.com

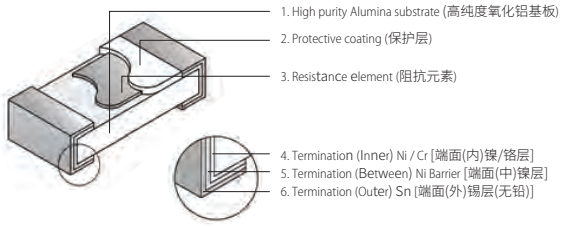
Feature (特性)

- High-precision,high-power,anti-pulse 高精度，高功率，抗浪涌
- Suitable for reflow & wave soldering 适合波峰焊与回流焊。
- Application monitors,power supplies, DVD,camcorder,laptop computer
  适用于显示器、电源、DVD、笔记本电脑。
- AEC-Q200 qualified 符合AEC-Q200相关条款

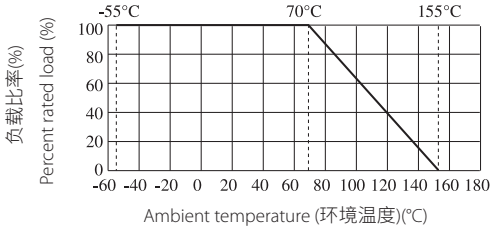


Figures (型状)

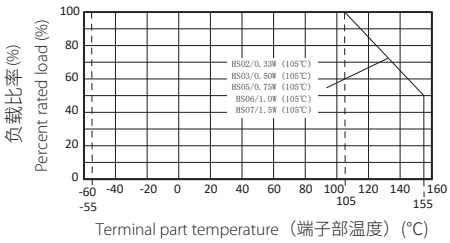




Derating Curve (降功率曲线)

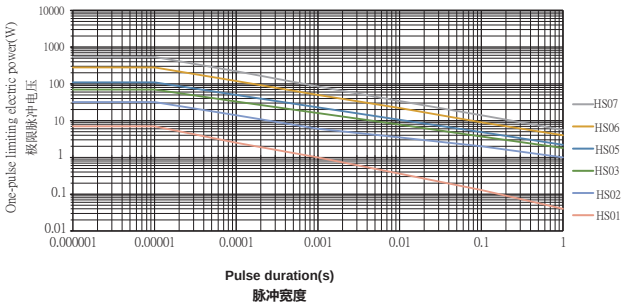


Terminal temperature (端子温度)

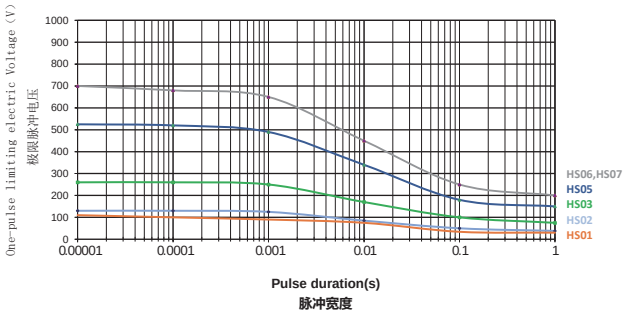


Note:When the terminal part temperature of the resistor exceeds the rated terminal part temperature shown above, the power shall be derated according to the derating curve.
备注：超过上述额定端子部温度使用时，请根据功率降额曲线减小额定功率后使用。
For the usage method, please refer to "Application of Derating Curve for Terminal Section Temperature".
使用方法请参考“端子部分温度的降额曲线应用”

Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



Specification (性能)

Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Tolerance 精度	Operating Temperature 工作温度范围
HS01	0201	25V	50V	50V	±0.5% ±1% ±5%	-55~+155°C
HS02	0402	50V	100V	100V		
HS03	0603	75V	150V	300V		
HS05	0805	150V	300V	500V		
HS06	1206	200V	400V	500V		
HS07	1210	200V	500V	500V		

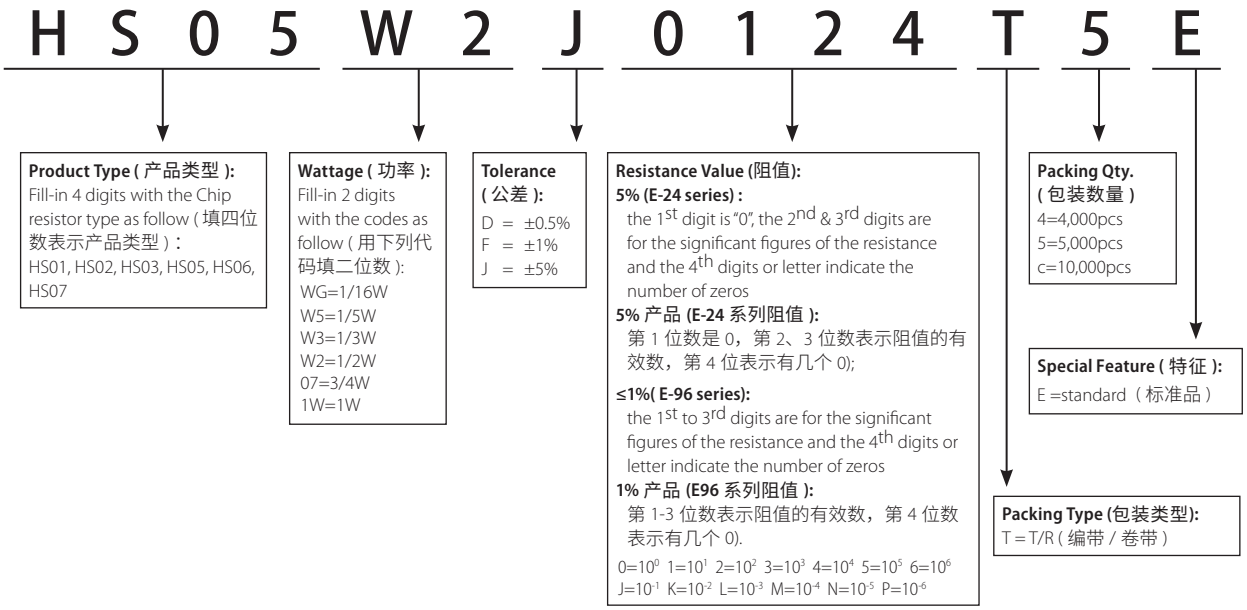
Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%，±1%，±5%
HS01	1/16W	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05	1Ω~10MΩ
HS02	1/5W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
HS03	1/3W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
HS05	1/2W	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
HS06	3/4W	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	
HS07	1W	3.10±0.10	2.50±0.15	0.55±0.10	0.55±0.25	0.50±0.20	

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	Mil-std-202 Method 304 GB/T 5729 4.8 JIS-C-5201 4.8 IEC 60115-1 6.2	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	HS01: 1Ω~10Ω:-100~+350PPM/°C ≥10Ω:±200PPM/°C HS02:1Ω≤R≤10Ω:±400PPM/°C 10Ω<R<100Ω:±200PPM/°C ≥100Ω:±100PPM/°C HS03~HS07 :1Ω~10Ω: ±200PPM/°C ≥10 Ω: ±100PPM/°C
Short-time overload 短時间过负荷	GB/T 5729 4.13 JIS-C-5201 4.13 IEC60115-8 5.3.6	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	MIL-STD-202 Method 103	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Operational Life 工作寿命	MIL-STD-202 Method 108	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%,±1%: ±(1%+0.1Ω) ±5%: ±(3%+0.1Ω)
Temperature Cycling 温度循环	JESD22 Method JA-104	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.1Ω)
Soldering Heat 耐焊接热	MIL-STD-202 Method 210	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	J-STD-002	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	AEC-Q200-005	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)
Single pulse 单脉冲	GB/T 5729 4.27	Reference pulse curve 参考脉冲曲线	±(1.0%+0.1Ω)

Ordering Procedure (Example: HS05 1/2W 5% 120KΩ T/R-5000)

订购方式 (例如: HS05 1/2W 5% 120KΩ T/R-5000)



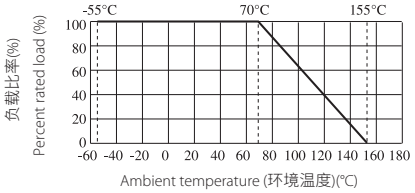
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

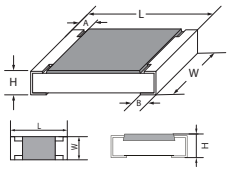
- Low T.C.R ±50PPM/°C 低温度系数 ±50PPM/°C
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application Precision medical equipment, Auto industrial control system, Communication equipment, IPAD, Portable computer, LED lamps, Intelligent home appliances

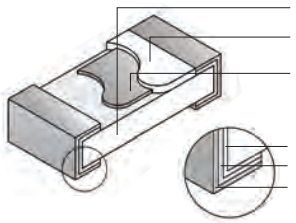
  适用于精密医疗器械、自动工业控制系统、通讯设备、iPad 、手提电脑、LED灯具、智能家电产品等
- AEC-Q200 qualified 符合AEC-Q200相关条款

Derating Curve (降功率曲线)



Figures (型状)





Specification (性能)

Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
LT02	0402 (1005)	50V	100V	100V	-55~+155°C
LT03	0603 (1608)	75V	150V	300V	
LT05	0805 (2012)	150V	300V	500V	
LT06	1206 (3216)	200V	400V	500V	

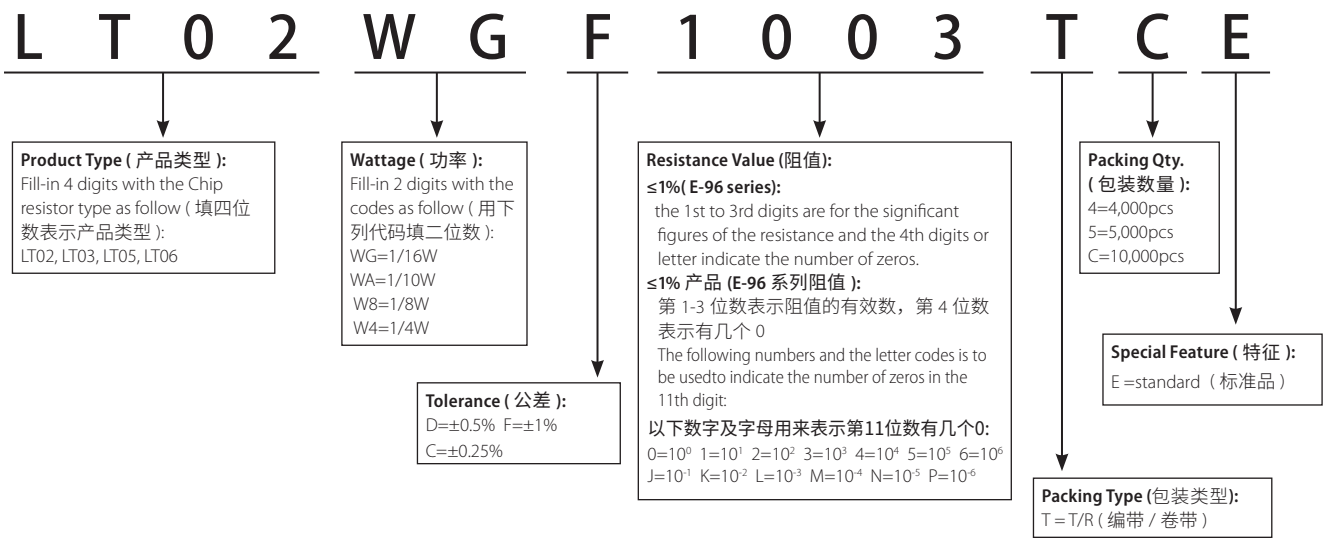
Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A(mm)	B (mm)	Resistance Range 阻值范围 0.25%, 0.5%, 1%
LT02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	100Ω~1MΩ
LT03	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1Ω~1MΩ
LT05	1/8W	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
LT06	1/4W	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	LT02: ±50ppm/°C LT03: 1Ω≤R≤10Ω: ±100ppm/°C 10Ω<R≤1MΩ: ±50ppm/°C LT05: 1Ω≤R≤10Ω: ±100ppm/°C 10Ω<R≤1MΩ: ±50ppm/°C LT06: 1Ω≤R≤10Ω: ±100ppm/°C 10Ω<R≤1MΩ: ±50ppm/°C
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±(1.0%+0.05Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±(1.0%+0.05Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±(1.0%+0.05Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.05Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)

Ordering Procedure (Example: LT02 1/16W 1% 100KΩ T/R-10000)

订购方式 (例如: LT02 1/16W 1% 100KΩ T/R-10000)

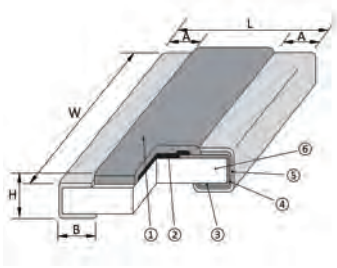


Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

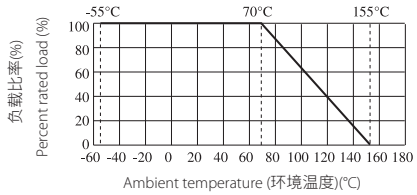
- High power & Wide terminal 高功率，宽电极
- Suitable for both wave & re-flow soldering 适合波峰焊及回流焊
- Application:AV adapters, LCD back-light,camera strobe etc.
  适用于AV适配器，LCD背光电路，照相机阀门等
- AEC-Q200 qualified 符合AEC-Q200相关条款

Figures (型状)



1. Protective layer (保护层)
2. Resistive element (阻抗元素)
3. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
4. Termination (Between) Ni [端面(中)镍层]
5. Termination (Outer) Sn [端面(外)锡层(无铅)]
6. High purity Alumina substrate (高纯度氧化铝基板)

Derating Curve & Specification (降功率曲线及性能)



Type 类型	L (mm)	W(mm)	H(mm)	A(mm)	B(mm)
WR08(0508)	1.20±0.10	2.0±0.10	0.55±0.10	0.20±0.10	0.30±0.20
WR12(0612)	1.60±0.15	3.20±0.20	0.55±0.10	0.30±0.20	0.45±0.20
WR20(1020)	2.50±0.15	5.00±0.15	0.55±0.10	0.40±0.20	0.60±0.20
WR18(1218)	3.10±0.10	4.60±0.15	0.55±0.10	0.45±0.20	0.40±0.20
WR25(1225)	3.10±0.15	6.25±0.15	0.55±0.10	0.45±0.20	0.65±0.20

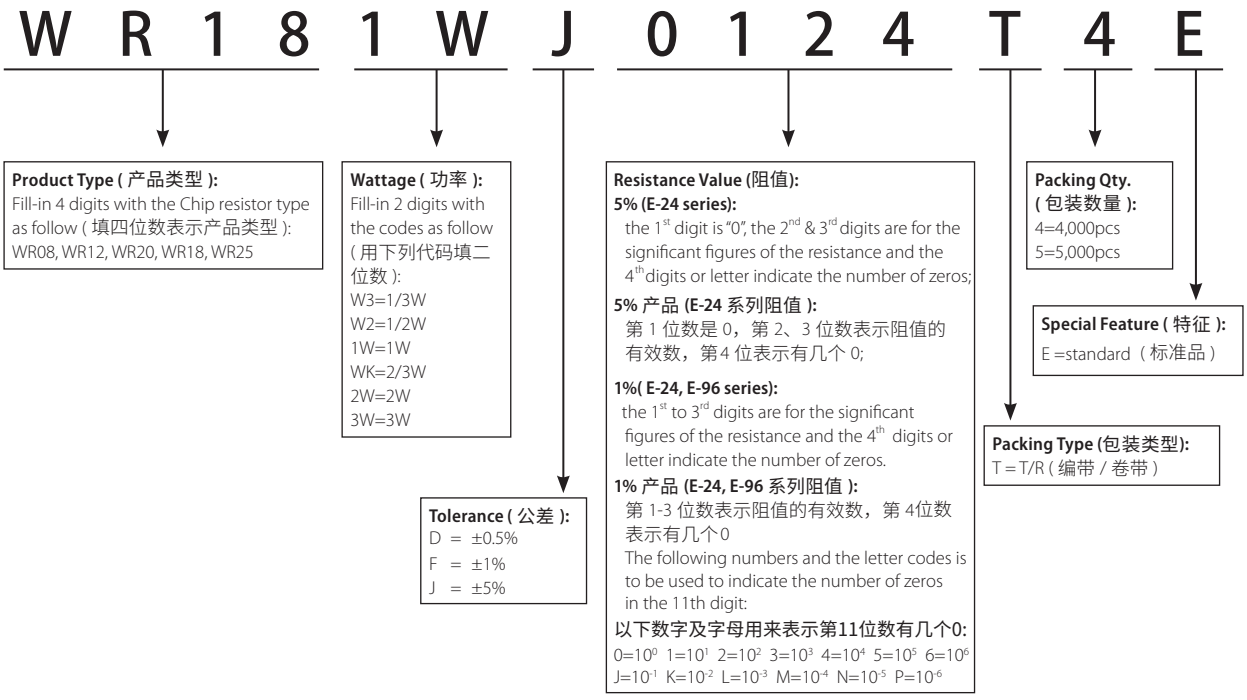
Type 类型	Size 尺寸	Power Rating 额定功率	Resistance Range 阻值范围		Max. Working Voltage 最大工作电压 / 电流	Max. Overload Voltage 最大过负荷电压 / 电流	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围	T.C.R 温度系数 PPM/°C
			0.5% & 1%	5%					
WR08	0508 (1220)	2/3W	10mΩ≤R<10Ω		/	/	500V	-55°C~155°C	10mΩ≤R<30mΩ:0~+400 30mΩ≤R<1Ω:0~+150 1Ω≤R<10Ω:±200
		1/3W	10Ω≤R≤1MΩ		150V	300V			10Ω≤R≤100Ω:±200 >100Ω:±100
		1/3W	Jumper<50mΩ		4A	8A			/
WR12	0612 (1632)	1W	10mΩ≤R<1Ω		/	/	500V	-55°C~155°C	10mΩ≤R<100mΩ:0~+200 100mΩ≤R<1Ω:0~+150 1Ω≤R≤100Ω:±200 100Ω<R≤1KΩ:±100
			1Ω≤R≤1KΩ		200V	400V			
		1/2W	1KΩ<R≤1MΩ						>1KΩ:±100
		1/2W	Jumper<50mΩ		5A	10A			/
WR20	1020 (2550)	1W	10mΩ≤R<1Ω		/	/	500V	-55°C ~155°C	10mΩ≤R<30mΩ:0~+200 30mΩ≤R<1Ω:0~+100 1Ω≤R≤100Ω:±200 >100Ω:±100
			1Ω 10Ω≤R≤1MΩ	1Ω≤R≤1MΩ	200V	400V			
		1W	Jumper<50mΩ		6A	12A			/
WR18	1218 (3245)	1W	10mΩ≤R<1Ω		/	/	500V	-55°C~155°C	10mΩ≤R<30mΩ :0~+200 30mΩ≤R<1Ω :0~+100 1Ω≤R ≤100Ω:±200 >100Ω:±100
			1Ω≤R≤1MΩ		200V	400V			
		1W	Jumper<50mΩ		6A	10A			/
WR25	1225 (3264)	3W	10mΩ≤R≤1Ω		/	/	500V	-55°C~155°C	10mΩ≤R<30mΩ:0~+150 30mΩ≤R<1Ω:0~+100 1Ω:±200
		2W	1Ω<R≤1MΩ		200V	400V			1Ω<R≤100Ω :±200 >100Ω:±100
		2W	Jumper<50mΩ		6A	15A			/

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±0.5%,±1%: ±(1.0%+0.005Ω) ±5%: ±(2.0%+0.005Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±0.5%,±1%: ±(1.0%+0.005Ω) ±5%: ±(3.0%+0.005Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%,±1%: ±(1.0%+0.005Ω) ±5%: ±(3.0%+0.005Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±(1.0%+0.005Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.005Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1%+0.005Ω)

Ordering Procedure (Example:Wide Terminal WR18 1W 5% 120KΩ T/R-4000)

订购方式(例如:宽电极WR18 1W 5% 120KΩ T/R-4000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

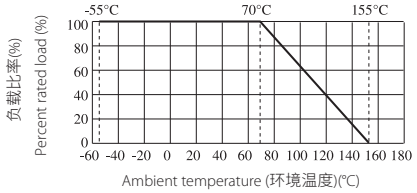
Anti-Electro Static Discharge Thick Film Chip Resistors - ES

ESD 抗静电厚膜电阻器 - ES系列

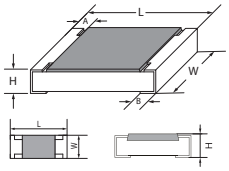
Feature (特性)

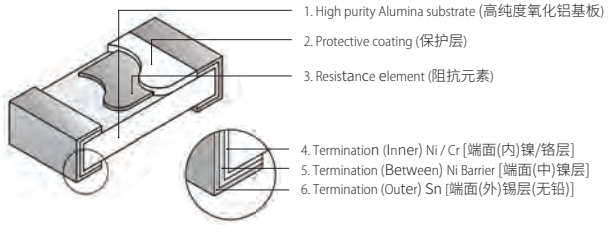
- Anti-Electro Static Discharge 抗静电
- High voltage 耐高压
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Medical Devices, Industrial Controls, AV adapter, Flash lamp of camera, Outdoor Equipments
  适用于医疗器械、工业控制、电源适配器、照相机的闪光灯、户外设备等
- AEC-Q200 qualified 符合AEC-Q200相关条款

Derating Curve (降功率曲线)



Figures (型状)





Specification (性能)

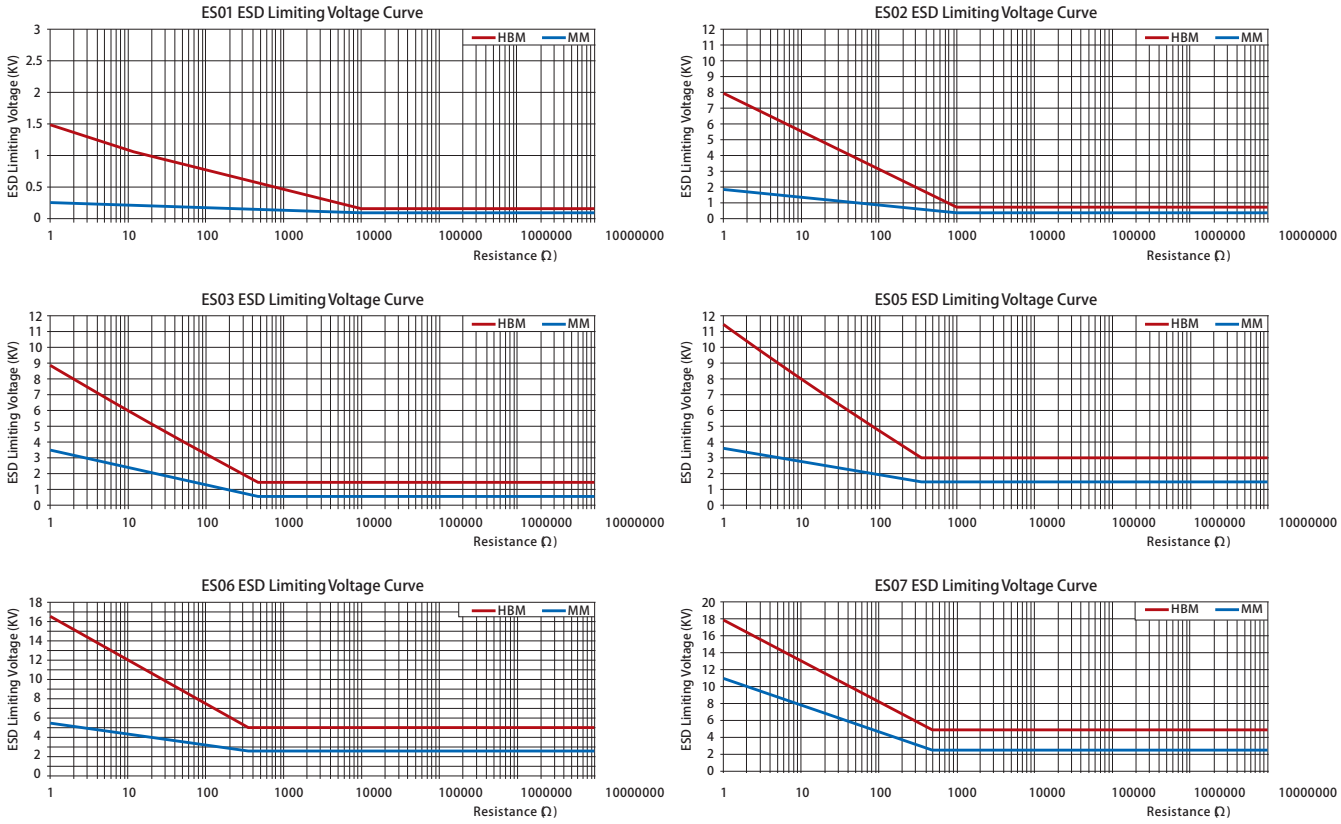
Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
ES01	0201 (0603)	25V	50V	50V	-55~+155℃
ES02	0402 (1005)	50V	100V	100V	
ES03	0603 (1608)	150V	200V	300V	
ES05	0805 (2012)	200V	400V	500V	
ES06	1206 (3216)	500V	1000V	500V	
ES07	1210 (3225)	800V	1500V	500V	

Type 类型	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A(mm)	B (mm)	Resistance Range 阻值范围 0.5% & 1% & 5%
ES01	1/20W	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05	1Ω~10MΩ
ES02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
ES03	1/4W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
ES05	2/5W	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
ES06	2/3W	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	
ES07	1/2W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**Mil-std-202 Method 304** **GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Test temperature: +25/–55 °C and +25/+125 °C 测试温度：+25/ -55°C和+25/+125°C	ES01: 1Ω≤R≤10Ω: ±400PPM/°C 10Ω<R≤10MΩ: ±200PPM/°C ES02, ES03, ES05, ES06, ES07: 1Ω≤R≤10Ω: ±200PPM/°C 10Ω<R≤10MΩ: ±100PPM/°C
Short-time overload 短時间过负荷	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC60115-8 5.3.6**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max. Overload Voltage whichever less for 5 seconds.. 施加2.5倍额定工作电压或最大过负荷电压(取其低者)，持续5 秒钟，测阻值变化。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	**MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度85°C,湿度85%RH条件下放置1000小时。 注：指定条件：10%的工作功率，试验结束后24±4小时测试。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Operational Life 工作寿命	**MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%,±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Temperature Cycling 温度循环	**JESD22 Method JA-104**	1000 Cycles (-55°C to +155°C). Measurement at 24±4 hours after test conclusion. -55°C 到 +155°C，1000循环，试验结束后24±4小时测试。	±0.5%,±1%: ±(0.5%+0.05Ω) ±5%: ±(1.0%+0.05Ω)
Soldering Heat 耐焊接热	**MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**J-STD-002**	For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡 b)方法D：在260±3°C下，30±0.5秒	95% coverage Min.
Board Flex 端子弯曲	**AEC-Q200-005**	Bending 2mm(min) for 60+5sec 弯曲最小2mm，时间60s+5s	±(1.0%+0.05Ω)
ESD	**AEC-Q200-002**	HBM:100PF 1K5 1Cycle; MM:200PF 0Ω 1Cycle	±(1.0%+0.05Ω)

ESD Limiting Voltage Curve (抗静电曲线)



NOTE 备注： HBM:100PF 1K5 1Cycle; MM:200PF 0Ω 1Cycle

Ordering Procedure (Example: ES06 2/3W 5% 1.2Ω T/R-5000)

订购方式 (例如: ES06 2/3W 5% 1.2Ω T/R-5000)

E S 0 6 W K J 0 1 2 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
ES01, ES02, ES03, ES05, ES06, ES07

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WM=1/20W
WG=1/16W
W4=1/4W
WK=2/3W
W2=1/2W
04 = 2/5W

Tolerance (公差):
D=±0.5%
F=±1% J=±5%

Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0;

≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$ $N=10^{-5}$ $P=10^{-6}$

Packing Qty. (包装数量):
5=5,000pcs
C=10,000pcs
E=15,000pcs

Special Feature (特征):
E =standard （标准品）

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

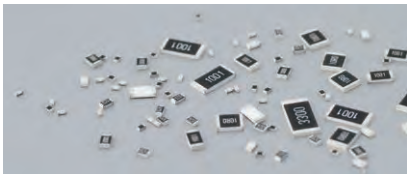
Automotive Thick Film Chip Resistors - CQ

汽车级晶片电阻器 - CQ系列

ROYALOHM
www.royalohm.com

Feature (特性)

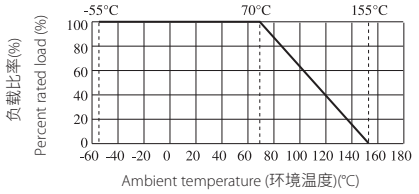
- Tolerance 精度为: ±0.5%~±5%
- AEC-Q200 qualified 符合AEC-Q200相关条款
- Anti-sulfurized performance 具有抗硫化性能
- Stable electrical capability, high reliability 电性能稳定, 可靠性高
- Suitable for reflow & wave soldering 适合于回流焊或波峰焊接
- RoHS complaint 符合欧盟ROHS 标准



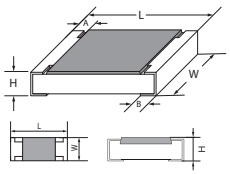
Application (应用)

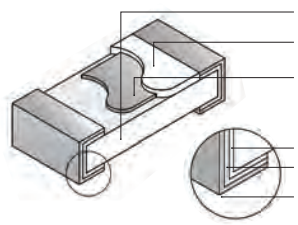
- Intelligent home appliances 智能家电产品
- High-end computer 电脑终端
- Medical equipment 医疗设备
- Industrial equipment 工业设备
- Outdoor electronic application 电子门禁
- Automotive Electronics: car audio, driving recorder, navigation products
  汽车电子:汽车音响,行车记录仪,导航产品

Derating Curve 降功率曲线



Figures (型状)





Dimension (尺寸) mm

TYype	L	W	H	A	B
CQ01 (0201)	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05
CQ02 (0402)	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
CQ03 (0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
CQ05 (0805)	2.00±0.15	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20
CQ06 (1206)	3.10±0.15	$1.55^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20
CQ07 (1210)	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20
CQ10 (2010)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
CQ12 (2512)	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

Specification (性能)

Type 类型	Power Rating 额定功率	Resistance Range 阻值范围		Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric With-standing Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	Max. Current of Jumper 零欧姆电阻最大电流	Operating Temperature Range 工作温度范围
		±0.5%	±1% ±2% ±5%							
CQ01(0201)	1/20W	1Ω~10MΩ	1Ω~10MΩ	25V	50V	50V	<50mΩ	0.5A	1A	-55~+155°C
CQ02(0402)	1/16W	1Ω~10MΩ	0.1Ω~10MΩ	50V	100V	100V	<50mΩ	1A	2A	
CQ03(0603)	1/10W	1Ω~10MΩ	0.01Ω~10MΩ	75V	150V	300V	<50mΩ	1A	2A	
CQ05(0805)	1/4W	/	0.01Ω≤R<0.1Ω	150V	300V	500V	<50mΩ	2A	5A	
	1/8W	1Ω~10MΩ	0.1Ω≤R≤10MΩ	150V	300V	500V	<50mΩ	2A	5A	
CQ06(1206)	1/3W	/	0.01Ω≤R<0.1Ω	200V	400V	500V	<50mΩ	2A	10A	
	1/4W	1Ω~10MΩ	0.1Ω≤R≤10MΩ	200V	400V	500V	<50mΩ	2A	10A	
CQ07(1210)	1/2W	1Ω~10MΩ	0.01Ω~10MΩ	200V	500V	500V	<50mΩ	2A	10A	
CQ10(2010)	3/4W	1Ω~10MΩ	0.01Ω~10MΩ	200V	500V	500V	<50mΩ	2A	10A	
CQ12(2512)	1W	1Ω~10MΩ	0.01Ω~10MΩ	200V	500V	500V	<50mΩ	2A	10A	

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	MIL-STD-202 Method 304	Measure between:-55℃ ~+125℃ 测定范围：-55℃ ~+125℃	CQ01:1Ω≤R≤10Ω: -100~+350PPM/℃ >10Ω: ±200PPM/℃ CQ02:0.1Ω≤ R<1Ω:±800PPM/℃ 1Ω≤ R≤10Ω:±200PPM/℃ >10Ω:±100PPM/℃ CQ03:0.01Ω≤R≤0.03Ω:±1500 PPM/℃ 0.03Ω<R≤0.05Ω:±1000 PPM/℃ 0.05Ω<R<1Ω:± 800PPM/℃ 1Ω≤R≤10Ω: ±200PPM/℃ >10Ω: ±100PPM/℃ CQ05,CQ06,CQ07,CQ10, CQ12: 0.01Ω≤R≤0.015Ω: ±1500PPM/℃ 0.015Ω<R≤0.03Ω: ±1000PPM/℃ 0.03Ω<R<1Ω: ±800PPM/℃ 1Ω≤R≤10Ω: ±200PPM/℃ >10Ω: ±100PPM/℃
Pre- and Post-Stress ElectricalTest (Short time Overload) 短時间过负荷	AEC-Q200 TEST 1 IEC60115 4.13	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±2%, ±5%: ±(2.0%+0.05Ω)
Biased Humidity 偏置湿度	AEC-Q200 TEST 7 MIL-STD-202 Method 103	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 °C，湿度 85% 的条件下放置 1000 小时。 注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±2%, ±5%: ±(3.0%+0.05Ω)
Operational Life 工作寿命	AEC-Q200 TEST 8 MIL-STD-202 Method 108	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）	±0.5%, ±1%: ±(1.0%+0.1Ω) ±2%, ±5%: ±(3.0%+0.1Ω)
Resistance to Soldering Heat 耐焊接热	AEC-Q200 TEST 15 MIL-STD-202 Method 210	Condition K: Reflow test time above217°Cis 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	
Solderability 可焊性	AEC-Q200 TEST 18 J-STD-002	SMD. Electrical test not required. Magnification 50 X. **Conditions:** 1. Baking 4 hours@155°C dry heat, dipping @ 245±3°C for 5±0.5 second. 2. Steam aging 8 hours, dipping @ 260±3°C for 30±0.5 second. 表面贴装元件 , 不需要电气测试 . 放大倍数 50 倍 . **测试条件：** 1. 155°C干噪4H后, 245°C 5±0.5秒浸锡. 2. 8H蒸汽后, 260±3°C 30±0.5秒浸锡.	Coverage must be over 95%.
Board Flex 弯曲	AEC-Q200 TEST 21 AEC-Q200-005	Bending 3mm(CQ01-CQ05)/2mm(CQ06-CQ12)for 60±5sec 弯曲 3mm(CQ01-CQ05)/2mm(CQ06-CQ12) 保持 60±5 秒	±(1.0%+0.05Ω)
Anti-Sulfurzed test 硫化测试	ASTM B 809-95	Sulfur (Saturated vapor) 硫（饱和蒸汽） • Test temp. 测试温度：60±2°C • Relative humidity 相对湿度：85±4%RH • Test time 测试时长：1000H	±(1%+0.05Ω)

Ordering Procedure (Example: CQ06 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: CQ06 1/4W 5% 1.2 Ω T/R-5000)

C Q 0 6 W 4 J 0 1 2 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示下列各种晶片电阻类型) :
CQ01, CQ02, CQ03, CQ05, CQ06, CQ07, CQ10 , CQ12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WM = 1/20W WG = 1/16W
WA = 1/10W W8 = 1/8W
W4 = 1/4W W2 = 1/2W
07 = 3/4W 1W=1W

Tolerance (公差):
D= ±0.5%
F = ±1%
G= ±2%
J = ±5%

Resistance Value (阻值):
2%, 5%(E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个0).
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$ $N=10^{-5}$ $P=10^{-6}$

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
C=10,000pcs
E=15,000pcs

Special Feature (特征):
E =standard （ 标准品)

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

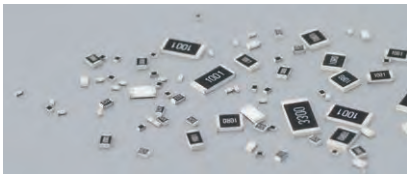
Automotive High Power Thick Film Chip Resistors - HQ

汽车级高功率晶片电阻器 - HQ系列

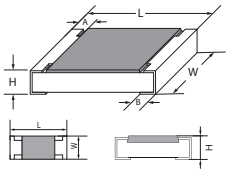
ROYALOHM
www.royalohm.com

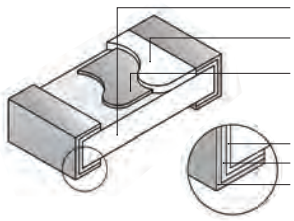
Feature (特性)

- AEC-Q200 qualified 符合AEC-Q200相关条款
- Suitable for reflow & wave soldering. 适合波峰焊与回流焊
- Application car. 适用于汽车



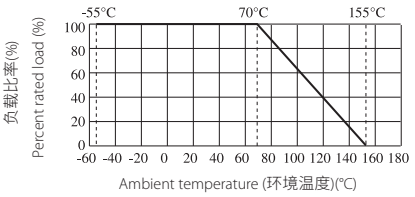
Figures (型状)





1. High purity Alumina substrate (高纯度氧化铝基板)
2. Protective coating (保护层)
3. Resistance element (阻抗元素)
4. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
5. Termination (Between) Ni Barrier [端面(中)镍层]
6. Termination (Outer) Sn [端面(外)锡层(无铅)]

Derating Curve 降功率曲线



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current Of Jumper 零欧姆电阻 额定电流	Max. Overload Current of Jumper 零欧姆电阻 最大过负荷电流	Operating Temperature 工作温度范围
HQ02	50V	100V	100V	< 50mΩ	1A	2A	-55~+155°C
HQ03	75V	150V	300V		1A	2A	
HQ05	150V	300V	500V		2A	5A	
HQ06	200V	400V	500V		2A	10A	
HQ07	200V	500V	500V		2A	10A	
HQ10	200V	500V	500V		2A	10A	
HQ12	250V	500V	500V		2A	10A	

Type 类型	Size 尺寸	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
HQ02	0402 (1005)	1/10W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
HQ03	0603 (1608)	1/5W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
HQ05	0805 (2012)	1/3W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
HQ06	1206 (3216)	1/2W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	
HQ07	1210 (3225)	3/4W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	
HQ10	2010 (5025)	1W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
HQ12	2512 (6432)	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	

*Special offers 特别提供：HQ12 B:1.80±0.25mm

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**MIL-STD-202 Method 304**	Measure between: -55°C ~+125°C 测定范围：-55°C ~+125°C	1Ω≤R≤10Ω:±200ppm/°C 10Ω<R≤10MΩ:±100ppm/°C
Pre- and Post-Stress ElectricalTest (Short time Overload) 短時间过负荷	**AEC-Q200 TEST 1** **IEC60115 4.13**	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±0.5, %±1%: ±(1.0%+0.05Ω) ±5%: ±(2.0%+0.05Ω)
Biased Humidity 偏置湿度	**AEC-Q200 TEST 7** **MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 °C，湿度 85% 的条件下放置 1000 小时。 注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±0.5, ±1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Operational Life 工作寿命	**AEC-Q200 TEST 8** **MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5, ±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Soldering Heat 耐焊接热	**AEC-Q200 TEST 15** **MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**AEC-Q200 TEST 18** **J-STD-002**	SMD. Electrical test not required. Magnification 50 X. **Conditions:** 1. Baking 4 hours@155°C dry heat, dipping @ 245±3°C for 5±0.5 second. 2. Steam aging 8 hours, dipping @ 260±3°C for 30±0.5 second. 表面贴装元件 , 不需要电气测试 . 放大倍数 50 倍 . 测试条件 : 1.155°C 干燥 4H 后 , 245 °C 5±0.5 秒浸锡 . 2.8H 蒸汽后 , 260±3°C 30±0.5 秒浸锡 .	Coverage must be over 95%.
Board Flex 弯曲	**AEC-Q200 TEST 21** **AEC-Q200-005**	Bending 3mm(HQ02-HQ05)/2mm(HQ06-HQ12)for 60±5sec 弯曲 3mm(HQ02-HQ05)/2mm(HQ06-HQ12) 保持 60±5 秒	±(1.0%+0.05Ω)
Anti-Sulfurzed test 硫化测试	**ASTM B 809-95**	Sulfur (Saturated vapor) 硫（饱和蒸汽） • Test temp. 测试温度：60±2°C • Relative humidity 相对湿度：85±4%RH • Test time 测试时长：1000H	±(1%+0.05Ω)

Ordering Procedure (Example: HQ06 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: HQ06 1/2W 5% 1.2 Ω T/R-5000)

H Q 0 6 W 2 J 0 1 2 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示下列各种晶片电阻类型):
HQ02, HQ03, HQ05, HQ06, HQ07, HQ10 , HQ12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WA=1/10W
W5=1/5W
W3=1/3W
W2=1/2W
07=3/4W
1W=1W
2W=2W

Tolerance (公差):
F = ±0.5%
F = ±1%
J = ±5%

Resistance Value (阻值):
2%, 5%(E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0).
The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
C=10,000pcs

Special Feature (特征):
E =standard (标准品)

Packing Type (包装类型):
T = T/R (编带 / 卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Automotive Low Resistance Thick Film Chip Resistors -CS

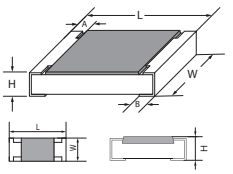
汽车级低阻厚膜晶片电阻-CS系列

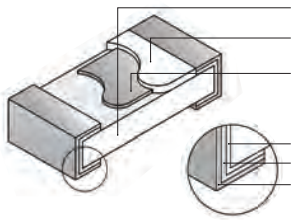
ROYALOHM
www.royalohm.com

Feature (特性)

- Ultra-low Value 超低阻值
- Low Temperature Coefficient 低温度系数
- Suitable for reflow & wave soldering
  适合波峰焊及回流焊
- Application: Power supply
  应用于电源
- AEC-Q200 qualified 符合AEC-Q200相关条款

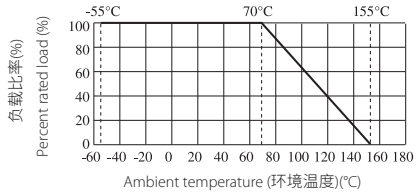
Figures (型状)





1. High purity Alumina substrate (高纯度氧化铝基板)
2. Protective coating (保护层)
3. Resistance element (阻抗元素)
4. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
5. Termination (Between) Ni Barrier [端面(中)镍层]
6. Termination (Outer) Sn [端面(外)锡层(无铅)]

Derating Curve & Specification (降功率曲线及性能)



Type 类型	Dielectirc Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
CS02	100V	-55°C~155°C
CS03	300V	-55°C~155°C
CS05	500V	-55°C~155°C
CS06	500V	-55°C~155°C
CS07	500V	-55°C~155°C
CS10	500V	-55°C~155°C
CS11	500V	-55°C~155°C
CS12	500V	-55°C~155°C

Type 类型	Size 尺寸	Power Rating 额定功率	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Resistance Range 阻值范围 1% & 5%	T.C.R. 温度系数
CS02	0402 (1005)	1/8W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	50mΩ~1Ω	50mΩ≤R<100mΩ: ±700 ppm/°C 100mΩ≤R≤1Ω: ±200 ppm/°C
CS03	0603 (1608)	1/5W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	10mΩ~1Ω	10mΩ≤R<15mΩ: ±1500ppm/°C 15mΩ ≤R<20mΩ: ±1000ppm/°C 20mΩ≤R<30mΩ: ±800 ppm/°C 30mΩ≤R<33mΩ: ±600 ppm/°C 33mΩ≤R≤50mΩ: ±400 ppm/°C 50mΩ<R≤0.1Ω: ±300 ppm/°C 0.1Ω<R≤1Ω: ±200 ppm/°C
CS05	0805 (2012)	1/4W	2.00±0.15	1.25 +0.15 -0.10	0.55±0.10	0.40±0.20	0.40±0.20	10mΩ~1Ω	10mΩ≤R≤15mΩ: ±800 ppm/°C 15mΩ<R≤25mΩ: ±600 ppm/°C 25mΩ<R≤50mΩ: ±400 ppm/°C 50mΩ<R≤0.2Ω: ±200 ppm/°C 0.2Ω<R≤1Ω: ±100 ppm/°C
CS06	1206 (3216)	1/3W	3.10±0.15	1.55 +0.15 -0.10	0.55±0.10	0.45±0.20	0.45±0.20	10mΩ~1Ω	10mΩ≤R<15mΩ: ±700ppm/°C 15mΩ≤R≤30mΩ: ±400ppm/°C 30mΩ<R≤50mΩ: ±300ppm/°C 50mΩ<R≤0.1Ω: ±200ppm/°C 0.1Ω<R≤1Ω: ±150ppm/°C
CS07	1210 (3225)	1/2W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	10mΩ~1Ω	10mΩ≤R<15mΩ: ±500ppm/°C 15mΩ≤R<20mΩ: ±400ppm/°C 20mΩ≤R≤50mΩ: ±300ppm/°C 50mΩ<R≤1Ω: ±100ppm/°C
CS10	2010 (5025)	3/4W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	10mΩ~1Ω	10mΩ≤R<15mΩ: ±600ppm/°C 15mΩ≤R<20mΩ: ±500ppm/°C 20mΩ≤R≤30mΩ: ±300ppm/°C 30mΩ<R≤50mΩ: ±200ppm/°C 50mΩ<R≤0.1Ω: ±150ppm/°C 0.1Ω<R≤1Ω: ±100ppm/°C
CS11	1812 (4532)	3/4W	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.80±0.30	10mΩ~1Ω	10mΩ≤R<20mΩ: ±500ppm/°C 20mΩ≤R<50mΩ: ±400ppm/°C 50mΩ≤R≤0.1Ω: ±200ppm/°C 0.1Ω<R≤1Ω: ±100ppm/°C
CS12	2512 (6432)	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.80±0.30	10mΩ~1Ω	10mΩ≤R<15mΩ: ±600ppm/°C 15mΩ≤R<20mΩ: ±400ppm/°C 20mΩ≤R≤30mΩ: ±300ppm/°C 30mΩ<R≤50mΩ: ±200ppm/°C 50mΩ<R≤0.1Ω: ±150ppm/°C 0.1Ω<R≤1Ω: ±100ppm/°C

Performance Specifications (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Pre- and Post-Stress ElectricalTest (Short time Overload) 短時间过负荷	**AEC-Q200 TEST 1** **IEC60115 4.13**	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±1%: ±(1.0%+0.005Ω) ±5%: ±(2.0%+0.005Ω)
Biased Humidity 偏置湿度	**AEC-Q200 TEST 7** **MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 °C，湿度 85% 的条件下放置 1000 小时。 注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±1%: ±(1.0%+0.005Ω) ±5%: ±(3.0%+0.005Ω)
Operational Life 工作寿命	**AEC-Q200 TEST 8** **MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±1%: ±(1.0%+0.005Ω) ±5%: ±(3.0%+0.005Ω)
Soldering Heat 耐焊接热	**AEC-Q200 TEST 15** **MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.005Ω)
Solderability 可焊性	**AEC-Q200 TEST 18** **J-STD-002**	SMD. Electrical test not required. Magnification 50 X. **Conditions:** 1. Baking 4 hours@155°C dry heat, dipping @ 245±3°C for 5±0.5 second. 2. Steam aging 8 hours, dipping @ 260±3°C for 30±0.5 second. 表面贴装元件 , 不需要电气测试 . 放大倍数 50 倍 . **测试条件 :** 1. 155°C 干燥 4H 后 , 245°C 5±0.5 秒浸锡 . 2. 8H 蒸汽后 , 260±3°C 30±0.5 秒浸锡 .	Coverage must be over 95%.
Board Flex 弯曲	**AEC-Q200 TEST 21** **AEC-Q200-005**	Bending 3mm(CS02-CS05)/2mm(CS06-CS12)for 60±5sec 弯曲 3mm(CS02-CS05)/2mm(CS06-CS12) 保持 60±5 秒	±(1.0%+0.005Ω)

* CS07 size in 0.75W 0.1~1Ω 100PPM/°C could be provided specially (* CS07 0.75W 0.1~1Ω 100PPM/°C 可特别提供)

Ordering Procedure (Example: CS12 1W 5% 22mΩ T/R-4000)

订购方式 (例如: CS12 1W 5% 22mΩ T/R-4000)

C S 1 2 | 1 W | J | 0 2 2 L | T | 4 | E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
CS02, CS03, CS05, CS06, CS07, CS10, CS11, CS12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
W8=1/8W W4=1/4W
W5=1/5W W3=1/3W
W2=1/2W 07 = 3/4W
1W=1W

Tolerance (公差):
F = ±1%
J = ±5%

Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0;
1%(E-24, E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
$0=10^0$ $1=10^1$ $2=10^2$ $3=10^3$ $4=10^4$ $5=10^5$ $6=10^6$
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$ $M=10^{-4}$ $N=10^{-5}$ $P=10^{-6}$

Packing Type (包装类型):
T = T/R
(编带 / 卷带)
B = Bulk in Poly bag
(散装 / 袋装)

Packing Qty. (包装数量):
4=4,000pcs,
5=5,000pcs
C=10,000pcs
D=20,000pcs

Special Feature (特征):
E =standard (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

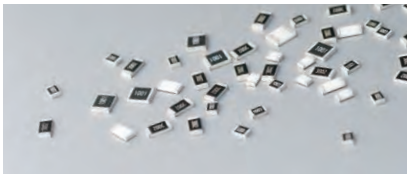
Anti-Sulfurized Automotive Thick Film Chip Resistors - NQ

抗硫化汽车级晶片电阻器 - NQ系列

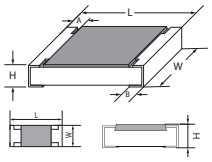
ROYALOHM
www.royalohm.com

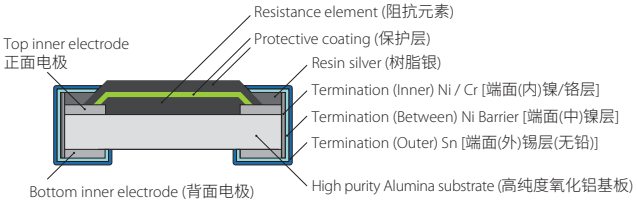
Feature (特性)

- Excellent Anti-Sulfurized 卓越的抗硫化
- AEC-Q200 qualified符合 AEC-Q200 相关条款
- Suitable for reflow & wave soldering 适合波峰焊和回流焊
- RoHS compliant 符合欧盟 ROHS 标准

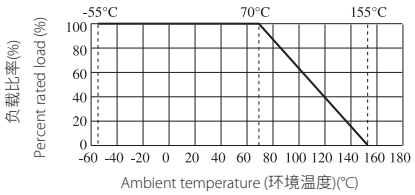


Figures (型状)





Derating Curve (降功率曲线)



Specification (性能)

Type 类型	Size 尺寸	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻 额定电流	Max. Overload Current of Jumper 零欧姆电阻 最大过负荷电流	Operating Temperature 工作温度范围
NQ01	0201 (0603)	25V	50V	50V	<50mΩ	0.5A	1A	-55~+155°C
NQ02	0402 (1005)	50V	100V	100V	<50mΩ	1A	2A	
NQ03	0603 (1608)	75V	150V	300V	<50mΩ	1A	2A	
NQ05	0805 (2012)	150V	300V	500V	<50mΩ	2A	5A	
NQ06	1206 (3216)	200V	400V	500V	<50mΩ	2A	10A	
NQ07	1210 (3225)	200V	500V	500V	<50mΩ	2A	10A	
NQ10	2010 (5025)	200V	500V	500V	<50mΩ	2A	10A	
NQ12	2512 (6432)	200V	500V	500V	<50mΩ	2A	10A	

Type 类型	Size 尺寸	Power Rating 额定功率	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
NQ01	0201 (0603)	1/20W	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05	1Ω~10M 0Ω
NQ02	0402 (1005)	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
NQ03	0603 (1608)	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
NQ05	0805 (2012)	1/8W	2.00±0.15	1.25 $^{+0.15}_{-0.10}$	0.55±0.10	0.40±0.20	0.40±0.20	
NQ06	1206 (3216)	1/4W	3.10±0.15	1.55 $^{+0.15}_{-0.10}$	0.55±0.10	0.45±0.20	0.45±0.20	1Ω~20MΩ 0Ω
NQ07	1210 (3225)	1/2W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	1Ω~10M 0Ω
NQ10	2010 (5025)	3/4W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
NQ12	2512 (6432)	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**MIL-STD-202 Method 304**	Measure between: -55℃ ~+125℃ 测定范围：-55℃ ~+125℃	NQ01: 1Ω≤R≤10Ω: -100~+350ppm/℃ >10Ω: ±200ppm/℃ NQ02-NQ12: 1Ω≤R≤10Ω: ±200ppm/℃ >10Ω: ±100ppm/℃
Pre- and Post-Stress ElectricalTest (Short time Overload) 短时间过负荷	**AEC-Q200 TEST 1** **IEC60115 4.13**	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±5%: ±(2.0%+0.05Ω)
Biased Humidity 偏置湿度	**AEC-Q200 TEST 7** **MIL-STD-202 Method 103**	1000 hours 85℃/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 ℃，湿度 85% 的条件下放置 1000 小时。 注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Operational Life 工作寿命	**AEC-Q200 TEST 8** **MIL-STD-202 Method 108**	70℃ rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70℃额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%, ±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Soldering Heat 耐焊接热	**AEC-Q200 TEST 15** **MIL-STD-202 Method 210**	Condition K: Reflow test time above217℃ is 60s-150s,time above 250±5C is30±5s 条件K: 217℃以上回流试验时间60s-150s， 250±5℃以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**AEC-Q200 TEST 18** **J-STD-002**	SMD. Electrical test not required. Magnification 50 X. **Conditions:** 1. Baking 4 hours@155℃ dry heat, dipping @ 245±3℃ for 5±0.5 second. 2. Steam aging 8 hours, dipping @ 260±3℃ for 30±0.5 second. 表面贴装元件 , 不需要电气测试 . 放大倍数 50 倍 . **测试条件 :** 1. 155℃ 干噪 4H 后 , 245℃ 5±0.5 秒浸锡 . 2. 8H 蒸汽后 , 260±3℃ 30±0.5 秒浸锡 .	Coverage must be over 95%. 覆盖率≥ 95%
Board Flex 弯曲	**AEC-Q200 TEST 21** **AEC-Q200-005**	Bending 3mm(NQ01-NQ05)/2mm(NQ06-NQ12)for 60±5sec 弯曲 3mm(NQ01-NQ05)/2mm(NQ06-NQ12) 保持 60±5 秒	±(1.0%+0.05Ω)
Anti-Sulfurized test 硫化测试		Soaked in industrial oil with sulfur substance 3.5% contained 105℃ ±3℃ 500h 工业用油含硫磺成份 3.5%，105℃±3℃, 500H	±(5%+0.05Ω)
Anti-Sulfurized test 硫化测试	**ASTM B 809-95**	Sulfur (Saturated vapor) 硫 (饱和蒸汽) • Test temp. 测试温度 : 105℃ • Test time 测试时长 : 1000h	±(3%+0.05Ω)

Ordering Procedure (Example: NQ06 1/4W 5% 1.2 Ω T/R-5000)

订购方式 (例如: NQ06 1/4W 5% 1.2 Ω T/R-5000)

N Q 0 6 W 4 J 0 1 2 J T 5 E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型) :
NQ01, NQ02, NQ03, NQ05, NQ06, NQ07, NQ10, NQ12

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WM=1/20W WG=1/16W
WA=1/10W W8=1/8W
W4=1/4W 07=3/4W
W2=1/2W 1W=1W

Tolerance (公差):
D=±0.5%
F=±1%
J=±5%

Resistance Value (阻值):
5% (E-24 series) :
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
≤1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
≤1% 产品 (E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个0).
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
C=10,000pcs
E=15,000pcs

Special Feature (特征):
E =standard （ 标准品 ）

Packing Type (包装类型):
T=T/R(编带/卷带)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

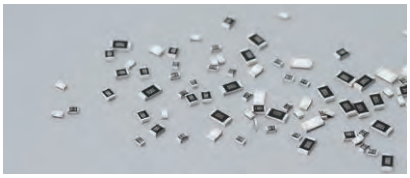
High Quality Anti-Sulfurized Automotive Thick Film Chip Resistors-NS

高品质抗硫化汽车级晶片电阻器 - NS系列

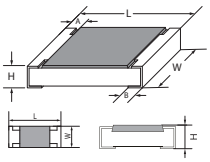
ROYALOHM
www.royalohm.com

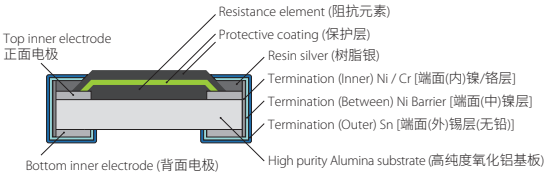
Feature (特性)

- High power 高功率
- Superior Anti-Sulfurized 优越的抗硫化
- Superior Anti-Surge Voltage performance 优越的抗浪涌电压特性
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- AEC-Q200 qualified 符合AEC-Q200相关条款

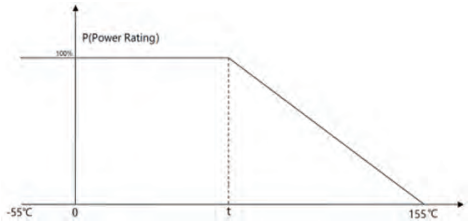


Figures (型状)

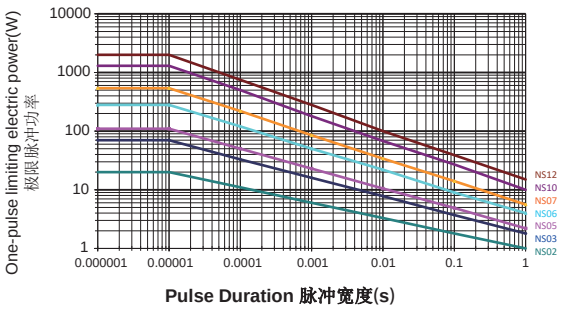




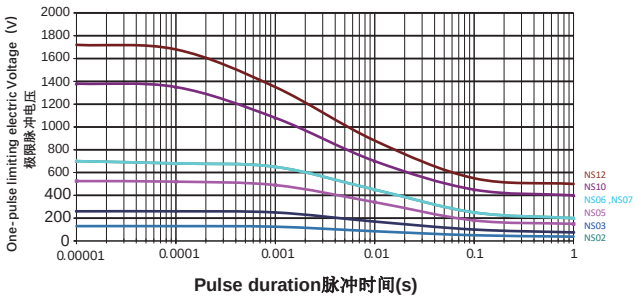
Derating Curve (降功率曲线)



Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



Specification (性能)

Type 类型	Size 尺寸	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	Max. Overload Current of Jumper 零欧姆电阻最大过负荷电流	Operating Temperature 工作温度范围
NS01	0201 (0603)	25V	50V	50V	< 50mΩ	0.5A	1A	-55~+155℃
NS02	0402 (1005)	50V	100V	100V	< 50mΩ	1A	2A	
NS03	0603 (1608)	75V	150V	300V	< 50mΩ	1A	2A	
NS05	0805 (2012)	150V	300V	500V	< 50mΩ	2A	5A	
NS06	1206 (3216)	200V	400V	500V	< 50mΩ	2A	10A	
NS07	1210 (3225)	200V	500V	500V	< 50mΩ	2A	10A	
NS10	2010 (5025)	200V	500V	500V	< 50mΩ	2A	10A	
NS12	2512 (6432)	200V	500V	500V	< 50mΩ	2A	10A	

Type 类型	Power Rating(Pt) 额定功率		L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 ±0.5%, ±1%, ±5%
	t=70℃	t=125℃						
NS01	1/20W	/	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05	1Ω~10M 0Ω
NS02	1/10W	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
NS03	1/5W	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
NS05	1/3W	1/8W	2.00±0.15	1.25 +0.15 -0.10	0.55±0.10	0.40±0.20	0.40±0.20	
NS06	1/2W	1/4W	3.10±0.15	1.55 +0.15 -0.10	0.55±0.10	0.45±0.20	0.45±0.20	
NS07	3/4W	1/3W	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.25	0.50±0.20	
NS10	1W	3/4W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	0.1Ω~10MΩ 0Ω
NS12	2W	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	1Ω~10M 0Ω

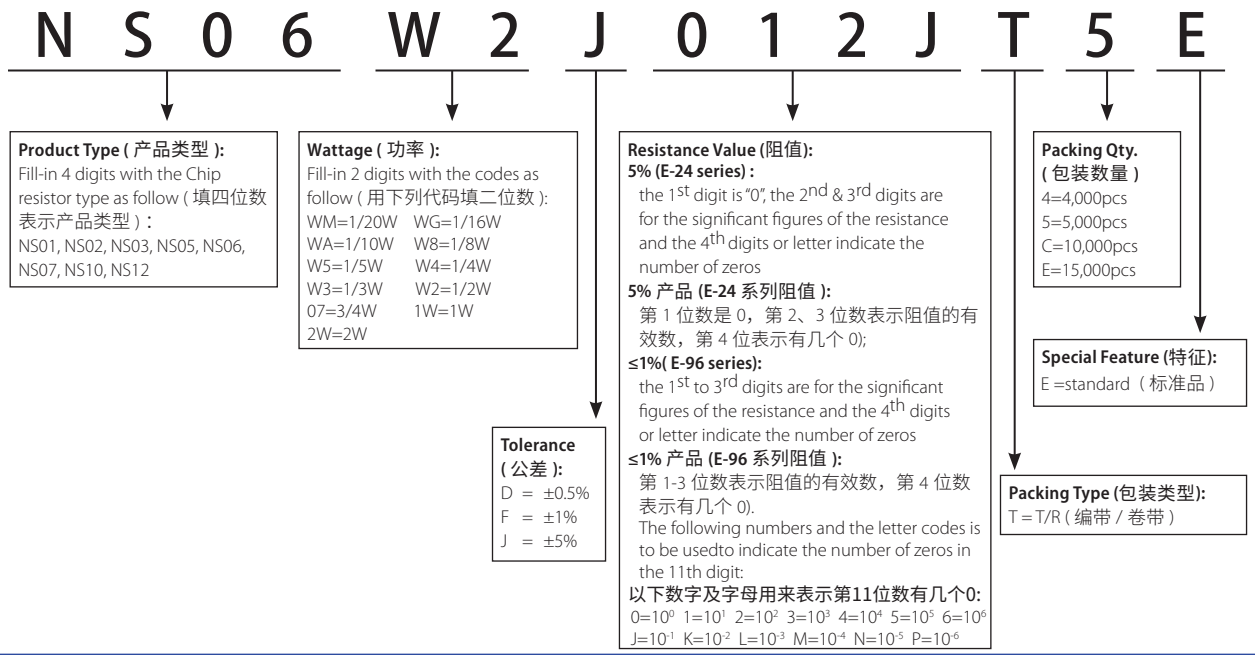
* Special offered 特别提供 : NS12 B:1.80±0.25mm

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Temperature Coefficient of Resistance 温度系数	**MIL-STD-202 Method 304**	Measure between: -55°C ~+125°C 测定范围：-55°C ~+125°C	NS01: 1Ω≤R≤10Ω: -100~+350ppm/°C >10Ω: ±200ppm/°C NS02-NS12: 1Ω≤R≤10Ω: ±200ppm/°C >10Ω: ±100ppm/°C NS10: 0.1Ω≤R<0.51Ω: ±400ppm/°C 0.51Ω≤R≤10Ω: ±200ppm/°C >10Ω: ±100ppm/°C
Pre- and Post-Stress ElectricalTest (Short time Overload) 短时间过负荷	**AEC-Q200 TEST 1** **IEC60115 4.13**	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±5%: ±(2.0%+0.05Ω)
Biased Humidity 偏置湿度	**AEC-Q200 TEST 7** **MIL-STD-202 Method 103**	1000 hours 85°C/85%RH. Note: Specified conditions:10% of operating power. Measurement at 24±4 hours after test conclusion. 在温度 85 °C，湿度 85% 的条件下放置 1000 小时。 注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±0.5%, ±1%: ±(1.0%+0.05Ω) ±5%: ±(3.0%+0.05Ω)
Operational Life 工作寿命	**AEC-Q200 TEST 8** **MIL-STD-202 Method 108**	70°C rated power, 1000H(1.5 hours "ON", 0.5 hour "OFF"). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±0.5%, ±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Soldering Heat 耐焊接热	**AEC-Q200 TEST 15** **MIL-STD-202 Method 210**	Condition K: Reflow test time above217°C is 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	**AEC-Q200 TEST 18** **J-STD-002**	SMD. Electrical test not required. Magnification 50 X. **Conditions:** 1. Baking 4 hours@155°C dry heat, dipping @ 245±3°C for 5±0.5 second. 2. Steam aging 8 hours, dipping @ 260±3°C for 30±0.5 second. 表面贴装元件 , 不需要电气测试 . 放大倍数 50 倍 . **测试条件 :** 1.155°C 干燥 4H 后 , 245°C 5±0.5 秒浸锡 . 2.8H 蒸汽后 , 260±3°C 30±0.5 秒浸锡 .	Coverage must be over 95%.
Board Flex 弯曲	**AEC-Q200 TEST 21** **AEC-Q200-005**	Bending 3mm(NS01-NS05)/2mm(NS06-NS12)for 60±5sec 弯曲 3mm(NS01-NS05)/2mm(NS06-NS12) 保持 60±5 秒	±(1.0%+0.05Ω)
Anti-Sulfurized test 硫化测试		Soaked in industrial oil with sulfur substance 3.5% contained 105°C ±3°C 500h 工业用油含硫磺成份 3.5%，105°C±3°C, 500H	±(5%+0.05Ω)
Anti-Sulfurized test 硫化测试	**ASTM B 809-95**	Sulfur (Saturated vapor) 硫 (饱和蒸汽) • Test temp. 测试温度 : 105°C • Test time 测试时长 : 1000h	±(3%+0.05Ω)

Ordering Procedure (Example: NS06 1/2W 5% 1.2 Ω T/R-5000)

订购方式 (例如: NS06 1/2W 5% 1.2 Ω T/R-5000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

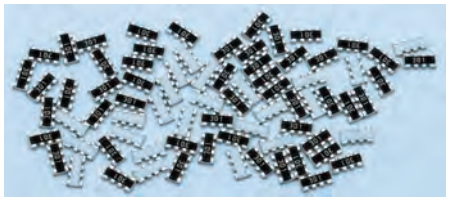
Anti-Sulfurized Thick Film Chip Resistor Array-Convex Terminal

抗硫化厚膜晶片排列电阻器

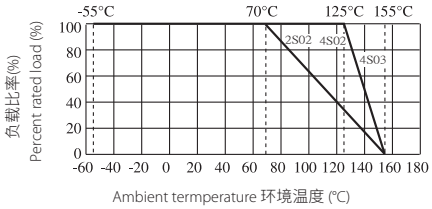
ROYALOHM
www.royalohm.com

Feature (特性)

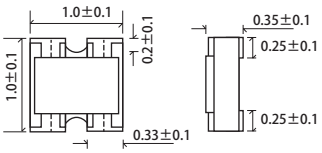
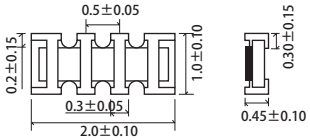
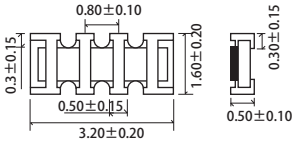
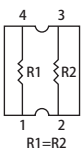
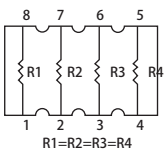
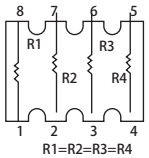
- Anti-Sulfuration 抗硫化
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application car, power 适用于汽车、电源等
- AEC-Q200 qualified　符合AEC-Q200相关条款



Derating Curve (降功率曲线)



Dimension (mm) & Conformation [尺寸(mm)与结构]

Type 类型	2S02	4S02	4S03
Size 尺寸	0402×2	0402×4	0603×4
Dimension 规格 (mm)			
Equivalent Circuit Diagram 等效电路图			

Characteristics (特性)

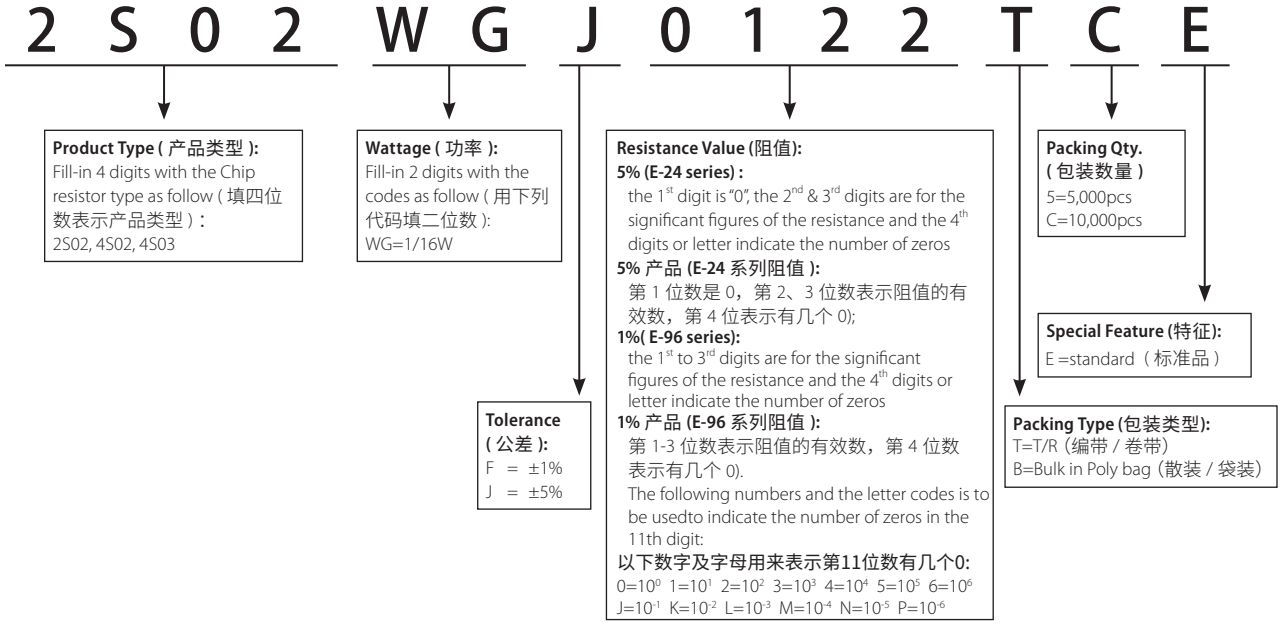
Type 类型	Power Rating 额定功率	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Resistance Range 阻值范围	Dielectric Withstanding Voltage 绝缘耐压	Tolerance 公差	Operating Temperature 工作温度范围	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	T.C.R 温度系数 (PPM/°C)
2S02	1/16W	50V	100V	10Ω~1MΩ	100	±1%, ±5%	-55°C~+155°C	<50mΩ	1A	±200
4S02				10Ω~1MΩ	100					±200
4S03				1Ω ~1MΩ	300					≥10Ω:±200 <10Ω:±400

Performance Specification (性能)

Test Item 试验项目	Reference standard 参考标准	Test Methods 试验方法	Evaluation Criteria 判定标准
Pre- and Post-Stress ElectricalTest (Short time Overload) 短時間過負荷	AEC-Q200 TEST 1 IEC60115 4.13	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟 , 然后测阻值。	±(2.0%+0.1Ω)
Biased Humidity 偏置湿度	AEC-Q200 TEST 7 MIL-STD-202 Method 103	1000 hours 85℃/85%RH. Note: Specified conditions:10% of operating power.Measurement at 24±4 hours after test conclusion. 在温度 85℃，湿度 85% 的条件下放置 1000 小时。注意 : 指定条件 : 工作功率的 10%，试验结束后 24±4 小时内进行测试。	±(3.0%+0.1Ω)
Operational Life 工作寿命	AEC-Q200 TEST 8 MIL-STD-202 Method 108	70°C rated power, 1000H(1.5 hours “ON”, 0.5 hour “OFF”). 70°C额定功率，1000H（1.5小时“开”，0.5小时“关”）。	±(3.0%+0.1Ω)
Soldering Heat 耐焊接热	AEC-Q200 TEST 15 MIL-STD-202 Method 210	Condition K: Reflow test time above217°Cis 60s-150s,time above 250±5C is30±5s 条件K: 217°C以上回流试验时间60s-150s， 250±5°C以上回流试验时间30±5s	±(1.0%+0.05Ω)
Solderability 可焊性	AEC-Q200 TEST 18 J-STD-002	For both Leaded & SMD. Electrical test not required.Magnification 50 X. Conditions:Leaded: Method A @ 235℃, category 3.SMD: a) Method B, 4 hrs @ 155℃ dry heat @ 235℃ b) Method B @ 215℃ category 3. c) Method D category 3 @ 260℃. 用于引脚和表面贴装元件，不需要电气测试 . 放大倍数 50 倍。 测试条件 : 引脚产品 : 方法 A@235℃ , 类别 3 表面贴装元件 : a) 方法 B,4 小时 @155°C干热 @235°C . b) 方法 B@215°C类别 3. c) 方法 D 类别 3@260°C .	Coverage must be over 95%.
Board Flex 弯曲	AEC-Q200 TEST 21 AEC-Q200-005	60 sec minimum holding time. 至少 2mm，60 秒的支撑时间	±(1.0%+0.05Ω)
Anti-Sulfurized test 硫化测试		Soaked in industrial oil with sulfur substance 3.5% contained 105°C ±3°C 500h 工业用油含硫磺成份 3.5%，105°C±3°C, 500H	±(5%+0.05Ω)
Anti-Sulfurized test 硫化测试	ASTM B 809-95	Sulfur (Saturated vapor) 硫 (饱和蒸汽) • Test temp. 测试温度 : 50±2°C • Relative humidity 相对湿度 : 86~90%RH • Test time 测试时长 : 1000h	±(1%+0.05Ω)

Ordering Procedure (Example: 2S02 1/16W ±5%1.2K T/R-10000)

订购方式 (例如: 2S02 1/16W ±5%1.2K T/R-10000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Chip Resistor Array
晶片排列电阻器

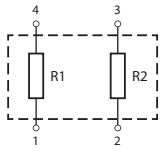
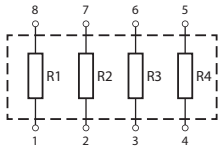
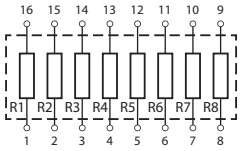
ROYALOHM
www.royalohm.com

Feature (特性)

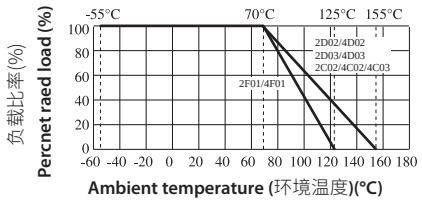
- High density, more than 1 resistors in one small case 高度密集, 多个电阻在一个表贴封装中
- Improvement of placement efficiency 装配效率高
- Tape/Reel packaging is suitable for automatic placement machine 编带卷装适合自动化机器
- Superior solderability 优越焊锡性
- Application: Master board, CD & DVD Rom, Hard Disk, RAM
  应用于 CD、DVD、硬盘、内存、主板等



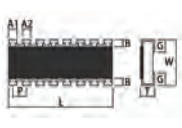
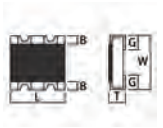
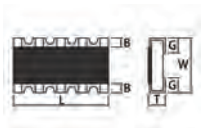
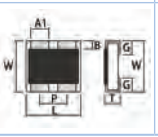
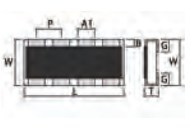
Equivalent Circuit Diagram (等效电路图)

2D02/2D03/2C02/2F01	4D02/4D03/4DP3/4C02/4C03/4F01	16P8
		
R1=R2	R1=R2=R3=R4	R1=R2=R3=R4=R5=R6=R7=R8

Derating Curve (降功率曲线)



Dimensions in mm (外观尺寸)

Convex Terminal type 凸式电极			Concave Terminal 凹式电极		Flat Terminal 平式电极	
2D02/2D03	4D02/4D03/4DP3	16P8	2C02	4C02/4C03	2F01	4F01
						

*The 16P8 series of Anti-sulfuration products are available in particular.
*16P8 系列抗硫化产品可特别提供

Type 类型	Dimensions 尺寸 (mm)							
	L	W	T	A1	A2	B	P	G
2D02 0402*2	1.00±0.10	1.00±0.10	0.35±0.10	0.33±0.10	/	0.15±0.05	0.65±0.05	0.25±0.10
4D02 0402*4	2.00±0.10	1.00±0.10	0.45±0.10	0.40±0.05	0.30±0.05	0.20±0.15	0.50±0.05	0.30±0.15
2D03 0603*2	1.60±0.15	1.60±0.15	0.50±0.10	0.60±0.15	/	0.30±0.10	0.80±0.05	0.25±0.10
4D03/4DP3 0603*4	3.20±0.20	1.60±0.20	0.50±0.10	0.65±0.15	0.50±0.15	0.30±0.15	0.80±0.10	0.30±0.15
16P8	4.00±0.20	1.60±0.15	0.45±0.10	0.45±0.05	0.30±0.05	0.30±0.15	0.50±0.05	0.40±0.15
2C02 0402*2	1.00±0.10	1.00±0.10	0.35±0.10	/	/	0.15±0. 10	/	0.30±0.10
4C02 0402*4	2.00±0.10	1.00±0.10	0.45±0.10	/	/	0.15±0.10	/	0.30±0.10
4C03 0603*4	3.20±0.20	1.60±0.20	0.60±0.10	/	/	0.30±0.20	/	0.40±0.10
2F01 0201*2	0.80±0.10	0.60±0.10	0.35±0.10	0.30±0.10	/	0.15±0.10	0.50±0.05	0.15±0.10
4F01 0201*4	1.40±0.10	0.60±0.10	0.35±0.10	0.20±0.10	/	0.15±0.10	0.40±0.05	0.15±0.10

Ratings (规格)

Type 类型	Power Rating 额定功率	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围 ±5%，±1%	Temperature Coefficient 温度系数 PPM/°C	Operating Temperature 工作温度范围	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流
2D02	1/16W	50V	100V	100V	1Ω~1MΩ	≥10Ω:±200 <10Ω:±400	-55℃~+155℃	<50mΩ	1A
4D02	1/16W	50V	100V	100V	1Ω~1MΩ				
2D03	1/16W	50V	100V	100V	10Ω~1MΩ	±200			
4D03	1/16W	50V	100V	300V	1Ω~2MΩ	≥10Ω:±200 <10Ω:±400			
4DP3	1/10W	50V	100V	300V	1Ω~1MΩ	≥10Ω:±200 <10Ω:±400			
16P8	1/16W	50V	100V	300V	1Ω~1MΩ	≥10Ω:±200 <10Ω:±400			
2C02	1/16W	50V	100V	100V	10Ω~1MΩ	±200			
4C02	1/16W	50V	100V	100V	10Ω~1MΩ	±200			
4C03	1/10W	50V	100V	300V	1Ω~1MΩ	≥10Ω:±200 <10Ω:±400			
2F01	1/20W	12.5V	25V	/	10Ω~1MΩ	±200	-55℃~+125℃	<50mΩ	1A
4F01	1/20W	12.5V	25V	/	10Ω~1MΩ	±200			

Performance Specification (性能)

Short-time overload	短时间过负荷	± (2.0%±0.1Ω) 2F01: ±1%: ±(1%+0.05Ω) , ±5%: ±(2%+0.05Ω)
Insulation Resistance	绝缘电阻	≥1000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover mechanical damage, arcing or insulation break down. 无击穿，飞弧及可见机械性损伤
Terminal bending	端子弯曲	± (1.0%+±0.05Ω)
Soldering heat	耐焊接热	ΔR/R ≤ ± (1.0%+0.05Ω)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	ΔR/R ≤ ± (1.0%+0.05Ω) 2F01: ±1%: ±(0.5%+0.05Ω) , ±5%:±(1%+0.05Ω)
Load life in humidity	湿度寿命	± (3.0%±0.1Ω) 2F01: ±1%:±(2%+0.1Ω) , ±5%: ±(3.0%±0.1Ω)
Load life	负载寿命	± (3.0%±0.1Ω) 2F01: ±1%: ±(2%+0.1Ω), ±5%: ±(3.0%±0.1Ω)

Ordering Procedure (Example: 2F01 1/20W ±5% 10K T/R-15000)

订购方式 (例如: 2F01 1/20W ±5% 10K T/R-15000)

2 F 0 1 W M J 0 1 0 3 T E E

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型)：
2F01, 4F01, 2D02, 2D03, 4D03, 4D02, 4DP3, 2C02, 4C02, 4C03, 16P8

Wattage (功率):
Fill-in 2 digits with the codes as follow (用下列代码填二位数):
WM=1/20W
WG=1/16W
WA=1/10W

Tolerance (公差):
F = ±1%
J = ±5%

Resistance Value (阻值):
5% (E-24 series) :
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5% 产品 (E-24 系列阻值):
第 1 位数是 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0);
1%(E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
1% 产品 (E-24, E-96 系列阻值):
第 1-3 位数表示阻值的有效数，第 4 位数表示有几个 0).
The following numbers and the letter codes is to be usedto indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第11位数有几个0:
0=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Qty. (包装数量)
4=4,000pcs
5=5,000pcs
C=10,000pcs
D=20,000pcs
E=15,000pcs

Special Feature (特征):
E =standard（标准品）

Packing Type (包装类型):
T=T/R（编带 / 卷带）
B=Bulk in Poly bag（散装 / 袋装）

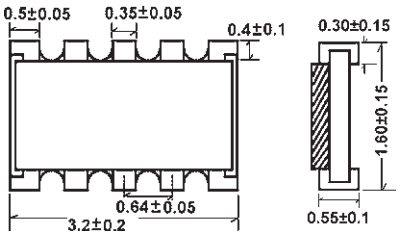
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

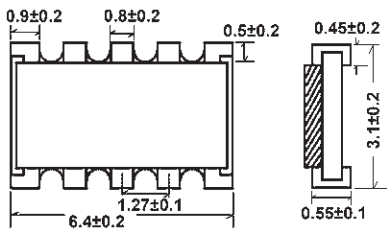
- High density, more than 1 resistors in one small case 高度密集, 多个电阻在一个表贴封装中
- Improvement of placement efficiency 装配效率高
- Tape/Reel packaging is suitable for automatic placement machine 编带卷装适合自动化机器
- Superior solderability 优越焊锡性

Dimension (尺寸) (mm)

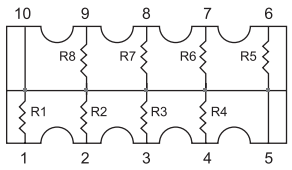
10P8, 10S8, 10T8, 10E9



8R06, 8S06

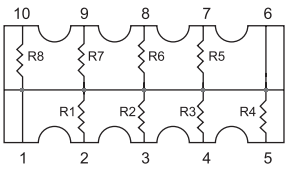


Equivalent Circuit Diagram (等效电路图)



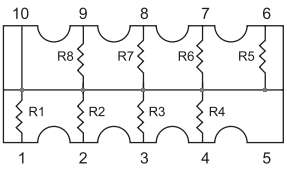
R1=R2=R3=R4=R5=R6=R7=R8

8R06 / 10P8 (P Type)



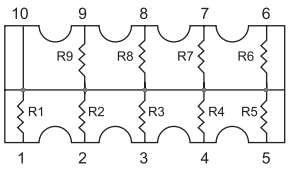
R1=R2=R3=R4=R5=R6=R7=R8

8S06/10S8 (S Type)



R1=R2=R3=R4=R5=R6=R7=R8

10T8 (T Type)



R1=R2=R3=R4=R5=R6=R7=R8=R9

10E9 (E Type)

Characteristics (特性)

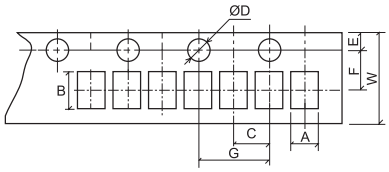
Type	规格	10P8,10S8,10T8,10E9	8R06, 8S06
Power Rating Per Resistance	每个电阻功率	1/32W [1/16W Special available (可特别提 供)]	1/16W
Package Power Rating	封装功率	1/4W [1/2W Special available (可特别提 供)]	1/2W
Max. Working Voltage	最大工作电压	25V	50V
Max. Overload Voltage	最大过负荷电压	50V	100V
Dielectric withstanding Voltage	绝缘耐压	50V	100V
Operating temperature	工作温度	-55℃ ~ +155 ℃	-55℃ ~ +155 ℃
Resistance Range	阻值范围	10Ω~1MΩ	±1% :30Ω~1MΩ ±5% :10Ω~1MΩ
Resistance Value of Jumper	零欧姆电阻阻值	<50mΩ	/
Rated Current of Jumper	零欧姆电阻额定电流	0.5A	/

Performance Specification (性能)

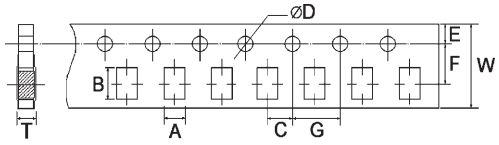
Temperature Coefficient	温度系数	±200PPM/℃
Short-time overload	短时间过负荷	±(2.0% ±0.05Ω)
Insulation resistance	绝缘电阻	≥1,000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿 , 飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% ±0.05Ω)
Soldering heat	耐焊接热	ΔR/R ≤ ±(1.0% ±0.05Ω)
Solderability	可焊性	Coverage must be over 95%.
Load life in humidity	湿度寿命	±(3.0% ±0.1Ω)
Load life	负载寿命	±(3.0% ±0.1Ω)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Dimension of Paper Taping (纸带尺寸)(mm)



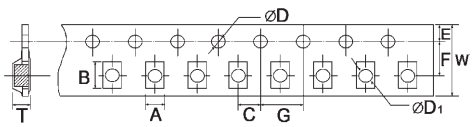
01005 0201 CQ01 2F01 4F01 PF0A NS01 0402 AS02 CQ02 HP02 HQ02 NM02
TC02 PF02 PS02 CS02 NS02 2C02 4C02 4D02 2D02 2S02 4S02



0603 CQ03 0805 CQ05 1206 CQ06 1210 CQ10 2010 CQ07 0508 0612 1020 HQ03 HQ05 HQ06 HQ07 HQ10 HP03 HP05 HP06 HP07 HP10
HV03 HV05 HV06 HV07 HV10 NM03 NM05 NM06 NS03 NS05 NS06 NS07 NS10 AS03 AS05 AS06 AS07 AS10 PS03 PS05 PS06 PS07 PS10
CS03 CS05 CS06 CS07 CS10 TC03 TC05 TC06 TC07 TC10 2F01 4F01 2D03 4D03 4C03 10P8 10S8 10T8 10E9 16P8

Type (类型)	A±0.2	B±0.2	C±0.05	ØD $^{+0.1}_{-0}$	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
01005, PF0A	0.24±0.05	0.45±0.05	2.0	1.5	1.75	3.5	4.0	8.0	0.40
0201, CQ01, ES01, PF01, NS01, NQ01, CM01, TC01, HS01	0.40±0.05	0.70±0.05	2.0	1.5	1.75	3.5	4.0	8.0	0.42
0402, CQ02, AS02, CS02, NQ02, ES02, HP02, HQ02, PF02, LT02, NM02, TC02, PS02 NS02, CM02, HS02	0.65±0.1	1.2±0.1	2.0	1.5	1.75	3.5	4.0	8.0	0.42±0.05
0603, CQ03, AS03, PS03, NQ03, ES03, HP03, HQ03, HV03, PF03, LT03, NM03, NS03, TC03, CS03, 4DP3, CM03, HS03	1.10	1.90	2.0	1.5	1.75	3.5	4.0	8.0	0.67
0805, CQ05, AS05, NQ05, CS05, ES05, HP05, HV05, HQ05, PF05, LT05, LE05, MS05, NM05, NS05, PS05, TC05, WR08, VS05, CM05, HS05	1.65	2.40	2.0	1.5	1.75	3.5	4.0	8.0	0.81
1206, CQ06, AS06, NQ06, CS06, ES06, HP06,HQ06, HV06, PF06, LT06, LE06,MS06, NS06, NM06, PS06, TC06, WR12, CM06, HS06	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.81
1210, CQ07, AS07, NQ07, HQ07, HP07, CS07, ES07, HV07, PF07, PS07, AS07, TC07, NS07 CM07, HS07	2.80	3.50	2.0	1.5	1.75	3.5	4.0	8.0	0.75
2D02, 2C02, 2S02	1.20	1.20	2.0	1.5	1.75	3.5	4.0	8.0	0.45
4D02, 4C02, 4S02	1.20	2.20	2.0	1.5	1.75	3.5	4.0	8.0	0.70
2F01	0.79	1.0	2.0	1.5	1.75	3.5	4.0	8.0	0.5
4F01	0.9	1.7	2.0	1.5	1.75	3.5	4.0	8.0	0.5
2D03	1.90	1.90	2.0	1.5	1.75	3.5	4.0	8.0	0.83
4D03, 4C03, 4S03	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.83
10P8, 10S8, 10T8, 10E9	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.85

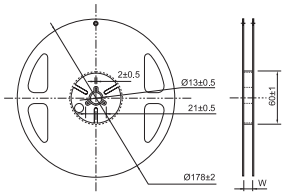
Dimension of Embossed Taping (塑胶带尺寸)(mm)



Type (类型)	A±0.2	B±0.2	C±0.05	ØD $^{+0.1}_{-0}$	ØD$_1$ $^{+0.25}_{-0}$	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
2010, AS10, CQ10, NQ10, HQ10, HP10, CS10, HV10, NS10 PS10, PF10, TC10, WR20,TA10,VS10,CM10, MS10	2.9	5.6	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
1812, CS11, HP11, WR18	3.5	4.8	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
2512, CQ12, AS12, CS12, NQ12, HP12, HQ12, HV12, PF11, PF12, MS12, LR12, NM12, PS12, TC12, WR25, NS12, TA12, VS12,CM12	3.5	6.7	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
16P8	1.8	4.30	2.0	1.5	1.0	1.75	5.5	4.0	12	0.75
8R06, 8S06	3.4	6.6	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
SP10	2.90	5.6	2.0	1.5	1.5	1.75	5.5	4.0	12	1.35
SP12	3.50	6.7	2.0	1.5	1.5	1.75	5.5	4.0	12	1.35
SP17	4.50	7.4	2.0	1.5	-	1.75	7.5	4.0	16	1.35
SP20	5.40	11.5	2.0	1.5	-	1.75	11.5	4.0	24	1.35
SP27	7.20	11.9	2.0	1.5	-	1.75	11.5	4.0	24	1.35

Dimension of Reel (卷轴尺寸)(mm)

Type (类型)	Tape 编带	Qty. / Reel 数量 / 卷装	Tape Width 纸带宽	W±1
01005, PF0A	Paper 纸带	20,000pcs	8mm	10
0201, CQ01, 2F01, 4F01, ES01, NQ01, NS01, PF01, ES01, CM01, HS01	Paper 纸带	15,000pcs	8mm	10
0402, CQ02, CS02, ES02, HP02, HQ02, LT02, NM02, NQ02, NS02, PF02, PS02, TC02, AS02, MS01, TL01, MS02, TL02, CM02, HS02	Paper 纸带	10,000pcs	8mm	10
0603, CQ03, AS03, CS03, ES03, HP03, HQ03, HV03, LT03, NM03, NS03, NQ03, PF03, PS03, TC03, MS03, TL03, CM03, HS03	Paper 纸带	5,000pcs	8mm	10
0805, CQ05, AS05, CS05, ES05, HP05, HQ05, HV05, LT05, MS05, NM05, NQ05, NS05, PF05, PS05, TC05, WR08, LE05, MS05, MW08, TL05, VS05, CM05, HS05	Paper 纸带	5,000pcs	8mm	10
1206, CQ06, AS06, CS06, ES06, HP06, HQ06, HV06, LT06, MS06, NM06, NQ06, PF06, PS06, TC06, WR12,LE06, NS06, MS06, MW12, TL06, CM06, HS06	Paper 纸带	5,000pcs	8mm	10
1210, CQ07, AS07, CS07, NQ07, ES07, HP07, HQ07, HV07, PF07, PS07, AS07, TC07 NS07, TL07, CM07, HS07	Paper 纸带	5,000pcs	8mm	10
ML05, ML06	Embossed 塑胶带	5,000pc	8mm	10
2010, CQ10, AS10, CS10, HP10, HQ10, HV10, PF10, NQ10, PS10, WR20, NS10, TL10, VS10, CM10	Embossed 塑胶带	4,000pcs	12mm	13.8
WR18, 1812, CS11, HP11, TC10, PF11, TA10	Embossed 塑胶带	4,000pcs	12mm	10
2512, CQ12, AS12, CS12, HP12, HQ12, HV12, MS12, NM12, NQ12, PF12, PS12, TC12, WR25, LR12, NS12, LR12, TL12, MW15, MW25, TA12, VS12, CM12	Embossed 塑胶带	4,000pcs	12mm	13.8
2D02, 2C02, 2S02	Paper 纸带	10,000pcs	8mm	10
4D02, 4C02, 4S02	Paper 纸带	10,000pcs	8mm	10
2D03, 4D03, 4C03, 4S03, 4DP3	Paper 纸带	5,000pcs	8mm	10
10P8, 10S8, 10T8, 10E9	Paper 纸带	5,000pcs	8mm	10
16P8	Embossed 塑胶带	4,000pcs	12mm	13.8
8R06, 8S06	Embossed 塑胶带	4,000pcs	12mm	13.8
SP10, SP12, ML25, ML28	Embossed 塑胶带	2,000pcs	12mm	13.5
SP17	Embossed 塑胶带	1,000pcs	16mm	17.5
SP20, SP27, ML27	Embossed 塑胶带	1,000pcs	24mm	25.5



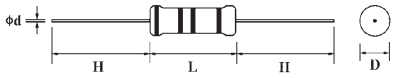
*Remark: 15,000 pcs/reel package could be offered for 0402 size. (备注：0402 可提供 15,000 只包装)

Feature (特性)

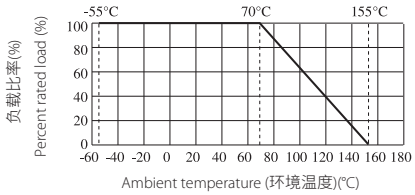
- High quailty performance 高品质
- Economical 低成本
- Flame Retardant available 可提供不燃性涂装
- Automatically insertable 适用自动化插件



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Specification(性能)

料号	类型	Power Rating 额定功率	Dimension (尺寸)(mm)					MAX. Working Voltage 最大工作电压	MAX. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压		Resistance Range 阻值范围	Tolerance 公差
			D	L	d ±0.05	H±3	PT			可燃性 Flammability	不燃性 Flame Retardance		
Ordinary Products(普通产品)													
CFR0W8	CFR-12	1/8W	1.9±0.3	3.3±0.3	0.45	28	52	200V	400V	400V	200V	1Ω~1MΩ	±2% ±5% ±10%
CFR0S4	CFR-25-S	1/4W-S	1.9±0.3	3.3±0.3	0.45	28	52	200V	400V	400V	200V	1Ω~1MΩ	
CFR0W4	CFR-25	1/4W	2.2±0.3	6.5±1.0	0.54	28	52	250V	500V	500V	250V	1Ω~10MΩ	
CFR0W2	CFR-50	1/2W	3.5±0.6	9.5±1.0	0.54	28	52	350V	700V	700V	250V	1Ω~10MΩ	
CFR01S	CFR-100-S	1W-S	4.5±0.6	11.5±1.0	0.70	25	52	500V	1000V	1000V	350V	1Ω~10MΩ	
CFR01W	CFR-100	1W	5.0±0.6	15.5±1.0	0.70	28	64	500V	1000V	1000V	350V	1Ω~10MΩ	
CFR02S	CFR-200-S	2W-S	5.0±0.6	15.5±1.0	0.70	28	64	500V	1000V	1000V	350V	1Ω~10MΩ	
CFR02W	CFR-200	2W	6.0±0.6	17.5±1.0	0.75	28	64	500V	1000V	1000V	350V	1Ω~10MΩ	
CFR03S	CFR-300-S	3W-S	6.0±0.6	17.5±1.0	0.75	28	64	500V	1000V	1000V	350V	1Ω~10MΩ	
High Power Products(高功率产品)													
CPR0W2	CPR-50	1/2W	2.2±0.5	6.5±1.0	0.54	28	52	300V	500V	/	700V	3Ω~10MΩ	±2% ±5% ±10%
CPR01W	CPR-100	1W	3.5±0.5	9.5±1.0	0.54	28	52	500V	700V	/	1000V	3Ω~10MΩ	
CPR02W	CPR-200	2W	4.5±0.5	11.5±1.0	0.70	25	52	500V	1000V	/	1000V	3Ω~10MΩ	

- Standard E-24 series values in ±2% ±5% & ±10% tolerance
  标准 E-24 系列公差为 ±2%、±5% & ±10%
- Standard: Beige color, CFR1WS, CFR2WS, CFR3WS with light brown color, High Power Products with Grey-green
  正常尺寸涂标准米黄色底漆，CFR1WS、CFR2WS、CFR3WS 涂浅棕色底漆，高功率产品涂灰绿色底漆
- For any special inquiry such as too Low or too High ohmic values is availabie on a case to case basis
  特殊要求，含超高、超低阻值也可特别安排生产

Performance Specification(性能)

Temperature coefficient	温度系数	≤10 Ω: ±300PPM/℃; 11Ω~99KΩ: ±450PPM/℃ 100KΩ~1MΩ: 0~-700PPM/℃; 1.1MΩ~10MΩ: 0~-1500PPM/℃;
Short-time Overload	短时间过负荷	CFR Products（CFR 产品）：ΔR/R：±(1%+0.05 Ω) CPR Products（CPR 产品）：ΔR/R：±(0.75%+0.05 Ω)
Dielectric withstanding voltage	绝缘耐压	With no evidence of flashover,mechanical damage,arcing or insulation breakdown （无击穿 · 飞弧及可见机械损伤）
Terminal strength	端子强度	No evidence of mechanical damage （无可见机械损伤）
Soldering heat	耐焊接热	ΔR/R：±(1%+0.05 Ω) with no evidence of mechanical damage（无可见机械损伤）
Solderability	可焊性	Coverage must be over 95%.
Resistance to solvent	耐熔剂	No deterioration of protective coating and markings（包封层，色码完整）
Rapid change of temperature	温度快速变化	ΔR/R：±(1%+0.05 Ω) with no evidence of mechanical damage（无可见机械损伤）
Load life in humidity	湿度寿命	CFR Ordinary Products (CFR 普通产品)：ΔR/R ±3%for ＜ 100KΩ ,±5% for ≥100KΩ CFR Flame retardant type(CFR 不燃性): ΔR/R ±5%for ＜ 100KΩ ,±10%for ≥100KΩ High Power Products（高功率产品):ΔR/R ±(3%+0.05Ω)
Load life	负载寿命	CFR Ordinary Products（普通产品）：ΔR/R ±2%for ＜ 56KΩ ,±3%for ≥56KΩ CFR Flame retardant type (CFR 不燃性产品): ΔR/R ±5%for ＜ 100KΩ ,±10%for ≥100KΩ High Power Products（高功率产品):ΔR/R ±(3%+0.05Ω)

Ordering Procedure (Example: CFR 1/4WS 5% 10Ω T/B-5000)

订购方式 (例如: CFR1/4WS 5% 10Ω T/B-5000)

C F R 0 S 4 J 0 1 0 0 A 5 0

Product Type (产品类型):
CFR=Carbon Film Fixed Resistors (碳膜固定电阻器)
CPR=Carbon Film Power Resistors (高功率碳膜电阻器)

Wattage (功率):
W8=1/8W
W4/=1/4W
W2=1/2W
1W=1W
2W=2W
S4=1/4W-S
1S=1W-S
2S=2W-S
3S=3W-S

Special Feature (特征):
0 = Standard（标准产品）
F = Flame Retardant（阻燃型）
I = Non-Inductive（无感型）

Tolerance (公差):
G = ± 2%
J = ± 5%
K = ± 10%

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数，第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数，第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box（编带 / 盒装）
T=Tape/Reel（编带 / 卷装）
B=Bulk/Box（散装 / 盒装）
P=Tape/Box of PT-26 product
编带（PT-26 产品）/ 盒装

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
（散装 / 盒装）

Additional Information(注):
0=NIL(标准品)
P=Panasert type
1=Avisert type 1
2=Avisert type 2
3=Avisert type 3
8=PT-58mm
9=PT-64mm
7=Lead wire(H)38mm
A=PT-83mm
C=PT-73mm
D=PT-71mm
B=PT-52mm

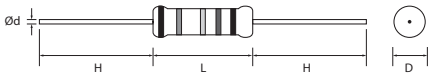
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

Feature (特性)

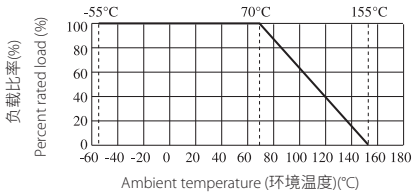
- EIA standard color. EIA标准色码
- Flame Retardant type available 可提供不燃性漆
- Low noise & voltage coefficient 噪声低，电压系数小
- Low temperature coefficient range 温度系数低
- Multiple epoxy coating on vacuum-deposited metal film provideds superior moisture protection
  真空溅射金属皮膜涂多层环氧树脂，防水性效果好
- Nichrome resistive element provides stable performance in various environments
  镍基金属膜层的采用使各项性能更加稳定



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Specification(性能)

Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					MAX. Working Voltage 最大工作电压	MAX. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	
			D	L	d ±0.05	H±3	PT			可燃性 Flammability	不燃性 Flame Retardance
MF0W8	MF-12	1/8W	1.9±0.3	3.3±0.3	0.45	28	52	200V	400V	400V	200V
MF0S4	MF-25-S	1/4W-S	1.9±0.3	3.3±0.3	0.45	28	52			400V	200V
MF004	MF-40-SS	0.4W-SS	1.9±0.5	3.3±0.3	0.45	28	52	200V	400V	400V	200V
MF0W4	MF-25	1/4W	2.2±0.3	6.5±1.0	0.54	28	52	250V	500V	500V	250V
MF0S2	MF-50-S	1/2W-S	2.2±0.5	6.5±1.0	0.54	28	52	250V	500V	/	250V
MF0W2	MF-50	1/2W	3.5±0.6	9.5±1.0	0.54	28	52	350V	700V	700V	250V
MF006	MF-60-S	0.6W-S	2.2±0.5	6.5±1.0	0.54	28	52	250V	500V	500V	250V
MF01S	MF-100-S	1W-S	3.5±0.6	9.5±1.0	0.54	28	52	350V	700V	700V	250V
MF01W	MF-100	1W	4.5±0.6	11.5±1.0	0.70	25	52	500V	1000V	1000V	350V
MF02S	MF-200-S	2W-S	4.5±0.6	11.5±1.0	0.70	25	52	500V	1000V	1000V	350V
MF02W	MF-200	2W	5.0±0.6	15.5±1.0	0.70	28	64	500V	1000V	1000V	350V
MF03S	MF-300-S	3W-S	5.0±0.6	15.5±1.0	0.70	28	64	500V	1000V	1000V	350V
MF03W	MF-300	3W	6.0±0.6	17.5±1.0	0.75	28	64	500V	1000V	1000V	500V

Part No 料号	Type 类型	Standard Order 标准品			Special Order 特殊订购品		
		Tolerance 公差	Resistance Range 阻值范围	TCR温度系数 (ppm/°C)	Tolerance 公差	Resistance Range 阻值范围	TCR温度系数 (ppm/°C)
MF0W8 **MF0S4** **MF004**	MF0W8 MF0S4 MF004	±1%	10Ω~1MΩ	±50	±0.25%	51.1Ω~200KΩ	±15
		±2%	10Ω~1MΩ	±100	±0.5%	51.1Ω~511KΩ	±25
		±5%	1Ω~1MΩ	±200	±0.5%	51.1Ω~511KΩ	±50
MF0W4 **MF0S2** **MF006**	MF-25 MF-50-S MF-60-S	±1%	10Ω~1MΩ	±50	±0.1%	10Ω~1MΩ	±15
		±2%	1Ω~1MΩ	±100	±0.25%	10Ω~1MΩ	±25
		±5%	1Ω~1MΩ	±200	±0.5%	10Ω~1MΩ	±50
MF0W2 **MF01S**	MF-50 MF-100-S	±1%	10Ω~1MΩ	±50	±0.1%	100Ω~330KΩ	±15
		±2%	10Ω~1MΩ	±100	±0.25%	51.1Ω~511KΩ	±25
		±5%	1Ω~1MΩ	±200	±0.5%	10Ω~1MΩ	±50
MF01W **MF02S** **MF02W** **MF03S** **MF03W**	MF-100 MF-200-S MF-200 MF-300-S MF-300	±1%	51.1Ω~1MΩ	±50	±0.1%	100Ω~330KΩ	±15
		±2%	51.1Ω~1MΩ	±100	±0.25%	51.1Ω~511KΩ	±25
		±5%	1Ω~1MΩ	±200	±0.5%	51.1Ω~1MΩ	±50

Performance Specification(性能)

Short-time Overload	短时间过负荷	ΔR/R ：±(0.5%+0.05 Ω),with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	With no evidence of flashover, mechanical damage,arcing or insulation breakdown (无击穿 · 飞弧及可见机械损伤)
Pulse Overload	脉冲过负荷	ΔR/R ：±(1%+0.05Ω),with noevidence of mechanical damage (无可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage （无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R ：±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Resistance to solvent	耐熔剂	No deterioration of protective coating and markings (包封层，色码完整)
Rapid change of temperature	温度快速变化	ΔR/R : ±(1%+0.05 Ω) with no evidence of mechanical damage （无可见机械损伤)
Load life in humidity	湿度寿命	Normal type(普通型):ΔR/R ≤ ±1.5% & Flame retardant type(阻燃性): ΔR/R ≤ ±5%
Load life	负载寿命	Normal type(普通型):ΔR/R ≤ ±1.5% & Flame retardant type(阻燃性): ΔR/R ≤ ±5%

Ordering Procedure (Example: MF 1/8W 1% 47.5KΩ T/R-5000)

订购方式 (例如: MF 1/8W 1% 47.5KΩ T/R-5000)

M F 0 W 8 F F 4 7 5 2 T 5 0

Product Type (产品类型):
MF=Precision Metal Film Fixed Resistors
(精密金属膜固定电阻器)

Special Feature (特征):
0=Standard(标准品)
F=Flame retardant (阻燃型)
I=Non-Inductive (无感型)

Wattage (功率):
W8=1/8W S4=1/4WS
W4=1/4W 04=0.4W-SS
S2=1/2WS W2=1/2W
06=0.6W-S 1S=1W-S
1W=1W 2S=2W-S
2W=2W 3S=3W-S
3W=3W

Tolerance (公差):
B=±0.1%
C=±0.25%
D=±0.5%
F=±1%
G=±2%
J=±5%

PPM requirement:
B=15PPM
C=25PPM
F=50PPM
G=100PPM
J=200PPM

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box （散装 / 盒装)
P=Tape/Box of PT-26 product
编带 （PT-26 产品） / 盒装

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
（散装 / 盒装)

Additional Information(注):
0=NIL(标准品)
P=Panasert type
1=Avisert type 1
2=Avisert type 2
3=Avisert type 3
8=PT-58mm
9=PT-64mm
7=Lead wire(H)38mm
A=PT-83mm
C=PT-73mm
D=PT-71mm
B=PT-52mm

New/Old Part.no Contrast (新旧料号对照)

New Part.no 新料号	Old Part.no 旧料号
MF0W8FF**A*0**	MFR0W8F****A*0
MF0S4FF**A*0**	MFR0S4F****A*0
MF004FF**A*0**	MFR004F****A*0
MF0W4FF**A*0**	MFR0W4F****A*0
MF0S2FF**A*0**	MFR0S2F****A*0
MF0W2FF**A*0**	MFR0W2F****A*0
MF006FF**A*0**	MFR006F****A*0

New Part.no 新料号	Old Part.no 旧料号
MF01SFF**A*0**	MFR01SF****A*0
MF01WFF**A*0**	MFR01WF****A*0
MF02SFF**A*0**	MFR02SF****A*0
MF02WFF**A*0**	MFR02WF****A*0
MF03SFF**A*0**	MFR03SF****A*0
MF03WFF**A*0**	MFR03WF****A*0

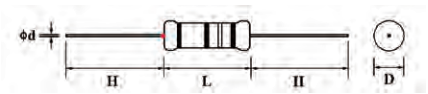
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

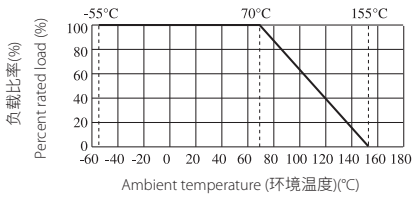
- High power in small body size 体积小功率高
- Excellent flame Retardant coating 优异不燃性涂装
- High stablity even in bad environment 恶劣环境下同样稳定工作
- Match the safety requirement 满足安全标准要求



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					MAX.Working Voltage 最大工作电压	MAX.Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围
			D	L	d ±0.05	H±3	PT				
PMR01S	PMR-100-S	1WS	2.2±0.5	6.5±1.0	0.54	28	52	350V	400V	350V	0.56Ω~1MΩ
PMR02S	PMR-200-S	2WS	4.0±0.6	11.5±1.0	0.70	25	52	500V	600V	350V	3.9Ω~680KΩ
PMR03S	PMR-300-S	3WS	5.0±0.6	15.5±1.0	0.75	28	64	750V	800V	350V	12Ω~180KΩ

Performance Specification(性能)

Temperature coefficient 温度系数	1W-S : 0.56Ω~100KΩ: ±350PPM/℃; 101KΩ~470KΩ: ±400PPM/℃; 471KΩ~1MΩ: ±800PPM/℃ 2W-S : ±350PPM/℃ (3.9Ω~100KΩ); ±400PPM/℃ (101KΩ~680KΩ) 3W-S : ±350PPM/℃ (12Ω~100KΩ); ±400PPM/℃ (101KΩ~180KΩ)
Short-time Overload 短时间过负荷	ΔR/R : ±(2%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤)
Terminal strength 端子强度	with no evidence of mechanical damage (无可见机械损伤)
Soldering heat 耐焊接热	ΔR/R : ±(1%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤)
Solderability 可焊性	Coverage must be over 95%.
Rapid change of temperature 温度快速变化	ΔR/R : ±(2%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity 湿度寿命	1W-S: ΔR/R : ±(5%+0.05 Ω) 2W-S&3W-S: <100KΩ: ΔR/R : ±(5%+0.05 Ω) ≥100KΩ: ΔR/R : ±(10%+0.05 Ω)
Load life 负载寿命	1W-S : ΔR/R : ±(5%+0.05 Ω) 2W-S&3W-S: <100KΩ: ΔR/R : ±(5%+0.05 Ω) ≥100KΩ: ΔR/R : ±(10%+0.05 Ω)
Flame retardant 阻燃	Resistor insulation is self-extinguishing within 10 seconds after externally applied flame is removed 火焰移开后 10 秒内，电阻自动绝燃，无可见火焰

Ordering Procedure (Example: PMR1WS 5% 100Ω T/B-5000)

订购方式 (例如: PMR1WS 5% 100Ω T/B-5000)

P M R 0 1 S J 0 1 0 1 A 5 0

Product Type (产品类型):
PMR= Power Metal Fixed Resistors
功率型金属膜固定电阻器

Special Feature (特征):
0=Standard(标准品)

Wattage (功率):
1S=1WS
2S=2WS
3S=3WS

Tolerance (公差):
G=±2% J=±5%

Resistance Value (阻值):
2%, 5% (E-24 series):
the 1st digit is "0"; the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列电阻):
第 1 位是 0，第 2,3 位表示阻值的有效数，第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
1=1,000pcs 2=2,000pcs 3=3,000pcs
4=4,000pcs 5=5,000pcs A=500pcs
B=2,500pcs 0=Bulk/Box (散装 / 盒装)

Additional Information(注):
0=NIL(标准品)
P=Panasert type 1=Avisert type 1
2=Avisert type 2 3=Avisert type 3
8=PT-58mm 9=PT-64mm
7=Lead wire(H)38mm A=PT-83mm
C=PT-73mm D=PT-71mm
B=PT-52mm

New/Old Part.no Contrast (新旧料号对照)

New Part.no 新料号	Old Part.no 旧料号
PMR01SJ**A*0**	MPR01WJ****A*0
PMR03SJ**A*0**	MPR03WJ****A*0

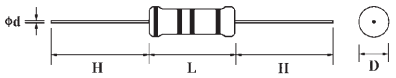
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

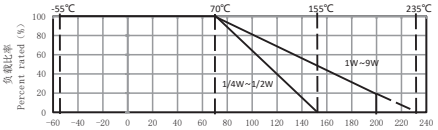
- Excellent flame retardant coating 优异不燃性涂装
- High stability even in bad environment
  恶劣环境下同样稳定工作
- High purity ceramic core 高纯度瓷芯
- Meet EIA-RC2655A requirements 满足EIA-RC2655A标准要求
- High safety standard 满足安全性标准要求



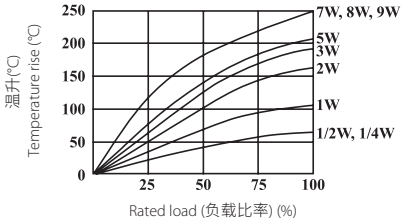
Dimension(尺寸) mm



Derating Curve (降功率曲线)



Heat Rise Chart (表面温升)



Specification(性能)

Part No. 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					MAX. Working Voltage 最大工作电压	MAX. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围
			D	L	d ±0.05	H±3	PT				
MOR0W4	MOR-25	1/4W	2.2±0.5	6.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~470KΩ
MOR0S2	MOR-50-S	1/2W-S	2.2±0.5	6.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~470KΩ
MOR0W2	MOR-50	1/2W	3.0±0.6	9.5±1.0	0.54	28	52	250V	400V	250V	0.1Ω~560KΩ
MOR01S	MOR-100-S	1W-S	3.5±0.6	9.5±1.0	0.54	28	52	350V	600V	350V	0.1Ω~560KΩ
MOR01W	MOR-100	1W	4.5±0.6	11.5±1.0	0.70	25	52	350V	600V	350V	0.1Ω~560KΩ
MOR02S	MOR-200-S	2W-S	4.5±0.6	11.5±1.0	0.70	25	52	350V	600V	350V	0.1Ω~560KΩ
MOR02W	MOR-200	2W	5.0±0.6	15.5±1.0	0.70	28	64	350V	600V	350V	0.1Ω~560KΩ
MOR03S	MOR-300-S	3W-S	5.0±0.6	15.5±1.0	0.70	28	64	350V	600V	350V	0.1Ω~560KΩ
MOR03W	MOR-300	3W	6.0±0.6	17.5±1.0	0.75	28	64	500V	800V	500V	0.1Ω~560KΩ
MOR05S	MOR-500-S	5W-S	6.0±0.6	17.5±1.0	0.75	28	64	500V	800V	500V	0.1Ω~560KΩ
MOR05W	MOR-500	5W	8.0±0.6	24.5±1.0	0.75	38	90&B/B	750V	1000V	750V	0.1Ω~680KΩ
MOR07W	MOR-700	7W	8.0±0.6	29.5±1.0	0.75	38	B/B	750V	1000V	750V	20Ω~150KΩ
MOR08W	MOR-800	8W	8.0±0.6	39.5±1.0	0.75	38	B/B	750V	1000V	750V	30Ω~200KΩ
MOR09W	MOR-900	9W	8.0±0.6	52.5±1.0	0.75	38	B/B	750V	1000V	750V	50Ω~200KΩ

- Standard E-24 Series ±5% tolerance 标准 E-24 系列 ±5% 公差阻值
- Standard Gray base color for Normal Size product,Blue color for Small Size product 正常尺寸产品涂灰色底漆，小尺寸产品涂海蓝色底漆
- Standard Non-Flammable coating 标准不燃性涂装
- Non-Inductive type available on a case to case basis 无感，可特别生产

Performance Specification(性能)

Temperature coefficient	温度系数	1/4W,1/2W-S: ≤ 100K Ω : ±350PPM/℃ ; 100KΩ<R≤470KΩ : 0~-700PPM/℃ 1/2W,1W-S: ≤ 120K Ω : ±350PPM/℃ ; 120KΩ<R≤560KΩ : 0~-700PPM/℃ 1W,2W,2W-S,3W,3W-S,5W-S: ≤ 150K Ω: ±350PPM/℃ ; 150KΩ<R≤560KΩ : 0~-700PPM/℃ 5W : ≤ 180K Ω : ±350PPM/℃ ; 180KΩ<R≤680KΩ : 0~-700PPM/℃ 7W,8W, 9W: ±350PPM/℃
Short-time Overload	短时间过负荷	Normal size(正常尺寸), ΔR/R : ±(1%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤) Small size(小尺寸), ΔR/R : ±(2%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage,arcing or insulation breakdown (无击穿、飞弧及可见机械损伤)
Pulse Overload	脉冲过负荷	Normal size(正常尺寸), ΔR/R : ±(2%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤) Small size(小尺寸), ΔR/R : ±(5%+0.05 Ω), with no evidence of mechanical damage (无可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R : ± (1%+0.05 Ω)， with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Resistance to solvent	耐熔剂	No deterioration of protective coating and markings (包封层，色码完整)
Rapid change of temperature	温度快速变化	ΔR/R : ± (2%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Humidity (Steady State)	恒定湿热	ΔR/R : ± (2%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	<100kΩ: ± (5%+0.05Ω) ≥100kΩ: ±(10%+0.05Ω)
Load life	负载寿命	<100kΩ: ± (5%+0.05Ω) ≥100kΩ: ±(10%+0.05Ω)
Flame retardant	阻燃	Resistor insulation is self-extinguishing within 10 seconds after externally applied flame is removed （火焰移开后 10 秒内，电阻自动绝燃，无可见火焰）

Ordering Procedure (Example: MOR 1W-S 5% 8.2Ω T/B-1000)

订购方式 (例如: MOR 1W-S 5% 8.2Ω T/B-1000)

M O R 0 1 S J 0 8 2 J A 1 0

Product Type (产品类型):
MOR=Metal Oxide Film Fixed Resistors
(金属氧化膜固定电阻器)

Special Feature (特征):
0=Standard(标准品)
I=Non-Inductive (无感型)

Wattage (功率):

W4=1/4W	S2=1/2W- S	W2=1/2W
1S=1W-S	1W=1W	2S=2W-S
2W=2W	3S=3W-S	3W=3W
5S=5W-S	5W=5W	7W=7W
8W=8W	9W=9W	

Tolerance (公差):
G=±2% J=±5% K=±10%

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)
P=Tape/Box of PT-26 product
编带 (PT-26 产品) / 盒装

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):
0=NIL(标准品)

P=Panasert type	1=Avisert type 1
2=Avisert type 2	3=Avisert type 3
8=PT-58mm	9=PT-64mm
7=Lead wire(H)38mm	
A=PT-83mm	C=PT-73mm
D=PT-71mm	B=PT-52mm

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

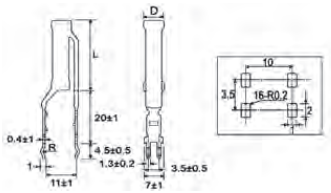
Feature (特性)

- Excellent flame retardant coating 优异不燃性涂装
- High Stability even in bad environment 恶劣环境下同样稳定工作
- High purity ceramic core 高纯度瓷芯
- High safety standard 电器性能稳定
- Meet EIAJ-RC2655A requirements 达到 EIAJ-RC2655A 标准要求
- Too low or too high Resistance value can be provided case by case
  超低或超高阻值也能特别提供



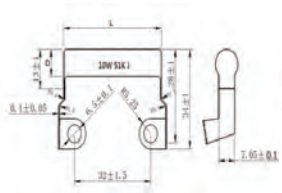
Vertical type - TMOV

端片 MOR 电阻-立式 (TMOV)

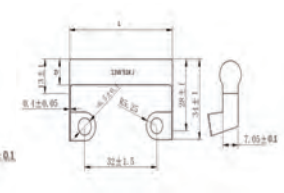


"L" type terminal - TMOL

端片 MOR 电阻-L型端片 (TMOL)



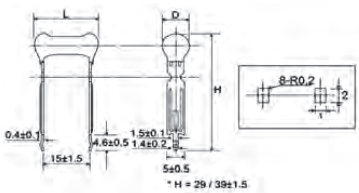
TMOL 10W



TMOL 13W

Radial type - TMOR

端片 MOR 电阻-卧式 (TMOR)



Specification(性能)

Part No 料号	Type 类型	Power Rating 额定功率	Dimension(尺寸) (mm)		MAX. Working Voltage 最大工作电压	MAX. Overload Voltage 最大过负荷电压	Resistance Range 阻值范围	Tolerance 精度 (%)
			L±1	D±1				
TMOV5W	TMOV-500	5W	20	7	500V	800V	≤ 10Ω	±10%
							10Ω~10KΩ	±5%
TMOV7W	TMOV-700	7W	30	7	500V	800V	≤ 10Ω	±10%
							10Ω~10KΩ	±5%
TMOLAW	TMOL-10W	10W	46Max 最大	10Max 最大	500V	800V	100Ω~82KΩ	±5%
TMOLDW	TMOL-13W	13W	47	10	750V	1000V	100Ω~82KΩ	±5%
TMOR3W	TMOR-300	3W	16	6	350V	600V	≤ 10Ω	±10%
							10Ω~43KΩ	±5%
TMOR5W	TMOR-500	5W	18	7	500V	800V	≤ 10Ω	±10%
							10Ω~43KΩ	±5%

Ordering Procedure (Example: TMOV5W 5% 1KΩ B/B)

订购方式 (例如: TMOV5W 5% 1KΩ B/B)

T M O V 5 W J 0 1 0 2 B 0 0

Product Type (产品类型):
TMOV= Terminal type MOR-VERTICAL
端片类型MOR电阻-立式
TMOR= Terminal type MOR-RADIAL
端片类型MOR电阻-卧式
TMOL= Terminal type MOR-"L"type terminal
端片类型MOR电阻-"L"式

Wattage (功率):
3W=3W
5W=5W
7W=7W
AW=10W
DW=13W

Tolerance (公差):
J=±5% K=±10%

Resistance Value (阻值):
5% & 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):
0=NIL(标准品)
L=TMOR H39mm

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Metal Glaze Film Fixed Resistors - MGR

金属玻璃釉膜固定电阻器 - MGR系列

ROYALOHM
www.royalohm.com

Feature (特性)

- Provide high stable performance against environment conditions & overload voltage
  耐高压，稳定性强，抗湿热高温环境
- Can withstand High Surge Voltage 可承受高浪涌电压
- Wide resistance range & low TCR 阻值范围宽，温度系数低
- VDE According to IEC62368,VDE items available (File NO:40011056)
  VDE根据IEC62368标准，产品VDE 认证（认证号：40011056）
- UL According to UL1676,UL items available (File NO:E244546)
  UL根据UL1676标准，产品UL安规 认证（认证号： E244546）

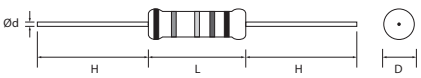


The tolerance ±5% has five color codes, and the last one is marked in black
公差 ±5% 有五道色码，最后一道以黑色标示

Tolerance ±1% with 5 color codes
公差 ±1% 有 5 道色码

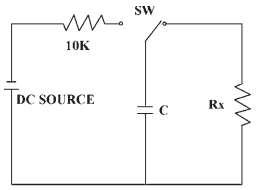
Dimension

(尺寸) mm



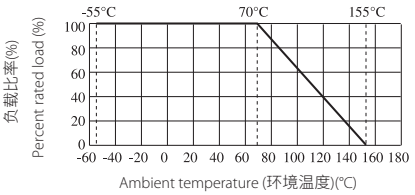
Surge Withstanding Voltage

(承受浪涌电压)



Derating Curve

(降功率曲线)



- SW:Switch开关； C:Electric capacity电容； Rx:Resistance under test被测试电阻
- The applied DC source voltage is shown as below table. 电路中的直流电压如下表 " 承受浪涌电压 " 所述 .

Specification(性能)

Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)				MAX. Working Voltage 最大工作电压	MAX. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Surge Withstanding Voltage 浪涌电压	Surge Withstanding Voltage Test Condition 浪涌电压试验条件	Resistance Range 阻值范围
			D	L	d±0.05	H±3						
Normal Size(正常尺寸)												
MGR0W4	MGR-25	1/4W	2.2±0.5	6.5±1.0	0.60	28	1,600V	2,000V	700V	100KΩ~1M:3kV 1M1~6M2: 4kV ≥6M8: 6kV	2.5 seconds"ON",2.5 seconds "OFF",10 cycles, C=0.01uf. 2.5 秒 " 通 ",2.5S " 断 ",10 次循环，电容值C=0.01uf.	1KΩ~510MΩ (±5%,±10%) 1KΩ≤R≤10MΩ(±1%) 10MΩ~100MΩ(±2%)
MGR0W2	MGR-50	1/2W	3.5±0.6	9.5±1.0	0.60	28	3,500V	4,000V	1000V			
MGR01W	MGR-100	1W	4.0±0.6	11.5±1.0	0.75	25	3,500V	4,000V	1000V	≥100KΩ:10kV	2.5 seconds"ON",2.5 "OFF",50 cycles, C=0.001uf. 2.5 秒 " 通 ",2.5秒 " 断 ",50 次循环，电容值C=0.001uf.	1KΩ~1GΩ (±5%,±10%) 1KΩ≤R≤10MΩ(±1%) 10MΩ~100MΩ(±2%)
MGR02W	MGR-200	2W	5.0±0.6	15.5±1.0	0.75	28	3,500V	4,000V	1000V			
MGR03W	MGR-300	3W	6.0±0.6	17.5±1.0	0.80	28	3,500V	4,000V	1000V			1KΩ~100MΩ (±5%,±10%) 100KΩ~1MΩ(±1%)

*MGR 1/4W可特别提供：50次循环，电容值C=0.001uf. 浪涌电压10Kv
* MGR 1/4W can specially provide ：50 cycles, C=0.001uf.. Surge Withstanding Voltage 10kV

Small Size&Ultra Small Size(小型尺寸)												
MGR0S2	MGR-50-S	1/2W-S	2.2±0.5	6.5±1.0	0.60	28	500V	700V	500V	100KΩ~1M:3kV 1M1~6M2: 4kV ≥6M8: 6kV	2.5 seconds"ON",2.5 seconds "OFF",10 cycles, C=0.01uf. 2.5 秒 " 通 ",2.5S " 断 ",10 次循环，电容值C=0.01uf.	1KΩ~33MΩ (±5%,±10%) 100KΩ~1MΩ (±1%)
MGR01S	MGR-100-S	1W-S	3.5±0.6	9.5±1.0	0.60	28	700V	1000V	700V	100KΩ~1M:4kV 1M1~6M2: 5kV ≥6M8: 8kV		
MGR02S	MGR-200-S	2W-S	4.5±0.6	11.5±1.0	0.75	25	1000V	1400V	700V	100KΩ~1M:5kV 1M1~6M2: 6kV ≥6M8: 9kV		
MGR03U	MGR-300-SS	3W-SS	4.5±0.6	11.5±1.0	0.75	25	1000V	1400V	700V			
MGR03S	MGR-300-S	3W-S	5.0±0.6	15.5±1.0	0.75	28	1000V	1400V	700V	100KΩ~1M:8kV 1M1~6M2: 9kV ≥6M8: 10kV		

Performance Specification(性能)

Temperature coefficient	温度系数	±200PPM°C
Short-time Overload	短时间过负荷	ΔR/R: ±(1%+0.05 Ω),with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	With no evidence of flashover,mechanical damage,arcing or insulation breakdown (无击穿 · 飞弧及可可见机械损伤)
Pulse Overload	脉冲过负荷	ΔR/R: ±(2%+0.05),with no evidence of mechanical damage (无可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R: ±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Resistance to solvent	耐熔剂	No deterioration of protective coating and marking (包封层，色码完整)
Rapid change of temperature	温度快速变化	ΔR/R: ±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R: ±(5%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Load life	负载寿命	ΔR/R: ±(5%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Surge Withstanding Voltage	尖峰脉冲	ΔR/R: ±(20%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: MGR 1W 5% 27MΩ T/B-1000)

订购方式 (例如: MGR 1W 5% 27MΩ T/B-1000)

M G R 0 1 W J 0 2 7 6 A 1 0

Product Type (产品类型):
MGR=Metal Glaze Film Fixed Resistors
(金属玻璃釉膜固定电阻器)

Special Feature (特征):
0=Standard(标准品)

Wattage (功率):

W4=1/4W	S2=1/2W-S	W2=1/2W
1S=1W-S	1W=1W	2S=2W-S
2W=2W	3U=3W-SS	3S=3W-S
3W=3W		

Tolerance (公差):
F=±1% G=±2% J=±5%

Resistance Value (阻值):
5% & 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
1%(E-24,E-96 Series)
The 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros:
1% 产品 (E-24,E-96 系列阻值)
第 1~3 位表示阻值的有效数，第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)
P=Tape/Box of PT-26 product
编带 (PT-26 产品) / 盒装

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):

0=NIL(标准品)	
P=Panasert type	1=Avisert type 1
2=Avisert type 2	3=Avisert type 3
8=PT-58mm	9=PT-64mm
7=Lead wire(H)38mm	
A=PT-83mm	C=PT-73mm
D=PT-71mm	B=PT-52mm

New/Old Part.no Contrast (新旧料号对照)

New Part.no 新料号	Old Part.no 旧料号
MGR0J*********	HMGR**J*******
MGR0J********	HVR0**J*******
MGR*S2*******	MGR*U2********

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

High Voltage Non Inductive Resistance - MGRN

高压无感电阻器 - MGRN系列

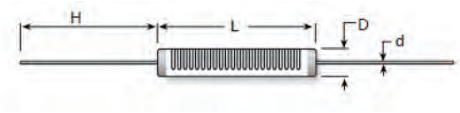
ROYALOHM
www.royalohm.com

Feature (特性)

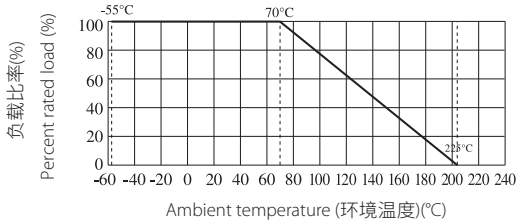
- low temperature coefficien combines proprietary non inductive resistance system and design to achieve.
  低温系数结合了专有的非感应电阻系统和设计
- low temperature coefficient, low voltage coefficients.
  以实现低温系数 、低压系数
- High stability and increased high operating voltages.
  高稳定性和高工作电压



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Part No 料号	Type 类型	Dimension (尺寸)(mm)				Max.working Voltage 最大工作电压	Max.overload Voltage 最大过负荷电压	Resistance Range 阻值范围
		L±1	D±1	H±2	d±0.05			
MGRN8W	MGRN-8W	51	8	35	1.0	20kV	20kV	1M~500MΩ
MGRN10W	MGRN-10W	115	8	35	1.0	35kV	50kV	1M~500MΩ

Performance Specification(性能)

Temperature Coefficient	温度系数	±200ppm/℃
Load life	寿命	△R/R:±(3%+0.1Ω)
Short-time overload	短时间过负荷	△R/R:±(3%+0.1Ω),no evidence of mechanical damager(无可见机械损伤)
Insulation resistance	绝缘阻值	≥1000MΩ
Rapid change of temperature	温度快速变化	△R/R:±(3%+0.1Ω),no evidence of mechanical damager(无可见机械损伤)
Humidity(Steady State)	恒定湿热	△R/R:±(3%+0.1Ω),no evidence of mechanical damager(无可见机械损伤)

Ordering Procedure (Example: MGRN 10W±2% 200MΩB/B)

订购方式 (例如: MGRN 10W±2% 200MΩB/B)

M G R N A W G 0 2 0 7 B 0 0

Product Type (产品类型):
MGR=Metal Glaze Film Fixed Resistors
(金属玻璃釉膜固定电阻器)

Special Feature(特征):
N=Non-Inductive and High Voltage(无感高压大功率型)

Wattage (功率):
8W=8W
AW=10W

Tolerance (公差):
G=±2%
J=±5%
K=±10%

Resistance Value (阻值):
2% 5%,10%(E-24 series):
The 1st digit is will be "0",the 2nd & 3rd digits are for the significant figures of the resistace and the 4th digits or letter indicate the number of zeros
第1位是0，第2.3位表示阻值的有效数，第4位表示有几个0
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type: (包装类型):
B=Bulk/Box
散装/盒装

Packing Quantity: (包装数量):
B=Bulk/Box
散装/盒装

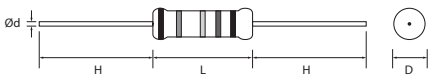
Additional Information (注):
0=Standard product

Feature (特性)

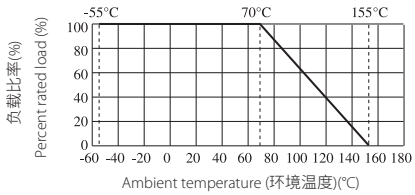
- Ideal circuit opening controller,disconnecting units from overload rating specified .
  理想的电流过负荷保护组件
- Too low or too high ohmic value can be supplied on a case to case to case basis.
  超高或超低阻值也能特别生产
- According to UL1412,UL items available (File NO:E306074)
  根据UL1412标准，产品UL安规认证（认证号：E306074)



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Specification(性能)

Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围
			D	L	d ±0.05	H±3	PT		
FRN0W4	FRN-25	1/4W	2.2±0.5	6.5±1.0	0.60	28	52	300V	0.22Ω~10KΩ
FRN0S2	FRN-50-S	1/2W-S	2.2±0.5	6.5±1.0	0.60	28	52	300V	0.22Ω~10KΩ
FRN004	FRN-40	0.4W	2.2±0.5	6.5±1.0	0.60	28	52	300V	0.22Ω~10KΩ
FRN0W2	FRN-50	1/2W	3.0±0.5	9.0±1.0	0.60	28	52	350V	0.22Ω~10KΩ
FRN075	FRN-75	3/4W	3.5±0.6	9.5±1.0	0.54	28	52	350V	0.22Ω~10KΩ
FRN01W	FRN-100	1W	3.5±0.6	9.5±1.0	0.54	28	52	350V	0.22Ω~10KΩ
FRN01A	FRN-150	1.5W	4.5±0.6	11.5±1.0	0.70	25	52	600V	0.22Ω~10KΩ
FRN02W	FRN-200	2W	4.5±0.6	11.5±1.0	0.70	25	52	600V	0.22Ω~10KΩ
FRN03W	FRN-300	3W	5.0±0.6	15.5±1.0	0.80	28	64	600V	0.22Ω~10KΩ

Fusing Characteristics (熔断特性)

Resistance Value (阻值)	Test Wattage (测试功率)	Fusing Time (熔断时间)
≤2.2Ω	32 X Power Rating (额定功率)	≤ 60 seconds (秒)
>2.2Ω	16 X Power Ratring (额定功率)	≤ 60 seconds (秒)

The fusing test current or voltage should be stable, change within 5%. (测试电流或电压必须稳定变化率不超过 5%)

Performance Specification(性能)

Temperature coefficient	温度系数	±350PPM/℃
Short-time Overload	短时间过负荷	ΔR/R：±(2%+0.05 Ω),with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	With no evidence of flashover,mechanical damage,arcing or insulation breakdown (无击穿 · 飞弧及可可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage （无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R：±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	ΔR/R : ±(2%+0.05 Ω）with no evidence of mechanical damage（无可见机械损伤）
Load life in humidity	湿度寿命	ΔR/R : ±(5%+0.05 Ω）with no evidence of mechanical damage（无可见机械损伤）
Load life	负载寿命	ΔR/R : ±(5%+0.05 Ω）with no evidence of mechanical damage（无可见机械损伤）
Flame retardant	阻燃	Resistor insulation is self-extinguishing within 10 seconds after externally applied flame is removed （火焰移开后 10S 内，电阻自动绝燃，无可见火焰）

Ordering Procedure (Example: FRN 1W 5% 1Ω T/B-1000)

订购方式 (例如: FRN 1W 5% 1Ω T/B-1000)

F R N 0 1 W J 0 1 0 J A 1 0

Product Type (产品类型):
FRN=Fusible Resistors
(保险丝电阻器)

Special Feature (特征):
0=Standard(标准品)

Wattage (功率):
W4=1/4W W2=1/2W
1W=1W 2W=2W
3W=3W S2=1/2W-S
04 = 0.4W 75=3/4W
1A=1.5W

Tolerance (公差):
G=±2% J=±5%
K=±10%

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
3=3,000pcs
4=4,000pcs
5=5,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):
0=NIL(标准品)
P=Panasert type 1=Avisert type 1
2=Avisert type 2 3=Avisert type 3
8=PT-58mm 9=PT-64mm
7=Lead wire(H)38mm
A=PT-83mm C=PT-73mm
D=PT-71mm B=PT-52mm

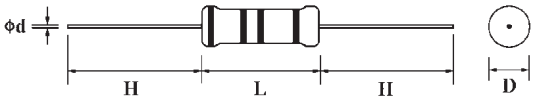
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

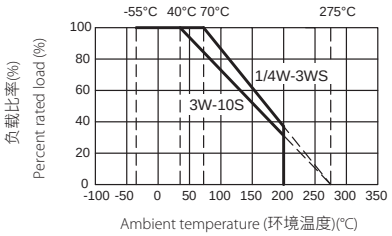
- Excellent flame retardant coating 优异不燃性涂装
- Too low or too high ohmic value can be supplied on a case to basis
  超低阻值或超高阻值都可特别提供
- Non-inductive type available
  可特别提供无感型产品



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Specification(性能)

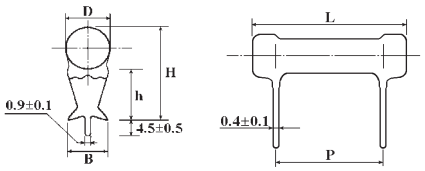
Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					Resistance Range 阻值范围	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Tolerance 公差
			D±1	L±1	d ±0.05	H±3	PT					
KNP0W4	KNP-25	1/4W	2.5	6.5	0.54	28	52	0.01Ω~200Ω	500V	1000V	350V	±1% ±2% ±5% ±10%
KNP0S2	KNP-50-S	1/2W-S	2.5	6.5	0.54	28	52	0.01Ω~200Ω	500V	1000V	350V	
KNP0W2	KNP-50	1/2W	3.0	9.5	0.54	28	52	0.01Ω~390Ω	500V	1000V	350V	
KNP01S	KNP-100-S	1W-S	3.0	9.5	0.54	28	52	0.01Ω~390Ω	500V	1000V	350V	
KNP01W	KNP-100	1W	4.5	11.5	0.70	25	52	0.01Ω~1.2KΩ	500V	1000V	500V	
KNP02S	KNP-200-S	2W-S	4.5	11.5	0.70	25	52	0.01Ω~1.2KΩ	500V	1000V	500V	
KNP02W	KNP-200	2W	5.5	15.5	0.70	28	64	0.01Ω~3.0KΩ	500V	1000V	500V	
KNP03S	KNP-300-S	3W-S	5.5	15.5	0.70	28	64	0.01Ω~3.0KΩ	500V	1000V	500V	
KNP03W	KNP-300	3W	6.5	17.5	0.75	28	64	0.039Ω~3.9KΩ	500V	1000V	500V	
KNP05S	KNP-500-S	5W-S	6.5	17.5	0.75	28	64	0.039Ω~3.9KΩ	500V	1000V	500V	
KNP05W	KNP-500	5W	8.5	24.5	0.75	38	90&B/B	0.082Ω~5.6KΩ	500V	1000V	500V	
KNP07S	KNP-700-S	7W-S	8.5	24.5	0.75	38	90&B/B	0.082Ω~5.6KΩ	500V	1000V	500V	
KNP07W	KNP-700	7W	8.5	29.5	0.75	38	B/B	0.1Ω~8.2KΩ	500V	1000V	500V	
KNP08S	KNP-800-S	8W-S	8.5	29.5	0.75	38	B/B	0.1Ω~8.2KΩ	500V	1000V	500V	
KNP08W	KNP-800	8W	8.5	39.5	0.75	38	B/B	0.15Ω~12KΩ	500V	1000V	500V	
KNP09S	KNP-900-S	9W-S	8.5	39.5	0.75	38	B/B	0.15Ω~12KΩ	500V	1000V	500V	
KNP09W	KNP-900	9W	8.5	52.5	0.75	38	B/B	0.22Ω~15KΩ	500V	1000V	500V	
KNP0AS	KNP-1000-S	10W-S	8.5	52.5	0.75	38	B/B	0.22Ω~15KΩ	500V	1000V	500V	

Wire-Wound Fixed Resistors - KNS、 KNH

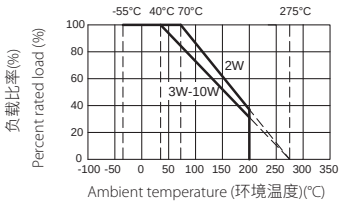
绕线型固定电阻器 - KNS、KNH系列

ROYALOHM
www.royalohm.com

KNS Type (KNS型)



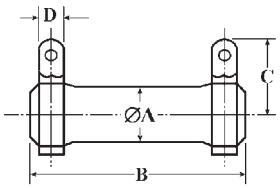
Derating Curve (降功率曲线)



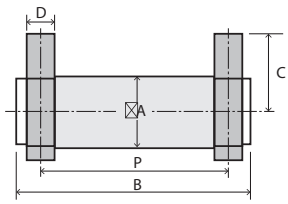


Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)						Resistance Range 阻值范围	Tolerance 公差
			D±1	L±1.5	P ±1.0	H±1.0	h±1.0	B±0.5		
KNS02W	KNS-200	2W	7.0	19.0	8	19	12	4.5	0.05Ω~470Ω	±2% ±5% ±10%
KNS03W	KNS-300	3W	7.0	21.0	10	19	13	4.5	0.068Ω~470Ω	
KNS05W	KNS-500	5W	9.0	26.0	15	21.5	13	6.5	0.01Ω~750Ω	
KNS07W	KNS-700	7W	9.0	31.0	20	21.5	13	6.5	0.1Ω~1.1KΩ	
KNS08W	KNS-800	8W	9.0	41.0	30	21.5	13	6.5	0.2Ω~2.2KΩ	
KNS0AW	KNS-1000	10W	9.0	54.0	43	21.5	13	6.5	0.3Ω~3.3KΩ	

KNH Type (KNH型)



KNHA Type (KNHA型)





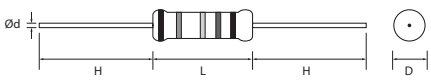
Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)				Resistance Range 阻值范围	Tolerance 公差
			A±1.5	B±1.5	C ±3	D±1		
KNH020	KNH-20W	20W	19	50	19	5	0.4Ω~10KΩ	±2% ±5% ±10%
KNH025	KNH-25W	25W	19	60	19	5	0.4Ω~10KΩ	
KNH030	KNH-30W	30W	19	75	19	5	0.5Ω~15KΩ	
KNH040	KNH-40W	40W	19	90	19	5	0.6Ω~20KΩ	
KNH050	KNH-50W	50W	31 28	75	31	8	3Ω~25KΩ	
KNH060	KNH-60W	60W	31 28	90	31	8	3Ω~30KΩ	
KNH080	KNH-80W	80W	31 28	115	31	8	3Ω~40KΩ	
KNH100	KNH-100W	100W	31 28	140	31	8	3Ω~50KΩ	
KNHA25	KNHA-25W	25W	21	41	24	5	0.4Ω~10KΩ	
KNHA30	KNHA-30W	30W	21	42	24	5	0.4Ω~10KΩ	

Feature (特性)

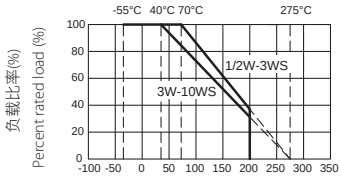
- Excellent flame retardant coating 优异不燃性漆
- Too low or too high ohmic value can be supplied on a case to case basis
  超低或超高阻值都可特别提供
- Non-inductive production process 无感的制作工艺



Dimension(尺寸) mm



Derating Curve (降功率曲线)



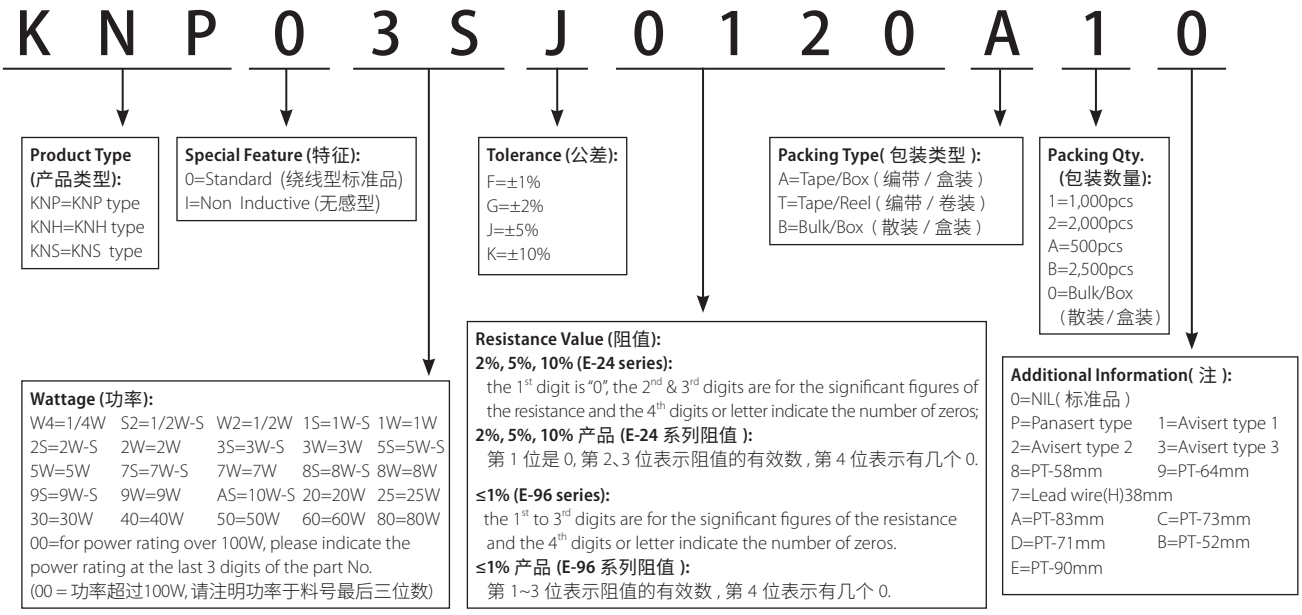
Part No 料号	Type 类型	Dimension (尺寸)(mm)					Resistance Range 阻值范围	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Tolerance 公差
		D±1	L±1	d±0.05	H±3	PT					
KNPIW2	KNPI-50	3.0	9.5	0.54	28	52	0.01Ω~30Ω	500V	1000V	350V	±1% ±2% ±5% ±10%
KNPI1S	KNPI-100-S	3.0	9.5	0.54	28	52		500V	1000V	350V	
KNPI1W	KNPI-100	4.0	11.5	0.70	25	52	0.01Ω~62Ω	500V	1000V	500V	
KNPI2S	KNPI-200-S	4.0	11.5	0.70	25	52		500V	1000V	500V	
KNPI2W	KNPI-200	5.5	15.5	0.70	28	64	0.018Ω~120Ω	500V	1000V	500V	
KNPI3S	KNPI-300-S	5.5	15.5	0.70	28	64		500V	1000V	500V	
KNPI3W	KNPI-300	6.5	17.5	0.75	28	64	0.024Ω~150Ω	500V	1000V	500V	
KNPI5S	KNPI-500-S	6.5	17.5	0.75	28	64		500V	1000V	500V	
KNPI5W	KNPI-500	8.5	24.5	0.75	38	90&B/B	0.043Ω~430Ω	500V	1000V	500V	
KNPI7S	KNPI-700-S	8.5	24.5	0.75	38	90&B/B		500V	1000V	500V	
KNPI7W	KNPI-700	8.5	29.5	0.75	38	B/B	0.047Ω~430Ω	500V	1000V	500V	
KNPI8S	KNPI-800-S	8.5	29.5	0.75	38	B/B		500V	1000V	500V	
KNPI8W	KNPI-800	8.5	39.5	0.75	38	B/B	0.091Ω~620Ω	500V	1000V	500V	
KNPI9S	KNPI-900-S	8.5	39.5	0.75	38	B/B		500V	1000V	500V	
KNPI9W	KNPI-900	8.5	52.5	0.75	38	B/B	0.13Ω~820Ω	500V	1000V	500V	
KNPIAS	KNPI-1000-S	8.5	52.5	0.75	38	B/B		500V	1000V	500V	

Performance Specification(性能)

Temperature coefficient 温度系数	≥20 Ω：±300PPM/℃； ＜ 20Ω：±400PPM/℃
Short-time Overload 短时间过负荷	ΔR/R ≤ ±(2%+0.05 Ω)Max,with no evidence of mechanical damage (无可见机械损伤)
Terminal strength 端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat 耐焊接热	ΔR/R ≤ ±(1%+0.05 Ω)Max, with no evidence of mechanical damage (无可见机械损伤)
Solderability 可焊性	Coverage must be over 95%.
Load life in humidity 湿度寿命	ΔR/R≤ ±(5%+0.05 Ω)Max，with no evidence of mechanical damage (无可见机械损伤)
Load life 负载寿命	ΔR/R≤ ±(5%+0.05 Ω)Max，with no evidence of mechanical damage (无可见机械损伤)
Resistance to solvent 耐溶剂	No evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: KNP 3WS 5% 12Ω T/B-1000)

订购方式 (例如: KNP 3WS 5% 12Ω T/B-1000)



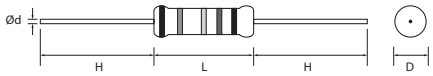
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

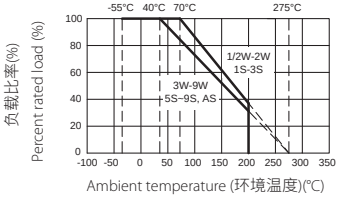
- Excellent flame retardant coating (优异不燃性涂装)
- According to IEC 61000-4-5 (符合 IEC61000-4-5 标准)
- Applies to electricity meters, home appliance and ballast (适用于电表、家电及整流器产品)



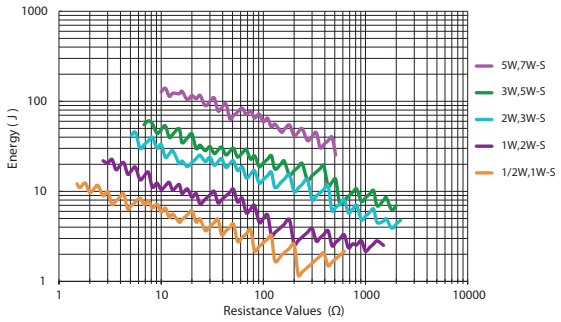
Dimension(尺寸) mm



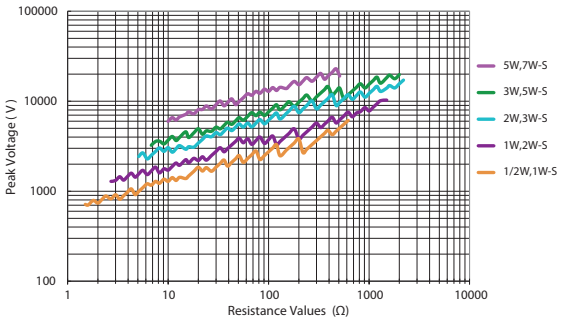
Derating Curve (降功率曲线)



KNPA Pulses Energy Curve (KNPA耐脉冲能量曲线)



KNPA 1.2/50us Pulses Voltage Curve (KNPA1.2/50us耐脉冲电压曲线)



Part No 料号	Type 类型	Dimension (尺寸)(mm)					Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围	Tolerance 公差
		D±1	L±1	d±0.05	H±3	PT					
KNPA1T	KNPA-100-SSS	2.5	6.5	0.54	28	52	500V	1000V	350V	1.0Ω~560Ω	±1% ±2% ±5% ±10%
KNPA1U	KNPA-100-SS	3.0	9.0	0.54	28	52	500V	1000V	350V	1.0Ω~750Ω	
KNPAW2,01S	KNPA-50,KNPA-100-S	3.5	9.5	0.54	28	52	500V	1000V	350V	1.5Ω~820Ω	
KNPA2U	KNPA-200-SS	3.5	9.5	0.54	28	52	500V	1000V	350V	1.0Ω~910Ω	
KNPA1W,02S	KNPA-100,KNPA-200-S	4.5	11.5	0.70	25	52	500V	1000V	500V	2.5Ω~1.2KΩ	
KNPA3U	KNPA-300-SS	5.5	13.5	0.70	28	64	500V	1000V	500V	1Ω~2.2KΩ	
KNPA2W,03S	KNPA-200,KNPA-300-S	5.5	15.5	0.70	28	64	500V	1000V	500V	5Ω~3.0KΩ	
KNPA4U	KNPA-400-SS	5.5	15.5	0.70	28	64	500V	1000V	500V	1Ω~2.2KΩ	
KNPA3W,05S	KNPA-300,KNPA-500-S	6.5	17.5	0.75	28	64	500V	1000V	500V	6.5Ω~3.9KΩ	
KNPA5W,07S	KNPA-500,KNPA-700-S	8.5	24.5	0.75	38	90&B/B	500V	1000V	500V	10Ω~5.6KΩ	
KNPA7W,08S	KNPA-700,KNPA-800-S	8.5	29.5	0.75	38	B/B	500V	1000V	500V	10Ω~8.2KΩ	
KNPA8W,09S	KNPA-800,KNPA-900-S	8.5	39.5	0.75	38	B/B	500V	1000V	500V	10Ω~10KΩ	
KNPAAU	KNPA 1000W-SS	8.5	39.5	0.75	38	B/B	500V	1000V	500V	1Ω~10KΩ	
KNPA9W,AS	KNPA-900,KNPA-1000-S	8.5	52.5	0.75	38	B/B	500V	1000V	500V	10Ω~15KΩ	

Performance Specification(性能)

Temperature coefficient	温度系数	±200PPM/℃
Short-time Overload	短时间过负荷	ΔR/R±(2%+0.05Ω)MAX，with no evidence of mechanical damage (无可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R±(1%+0.05Ω) MAX，with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	ΔR/R±(2%+0.05Ω) MAX，with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R±(5%+0.05Ω) MAX，with no evidence of mechanical damage (无可见机械损伤)
Load life	负载寿命	ΔR/R±(5%+0.05Ω) MAX，with no evidence of mechanical damage (无可见机械损伤)
Surge Immunity	脉冲测试	ΔR/R±(5%+0.05Ω) MAX
Resistance to solvent	耐溶剂	No evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: KNPA 3WS 5% 12Ω T/B-1000)

订购方式 (例如: KNPA3WS 5% 12Ω T/B-1000)

K N P A 3 S J 0 1 2 0 A 1 0

Product Type (产品类型):
KNP=KNPtype

Special Feature (特征):
A=Anti-Surge

Wattage (功率):

S2=1/2WS	W2=1/2W
1S=1W-S	1W=1W
2S=2W-S	2W=2W
3S=3W-S	3W=3W
5S=5WS	5W=5W
7S=7WS	7W=7W
8S=8WS	8W=8W
9S=9WS	9W=9W
AS=10WS	

Tolerance (公差):
F=±1%
G=±2%
J=±5%
K=±10%

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
1=1,000pcs
2=2,000pcs
A=500pcs
B=2,500pcs
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):

0=NIL(标准品)	
P=Panasert type	1=Avisert type 1
2=Avisert type 2	3=Avisert type 3
8=PT-58mm	9=PT-64mm
7=Lead wire(H)38mm	
A=PT-83mm	C=PT-73mm
D=PT-71mm	B=PT-52mm
E=PT-90mm	

New/Old Part.no Contrast (新旧料号对照)

New Part.no 新料号	Old Part.no 旧料号
KNPAJ*******	KSR0**J*******

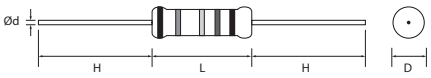
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

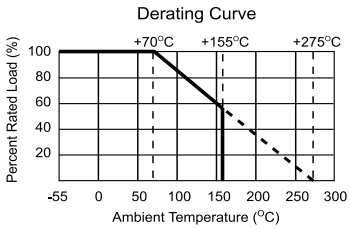
- Suitable for all kinds of protection circuit 适用各种保护电路
- Non-flammable coating,could withstand High Temperature
  优异不燃性涂装，耐高温
- Common resistor with additional safety function , no flame or smoke, no explosion or coating crack when fusing
  常见的电阻器具有额外的安全性能，无火焰或烟，无爆炸或涂层裂纹
- KNPU According to UL1412,UL items available (File NO:E306074)
  KNPU根据UL1412标准，产品 UL 安规认证（认证号：E306074）



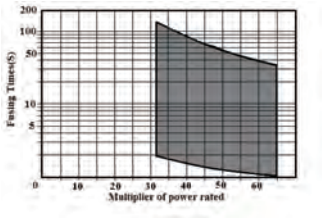
Dimension(尺寸) mm



Derating Curve (降功率曲线)



Fuseing Curve (熔断曲线)



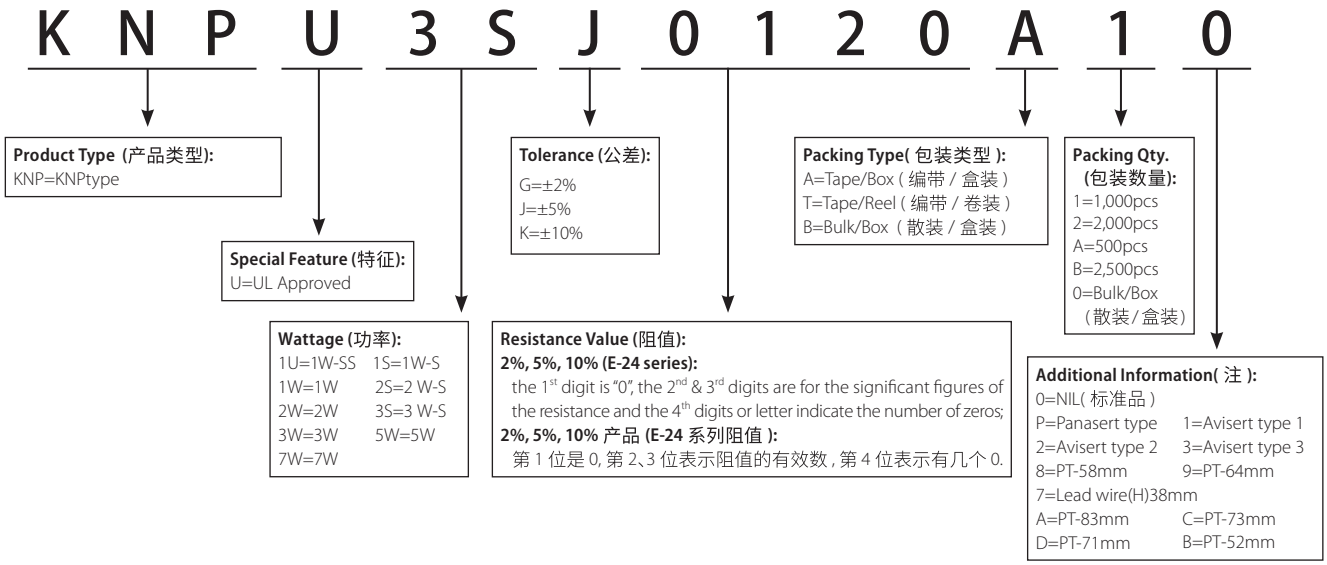
Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					Resistance Range 阻值范围	Tolerance 公差
			D	L±1	H±3	d±0.05	PT		
KNPU1U	KNPU1W-SS	1W-SS	2.5+1/-0.3	7.5	28	0.54	52	10Ω	±2% ±5% ±10%
KNPU1S	KNPU1W-S	1W-S	3.5+1/-0.5	9.5	28	0.75	52	0.47Ω~240Ω	
KNPU1W	KNPU100	1W	4.5+1/-0.3	11.5	28	0.70	52	0.47Ω~240Ω	
KNPU2S	KNPU2W-S	2W-S	4.5+1/-0.3	11.5	28	0.70	52	0.47Ω~240Ω	
KNPU2W	KNPU200	2W	5.5+1/-0.5	15.5	28	0.70	64	0.47Ω~240Ω	
KNPU3S	KNPU3W-S	3W-S	5.5+1/-0.5	15.5	28	0.70	64	0.47Ω~240Ω	
KNPU3W	KNPU300	3W	6.5+1/-0.5	17.5	28	0.75	64	0.47Ω~240Ω	
KNPU5W	KNPU500	5W	7.0+1/-0.3	19.5	38	0.75	B/B	0.47Ω~240Ω	
KNPU7W	KNPU700	7W	8.5+1/-0.5	24.5	38	0.75	B/B	0.47Ω~47Ω	

Performance Specification(性能)

Temperature coefficient	温度系数	≥20 Ω: ±300PPM/°C <20 Ω: ±400PPM/°C
Short-time Overload	短时间过负荷	ΔR/R : ±(2%±0.05Ω), with no evidence of mechanical damage (无可 见机械损伤)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage.(1000V). 无击穿、飞弧及可见机械损伤 (1000V)
Terminal strength	端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R : ±(1%±0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Load life in humidity	湿度寿命	ΔR/R : ±(5%±0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Load life	负载寿命	ΔR/R : ±(5%±0.05Ω), witn no evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: KNPU 3WS 5% 12Ω T/B-1000)

订购方式 (例如: **KNPU3WS 5% 12Ω T/B-1000**)



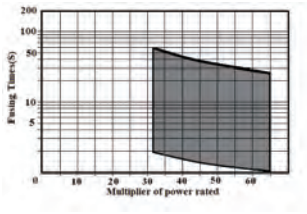
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

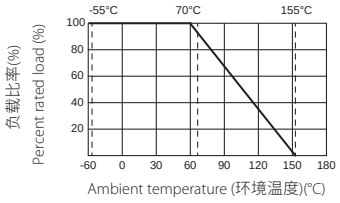
- FWR0/FWRA According to UL1412 UL approved-No.E306074(Until 3W)
  FWR0/FWRA根据UL1412标准，产品UL安规认证(认证号:E306074)
- Surge Voltage up to 10kV 浪涌电压可达10kV
- Fuse function 熔断性能
- Rated Voltage up to 250V 额定电压可达250V
- Surge function base on IEC 61000-4-5 浪涌函数基于IEC 61000-4-5
- Excellent Flame Retardant 优异的阻燃



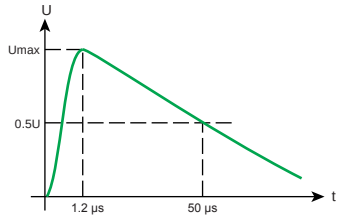
Fusing Curve(熔断曲线)



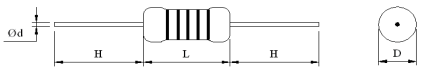
Derating Curve (降功率曲线)



Surge Waveform 浪涌波形 (1.2/50μs)



Dimension(尺寸) mm



FWR

Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					Resistance Range 阻值范围
			D±1	L±1	d±0.05	H±3.0	PT	
FWR01S	FWR-100-S	1W-S	3.5	9.5	0.54	28	52	0.47Ω~470Ω
FWR01W/2S	FWR-100 FWR-200-S	1W 2W-S	5.0	12.0	0.70	25	52	0.47Ω~470Ω
FWR02W/3WS	FWR-200 FWR-300-S	2W 3W-S	5.5	16	0.70	28	64	0.47Ω~470Ω
FWR03W	FWR-300	3W	6.5	17.5	0.75	28	64	0.47Ω~470Ω

FWRA Anti-Surge(FWRA 抗浪涌)

Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)					Resistance Range 阻值范围
			D±1	L±1	d±0.05	H±3.0	PT	
FWRA1S	FWRA-100-S	1W-S	3.5	9.5	0.54	28	52	0.47Ω~470Ω
FWRA1W/2S	FWRA-100 FWRA-200-S	1W 2W-S	5.0	12.0	0.70	25	52	0.47Ω~470Ω
FWRA2W/3WS	FWRA-200 FWRA-300-S	2W 3W-S	5.5	16	0.70	28	64	0.47Ω~470Ω
FWRA3W	FWRA-300	3W	6.5	17.5	0.75	28	64	0.47Ω~470Ω
FWRA5S	FWRA-500-S	5W-S	7.2max	19.5max	0.80	38	83	10Ω~1KΩ

FWRA Surge Rating(FWRA 额定浪涌功率)

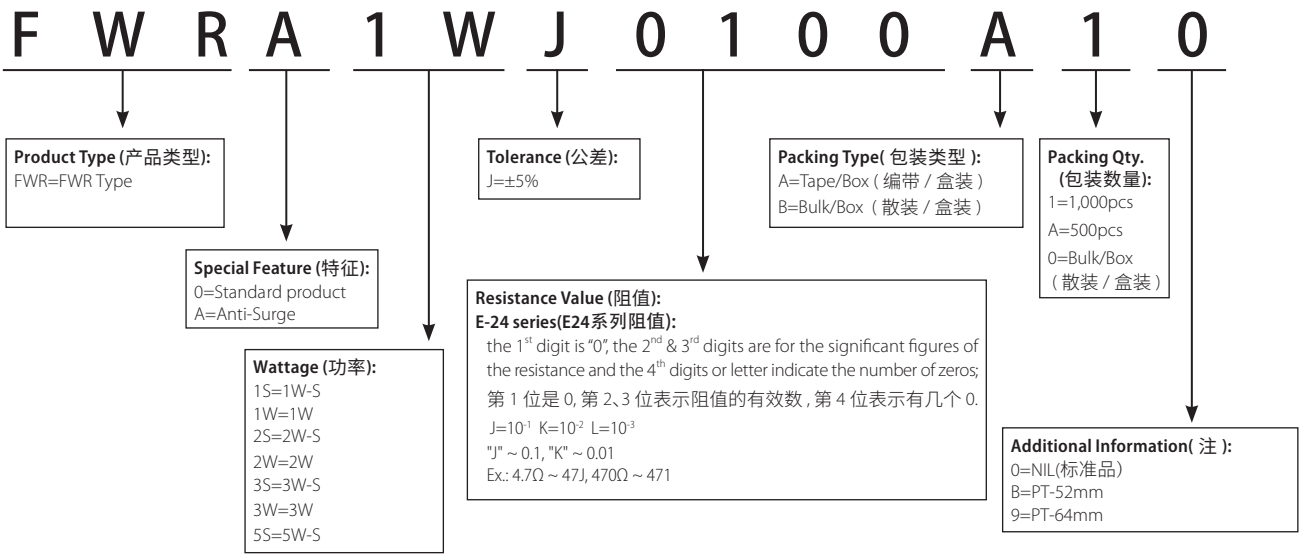
Type 类型	Low Resistance Range 低阻值范围	Maximum Surge Voltage 最大浪涌电压	Medium Resistance Range 中阻值范围	Maximum Surge Voltage 最大浪涌电压	High Resistance Range 高阻值范围	Maximum Surge Voltage 最大浪涌电压
FWRA-100-S	0.47Ω-40Ω	2kV	43Ω-240Ω	3kV	270Ω-470Ω	4kV
FWRA-100 FWRA-200-S	0.47Ω-50Ω	3kV	51Ω-240Ω	4kV	270Ω-470Ω	5kV
FWRA-200 FWRA-300-S	0.47Ω-100Ω	4kV	110Ω-240Ω	5kV	270Ω-470Ω	6kV
FWRA-300	0.47Ω-100Ω	6kV	110Ω-470Ω	7kV	---	---
FWRA-500-S	10Ω-50Ω	9kV	51Ω-1KΩ	10kV	---	---

Performance Specification(性能)

Temperature coefficient	温度系数	<20Ω:±400PPM/°C ≥20Ω:±300PPM/°C
Short-time Overload	短时间过负荷	ΔR/R：±(2.0%+0.05Ω)
Dielectric withstanding voltage	绝缘耐压	Dimension 3.5*9.5:350VAC Dimension>3.5*9.5:500VAC
Resistance to Soldering heat	耐焊接热	ΔR/R：±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Temperature cycling	温度循环	ΔR/R：±(2.0%+0.05Ω)
Solderability	可焊性	Min 95% coverage
Fusing	熔断	x32 times within 60sec.
Load life in humidity	湿度寿命	ΔR/R：±(5%+0.05 Ω) with no evidence of mechanical damage（无可见机械损伤）
Load life	负载寿命	ΔR/R：±(5%+0.05 Ω) with no evidence of mechanical damage（无可见机械损伤）
Surge Immunity	脉冲测试	ΔR/R：±(5.0%+0.05Ω)

Ordering Procedure (Example: FWRA 1W 5% 10Ω)

订购方式 (例如: **FWRA 1W 5% 10Ω TB 1000)**



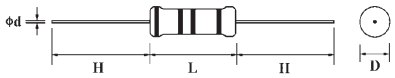
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

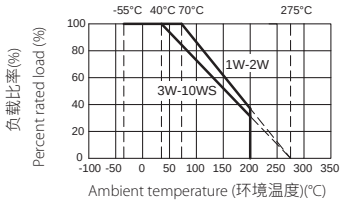
- Small body size 体积小
- High power 功率大
- Excellent flame retardant coating 优异的阻燃封装
- Provides stable performance in various environments
  在各种环境中提供优异的稳定性



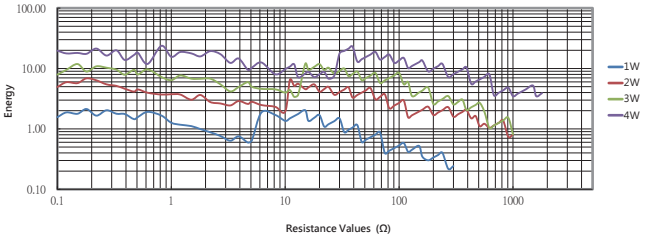
Dimension(尺寸) mm



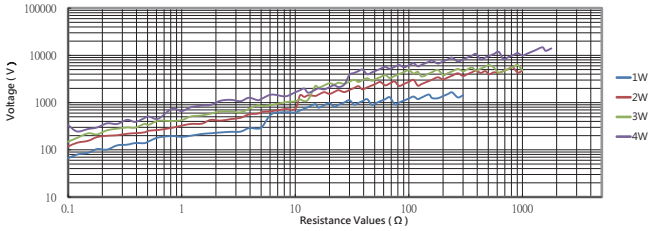
Derating Curve (降功率曲线)



Pulse Energy Curve(耐脉冲能量曲线)



1.2/50us Pulse Voltage Curve(耐脉冲电压曲线)



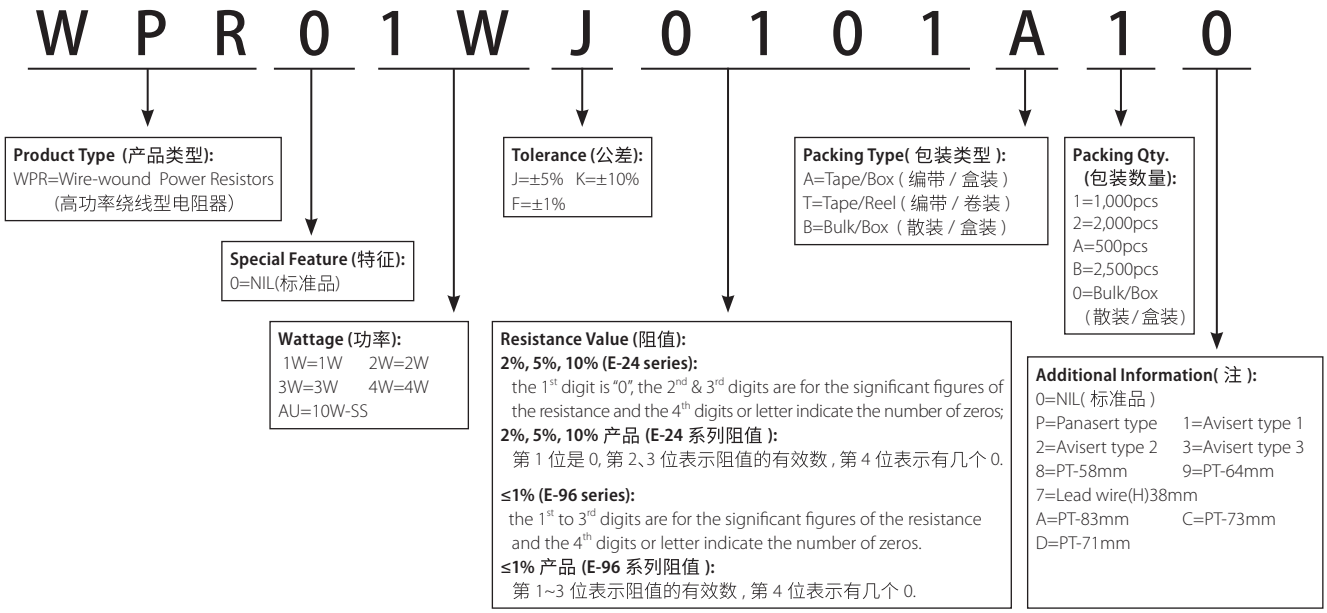
Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)						Resistance Range 阻值范围
			D±1	L±1	d±0.05	H±3	Max Working Voltage 最大工作电压	Dieletric Withstand Voltage 绝缘耐压	
WPR01W	WPR-100	1W	2.5	6.2	0.60	28	50V	250V	0.1Ω~300Ω
WPR02W	WPR-200	2W	3.5	9.0	0.75	28	50V	250V	0.1Ω~1KΩ
WPR03W	WPR-300	3W	4.5	10.5	0.75	25	50V	350V	0.1Ω~1KΩ
WPR04W	WPR-400	4W	5.5	15.5	0.75	28	50V	350V	0.1Ω~1.8KΩ
WPR0AU	WPR-1000-SS	10W-SS	8.5	39.5	0.75	38	50V	350V	1Ω~5KΩ

Performance Specification(性能)

Temperature coefficient	温度系数	±200PPM/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(5.0%+0.05Ω) with no evidence of mechanical damage (无可见机械损伤)
Terminal strength	端子强度	No evidence of mechanical damage (无可见机械损伤)
Soldering heat	耐焊接热	ΔR/R : ±(1.0%+0.05Ω) with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Rapid change of temperature	温度快速变化	ΔR/R : ±(2.0%+0.05Ω) with no evidence of mechanical damage (无可见机械损伤)
Humidity (Steady State)	恒定湿热	ΔR/R : ±(2.0%+0.05Ω) with no evidence of mechanical damage (无可见机械损伤)
Pulse test	脉冲测试	ΔR/R : ±(5.0%+0.05Ω)
Resistance to solvent	耐溶剂	No deterioration of protective coating and markings (包封层，色码完整)
Load life in humidity	湿度寿命	ΔR/R : ±(5.0%+0.05Ω) Max. with no evidence of mechanical damage (无可见机械损伤)
Load life	负载寿命	ΔR/R : ±(5.0%+0.05Ω) Max. with no evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: WPR1W 5% 100Ω T/B-1000)

订购方式 (例如: WPR1W 5% 100Ω T/B-1000)



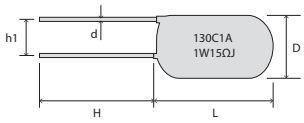
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

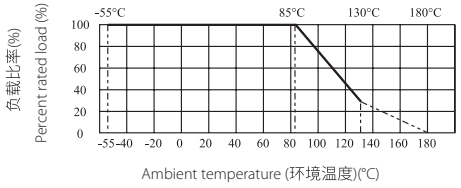
- Low resistance value with higher power dissipation 低阻值高功耗
- Wire-wound resistor with thermal fuse protection 绕线电阻热熔断保护
- Used in Electronic ballast ,other lighting applications
  一般用在电子整流器及其它照明用途



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)											Resistance Range 阻值范围
		D	L	H (Min)	h1 (Min)	d±0.02	Current Rating	TF (°C)	TH/TC (°C)	TM (°C)	Ir	Ur	
TFR	1W	5.5±0.5	14±1	12	3.5	0.53	2A	130	102	180	2	250	2.2Ω~4.7Ω
TFR	1W	5.5 $^{+1}_{-0.5}$	11(Max)	12	3.5	0.53	1A	130	102	180	1	250	

Ordering Procedure (Example: TFR1W 5% 4.7Ω B/B)

订购方式 (例如: TFR1W 5% 4.7Ω B/B)

T F R 0 1 W J 0 4 7 J B 0 0

- **Product Type (产品类型):** TFR0=TFR
- **Wattage (功率):** 1W=1W
- **Tolerance (公差):** J=±5% K=±10%
- **Resistance Value (阻值):**
  5% & 10% (E-24 series):
  the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
  5%,10% 产品 (E-24 系列阻值):
  第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
- **Packing Type(包装类型):** B=Bulk/Box (散装 / 盒装)
- **Packing Qty. (包装数量):** 0=Bulk/Box (散装 / 盒装)
- **Additional Information(注):** 0=Standard

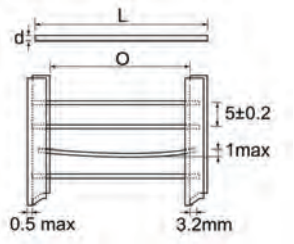
Remark: For more details,please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Jumper Wires & Zero-ohm Resistors - ZW、ZO

跳线&零欧姆电阻器 - ZW、ZO系列

ROYALOHM
www.royalohm.com

ZW Type (ZW 型)

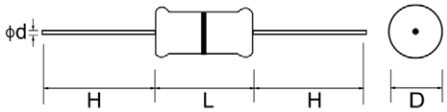




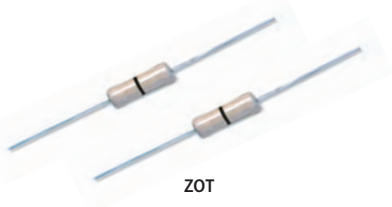
Part No 料号	Type 类型	L±3	d±0.05	O±1		最大额定电流 Max Rated Current
ZWA0	ZW-A	60/34	0.45	52	26	3A
ZWA1	ZW-A1	60/34	0.50	52	26	5A
ZWB0	ZW-B	60/34	0.54	52	26	5.5A
ZWB1	ZW-B1	60/34	0.60	52	26	7A
ZWC0	ZW-C	60/34	0.70	52	26	9A
ZWJ0	ZW-J	60/34	0.71	52	26	9.5A
ZWD0	ZW-D	60/34	0.75	52	26	11A
ZWD1	ZW-D1	60/34	0.80	52	26	12A

Part No 料号	Type 类型	L±3	d±0.05	O±1		最大额定电流 Max Rated Current
ZWE0	ZW-E	60/34	1.00	52	26	15A
ZWH0	ZW-H	60/34	1.20	/	/	20A
ZWM0	ZW-M	60/34	1.30	/	/	20A
ZWK0	ZW-K	60/34	1.50	/	/	30A
ZWF0	ZW-F	60/34	1.60	/	/	30A
ZWG0	ZW-G	60/34	1.80	/	/	40A
ZWI0	ZW-I	60/34	2.00	/	/	40A

ZO Type (ZO 型)



ZOC



ZOT

Part No 料号	Type	Power Rating 额定功率	Dimension (尺寸)(mm)				Resistance Range 阻值范围 (≤mΩ)
			D±0.3	L	d±0.05	H±3	
ZOT0W8/ZOCOW8	ZO-12	1/8W	1.9	3.3±0.3	0.45	28	ZOT：10 ZOC：40
ZOT0W4/ZOCOW4	ZO-25	1/4W	2.2	6.5±1.0	0.54	28	

Performance Specification(性能)

Lead material	引线材料	Tin-Plated copper（镀锡铜线）
Insulation resistance	绝缘阻值	Dry(干态)-10,000MΩ,Wet(湿态)-100MΩ
Dielectric withstanding voltage	绝缘耐压	Atmospheric（正常气压）-500V RMS; Reduced（减压）-325VRMS;
Rated current	额定电流	1/8W70°C 1.5A，1/4W 70°C 2.5A Derating to 0 Amps at 150°C 1/8W70°C 1.5A，1/4W 70°C 2.5A 150°C时，电流降低到 0A

Ordering Procedure (Example: ZOC 1/4W 0Ω T/R-5000)

订购方式 (例如: ZOC 1/4W 0Ω T/R-5000)

Z O C 0 W 4 0 0 0 0 0 T 5 0

Product Type (产品类型):
Zero Ohm Resistors(0Ω电阻)
ZOT0=0Ω(铁棒涂漆0Ω电阻)
ZOC0=0Ω(镀铜瓷棒0Ω电阻)
Jumper Wire(跳线）：
ZWA0=0.45mm ZWA1=0.50mm
ZWB0=0.54mm ZWB1=0.60mm
ZWC0=0.70mm ZWJ0=0.71mm
ZWD0=0.75mm ZWD1=0.80mm
ZWE0=1.00mm ZWH0=1.20mm
ZWM0=1.30mm ZWK0=1.50mm
ZWF0=1.60mm ZWG0=1.80mm
ZWI0=2.00mm

Wattage (功率):
Zero Ohm Resistors(0Ω 电阻)
W8=1/8W
W4=1/4W
Jumper Wire(跳线):
00=NIL

Tolerance (公差):
0=NIL

Resistance Value (阻值):
Fill-in these 4digits with "0" specially 填 4 个 0 表示 0 阻值

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)
P=Tape/Box of PT-26 product
编带 /（PT-26 产品）盒装

Packing Qty. (包装数量):
5=5,000pcs
7=7,000pcs
8=8,000pcs
C=10,000pcs
0=Bulk/Box
（散装 / 盒装）

Additional Information(注):
0=NIL(标准品)

New/Old Part.no Contrast (新旧料号对照)

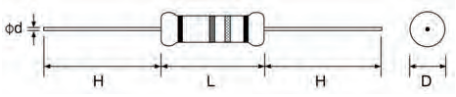
New Part.no 新料号	Old Part.no 旧料号
ZOC0**00000A*0	CFR0**00000A*0
ZOT0**00000A*0	ZO00**00000A*0

New Part.no 新料号	Old Part.no 旧料号
ZWB10000000A*0	ZWF00000000A*0
ZWE00000000A*0	ZWF00000000A*0

*M-type jumpers can be customized on request *M型跳線可特別提供

Copper Plated Steel Wire [铜包钢（CP型）]

Tin Plated Copper Steel Lead Wire[镀锡铜包钢（CT型）]



Part No 料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)				MAX.Working Voltage 最大工作电压	MAX.Overlaod Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围
			D	L	d ±0.05	H±3				
CPXXW8/CTXXW8	CP/CT12	1/8W	1.9±0.3	3.3±0.3	0.54	28	200V	400V	400V	1Ω~10MΩ
CPXXW4/CTXXW4	CP/CT25	1/4W	2.2±0.5	6.5±1.0	0.54	28/38	250V	500V	500V	1Ω~10MΩ
CPXXS3/CTXXS3	CP/CT33-S	1/3W-S	2.2±0.5	6.5±1.0	0.54	28/38	300V	600V	500V	1Ω~10MΩ
CPXXW3/CTXXW3	CP/CT33	1/3W	3±0.5	9.0±1.0	0.54	28	300V	600V	700V	1Ω~10MΩ
CPXXS2/CTXXS2	CP/CT50-S	1/2W-S	3±0.5	9.0±1.0	0.54	28	350V	700V	700V	1Ω~10MΩ

Ordering Procedure (Example: CTO 1/4W 5% 10Ω T/B-5000, CTO lead wire)

订购方式 (例如: CTO 1/4W 5% 10Ω T/B-5000, CTO导线)

C T O 0 W 4 J 0 1 0 0 A 5 0

Product Type (产品类型):
CPO=Copper plated steel lead wire
铜包钢线 (H=28mm)
CPL=Copper plated steel lead wire
铜包钢线 (H=38mm)
CTO=Tin Plated copper steel lead wire
镀锡铜包钢线 (H=28mm)
CTL=Tin Plated copper steel lead wire
镀锡铜包钢线(H=38mm)

Special Feature (特征):
0=Standard(标准品)
F=Flame Retardant (阻燃型)
I=Non-Inductive (无感型)

Wattage (功率):
W8=1/8W
W4=1/4W
W3=1/3W
S3=1/3W-S
S2=1/2W-S

Tolerance (公差):
G = ±2%
J = ±5%
K = ±10%

Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)
B=Bulk/Box (散装 / 盒装)
P=Tape/Box of PT-26 product
编带 (PT-26 产品) / 盒装

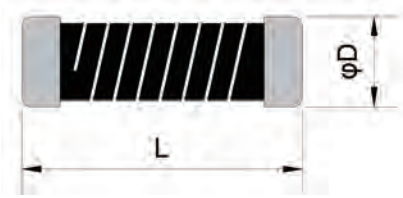
Packing Qty. (包装数量):
1=1,000pcs,
2=2,000pcs
3=3,000pcs,
4=4,000pcs
5=5,000pcs,
A=500pcs
B=2,500pcs
0=Bulk/Box
(散装 / 盒装)

Additional Information(注):
0=Standard (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Cutting Semi-Finished Product - CO、CMO

切割半成品 - CO、CMO系列



Type 类型	Size 规格	L	ΦD	Resistance Range 阻值范围
COT/CON	1.3×2.7	2.86-3.16	1.54-1.66	1Ω~10MΩ
	1.7×6.0	6.16-6.66	2.03-2.17	1Ω~10MΩ
	3×8	8.16-8.77	3.32-3.58	1Ω~10MΩ
CMO	4×14	14.06-14.89	4.31-4.59	3.3Ω~200KΩ
	4×28	28.10-29.20	4.57-4.75	3.3Ω~200KΩ
	4×39	37.70-39.60	4.57-4.75	3.3Ω~200KΩ
	6.4×22	22.00-23.08	6.88-7.06	3.3Ω~200KΩ
	7×23	22.96-24.09	7.39-7.61	3.3Ω~200KΩ
	7×28	27.96-29.09	7.39-7.61	3.3Ω~200KΩ
	7×51	50.96-52.09	7.39-7.61	3.3Ω~200KΩ

Ordering Procedure (Example: CMO 4×28 5% 10Ω B/B)

订购方式 (例如: CMO 4×28 5% 10Ω B/B)

C M O 0 2 0 J 0 1 0 0 B 0 0

Product Type (产品类型):
COT=Cutting Carbon film (Tin-plated cap)
切割碳膜(镀锡铁帽)
CON=Cutting Carbon film (Nickel-plated cap)
切割碳膜(镀镍铁帽)
CMO=Cutting Metal oxied film
切割氧化膜

Special Feature (特征):
0=Standard (标准品)

Material Size (材料尺寸):
01=1.3×2.7
24=1.7×6.0
06=3×8
09=4×14
20=4×28
21=4×39
11=6.4×22
12=7×23
13=7×28
15=7×51

Tolerance (公差):
J = ±5%

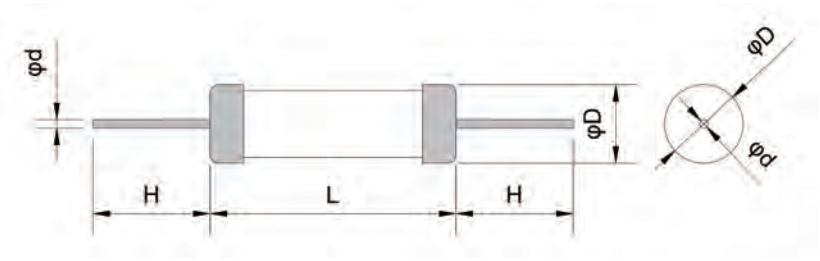
Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%产品(E-24系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Packing Type(包装类型):
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
0=Bulk/Box (散装 / 盒装)

Additional Information(注):
0=Standard (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。



Type 类型	Size 规格	L	ΦD	H	Φd±0.05
WMO	4×22	22.10-23.18	4.57-4.75	40±0.5	0.80
	5×40	39.60-41.18	5.48-5.66	38±0.5	0.80
	5×51	50.6-52.48	5.48-5.66	38±0.5	0.80
	7×28	27.96-29.09	7.39-7.61	37.0±0.2	0.80
	7×51	50.96-52.09	7.39-7.61	37.0±0.2	0.80

*H&φd can be specially provided according to customer requirements

H&φd可根据客户需求特别提供

Ordering Procedure (Example: WMO 4×22 5% 100Ω B/B)

订购方式 (例如: WMO 4×22 5% 100Ω B/B)

W M O 0 1 8 J 0 1 0 1 B 0 0

Product Type (产品类型):
W=welding

Product Type (产品类型):
MO=Metal Oxide Film Fixed Resistors

Special Feature (特征):
0=Standard(标准品)

Material Size: (材料尺寸):
18=4×22
23=5×40
22=5×51
13=7×28
15=7×51

Tolerance (公差):
J = ±5%

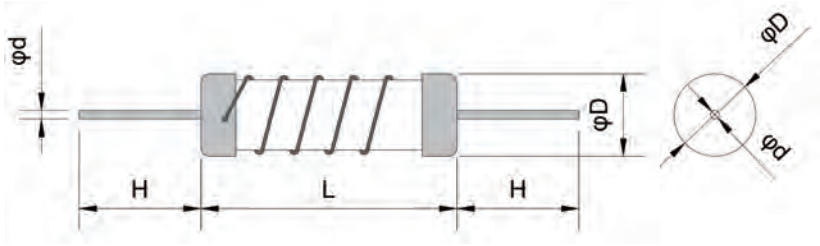
Resistance Value (阻值):
5% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type(包装类型):
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
0=Bulk/Box (散装 / 盒装)

Additional Information(注):
0=Standard (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。



Type 类型	Size 规格	L	ΦD	H	Φd±0.05	Resistance Range 阻值范围
WWR	3×12	12.19-12.87	3.48-3.63	6±0.5	0.75	0.01Ω~390Ω
	7×15	15.19-15.87	7.50-7.70	6±0.5	0.75	0.01Ω~3.0KΩ
	7×51	50.50-52.60	7.50-7.70	6±0.5	0.75	0.01Ω~8.2KΩ
	7×100	100.00-102.00	7.50-7.70	6±0.5	1.0	0.22Ω~15KΩ

H can be selected according to customer demand6~38mm
H可根据客户需求选择6~38mm

Ordering Procedure (Example: WWR 3×12 5% 100Ω B/B)

订购方式 (例如: WWR 3×12 5% 100Ω B/B)

W W R 0 2 6 J 0 1 0 1 B 0 0

Product Type (产品类型):
WWR=Wire-Wound-Semi-Finished Product
(绕线半成品)

Special Feature (特征):
0=Standard(标准品)

Material Size (材料尺寸) :
26=3×12
27=7×15
15=7×51
25=7×100

Tolerance (公差):
J = ±5%

Resistance Value (阻值):
±5%, ±10 % (E-24 series):
The 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type(包装类型):
B=Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
0=Bulk/Box
(散装 / 盒装)

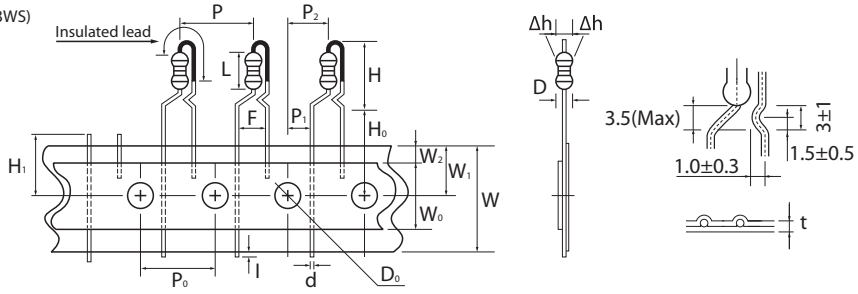
Additional Information(注):
0=NIL (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

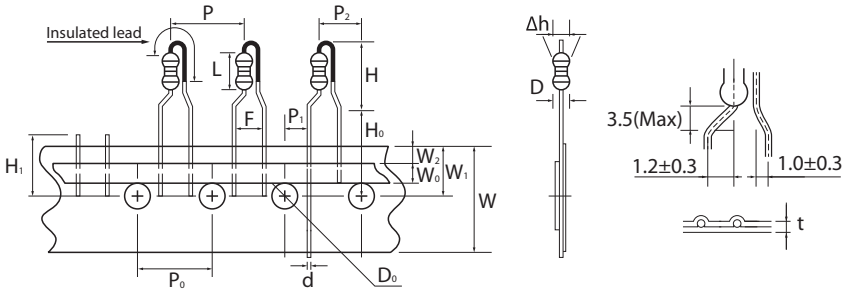
Feature (特性)

- Panasert forming type is applied to those products as below (Panasert 成型方式适用于如下产品):
  - CFR 1/4W, 1/2W, 1WS
  - CPR 1/2W
  - MF 1/4W, 1/2WS, 1/2W, 1WS, 2WS, 3WS
  - MOR 1/4W, 1WS, 2WS, 3WS
  - KNP 1/4W, 1/2WS, 1WS, 2WS, 3WS
- Please contact sales if need another size or forming dimension (如果需要其他产品规格或成型尺寸，请联系我司销售).
- As standard product, there is insulated paint on bending of lead wire shown in figure. and the length of insulated paint is limited:
  标准品在引线弯曲处涂覆绝缘涂层，如图所示。绝缘涂层长度如下：
  - 1/4W: 9.5 ± 1mm
  - 1WS: 13 ± 1mm
  - 2WS: 15 ± 1mm
  - 3WS: 21 ± 1mm

Panasert Type 1:
(1/4W, 1/2WS, 1WS, 2WS, 3WS)



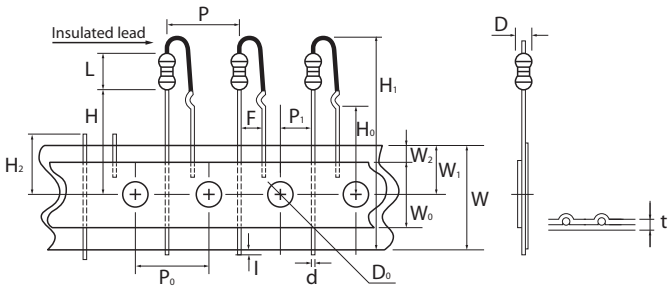
Panasert Type 2:
(1WS, 2WS)



Items(项目)	Symbol	Dimension 尺寸 (mm)				
		1/4W	1/2WS	1WS	2WS	3WS
Body diameter 本体直径	D	2.5 (Max)	3±0.5	3.5±0.5	4±0.5	5.5±1
Body length 本体长度	L	6.8 (Max)	9±1	9±1	11.5±1	16 (Max)
Body height 本体高度	H	12 (Max)	17 (Max)	19 (Max)	21 (Max)	23 (Max)
Lead-wire diameter 导线直径	d	0.60±0.05	0.60±0.05	0.70±0.05	0.70±0.05	0.75±0.05
Pitch of component 零件间距	p	12.7±1	12.7±1	12.7±1	12.7±1	12.7±1
Feed hole pitch 孔距	P0	12.7±0.3	12.7±0.3	12.7±0.3	12.7±0.3	12.7±0.3
Hole center to lead 中心测量	P1	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7	3.85±0.7
Hole center to body 孔心至本体	P2	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3	6.35±1.3
Lead to lead distance 两脚导线中心测量	F	5±1	5±1	5±1	5±1	5±1
Component aligment 零件偏移	Δh	0±1	0±1	0±1	0±1	0±1
Tape width 纸带宽度	W	18±1	18+1/-1.5	18+1/-1.5	18+1/-1.5	18+1
Sticky tape width 热熔胶带宽	W0	10 (Min)	/	10 (Min)	10 (Min)	10 (Min)
		6 (min)	6±0.2	6±0.2	6±0.2	-
Hole position 孔位	W1	9±0.5	9+0.75/-0.5	9+0.75/-0.5	9+0.75/-0.5	9±0.5
Uncovered paper tape width 纸带露出宽度	W2	1.5 (Max)	1.5 (Max)	1.5 (Max)	1.5 (Max)	1.5 (Max)
Lead –wire clinch height 导线固定高度	H0	16.5 (Max)	16±0.5	16±0.5	16±0.5	17±1
Length of snipped lead 导线剪断高度	H1	11 (Max)	11 (Max)	11 (Max)	11 (Max)	11 (Max)
Feed hole diameter 孔径	D0	4±0.3	4±0.3	4±0.3	4±0.3	4±0.3
Total tape thickness 胶带厚度	t	0.5±0.2	0.5±0.2	0.5±0.2	0.5±0.2	0.5±0.2
Lead wire protrusion 导线露出	i	1Max	-	-	-	-
Length of lead cut 切脚的长度	H1-w1	2±0.5	2±0.5	2±0.5	2±0.5	2±0.5

Avisert(1) Type【Avisert(1)型】

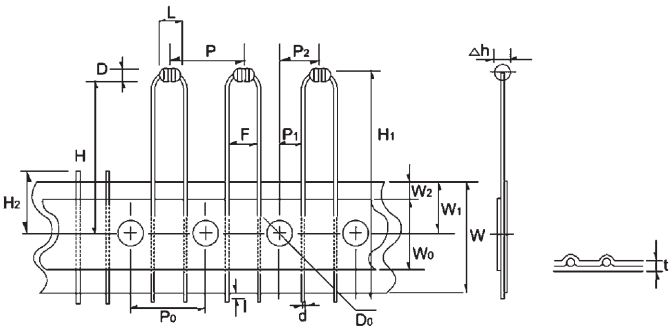
- This specification is applicable for CFR1/4W,CPR1/2W&MF1/4W,1/2WS,0.6WS,MOR1/4W,1/2WS,product only; For other product (size), please consult factory for the specification and drawing.
  适用于 CFR1/4W, CPR1/2W & MF1/4W, 1/2WS, 0.6WS, MOR1/4W, 1/2WS 固定电阻。其它产品的立式加工，可洽询工厂以取得可生产的规格图样。
- Standard product is insulated lead wire,insulated coating length 9.5±1mm
  标准品为绝缘引线，绝缘涂层长度为 : 9.5±1mm。



Items (项目)	Symbol	Dimension 尺寸 (mm) 1/4W
Body diameter 本体直径	D	2.5 (Max)
Body length 本体长度	L	6.8 (Max)
Lead-wire diameter 导线直径	d	0.60±0.05
Pitch of component 零件间距	p	12.7±1
Feed hole pitch 孔距	P0	12.7±0.3
Hole center to lead 中心测量	P1	3.85±0.7
Lead to lead distance 两脚导线中心测量	F	5±1
Tape width 纸带宽度	W	18±1
Sticky tape width 热熔胶带宽	W0	10(Min) 6 (min)
Hole position 孔位	W1	9.5±0.5
Uncovered paper tape width 纸带露出宽度	W2	3.0 (Max)
Height of component from tape center 零件至纸带中间的宽度	H	17.3±0.5
Lead –wire clinch height 导线固定高度	H0	16.5 (Max)
Component height 零件高度	H1	34.5 (Max)
Length of snipped lead 导线剪断高度	H2	11 (Max)
Feed hole diameter 孔径	D0	4±0.3
Total tape thickness 胶带厚度	t	0.5±0.2
Lead wire protrusion 导线露出	i	1 (Max)

Avisert(2) Type【Avisert(2)型】

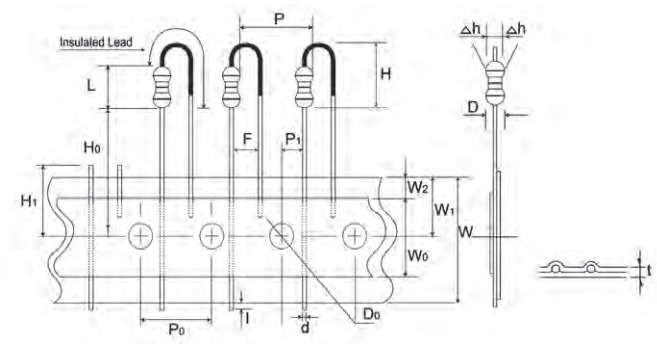
- This specification is applicable for CFR1/8W, 1/4WS&MF1/8W, 1/4WS product only; For other product avaiable forming products, please consult factory for the specification and drawing.
  适用于 CFR1/8W, 1/4WS&MF1/8W, 1/4WS 固定电阻。其它产品的立式加工，可洽询工厂以取得可生产的规格图样。



Items (项目)	Symbol	Dimension 尺寸 (mm) 1/8W
Body diameter 本体直径	D	1.85 (Max)
Body length 本体长度	L	3.5 (Max)
Lead-wire diameter 导线直径	d	0.45±0.05
Pitch of component 零件间距	p	12.7±1
Feed hole pitch 孔距	P0	12.7±0.3
Hole center to lead 中心测量	P1	3.85±0.7
Hold center to component center 孔心至零件中心距离	P2	6.35±1.3
Lead to lead distance 两脚导线中心测量	F	5±1
Tape width 纸带宽度	W	18±1
Sticky tape width 热熔胶带宽	W0	6 (Min)
Hole position 孔位	W1	9.0±0.5
Uncovered paper tape width 纸带露出宽度	W2	3.0 (Max)
Lead wire protrusion 打弯处到纸带中心位置	H	21.25 (Max)
Component height 零件高度	H1	32.25 (Max)
Length of snipped lead 导线剪断高度	H2	11 (Max)
Feed hole diameter 孔径	D0	4±0.3
Total tape thickness 胶带厚度	t	0.5±0.2
Lead wire protrusion 导线露出	i	1 (Max)

Avisert(3) Type【Avisert(3)型】

- This specification is applicable for CFR1/8W, CFR1/4WS, MF1/8W, MF1/4WS, MF1/4W, MF1/2WS, MF0.6WS, MOR1/4W, MOR1/2WS. For other product (size), please consult factory for the specification and drawing.
  下图规格适用于 CFR1/8W,CFR1/4WS,MF1/8W,MF1/4WS,MF1/4W,MF1/2WS,MF0.6WS,MOR1/4W,MOR1/2WS ; 其它产品的立式加工，可洽询工厂以取得可生产的规格图样 .
- Standard product is insulated lead wire,insulated coating length 9.5±1mm.
  标准品为绝缘引线，绝缘涂层长度为：9.5±1mm.



Items (项目)	Symbol	Dimension 尺寸 (mm)	
		1/8W	1/4W
Body diameter 本体直径	D	2.0 (Max)	2.5 (Max)
Body length 本体长度	L	4.2 (Max)	6.8 (Max)
Lead-wire diameter 导线直径	d	0.45±0.05	0.60±0.05
Pitch of component 零件间距	p	12.7±1	12.7±1
Feed hole pitch 孔距	P0	12.7±0.3	12.7±0.3
Hole center to lead 中心测量	P1	3.85±0.7	3.85±0.7
Lead to lead distance 两脚导线中心测量	F	2.5±1	5±1
Tape width 纸带宽度	W	18±1	18±1
Sticky tape width 热熔胶带宽	W0	6min	6min
Hole position 孔位	W1	9.0±0.5	9.0±0.5
Uncovered paper tape width 纸带露出宽度	W2	3.0 (Max)	3.0 (Max)
Body height 本体高度	H	7.0 (Max)	10.0 (Max)
Lead –wire clinch height 导线固定高度	H0	20.0 (Max)	16.0 (Max)
Component aligment 零件偏移	Δh	0±1	0±1
Length of snipped lead 导线剪断高度	H1	11 (Max)	11 (Max)
Feed hole diameter 孔径	D0	4±0.3	4±0.3
Total tape thickness 胶带厚度	t	0.5±0.2	0.5±0.2
Lead wire protrusion 导线露出	i	1 (Max)	1 (Max)

Ordering Procedure (Example: CFR1/4W 5% 100KΩ T/B-2000 PANASERT Type)

订购方式 (例如: CFR1/4W 5% 100KΩ T/B-2000 PANASERT Type)

C F R 0 W 4 J 0 1 0 4 A 2 P

Special Feature (特征):
0=Standard(标准品)
I=Non-Inductive (无感型)

Wattage (功率):
W8=1/8W
W4=1/4W
W2=1/2W
S4=1/4W-S
S2=1/2W-S
06=0.6W-S

Tolerance (公差):
G=2% J=±5%
K=±10%

Packing Type(包装类型):
A=Tape/Box (编带 / 盒装)
T=Tape/Reel (编带 / 卷装)

Packing Qty. (包装数量):
2=2,000pcs(T/B only)(限 T/B)
5=5,000pcs(T/R only)(限 T/R)
T/R is 2500PCS per reel &2reels per box (T/R 是每卷 2,500pcs, 每盒 2 卷)

Product Type (产品类型):
CFR = Carbon Film Fixed Resistors (碳膜固定电阻器)
MF = Metal Film Fixed Resistors (金属膜固定电阻器)
MOR= Metal Oxide Film Fixed Resistors (金属氧化膜固定电阻器)

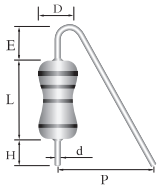
Resistance Value (阻值):
2%, 5%, 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
2%, 5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.

≤1% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
≤1% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

Additional Information(注):
P=Panasert type 1
Q=Panasert type 2
1= Avisert type 1
2= Avisert type 2
3= Avisert type 3

Remark: For more details,please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

F Forming Type (F 型)



F Type (F 型)



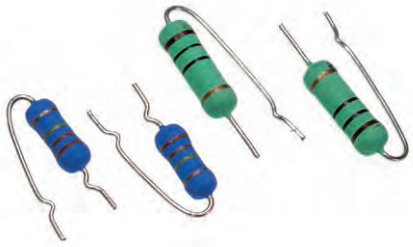
F1 Type (F1 型)



F2 Type (F2 型)



F3 Type (F3 型)

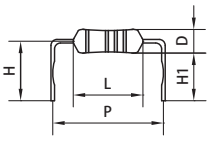


Dimension (尺寸) (mm)

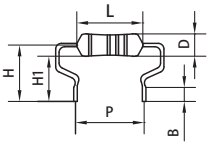
Power Rating 额定功率	L Max. L 最大	D Max. D 最大	d ± 0.05	P +1 -3	H ± I	E ± 0.5
I W (2W-S)	12.5	5.1	0.70	6~9	4.5~20	2.5
2 W (3W-S)	16.5	6.5	0.70	5~11	3~10	2.5
3 W (5W-S)	18.5	7.5	0.75	5~8.5	3	2.5

M Forming Type (M 型)

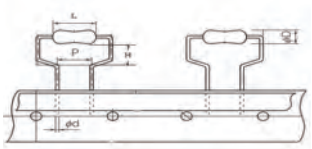
MF Type (MF 型)



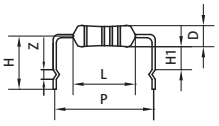
MC Type (MC 型)



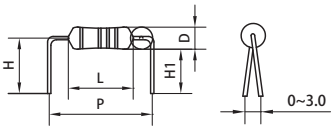
MC Type Tape (MC 编带型)



MK Type (MK 型)



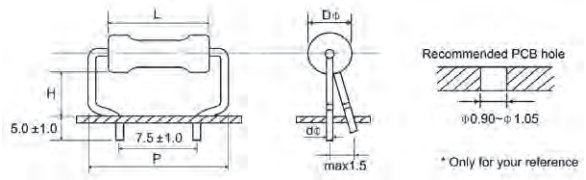
ML Type (ML型)



Power Rating 额定功率	L(Max)	D(Max)	d±0.05	H±2	P±1.5
1/2W & 1WS	10.5	4.1	0.70	9~17.5	12.5~39.4
1W & 2WS	12.5	5.1	0.70	9~14	12.5~39.4
2W & 3W-S	16.5	6.5	0.70	9~18	17.5~25
2W & 3W-S(MC编带型)	16.5	6.5	0.70	9~13	7.5~10
3W & 5WS	18.5	7.5	0.75	9~20	17.5~31
5W(7WS)	26	9.5	0.75	11~20	31~35

T Forming Type (T 型)

Power Rating 额定功率	L(Max)	D(Max)	d±0.05	P(Max)	H +1 -0
1W-S	10.5	4.1	0.70	12.5	8
1W(2W-S)	12.5	5.1	0.70	15	8
2W(3W-S)	16.5	6.5	0.70	20	9



Ordering Procedure (Example: MOR1WS 5% 10Ω B/B M Type with flattened lead wire)

订购方式 (例如: MOR1WS 5% 10Ω B/B M 型导线打扁)

M O R 0 1 S J 0 1 0 0 B M F

Product Type (产品类型):
MOR=Metal Oxide Film Fixed Resistors (金属氧化膜固定电阻器)
CFR=Carbon Film Fixed Resistors (碳膜固定电阻器)

Special Feature (特征):
0=Standard(标准品)
I=Non-Inductive (无感型)

Wattage (功率):
W2=1/2W 1W=1W
2W=2W 3W=3W
5W=5W 1S=1W-S
2S=2W-S 3S=3W-S
5W=5W-S

Tolerance (公差):
G=2% J=±5% K=±10%

Resistance Value (阻值):
5% & 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.

2% (E-96 series):
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
2% 产品 (E-96 系列阻值):
第 1~3 位表示阻值的有效数 , 第 4 位表示有几个 0.

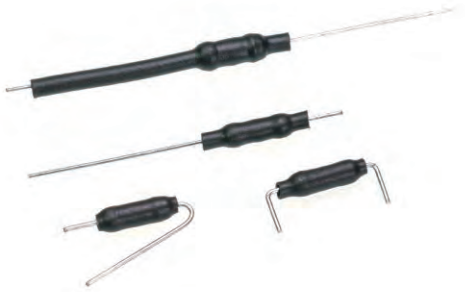
Packing Type(包装类型):
B=Bulk/Box (散装 / 盒装)
A=Tape/Box (编带 / 盒装)

Additional Information(注):
F0=F Type (F 型) F1=F1 Type (F1 型)
F2=F2Type (F2 型) F3=F3 Type (F3 型)
T0=T Type (T 型)
MF=M Type with flattened lead wire M 型导线打扁
MC=M Type with bending lead wire M 型导线打弯曲
MK=M Type with kinked lead wire M 型导线打弯折
ML=M Type with normal lead wire M 型导线直线
TZ=Axial type 套管轴向型
TF=F Processing-type 套管F加工型
TM=M Processing-type 套管M加工型

Remark: For more details,please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

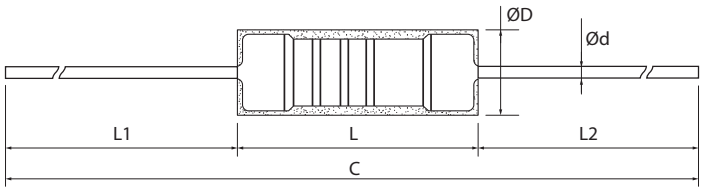
Feature (特性)

- Used for insulation protection and fusing protection of wire-wound (fusible) resistor.
  用于涂装产品的绝缘防护及绕线 (保险丝) 电阻的熔断防护。
- This specification is applicable for KNP、KNPU product only. For the other products (size), please consult factory for the available specification and drawing..
  适用于 KNP、KNPU 的产品，其他产品请洽谈工厂取得可生产的规格图样。

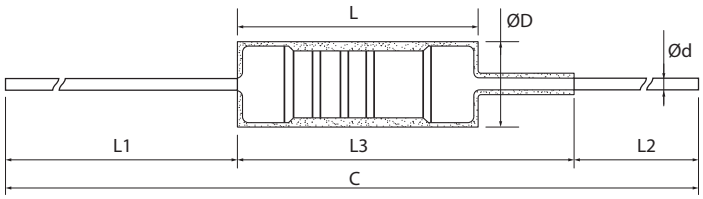


TZ Forming Type (TZ 轴向套管)

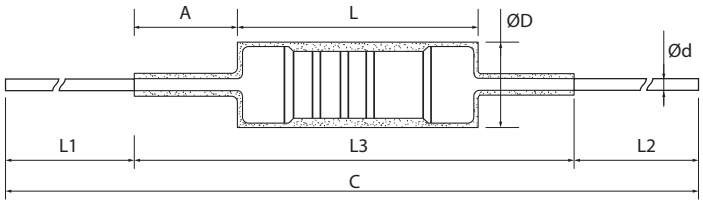
TZ-1 Wrapped resistor body only
TZ-1套管包电阻本体



TZ-2 Wrapped resistor body and lead one side only
TZ-2套管包电阻本体及一边导线



TZ-3 Wrapped resistor body and lead both two side
TZ-3套管包电阻本体及两边导线



Dimension (尺寸) (mm)

Type 类型	Forming type 加工形态	Dimension (尺寸)(mm) (L1、L2、L3 Adjustable range 可调范围)							
		D±1	L±1	L1	L2	L3	Ød±0.05	A (Max.)	C (Max.)
1/4W, 1/2W, 1WSS	TZ-1	2.5	6.5	38	25	/	0.54	/	68mm
	TZ-2			38	2Min.	40Max.		/	
	TZ-3			2Min.	2Min.	40Max.		33	
1/2W, 1WS, 2WSS	TZ-1	3.5	9.5	38	25	/	0.54	/	71mm
	TZ-2			38	2Min.	40Max.		/	
	TZ-3			2Min.	2Min.	40Max.		30	
1W, 2WS, 3WSS	TZ-1	4.5	11.5	38	25	/	0.70	/	73mm
	TZ-2			38	2Min.	40Max.		/	
	TZ-3			2Min.	2Min.	40Max.		28	
2W, 3WS, 4WSS	TZ-1	5.5	15.5	38	25	/	0.70	/	77mm
	TZ-2			38	2Min.	40Max.		/	
	TZ-3			2Min.	2Min.	40Max.		25	

General Metal Film MELF Resistors -G Series

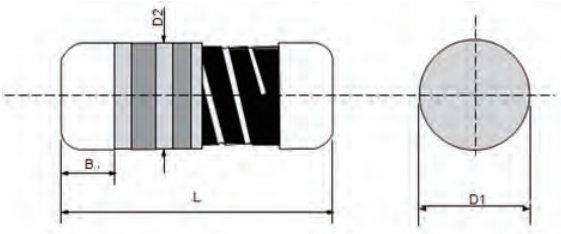
普通金属膜无脚电阻器 - G系列

ROYALOHM
www.royalohm.com

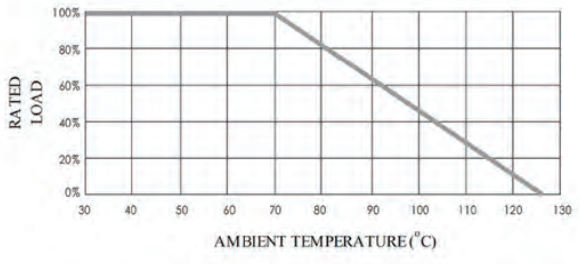
Feature (特性)

- High Power in small body size 小体积高功率
- Great design for SMD 良好的贴装设计
- Excellent solderability termination 优越的可焊性

Dimension (尺寸图)



Derating Curve (降功率曲线)



Type 类型	Dimension尺寸 (mm)			
	L	D1	D2	B
G24	3.52±0.15	1.35±0.1	D1+0.02/-0.15	0.6 Min.
G27	5.90±0.20	2.20±0.1	D1+0.02/-0.2	1.0 Min.

Type 类型	Power Rating 额定功率	Tolerance 精度	Resistance Range 阻值范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压
G24	1/4W	±1%,±2%,±5%	0.51Ω~10MΩ	200V	400V	200V
		±0.5%	10Ω~1MΩ			300V
		±0.25%	22Ω~510KΩ			
		±0.1%	43Ω~510KΩ			
G27	1/3W	±1%,±2%,±5%	0.51Ω~10MΩ	300V	500V	500V
	1/2W					
	1/2W	±0.5%	10Ω~1MΩ			
		±0.25%	15Ω~1MΩ			
		±0.1%	33Ω~1MΩ			

Temperature Coefficient (温度系数)

Tolerance 公差	Resistance Range 阻值范围		TCR (PPM/℃)
	G24	G27	
±1%,±2%	0.51Ω~10MΩ	0.51Ω~10MΩ	±25, ±50, ±100
±5%	0.51Ω~10MΩ	0.51Ω~10MΩ	±100
±0.5%	10Ω~330KΩ	10Ω~680KΩ	±15
±0.25%	22Ω~330KΩ	15Ω~510KΩ	
±0.1%	43Ω~330KΩ	33Ω~510KΩ	
±0.5%	10Ω~750KΩ	10Ω~1MΩ	±25
±0.25%	22Ω~510KΩ	15Ω~1MΩ	
±0.1%	43Ω~510KΩ	33Ω~1MΩ	
±0.5%	10Ω~1MΩ	10Ω~1MΩ	±50
±0.25%	22Ω~510KΩ	15Ω~1MΩ	
±0.1%	43Ω~510KΩ	33Ω~1MΩ	

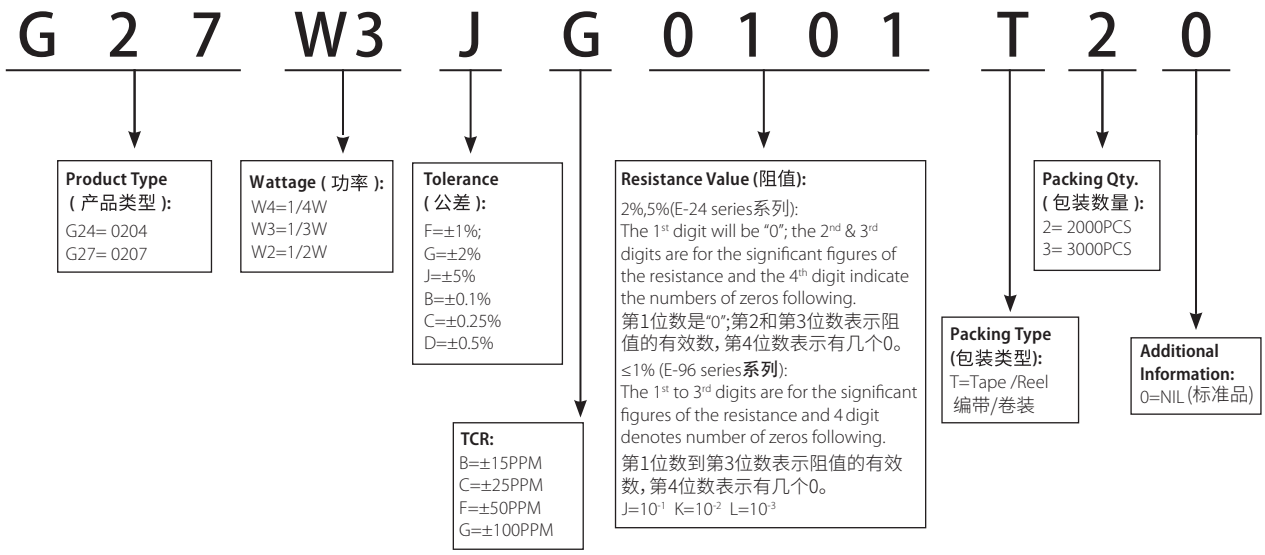
*Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).
不适用于所有电阻值。请与我们核对具体电阻值的PPM。

Performance Specification (特性)

Short Time Overload	短时间过负荷	≤332KΩ:±(0.25%+0.01Ω);>332KΩ:±(0.5%+0.01Ω)
Resistance to soldering heat	耐焊接热	±(0.5%+0.01Ω)
Solderability	可焊性	95% coverage min
Load life in humidity	湿度寿命	≤332KΩ:±(1.0%+0.01Ω);>332KΩ:±(2.0%+0.01Ω)
Load life	负载寿命	≤332KΩ:±(0.75%+0.01Ω);>332KΩ:±(1.0%+0.01Ω)

Ordering Procedure (Example: G27 1/3W ±5% 100Ω 100PPM/℃ T/R-2000)

订购方式 :(例如: G27 1/3W ±5% 100Ω 100PPM/℃ T/R-2000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Auto-grade Metal Film MELF Resostors - A Series

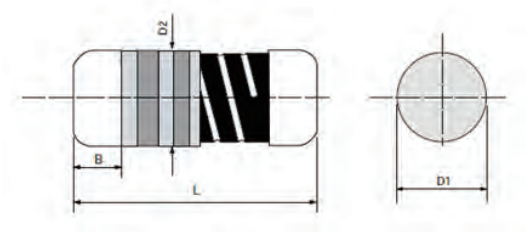
车规金属膜无脚电阻器 - A系列

ROYALOHM
www.royalohm.com

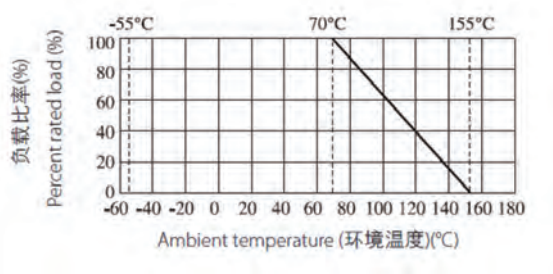
Feature (特性)

- High Power in small body size 小体积高功率
- Great design for SMD 良好的贴装设计
- Excellent solderability termination 优越的可焊性
- Anti-sulfuration test qualified 满足抗硫化测试
- AEC-Q200 qualified 符合AEC-Q200相关条款

Dimension (尺寸图)



Derating Curve (降功率曲线)



Type 类型	Dimension尺寸 （mm）			
	L	D1	D2	B （Min.）
A24	3.52 ± 0.15	1.35±0.1	D1+0.02/-0.15	0.6
A27	5.90 ± 0.20	2.20±0.1	D1+0.02/-0.2	1.0

Type 类型	Power Rating 额定功率	Tolerance 精度	Resistance Range 阻值范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压
A24	1/4W	±0.5%	10Ω~1MΩ	200V	400V	300V
		±0.25%	22Ω~1MΩ			
		±0.1%	43Ω~1MΩ			
		±1%,±2%,±5%	0.47Ω~10MΩ			
A27	1/2W	±0.5%	10Ω~1MΩ	300V	500V	500V
		±0.25%	15Ω~1MΩ			
		±0.1%	33Ω~1MΩ			
		±1%,±2%,±5%	0.47Ω~10MΩ			

Temperature Coefficient (温度系数)

Tolerance 公差	Resistance Range 阻值范围		TCR (PPM/℃)
	A24	A27	
±0.5%	10Ω-330KΩ	10Ω-680KΩ	±15
±0.25%	22Ω-330KΩ	15Ω-510KΩ	
±0.1%	43Ω-330KΩ	33Ω-510KΩ	
±0.5%	10Ω-1MΩ	10Ω-1MΩ	±25, ±50
±0.25%	22Ω-1MΩ	15Ω-1MΩ	
±0.1%	43Ω-1MΩ	33Ω-1MΩ	
±1%、±2%	1.5Ω-10MΩ	1.5Ω-10MΩ	±25, ±50,±100
±1%、±2%	<1.5Ω	<1.5Ω	±50
±5%	0.47Ω-10MΩ	0.47Ω-10MΩ	±100

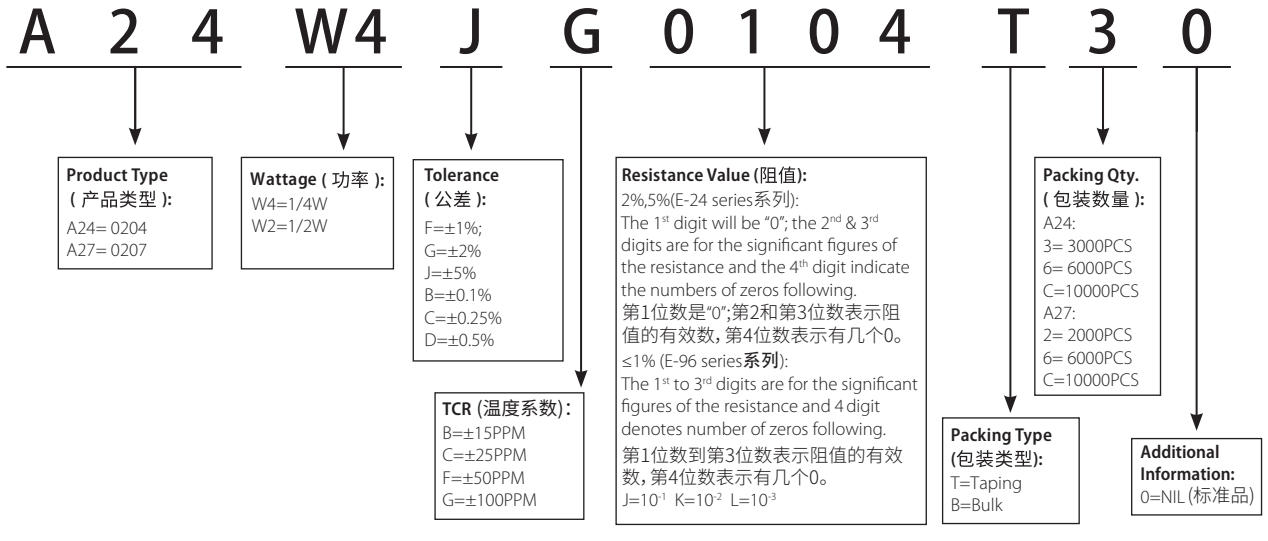
*Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).
不适用于所有电阻值。请与我们核对具体电阻值的PPM。

Performance Specification (性能)

Test Item 试验项目	Test Method 试验方法	Tolerance 公差	Evaluation Criteria 判定标准	
Short-time overload 短时间过负荷	IEC60115-8 5.3.6 5 seconds 2.5x rated voltage (not over max. overload voltage) 2.5倍额定电压(不超过最大过载电压)	±1% ±2% ±5%	0.47Ω to 332KΩ	±(0.25%+0.01Ω)
			>332KΩ	±(0.5%+0.01Ω)
		±0.1% ±0.25% ±0.5%	10Ω to 1MΩ	±(0.25%+0.01Ω)
Temperature Cycling 温度循环	JESD22 Method JA-104 -55°C 30minutes, +125°C 30minutes, 1,000 cycles -55°C 到 +125°C，1000循环	±1% ±2% ±5%	0.47Ω to 332KΩ	±(0.5%+0.01Ω)
			>332KΩ	±(0.5%+0.01Ω)
		±0.1% ±0.25% ±0.5%	10Ω to 332KΩ	±(0.5%+0.01Ω)
			>332KΩ	±(0.75%+0.01Ω)
Biased Humidity 偏置湿度	MIL-STD-202 Method 103 1,000 hours at 85°C and 85% relative humidity with 10% operating power (not over max. working voltage) 在85°C和85%的相对湿度下工作1000小时 10%的工作功率（不超过最大工作电压)。	±1% ±2% ±5%	0.47Ω to <100KΩ	±(1%+0.01Ω)
			100KΩ to 332KΩ	±(2%+0.01Ω)
			>332KΩ	±(3%+0.01Ω)
		±0.1% ±0.25% ±0.5%	10Ω to <10KΩ	±(0.75%+0.01Ω)
			10KΩ to <332KΩ	±(1.5%+0.01Ω)
			>332KΩ	±(2.5%+0.01Ω)
Operational Life 工作寿命	MIL-STD-202 Method 108 1,000 hours at 125°C with de-rated continuous working voltage (not over max. working voltage) 125°C下连续工作1000小时（不超过最大工作电压）	±1% ±2% ±5%	0.47Ω to <1Ω	±(2%+0.01Ω)
			1Ω to 332KΩ	±(1.5%+0.01Ω)
			>332KΩ	±(2.5%+0.01Ω)
		±0.1% ±0.25% ±0.5%	10Ω to 332KΩ	±(1.5%+0.01Ω)
			>332KΩ	±(3%+0.01Ω)
Resistance to Soldering Heat 耐焊接热	MIL-STD-202 Method 210 Dip the resistor into a solder bath measured (260±5)°C and hold it for a 10±1 seconds 将电阻器浸入温度为260°C±5°C的焊接液中，保持10±1秒	±0.5%+0.01Ω)		
Solderability 可焊性	J-STD-002 For both leaded & SMD. Electrical test not required. Magnification 50X. Conditions: a) Method B 4hrs at 155°C dry heat, the dip in bath with 245±3°C,5±0.5s. b) Method D: at 260±3°C, 30±0.5s. 表面贴装元件，不需要电气测试，放大倍数50倍 a)方法B：155°C干燥4H后，245±3°C,5±0.5秒浸锡	95% min. coverage		
Anti-sulfuration test 抗硫化测试	EIA-977 750 hours at (105±2)°C without load 在（105±2）°C下无负载750小时	±0.1% ±0.25% ±0.5% ±1% ±2% ±5%	±(0.1%+0.01Ω) ±(0.25%+0.01Ω) ±(0.5%+0.01Ω) ±(1%+0.01Ω) ±(2%+0.01Ω) ±(5%+0.01Ω)	

Ordering Procedure (Example: A24 1/4W ±5% 100PPM 100KΩT/R-3000)

订购方式：(例如：A24 1/4W ±5% 100PPM 100KΩT/R-3000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Anti-Surge Wire Wound MELF Resistors - WM Series

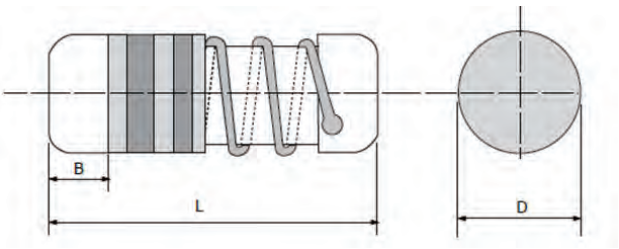
抗浪涌绕线无脚电阻器-WM系列

ROYALOHM
www.royalohm.com

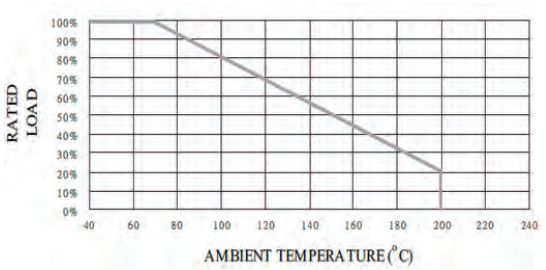
Feature (特性)

- Great design for SMD 良好的贴装设计
- Excellent solderability termination 优越的可焊性
- Enhanced weld spot is reliable against surge 可靠的抗浪涌

Dimension (尺寸图)

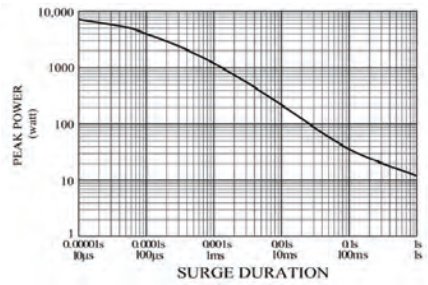


Derating Curve (降功率曲线)

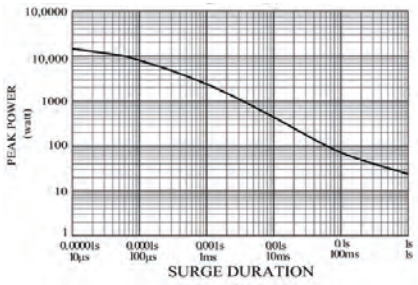


Single surge curve（单脉冲性能）

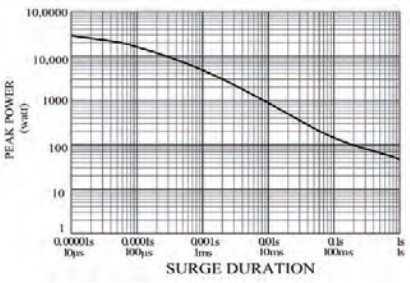
WM39



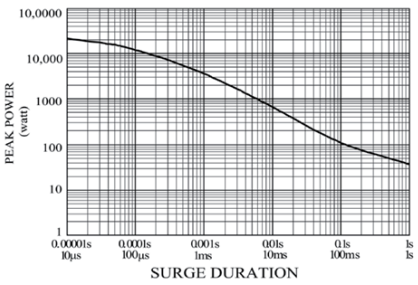
WM41



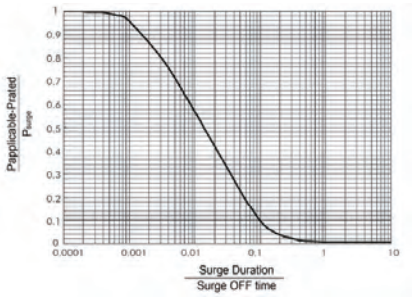
WM55



WM42



Surge power derating curve(脉冲降功率曲线)



Type 类型	Dimension尺寸（mm）		
	L	D	B（Min.）
WM39	8.5 ± 0.5	3.0 ± 0.2	1.3
WM41	10.5 ± 0.5	4.0 ± 0.5	1.6
WM42	12.6 ± 0.6	4.6 ± 0.5	1.8
WM55	14.6 ± 0.6	5.1 ± 0.5	2.0

Type 类型	Power Rating 额定功率	Max. Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Maximum Permissible Surge Voltage 最大浪涌电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance range 阻值范围	Tolerance 公差	Temperature Coefficient, PPM / °C*	Operating Temperature 工作温度
WM39	1W	350V	700V	7.5KV	700V	1 Ω~1.2KΩ	±5%	±100,±300	-55°C~+200°C
WM41	2W	400V	800V	8.5KV					
WM42	3W	400V	800V	9KV					
WM55	4W	450V	900V	11KV	1000V				

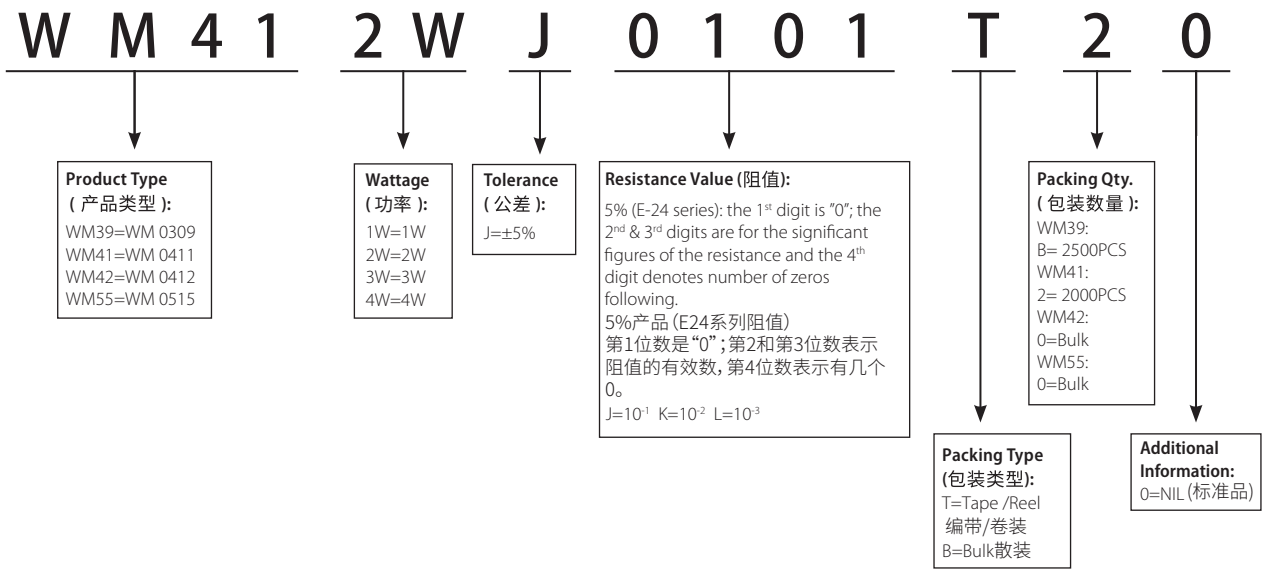
Not applicable to all resistance values. Please check with us regarding the PPM of specific resistance value(s).
不适用于所有电阻值。请与我们核对具体电阻值的PPM。

Performance Specification (特性)

Short Time Overload	短时间过负荷	±(2%+0.01Ω)
Load Life In Humidity	湿度寿命	(±5%+0.01Ω)
Load Life	寿命	±(5%+0.01Ω)
Soldering Heat	耐焊接热	±(1.5%+0.01Ω)
Solderability	可焊性	95% min. coverage
Surge Test	脉冲测试	±(5%+0.01Ω)

Ordering Procedure (Example: WM41 1W ±5% 100ΩT/R-2000)

订购方式(例如:WM41 1W ±5% 100ΩT/R-2000)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

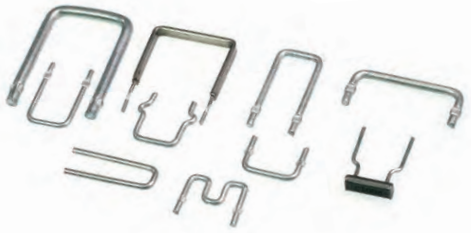
Current Sense Resistors - CSR

电流检测电阻器 - CSR系列

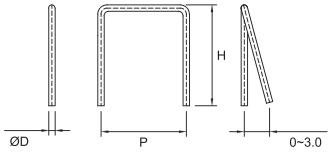
ROYALOHM
www.royalohm.com

Feature (特性)

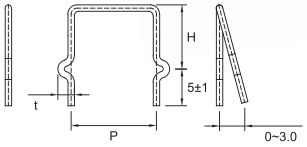
- Made by Cu/Ni or Mn/Cu Alloy resistance wire materials
  由铜 / 镍或锰 / 铜合金电阻线制成
- Excellent Solderability 优越的焊接性能
- Suitable for all kinds of Current sense application
  适用于各种类型的电流感应器应用
- Application: Power Supply 电源供应



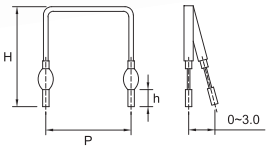
CSRA Type- CSRA 型



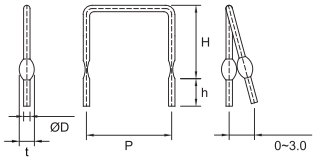
CSRB Type- CSRB 型



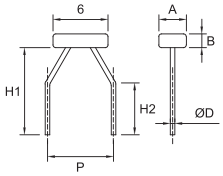
CSRC Type- CSRC 型



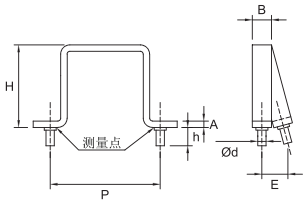
CSRD Type- CSRD 型



CSRE Type- CSRE 型



CSRJ Type-CSRJ型



Specification(性能)

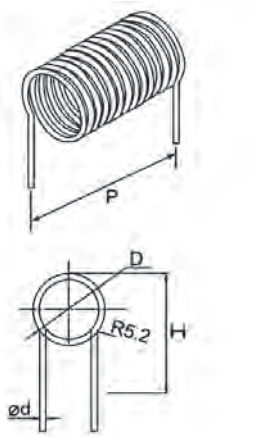
Type 类型	ΦD 线径 (mm)	Rated Current 额定电流(A)	Resistance Range 阻值范围(mΩ)	TCR	Remark 备注
CSRA CSRB CSRC CSRD CSRJ	0.8	4.5	5~50	±100PPM/℃	*P&H could be design by customer's requirement P 值和 H 值可根据客户的要求进行设计 *Temperature coefficient of resistor could be design by customer's requirement 温度系数可根据客户的要求进行设计
	0.9	5.0	5~40		
	1.0	5.5	3~30		
	1.1	6.0	3~20		
	1.2	7.0	3~20		
	1.3	7.5	3~20		
	1.4	8.0	3~20		
	1.5	9.0	3~20		
	1.6	9.5	3~15		
	1.8	11	3~10		
	2.0	12	3~10		
	2.3	14	3~7		
CSRE	1.0	50	1		

Feature (特性)

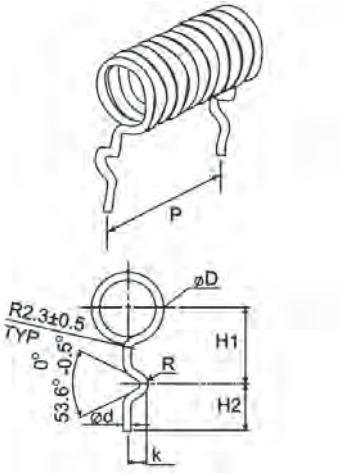
- Made by Cu/Ni or Mn/Cu Alloy resistance wire materials
  由铜 / 镍或锰 / 铜合金电阻线制成
- Excellent Solderability 优越的焊接性能
- Suitable for all kinds of Current sense application
  适用于各种类型的电流感应器应用
- Application: Power Supply 电源供应



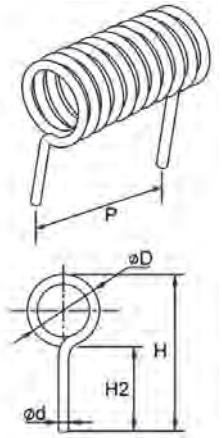
CSSA Type- CSSA 型



CSSB Type- CSSB 型



CSSC Type- CSSC 型



Type 类型	Φd 线径 (mm)	Rated Current(A) 额定电流(A)	Resistance Range 阻值范围(mΩ)	Remark 备注
CSSA CSSB CSSC	0.8	4.5	5~50	*P&H could be design by customer's requirement *P 值和 H 值可根据客户的要求进行设计
	1.0	5.5	3~30	
	1.6	9.5	3~15	
	2.0	12	3~10	

Ordering Procedure (Example: CSRC Φ1.5mm 10mΩ±5% B/B)

订购方式 (例如: CSRC Φ1.5mm 10mΩ±5% B/B)

C S R C 1 5 J 0 1 0 L B 0 0

Type (产品类型):
CSRA = CSRA type
CSRB = CSRB type
CSRC = CSRC type
CSRD = CSRD type
CSRE = CSRE type
CSRJ = CSRJ type
CSSA = CSSA type
CSSB = CSSB type
CSSC = CSSC type

Wire Ø (线径 Ø):
08=Ø0.8 10=Ø1.0
12=Ø1.2 15=Ø1.5
16=Ø1.6 20=Ø2.0
23=Ø2.3

Tolerance (公差):
J=±5% K=±10%

Resistance Value (阻值):
2%, 5% (E-24 series): the 1st digit is "0"; the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
2%, 5%产品（E-24系列电阻）：第1位是0，第2,3位表示阻值的有效数，第4位表示有几个0.
≤1%(E-96 Series)
the 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros:
≤1% 产品（E-96系列阻值）
第1~3位表示阻值的有效数，第4位表示有几个0.

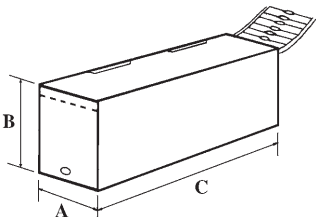
Packing Type (包装类型):
B=Bulk/Box (散装 / 盒装)

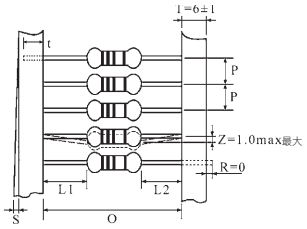
Packing Qty. (包装数量)
0=Bulk/Box
0= 散装 / 盒装

Additional Information (注):
0=NIL (标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Tape in Box Packing (Ammo Pack) (编带盒装)



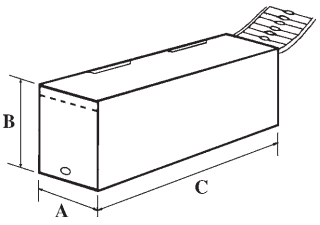


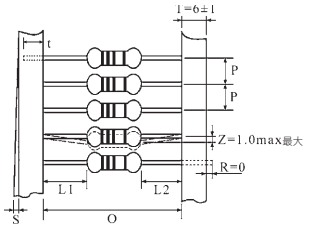
*L1-L2=1.0 Max. 最大
ZW: 0
**S=0.5 Max. 最大
PT-26: 0.8 Max. 最大

Part No 料号	Type 类型	Dimension of T/B(尺寸) (mm)					Qty./Box 数量 / 盒
		O	P	A±5	B±5	C±5	
Carbon Film Fixed Resistors (碳膜固定电阻器)							
CFR0W8	CFR-12	52±1	5±0.3	75	70	255	5,000
CFR0S4	CFR-25-S	52±1	5±0.3	75	70	255	5,000
CFR0W4	CFR-25	52±1	5±0.3	75	98	255	5,000
CFR0W2	CFR-50	52±1	5±0.3	75	45	255	1,000
CFR01S	CFR-100-S	52±1	5±0.3	80	82	255	1,000
CFR01W	CFR-100	64±5	10±0.5	90	119	255	1,000
CFR02S	CFR-200-S	64±5	10±0.5	90	119	255	1,000
CFR02W	CFR-200	64±5	10±0.5	90	88	255	500
CFR03S	CFR-300-S	64±5	10±0.5	90	88	255	500
CPR0W2	CPR-50	52±1	5±0.3	75	116	255	5,000
CPR01W	CPR-100	52±1	5±0.3	75	70	255	1,000
CPR02W	CPR-200	52±1	5±0.3	80	82	255	1,000
Precision Metal Film Lilm Fixed Resistors (金属膜固定电阻器)							
MF0W8	MF-12	52±1	5±0.3	75	70	255	5,000
MF0S4	MF-25-S	52±1	5±0.3	75	70	255	5,000
MF004	MF-40-SS	52±1	5±0.3	75	70	255	5,000
MF0W4	MF-25	52±1	5±0.3	75	98	255	5,000
MF0S2	MF-50-S	52±1	5±0.3	75	98	255	5,000
MF006	MF-60-S	52±1	5±0.3	75	98	255	5,000
MF0W2	MF-50	52±1	5±0.3	75	45	255	1,000
MF01S	MF-100-S	52±1	5±0.3	75	45	255	1,000
MF01W	MF-100	52±1	5±0.3	80	82	255	1,000
MF02S	MF-200-S	52±1	5±0.3	80	82	255	1,000
MF02W	MF-200	64±5	10±0.5	90	119	255	1,000
MF03S	MF-300-S	64±5	10±0.5	90	119	255	1,000
MF03W	MF-300	64±5	10±0.5	90	88	255	500
Metal Film Power Resistors (高功率金属膜电阻器)							
PMR01S	PMR-100-S	52±1	5±0.3	75	116	255	5,000
PMR02S	PMR-200-S	52±1	5±0.3	80	82	255	1,000
PMR03S	PMR-300-S	64±5	10±0.5	90	119	255	1,000

Note: Packing type customized is available upon request.
备注: 可根据需求提供客制化包装方式。

Tape in Box Packing (Ammo Pack) (编带盒装)



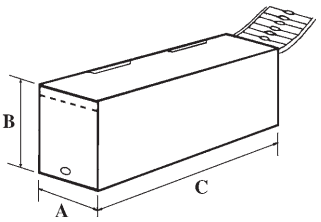


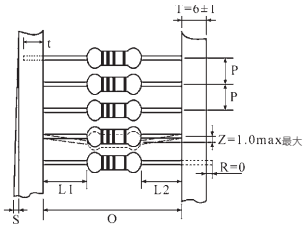
*L1-L2=1.0 Max. 最大
ZW: 0
**S=0.5 Max. 最大
PT-26: 0.8 Max. 最大

Part No 料号	Type 类型	Dimension of T/B(尺寸) (mm)					Qty./Box 数量 / 盒
		O	P	A±5	B±5	C±5	
Metal Oxide Film Fixed Resistors (金属氧化膜固定电阻器)							
MOR0W4	MOR-25	52±1	5±0.3	75	116	255	5,000
MOR0S2	MOR-50-S	52±1	5±0.3	75	116	255	5,000
MOR0W2	MOR-50	52±1	5±0.3	75	45	255	1,000
MOR01S	MOR-100-S	52±1	5±0.3	75	70	255	1,000
MOR01W	MOR-100	52±1	5±0.3	80	82	255	1,000
MOR02S	MOR-200-S	52±1	5±0.3	80	82	255	1,000
MOR02W	MOR-200	64±5	10±0.5	90	119	255	1,000
MOR03S	MOR-300-S	64±5	10±0.5	90	119	255	1,000
MOR03W	MOR-300	64±5	10±0.5	90	88	255	500
MOR05S	MOR-500-S	64±5	10±0.5	90	88	255	500
MOR05W	MOR-500	90±5	10±0.5	115	124	500	500
Metal Glaze Film Fixed Resistors (精密玻璃釉膜固定电阻器)							
MGR0W4	MGR-25	52±1	5±0.3	75	116	255	4,000
MGR0W2	MGR-50	52±1	5±0.3	75	70	255	1,000
MGR01W	MGR-100	52±1	5±0.3	80	82	255	1,000
MGR02W	MGR-200	64±5	10±0.5	90	119	255	1,000
MGR03W	MGR-300	64±5	10±0.5	90	88	255	500
MGR0S2	MGR-50-S	52±1	5±0.3	75	116	255	4,000
MGR01S	MGR-100-S	52±1	5±0.3	75	70	255	1,000
MGR02S	MGR-200-S	52±1	5±0.3	80	82	255	1,000
MGR03U	MGR-300-SS	52±1	5±0.3	80	82	255	1,000
MGR03S	MGR-300-S	64±5	10±0.5	90	119	255	1,000
Fusible Resistors (保险丝电阻器)							
FRN0W4	FRN-25	52±1	5±0.3	75	116	255	5,000
FRN0S2	FRN-50-S	52±1	5±0.3	75	116	255	5,000
FRN004	FRN-40	52±1	5±0.3	75	116	255	5,000
FRN0W2	FRN-50	52±1	5±0.3	75	36	255	1,000
FRN075	FRN-75	52±1	5±0.3	75	70	255	1,000
FRN01W	FRN-100	52±1	5±0.3	75	70	255	1,000
FRN01A	FRN-150	52±1	5±0.3	80	82	255	1,000
FRN02W	FRN-200	52±1	5±0.3	80	82	255	1,000
FRN03W	FRN-300	64±5	10±0.5	90	119	255	1,000

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Tape in Box Packing (Ammo Pack) (编带盒装)



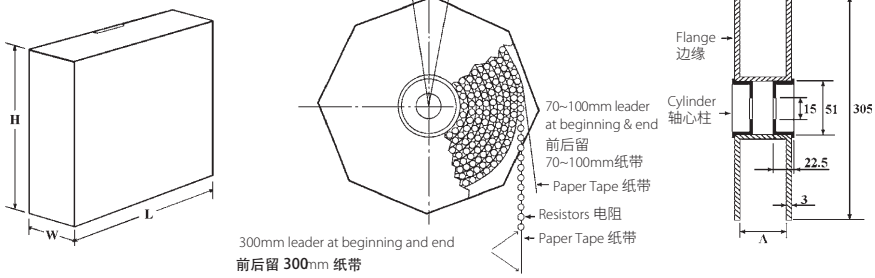


*L1-L2=1.0 Max. 最大
ZW: 0
**S=0.5 Max. 最大
PT-26: 0.8 Max. 最大

Part No 料号	Type 类型	Dimension of T/B(尺寸) (mm)					Qty./Box 数量 / 盒
		O	P	A±5	B±5	C±5	
Wire Wound Fixed Resistors KNP (with Non-inductive KNPN & Anti-surge KNPA) 绕线固定器 (含无感型 KNPI 与耐脉冲型 KNPA)							
KNP*W4	KNP*-25	52±1	5±0.3	75	116	255	5,000
KNP*S2	KNP*-50-S	52±1	5±0.3	75	116	255	5,000
KNP*W2	KNP*-50	52±1	5±0.3	75	45	255	1,000
KNP*1S	KNP*-100-S	52±1	5±0.3	75	45	255	1,000
KNP*1W	KNP*-100	52±1	5±0.3	80	82	255	1,000
KNP*2S	KNP*-200-S	52±1	5±0.3	80	82	255	1,000
KNP*2W	KNP*-200	64±5	10±0.5	90	119	255	1,000
KNP*3S	KNP*-300-S	64±5	10±0.5	90	119	255	1,000
KNP*3W	KNP*-300	64±5	10±0.5	90	88	255	500
KNP*5S	KNP*-500-S	64±5	10±0.5	90	88	255	500
KNP*5W	KNP*-500	90±5	10±0.5	115	124	500	500
KNP*7S	KNP*-700-S	90±5	10±0.5	115	124	500	500
Jumper Wires & Zero Ohm Resistors(跳线和零欧姆固定电阻器)							
ZWA0	ZW-A	52±1	5±0.3	75	98	255	10,000
ZWB0	ZW-B	52±1	5±0.3	75	116	255	10,000
ZWB-1	ZW-B1	52±1	5±0.3	75	116	255	10,000
ZWC0	ZW-C	52±1	5±0.3	75	98	255	8,000
ZWD0	ZW-D	52±1	5±0.3	75	98	255	8,000
ZWE0	ZW-E	52±1	5±0.3	75	98	255	7,000
ZOT0W8 **ZOC0W8**	ZOT-12 ZOC-12	52±1	5±0.3	75	70	255	5,000
ZOT0W4 **ZOC0W4**	ZOT-25 ZOC-25	52±1	5±0.3	75	98	255	5,000
PT-26Type (PT-26 类型)							
CFR0W8 **MF0W8**	CFR-12 MF-12	26 $^{+1.5}_{-1.0}$	5±0.5	50	66	255	5,000
CFR0S4 **MF0S4**	CFR-25-S MF-25-S	26 $^{+1.5}_{-1.0}$	5±0.5	50	66	255	5,000
MF004	MF-40-SS	26 $^{+1.5}_{-1.0}$	5±0.5	50	66	255	5,000
CFR0W4 **MF0W4** **FRN0W4**	CFR-25 MF-25 FRN-25	26 $^{+1.5}_{-0}$	5±0.5	50	116	255	5,000
MF0S2 **MOR0S2**	MF-50-S MOR-50-S	26 $^{+1.5}_{-0}$	5±0.5	50	116	255	5,000
MF006	MF-60-S	26 $^{+1.5}_{-0}$	5±0.5	50	116	255	5,000

Note: Packing type customized is available upon request.
备注: 可根据需求提供客制化包装方式。

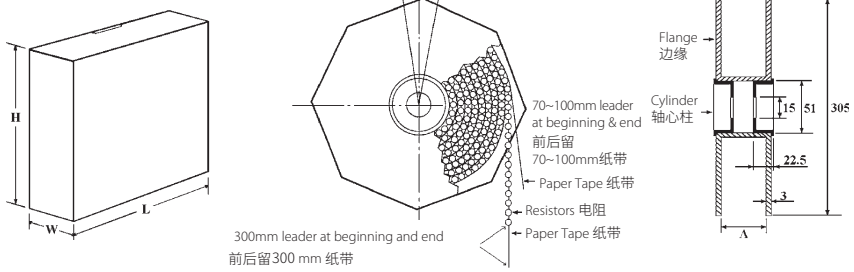
Tape in Reel (编带卷装)



Part No 料号	Type 类型	Dimension of T/R(尺寸) (mm)					Qty./Box 数量 / 盒
		O	A	W±5	H±5	L±5	
Carbon Film Fixed Resistors(碳膜固定电阻器)							
CFR0W8	CFR-12	52±1	73±2	85	294	293	5,000
CFR0S4	CFR-25-S	52±1	73±2	85	294	293	5,000
CFR0W4	CFR-25	52±1	73±2	85	294	293	5,000
CFR0W2	CFR-50	52±1	73±2	85	294	293	4,000
CFR01S	CFR-100-S	52±1	73±2	85	294	293	2,500
CFR01W	CFR-100	64±5	80±5	95	294	293	1,000
CFR02S	CFR-200-S	64±5	80±5	95	294	293	1,000
CFR02W	CFR-200	64±5	80±5	95	294	293	1,000
CFR03S	CFR-300-S	64±5	80±5	95	294	293	1,000
CPR0W2	CPR-50	52±1	73±2	85	294	293	5,000
CPR01W	CPR-100	52±1	73±2	85	294	293	4,000
CPR02W	CPR-200	52±1	73±2	85	294	293	2,500
Precision Metal Film Fixed Resistors (金属膜固定电阻器)							
MF0W8	MF-12	52±1	73±2	85	294	293	5,000
MF0S4	MF-25-S	52±1	73±2	85	294	293	5,000
MF004	MF-40-SS	52±1	73±2	85	294	293	5,000
MF0W4	MF-25	52±1	73±2	85	294	293	5,000
MF0S2	MF-50-S	52±1	73±2	85	294	293	5,000
MF0W2	MF-50	52±1	73±2	85	294	293	4,000
MF006	MF-60-S	52±1	73±2	85	294	293	5,000
MF01S	MF-100-S	52±1	73±2	85	294	293	4,000
MF01W	MF-100	52±1	73±2	85	294	293	2,500
MF02S	MF-200-S	52±1	73±2	85	294	293	2,500
MF02W	MF-200	64±5	80±5	95	294	293	1,000
MF03S	MF-300-S	64±5	80±5	95	294	293	1,000
MF03W	MF-300	64±5	80±5	95	294	293	1,000
Metal Film Power Resistors (高功率金属膜电阻器)							
PMR01S	PMR-100-S	52±1	73±2	85	294	293	5,000
PMR02S	PMR-200-S	52±1	73±2	85	294	293	2,500
PMR03S	PMR-300-S	64±5	80±5	95	294	293	1,000

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

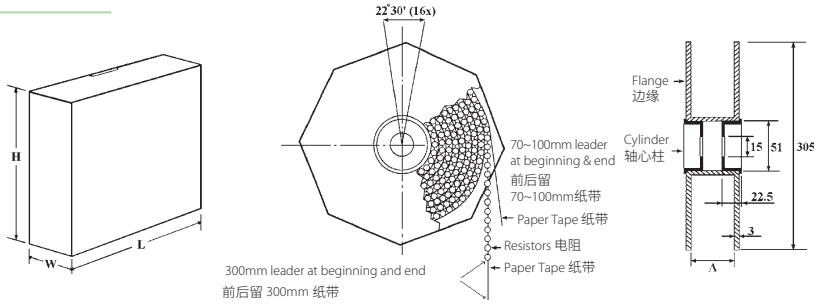
Tape in Reel (编带卷装)



Part No 料号	Type 类型	Dimension of T/R(尺寸) (mm)					Qty./Box 数量 / 盒
		O	A	W±5	H±5	L±5	
Metal Oxide Film Fixed Resistors (金属氧化膜固定电阻器)							
MOR0W4	MOR-25	52±1	73±2	85	294	293	5,000
MOR0S2	MOR-50-S	52±1	73±2	85	294	293	5,000
MOR0W2	MOR-50	52±1	73±2	85	294	293	4,000
MOR01S	MOR-100-S	52±1	73±2	85	294	293	4,000
MOR01W	MOR-100	52±1	73±2	85	294	293	2,500
MOR02S	MOR-200-S	52±1	73±2	85	294	293	2,500
MOR02W	MOR-200	64±5	80±5	95	294	293	1,000
MOR03S	MOR-300-S	64±5	80±5	95	294	293	1,000
MOR03W	MOR-300	64±5	80±5	95	294	293	1,000
MOR05S	MOR-500-S	64±5	80±5	95	294	293	1,000
MOR05W	MOR-500	90±5	115±5	110	310	310	700
Metal Glaze Film Fixed Resistors (精密玻璃釉膜固定电阻器)							
MGR0W4	MGR-25	52±1	73±2	85	294	293	5,000
MGR0W2	MGR-50	52±1	73±2	85	294	293	4,000
MGR01W	MGR-100	52±1	73±2	85	294	293	2,500
MGR02W	MGR-200	64±5	80±5	95	294	293	1,000
MGR03W	MGR-300	64±5	80±5	95	294	293	1,000
MGR0S2	MGR-50-S	52±1	73±2	85	294	293	5,000
MGR01S	MGR-100-S	52±1	73±2	85	294	293	4,000
MGR02S	MGR-200-S	52±1	73±2	85	294	293	2,500
MGR03U	MGR-300-SS	52±1	73±2	85	294	293	2,500
MGR03S	MGR-300-S	64±5	80±5	95	294	293	1,000
Fusible Resistors(保险丝电阻器)							
FRN0W4	FRN-25	52±1	73±2	85	294	293	5,000
FRN0S2	FRN-50-S	52±1	73±2	85	294	293	5,000
FRN004	FRN-40	52±1	73±2	85	294	293	5,000
FRN0W2	FRN-50	52±1	73±2	85	294	293	4,000
FRN075	FRN-75	52±1	73±2	85	294	293	4,000
FRN01W	FRN-100	52±1	73±2	85	294	293	4,000
FRN01A	FRN-150	52±1	73±2	85	294	293	2,500
FRN02W	FRN-200	52±1	73±2	85	294	293	2,500
FRN03W	FRN-300	64±5	80±5	95	294	293	1,000

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Tape in Reel (编带卷装)



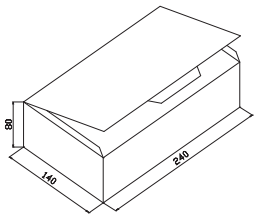
Part No 料号	Type 类型	Dimension of T/R(尺寸) (mm)					Qty./Box 数量 / 盒
		O	A	W±5	H±5	L±5	
Wire Wound Fixed Resistors KNP (with Non-inductive KNPN & Anti-surge KNPA) 绕线固定器 (含无感型 KNPI 与耐脉冲型 KNPA)							
KNP*W4	KNP*-25	52±1	73±2	85	294	293	5,000
KNP*S2	KNP*-50-S	52±1	73±2	85	294	293	5,000
KNP*W2	KNP*-50	52±1	73±2	85	294	293	4,000
KNP*1S	KNP*-100-S	52±1	73±2	85	294	293	4,000
KNP*1W	KNP*-100	52±1	73±2	85	294	293	2,500
KNP*2S	KNP*-200-S	52±1	73±2	85	294	293	2,500
KNP*2W	KNP*-200	64±5	80±5	95	294	293	1,000
KNP*3S	KNP*-300-S	64±5	80±5	95	294	293	1,000
KNP*3W	KNP*-300	64±5	80±5	95	294	293	1,000
KNP*5S	KNP*-500-S	64±5	80±5	95	294	293	1,000
KNP*5W	KNP*-500	90±5	115±5	110	310	310	700
KNP*7S	KNP*-700-S	90±5	115±5	110	310	310	700
Jumper Wires & Zero Ohm Resistors(跳线和零欧姆固定电阻器)							
ZWA0	ZW-A	52±1	73±2	85	294	293	10,000
ZWB0	ZW-B	52±1	73±2	85	294	293	10,000
ZWB-1	ZW-B1	52±1	73±2	85	294	293	10,000
ZWC0	ZW-C	52±1	73±2	85	294	293	10,000
ZWD0	ZW-D	52±1	73±2	85	294	293	10,000
ZWE0	ZW-E	52±1	73±2	85	294	293	10,000
ZOT0W8 ZOC0W8	Z0-12	52±1	73±2	85	294	293	5,000
ZOT0W4 ZOC0W4	ZO-25	52±1	73±2	85	294	293	5,000

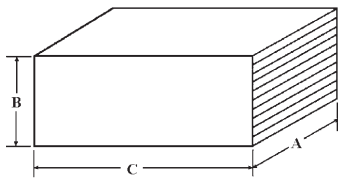
Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Standard Packing of Coated Type Resistors

涂装型电阻器包装标准

Bulk in Box Packing (散装盒装)

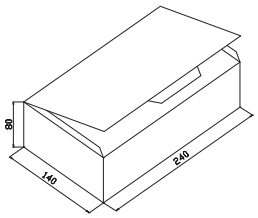


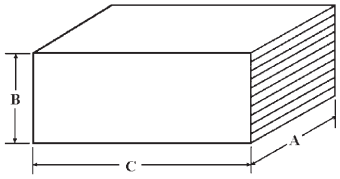


Part No 料号	Type 类型	Dimension of B/B(尺寸) (mm)			Qty.of Bag/Box 袋数量 / 盒数量
		A±5	B±5	C±5	
Carbon Film Fixed Resistors(碳膜固定电阻器)					
CFR0W8	CFR-12	140	80	240	1,000/20,000
CFR0S4	CFR-25-S	140	80	240	1,000/20,000
CFR0W4	CFR-25	140	80	240	500/10,000
CFR0W2	CFR-50	140	80	240	200/4,000
CFR01S	CFR-100-S	140	80	240	100/2,500
CFR01W	CFR-100	140	80	240	100/1,500
CFR02S	CFR-200-S	140	80	240	100/1,500
CFR02W	CFR-200	140	80	240	100/1,000
CFR03S	CFR-300-S	140	80	240	100/1,000
CPR0W2	CPR-50	140	80	240	500/10,000
CPR01W	CPR-100	140	80	240	200/4,000
CPR02W	CPR-200	140	80	240	100/2,500
Precision Metal Film Fixed Resistors (金属膜固定电阻器)					
MF0W8	MF-12	140	80	240	1,000/20,000
MF0S4	MF-25-S	140	80	240	1,000/20,000
MF004	MF-40-SS	140	80	240	1,000/20,000
MF0W4	MF-25	140	80	240	500/10,000
MF0S2	MF-50-S	140	80	240	500/10,000
MF0W2	MF-50	140	80	240	200/4,000
MF006	MF-60-S	140	80	240	500/10,000
MF01S	MF-100-S	140	80	240	200/4,000
MF01W	MF-100	140	80	240	100/2,500
MF02S	MF-200-S	140	80	240	100/2,500
MF02W	MF-200	140	80	240	100/1,500
MF03S	MF-300-S	140	80	240	100/1,500
MF03W	MF-300	140	80	240	100/1,000
Metal Film Power Resistors (高功率金属膜电阻器)					
PMR01S	PMR-100-S	140	80	240	500/10,000
PMR02S	PMR-200-S	140	80	240	100/2,500
PMR03S	PMR-300-S	140	80	240	100/1,000

Note: Packing type customized is available upon request.
备注: 可根据需求提供客制化包装方式。

Bulk in Box Packing (散装盒装)





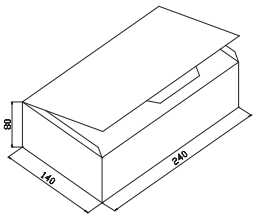
Part No 料号	Type 类型	Dimension of B/B(尺寸) (mm)			Qty.of Bag/Box 袋数量 / 盒数量
		A±5	B±5	C±5	
Metal Oxide Film Fixed Resistors (金属氧化膜固定电阻器)					
MOR0W4	MOR-25	140	80	240	500/10,000
MOR0S2	MOR-50-S	140	80	240	500/10,000
MOR0W2	MOR-50	140	80	240	200/4,000
MOR01S	MOR-100-S	140	80	240	200/4,000
MOR01W	MOR-100	140	80	240	100/2,500
MOR02S	MOR-200-S	140	80	240	100/2,500
MOR02W	MOR-200	140	80	240	100/1,500
MOR03S	MOR-300-S	140	80	240	100/1,500
MOR03W	MOR-300	140	80	240	100/1,000
MOR05S	MOR-500-S	140	80	240	100/1,000
MOR05W	MOR-500	140	80	240	25/400
MOR07W	MOR-700	140	80	240	25/300
MOR08W	MOR-800	140	80	240	25/200
MOR09W	MOR-900	140	80	240	25/200
Metal Glaze Film Fixed Resistors (精密玻璃釉膜固定电阻器)					
MGR0W4	MGR-25	140	80	240	500/10,000
MGR0W2	MGR-50	140	80	240	200/4,000
MGR01W	MGR-100	140	80	240	100/2,500
MGR02W	MGR-200	140	80	240	100/1,500
MGR03W	MGR-300	140	80	240	100/1,000
MGR0S2	MGR-50-S	140	80	240	500/10,000
MGR01S	MGR-100-S	140	80	240	200/4,000
MGR02S	MGR-200-S	140	80	240	100/2,500
MGR03U	MGR-300-SS	140	80	240	100/2,500
MGR03S	MGR-300-S	140	80	240	100/1,500

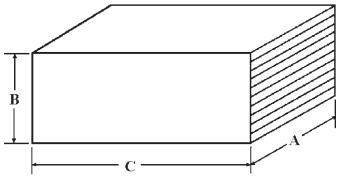
Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Standard Packing of Coated Type Resistors
涂装型电阻器包装标准

ROYALOHM
www.royalohm.com

Bulk in Box Packing (散装盒装)





Part No 料号	Type 类型	Dimension of B/B(尺寸) (mm)			Qty.of Bag/Box 袋数量 / 盒数量
		A±5	B±5	C±5	
Fusible Resistors(保险丝电阻器)					
FRN0W4	FRN-25	140	80	240	500/10,000
FRN0S2	FRN-50-S	140	80	240	500/10,000
FRN004	FRN-40	140	80	240	500/10,000
FRN0W2	FRN-50	140	80	240	200/4,000
FRN075	FRN-75	140	80	240	200/4,000
FRN01W	FRN-100	140	80	240	200/4,000
FRN01A	FRN-150	140	80	240	100/2,500
FRN02W	FRN-200	140	80	240	100/2,500
FRN03W	FRN-300	140	80	240	100/1,500
Wire Wound Fixed Resistors KNP (with Non-inductive KNPN & Anti-surge KNPA) 绕线固定器 (含无感型 KNPI 与耐脉冲型 KNPA)					
KNP*W4	KNP*-25	140	80	240	500/10,000
KNP*S2	KNP*-50-S	140	80	240	500/10,000
KNP*W2	KNP*-50	140	80	240	200/4,000
KNP*1S	KNP*-100-S	140	80	240	200/4,000
KNP*1W	KNP*-100	140	80	240	100/2,500
KNP02S	KNP*-200-S	140	80	240	100/2,500
KNP*2W	KNP*-200	140	80	240	100/1,500
KNP*3S	KNP*-300-S	140	80	240	100/1,500
KNP*3W	KNP*-300	140	80	240	100/1,000
KNP*5S	KNP*-500-S	140	80	240	100/1,000
KNP*5W	KNP*-500	140	80	240	25/400
KNP*7S	KNP*-700-S	140	80	240	25/400
KNP*7W	KNP*-700	140	80	240	25/300
KNP*8S	KNP*-800-S	140	80	240	25/300
KNP*8W	KNP*-800	140	80	240	25/200
KNP*9S	KNP*-900-S	140	80	240	25/200
KNP*9W	KNP*-900	140	80	240	25/200
KNP*AS	KNP*-1000-S	140	80	240	25/200
Zero Ohm Resistors(零欧姆固定电阻器)					
ZOT0W8 **ZOCOW8**	ZO-12	140	80	240	1,000/20,000
ZOT0W4 **ZOCOW4**	ZO-25	140	80	240	500/10,000

Note: Packing type customized is available upon request.
备注: 可根据需求提供客制化包装方式。

Feature (特性)

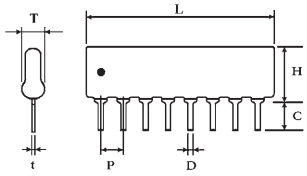
- Miniature, high density packaging
  小型高密度封装
- High reliability $RU0_2$ paste
  使用高稳定性 $RU0_2$ 电阻材料

Application (应用)

- Control circuit V.C.R. (V.C.R.控制电路)
- Air-conditioner (空调)
- Computer, color TV (计算机，彩电)
- Facsimile (传真机)

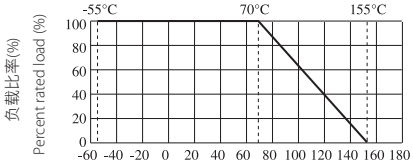


Dimension (尺寸) (mm)



"●" indicate the 1st pin (表示第一脚位置)

Derating Curve (降功率曲线)



Type 类型	Dimension of L(Max.) L 的最大尺寸											H max	C +0.5 -0.3	T max	t±0.05	P±0.2	D±0.1
	4pin	5pin	6pin	7pin	8pin	9pin	10 pin	11 pin	12 pin	13 pin	14 pin						
RNL	10.2	12.7	15.3	17.8	20.4	22.9	25.4	28.0	30.5	33.1	35.6	5.08	3.3	2.5	0.25	2.54	0.5
RPL	10.2	12.7	15.3	17.8	20.4	22.9	25.4	28.0	30.5	33.1	35.6	5.08	3.3	2.5	0.25	2.54	0.5
RNM	10.2	12.7	15.3	17.8	20.4	22.9	25.4	28.0	30.5	33.1	35.6	6.35	3.3	2.5	0.25	2.54	0.5
RPH	10.2	12.7	15.3	17.8	20.4	22.9	25.4	28.0	30.5	33.1	35.6	8.89	3.3	2.5	0.25	2.54	0.5

Circuit Structure (电路结构)

A	B	C	D	E
RNL/RPL/RNM/RPH	RNL/RPL/RNM/RPH	RNL	RNL	RNL
R1=R2=.....Rn	R1=R2=.....Rn	R1=R2=R_n	R1=R2=.....Rn $R_1 \neq R_2 \neq$.....Rn	R1=R2 or R1≠R2

G	H	L	P	R
RNL	RNL	RNL	RNL	RNL/RPL/RNM/RPH
R1=R2=.....Rn				R1=R2 or R1≠R2

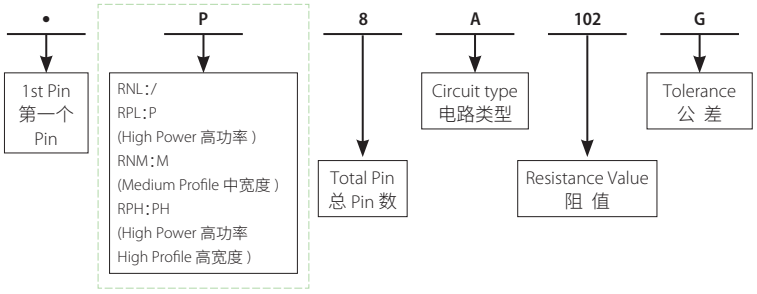
* Custom Design Circuit could be available on a case to case basis. (可按客户特殊要求定制)

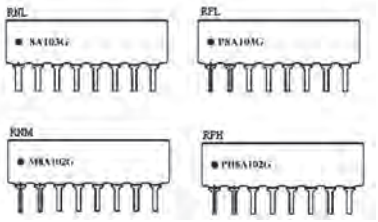
Package Power Ratings (封装功率等级)

Type 类型	4PIN	5PIN	6PIN	7PIN	8PIN	9PIN	10PIN	11PIN	12PIN	13PIN	14PIN
RPL	0.5W	0.63W	0.75W	0.88W	1.0W	1.13W	1.25W	1.38W	1.5W	1.63W	1.75W
RNM	0.6W	0.75W	0.9W	1.05W	1.20W	1.35W	1.50W	1.65W	1.80W	1.95W	2.10W
RPH	0.8W	1.0W	1.2W	1.4W	1.6W	1.8W	2.0W	2.2W	2.4W	2.6W	2.8W

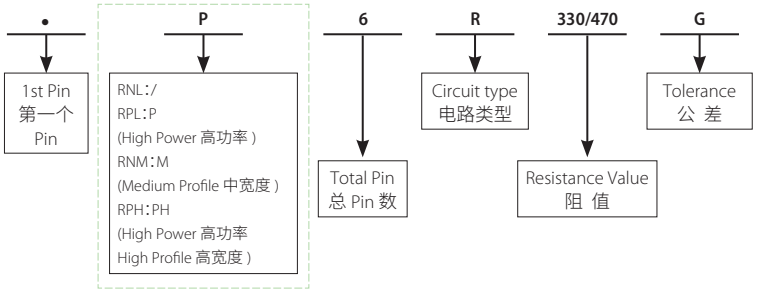
Type 类型	Power Rating 额定功率	Max .Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围	Tolerance 公差	Operating Temperature 工作温度范围
RNL	B type(B 型)：0.2W Others(其它类型)：0.125W	100V	150V	200V	R Type(R 型)：100Ω~10K Others(其它类型)：10Ω~1MΩ	±2% ±5%	-55℃~+155℃
RPL	A:0.2W	100V	150V	200V	10Ω~1MΩ	±2% ±5%	-55℃~+155℃
	B:0.3W				10Ω~1MΩ		
	R:0.2W				100Ω~10KΩ		
RNM	A:0.25W	100V	150V	200V	10Ω~1MΩ	±2% ±5%	-55℃~+155℃
	B:0.4W				10Ω~1MΩ		
	R:0.25W				100Ω~10KΩ		
RPH	A:0.3W	100V	150V	200V	10Ω~1MΩ	±2% ±5%	-55℃~+155℃
	B:0.5W				10Ω~1MΩ		
	R:0.3W				100Ω~10KΩ		

Marking (Single Value) [标示(单个阻值)]:





Marking(Dual Value)[标示(双阻类型)]:



Dual Value (双阻型阻值系列)(R1/R2)(Ohm)

160 / 240	330 / 390
180 / 390	330 / 470
220 / 270	1.5K / 3.5K
220 / 330	3.0K / 6.2K

* Special Value available on a case to case basis. (另可按客户特殊要求订做)

Performance Specification(性能)

Test Item 试验项目		Evaluation Criteria 判定标准			
Temperature	温度系数	RNL	RPL	RNM	RPH
		50Ω~1MΩ：±200PPM/℃ <50Ω&>1MΩ：±250PPM/℃	50Ω~1MΩ：±100PPM/℃ <50Ω&>1MΩ：±250PPM/℃		
Short-time overload	短时间过负荷	ΔR/R≤±(0.5%+0.1Ω)	ΔR/R≤±(0.25%+0.1Ω)		
Insulation resistance	绝缘电阻	≥10,000MΩ			
Dielectric withstanding voltage	绝缘耐压	No Evidence of flashover,arcing or insulation breakdown(无击穿、飞弧及可见机械损伤)			
Terminal strength	端子强度	ΔR/R≤±(0.5%+0.1Ω)	ΔR/R≤±(0.25%+0.1Ω)		
Soldering heat	耐焊接热	ΔR/R≤±(0.5%+0.1Ω)			
Solderability	可焊性	Coverage must be over 95%.			
Thermal shock	热冲击	ΔR/R≤±(0.5%+0.1Ω)	ΔR/R≤±(0.25%+0.1Ω)		
Rapid change of temperature	温度快速变化	ΔR/R≤±(0.5%+0.1Ω)			
Load life in humidity	湿度寿命	ΔR/R≤±(3%+0.1Ω)	ΔR/R≤±(0.5%+0.1Ω)		
Load life	负载寿命	ΔR/R≤±(3%+0.1Ω)	ΔR/R≤±(1%+0.1Ω)		

Ordering Procedure (Example: RNL A type 10 PIN 2% 10KΩ B/B)

订购方式 (例如: RNL A 型 10 PIN 2% 10KΩ B/B)

R N L A 1 0 G 0 1 0 3 B 0 E

Product Type（产品类型）：
RNL = General type, low profile
普通网络电阻器
RPL = High power, low profile
高功率网络电阻器
RNM = High Power, medium profile
高功率中宽度电阻器
RPH = High power, high profile
高功率高宽度网络电阻器

Circuit Type(电路类型)：
RNL: A, B, C, D, E, L, R, G, P
RPL/RNM/RPH：A, B, R

Number of Pins (Pin 数)：
04=4pins
05=5pins
06=6pins
07=7pins
08=8pins
09=9pins
10=10pins
11=11pins
12=12pins
13=13pins
14=14pins

Tolerance (公差):
G = ± 2%
J = ± 5%

Resistance Value（阻值）：
2%, 5%（E24 series):
the 1st digit is "0",the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5%（(E24 系列阻值)：
第 1 位数量 0，第 2、3 位数表示阻值的有效数，第 4 位表示有几个 0；

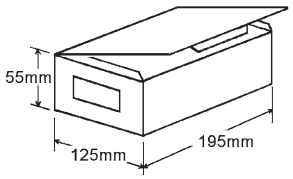
Packing Type (包装类型)：
B=Bulk/Box (散装 / 盒装)
A=Ammo Pack (编带包装)

Packing Qty.
(包装数量)：
Indicate"0"for Bulk/Box packing
散装请填 "0"

Special Feature:(特征):
E=Lead Free (standard)
(无铅标准品)

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

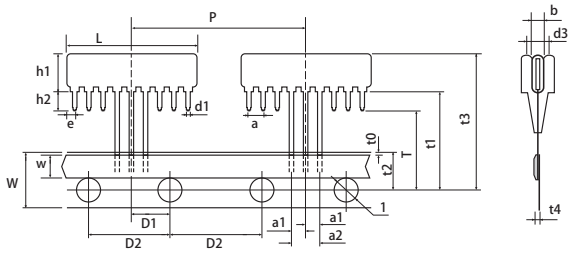
Standard Packing of Resistor Network (网络电阻器的标准包装)



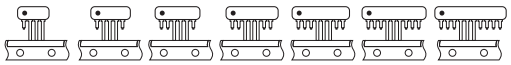
Type 类型	Pins Pins 数	Weight of 1,000pcs 1,000 只 重量 (g)	Qty.per Bag 每袋数量	Qty.per Box 每盒数量	Qty.per Carton 每箱数量
RNL RPL	4	210	200	1,000	30,000
RNM		240	100		
RPH		330			
RNL RPL	5	250	200	1,000	30,000
RNM		300	100		
RPH		410			
RNL RPL	6	320	200	1,000	30,000
RNM		360	100		
RPH		490			
RNL RPL	7	360	200	1,000	30,000
RNM		420	100		
RPH		570			
RNL RPL	8	430	200	1,000	30,000
RNM		480	100		
RPH		660	50	500	15,000
RNL RPL	9	450	200	1,000	30,000
RNM		540	50	500	15,000
RPH		760			

Type 类型	Pins Pins 数	Weight of 1,000pcs 1,000 只 重量 (g)	Qty.per Bag 每袋数量	Qty.per Box 每盒数量	Qty.per Carton 每箱数量
RNL RPL	10	530	200	1,000	30,000
RNM		610	50	500	15,000
RPH		870			
RNL RPL	11	600	100	500	15,000
RNM		670	50		
RPH		950			
RNL RPL	12	650	100	500	15,000
RNM		730	50		
RPH		1030			
RNL RPL	13	710	100	500	15,000
RNM		790	50		
RPH		1130			
RNL RPL	14	770	100	500	15,000
RNM		850	50		
RPH		1210			

Ammo Pack of Resistor Network (网络电阻器编带包装)

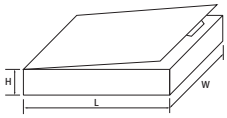


* … n=Pin Count



Dimension 尺寸 (mm)		Dimension 尺寸 (mm)	
H1	Max 5.08	t0	2.0Max
L	Max 2.54*n	t1	18.99±0.5
a	2.54±0.25	t2	9.0±0.5
d1	0.5±0.1	t3	24.46Max
P	25.4±1.0	t4	1.5max
W	18±0.5	I	φ4.0±0.3
w	5.0min	h2	3.0±0.5
P1	6.35±0.7	a1	2.54±0.25
P2	12.7±0.3	a2	5.08±0.3
B	Max 2.49	d3	2.0Max
T	16±0.5	/	/

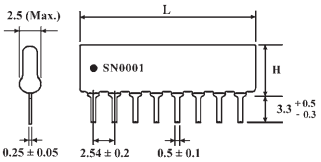
Packing quantity (包装数量)



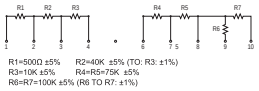
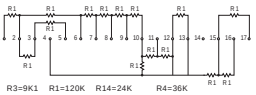
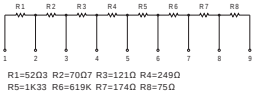
The inner box sizes 内盒尺寸 :
4~9pin: 320(L) × 207(W) × 40(H)mm
10pin:315(L) × 295(W) × 40(H)mm

Pins Pins 数	Qty.per Box 每盒数量	Qty.per Carton 每箱数量
4~10	1,000	12,000

Special Network-SIP Series
特殊网络电阻器 SIP 系列

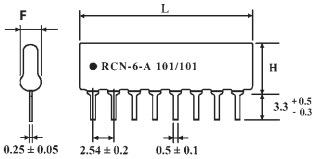


"●" indicate the 1st pin (表示第一脚位置)

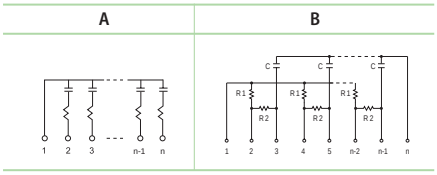
Type(类型)	SN0001	SN0002	SN0003	SN0004
Circuit Structure (电路结构)	 R1=500Ω ±5% R2=40K ±5% (TO: R3: ±1%) R3=10K ±5% R4=R5=75K ±5% R6=R7=100K ±5% (R6 TO R7: ±1%)	 R1=33KΩ ±5% R2=22KΩ ±5%	 R3=9K1 R1=120K R14=24K R4=36K R9=14K R15=1K5 R5=R6=7K5 R10=R11=R12=20K R13=2K R7=52K5 R13=11K	 R1=52Ω3 R2=70Ω7 R3=121Ω R4=249Ω R5=1K33 R6=619K R7=174Ω R8=75Ω
Dimension of L(max) 尺寸 L(最大)	10PINS:25.4mm	10PINS:25.4mm	17PINS:43.2mm	9PINS:22.9mm
H(max) H(最大)	5.08mm	5.08mm	6.35mm	5.08mm
Power Rating 额定功率	0.2W	0.2W	0.125W	0.125W
Max Working Voltage 最大工作电压	100V	100V	100V	100V
Max Overload Voltage 最大过负荷电压	150V	150V	200V	150V
Operating Temperature 工作温度	-55~+155 ℃	-55~+155℃	-55~+155 ℃	-55~+155 ℃

* Custom Design Circuit could be available on a case to case basis (可提供客户特殊要求之线路产品)

Resistor/Capacitor Network - SIP Series
网络阻容器 - SIP 系列



"●" indicate the 1st pin (表示第一脚位置)



Electrical Characteristics- Capacitor (电容特性)

Capacitance Dielectric 电容介质	Capacitance Range 电容范围	Capacitance Tolerance 电容公差	Capacitance Voltage 电容电压
NPO	39pF~270pF	±10%	50V
X7R	>270pF~0.1μF	±20%	

Dimension (尺寸) (mm):

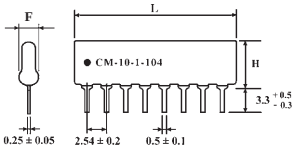
Type 类型	H (mm)	F (mm)
RCH	7.62 Max.	3.81 Max.
RCN	8.89 Max.	3.81 Max.

Dimension (尺寸) (mm):

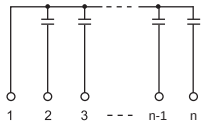
L	
4 PIN: 10.2mm	10 PIN: 25.4mm
5 PIN: 12.7mm	11 PIN: 28.0mm
6 PIN: 15.3mm	12 PIN: 30.5mm
7 PIN: 17.8mm	13 PIN: 33.1mm
8 PIN: 20.4mm	14 PIN: 35.6mm
9 PIN: 22.9mm	

* Custom Design Circuit could be available on a case to case basis （可提供客户特殊要求之线路产品）

Capacitor Network-SIP Series
网络电容器 SIP 系列



"●" indicate the 1st pin (表示第一脚位置)



Circuit Structure (电路结构)

Electrical Characteristics- Capacitor (电容特性)

Capacitance Dielectric 电容介质	Capacitance Range 电容范围	Capacitance Tolerance 电容公差	Capacitance Voltage 电容电压
NPO	39pF~270pF	±10%	50V
X7R	>270pF~0.1μF	±20%	

Dimension (尺寸) (mm):

Type 类型	H (mm)	F (mm)
CNM	6.35 Max.	3.81 Max.
CNH	7.62 Max.	3.81 Max.

Dimension (尺寸) (mm):

L	
4 PIN: 10.2mm	10 PIN: 25.4mm
5 PIN: 12.7mm	11 PIN: 28.0mm
6 PIN: 15.3mm	12 PIN: 30.5mm
7 PIN: 17.8mm	13 PIN: 33.1mm
8 PIN: 20.4mm	14 PIN: 35.6mm
9 PIN: 22.9mm	

* Custom Design Circuit could be available on a case to case basis （可提供客户特殊要求之线路产品）

High Voltage Flat Resistors - HFR、 HFHB

高压扁平式电阻器 - HFR、HFHB系列

ROYALOHM
www.royalohm.com

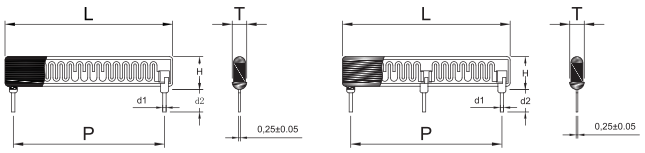
Feature (特性)

- Small size, Light weight 小尺寸，重量轻
- High stability, Reliability 高稳定性，高可靠性
- Max working voltage 10KV 最大工作电压可达10KV
- Used in Microwave Ovens, Induction Cooker, High Voltage Power Supply, Laser light control circuit and other applications
  用于微波炉、电磁炉、高压电源、激光控制电路及其它产品

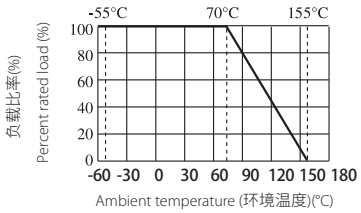


HFH HFR HFHB

Dimension (尺寸) (mm)



Derating Curve & Specification (降功率曲线和性能)



Part No. 料号	Type 类型	Power rating 额定功率	Dimension (尺寸)(mm)						Max Working Voltage 最大工作电压	Dielectronic Withstanding Voltage 绝缘耐压	Resistance Range 阻值范围
			P±0.5	L(max) L 最大	d1±0.1	d2 $^{+0.5}_{-0.2}$	H(max) H 最大	T(max) T 最大			
HFR0W2	HFR-50	0.5W	17.8	20.4	0.5	3.5	5.08	2.5	5KV	500V	1M~1GΩ
HFR007	HFR-75	0.75W	22.9	25.4	0.5	3.5	5.08	2.5	10KV	500V	1M~1GΩ
HFR01W	HFR-100	1W	27.9	30.5	0.5	3.5	5.08	2.5	10KV	500V	1M~1GΩ
HFH01W	HFH-100	1W	10	13.2	0.5	3.5	8.89	2.5	10KV	500V	1M~1GΩ
HFHB1W	HFHB-100	1W	25.4	28	0.5	3.5	8.89	2.5	10KV	500V	1M~1GΩ

Performance Specification (性能)

Temperature coefficient	温度系数	±200PPM/°C
Terminal strength	端子强度	ΔR/R: ±(1%+0.1Ω)
Soldering heat	耐焊接热	ΔR/R: ±(1%+0.1 Ω)
Solderability	可焊性	Min.95% coverage (最少 95% 覆盖率)
Rapid change of temperature	温度快速变化	ΔR/R±(1%+0.1 Ω)
Humidity (Steady State)	恒定湿热	ΔR/R: ±(1.0%+0.1 Ω)
Load life in humidity	湿度寿命	ΔR/R: ±(3.0%+0.1Ω)
Load life	负载寿命	ΔR/R: ±(3.0%+0.1Ω)
Insulation resistance	绝缘电阻	≥10,000MΩ
Thermal shock	热冲击	ΔR/R±(1%+0.1Ω)

Ordering Procedure (Example: HFR 0.75W 10% 10M B/B)

订购方式 (例如: HFR 0.75W 10% 10M B/B)

H F R 0 0 7 K 0 1 0 6 B 0 E

Product Type (产品类型):
HFR=High Power,Low Profile
高功率底宽度
HFH=High Power,High Profile
高功率高宽度
HFM=High Power,Medium Profile
高功率中宽度

Circuit type (电路类型):
0=One resistor (单电阻)
B=Two resistor (双电阻)

Wattage (功率):
W2 = 1/2W
07= 0.75W
1W = 1W

Tolerance (公差):
J =±5%
K=±10%
M=±20%

Resistance Value (阻值):
5%,10%,20%(E-24 series)
The 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%,10%,20% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数，第 4 位表示有几个 0.

Packing Type: (包装类型):
B = Bulk / Box
B = 散装 / 盒装

Special Feature (特征):
0 =For Bulk/Box packing (散装 / 盒装)
E =lead-free (无铅标准品)

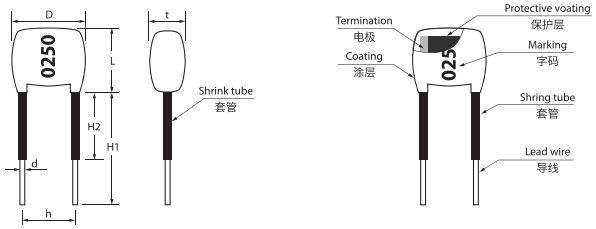
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Feature (特性)

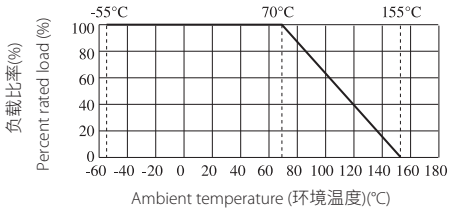
- Small size and light weight (体积小, 重量轻)
- Lighting application (照明应用)
- Too low/high ohmic value can be supplied case to case basis
  (可特别提供过低/过高的欧姆值)
- Patent No:1581275 (专利号:1581275)



Dimension (尺寸) (mm)



Derating Curve (降功率曲线)



Type	Power Rating 额定功率	D ±1	L ±1	H1 ±1.5	H2 ±1	h ±1	d ±0.05	t ±1	Tolerance 精度 %	Resistance Range 阻值範圍	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Standard Color 标准色	Operating Temperature 工作温度
RC06	0.25W (1/4W)	5.5	6	13.5	4.5	3.5	0.68	3.5	Jumper	<50mΩ	200V	400V	500V	Brown	-55 ~ +155°C
									1%	10Ω ~ 1MΩ					
RC06-1	0.25W (1/4W)	5.5	7.5	13.5	4.5	3.5	0.68	4.5	5%	1Ω ~ 10MΩ	200V	400V	500V	Blue	

Performance Specification (性能)

Temperature Coefficient 温度系数	1Ω ~ 10Ω : ±400PPM/°C 10.1Ω ~ 100Ω: ±200PPM /°C >100Ω: ±100PPM /°C
Short Time Overload 短时间过负荷	±1% : ±(1.0%+0.1Ω) ±5%: ±(2.0%+0.1Ω)
Solderability 可焊性	Min. 95%coverage
Soldering Heat 耐焊接热	±(1.0%+0.05Ω)
Temperature Cycling 温度循环	±1%: ±(0.5%+0.05Ω) ±5%: ±(1.0%+0.05Ω)
Insulation Resistance 绝缘电阻	1,000 MΩ or more
Load Life in Humidity 湿度寿命	±1%: ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)
Load Life 负载寿命	±1% : ±(1.0%+0.1Ω) ±5%: ±(3.0%+0.1Ω)

Ordering Procedure (Example: RC06 1/4W 1% 10Ω)

订购方式 (例如: RC06 1/4W 1% 10Ω)

R C 0 6 W 4 F 1 0 0 J B 3 0

Product Type (产品类型):
RC06= Special Metal Glaze film (non-flame)
RC16= RC06-1 Special Metal Glaze film

Wattage (功率):
W4= 1/4W

Tolerance (公差):
F= ±1% J= ±5%

Resistance Value (阻值):
5% & 10% (E-24 series):
the 1st digit is "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros;
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0.
1%(E-96 Series)
The 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros:
1% 产品 (E-96 系列阻值)
第 1~3 位表示阻值的有效数，第 4 位表示有几个 0.

Color: (色标):
1= Blue (蓝)
3= Brown (综)

Special Feature (特征):
0 =For Bulk/Box packing (散装 / 盒装)

Packing Type:
B = Bulk / Box
包装类型:
B = 散装 / 盒装

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

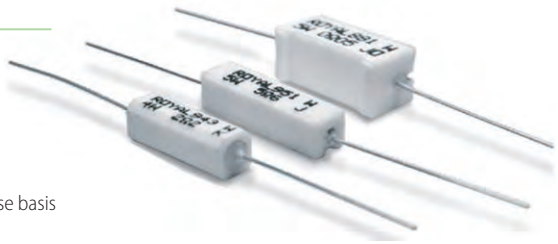
Axial Leaded Type Cement Fixed Resistors - PRW

轴向导线型水泥固定电阻器 - PRW系列

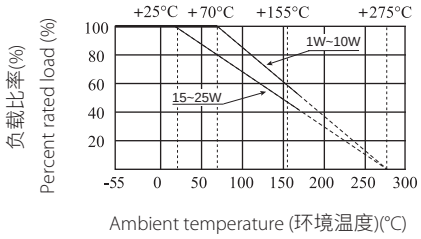
ROYALOHM
www.royalohm.com

Feature (特性)

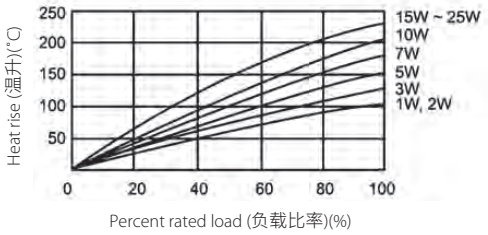
- Self-extinguishing 完全不燃性
- Extremely small & sturdy mechanically safe 体积小且坚固安全
- Non-inductive type available 无感也可提供
- Excellent flame & moisture resistance 卓越抗湿性
- Too low or too high values on Wire-wound & Power-film type can be supplied on a case to case basis
  过低或过高的阻值，绕线或切割型都可以特别提供



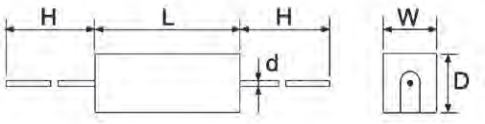
Derating Curve (降功率曲线)



Heat Rise Chart (表面温升)

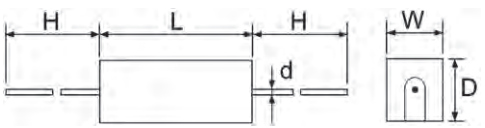


Axial Leaded Type-PRW Series(轴向导线型 -PRW 系列)



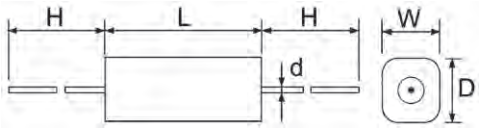
Part No. 料号	Type 类型	Dimension(尺寸)(mm)					Max. working voltage 最大工作电压	Max. Overload voltage 最大过负荷电压	Resistance Range 阻值范围	
		W±1	D±1	L±1	H	d±0.05			Wire-wound 绕线型	Power Film 膜层型
PRW01W	PRW1W	6	6	13.5	25±3	0.70	200V	400V	0.1Ω~27Ω	28Ω~100KΩ
PRW02W	PRW2W	7	7	18	28±5	0.70	250V	500V	0.1Ω~27Ω	28Ω~120KΩ
PRW03W	PRW3W	8	8	22	32±5	0.70	300V	600V	0.1Ω~39Ω	40Ω~150KΩ
PRW05W	PRW5W	10	9	22	35±5	0.75	350V	700V	0.1Ω~47Ω	48Ω~150KΩ
PRW07W	PRW7W	10	9	35	35±5	0.75	500V	1000V	0.1Ω~680Ω	681Ω~200KΩ
PRW0AW	PRW10W	10	9	49	35±5	0.75	700V	1400V	0.1Ω~910Ω	911Ω~200KΩ
PRW0FW	PRW15W	12.5	11.5	49	35±5	0.75	700V	1400V	1Ω~1.0KΩ	1.1KΩ~200KΩ
PRW020	PRW20W	14.5	13.5	60	35±5	0.75	750V	1500V	2Ω~1.2KΩ	1.3KΩ~200KΩ
PRW025	PRW25W	14.5	13.5	64	35±5	0.75	750V	1500V	2Ω~1.2KΩ	1.3KΩ~200KΩ

Axial Leaded Type-PRWC Series(轴向导线型 -PRWC 系列)



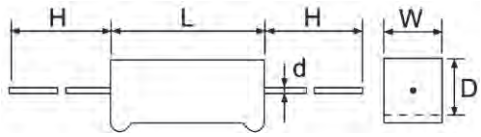
Part No. 料号	Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
		W±1	D±1	L±1	H	d±0.05	Wire-wound 绕线型	Power Film 膜层型
PRWC1W	**PRWC-1W**	6	6	12	25±3	0.70	1Ω~27Ω	28Ω~33KΩ
PRWC2W	**PRWC-2W**	6	6	18	28±5	0.70	1Ω~27Ω	28Ω~33KΩ
PRWC3W	**PRWC-3W**	6	6	20	28±5	0.70	1Ω~27Ω	28Ω~120KΩ
PRWC5W	**PRWC-5W**	6	6	25	35±5	0.75	1Ω~200Ω	201Ω~150KΩ
PRWC7W	**PRWC-7W**	9	9	25	35±5	0.75	1Ω~200Ω	201Ω~150KΩ

Axial Leaded Type-PRWC Series(轴向导线型 -PRWC 系列)



Part No. 料号	Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
		W±1	D±1	L±1	H±5	d±0.05	Wire-wound 绕线型	Power Film 膜层型
PRC14W	PRWC-1 4W	6.4	6.4	20	28	0.70	1Ω~200Ω	201Ω~100KΩ
PRC15W	PRWC-1 5W	6.4	6.4	25	28	0.70	1Ω~200Ω	201Ω~100KΩ
PRC16W	PRWC-1 6W	6.4	6.4	38	35	0.75	1Ω~200Ω	201Ω~100KΩ

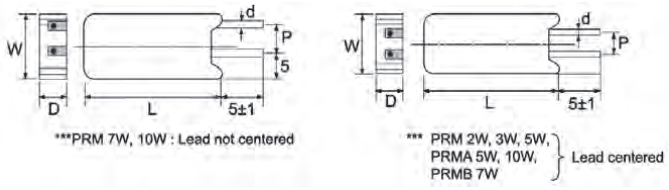
Axial Leaded Type-PRWA Series(轴向导线型 -PRWA 系列)

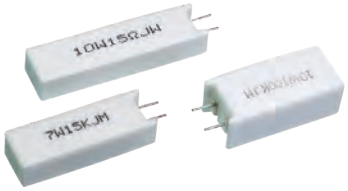


Part No. 料号	Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
		W±1	D±1	L±1	H±5	d±0.05	Wire-wound 绕线型	Power Film 膜层型
PRWA2W	PRWA-2W	7	7	18	28	0.70	0.1Ω~27Ω	28Ω~120KΩ
PRWA5W	PRWA-5W	10	9	22	35	0.75	0.1Ω~47Ω	48Ω~150KΩ
PRWA7W	PRWA-7W	10	9	35	35	0.75	0.1Ω~680Ω	681Ω~200KΩ
PRWAAW	PRWA-10W	10	9	49	35	0.75	0.1Ω~910Ω	911Ω~200KΩ

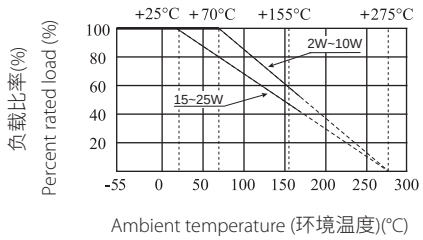
*Max. working voltage&Max. Overloadvoltage Reference to PRW Type 最大工作电压、最大过负荷电压参考 PRW 规格

Radial Leaded Type-PRM Series(立式导线型-PRM系列)



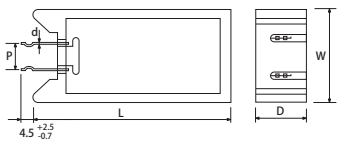


Derating Curve(降功率曲线)



Part No. 料号	Type 类型	Dimension(尺寸)(mm)					Max. working voltage 最大工作电压	Max. Overload voltage 最大过负荷电压	Resistance Range 阻值范围	
		W±1	D±1	L±1	P±1	d ±0.05			Wire-wound 绕线型	Power Film 膜层型
PRM02W	PRM-2W	11.5	7.5	20	5	0.70	250V	500V	0.1Ω~27Ω	28Ω~120KΩ
PRM03W	PRM-3W	12.5	8.5	25	5	0.70	300V	600V	0.1Ω~39Ω	40Ω~150KΩ
PRM05W	PRM-5W	13	9	25	5	0.75	350V	700V	0.1Ω~47Ω	48Ω~150KΩ
PRM07W	PRM-7W	13	9	38	5	0.75	500V	1000V	0.1Ω~680Ω	681Ω~200KΩ
PRM0AW	PRM-10W	13	9	50	5	0.75	700V	1400V	0.1Ω~910Ω	911Ω~200KΩ
PRMA5W	PRMA-5W	13	9	25	7.5	0.75	350V	700V	0.1Ω~47Ω	48Ω~100KΩ
PRMAAW	PRMA-10W	16	12	35	7.5	0.75	700V	1400V	0.1Ω~560Ω	561Ω~100KΩ
PRMB7W	PRMB-7W	12.5	9	38	5	0.75	500V	1000V	0.1Ω~680Ω	681Ω~200KΩ

Radial Terminal Type-PRMT Series(端片型 -PRMT系列)





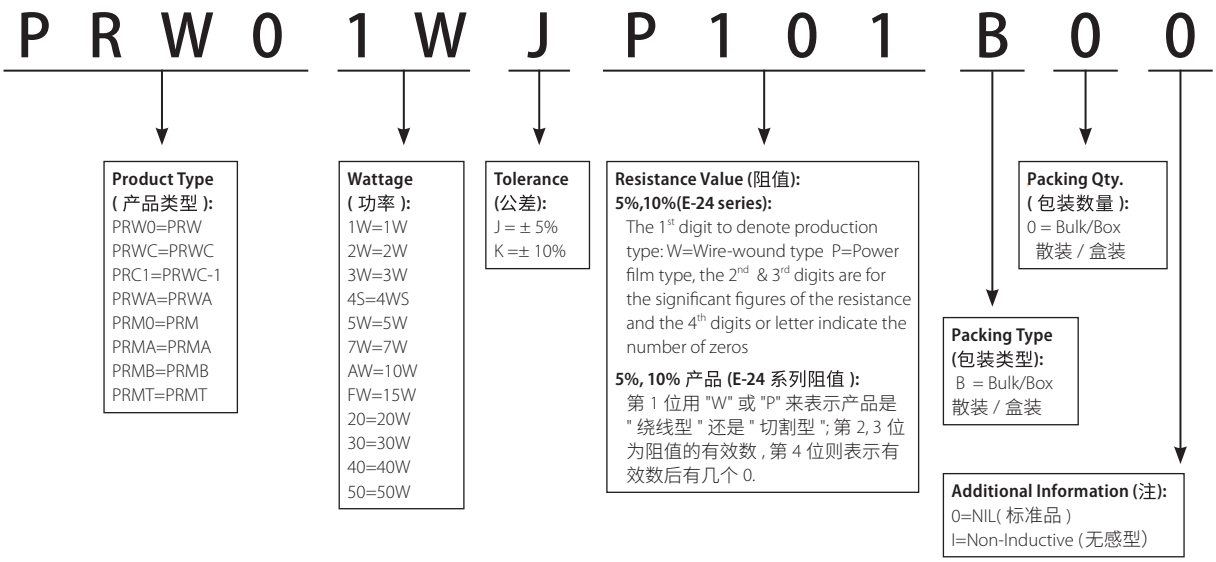
Part No. 料号	Type	Dimension(尺寸)(mm)					Max. working voltage 最大工作电压	Max. Overload voltage 最大过负荷电压	Resistance Range 阻值范围	
		W±1	D±0.5	L±1	P±1	d ±0.05			Wire-wound 绕线型	Power Film 膜层型
PRMT15	PRMT15W	20	13	38	7.5	0.5	700V	1400V	0.1Ω~560Ω	561Ω~200KΩ
PRMT20	PRMT20W	20	13	45	7.5	0.5	750V	1500V		

Performance Specification (特性)

Temperature coefficient	温度系数	< 20Ω : ±400ppm/℃ ; ≥20Ω : ±350ppm/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(5%+0.05 Ω), no evidence of mechanical damage(无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	no evidence of mechanical damage(无可见机械损伤)
Load life in humidity	湿度寿命	Wire-wound type(绕线型):ΔR/R : ±5% Power Film type(膜层型):<100KΩ:ΔR/R : ±5%; ≥100KΩ:ΔR/R : ±10%
Load life	负载寿命	Wire-wound type(绕线型):ΔR/R : ±5% Power Film type(膜层型):<100KΩ:ΔR/R : ±5%; ≥100KΩ:ΔR/R : ±10%

Ordering Procedure (Example: PRW 1W 5% 100Ω B/B)

订购方式 (例如: PRW 1W 5% 100Ω B/B)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

High Surge Radial Type Cement Fixed Resistors - PRMS

高浪涌立式水泥固定电阻器 - PRMS系列

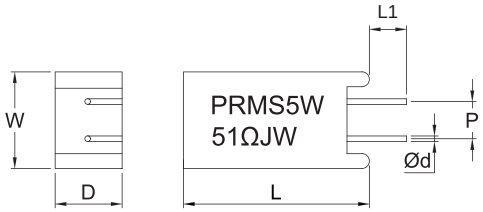
ROYALOHM
www.royalohm.com

Feature (特性)

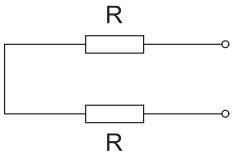
- High power, high pulse 高功率，高脉冲
- Suitable for electric meters, home appliances, rectifiers and charging pile products
  适用于电表，家电，整流器及充电桩产品
- AEC-Q200 qualified 符合AEC-Q200相关条款



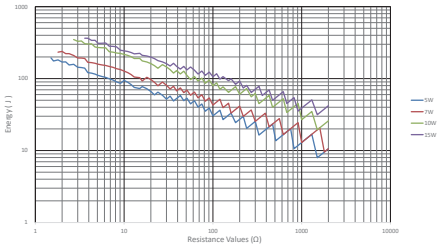
Dimension(尺寸) mm



Circuit Diagram(电路图)



Curve of Pulse Duration (脉冲曲线)



Part No 料号	Type 类型	Dimension (尺寸)(mm)						Max.Working Voltage 最大工作电压	Max.overload Voltage 最大过负荷电压	Resistance Range 阻值范围
		W±1	D±1	L±1	L1±1	P±1	d±0.05			Wire-wound 绕线型
PRMS5W	PRM-5W	13.5	9	25	5	5	0.75	350V	700V	1.5Ω~2KΩ
PRMS7W	PRM-7W	15	9	38	10	7.5	0.75	500V	1000V	1.8Ω~2KΩ
PRMSAW	PRM-10W	16	12	38	10	7.5	0.75	700V	1400V	2.7Ω~4KΩ
PRMSFW	PRM-15W	21	11	37.5	5	9.5	1.0	700V	1400V	2.0Ω~2KΩ

Specification(性能)

Temperature coefficient	温度系数	<20Ω:±400ppm/℃; ≥20Ω:±350ppm/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(5%+0.05Ω),no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	No evidence mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R : ±(5%+0.05Ω)
Load life	负载寿命	ΔR/R : ±(5%+0.05Ω)
Surge Immunity	脉冲测试	ΔR/R : ±(5%+0.05Ω)

Ordering Procedure (Example: PRMS 5W±5%100ΩB/B)

订购方式 (例如: PRMS 5W±5%100ΩB/B)

P R M S 5 W J W 1 0 1 B 0 0

Product Type (产品类型):
PRM=PRM

Special Feature (特征):
S=Double rods (双棒型)

Wattage (功率):
5W=5W
7W=7W
AW=10W
FW=15W

Tolerance (公差):
J = ± 5%
K =± 10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit to denote production type: W=Wire-wound type, the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第 1 位用 "W" 表示产品是 " 绕线型 " 第 2, 3 位为阻值的有效数,第 4 位则表示 有效数后有几个0.

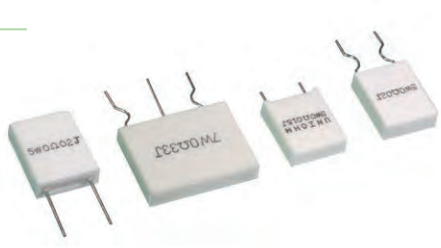
Packing Type (包装类型):
B = Bulk/Box
散装 / 盒装

Packing Qty. (包装数量):
0 = Bulk/Box
散装 / 盒装

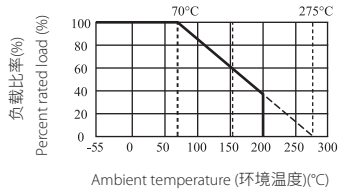
Additional Information (注):
0=NIL(标准品)

Feature (特性)

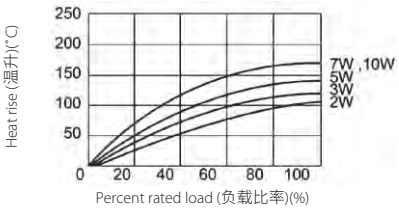
- Low indutance 低电感量
- Safety flameroof construction 耐高温
- Thin& lightweight body save the PCB space cosiderably
  体积小轻薄，节省PCB空间



Derating Curve (降功率曲线)

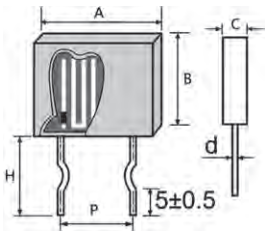


Heat Rise Chart (表面温升)



PFAS (Single circuit-S Type) Dimension(mm)

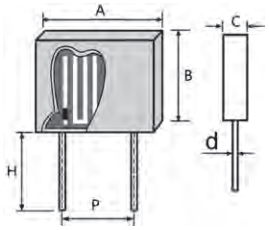
PFAS(单电路 -S 型) 尺寸 (mm)



Type 类型	A±1.0	B±1.0	C±0.5	d±0.05	P±1	H±1	Resistance Range 阻值范围 (±5%、±10%)
PFAS2W	13	8.5	5	0.75	9 & 10	13	0.01Ω~1Ω
PFAS3W	14	13.5	5	0.75		13	0.01Ω~1Ω
PFAS5W	14	18	5	0.75		13	0.01Ω~1Ω
PFAS10W	26	18	5	0.75	20	13	0.01Ω~3.3Ω

PFAP (Single circuit-P Type) Dimension(mm)

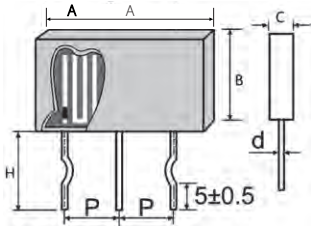
PFAP(单电路 -P 型) 尺寸 (mm)



Type 类型	A±1.0	B±1.0	C±0.5	d±0.05	P±1	H±1	Resistance Range 阻值范围 (±5%、±10%)
PFAP2W	13	8.5	5	0.75	9 & 10	4 & 10	0.01Ω~1Ω
PFAP3W	14	13.5	5	0.75			0.01Ω~1Ω
PFAP5W	14	18	5	0.75			0.01Ω~1Ω
PFAP10W	26	18	5	0.75	20		0.01Ω~3.3Ω

PFAT (Twin circuit-S Type) Dimension(mm)

PFAT(双电路 -S 型) 尺寸 (mm)



Type 类型	A±1.0	B±1.0	C±0.5	d±0.05	P±1	H±1	Resistance Range 阻值范围 (±5%、±10%)
PFAT2W	26	9	5	0.75	10	13	0.05Ω~1Ω
PFAT3W	26	13	5	0.75			0.05Ω~1Ω
PFAT5W	26	18	5	0.75			0.05Ω~1Ω
PFAT7W	26	20	5	0.75			0.1Ω~1Ω

Performance Specification (特性)

Temperature coefficient	温度系数	±350ppm/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(2%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	2000V
Operating temperature	工作温度范围	-55℃~+200℃
soldering heat	耐焊接热	ΔR/R: ±(1%+0.05 Ω) with no evidence of mechanical damage (无可见机械损伤)
Solderability	可焊性	Coverage must be over 95%.
Resistance to solvent	耐溶剂	No deterioration of protective coating and markings (包封层，色码完整)
Humidity (Steady State)	恒定湿热	ΔR/R: ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R: ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Load life	负载寿命	ΔR/R: ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: PFAS 5W ±5% 0.68Ω B/B)

订购方式 (例如: PFAS 5W ±5% 0.68Ω B/B)

P F A S | 5 W | J | 0 6 8 K | B | 0 | 0

Product Type (产品类型):
PFAS=PFA single circuit "S"type
单电路 S 型
PFAP=PFA single circuit "P"type
单电路 P 型
PFAT=PFA Twin single circuit "S"type
双电路 S 型

Wattage (功率):
2W=2W
3W=3W
5W=5W
7W=7W
AW=10W

Tolerance (公差):
J = ± 5%
K =± 10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0", the 2nd & 3rd digits are for the signifcant fgures of the resistance and the 4th digits or letter indicate the number of zeros
5%,10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0

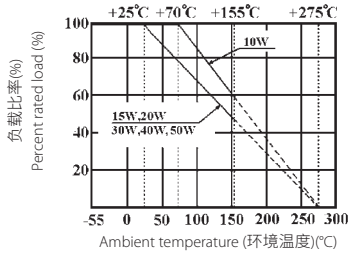
Packing Type (包装类型):
B = Bulk/Box
散装 / 盒装

Packing Qty. (包装数量):
0 = Bulk/Box
散装 / 盒装

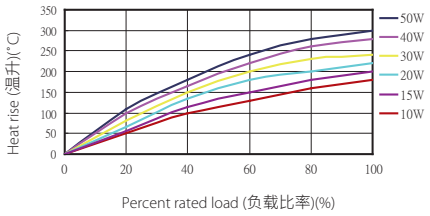
Additional Information (注):
0=NIL(标准品)

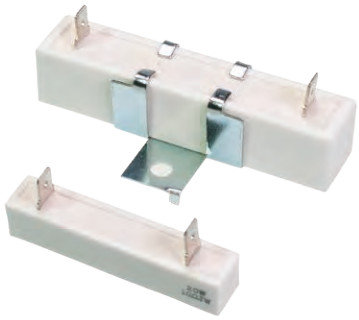
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198标准料号系统。

Derating Curve (降功率曲线)



Heat Rise Chart (表面温升)

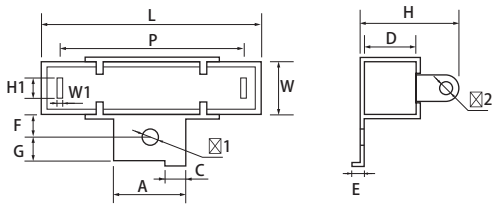




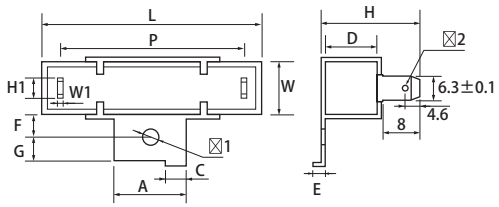
Radial Terminal Type - PRT (With metal mounting bracket)/PRU Series

立式端片型 PRT (带金属安装支架)/PRU

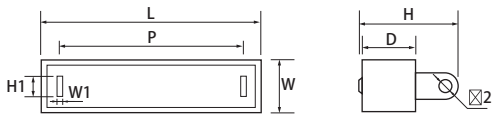
PRT0



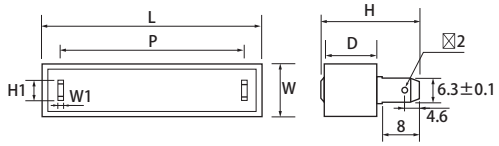
PRTA



PRU0



PRUA



Type 类型		Dimension (尺寸)(mm)														Resistance Range 阻值范围	
		W ±1	D ±1	L ±1.5	P ±1	H ±1	A ±0.5	H1 ±0.4	C ±0.5	F ±0.5	G ±0.5	E ±1	Φ1 ±0.2	Φ2 ±0.2	W1 ±0.08	Wire-wound 绕线型	Power Film 膜层型
10W	PRT0 PRUO	10	9	48	32	18	12	5.5	3	8.7	5	3	4.1	2.5	0.5	1Ω~820Ω	821Ω~200KΩ
	PRTA PRUA					19		8.0						1.6	0.8		
15W	PRT0 PRUO	12.5	11.5	48	32	21	12	6.2	3	8.0	6	3	4.1	2.5	0.5	1Ω~1KΩ	1.1KΩ~200KΩ
	PRTA PRUA					23.5		7.6						1.6	0.8		
20W	PRT0 PRUO	12.5	13.5	63	44	21	12	6.2	3	10	6	3	4.1	2.5	0.5	2Ω~1.2KΩ	1.3KΩ~200KΩ
	PRTA PRUA					25		7.6						1.6	0.8		
30W	PRT0 PRUO	19	19	75	54	32	18	7.6	3	9.5	7.5	4	4.1	3.2	0.5	3Ω~1.5KΩ	-
	PRTA PRUA					30		7.6					6.0	1.6	0.8		
40W	PRT0 PRUO	19	19	90	70	32	18	7.6	3	9.5	7.5	4	4.1	3.2	0.5	6Ω~1.5KΩ	-
	PRTA PRUA					30		8.0					6.0	1.6	0.8		
50W	PRT0 PRUO	19	19	90	70	32	18	7.6	3	9.5	7.5	4	4.1	3.2	0.5	6Ω~1.5KΩ	-
	PRTA PRUA					30		8.0					6.0	1.6	0.8		

Performance Specification (特性)

Temperature coefficient	温度系数	< 20Ω : ±400ppm/℃ ; ≥20Ω : ±350ppm/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(5%+0.05 Ω) , no evidence of mechanical damage(无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	no evidence of mechanical damage(无可见机械损伤)
Load life in humidity	湿度寿命	Wire-wound type(绕线型):ΔR/R : ±5% Power Film type(膜层型):<100KΩ:ΔR/R : ±5%; ≥100KΩ:ΔR/R : ±10%
Load life	负载寿命	Wire-wound type(绕线型):ΔR/R : ±5% Power Film type(膜层型):<100KΩ:ΔR/R : ±5%; ≥100KΩ:ΔR/R : ±10%

Ordering Procedure (Example: PRT 50W 5% 100Ω B/B)

订购方式 (例如: PRT 50W 5% 100Ω B/B)

P R T 0 5 0 J W 1 0 1 B 0 0

Product Type (产品类型):
PRT0=PRT
PRU0=PRU
PRTA=PRTA
PRUA=PRUA

Wattage (功率):
AW=10W
FW=15W
20=20W
30=30W
40=40W
50=50W

Tolerance (公差):
J = ± 5%
K = ±10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit to denote production type: W=Wire-wound type P=Power film type, the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

Packing Type (包装类型):
B = Bulk/Box
散装 / 盒装

Packing Qty. (包装数量):
0 = Bulk/Box
散装 / 盒装

Additional Information (注):
0=NIL(标准品)
I=Non-Inductive (无感性)

Remark: For more details, please check page 198 Part No. System. 注：更多细节详见P198标准料号系统。

Cement Heating Fixed Resistors - PRWD、PRWL、PRWP、PRWH、PRWS

水泥加热固定电阻器 - PRWD、PRWL、PRWP、PRWH、PRWS系列

Feature (特性)

- Double resistor design,high calorific value,high power,strong pressure resistance
  双电阻设计，热值高，功率大，耐压性强
- For electrical mosquito repeller 用于电蚊香器
- For fragrance diffuser 用于熏香器

PRWD



PRWP



PRWS



PRWL

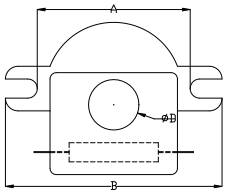


PRWH



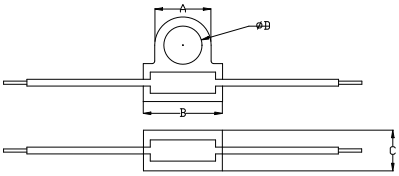
Dimension (尺寸) (mm)

PRWD



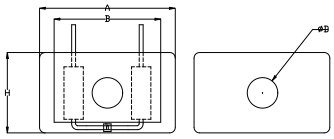
Type 类型	Dimension (尺寸)(mm)			Resistance Range 阻值范围
	A±0.5	B±0.5	ΦD±0.5	
PRWD3W	24.9	33	10	5K6~16K

PRWL



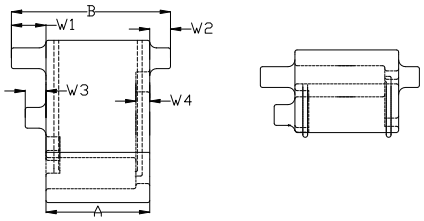
Type 类型	Dimension (尺寸)(mm)				Resistance Range 阻值范围
	A±0.3	B±0.4	C±0.3	ΦD±0.4	
PRWL3W	12.6	18.3	8.9	9.4	5K6~16K

PRWP



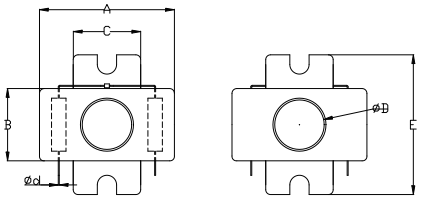
Type 类型	Dimension (尺寸)(mm)				Resistance Range 阻值范围
	A±1	B±0.5	H±0.5	ΦD±0.5	
PRWP3W	40	32.5	24.5	10	5K4~25K

PRWH



Type 类型	Dimension (尺寸)(mm)						Resistance Range 阻值范围
	A+0.55/-0.3	B+0.5/-0.3	W1±0.3	W2±0.3	W3±0.3	W4±0.3	
PRWH3W	15	22.8	5	2.8	3	2	2K5~12K

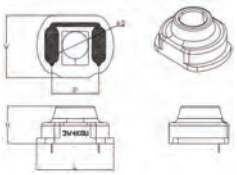
PRWS



Type 类型	Dimension (尺寸)(mm)						Resistance Range 阻值范围
	A±0.2	B±0.2	C±0.2	ΦD±0.5	E±0.5	Φd±0.05	
PRWS3W	28.5	17	13.7	10	33	0.75	6K8~14K

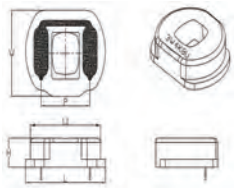
Remark: For more details, please check page 198 Part No. System. 注：更多细节详见 P198标准料号系统。

PRH1



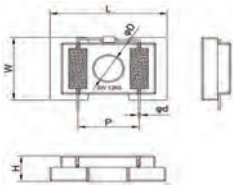
Type 类型	Dimension (尺寸)(mm)					Resistance Range 阻值范围
	L±1	W±1	P±2	H±1	ΦD + 1/-0	
PRH1 3W	26.2	20.28	16	12.2	9	1Ω~500KΩ

PRH2



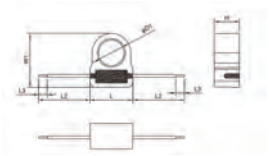
Type 类型	Dimension (尺寸)(mm)					Resistance Range 阻值范围
	L±1	L2±1	W±1	P±2	H±1	
PRH2 3W	26.2	23	20.24	16	6.85	1Ω~500KΩ

PRWP-1



Type 类型	Dimension (尺寸)(mm)						Resistance Range 阻值范围
	L±1	W±1	ΦD + 0.5/-0	P±1	H±1	Φd±0.05	
PRWP-1 3W	40.5	24.5	10	21.1	10	0.75	1Ω~500KΩ

PRWN



Type 类型	Dimension (尺寸)(mm)						Resistance Range 阻值范围
	L±1	L2±1	L3±1	W1±1	H±1	ΦD1±0.5	
PRWN 3W	15	33	3	18.5	8.8	9	1Ω~500KΩ

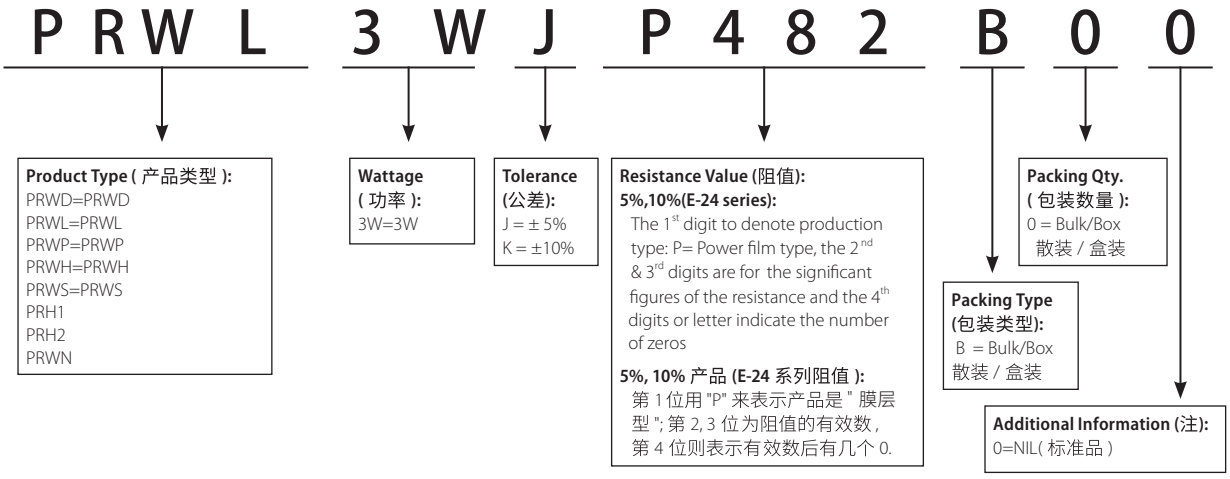
Remark: For more details, please check page 198 Part No. System. 注：更多细节详见 P198标准料号系统。

Performance Specification (特性)

Temperature coefficient	温度系数	±350PPM/°C
Short-time Overload	短时间过负荷	ΔR/R : ±(5%+0.05 Ω) , no evidence of mechanical damage(无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover,mechanical damage,arcing o r insulation breakdown (无击穿、飞弧及可见机械操作)
Solderability	可焊性	Coverage must be over 95%
Rapid change of temperature	温度快速变化	ΔR/R : ±(2%+0.05Ω) With no evidence of mechanical damage(无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R : ±(5%+0.05Ω) With no evidence of mechanical damage(无可见机械损伤)
Load life	负载寿命	ΔR/R : ±(5%+0.05Ω) With no evidence of mechanical damage(无可见机械损伤)

Ordering Procedure (Example: PRWL 3W ±5% 4.8KΩ B/B)

订购方式 (例如: PRWL 3W ±5% 4.8KΩ B/B)



Remark: For more details, please check page 198Part No. System. 注：更多细节详见P198标准料号系统。

Radial Terminal Type Cement Fixed Resistors - PRVA、 PRVB

立式端片型水泥固定电阻器 - PRVA、PRVB系列

ROYALOHM
www.royalohm.com

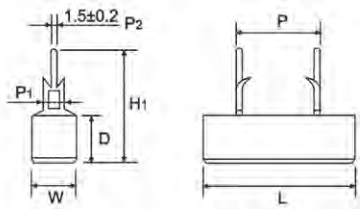
Feature (特性)

- Self-extinguishing 完全不燃性
- Extremely small & sturdy mechanically safe 体积小且坚固安全
- Excellent flame & moisture resistance 卓越抗湿性
- Too low or too high values on Wire-wound & Power-film type can be supplied on a case to case basis
  过低或过高的阻值，绕线或切割型都可以特别提供



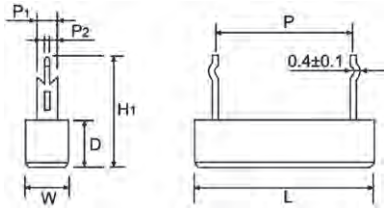
Radial Terminal Type-PRVA Series

(立式端片型-PRVA系列)



Radial Terminal Type - PRVB Series

立式端片型-PRVB系列



类型 Type	Dimension (尺寸)(mm)				Resistance Range 阻值范围	
	W±1	D±1	L ±1	P±1	Wire Wound	Power Film
PRVA-3W PRVB-3W	10	9	22	9.5	0.1Ω-47Ω	48Ω-150KΩ
PRVA-5W PRVB-5W	10	9	27/25	15/9.5	0.1Ω-120Ω	121Ω-200KΩ
PRVA-7W PRVB-7W	10	9	35	22	0.1Ω-560Ω	561Ω-200KΩ
PRVA-10W PRVB-10W	10	9	48	35/32	1Ω-820Ω	821Ω-200KΩ
PRVA-15W PRVB-15W	12.5	11.5	48	32	1Ω-1KΩ	1.1KΩ-200KΩ
PRVA-20W PRVB-20W	12.5	13.5	63	42	1Ω-1.2KΩ	1.3KΩ-200KΩ

Ordering Procedure (Example: PRVA 15W ±5% 3.3Ω B/B)

订购方式 (例如: PRVA 15W ±5% 3.3Ω B/B)

P R V A F W J W 3 3 J B 0 0

Product Type (产品类型):
PRVA=Radial Terminal Type-PRVA Series
PRVB=Radial Terminal Type-PRVB Series

Wattage (功率):
3W=3W
5W=5W
7W=7W
AW=10W
FW=15W
20=20W

Tolerance (公差):
J = ±5%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

Packing Qty. (包装数量):
0=Bulk 散装

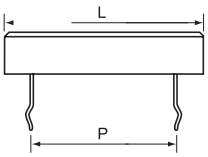
Additional Information (注):
0=NIL（标准品 ）

Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

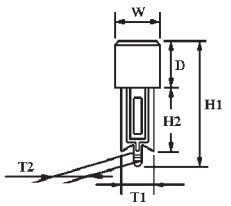
Remark: For further information, please contact our sales team. 若需详细信息 , 请联系我司销售。

Radial Terminal Type-PRZ Series

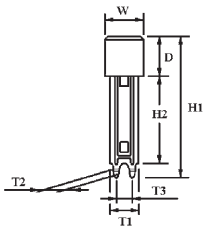
(立式端片型-PRZ系列)



PRZA/PRZC/PRZD



PRZA



PRZC/PRZD

Type	Dimension (尺寸)(mm)				Resistance Range 阻值范围	
	W±1	D±1	L	P±1.5	Wire Wound	Power Film
PRZA-1/PRZA-2 /PRZC/PRZD 3 W	10	9	22±1	9.5	0.1Ω~47Ω	48Ω~150KΩ
PRZA-1/PRZA-2/PRZA-3/PRZC/PRZD 5W	10	9	25/27±1	9.5/15	0.1Ω~120Ω	121Ω~200KΩ
PRZA-1/PRZA-2/PRZC/PRZD 7W	10	9	35±1	22	0.1Ω~560Ω	561Ω~200KΩ
PRZA-1/PRZA-2/PRZC/PRZD 10W	10	9	48±1.5	32/35	1Ω~820Ω	821Ω~200KΩ
PRZA-1/PRZA-2/PRZC/ 15W	12.5	11.5	48±1.5	32	1Ω~1KΩ	1.1KΩ~200KΩ
PRZA-1/PRZA-2/PRZC/ 20W	12.5	13.5	63±1.5	42/45	2Ω~1.2KΩ	1.3KΩ~200KΩ

Ordering Procedure (Example: PRZC 15W ±5% 10Ω B/B)

订购方式 (例如: PRZC 15W ±5% 10Ω B/B)

P R Z C F W J W 1 0 0 B 0 0

Product Type (产品类型):
PZ1A=PRZA-1
PZ2A=PRZA-2
PRZC=PRZC
PR1C=PRZC-1
PRZD=PRZD

Wattage (功率):
3W=3W
5W=5W
7W=7W
AW=10W
FW=15W
20=20W

Tolerance (公差):
J = ±5%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Packing Qty. (包装数量):
0=For Bulk/Box packing

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Terminal Type-With metal mounting bracket - PRS

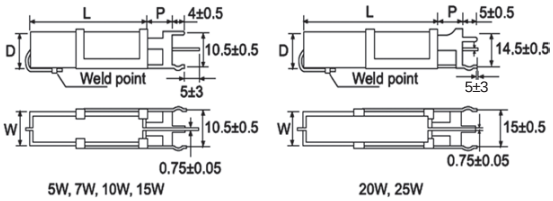
立式端片型带金属安装支架 - PRS系列

ROYALOHM
www.royalohm.com

Feature (特性)

- Self-extinguishing 完全不燃性
- Extremely small & sturdy mechanically safe 体积小且坚固安全
- Excellent flame & moisture resistance 卓越抗湿性
- Too low or too high values on Wire-wound & Power-film type can be supplied on a case to case basis
  过低或过高的阻值，绕线或切割型都可以特别提供





Radial Leaded Type-PRS Series(立式导线型-PRS系列)

Part No. 料号	Type	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
		W±1	D±1	L±1	P±1	d ±0.05	Wire Wound	Power Film
PRS05W	PRS-5W	10	9	22	5	0.75	0.1Ω~47Ω	48Ω~150KΩ
PRS07W	PRS-7W	10	9	35	10	0.75	0.1Ω~680Ω	681Ω~200KΩ
PRS0AW	PRS-10W	10	9	45	10	0.75	0.1Ω~910Ω	911Ω~200KΩ
PRS0FW	PRS-15W	12.5	13.5	49	11	0.75	0.1Ω~1KΩ	1.1KΩ~200KΩ
PRS020	PRS-20W	14.5	13.5	60	10	0.75	0.1Ω~1.2KΩ	1.3KΩ~200KΩ
PRS025	PRS-25W	14.5	13.5	64	10	0.75	0.1Ω~1.4KΩ	1.5KΩ~200KΩ

Ordering Procedure (Example: PRS 5W ±5% 10Ω B/B)

订购方式 (例如: PRS 5W ±5% 10Ω B/B)

P R S 0 5 W J W 1 0 0 B 0 0

Product Type (产品类型):
PRS0=PRS

Wattage (功率):
5W=5W
7W=7W
AW=10W
FW=15W
25=25W

Tolerance (公差):
J = ±5%
K = ±10%

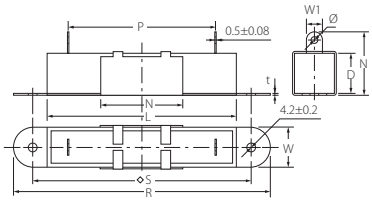
Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

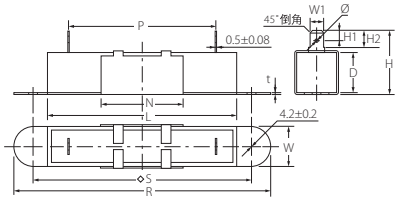
Packing Qty. (包装数量):
0=Bulk/Box

Additional Information (注):
0=NIL

Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Radial Terminal Type Resistors (立式端片型电阻器)







Type 类型	Dimension(尺寸)(mm)				Resistance Range 阻值范围	
	W±1	D±1	L±1.5	H±1	Wire Wound	Power Film
PRTC/PRTD10W	10	9	48	18/19	0.1Ω~820Ω	821Ω~200KΩ
PRTC/PRTD15W	12.5	11.5	48	21/23.5	1Ω~1KΩ	1.1KΩ~200KΩ
PRTC/PRTD20W	12.5	13.5	63	21/25	1Ω~1.2KΩ	1.3KΩ~200KΩ
PRTC/PRTD30W	19	19	75	32/30	1Ω~1.5KΩ	/
PRTC/PRTD40W	19	19	90	32/30	1Ω~1.5KΩ	/
PRTC/PRTD50W	19	19	90	32/30	1Ω~1.5KΩ	/

Ordering Procedure (Example: PRTC 20W ±5% 30KΩ B/B)

订购方式 (例如: PRTC 20W ±5% 30KΩ B/B)

P R T C 2 0 J P 3 0 3 B 0 0

Product Type (产品类型):
PRTC=PRTC Type
PRTD=PRTD Type

Wattage (功率):
AW=10W
FW=15W
20=20W
30=30W
40=40W
50=50W

Tolerance (公差):
J = ±5%
K = ±10%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digit denotes number of zeros following.
以下数字及字母用来表示第11位数有几个0:
$J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$

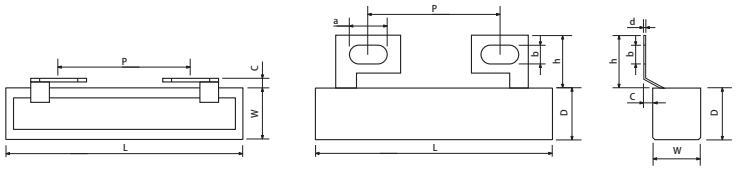
Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Packing Qty. (包装数量):
0=Bulk

Additional Information (注):
0=Standard

Remark: For further information, please contact our sales team. 若需详细信息 , 请联系我司销售。

Resistors of Capacitor Voltage Balance (电容电压平衡电阻器)



Type 类型	Dimension(尺寸) (mm)				Resistance Range 阻阻值范围
	W±1.0	D±1.5	L±1.5	P±1.5	Power Film 切割型
PRTM4W	12.5	12.5	48.0	27.0	1.3KΩ~200KΩ
PRTM7W	12.5	12.5	63.0	27.0	
PRTM20W	12.5	13.5	63.0	35.0	

Ordering Procedure (Example: PRTM 20W ±5% 30KΩ B/B)

订购方式 (例如: PRTM 20W ±5% 30KΩ B/B)

P R T M 2 0 J P 3 0 3 B 0 0

Product Type (产品类型):
PRTM=PRTM Type

Wattage (功率):
4W=4W
7W=7W
20=20W

Tolerance (公差):
G=± 2%
J=± 5%
K=±10%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Packing Qty. (包装数量):
0=Bulk

Additional Information (注):
0=Standard

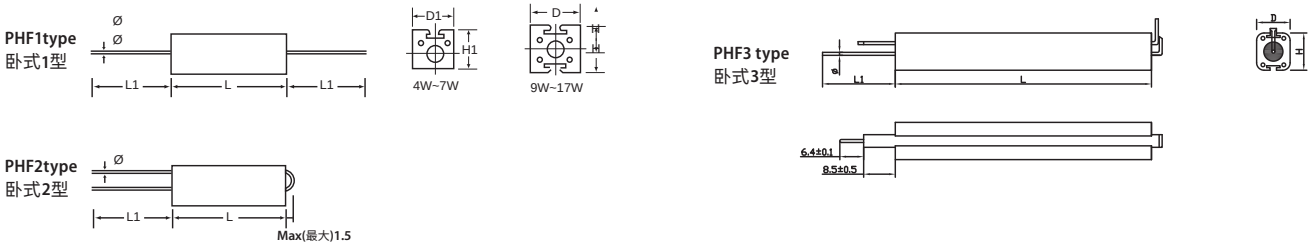
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

- Square porcelain tube 方形瓷管外壳
- Excellent insulation and moisture resistance优良的绝缘性和耐湿性
- Winding process, good resistance to load绕线工艺，良好的耐负荷能力
- Application：Power supply of frequency converter 应用：变频器的电源



Dimension (尺寸) (mm)



PHF1、PHF2、PHF3 Series

值范围

Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
	H±1.5	H1±0.5	D±0.5	D1±0.5	L	Wire Wound	Power Film
PHF1/PHF2 4W	-	8.5	-	7.5	20±1	1Ω~1KΩ	/
PHF1/PHF2/ PHF3 11W	10	-	9	-	50±1	1Ω~3.5KΩ	3.6KΩ~6.2KΩ
PHF1/PHF2/ PHF3 17W	10	-	9	-	75±2	1Ω~8.5KΩ	8.6KΩ~10KΩ

Ordering Procedure (Example: PHF1 5W ±5% 82KΩ B/B)

订购方式 (例如: PHF1 5W ±5% 82KΩ B/B)

P H F 1 5 W J P 8 2 3 B 0 0

Product Type (产品类型):
Cement Fixed Resistors
PHF1=PHF1
PHF2=PHF2
PHF3=PHF3

Wattage (功率):
4W=4W
5W=5W
7W=7W
9W=9W
BW=11W
17=17W

Tolerance (公差):
J = ±5%
K = ±10%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

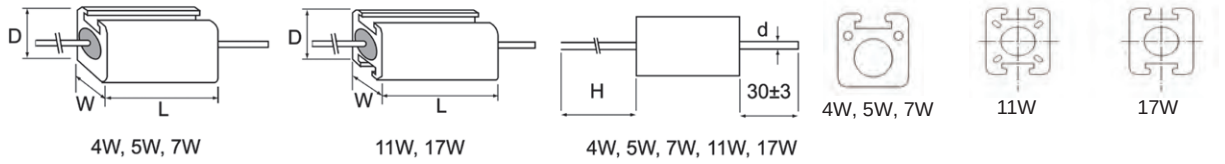
Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Packing Qty. (包装数量):
0=For Bulk/Box Packing

Note:
0=Standard

Remark: For further information, please contact our sales team. 若需详细信息 , 请联系我司销售。

PRWI Series



Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围	
	W±1	D	L±1	H±1	d±0.05	Wire Wound	Power Film
PRWI 4W	7.0	8±1	20	56	0.75	1Ω~1KΩ	1.1KΩ~6.8KΩ
PRWI 7W	7.0	8±1	38	70	0.75	1Ω~3.5KΩ	3.6KΩ~22KΩ
PRWI 11W	9.0	10±1.5	50	85	0.75	1Ω~5.6KΩ	5.7KΩ~22KΩ
PRWI 17W	9.0	10±1.5	75	110	0.75	1Ω~8.5KΩ	8.6KΩ~39KΩ

Ordering Procedure (Example: PRWI 4W ±5% 47KΩ B/B)

订购方式 (例如: PRWI 4W ±5% 47KΩ B/B)

P R W I 4 W J W 4 7 0 B 0 0

Product Type (产品类型):
Cement Fixed Resistors
PRWI

Wattage (功率):
4W=4W
5W=5W
7W=7W
BW=11W
17=17W

Tolerance (公差):
J=± 5%
K=±10%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
第 1 位用 "W" 或 "P" 来表示产品是 " 绕线型 " 还是 " 切割型 "; 第 2, 3 位为阻值的有效数 , 第 4 位则表示有效数后有几个 0.

Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

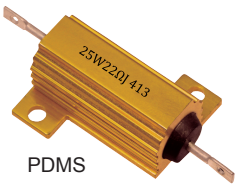
Packing Qty. (包装数量):
0=For Bulk/Box packing

Note:
0=Standard

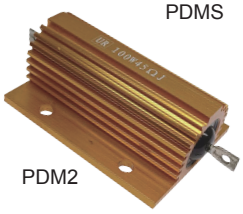
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Feature (特性)

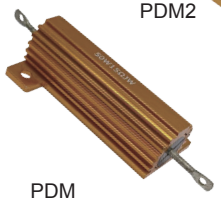
- With Aluminum Shell for a good heat dissipation, suitable for board mount
  铝外壳散热性能好，适用于散热板安装
- Thin & lightweight body with big power rating 本体小而轻，功率大
- Application: Power Supply, Adapter, Machine 应用：设备电源类



PDMS

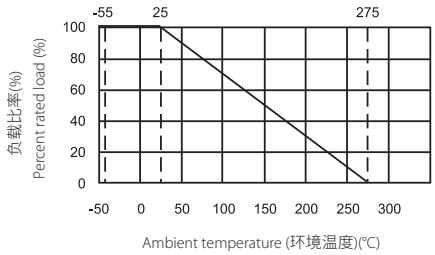


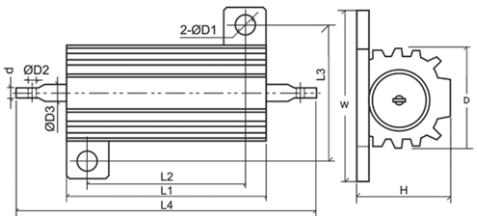
PDM2



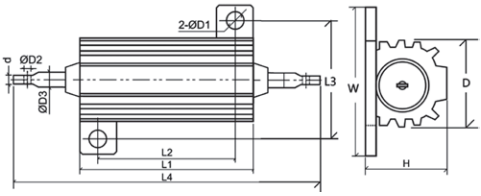
PDM

Derating Curve (降功率曲线)

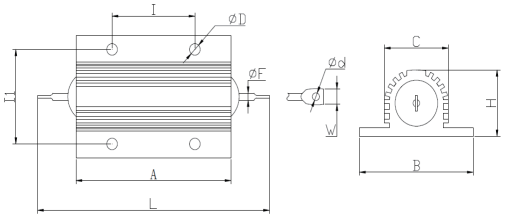




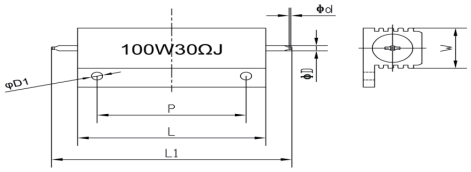
PDM5W~50W



(PDMS 25W~50W)



PDM2~100W



PDM3~100W

Type 类型	Dimension(尺寸)(mm)											Resistance range 阻值范围	Special high value 特殊最高值
	L1±1.0	L2	L3	L4±1.5	W	H±1.0	D±1	d±0.2	D1±0.5	D2±0.5	D3±0.1		
PDM0 5W	15.5	11.0±0.5	12.5±0.5	32.5	16.4±0.5	8.0	8.0	0.3	2.0	1.3	1.0	0.5Ω~1KΩ	1.8KΩ
PDM0 10W	20.5	14.2±0.5	15.9±0.5	40.5	21.0±0.5	10.0	11.0	0.8	2.5	2.0	2.0	1Ω~1.5KΩ	5KΩ
PDM0 25W	28.0	18.2±0.5	20.2±0.5	45.5	29.0±0.5	16.0	15.5	0.8	3.0	2.0	2.0	5.1Ω~8.2KΩ	12KΩ
PDMT 25W	28.0	18.0±0.5	19.0±0.5	49.0	27.0±1.0	14.0	13.5	0.8	4.0	2.0	2.0	5.1Ω~8.2KΩ	12KΩ
PDM0 35W	34.5	24.2±0.5	20.2±0.5	56.5	29.0±0.5	16.3	15.5	0.8	3.0	2.0	2.0	5.1Ω~8.2KΩ	15KΩ
PDM0 50W	50.0	40.2±0.5	20.2±0.5	78.5	29.0±0.5	16.0	15.5	0.8	3.5	2.0	2.0	5.1Ω~20KΩ	35KΩ
PDMT 50W	50.5	40.0±0.5	21.5±0.5	75.0	30.0±0.5	15.7	15.5	0.8	3.5	2.0	2.0	5.1Ω~20KΩ	35KΩ
PDMS 25W	28.0	18.0±0.5	19.0±1.0	49.0	27.0±0.5	14.0	13.5	0.8	4.0	2.0	2.0	5.1Ω~8.2KΩ	22KΩ
PDMS 50W	50.0	40.0±0.5	21.5±1.0	75.0	30.0±0.5	16.0	15.5	0.8	3.5	2.0	2.0	5.1Ω~20KΩ	35KΩ

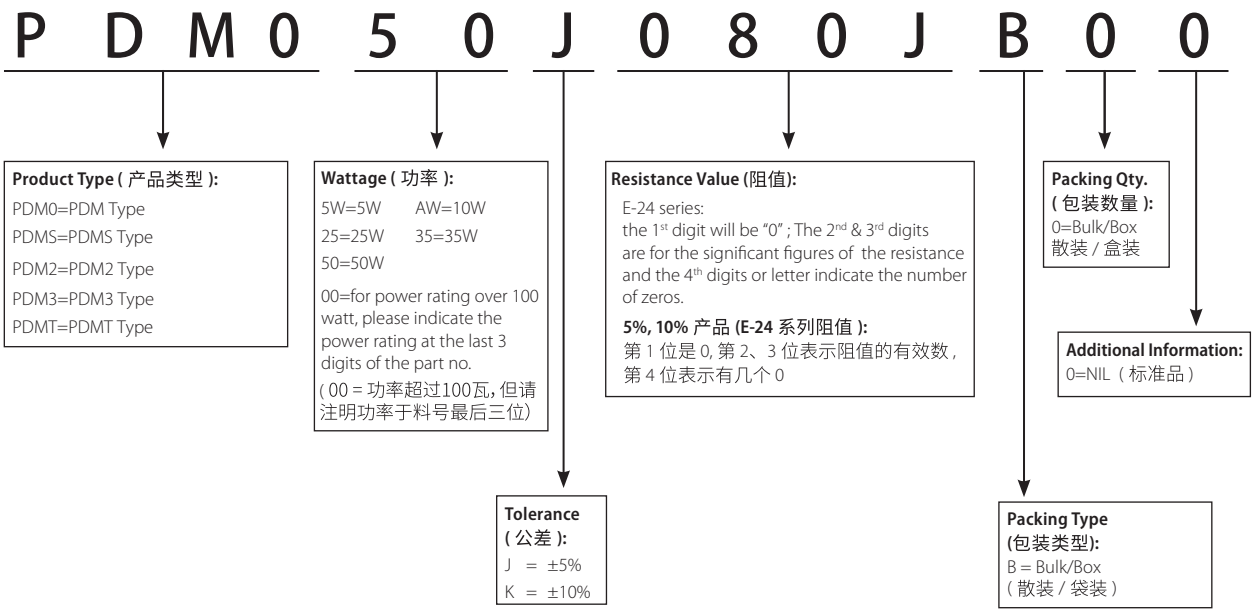
Type	Dimension(尺寸)(mm)										Resistance range 阻值范围
	A±0.5	B±0.5	C±0.5	H±0.5	I±0.5	I1±0.5	L±2	ΦD±0.5	W±0.5	Φd±0.5	
PDM2 100W	65.50	48	27	26	35	37	88	4.5	6	3	0.5Ω~22KΩ

Type	Dimension(尺寸)(mm)							Resistance range 阻值范围
	L±1	L1±2	P±1	W±1	ΦD±0.05	Φd±0.2	ΦD1±0.1	
PDM3 100W	59.5	85.7	45.5	15	2	1.8	3.8	2Ω~3KΩ

Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

Ordering Procedure (Example: PDM 50W ±5% 8Ω B/B)

订购方式 (例如：PDM 50W ±5% 8Ω B/B)



Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High Power Wire-wound Aluminum Case Resistors - HEWR

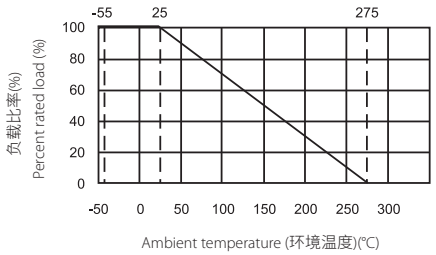
高功率绕线铝壳电阻器 - HEWR系列

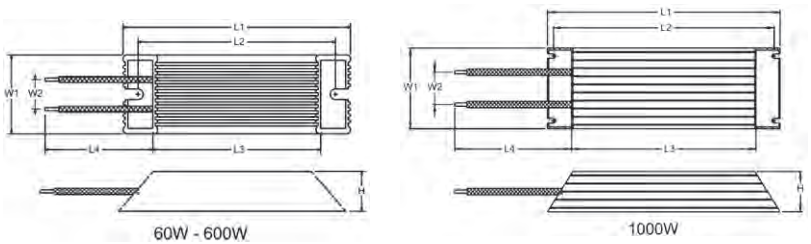
Feature (特性)

- Anti-vibration, high stability 优异的抗震性和稳定性
- Excellent transient current impact capability, suitable for the start of the inverter under harsh conditions
  优良的瞬间电流冲击能力，适合变频器严苛条件下的启动
- Application: Frequency Conversion Equipment, such as Elevator, Freezer, Crane, Lift etc.
  应用: 各类变频设备中, 如电梯,冷柜, 起重机, 升降机等



Derating Curve (降功率曲线)



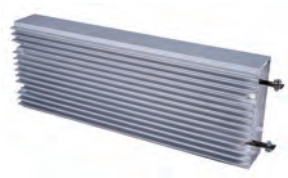


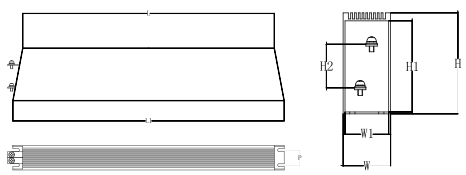
Type 类型	Dimension(尺寸)(mm)							Resistance Range 阻值范围
	L1±2	L2±2	L3±2	L4±10	W1±2	W2±5	H±2	
HEWR60W	115	100	80	190	40	15	20	2Ω~2.5KΩ
HEWR80W	140	125	105	200	40	15	20	1Ω~3KΩ
HEWR100W	140	125	100	240	60	25	30	1Ω~4KΩ
HEWR100W-S	165	150	125	240	40	15	20	1Ω~4KΩ
HEWR120W	190	175	150	240	40	15	20	1Ω~5KΩ
HEWR150W	215	200	175	240	40	15	20	1Ω~6KΩ
HEWR200W	165	150	125	255	60	25	30	1Ω~7KΩ
HEWR300W	215	200	175	255	60	25	30	1Ω~8KΩ
HEWR400W	265	250	225	255	60	25	30	0.5Ω~10KΩ
HEWR500W	335	320	295	255	60	25	30	0.5Ω~12KΩ
HEWR600W	335	320	295	255	60	25	30	0.5Ω~12KΩ
HEWR1000W	400	385	340	255	100	25	50	1Ω~15KΩ

High Power Wire-wound Aluminum Case Resistos - HEWR

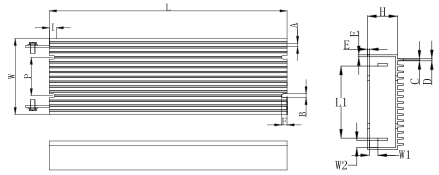
高功率绕线铝壳电阻器 - HEWR系列







1500W~2000W

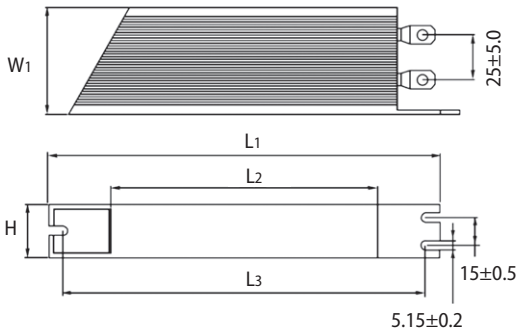


3000W~4000W

Type 类型	Dimension(尺寸)(mm)								Resistance Range 阻值范围
	L±1	L1±1	H±1	H1±1	H2±1	W±5	W1±2	P±0.5	
HEWR1500W	447	485	106	96	44	50	46	30.5	1Ω~15KΩ
HEWR2000W	510	550	106	96	44	50	46	30.5	1Ω~15KΩ

Type 类型	Dimension(尺寸)(mm)														Resistance Range 阻值范围
	L±1	W±1	A±0.1	B±0.1	C±0.1	D±0.1	E±0.1	H±1	P±1	F±0.5	L1±1	W1±0.5	W2±0.5	I±0.5	
HEWR3000W	400	150	6.7	8	2.5	3.5	3.3	50	70	10.5	91	20	23.5	13	1Ω~15KΩ
HEWR4000W	500	150	6.7	8	2.5	3.5	3.3	50	70	10.5	91	20	23.5	13	1Ω~15KΩ

HBWR Type-HBWR 型



Type 类型	Dimension（大小）(mm)					Resistance Range 阻值范围
	L1±2	L2±2	L3±2	H±2	W1±2	
HBWR200W	190	160	165	30	60	1Ω~7KΩ
HBWR300W	240	210	215	30	60	1Ω~8KΩ
HBWR400W	290	260	265	30	60	0.5Ω~10KΩ
HBWR500W	360	330	335	30	60	0.5Ω~12KΩ
HBWR600W	360	330	335	30	60	0.5Ω~12KΩ

Performance Specification (特性)

Temperature coefficient	温度系数	<20Ω:±400ppm/℃ ; ≥20Ω:±350ppm/℃
Short-time Overload	短时间过负荷	ΔR/R : ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage.(无击穿、飞弧及可见机械损伤)
Humidity (Steady State)	恒定湿热	ΔR/R : ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R : ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤
Load life	负载寿命	ΔR/R : ±(5%+0.05Ω), with no evidence of mechanical damage (无可见机械损伤)

Ordering Procedure (Example: HEWR200W ±5% 10Ω B/B)

订购方式 (例如: HEWR200W±5% 10Ω B/B)

H E W R B 0 J 0 1 0 0 2 0 0

Product Type (产品类型):
HEWR=HEWR
HBWR=HBWR

Additional information(注):
A0=Terminal Type
B0=Cable Type

Tolerance (公差):
J = ± 5%
K = ±10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0", the 2nd & 3rd digits are for the signifcant fgures of the resistance and the 4th digits or letter indicate the number of zeros;
5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0

Wattage (功率):
060=60W, 080=80W
100=100W, 120=120W
150=150W, 200=200W
300=300W, 400=400W
500=500W, 600=600W
A00=1000W, A50=1500W
C00=2000W, D00=3000W
E00=4000W, 10S=100W-S

New/Old Part.no Contrast (新旧料号对照)

New Part.no 新料号	Old Part.no 旧料号
HEWRJ*******	HPAR**J*******

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198 标准料号系统。

Power Alloy Wire-wound Resistors - QL

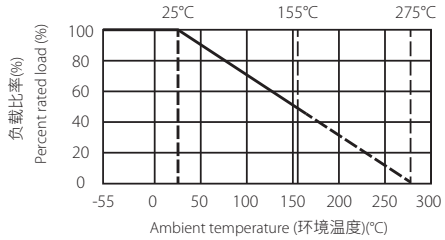
功率合金绕线电阻器 - QL系列

ROYALOHM
www.royalohm.com

Feature (特性)

- Multi-terminal types & variable types available多端子和多可调阻方式都可提供
- Small in size but capable of carrying high power load小体型负载大功率
- Resistance value unchanged after long use, good resistivity to short time overload
  长年使用不变阻值，短时间过负荷表现良好
- High resistivity to heat, small resistance temperature coefficient and the change in resistance with temperature being linear 抗热，温度系数低，温度变化小
- Too low or high ohmic value can be supplied on a case to case basis
  超低或超高阻值都可特别提供
- Adjustable & Multi-Resistor type is available 可调型与多阻型可提供
- Non-Inductive type is available可提供无感型

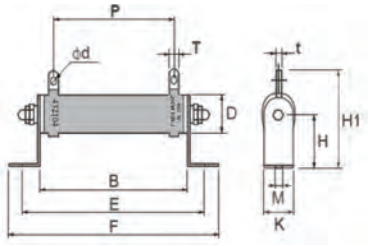




Derating Curve (降功率曲线)

Power Wire-wound Resistors-QL Type

功率绕线型 – QL Type



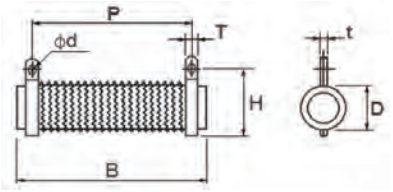
Power Rating 额定功率	Dimension (尺寸)(mm)												Resistance Range 阻值范围	Tolerance 公差
	B±2	E±5	F±3	D±2	H±1	H1±3	M±0.5	K±1	P±3	T±0.5	t±0.5	Ød±0.5		
QL 50W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~25KΩ	
QL 60W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~30KΩ	
QL 80W	152	174	196	28	28	61	6.5	28	126	8	1.8	4.5	0.1Ω~40KΩ	
QL 100W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~50KΩ	
QL 120W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~60KΩ	
QL 150W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	1Ω~70KΩ	
QL 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	10Ω~100KΩ	
QL 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	10Ω~150KΩ	
QL 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	16Ω~150KΩ	± 5% ± 10%
QL 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	21Ω~150KΩ	
QL 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	21Ω~150KΩ	
QL 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	76Ω~180KΩ	
QL 1,000W	300	325	350	60	60	119	8.5	60	279	15	2	6.5	101Ω~200KΩ	
QL 1,200W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	101Ω~250KΩ	
QL 1,500W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	121Ω~250KΩ	
QL 2,000W	510	535	560	60	60	119	8.5	60	489	15	2	6.5	121Ω~300KΩ	
QL 2,500W	600	625	650	60	60	119	8.5	60	577	15	2	6.5	121Ω~360KΩ	

Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

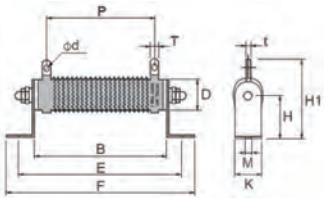
Power Ribbon Wire-wound Resistors-QR&QRZG Type

功率合金带绕线型 -QR&QRZG Type

QR Type (QR 型)



QRZG Type (QRZG 型)



Power Rating 额定功率	Dimension (尺寸)(mm)							Resistance Range 阻值范围	Tolerance 公差
	B±2	D±2	H±1	P±3	T±0.5	t±0.5	Ød±0.5		
QR 200W	195	40	62	179	10	1.8	5.5	0.4Ω~9.1Ω	± 5% ± 10%
QR 300W	282	40	62	266	10	1.8	5.5	0.5Ω~9.1Ω	
QR 400W	282	40	62	266	10	1.8	5.5	0.8Ω~15Ω	
QR 500W	316	50	82	294	16	1.8	6.5	1Ω~20Ω	
QR 600W	345	40	62	329	10	1.8	5.5	1Ω~20Ω	
QR 750W	316	50	82	294	16	1.8	6.5	1Ω~75Ω	
QR 1,000W	300	60	94	279	15	2	6.5	1Ω~100Ω	
QR 1,200W	415	60	94	394	15	2	6.5	1Ω~100Ω	
QR 1,500W	415	60	94	394	15	2	6.5	1Ω~120Ω	
QR 2,000W	510	60	94	489	15	2	6.5	1Ω~120Ω	
QR 2,500W	600	60	94	577	15	2	6.5	1Ω~120Ω	

Power Rating 额定功率	Dimension (尺寸)(mm)												Resistance Range 阻值范围	Tolerance 公差
	B±2	E±5	F±3	D±2	H±1	H1±3	M±0.5	K±1	P±3	T±0.5	t±0.5	Ød±0.5		
QRZG 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	0.4Ω~9.1Ω	± 5% ± 10%
QRZG 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.5Ω~9.1Ω	
QRZG 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.8Ω~15Ω	
QRZG 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~20Ω	
QRZG 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	1Ω~20Ω	
QRZG 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~75Ω	
QRZG 1,000W	300	325	350	60	60	119	8.5	60	279	15	2	6.5	1Ω~100Ω	
QRZG 1,200W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	1Ω~100Ω	
QRZG 1,500W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	1Ω~120Ω	
QRZG 2,000W	510	535	560	60	60	119	8.5	60	489	15	2	6.5	1Ω~120Ω	
QRZG 2,500W	600	625	650	60	60	119	8.5	60	577	15	2	6.5	1Ω~120Ω	

Ordering Procedure (Example:QRZG 200W 5% 1.8Ω)

订购方式 (例如: QRZG 200W 5% 1.8Ω)

Q R Z G T 0 J 0 1 8 J 2 0 0

Product Type (产品类型):
QL00=QL Type
QR00=QR Type
QRZG=QRZG Type

Additional information (注) :
T0=Standard (标准品)

Tolerance (公差):
J = ± 5% K =± 10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0", the 2nd & 3rd digits are for the signifcant fgures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0
J=10-1; K=10-2; L=10-3

Wattage (功率) :
050=50W, 060=60W, 080=80W
100=100W,120=120W,150=150W,
200=200W,300=300W,400=400W,
500-500W,600=600W,
750=750W A00=1000W,,A20=1200W
A50=1500W,C00=2000W, C50=2500W

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Metal Glaze Film Voltage Divider Resistors - MGRD

金属玻璃釉膜分压电阻器 - MGRD系列

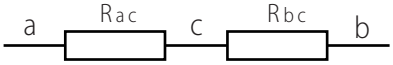
ROYALOHM
www.royalohm.com

Feature(特性)

- Non-inductive design,excellent characteristics at high frequency.
  无感设计、高频特性佳
- Be applicable for mutual inductor of electric system
  适用于电力系统电子式互感器

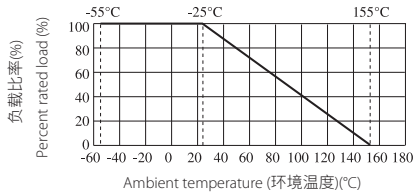


Circuit structure(等效电路图)



Total resistance value at both ends: Rab=Rac+Rbc,Voltage division ratio: Rab：Rbc
两端总阻值Rab=Rac+Rbc，分压比为Rab：Rbc

Derating Curve(降功率曲线)



Dimension(尺寸)mm



Part No料号	Type 类型	Power Rating 额定功率	Dimension (尺寸)(mm)		Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric WithstandingVoltage 绝缘耐压	Surge Withstanding Voltage 浪涌电压	Resistance Range 阻值范围
			D±2	L±2					
MGRD50W	MGRD-50W	50W	27	152	13.2KV	26.4KV	1000V	18.7KV	50MΩ~80MΩ

Performance Specification (特性)

Load life	寿命	△R/R±(3.0%±0.1Ω)
Short-time Overload	短时间过负荷	△R/R±(3.0%±0.1Ω)no evidence of mechanical damage(无可见机械损伤)
Insulation resistance	绝缘阻值	≥1000MΩ
Rapid change of temperature	温度快速变化	△R/R±(3.0%±0.1Ω)no evidence of mechanical damage(无可见机械损伤)
Humidity (Steady State)	恒定湿热	△R/R±(3.0%±0.1Ω)no evidence of mechanical damage(无可见机械损伤)

Ordering Procedure (Example: MGRD 50W ±1% 70MΩ B/B)

订购方式 (例如: MGRD 50W ±1% 70MΩ B/B)

M G R D 5 0 F 7 0 0 5 B 0 0

Product Type (产品类型):
MGR=Metal Glaze Film Fixed Resistors
(金属玻璃釉膜固定电阻器)

Special Features(特征):
D=Voltage Divider
D=分压型

Wattage(功率):
50=50W

Tolerance(公差):
F=±1%

Resistance Value (阻值):
±2%、±5% series:
The 1st digit is will be "0", the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
第1位是0，第2，3位表示阻值的有效数，第4位表示有几个0
≤±1% series:
The 1st to 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
第1~3位表示阻值的有效数，第4位表示有几个0
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type (包装类型):
B=Bulk/Box
散装/盒装

Packing quantity (包装数量):
0=Bulk/Box
散装/盒装

Additional Information(注):
0=standard product

Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

Vitreous Enamel Power Wire-wound Resistors - VWT1

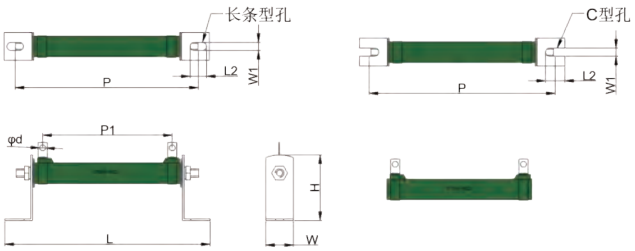
功率被釉绕线电阻器 - VWT1

Feature (特性)

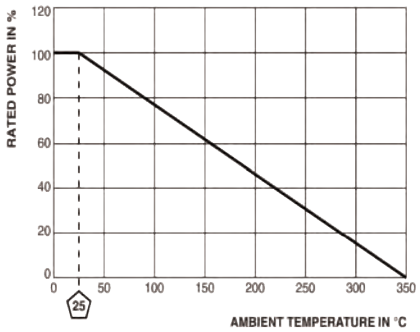
- It is moisture-resistant, has high insulation, strong overload capacity, good thermal stability and long service life.
  耐潮湿、绝缘度高、过负荷能力强、热稳定性好、使用寿命长
- Good thermal stability and reliability. 良好的热稳定性和可靠性
- Strong resistance to corrosion and harsh environment. 耐腐蚀与恶劣环境适应性强
- It is applicable to power supply testing,circuit load,frequency converter, lifting,braking,power, shipbuilding,industrial automation and other electromechanical equipment.
  适用于电源测试、电路负载、变频器、起重、制动、电力、船舶、工业自动化等机电装备



Dimension (尺寸)



Derating Curve (降功率曲线)



Type 类型	Dimension(尺寸)(mm)								Resistance Range 阻值范围	Tolerance 精度	Type of bracket installation holes 支架安装孔类型
	L ±5	L2 ±1	W ±2	W1 ±0.5	H ±2	P ±5	P1 ±5	Φd+0.5/-0			
VWT1 90W	144	11	13	5.5	35	126	89	5	0.1Ω~1.0KΩ	±5% ±10%	Elongated type 长条型孔
VWT1 100W	130	11	19	5.5	45	116	70	5	0.1Ω~3.3KΩ		
VWT1 150W	140	11	26	6.5	48	128	85	5	0.1Ω~3.3KΩ		C Slotted type C型孔
VWT1 175W	159	15	26	6.5	48	244	190	5	1.0Ω~5.0KΩ		
VWT1 220W	204	14	32	6.5	53	182	131	5	1.0Ω~5.0KΩ		Elongated type 长条型孔
VWT1 225W	315	19	26	6.0	48	298	245	5	1.0Ω~10KΩ		C Slotted type C型孔
VWT1 375W	303	11	26	6.5	48	290	245	5	1.0Ω~10KΩ		

Performance Specifications (性能)

Short-Time Overload	**短时间过负荷**	ΔR≤±(5%+0.05 Ω) , with no evidence of mechanical damage (无可见机械损伤)
Steady-state damp heat	**稳态湿热**	ΔR/R :±(5%+0.05Ω), with no evidence of mechanical damage （无可见机械损伤)
Temperature cycle	**温度循环**	ΔR ≤±(2%+0.05 Ω)
Insulation withstand voltage	**绝缘耐压**	with no evidence of mechanical damage（无机械损伤）
Insulation resistance	**绝缘电阻**	≥1MΩ
Load life	**负载寿命**	ΔR ≤±(5%+0.05 Ω）, with no evidence of mechanical damage （无可见机械损伤)

Ordering Procedure (Example: VWT1 220W ±10% 10Ω B/B)

订购方式 (例如: VWT1 220W ±10% 10Ω B/B)

V W T 1 C 0 K 0 1 0 0 2 2 0

Product Type (产品类型):
VWT1=Tubular Ceramic, Fixed, 1 High Bracket

Additional information(注):
第5码: 支架类型
C=C型C Slotted type bracket
L=长条型Elongated type bracket
第6码:
0=标准品 Standard

Tolerance (公差):
J=±5%
K=±10%

Resistance Value (阻值):
5% , 10% (E-24 series):
1st code is zero, 2nd~3rd codes are the significant figures of resistance value, and the rest code is the power of ten.
5% ,10%产品(E-24系列阻值):
第1位数是“0”；第2和第3位数表示阻值的有效数，第4位数表示有几个0

Wattage (功率):
090=90W, 100=100W, 150=150W,175=175W, 220=220W,225=225W, 375=375W

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Vitreous Enamel Power Wire-wound Resistors - VWT2

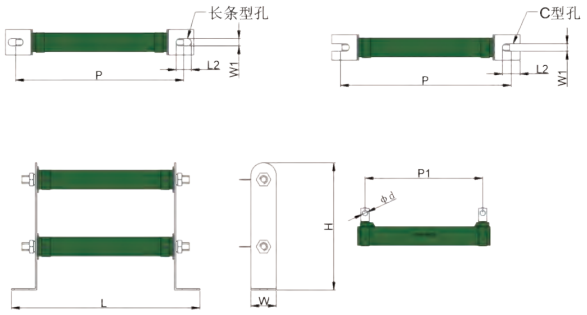
功率被釉绕线电阻器 - VWT2

Feature (特性)

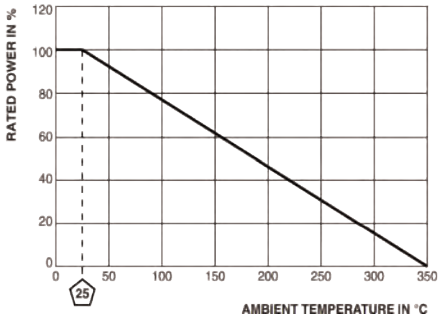
- It is moisture-resistant ,has high insulation,strong overload capacity, good thermal stability and long service life.
  耐潮湿、绝缘度高、过负荷能力强、热稳定性好、使用寿命长
- Good thermal stability and reliability. 良好的热稳定性和可靠性
- Strong resistance to corrosion and harsh environment. 耐腐蚀与恶劣环境适应性强
- It is applicable to power supply testing,circuit load,frequency converter, lifting,braking,power, shipbuilding,industrial automation and other electromechanical equipment.
  适用于电源测试、电路负载、变频器、起重、制动、电力、船舶、工业自动化等机电装备



Dimension (尺寸)



Derating Curve (降功率曲线)



Type 类型	Dimension(尺寸)(mm)								Resistance Range 阻值范围	Tolerance 精度	Type of bracket installation holes 支架安装孔类型
	L ±5	L2 ±1	W ±2	W1 ±0.5	H ±2	P ±5	P1 ±5	Φd+0.5/-0			
VWT2 90W	148	13	19	5.5	54	132	82	5	0.1Ω~1.0KΩ	±5% ±10%	Elongated type 长条型孔
VWT2 100W	133	11	19	5.5	82	116	70	5	0.1Ω~3.3KΩ		
VWT2 135W	170	11	19	5.5	82	152	110	5	0.1Ω~3.3KΩ		
VWT2 240W	217	19	32	7.0	105	196	143	5	1.0Ω~5.0KΩ		C Slotted type C型孔
VWT2 300W	270	19	32	7.0	105	247	194	5	1.0Ω~10KΩ		
VWT2 375W	316	19	32	7.0	105	300	246	5	1.0Ω~10KΩ		

Performance Specifications (性能)

Short-Time Overload	**短时间过负荷**	ΔR≤±(5%+0.05 Ω) , with no evidence of mechanical damage (无可见机械损伤)
Steady-state damp heat	**稳态湿热**	ΔR/R :±(5%+0.1 Ω), with no evidence of mechanical damage （无可见机械损伤)
Temperature cycle	**温度循环**	ΔR ≤±(2%+0.05 Ω)
Insulation withstand voltage	**绝缘耐压**	with no evidence of mechanical damage（无机械损伤）
Insulation resistance	**绝缘电阻**	≥1MΩ
Load life	**负载寿命**	ΔR ≤±(5%+0.1 Ω）, with no evidence of mechanical damage （无可见机械损伤)

Ordering Procedure (Example: VWT2 300W ±10% 10Ω B/B)

订购方式 (例如: VWT2 300W ±10% 10Ω B/B)

V W T 2 C 0 K 0 1 0 0 3 0 0

Product Type (产品类型):
VWT2=Tubular
Ceramic, Fixed,
2 High Bracket

Additional information(注):
第5码: 支架类型
C=C型C Slotted type bracket
L=长条型Elongated type bracket
第6码:
0=标准品 Standard

Tolerance (公差):
J=±5%
K=±10%

Resistance Value (阻值):
5% , 10% (E-24 series):
1st code is zero, 2nd~3rd codes are the significant figures of resistance value, and the rest code is the power of ten.
5% ,10%产品(E-24系列阻值):
第1位数是“0”；第2和第3位数表示阻值的有效数，第4位数表示有几个0

Wattage (功率):
090=90W,100=100W,
135=135W,240=240W,
300=300W,375=375W

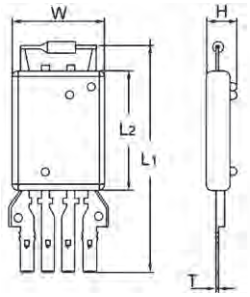
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见 P198 标准料号系统。

Thermal Fuse Wire-wound Resistors-ASSY Type
热熔保险丝型绕线电阻器 -ASSY 型

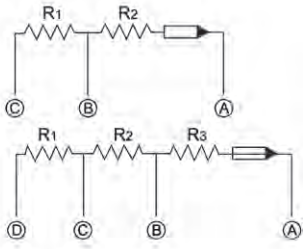
- High quality non-flame coating 高品质阻燃性涂装
- Self fusing 自熔断
- High current load and pulse capacity 高电流的负荷和脉冲能力
- Application：Automobile 应用：汽车



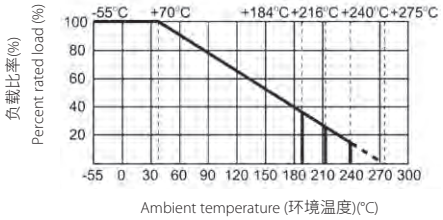
Dimension (尺寸图)



Circuit (电路图)



Derating Curve (降功率曲线)



Type 类型	Dimension (尺寸)(mm)					Resistance Range 阻值范围
	L1±3	L2±3	W±3	H(MAX)	T±0.2	
ASSY-4 Terminal	74	43	39	13	0.8	0.1Ω~10Ω
ASSY-5 Terminal	80	43	34	13	0.8	0.1Ω~10Ω

Ordering Procedure (Example: ASSY 12V +/-10% 10A B/B)
订购方式 (例如: ASSY 12V +/-10% 10A B/B)

A S S Y 1 D K 2 B 0 0 B 0 A

Product Type (产品类型):
ASSY=Assy Resistors

Voltage and Cut off temp (电压及断开温度):
1A=12V 92℃
1B=12V 167℃
1C=12V 184℃
1D=12V 216℃
1E=12V 227℃
1F=12V 240℃

Tolerance (公差):
K=±10%
J=±5%

Schematic style and resistance (原理式样&电阻):
2A00=2 Resistor circuit A
2B00=2 Resistor circuit B
3A00=3 Resistor circuit A
3B00=3 Resistor circuit B
2B11=2 Resistor circuit B with cable

Packing Qty. (包装数量):
0=for Bulk/Box

Current Rating :
2=2A
5=5A
A=10A

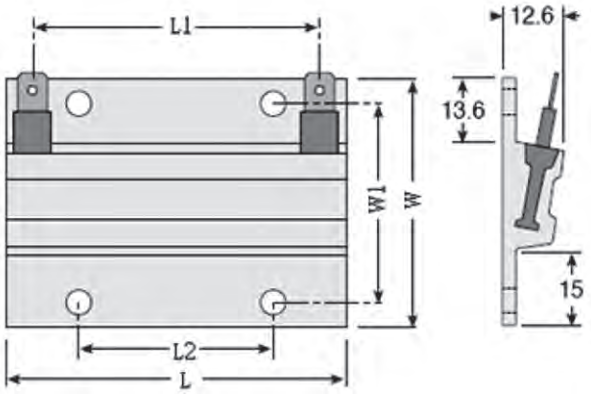
Packing Type (包装类型):
B = Bulk/Box
(散装 / 袋装)

Remark: For further information, please contact our sales team. 若需详细信息 , 请联系我司销售。

High Power Wire-wound Flat Aluminum Shell Fixed Resistors-HFWR Type
高功率绕线扁平铝壳电阻器 -HFWR 型



- Completely flame-retardant material 完全阻燃的材料
- Anti-vibration, high stability 优异的抗震性和稳定性
- Flat structure with great saving space 扁平式结构极大的节约空间
- Wire-wound process, good resistance to current impact
  绕线工艺，良好的耐电流冲击能力
- Application：Overload current protection of lithium battery pack in the start of new energy vehicle
  应用：新能源汽车启动时锂电池组的过载电流保护



Type 类型	Dimension (尺寸)(mm)				
	L±1.0	L1±0.5	L2±0.3	W±0.3	W1±0.3
HFWR90W	70	53	39.7	51	41
HFWR330W	280	263	2*100	51	41

Ordering Procedure (Example: HFWR 330W ±5% 100Ω B/B)
订购方式 (例如: HFWR 330W ±5% 100Ω B/B)

H F W R 0 0 J 0 1 0 1 3 3 0

Product Type (产品类型):
HFWR=High Power Wire-wound Flat Aluminum Shell Fixed Resistors

Wattage (功率):
90=90W
00= power is more than 100W; please indicate the power rating at the last 3 digits of the part

Tolerance (公差):
J=±5%
K=±10%

Resistance Value (阻值):
E-24 series: the 1st digit is 0, The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数，第 4 位表示有几个 0

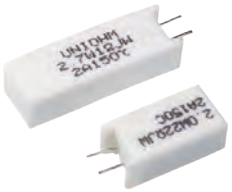
Additonal information：
330=330W

Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

Cement Thermal Fusible Resistors

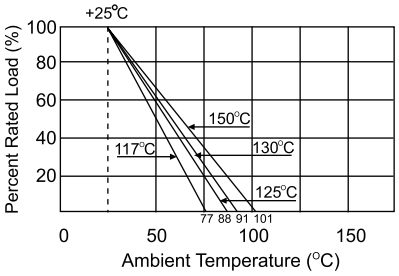
水泥热熔保险丝电阻器

- Self-extinguishing 自熄灭
- Excellent flame & moisture resistance 优异的阻燃性和抗湿性
- Extremely small & sturdy mechanically safe 体积小且坚固安全
- Non-inductive type available 无感也可提供
- Circuit protection applied to industrial and motor control
  应用于工业和马达控制的电路保护

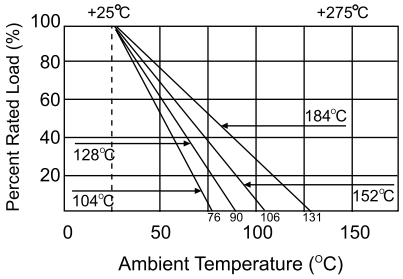


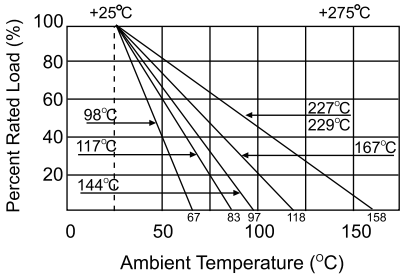


Derating Curve (current rating 2A)



Derating Curve (current rating 10A)





Specification(性能)

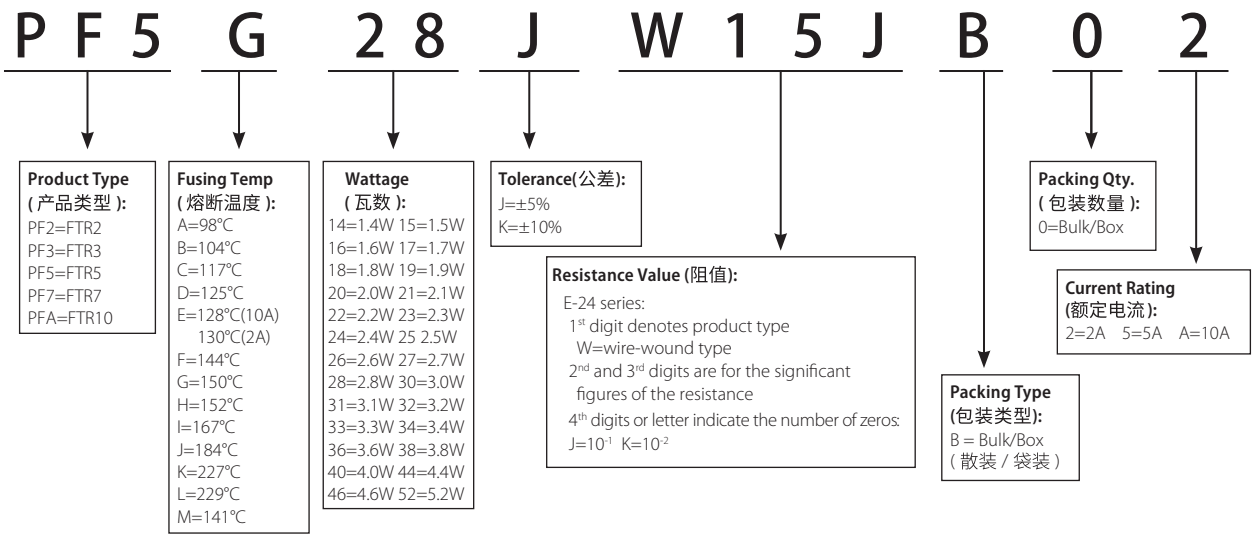
Part No 料号	Type 类型	Dimension (尺寸)(mm)						Current Rating 额定电流	Voltage Rating 额定电压	Rated Functioning Temp. 熔断温度代码				Resistance Range (E-24 series) ±5%, ±10%
		W±2	D±2	L±2	P±1	d1±0.05	d2±0.05			C 117℃	D 125℃	E 130℃	G 150℃	
PF2	FTR2	12	7	21	5	0.6	0.75	2A	250V	1.6W	1.9W	2.0W	2.0W	0.22Ω-270Ω
PF3	FTR3	12	8	26	5	0.6	0.75			1.7W	2.0W	2.1W	2.3W	0.27Ω-680Ω
PF5	FTR5	13	9	26	5	0.6	0.75			1.9W	2.3W	2.4W	2.8W	0.27Ω-680Ω
PF7	FTR7	13	9	38.5	5	0.6	0.75			2.2W	2.7W	2.8W	3.2W	0.68Ω-1.2KΩ
PFA	FTR10	16	13	35	7.5	0.6	0.75			2.6W	3.2W	3.3W	3.8W	1Ω-1.8KΩ

Part No 料号	Type 类型	Dimension (尺寸)(mm)						Current Rating 额定电流	Voltage Rating 额定电压
		W±2	D±2	L±2	P±1	d1±0.05	d2±0.05		
PF2	FTR2	12	7	21	5	1.0	0.75	10A	250V
PF3	FTR3	12	8	26	5	1.0	0.75		
PF5	FTR5	13	9	26	5	1.0	0.75		
PF7	FTR7	13	9	38.5	5	1.0	0.75		
PFA	FTR10	16	13	35	7.5	1.0	0.75		

Part No 料号	Type 类型	Fusing Temperature Code 熔断温度代码										Resistance Range (E-24 series) ±5%, ±10%
		A 98℃	B 104℃	C 117℃	E 128℃	F 144℃	H 152℃	I 167℃	J 184℃	K 227℃	L 229℃	
PF2	FTR2	1.4W	1.6W	1.8W	2.0W	2.0W	2.0W	2.0W	2.0W	2.0W	2.0W	0.22Ω-270Ω
PF3	FTR3	1.5W	1.7W	1.9W	2.1W	2.2W	2.5W	2.8W	3.0W	3.0W	3.0W	0.27Ω-680Ω
PF5	FTR5	1.7W	1.9W	2.2W	2.4W	2.6W	3.1W	3.3W	3.8W	3.8W	3.8W	0.27Ω-680Ω
PF7	FTR7	2.0W	2.2W	2.5W	2.8W	3.0W	3.4W	3.8W	4.4W	4.4W	4.4W	0.68Ω-1.2KΩ
PFA	FTR10	2.4W	2.6W	3.0W	3.3W	3.6W	4.0W	4.6W	5.2W	5.2W	5.2W	1Ω-1.8KΩ

Ordering Procedure (Example: FTR -5G 2.8W ±5% 1.5Ω 2A B/B)

订购方式 (例如: FTR -5G 2.8W ±5% 1.5Ω 2A B/B)



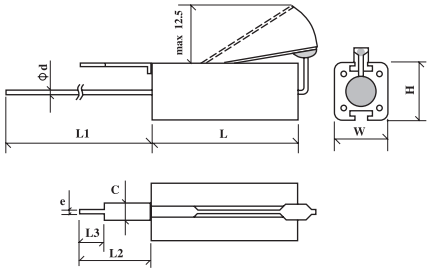
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Vertical Type Shrapnel Fuse Resistors - PHF0 Type

立式弹片型保险丝电阻 - PHF0 型

- Elastic sheet metal, solder dot fuse, reliable circuit cut off function
  弹性金属片，锡点熔断型，可靠的电路切断功能
- Fusing Temperature 220±20℃ 熔断温度220±20℃
- Application: Over temperature protection of industrial power supply
  应用：工业电源部分的超温保护

Type 类型	Dimension (尺寸)(mm)								
	L±1.0	W±1.0	H±1	L1±3	L2±1.5	L3±0.5	C±0.1	e±0.1	Φd±0.05
PHF-2W	25.0	9.0	10.0	38.0	13.0	4.5	3.0	0.9	0.75



Ordering Procedure (Example: PHF0 2W ±5% 390Ω B/B)

订购方式 (例如: PHF0 2W ±5% 390Ω B/B)

P H F 0 2 W J W 3 9 1 B 0 0

Product Type (产品类型):
PHF0=PHF0

Wattage (功率):
2W=2W

Tolerance (公差):
J = ±5%
K = ±10%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
W=wire wound type
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
以下数字及字母用来表示第11位数有几个0:
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type (包装类型):
B = Bulk/Box (散装 / 袋装)

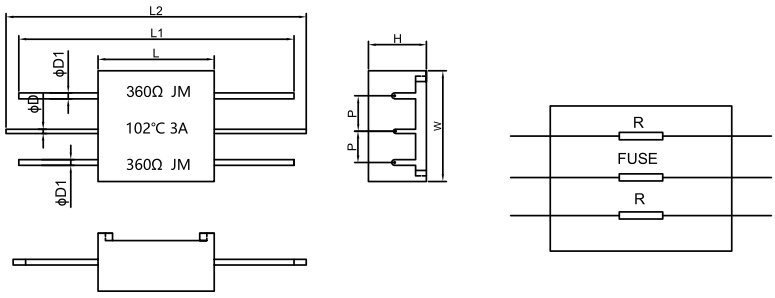
Packing Qty. (包装数量):
00=For Bulk/Box packing

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Array Type Cement Temperature Fusing Resistors - TFRC Type

排列式水泥温度保险丝电阻器 - TFRC 型

- Multi lead arrange encapsulation & space saving 多引线排列封装、节约空间
- Excellent flame &miosture resistance 良好的阻燃性、抗湿性
- Application: Over temperature protection of industrial power supply
  应用：工业电源部分的超温保护



品名规格	L±0.5	L1±3	L2±3	W±0.5	H±0.5	P±0.3	ΦD±0.04	ΦD1±0.04
TFRC 2W 360Ω	16	80	80	16.2	8	5	0.58	0.8
TFRC 2W 200Ω/1KΩ	17.5	70.5	83.5	17	8.5	5	1	0.8

Ordering Procedure (Example: TFRC 2W ±5% 360Ω B/B)

订购方式 (例如: TFRC 2W ±5% 360Ω B/B)

T F R C 2 W J P 3 6 1 B 0 0

Product Type (产品类型):
TFRC=TFRC

Wattage (功率):
2W=2W

Tolerance (公差):
J = ±5%

Resistance Value (阻值):
E-24 series: the 1st digit to denote production type of the product:
P=power film type
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
以下数字及字母用来表示第11位数有几个0:
J=10^{-1} K=10^{-2} L=10^{-3}

Packing Type (包装类型):
B = Bulk/Box (散装 / 袋装)

Packing Qty. (包装数量):
0=For Bulk/Box packing

Additional Information:
0=NIL

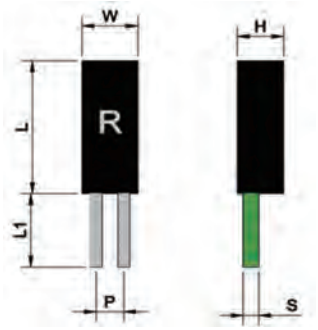
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

Communication Terminal Resistors-CTR系列

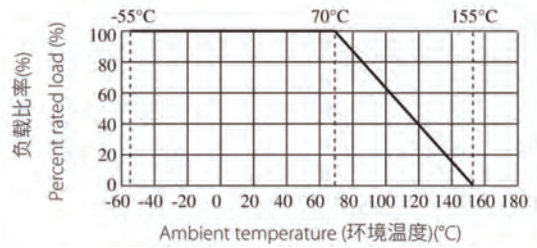
通信终端电阻器 - CTR系列

- Weaken signal reflection in communication cables　减弱在通信电缆中的信号反射
- Enhance anti-interference capability and quickly pass through high-frequency and low-energy signals
  提高抗干扰能力，迅速过掉高频低能量的信号

Dimension (尺寸图)



Derating Curve (降功率曲线)



Type 类型	W + 0.1/-0	L + 1/-0	L1 + 0/-1	H + 0.1/-0	P±0.1	S±0.1
CTR 1/4W	7.1	18	10	5.9	3.5	2

Type 类型	Power 功率	Resistance Range 阻值范围	Tolerance 公差	Operating Temperature 工作温度
CTR 1/4W	1/4W	120Ω	±1%	-55°C~+155°C

Performance Specification (特性)

Temperature Coefficient	温度系数	±100PPM/°C
Short Time Overload	短时间过负荷	△R/R≤±(1%+0.05Ω)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿，飞弧及可见机械性损伤
Insulation resistance	绝缘电阻	≥1 MΩ
Rapid change of temperature	温度快速变化	ΔR/R≤±(5%+0.05Ω)
Terminal strength	端子强度	No evidence of mechanical damage(无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R≤±(1%+0.05Ω)
Load life	负载寿命	ΔR/R≤±(1%+0.05Ω)

Ordering Procedure (Example: CTR 1/4W ±1% 120Ω B/B)

订购方式：(例如: CTR 1/4W ±1% 120Ω B/B)

C T R 0 W 4 F 1 2 0 0 B 0 0

- **Product Type (产品类型):** CTR=CTR-type
- **Special Feature (特性):** 0=Standard（标准品）
- **Wattage (功率):** W4=1/4W
- **Tolerance (公差):** F=±1%
- **Resistance Value (阻值):** ≤1% : The 1st to 3rd digits are for the significant figures of the resistance and 4th digit denotes number of zeros following. 第1位数到第3位数表示阻值的有效数，第4位数表示有几个0。 $J=10^{-1}$ $K=10^{-2}$ $L=10^{-3}$
- **Packing Type (包装类型):** B = Bulk/Box (散装 / 袋装)
- **Packing Qty. (包装数量):** 0=Bulk/Box (散装/盒装)
- **Additional Information:** 0=NIL (标准品)

Remark: For more details, please check page 198, Part No. System.　注：更多细节详见P198标准料号系统。

Columnar Type Cement Fixed Resistors-QHO Type

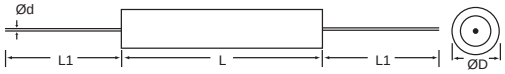
圆柱状水泥电阻器 -QHO 型



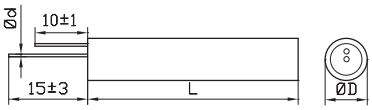
- Circular ceramic 圆形瓷管外壳
- Excellent insulation and moisture resistance优良的绝缘性和耐湿性
- Winding process, good resistance to load绕线工艺，良好的耐负荷能力
- Application：Power supply of frequency converter
  应用：变频器的电源

Type 类型	Dimension (尺寸)(mm)			
	L±1	L1±3	ΦD±1	d±0.05
QHO 4W	43	30	8	0.75
QHO 5W	45	30	8	0.75
QHO 7W	50	30	9	0.75
QHO 9W	60	30	9	0.75
QHO 11W	65	30	9	0.75
QHO 17W	75	38	9	0.75

QHO-1



QHO-2



Ordering Procedure (Example: QHO 17W ±10% 40Ω B/B)

订购方式 (例如: QHO 17W ±10% 40Ω B/B)

Q H O 0 1 7 K 0 4 0 0 B 0 0

Product Type (产品类型):
QHO0=Columnar Type Cement Fixed Resistors

Wattage (功率):
4W=4W
5W=5W
7W=7W
9W=9W
BW=11W
17=17W

Tolerance (公差):
J= ± 5%
K= ± 10%

Resistance Value (阻值):
2%,5%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列阻值):
第 1 位是0, 第 2、3 位表示阻值的有效数, 第 4 位表示有几个 0

Packing Type (包装类型):
B = Bulk/Box (散装 / 袋装)

Packing Qty. (包装数量):
0=Bulk/Box (散装 / 袋装)

Additional Information:
0=NIL(标准品)

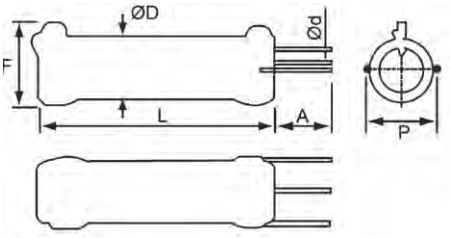
Multi-Lead Wire-wound Fixed Resistors - KNHW Type

多引线型绕线固定电阻器 - KNHW 型



- All materials are inorganic and non-flammable
  所有的材料均为无机或非燃性的固体材料
- Super heat dissipation & High stability 散热性高，稳定性好
- Special design of Multi-lead wire easy to assembled on PCB
  特殊设计的多导线易于在PCB上安装
- Application: Charging or discharging resistance of electrical equipment such as elevator
  应用：电气设备如电梯的充电电阻或放电电阻

Type 类型	Dimension (尺寸)(mm)					
	L±1	A±1	F±1	P±1	ΦD±1	d±0.05
KNHW10W	45	10	15	12	11.5	1.0
KNHW18W	40	12	18	15	14.5	1.0
KNHW25W	50	12	18	15	14.5	1.0
KNHW40W	65	12	20	17	16.5	1.0



Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

Ordering Procedure (Example: KNHW 25W ±5% 11Ω B/B)

订购方式 (例如: KNHW 25W ±5% 11Ω B/B)

K N H W 2 5 J 0 1 1 0 B 0 0

- **Product Type (产品类型):** KNHW=Multi-Lead Wire-wound Fixed Resistors
- **Wattage (功率):** AW=10W; 18=18W; 25=25W; 40=40W
- **Tolerance (公差):** J= ± 5%
- **Resistance Value (阻值):** 2%,5%(E-24 series): The 1st digit is "0",the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
  2%, 5% 产品 (E-24 系列阻值): 第 1 位是 0, 第 2、3 位表示阻值的有效数，第 4 位表示有几个 0
- **Packing Type (包装类型):** B = Bulk/Box (散装 / 袋装)
- **Packing Qty. (包装数量):** 0=Bulk/Box
- **Additional Information:** 0=NIL

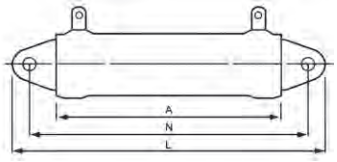
Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

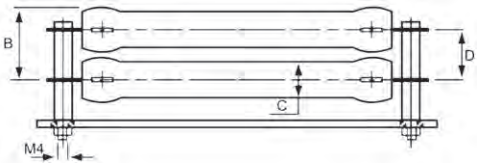
High Power Flat Wire-wound Fixed Resistors - KNHB Type

高功率扁平型绕线固定电阻器

- All materials are inorganic and non-flammable
  所有的材料均为无机或非燃性的固体材料
- Can withstand High Voltage pulse in short-time 短时间可承受高电压脉冲
- Can use in single or in-piles 可单个或成堆使用
- Application: Charging or discharging resistance of electrical equipment such as elevator
  应用：电气设备如电梯的充电电阻或放电电阻







Type 类型	Dimension (尺寸)(mm)					
	A±2	B±1	C±0.5	D±1	L±1	N±2
KNHB21W	32	19	12	14	68	51
KNHB31W	51	19	12	14	87	70
KNHB53W	90	19	12	14	126	109
KNHB68W	120	19	12	14	156	140
KNHB91W	153	19	12	14	189	173

Ordering Procedure (Example: KNHB 68W ±5% 15Ω B/B)

订购方式 (例如: KNHB 68W ±5% 15Ω B/B)

K N H B | 6 8 | J | 0 1 5 0 | B | 0 | 0

Product Type (产品类型):
KNHB=High Power Flat Wire-wound Fixed Resistors

Wattage (功率):
21=21W
31=31W
53=53W
68=68W
91=91W

Tolerance (公差):
J= ± 5%

Resistance Value (阻值):
2%,5%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0

Packing Type (包装类型):
B = Bulk/Box (散装 / 袋装)

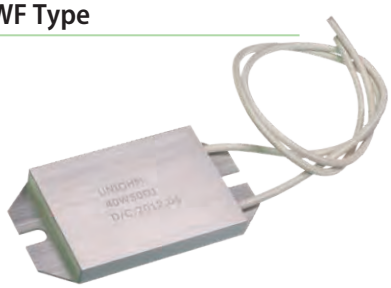
Packing Qty. (包装数量):
0=Bulk/Box

Additional Information:
0=NIL

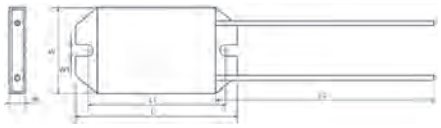
High Power Wire-wound Flat Aluminum Shell Fixed Resistors - HPWF Type

高功率绕线扁平铝壳电阻器 - HPWF 型

- Anti-vibration, high stability 优异的抗震性和稳定性
- Easy to assembled on PCB 易于在PCB 上安装
- Application：Power supply of frequency converter
  应用：变频器的电源



Type 类型	Dimension(尺寸)(mm)						Resistance Range 阻值范围
	L±1	L1±0.5	L2 $^{+20}_{-0}$	W±0.5	W1±0.2	H±0.5	
HPWF 40W	85	72	300	45	5.5	8.2	10Ω~100Ω

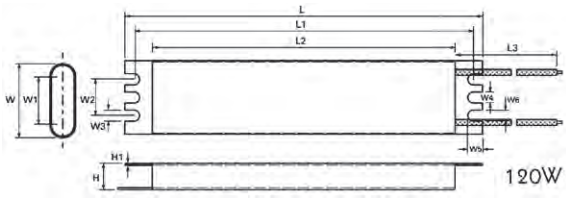


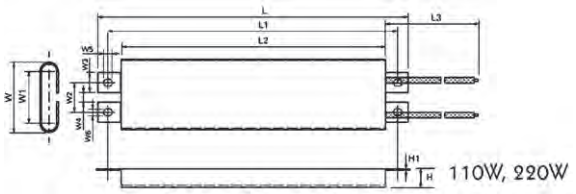
High Power Wire-wound Iron Shell Fixed Resistors - HPWR Type

高功率绕线铁壳固定电阻器 - HPWR 型

Type 类型	Dimension(尺寸)(mm)					Resistance Range 阻值范围
	L+0/-5	L1±0.5	W±0.5	H±0.5	L3±5	
HPWR110W	105	91.5	44.6	11.5	300	10Ω~500Ω
HPWR120W	195	184	40	14	250	10Ω~500Ω
HPWR220W	200	187	44.6	11.5	250	10Ω~600Ω







Ordering Procedure (Example: HPWR 110W ±5% 10Ω B/B)

订购方式 (例如: HPWR 110W ±5% 10Ω B/B)

H P W R B 0 J 0 1 0 0 1 1 0

Product Type (产品类型):
HPWF, HPWR

Additional information(注):
A0=Terminal Type端子类型
B0=Cable Type电缆类型

Tolerance (公差):
J= ± 5%
K= ± 10%

Resistance Value (阻值):
E-24 series: the 1 st digit is 0,
The 2nd and 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros.
5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0

Wattage (功率):
040=40W
110=110W
120=120W
220=220W

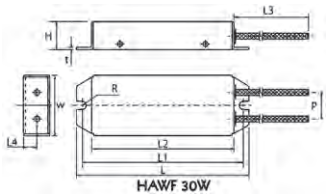
Remark: For further information, please contact our sales team. 若需详细信息 , 请联系我司销售。

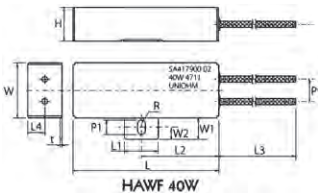
High Power Wire-wound Iron-Case Resistors - HAWF Type

高功率绕线型铁壳固定电阻器 - HAWF 型

- Anti-vibration, high stability 优异的抗震性和稳定性
- Excellent transient current impact capability, suitable for the start of the inverter under harsh conditions
  优良的瞬间电流冲击能力，适合变频器严苛条件下的启动
- Application: Frequency Conversion Equipment, such as Elevator, Freezer, Crane, Lift etc.
  应用: 各类变频设备中, 如电梯,冷柜, 起重机, 升降机等







Type 类型	Dimension(尺寸)(mm)			
	L±1	W±1	H±1	L1±1
HAWF30W	97	32	15	90.5
HAWF40W	85	32	20	20

Ordering Procedure (Example: HAWF 40W ±5% 470Ω B/B)

订购方式 (例如: HAWF 40W ±5% 470Ω B/B)

H A W F | B 0 | J | 0 4 7 1 | 0 4 0

Product Type (产品类型):
HAWF=High Power Wire-wound Iron-Case Resistors

Additional information(注):
A0=Terminal Type端子类型
B0=Cable Type电缆类型

Tolerance (公差):
J= ± 5%
K= ± 10%

Resistance Value (阻值):
2%,5%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数 , 第 4 位表示有几个 0

Wattage (功率):
030=30W
040=40W

Remark: For more details, please check page 198, Part No. System. 注：更多细节详见P198标准料号系统。

High Power Wire-wound Aluminum Shell Resistance - HAWR Type

高功率绕线型铝壳电阻器 - HAWR 型

Anti-vibration, high stability 优异的抗震性和稳定性

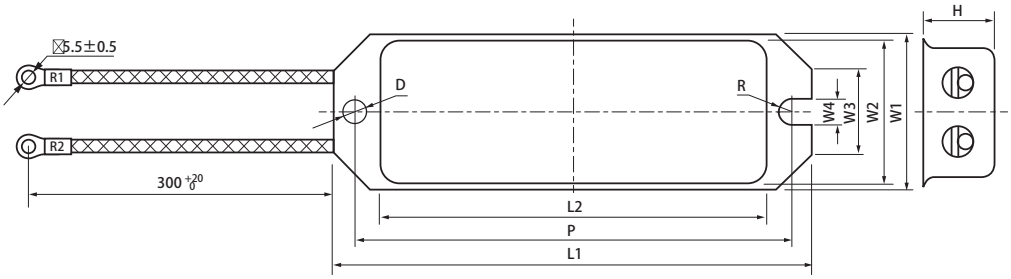
Excellent transient current impact capability, suitable for the start of the inverter under harsh conditions

优良的瞬间电流冲击能力，适合变频器严苛条件下的启动

Application: Frequency Conversion Equipment, such as Elevator, Freezer, Crane, Lift etc.

应用: 各类变频设备中, 如电梯,冷柜, 起重机, 升降机等





Type 类型	Dimension(尺寸)(mm)									阻值范围 Resistance Range
	L1±1	L2±2	P±1	W1±1	W2±1	W3±0.5	W4±0.2	D±0.2	H±1	
HAWR60W	100	75.5	90	30	28	16.5	4.5	4.6	16.5	1Ω~2KΩ
HAWR80W	130.5	104.5	117.5	43	38.5	22	6.0	6.0	21	1Ω~2KΩ
HAWR100W	130	110	118	42	39	22.5	6.0	6.0	20	1Ω~3KΩ

Ordering Procedure (Example: HAWR 60W ±5% 470Ω B/B)

订购方式 (例如: HAWR 60W ±5% 470Ω B/B)

H A W R B 0 J 0 4 7 1 0 6 0

Product Type (产品类型):
HAWR=High Power Wire-wound Aluminum Shell Resistance

Additional information(注):
A0=Terminal Type端子类型
B0=Cable Type电缆类型

Tolerance (公差):
J=±5% K=±10%

Resistance Value (阻值):
2%,5% (E-24 series):
The 1 st digit is "0"; the 2nd & 3rd digits are for the significant figures of the resistance and the 4th digits or letter indicate the number of zeros
2%, 5 % 产品 (E-24 系列阻值):
第 1 位是 0, 第 2、3 位表示阻值的有效数，第 4 位表示有几个 0

Wattage (功率):
060=60W
080=80W
100=100W

Remark: For further information, please contact our sales team. 若需详细信息，请联系我司销售。

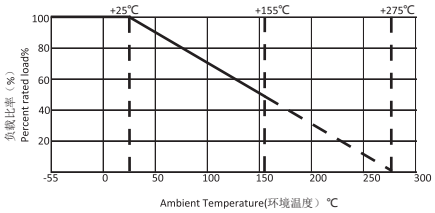
High Power Wire-wound Aluminum Case Resistors
高功率超薄型铝外壳电阻器

Feature (特性)

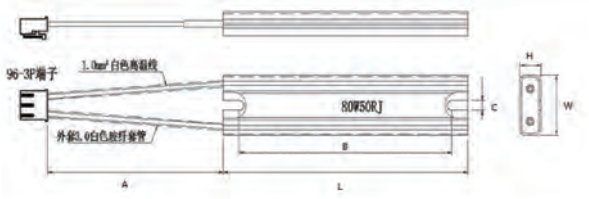
- Anti-vibration,high stability 优异的抗震性和稳定性
- Excellent transient current impact capability,suitable for the start of the inverter under harsh conditions
  优良的瞬间电流冲击能力,适合变频器严苛条件下的启动



Derating Curve (降功率曲线)



Dimension(尺寸) mm



Type 类型	Dimension(尺寸)(mm)						Resistance Range 阻值范围
	A±10	B±1	L±1	C±0.5	H±1	W±1	
HCWR80W	250	86.5	100	4.5	11	27.5	0.1Ω~200Ω

Ordering Procedure (Example: HCWR80W±5% 50ΩB/B)
订购方式 (例如: HCWR80W±5% 50ΩB/B)

H C W R | B 0 | J | 0 5 0 0 | 0 8 0

Product Type (产品类型):
HCWR=HCWR

Additional information(注):
A0=Terminal Type 端子类型
B0=Cable Type 电缆类型

Tolerance (公差):
J = ± 5%
K = ± 10%

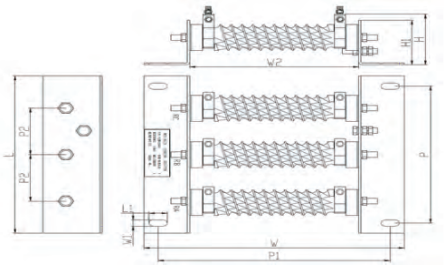
Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)

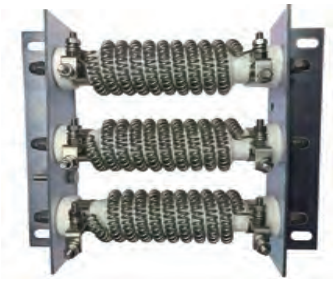
Wattage (功率):
080=80W

High power Starting Resistors
高功率启动电阻器

Feature（特性）

- Tolerance 精度为:±5%
- Temperature coefficient 温度系数为: ±200PPM/°C
- Operating • temperature range 工作温度范围为： -55°C ~+275°C
- Anti-vibration,high stability 优异的抗震性和减震性
- Excellent transient current impact capabitity,suitable for the start of the inverter under harsh conditions.
  优良的抗电流冲击能力，适合变频器严苛环境下的启动
- High stability、 reliability 高稳定性、高可靠性
- High overload capacity 高过载能力





Type 类型	Pated voltage 额定电压	Resistance 电阻	Impact current tolerance 0.5S 耐受冲击电流能力0.5S	Finished stock size 成品尺寸									
				L±1	L1±0.5	W±1.5	W1±0.2	W2±1.5	H±1	H1±1	P±1	P1±1.5	P2±1
HPSR200W	660V	3*0.5Ω±5%	500A	230	20	290	9	185	95	65	200	254	70
		3*0.7Ω±5%	450A										
		3*1.0Ω±5%	350A										
		3*1.2Ω±5%	250A										
		3*1.4Ω±5%	150A										
		3*2.0Ω±5%	100A										

Ordering Procedure (Example: HPSR200W ±5%2ΩB/B)
订购方式 (例如: HPSR200W ±5%2ΩB/B)

H P S R　0 0　J　0 2 0 J　2 0 0

Product Type (产品类型):
HPSR=HPSR

Wattage (功率):
00=for power rating over 100w,please indicate the power rating at the last 3 digits of the part No.
(00= 功率超过100瓦，但请注明功率于料号最后三位数)

Tolerance (公差):
J = ± 5%
K = ± 10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)

Additional information(注):
200=200W

High Power,High Current Mica Grid Resistors - GRM0

云母架电阻箱 - GRM0系列

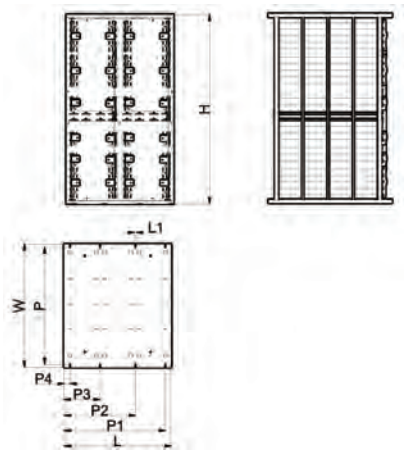
ROYALOHM
www.royalohm.com

Feature (特性)

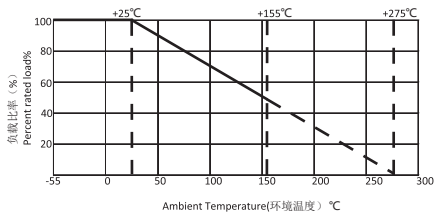
- Excellent impact resistance and stability 优异的耐冲击性和稳定性
- Application:Frequency Conversion Equipment,such as Elevator,Freezer,Crane,Lift etc.
  应用：各类变频设备中，如电梯，冷柜，起重机，升降机等



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Type 类型	Dimension(尺寸)(mm)									Resistance Range 阻值范围
	H±5	W±2	L±2	L1±0.5	P±1	P1±1	P2±1	P3±1	P4±1	
GRM0200W~4000W	460	300	260	5	285	246	173	87	14	40Ω~800Ω

*Remark：It can be customized according to different needs. For detailed information, please contact our sales department.
可根据不同需求定制，若需详细信息，请联系我司销售。

Performance Specification (特性)

Temperature coefficient	温度系数	<20Ω:±400PPM ; ≥20Ω:±350PPM
Short-time Overload	短时间过负荷	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Vibration	振动	ΔR/R ±(0.5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Humidity (Steady State)	恒定湿热	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Rapid change of temperature	温度快速变化	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)

Ordering Procedure (Example:GRM0 4KW 40Rx6+2KW 80Rx6+400W 400Rx2+800W 200Rx4+200W 800Rx2 ±5% B/B)

订购方式 (例如: GRM0 4000W 40Rx6+2KW 80Rx6+400W 400Rx2+800W 200Rx4+200W 800Rx2 ±5% B/B

G R M 0 0 0 J 0 4 0 0 E 0 0

Product Type (产品类型):
GRM0=GRM0 type

Wattage (功率):
00=for power rating over 100W, please indicate the power rating at the last 3 digits of the part No.
(00=功率超过100瓦, 但请注明功率于料号最后三位数)

Tolerance (公差):
J = ± 5%
K = ±10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)

Additional information(注):
100=100W
800=800W
A00=1000W
E00=4000W

Cemented Wire Wound Tubular Fixed Resistors - GRM1

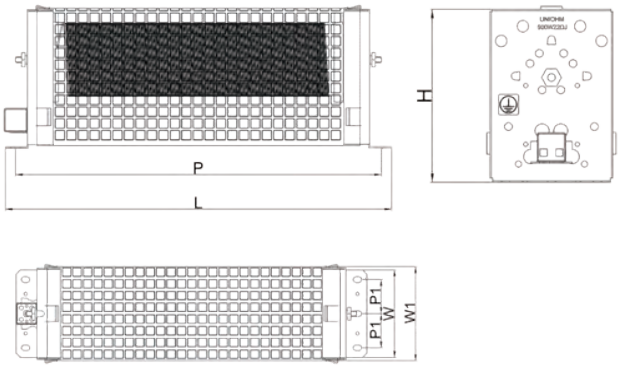
绕线管状大功率消谐固定电阻箱 - GRM1系列

Feature(特性)

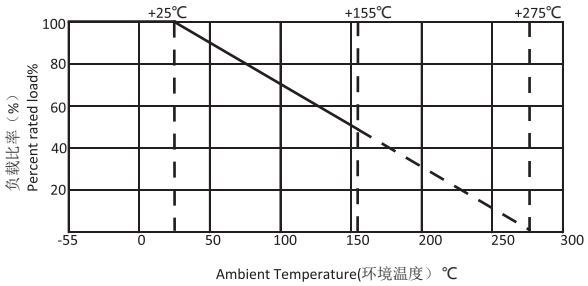
- Anti-vibration,high stability 优异的抗震性和稳定性
- Application:Frequency Conversion Equipment,such as Elevator,Freezer,Crane,Lift etc.
  应用：各类变频设备中，如电梯，冷柜，起重机，升降机等



Dimension(尺寸)mm



Derating Curve(降功率曲线)



Type 类型	Dimension(尺寸)(mm)						Resistance Range 阻值范围
	L±2	P±2	W±1	W1±1	H±1	P1±1	
GRM1500W	341	323	82	88	118	32	22Ω

*Remark：It can be customized according to different needs. For detailed information, please contact our sales department.
可根据不同需求定制，若需详细信息，请联系我司销售。

Performance Specification (特性)

Temperature coefficient	温度系数	<20Ω:±400PPM℃ ≥20Ω:±350PPM℃
Short-time Overload	短时间过负荷	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Rapid change of temperature	温度快速变化	ΔR/R ±(0.5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Load life in humidity	湿度寿命	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Load life	负载寿命	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)

Ordering Procedure (Example:GRM1 500W ±5% 22Ω B/B)

订购方式 (例如: GRM1 500W ±5% 22Ω B/B)

G R M 1 | 0 0 | J | 0 2 2 0 | B 0 0

Product Type (产品类型):
GRM1=GRM1 type

Wattage (功率):
00=for power rating over 100W, please indicate the power rating at the last 3 digits of the part No.
(00=功率超过100瓦, 但请注明功率于料号最后三位数)

Tolerance(公差):
J=±5%
K=±10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)

Additional Information(注):
100=100W,500=500W
A00=1000W,A50=1500W
C00=2000W,C50=2500W
D00=3000W,E00=4000W
F00=5000W,G00=6000W

High Power Wire-wound Iron Shell Fixed Resistors - HDWR

高功率绕线电阻器 - HDWR系列

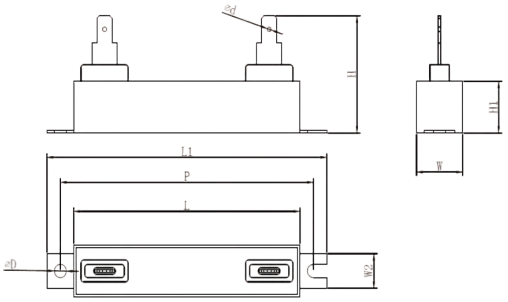
ROYALOHM
www.royalohm.com

Feature (特性)

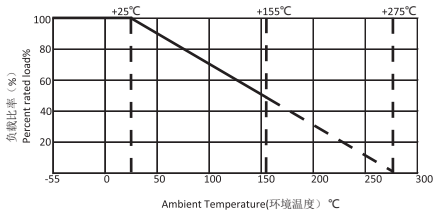
- Anti-vibration,high stability 优异的抗震性和稳定性
- Non-Inductive type is available 可提供无感型
- Application:Frequency Conversion Equipment,such as Elevator,Freezer,Crane,Lift etc.
  应用:各类变频设备中,如电梯,冷柜,起重机,升降机等



Dimension(尺寸) mm



Derating Curve (降功率曲线)



Type 类型	Dimension(尺寸)(mm)									Resistance Range 阻值范围
	L±1.5	L1±1.5	W±1	W2±1	H±1	H1±1	P1±1.5	ΦD±0.5	Φd±0.1	
HDWR20W/45W	25.4	47.6	19	12.7	38.1	19	36.5	5	1.8	0.05Ω~6KΩ
HDWR40W/70W	65	87.3	19	12.7	38.1	19	76.2	5	1.8	1Ω~25KΩ
HDWR50W/100W	94	116	19	12.7	38.1	19	105	5	1.8	1.5Ω~47.5KΩ
HDWR60W/115W	141.3	163.5	19	12.7	38.1	19	152.4	5	1.8	2.5Ω~81KΩ
HDWR85W/150W	190.5	215.9	19	12.7	38.1	19	203.2	5	1.8	4.5Ω~100KΩ

* Low power without radiator, high power with radiator 低功率无散热器,高功率带散热器

Performance Specification (特性)

Temperature coefficient	温度系数	±200PPM℃
Short-time Overload	短时间过负荷	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Vibration	绝缘耐压	no evidence of mechanical damage (无可见机械损伤)
Humidity (Steady State)	绝缘电阻	no evidence of mechanical damage (无可见机械损伤)
Rapid change of temperature	温度快速变化	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Load life	负载寿命	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)

Ordering Procedure (Example:HDWR 50W ±5% 3KΩ B/B)

订购方式 (例如: HDWR 50W ±5% 3KΩ B/B)

H D W R 5 0 J 0 3 0 2 B 0 0

Product Type (产品类型):
HDWR=HDWR

Wattage (功率):
20=20W 40=40W
45=45W 50=50W
60=60W 70=70W
85=85W
00=for power rating over 100W, please indicate the power rating at the last 3 digits of the part No.
00=功率超过100瓦,但请注明功率于料号最后三位数

Tolerance (公差):
H=±3%
J=±5%
K=±10%

Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)

Packing Type (包装类型):
B = Bulk/Box (散装 / 盒装)

Packing Qty. (包装数量):
0=for Bulk/Box

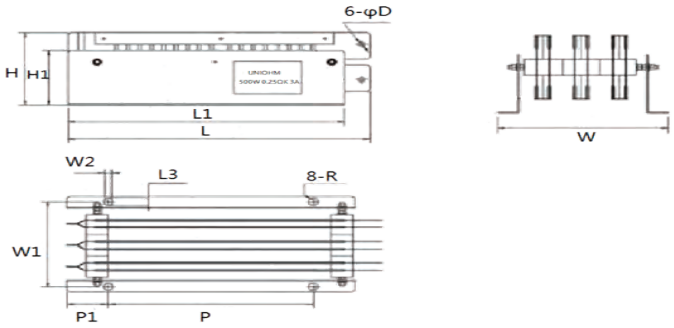
Additional Information (注):
0=NIL（标准品 ）
N=（无感性 ）

Feature(特性)

- Anti-vibration,high stability 优异的抗震性和稳定性
- Application: All kinds of frequency converters and harsh environments.
  应用：各类变频器和恶劣的环境中



Dimension(尺寸)mm



Type 类型	Dimension(尺寸)(mm)												Resistance Range 阻值范围
	L±3	L1±2	L3 + 0/-1	W±3	W1±2	W2 + 0/-1	P±1	P1±1	H±3	H1±2	6-φD±0.05	8-R±0.05	
MPCR500W	355	325	16	203	181	8	230	47.5	123	93	7	4	0.25Ω

*Remark：It can be customized according to different needs. For detailed information, please contact our sales department.
可根据不同需求定制，若需详细信息，请联系我司销售。

Performance Specification (特性)

Dielectric withstanding Voltage	绝缘耐压	no evidence of mechanical damage (无可见机械损伤)
Insulation resistance	绝缘电阻	≥100MΩ
Terminal strength	端子强度	ΔR/R ±(2%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Vibration	振动	ΔR/R ±(3%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Rapid change of temperature	温度快速变化	ΔR/R ±(2%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Constant damp heat	恒定湿热	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage(无可见机械损伤)
Salt spray test	盐雾试验	The resistor surface should not adhere to significant oxidation spots, rust and visible damage (电阻表面不应粘附有明显的氧化点，锈蚀和可见损伤)
Load life	负载寿命	ΔR/R ±(5%+0.05 Ω) Max, with no evidence of mechanical damage ，Allow the resistor sheet to change color (无可见机械损伤，允许电阻片变色)

Ordering Procedure (Example:MPCR 500W ±10% 0Ω25 B/B)

订购方式 (例如: MPCR 500W ±10% 0Ω25 B/B)

M P C R 0 0 K 0 2 5 K 5 0 0

Product Type (产品类型):
MPCR=MPCR type

Wattage (功率):
00=for power rating over 100W, please indicate the power rating at the last 3 digits of the part No.
(00=功率超过100瓦, 但请注明功率于料号最后三位数)

Tolerance(公差):
J=±5%
K=±10%

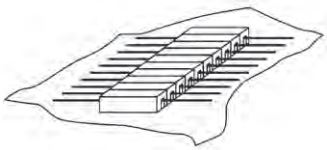
Resistance Value (阻值):
5%,10%(E-24 series):
The 1st digit is "0",the 2nd & 3rd digits are for the signifcant figures of the resistance and the 4th digits or letter indicate the number of zeros
5%, 10% 产品 (E-24 系列阻值):
第1位数是0，第2、3位数表示阻值的有效数，第4位表示有几个0)
J=10^{-1} K=10^{-2}

Additional Information(注):
500=500W

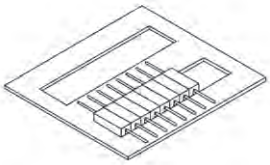
Standard Packing of Cement Resistors - (1)

水泥电阻器包装规范 - (1)

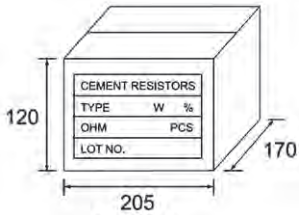
Type A Packing- 包装类型 A (mm)



Type-A1 plastic bag
塑料袋



Type-A2 paper tray
纸托盘

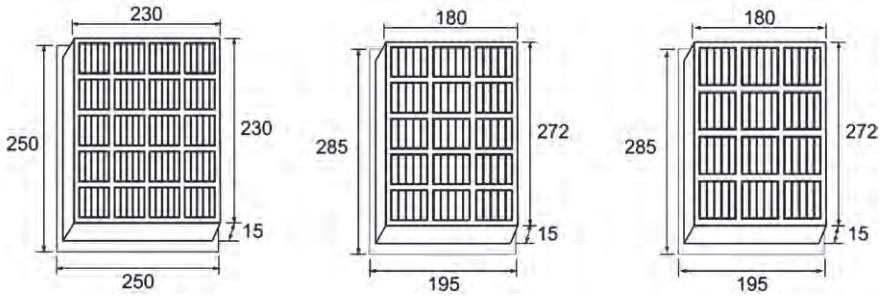


Inner box
内盒

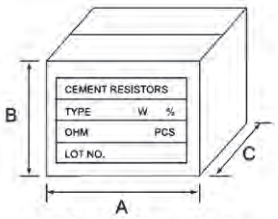
Type 类型	Qty/Plastic Bag(PCS) 每塑料袋数量	Qty/Inner Box(PCS) 每内盒数量	Qty/Carton (PCS) 每外箱数量	Carton Size L×W×H(±5%)	Gross Wt.±2Kgs	Packing Type 包装类型
PRW Series						
PRW 1W	10	500	3000	485×190×200	10.00	Type A1
PRW 2W	10	400	2400	485×190×200	8.00	Type A1
PRW 3W	10	500	3000	520×220×250	12.20	Type A1
PRW 5W	10	400	2400	520×220×250	13.72	Type A1
PRW 7W	28	280	1680	520×220×250	15.46	Type A1
PRW 10W	19	190	1140	520×220×250	14.30	Type A1
PRW 15W	14	112	672	520×220×250	14.24	Type A1
PRW 20W	10	70	420	510×200×270	10.75	Type A1
PRW 25W	10	70	420	510×200×250	11.22	Type A1
PRWA Series						
PRWA 5W	10	400	2400	520×220×250	15.00	Type A1
PRWA 7W	10	240	1440	520×220×250	14.20	Type A1
PRWA 10W	10	220	1320	520×220×250	16.30	Type A1
PRWC Series						
PRWC 3W	10	400	2400	485×190×200	7.30	Type A1
PRWC 5W	10	400	2400	485×190×200	9.40	Type A1
PRWC 7W	10	400	2400	520×220×250	14.00	Type A1
PRWC-1 Series						
PRC1 4W	50	500	3000	515×225×210	9.05	Type A2
PRC1 5W	10	600	3600	515×225×210	13.45	Type A1
PRC1 6W	40	400	2400	515×225×210	13.71	Type A2
PRT Series						
PRT 10W	10	200	1200	520×220×250	19.50	Type A1
PRT 15W	5	150	900	520×220×250	22.00	Type A1
PRT 20W	5	95	570	520×220×250	18.50	Type A1
PRT 30W	5	30	180	520×220×250	15.94	Type A1
PRT 40W	5	25	150	520×220×250	14.20	Type A1

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Type A Packing 包装类型 A (mm)



Dimension of Plastic Case (mm)			
Type	A	B	C
Type - B1	260	105	260
Type - B2	300	100	210
Type - B3	300	100	210



Inner Box of Plastic Case

Type 类型	Qty/Plastic Bag(PCS) 每塑料袋数量	Qty/Inner Box(PCS) 每内盒数量	Qty/Carton (PCS) 每外箱数量	Carton Size L×W×H(±5%)	Gross Wt.±2Kgs	Packing Type 包装类型
PRM/FTR Series						
PRM2W	10 (in Bag)	700	4200	520×220×250	18.50	Type A1
PRM3W	100	500	2000	535×270×220	14.20	Type B1
PRM5W	100	500	2000	535×270×220	14.20	Type B1
PRM7W	75	375	1500	435×305×215	17.42	Type B2
PRM 10W	60	300	1200	435×305×215	18.12	Type B3
PFA 10W	10 (in Bag)	150	900	485×190×200	14.74	Type A1
PRMA Series						
PRMA 5W	100	500	2000	535×270×220	14.00	Type B1
PRMA 10W	60	240	960	435×310×215	17.05	Type A1
PFAS & PFAT Series						
PFAS 2W	20 (in Bag)	600	3600	485×190×200	7.10	Type A1
PFAS 5W	160	900	3600	535×270×220	16.20	Type A1
PFAS 7W	160	900	3600	435×305×215	16.20	Type B1
PFAS 10W	10 (in Bag)	500	3000	520×220×250	22.40	Type A1
PFAT 5W	10 (in Bag)	300	1800	510×200×270	13.20	Type A1
PFAT 7W	10 (in Bag)	250	1500	485×190×200	11.50	Type A1

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

Standard Packing of Cement Resistors - (3)

水泥电阻器包装规范 - (3)

Type B Packing-Plastic Case 包装类型 B - 塑料盒 (mm)

Type 类型	Qty/Plastic Bag(PCS) 每塑料袋数量	Qty/Inner Box(PCS) 每内盒数量	Qty/Carton (PCS) 每外箱数量	Carton Size L×W×H(±5%)	Gross Wt.±2Kgs	Packing Type 包装类型
PRU Series						
PRU 10W	100	100	1000	560×305×310	12.50	Type D
PRU 15W	80	80	800	560×305×310	10.00	Type D
PRU 20W	60	60	600	560×305×310	16.00	Type D
PRU 30W	20	40	160	435×305×215	14.71	Type D
PRU 40W	20	40	160	435×305×215	16.37	Type D

Note: Packing type customized is available upon request.
备注：可根据需求提供客制化包装方式。

测试项目	引用标准	测试方法
Temperature coefficient **温度系数**	**GB/T 5729 4.8** **JIS-C-5201 4.8** **IEC 60115-1 6.2**	Natural resistance change per temperature degree centigrade 实际阻值随温度变化的变化率： $\frac{R_2-R_1}{R_1(t_2-t_1)}$ X 10^6 (PPM / °C) R_1: Resistance value at room temperature 室温下的阻值 (t_1); R_2: Resistance at test temperature 测试温度下的阻值(t_2); t_1: +25°C or specified room temperature +25°C 或者特殊要求的室内温度 ; t_2: Test temperature 测试温度(-55°C or +125°C)
Short-time overload **短时间过负荷**	**GB/T 5729 4.13** **JIS-C-5201 4.13** **IEC 60115-1 8.1.4.2**	Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds. 加 2.5 倍额定工作电压或最大过负荷电压 (取其低者)，持续 5 秒钟，测阻值变化。
Insulation resistance **绝缘阻值**	**GB/T 5729 4.6** **JIS-C-5201 4.6** **IEC 60115-1 12.1.3.5**	1. Chip Resistor:if insulation withstanding voltage is<100V,test voltage to use equals insulation withstanding voltage; if the insulation withstanding voltage is≥100V,test voltage will be 100±15VDC or insulation voltage,test the resistance value after 1 minute. 2. Through Hole Resistor:if insulation withstanding voltage is<500V,test voltage equals insulation withstanding voltage; if the insulation withstanding voltage is≥ 500V,test voltage will be 500±50VDC ; test the resistance value after 1 minute. 1. 贴片电阻: 绝缘耐压＜ 100V，测试电压取绝缘耐压的电压; 绝缘耐压 ≥100V，测试电压为 100±15VDC，或绝缘电压1分钟后量测阻值。 2. 插件电阻: 绝缘耐压 ＜500V，测试电压取绝缘耐压的电压；绝缘耐压 ≥500V，测试电压为 500±50VDC，1分钟后量测阻值。
Dielectric Withstanding Voltage **绝缘耐压**	**GB/T 5729 4.7** **JIS-C-5201 4.7** **IEC 60115-1 12.2.4**	Dip resistors: The resistors are fixed in a 90°V-shaped groove, with different AC voltages specified for different products, lasting for 60 ± 5 seconds. The voltage of the cement resistors is set to 1000V. 传统电阻：电阻固定在90°的V型槽中，根据不同产品规定交流电压，持续60±5秒，水泥型电阻电压设定为1000V。 Chip resistors: The resistors are fixed in a parallel groove using the parallel clamp method, with different AC voltages specified for different products, lasting for 60 ± 5 seconds. 晶片电阻：电阻固定在平行槽中，采用平行夹法，根据不同产品规定交流电压，持续60±5秒。 Note: Leakage current ≥ 10μA 注：漏电流≥10μA
Pulse overload **脉冲过负荷**	**JIS-C-5201 4.39**	Rsistance change after 10000 cycles(1 second"ON",25 seconds"OFF") at 4 times of RCWV or Max.Overload whichever less. 10000 次循环后变化 (1 秒 " 通 "、25 秒断)4 倍工作电压或最大工作电压 (取其最低者)。 **Remark:** DIP resistor using 4 times of RCWV, Chip resistor using 2.5 times of RCWV **注：**传统电阻 :4×Ur, 晶片电阻 : 2.5×Ur
Terminal strength **端子强度**	**GB/T 5729 4.16** **JIS-C-5201 4.16** **IEC-60115-1 9.5** **IEC-60115-1 9.7**	Chip resistors 晶片电阻: 0105:0.1kg; 0201:0.2kg; 0402 and above: 0.5kg Dip resistors传统电阻: Direct Load: Resistance at a 2.5kg direct load for 10 seconds in the direction of the longitudinal axis of the terminal leads. Twist Test: Terminal leads shall be bent through 90° at a point of about 6mm from the body of the resisitor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations. 直接负荷：在电阻引线方向直接加 2.5 公斤力 10 秒。扭曲测试：两端导线折弯 90 度在熔点 6mm 处交替旋转 360 度 3 次。
Terminal strength **端子强度**	**GB/T 5729 4.16** **JIS-C-5201 4.16** **IEC-60115-1 9.7**	(Applicable for Resister Network 适用网络电阻) Tensile：1KG,30 seconds /Bending:500g ,2 times 张力：1KG，30 秒 / 弯曲：500g，2 次。
Terminal bending **端子弯曲**	**GB/T 5729 4.33** **JIS-C-5201 4.33** **IEC 60115-1 9.8.4**	(Applicable for CHIP Resisters 适用晶片电阻) Twist of Test Board:Y/X=3/90mm 60 seconds. 测试板弯曲：Y/X=3/90mm 60 秒。
Soldering heat **耐焊接热**	**GB/T 5729 4.18** **JIS-C-5201 4.18** **IEC 60115-1 11.2.4.3**	(Applicable for CHIP Resisters 适用晶片电阻) Dip the resistor into a temperature of 260±5°C and hold it for a 10±1 seconds. 将电阻浸入到 260±5°C 的锡炉中并保持 10 秒时间
Soldering heat **耐焊接热**	**GB/T 5729 4.18** **JIS-C-5201 4.18** **IEC 60115-1 11.2.4.3**	(Applicable forTH Resisters 适用插件电阻) Permanent resistor change when leads immersed to a point 2.0~2.5mm from the body in 260±5°C solder 10±1 seconds . 锡炉温度 260±5°C，浸入深度：离本体导线根部约 2.0~2.5mm，处浸入时间 10±1 秒。
Solderability **可焊性**	**GB/T 5729 4.17** **JIS-C-5201 4.17** **IEC 60115-1 11.1.4.3**	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Temperature of solder: 245±3°C; Dwell time in solder: 2~3 seconds. 表面光滑、清洁、均匀、有光泽，锡炉温度：245±3°C；浸入时间：2~3 秒。
Resistance to solvent **耐溶剂**	**GB/T 5729 4.29** **JIS-C-5201 4.29** **IEC 60115-1 11.3.2**	Specimens shall be immersed in a bath of IPA completely for a 5±0.5 minutes using ultrasonic test equipment. 电阻浸入异丙醇超声波清洗 5±0.5 分钟。
Rapid change of temperature **温度快速变化**	**GB/T 5729 4.19** **JIS-C-5201 4.19** **IEC 60115-1 10.1.4**	30 min at lower limit temperature and 30 min at upper limit temperature,100 cycles. 下限温度放置30min, 上限温度放置30min, 100个循环；
High Temperature Exposure **高温暴露**	**MIL-STD-202 108A** **GB/T 5729 4.23.2** **IEC 60115-1 7.3**	Exposed to a test temperature (upper limit temperature) for 1000H. 在测试温度(上限温度)下曝露1000小时。

Test Methods of GB/T 5729, JIS-C-5201, IEC 60115-1

GB/T 5729、JIS-C-5201、IEC 60115-1 检测方法

ROYALOHM
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测试项目	引用标准	测试方法
Leaching **金属融出**	**J-STD-002 Test D**	Samples completely immersed for 30 sec in solder bath at 260℃, no visible damage. 样品浸入 260℃ 的焊锡炉 30S，无明显的损伤。
Steady state **稳态湿热**	**GB/T 5729 4.24** **JIS-C-5201 4.24** **IEC 60115-1 10.4**	Resistance change after 1000 hours (1.5hours"ON"，0.5hours"OFF") at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2℃ and 93%±3% RH. 持续时间：1000h (1.5h"通"，0.5h"断")；试验温度：40±2℃；相对湿度：93%±3% RH；试验电压：额定工作电压或最大工作电压 (取其低者)。
Load life **负载寿命**	**GB/T 5729 4.25.1** **JIS-C-5201 4.25.1** **IEC 60115-1 7.1**	Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours "ON"，0.5 hour "OFF" at 70±2℃ ambient. 持续时间：1000h (1.5h"通"，0.5h"断")；试验温度： 70±2℃；试验电压：额定工作电压或最大工作电压 (取其低者)。
Accidental overload **意外过载**	**GB/T 5729 4.26** **JIS-C-5201 4.26** **IEC 60115-1 12.3.5**	Resistors shall resist flaming or arcing when overload up to 5,10,16,25,40,63,100 times power or 4times Max.Working Voltage , whichever less. 施加 5,10,16,25,40,63 和 100 倍额定功耗的过负荷，但所加的电压不超过 4 倍的最大工作电压，测试其阻燃性。
Sulfuration test **硫化测试**		Soaked in industrial oil with sulfur substance 3.5% contained 105℃ ±3℃ 500h 工业用油含硫磺成份3.5%，105°C±3°C, 500h
Sulfuration test **硫化测试**	**ASTM B 809-95**	Sulfur (Saturated vapor) 硫(饱和蒸汽) The saturation temperature and the specified time as specified in the specification 规格中规定的饱和温度，和规定的时间

** *RCWV* = Rated Continuous Working Voltage 额定持续工作电压 = $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$ 额定功率 × 阻值

the calculated value or the Max. Working Voltage whichever less.
计算值或该产品最大工作电压取其低者

Standard Nominal Resistance Values
标准阻值

The below chart shows the nominal resistance value for each series. The values in the chart have been in this order using the approximate values that are based on the common ratios given in the following table:

下表列出每种系列的标准阻值，表中的阻值是按照通用倍率得出的接近阻值。

Series 系 列	Common Ratio 通用倍率	Remarks 备注
E-6	$\sqrt[6]{10}$ (1.46)	Rounded off to a 2-digit figure (2 位有效数字)
E-12	$\sqrt[12]{10}$ (1.21)	Rounded off to a 2-digit figure (2 位有效数字)
E-24	$\sqrt[24]{10}$ (1.10)	Rounded off to a 2-digit figure (2 位有效数字)
E-96	$\sqrt[96]{10}$ (1.02)	Rounded off to a 3-digit figure (3 位有效数字)

E-6	E-12	E-24	E-96
1.0	1.0	1.0	1.00
			1.02
			1.05
			1.07
		1.1	1.10
			1.13
			1.15
			1.18
	1.2	1.2	1.21
			1.24
			1.27
			1.30
		1.3	1.33
			1.37
			1.40
			1.43
1.5	1.5	1.5	1.47
			1.50
			1.54
			1.58
		1.6	1.62
			1.65
			1.69
			1.74
	1.8	1.8	1.78
			1.82
			1.87
			1.91
		2.0	1.96
			2.00
			2.05
			2.10

E-6	E-12	E-24	E-96
2.2	2.2	2.2	2.15
			2.21
			2.26
			2.32
		2.4	2.37
			2.43
			2.49
			2.55
	2.7	2.7	2.61
			2.67
			2.74
			2.80
		3.0	2.87
			2.94
			3.01
			3.09
3.3	3.3	3.3	3.16
			3.24
			3.32
			3.40
		3.6	3.48
			3.57
			3.65
			3.74
	3.9	3.9	3.83
			3.92
			4.02
			4.12
		4.3	4.22
			4.32
			4.42
			4.53

E-6	E-12	E-24	E-96
4.7	4.7	4.7	4.64
			4.75
			4.87
			4.99
		5.1	5.11
			5.23
			5.36
			5.49
	5.6	5.6	5.62
			5.76
			5.90
			6.04
		6.2	6.19
			6.34
			6.49
			6.65
6.8	6.8	6.8	6.81
			6.98
			7.15
			7.32
		7.5	7.50
			7.68
			7.87
			8.06
	8.2	8.2	8.25
			8.45
			8.66
			8.87
		9.1	9.09
			9.31
			9.53
			9.76

Standard Nominal Resistance Values

标准阻值

E-24 series standard resistance value & the codes to be used in the part No. system 2%, 5% & 10% tolerance (4 digits, start with "0"):

E-24 系列标准阻值和料号系统使用代码 (4 位 , 以 0 为首位 , 2%、5%、10% 公差):

Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码
1.0Ω	**010J**	10Ω	**0100**	100Ω	**0101**	1.0KΩ	**0102**	10KΩ	**0103**	100KΩ	**0104**	1.0MΩ	**0105**
1.1Ω	**011J**	11Ω	**0110**	110Ω	**0111**	1.1KΩ	**0112**	11KΩ	**0113**	110KΩ	**0114**	1.1MΩ	**0115**
1.2Ω	**012J**	12Ω	**0120**	120Ω	**0121**	1.2KΩ	**0122**	12KΩ	**0123**	120KΩ	**0124**	1.2MΩ	**0125**
1.3Ω	**013J**	13Ω	**0130**	130Ω	**0131**	1.3KΩ	**0132**	13KΩ	**0133**	130KΩ	**0134**	1.3MΩ	**0135**
1.5Ω	**015J**	15Ω	**0150**	150Ω	**0151**	1.5KΩ	**0152**	15KΩ	**0153**	150KΩ	**0154**	1.5MΩ	**0155**
1.6Ω	**016J**	16Ω	**0160**	160Ω	**0161**	1.6KΩ	**0162**	16KΩ	**0163**	160KΩ	**0164**	1.6MΩ	**0165**
1.8Ω	**018J**	18Ω	**0180**	180Ω	**0181**	1.8KΩ	**0182**	18KΩ	**0183**	180KΩ	**0184**	1.8MΩ	**0185**
2.0Ω	**020J**	20Ω	**0200**	200Ω	**0201**	2.0KΩ	**0202**	20KΩ	**0203**	200KΩ	**0204**	2.0MΩ	**0205**
2.2Ω	**022J**	22Ω	**0220**	220Ω	**0221**	2.2KΩ	**0222**	22KΩ	**0223**	220KΩ	**0224**	2.2MΩ	**0225**
2.4Ω	**024J**	24Ω	**0240**	240Ω	**0241**	2.4KΩ	**0242**	24KΩ	**0243**	240KΩ	**0244**	2.4MΩ	**0245**
2.7Ω	**027J**	27Ω	**0270**	270Ω	**0271**	2.7KΩ	**0272**	27KΩ	**0273**	270KΩ	**0274**	2.7MΩ	**0275**
3.0Ω	**030J**	30Ω	**0300**	300Ω	**0301**	3.0KΩ	**0302**	30KΩ	**0303**	300KΩ	**0304**	3.0MΩ	**0305**
3.3Ω	**033J**	33Ω	**0330**	330Ω	**0331**	3.3KΩ	**0332**	33KΩ	**0333**	330KΩ	**0334**	3.3MΩ	**0335**
3.6Ω	**036J**	36Ω	**0360**	360Ω	**0361**	3.6KΩ	**0362**	36KΩ	**0363**	360KΩ	**0364**	3.6MΩ	**0365**
3.9Ω	**039J**	39Ω	**0390**	390Ω	**0391**	3.9KΩ	**0392**	39KΩ	**0393**	390KΩ	**0394**	3.9MΩ	**0395**
4.3Ω	**043J**	43Ω	**0430**	430Ω	**0431**	4.3KΩ	**0432**	43KΩ	**0433**	430KΩ	**0434**	4.3MΩ	**0435**
4.7Ω	**047J**	47Ω	**0470**	470Ω	**0471**	4.7KΩ	**0472**	47KΩ	**0473**	470KΩ	**0474**	4.7MΩ	**0475**
5.1Ω	**051J**	51Ω	**0510**	510Ω	**0511**	5.1KΩ	**0512**	51KΩ	**0513**	510KΩ	**0514**	5.1MΩ	**0515**
5.6Ω	**056J**	56Ω	**0560**	560Ω	**0561**	5.6KΩ	**0562**	56KΩ	**0563**	560KΩ	**0564**	5.6MΩ	**0565**
6.2Ω	**062J**	62Ω	**0620**	620Ω	**0621**	6.2KΩ	**0622**	62KΩ	**0623**	620KΩ	**0624**	6.2MΩ	**0625**
6.8Ω	**068J**	68Ω	**0680**	680Ω	**0681**	6.8KΩ	**0682**	68KΩ	**0683**	680KΩ	**0684**	6.8MΩ	**0685**
7.5Ω	**075J**	75Ω	**0750**	750Ω	**0751**	7.5KΩ	**0752**	75KΩ	**0753**	750KΩ	**0754**	7.5MΩ	**0755**
8.2Ω	**082J**	82Ω	**0820**	820Ω	**0821**	8.2KΩ	**0822**	82KΩ	**0823**	820KΩ	**0824**	8.2MΩ	**0825**
9.1Ω	**091J**	91Ω	**0910**	910Ω	**0911**	9.1KΩ	**0912**	91KΩ	**0913**	910KΩ	**0914**	9.1MΩ	**0915**
												10MΩ	**0106**

E-96 series standard resistance value & the codes to be used in the part No. system not over 1% tolerance (4 digits):

E-96 系列标准阻值和料号系统使用代码 (4 位 , 0.1%、0.25%、0.5%、1% 公差):

Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码
10.0Ω	**l00J**	17.8Ω	**178J**	31.6Ω	**316J**	56.2Ω	**562J**	100Ω	**1000**	178Ω	**1780**	316Ω	**3160**	562Ω	**5620**
10.2Ω	**102J**	18.2Ω	**182J**	32.4Ω	**324J**	57.6Ω	**576J**	102Ω	**1020**	182Ω	**1820**	324Ω	**3240**	576Ω	**5760**
10.5Ω	**105J**	18.7Ω	**187J**	33.2Ω	**332J**	59.0Ω	**590J**	105Ω	**1050**	187Ω	**1870**	332Ω	**3320**	590Ω	**5900**
10.7Ω	**107J**	19.1Ω	**191J**	34.0Ω	**340J**	60.4Ω	**604J**	107Ω	**1070**	191Ω	**1910**	340Ω	**3400**	604Ω	**6040**
11.0Ω	**110J**	19.6Ω	**196J**	34.8Ω	**348J**	61.9Ω	**619J**	110Ω	**1100**	196Ω	**1960**	348Ω	**3480**	619Ω	**6190**
11.3Ω	**113J**	20.0Ω	**200J**	35.7Ω	**357J**	63.4Ω	**634J**	113Ω	**1130**	200Ω	**2000**	357Ω	**3570**	634Ω	**6340**
11.5Ω	**115J**	20.5Ω	**205J**	36.5Ω	**365J**	64.9Ω	**649J**	115Ω	**1150**	205Ω	**2050**	365Ω	**3650**	649Ω	**6490**
11.8Ω	**118J**	21.0Ω	**210J**	37.4Ω	**374J**	66.5Ω	**665J**	118Ω	**1180**	210Ω	**2100**	374Ω	**3740**	665Ω	**6650**
12.1Ω	**121J**	21.5Ω	**215J**	38.3Ω	**383J**	68.1Ω	**681J**	121Ω	**1210**	215Ω	**2150**	383Ω	**3830**	681Ω	**6810**
12.4Ω	**124J**	22.1Ω	**221J**	39.2Ω	**392J**	69.8Ω	**698J**	124Ω	**1240**	221Ω	**2210**	392Ω	**3920**	698Ω	**6980**
12.7Ω	**127J**	22.6Ω	**226J**	40.2Ω	**402J**	71.5Ω	**715J**	127Ω	**1270**	226Ω	**2260**	402Ω	**4020**	715Ω	**7150**
13.0Ω	**130J**	23.2Ω	**232J**	41.2Ω	**412J**	73.2Ω	**732J**	130Ω	**1300**	232Ω	**2320**	412Ω	**4120**	732Ω	**7320**
13.3Ω	**133J**	23.7Ω	**237J**	42.2Ω	**422J**	75.0Ω	**750J**	133Ω	**1330**	237Ω	**2370**	422Ω	**4220**	750Ω	**7500**
13.7Ω	**137J**	24.3Ω	**243J**	43.2Ω	**432J**	76.8Ω	**768J**	137Ω	**1370**	243Ω	**2430**	432Ω	**4320**	768Ω	**7680**
14.0Ω	**140J**	24.9Ω	**249J**	44.2Ω	**442J**	78.7Ω	**787J**	140Ω	**1400**	249Ω	**2490**	442Ω	**4420**	787Ω	**7870**
14.3Ω	**143J**	25.5Ω	**255J**	45.3Ω	**453J**	80.6Ω	**806J**	143Ω	**1430**	255Ω	**2550**	453Ω	**4530**	806Ω	**8060**
14.7Ω	**147J**	26.1Ω	**261J**	46.4Ω	**464J**	82.5Ω	**825J**	147Ω	**1470**	261Ω	**2610**	464Ω	**4640**	825Ω	**8250**
15.0Ω	**150J**	26.7Ω	**267J**	47.5Ω	**475J**	84.5Ω	**845J**	150Ω	**1500**	267Ω	**2670**	475Ω	**4750**	845Ω	**8450**
15.4Ω	**154J**	27.4Ω	**274J**	48.7Ω	**487J**	86.6Ω	**866J**	154Ω	**1540**	274Ω	**2740**	487Ω	**4870**	866Ω	**8660**
15.8Ω	**158J**	28.0Ω	**280J**	49.9Ω	**499J**	88.7Ω	**887J**	158Ω	**1580**	280Ω	**2800**	499Ω	**4990**	887Ω	**8870**
16.2Ω	**162J**	28.7Ω	**287J**	51.1Ω	**511J**	90.9Ω	**909J**	162Ω	**1620**	287Ω	**2870**	511Ω	**5110**	909Ω	**9090**
16.5Ω	**165J**	29.4Ω	**294J**	52.3Ω	**523J**	93.1Ω	**931J**	165Ω	**1650**	294Ω	**2940**	523Ω	**5230**	931Ω	**9310**
16.9Ω	**169J**	30.1Ω	**301J**	53.6Ω	**536J**	95.3Ω	**953J**	169Ω	**1690**	301Ω	**3010**	536Ω	**5360**	953Ω	**9530**
17.4Ω	**174J**	30.9Ω	**309J**	54.9Ω	**549J**	97.6Ω	**976J**	174Ω	**1740**	309Ω	**3090**	549Ω	**5490**	976Ω	**9760**

Standard Nominal Resistance Values
标准阻值

Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码
1.00K	**1001**	2.37K	**2371**	5.62K	**5621**	13.3K	**1332**	31.6K	**3162**	75.0K	**7502**	178K	**1783**	422K	**4223**
1.02K	**1021**	2.43K	**2431**	5.76K	**5761**	13.7K	**1372**	32.4K	**3242**	76.8K	**7682**	182K	**1823**	432K	**4323**
1.05K	**1051**	2.49K	**2491**	5.90K	**5901**	14.0K	**1402**	33.2K	**3322**	78.7K	**7872**	187K	**1873**	442K	**4423**
1.07K	**1071**	2.55K	**2551**	6.04K	**6041**	14.3K	**1432**	34.0K	**3402**	80.6K	**8062**	191K	**1913**	453K	**4533**
1.10K	**1101**	2.61K	**2611**	6.19K	**6191**	14.7K	**1472**	34.8K	**3482**	82.5K	**8252**	196K	**1963**	464K	**4643**
1.13K	**1131**	2.67K	**2671**	6.34K	**6341**	15.0K	**1502**	35.7K	**3572**	84.5K	**8452**	200K	**2003**	475K	**4753**
1.15K	**1151**	2.74K	**2741**	6.49K	**6491**	15.4K	**1542**	36.5K	**3652**	86.6K	**8662**	205K	**2053**	487K	**4873**
1.18K	**1181**	2.80K	**2801**	6.65K	**6651**	15.8K	**1582**	37.4K	**3742**	88.7K	**8872**	210K	**2103**	499K	**4993**
1.21K	**1211**	2.87K	**2871**	6.81K	**6811**	16.2K	**1622**	38.3K	**3832**	90.9K	**9092**	215K	**2153**	511K	**5113**
1.24K	**1241**	2.94K	**2941**	6.98K	**6981**	16.5K	**1652**	39.2K	**3922**	93.1K	**9312**	221K	**2213**	523K	**5233**
1.27K	**1271**	3.01K	**3011**	7.15K	**7151**	16.9K	**1692**	40.2K	**4022**	95.3K	**9532**	226K	**2263**	536K	**5363**
1.30K	**1301**	3.09K	**3091**	7.32K	**7321**	17.4K	**1742**	41.2K	**4122**	97.6K	**9762**	232K	**2323**	549K	**5493**
1.33K	**1331**	3.16K	**3161**	7.50K	**7501**	17.8K	**1782**	42.2K	**4222**	l00K	**1003**	237K	**2373**	562K	**5623**
1.37K	**1371**	3.24K	**3241**	7.68K	**7681**	18.2K	**1822**	43.2K	**4322**	102K	**1023**	243K	**2433**	576K	**5763**
1.40K	**1401**	3.32K	**3321**	7.87K	**7871**	18.7K	**1872**	44.2K	**4422**	105K	**1053**	249K	**2493**	590K	**5903**
1.43K	**1431**	3.40K	**3401**	8.06K	**8061**	19.1K	**1912**	45.3K	**4532**	107K	**1073**	255K	**2553**	604K	**6043**
1.47K	**1471**	3.48K	**3481**	8.25K	**8251**	19.6K	**1962**	46.4K	**4642**	110K	**1103**	261K	**2613**	619K	**6193**
1.50K	**1501**	3.57K	**3571**	8.45K	**8451**	20.0K	**2002**	47.5K	**4752**	113K	**1133**	267K	**2673**	634K	**6343**
1.54K	**1541**	3.65K	**3651**	8.66K	**8661**	20.5K	**2052**	48.7K	**4872**	115K	**1153**	274K	**2743**	649K	**6493**
1.58K	**1581**	3.74K	**3741**	8.87K	**8871**	21.0K	**2102**	49.9K	**4992**	118K	**1183**	280K	**2803**	665K	**6653**
1.62K	**1621**	3.83K	**3831**	9.09K	**9091**	21.5K	**2152**	51.1K	**5112**	121K	**1213**	287K	**2873**	681K	**6813**
1.65K	**1651**	3.92K	**3921**	9.31K	**9311**	22.1K	**2212**	52.3K	**5232**	124K	**1243**	294K	**2943**	698K	**6983**
1.69K	**1691**	4.02K	**4021**	9.53K	**9531**	22.6K	**2262**	53.6K	**5362**	127K	**1273**	301K	**3013**	715K	**7153**
1.74K	**1741**	4.12K	**4121**	9.76K	**9761**	23.2K	**2322**	54.9K	**5492**	130K	**1303**	309K	**3093**	732K	**7323**
1.78K	**1781**	4.22K	**4221**	10.0K	**1002**	23.7K	**2372**	56.2K	**5622**	133K	**1333**	316K	**3163**	750K	**7503**
1.82K	**1821**	4.32K	**4321**	10.2K	**1022**	24.3K	**2432**	57.6K	**5762**	137K	**1373**	324K	**3243**	768K	**7683**
1.87K	**1871**	4.42K	**4421**	10.5K	**1052**	24.9K	**2492**	59.0K	**5902**	140K	**1403**	332K	**3323**	787K	**7873**
1.91K	**1911**	4.53K	**4531**	10.7K	**1072**	25.5K	**2552**	60.4K	**6042**	143K	**1433**	340K	**3403**	806K	**8063**
1.96K	**1961**	4.64K	**4641**	11.0K	**1102**	26.1K	**2612**	61.9K	**6192**	147K	**1473**	348K	**3483**	825K	**8253**
2.00K	**2001**	4.75K	**4751**	11.3K	**1132**	26.7K	**2672**	63.4K	**6342**	150K	**1503**	357K	**3573**	845K	**8453**
2.05K	**2051**	4.87K	**4871**	11.5K	**1152**	27.4K	**2742**	64.9K	**6492**	154K	**1543**	365K	**3653**	866K	**8663**
2.10K	**2101**	4.99K	**4991**	11.8K	**1182**	28.0K	**2802**	66.5K	**6652**	158K	**1583**	374K	**3743**	887K	**8873**
2.15K	**2151**	5.11K	**5111**	12.1K	**1212**	28.7K	**2872**	68.1K	**6812**	162K	**1623**	383K	**3833**	909K	**9093**
2.21K	**2211**	5.23K	**5231**	12.4K	**1242**	29.4K	**2942**	69.8K	**6982**	165K	**1653**	392K	**3923**	931K	**9313**
2.26K	**2261**	5.36K	**5361**	12.7K	**1272**	30.1K	**3012**	71.5K	**7152**	169K	**1693**	402K	**4023**	953K	**9533**
2.32K	**2321**	5.49K	**5491**	13.0K	**1302**	30.9K	**3092**	73.2K	**7322**	174K	**1743**	412K	**4123**	976K	**9763**
														1M	**1004**

*** All values shown above are standard resistance values, other values could also be provided on a case to case basis (MOQ requested)*

*** 以上所有阻值都是标准阻值，其他阻值可以特别提供，但有相应 MOQ 之要求。*

Part No. System
标准料号系统

ROYALOHM
www.royalohm.com

1	2	3	4	5	6	7	8	9	10	11	12	13	14

The standard Part No. includes 14 digits with the following explanation (标准料号包括 14 位数字，注释如下):

1. 1st~4th digits (第 1 位 ~ 第 4 位):
   a) This is to indicate the SMD Resistor size. Example (表示晶片电阻的尺寸，例如): 1206, TC05 or HV03;
   b) For Resistor Network & Coated type, the 1st~3rd digits are to indicate the product type and the 4th digit is the special feature. Example: RNLA = Resistor Newtork Circuit A type; CFRF = Carbon Film Fixed Resistors Non-Flame type; MORI = Metal Oxide Film Fixed Resistor Non-Inductive type.
   网络电阻和涂装型电阻第 1 位到第 3 位表示产品类型，第 4 位表示特殊形态，如 : RNLA = 网络电阻 A 型 ; CFRF = 不燃性碳膜电阻器 ; MORI = 无感型金属氧化膜电阻器。
   c) For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3 digits, the 4th digit will be "0". Example: PRW0=PRW type; PRWC=PRWC type.
   水泥型前 4 位表示产品类型，如果产品只有 3 个字母，第 4 位为 0，例：PRW0=PRW 型 ; PRWC=PRWC 型。

2. 5th~ 6th digits (第 5 位 ~ 第 6 位):
   a) This is to indicate the wattage or power rating. To distinguish the sizes and the numbers, the following codes are used, and please refer to the following chart for details: W = Normal Size; S = Small Size; U = Ultra Small Size; "1" ~ "G" to denotes "1" ~ "16" as Hexadecimal:
   表示产品标识功率，为区别不同尺寸，同时使用以下字母，如 :W = 正常尺寸 ; S = 小尺寸 ; U = 超小尺寸 ; "1" ~ "G" 代表 "1" ~ "16" 为 16 进制。

1/16W ~ 1/2W (<1W)

Wattage 功率	1/2	1/3	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11	1/12	1/13	1/14	1/15	1/16
Normal Size 正常尺寸	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	WC	WD	WE	WF	WG
Small Size 小尺寸	S2	S3	S4	S5	S6	S7	S8	S9	SA	SB	SC	SD	SE	SF	SG
Ultra Small Size 超小尺寸	U2	U3	U4	U5	U6	U7	U8	U9	UA	UB	UC	UD	UE	UF	UG

1W ~ 16W (≥1W)

Wattage 功率	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Normal Size 正常尺寸	IW	2W	3W	4W	5W	6W	7W	8W	9W	AW	BW	CW	DW	EW	FW	GW
Small Size 小尺寸	1S	2S	3S	4S	5S	6S	7S	8S	9S	AS	BS	CS	DS	ES	FS	GS
Ultra Small Size 超小尺寸	1U	2U	3U	4U	5U	6U	7U	8U	9U	AU	BU	CU	DU	EU	FU	GU

   b) For power rating less than 1W, the 5th digit will be the letters W, S or U to represent the size required & the 6th digit will be a number or a letter code. Example: WA = 1/10W; U2 = 1/2W-SS (功率小于 1 瓦 , 第 5 位用 W, S 或 U 表示尺寸要求，第 6 位将是数字或字母，例 : WA = 1/10W; U2 = 1/2W-SS.).
   c) For power rating of 1W to 16W, the 5th digit will be a number or a letter code and the 6th digit will be the letters of W, S or U. Example: AW = 10W; 3S = 3W-S.
   当功率为 1 到 16 瓦 , 第 5 位将是数字或字母，第 6 位是 W, S or U. 例 : AW = 10W; 3S = 3W-S.
   d) For power rating between 17W to 99W, the 5th & 6th digits will show the whole numbers of the power rating itself. Example: 20 = 20W; 75 = 75W.
   当功率在 17 瓦 ~99 瓦之间第 5 位至第 6 位全部表示功率。例 : 20 = 20W; 75 = 75W.
   e) For power rating of 100W & over, the 5th & 6th digits will be indicated with "00" and the actual wattage being indicated at the last 3 digits (12th~14th) of the Part No.
   当大于 100 瓦时第 5 位和第 6 位表示为 "00" 实际功率表示在料号最后 3 位 (12 位 ~ 14 位)
   f) For special power ratings, the following codes are to be used (特殊功率用下列数字表示):
      1). WH = 1/32W (10P8 Chip Network 网络电阻)
      2). 07 = 3/4W [Chip 2010 size (晶片 2010 尺寸)]
      10). 3A=3.5W
      3). 04 = 0.4W-SS (0.4 watt Ultra Small size 超小尺寸)
      4). 06 = 0.6W-S (0.6 watt Small size 小尺寸)
      5). 2A = 2.5W
      6). 6A = 6.5W
      7). WK= 2/3W
      8). 1A =1.5W
      9). 1.25W =1Q
   g) For Resistor Network, since the power rating is fixed as 1/8W for A circuit & 1/5W for B circuit, the 5th & 6th digit is to be used to denote the number of pins required. Example: 09 = 9pins; 12 = 12pins. (网络电阻功率固定为 1/8W 或 1/5W，故第 5 位和第 6 位用来表示所需要的 pins 数 . 例 : 09 = 9pins; 12 = 12pins.)
   h) For Jumper Wires the 5th & 6th digits will be indicated with "00" .(跳线电阻的第 5 位、第 6 位用 "00" 来表示)
   i) For Thin Film Chip Resistors, these 2 digits will be used to indicated the requested Temperature coefficient:
   对於薄膜晶片电阻产品 , 这两位用来表示产品的温度系数要求 :
      1). 05 = 5PPM
      2). 10 = 10PPM
      3). 15 = 15PPM
      4). 25 = 25PPM
      5). 50 = 50PPM

3. The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resisance Tolerance. As for Metal Film Fixed Resistor products, it is also to denote the standard PPM as follows (第 7 位表示阻值误差。下列数码用来表示标准误差，用于金属膜产品时，同时用来表示标准 PPM，如下):

B = ±0.1% (15PPM)	**G** = ±2% (100PPM)	**W** = ±0.05%
C = ±0.25% (25PPM)	**J** = ±5% (200PPM)	**L** = ±0.01%
D = ±0.5% (50PPM)	**K** = ±10%	
F = ±1% (50PPM)		

Remark: *if it is not one of the above standard "tolerance-TCR", the requirement should be clearly stated when placing order. Example: ±1% (25PPM), the 7th digit still shows "F" but separately note the requirement of "25PPM"*

注 : 如果一个不是上述标准 " 公差 -PPM" 的要表示清楚 例 : ±1% (25PPM), 第 7 位要标示 "F" 并另注 "25PPM"

4. The 8th to 11th digits is to denote the Resistance Value (第 8 位 ~ 第 11 位表示阻值):

a) For the standard resistance values of E-24 series in 2% & 5% & 10% tolerance, the 8th digit is "0", the 9th & 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following (对于 E-24 系列的 2%、5%、10% 产品，第 8 位数是 0，第 9 位数和第 10 位数表示阻值的有效数，第 11 位表示有几个 0).

b) For the standard resistance values of E-96 series in ≤1% tolerance, the 8th digit to the 10th digits are to denote the significant figures of the resistance and the 11th digit is the number of zeros following (对于 E-96 系列 ≤1% 的产品，第 8 位数到第 10 位数表示阻值的有效数，第 11 位数表示有几个 0).

c) For the code to the significant figures to E-24 & E-96 series, please refer to page 170 & 171 of the standards Resistance Value list.(有效数 E-24 和 E-96 系列 , 请参考 170 页和 171 页标准阻值表)

d) The following numbers and the letter codes is to be used to indicate the number of zeros in the 11th digit:
以下数字及字母用来表示第 11 位数有几个 0:

$0 = 10^0$	$1 = 10^1$	$2 = 10^2$	$3 = 10^3$	$4 = 10^4$	$5 = 10^5$	$6 = 10^6$
$J = 10^{-1}$	$K = 10^{-2}$	$L = 10^{-3}$	$M = 10^{-4}$	$N = 10^{-5}$	$P = 10^{-6}$	

e) For Cement Resistors the 8th digit will be coded with "W" or "P" to denote Wire-wound type or Power Film type respectively of the Cement Fixed Resistor proudct. The 9th to 11th please refer to point 4.a (水泥电阻第 8 位数 "W" 或 "P" 用来表示绕线型或切割型，第 9 位数到第 11 位数请参考 4.a)
Example (例):

E-24 series 系列	E-96 series 系列	Cement Resistors 水泥型固定电阻值
0120 = 12 ohm	1210 = 121 ohm	W120 = 12 ohm Wire-wound type 绕线型
0123 = 12K ohm	1302 = 13K ohm	W12J = 1.2 ohm Wire-wound type 绕线型
012J = 1.2 ohm	196J = 19.6 ohm	P273 = 27 kohm Powe Film type 切割型

5. The 12th, 13th & 14th digits (第 12 位数、13 位数和 14 位数):

a) The 12th digit is to denote the Packaging type with the following codes (第 12 位数表示包装方式，采用如下代码):
A = Tape / Box (Ammo Pack) [编带 / 盒装（带装）] C = Bulk in Cassette (for Chip product)[散装盒（晶片产品）]
B = Bulk / Box (散装 / 盒装) T = Tape / Reel (编带 / 卷装) P = Tape / Box of PT-26 product [编带 / 盒装（PT-26 产品）]

b) The 13th digit is normally to indicate the Packing Quantity of Tape/Box or Tape/Reel packaging types. Except for Chip products Bulk packing, this digit should be filled "0" or other products with "Bulk/Box packaging requirement. The following letter codes is to be used for some packaging quantities (第 13 位数一般表示包装数量对于 T/B 或 T/R 型，除了晶片散装外，其他产品的散装包装用 "0" 表示数量。下列字母说明包装数量).
A = 500pcs (只) P =1500pcs (只) B = 2,500pcs (只) C = 10,000pcs (只) N = 12,500pcs (只) E = 15,000pcs (只)
D = 20,000pcs (只) G = 25,000pcs (只) L = 45,000pcs (只) H = 50,000pcs (只) J = 60,000pcs (只)
Example (例):

CHIP product (晶片产品)	Other products (其它产品)
TD = T/R-20,000	A5 = T/B-5,000
TE = T/R-15,000	TB = T/R-2,500
T4 = T/R-4,000	B0 = B/B (可提供标准包装)

c) For the Forming type products, the 13th & 14th digits are used to denote the forming types of the product with the following letter codes
(对于成型产品第 13 位数和第 14 位数用来表示成型产品，如下字母表示):
MF = M type with Flattened lead wire (M 型打扁加工) F0 = F type 型
MK = M type with Kinked lead wire (M 型打弯加工) F1 = F1 type 型
ML = M type with normal lead wire (M 型加工) F2 = F2 type 型
MC = M type with bending lead wire (M 型打弯加工) F3 = F3 type 型

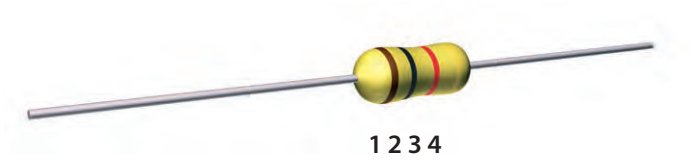
d) For power rating over 100watt, the 12th to the 14th digits are to denote the actual wattage of the products
(当功率超过 100W 时，它的第 12 位数到 14 位数用来表示产品的实际功率):
Example (例): 100 = 100watt (瓦) 150 = 150watt (瓦) 225 = 225watt (瓦) A00=1000watt (瓦) A50=1500watt (瓦)
C00=2000watt (瓦) C50=2500watt (瓦) D00=3000watt (瓦) E00=4000watt (瓦) F00=5000watt (瓦)

e) For some products, the 14th digit alone can use to denote special features or additional information with the following codes
(对于某些产品第 14 位可以显示特性和附加信息，如下字母):
P = Panasert type (Panasert 型) 1 = Avisert 1 type (Avisert 1 型) 2 = Avisert 2 type (Avisert 2 型)
3 = Avisert 3 type (Avisert 3 型) A = CO 1/4W - A type (切割型 CO 1/4W-A 型) B = CO 1/4W - B type (切割型 CO 1/4W-B 型)
E = used to denote the "Environment Protection, lead Free type" of SMD category resistors (now, this became the Standard type of SMD)
(晶片电阻，晶片排阻及网络电阻器 " 环保无铅型 ")

f) For some products, the 14th digit alone can use to denote special features or additional information with the following codes
(对于某些产品第 14 位可以显示特性和附加信息，如下字母):
B=1/32W D=1/20W C=1/16W F=1/10W G=1/8W H=1/6W Q=1/5W
J=1/4W K=1/3W M=1/2W N=3/4W P=1W S=Special

4 Band Color Code (available for CFR, MOR, KNP & 2% or 5% of MF products)

4 道色码 (适用于 CFR, MOR, KNP & 2% 或 5% of MF 产品)



4th Band
第四道

Red 红	= ±2%
Gold 金	= ±5%
Silver 银	= ±10%

1st Band
第一道

Black 黑	= 0
Brown 棕	= 1
Red 红	= 2
Orange 橙	= 3
Yellow 黄	= 4
Green 绿	= 5
Blue 蓝	= 6
Violet 紫	= 7
Gray 灰	= 8
White 白	= 9

2nd Band
第二道

Black 黑	= 0
Brown 棕	= 1
Red 红	= 2
Orange 橙	= 3
Yellow 黄	= 4
Green 绿	= 5
Blue 蓝	= 6
Violet 紫	= 7
Gray 灰	= 8
White 白	= 9

3rd Band
第三道

Black 黑	= Multiply by 乘积倍数 1 (10^0)
Brown 棕	= Multiply by 乘积倍数 10 (10^1)
Red 红	= Multiply by 乘积倍数 100 (10^2)
Orange 橙	= Multiply by 乘积倍数 1,000 (10^3)
Yellow 黄	= Multiply by 乘积倍数 10,000 (10^4)
Green 绿	= Multiply by 乘积倍数 100,000 (10^5)
Blue 蓝	= Multiply by 乘积倍数 1,000,000 (10^6)
Violet 紫	= Multiply by 乘积倍数 10,000,000 (10^7)
Gold 金	= Multiply by 乘积倍数 0.1 (10^{-1})
Silver 银	= Multiply by 乘积倍数 0.01 (10^{-2})

5 Band Color Code (available for MF 1% & FRN Proudcts)

5 道色码 (适用于 MF 1% & FRN 产品)



5th Band
第五道

Violet	= ±0.1%
Blue	= ±0.25%
Green	= ±0.5%
Brown	= ±1%

1st Band
第一道

Black 黑	= 0
Brown 棕	= 1
Red 红	= 2
Orange 橙	= 3
Yellow 黄	= 4
Green 绿	= 5
Blue 蓝	= 6
Violet 紫	= 7
Gray 灰	= 8
White 白	= 9

2nd Band
第二道

Black 黑	= 0
Brown 棕	= 1
Red 红	= 2
Orange 橙	= 3
Yellow 黄	= 4
Green 绿	= 5
Blue 蓝	= 6
Violet 紫	= 7
Gray 灰	= 8
White 白	= 9

3rd Band
第三道

Black 黑	= 0
Brown 棕	= 1
Red 红	= 2
Orange 橙	= 3
Yellow 黄	= 4
Green 绿	= 5
Blue 蓝	= 6
Violet 紫	= 7
Gray 灰	= 8
White 白	= 9

4th Band
第四道

Black 黑	= Multiply by 乘积倍数 1 (10^0)
Brown 棕	= Multiply by 乘积倍数 10 (10^1)
Red 红	= Multiply by 乘积倍数 100 (10^2)
Orange 橙	= Multiply by 乘积倍数 1,000 (10^3)
Yellow 黄	= Multiply by 乘积倍数 10,000 (10^4)
Green 绿	= Multiply by 乘积倍数 100,000 (10^5)
Blue 蓝	= Multiply by 乘积倍数 1,000,000 (10^6)
Violet 紫	= Multiply by 乘积倍数 10,000,000 (10^7)
Gold 金	= Multiply by 乘积倍数 0.1 (10^{-1})
Silver 银	= Multiply by 乘积倍数 0.01 (10^{-2})

Ceramic Rods For Resistors（电阻器用陶瓷基体）

	Ceramic Rod （瓷棒）	146	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23

Capped & Sorted Ceramic Rod （组帽棒）

	White Capped Ceramic Rod （组帽瓷棒）	148	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23
	Carbon Film Capped Ceramic Rod （碳膜组帽棒）	150	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23
	Metal Film Capped Ceramic Rod （金属膜组帽棒）	152	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23
	Metal Oxide Film Capped Ceramic Rod （金属氧化膜组帽棒）	154	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23
	Capped Metal Glaze Film Rod （玻璃釉膜组帽棒）	156	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16
	Capped Chemical Deposited Film Rod （化学沉积膜组帽棒）	158	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.0×10, 3.5×10, 4.0×14, 5.0×16, 7.0×23
	Zero Ohm Rod （零歐姆棒）	160	1.3×2.7, 1.7×5.2

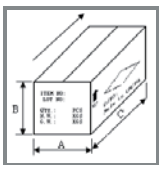
Tin-Plated Steel Cap（镀锡铁帽）

	Tin-Plated Steel Cap （镀锡铁帽）	162	Ø1.26, Ø1.64, Ø1.95, Ø2.45, Ø2.90, Ø3.41, Ø3.91, Ø4.90, Ø6.90

Ceramic Case（瓷壳）

	PRW series Case (PRW 系列瓷壳)	163	2W, 3W, 5W, 7W, 10W, 15W, 20W, 25W
	PRM series Case (PRM 系列瓷壳)	163	2W, 3W, 5W, 7W, 10W, 15W, 20W, 25W
	PRV series Case (PRV 系列瓷壳)	163	3W, 5W, 7W, 10W, 15W, 20W
	PRT series Case (PRT 系列瓷壳)	163	10W, 15W, 20W, 30W, 40W
	PFA series Case (PFA 系列瓷壳)	163	2W, 3W, 5W, 7W, 10W

Packing（包装）

	Ceramic Rod（瓷棒）	165	
	Filmed & Capped Rod（组帽棒）	165	
	Zero Ohm Rod（零欧姆棒）	166	
	Tin-Plated Steel Cap（铁帽）	166	

Material Characteristics Of Ceramics Rods
陶瓷棒特性表

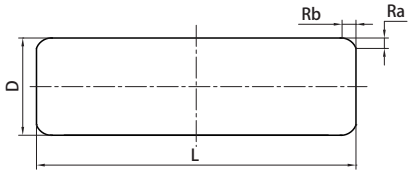
ROYALOHM
www.royalohm.com

Material 材质		Alumina 氧化铝瓷							
Product Code 产品代号		FS-25	FS-55	FS-70	FS-75	FS-80	FS-85	FS-92	FS-98
Chemical Analysis 主成份		AL_2O_3 25%	AL_2O_3 55%	AL_2O_3 70%	AL_2O_3 75%	AL_2O_3 80%	AL_2O_3 85%	AL_2O_3 92%	AL_2O_3 98%
Appearance 外观		Dense 致密质	Dense 致密质	Dense 致密质	Dense 致密质	Dense 致密质	Dense 致密质	Dense 致密质	Dense 致密质
Color 呈色		White 白色	White 白色	White 白色	White 白色	White 白色	White 白色	White 白色	White 白色
Features 特征		Good Heat Resistance, High Thermal Conductivity 耐热性优良，热传导性高							
Main Use 主要用途		Wire-wound Resistor 绕线电阻器用							
				Film Resistor 膜式电阻器用					
							Small-size & High power resistor 大功率小型化电阻器用		
Water Absorption 吸水率	%	≤ 0.02	≤ 0.02	≤0.01	≤0.01	≤0.01	≤0.01	< 0.02	< 0.02
Bulk Density 体积密度	g / cm^3	≥2.3	≥2.8	≥3.1	≥3.2	≥3.2	≥3.45	≥3.6	≥ 3.8
Thermal Expansion Coefficient 热膨胀系数	$\times10^{-6}$/°C (20-500°C)	> 4.0	> 5.5	> 6.1	> 6.7	> 7.0	> 7.3	> 7.0	> 7.7
Thermal Conductivity 热传导率	Cal/ cm.sec. °C	> 0.003	> 0.008	> 0.011	> 0.020	> 0.015	> 0.023	> 0.040	> 0.050
Dielectric Strength 绝缘强度	KV/mm	> 9	> 10	> 10	> 10	> 10	> 10	> 10	> 10
Dielectric Constant 绝缘常数	1MHZ	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Loss Rate 损失率	1MHZ	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.0001	0.0001	0.0001
Anti-cross break strength 抗折力	Kg	> 9	> 10	> 12	> 12	> 16	> 16	> 16	> 16



Feature (特性)

- Aluminum Content 70%, 80%, 85%. (70%, 80%, 85% 含铝量瓷棒)
- Electronic Ceramic parts in superior performance. (属于优良的电子陶瓷产品)
- Suitable for producing in different types of resistance film.
  (适合生产各种膜层的电阻)



Dimension (尺寸) (单位: mm)

NO	Size 规格	D 直径	L 长度	R	
				(Ra MIN 最小)	(Rb MAX 最大)
1	1.3×2.7	1.30±0.02	2.7±0.1	0.15	0.45
2	1.7×5.2	1.70±0.03	$5.2^{+0.1}_{-0.2}$	0.20	0.65
3	1.7×5.5	1.70±0.03	5.5±0.2	0.20	0.65
4	1.7×6.0	1.70±0.03	6.0±0.2	0.20	0.65
5	2.0×7.5	$2.00^{+0.04}_{-0.03}$	7.5±0.2	0.25	0.75
6	2.0×8.0	2.00±0.03	8.0±0.2	0.25	0.75
7	2.5×8.0	2.50±0.04	8.0±0.2	0.28	0.80
8	3.0×8.0	3.00±0.04	8.0±0.2	0.30	1.00
9	3.0×10	3.00±0.04	10.0±0.3	0.30	1.00
10	3.5×10	$3.50^{+0.04}_{-0.05}$	10.0±0.3	0.30	1.00
11	4.0×14	4.00±0.05	14.0±0.3	0.35	1.20
12	5.0×16	5.00±0.05	16.0±0.3	0.45	1.40
13	7.0×23	7.00±0.07	23.0±0.5	0.75	2.00

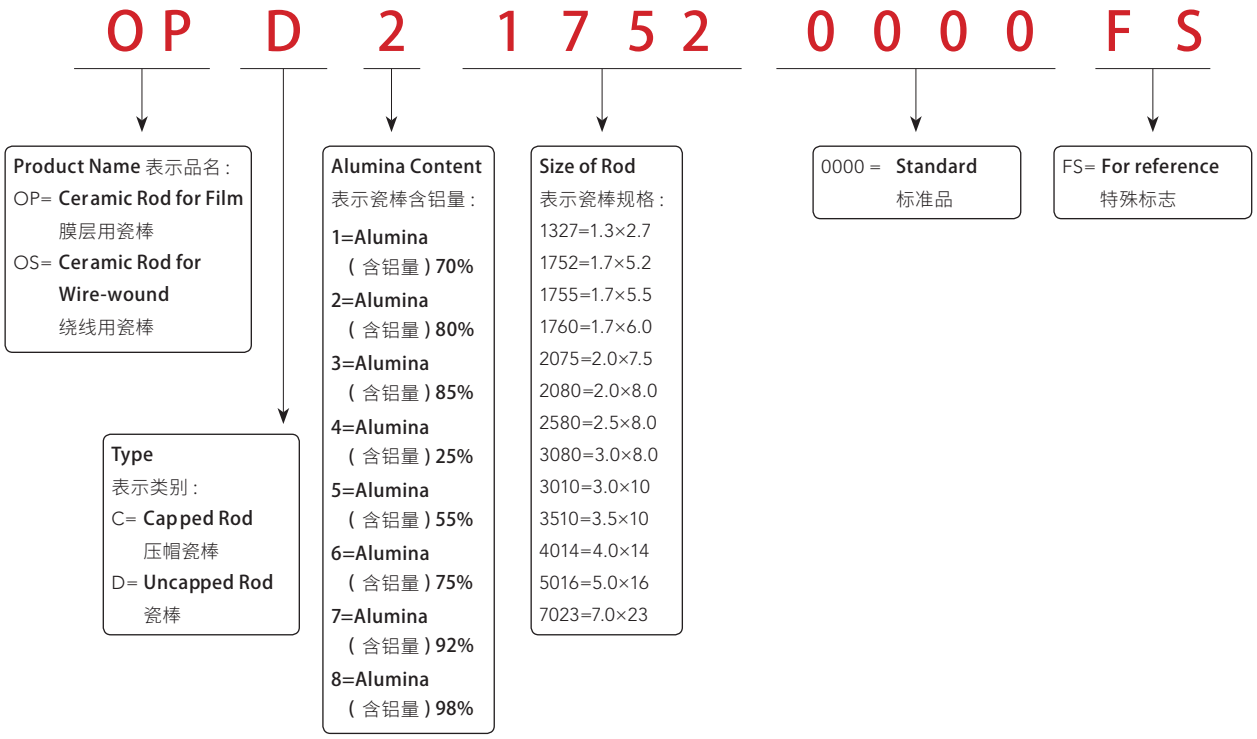
Remark: any special dimensions (4.0×12, 4.0×22, 4.0×39....) and Aluminum Content can be produced according to customer's request.
备注 : 特殊规格的尺寸 (4.0×12, 4.0×22, 4.0×39.....) 及公差和含铝量可以按客户的要求来生产。

Specification (产品规格)

Type (瓷 类)	Size (规 格)
FS-25 FS-55 FS-70	1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.5×10, 4.0×14, 5.0×16, 7.0×23
FS-75 FS-80	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.5×10, 4.0×14, 5.0×16, 7.0×23
FS-85 FS-92 FS-98	1.3×2.7, 1.7×5.2, 1.7×5.5, 1.7×6.0, 2.0×7.5, 2.0×8.0, 2.5×8.0, 3.0×8.0, 3.5×10, 4.0×14, 5.0×16, 7.0×23

Ordering Procedure (Example:OPD217520000FS)

订购方式 (例如: 膜层用 1.7×5.2 80%瓷棒)

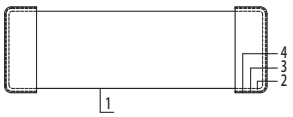


Remark: can produce other Alumina content product according to customer's request.
备注 : 可根据客户的要求订制其他含铝量的产品 .



Feature (特性)

- Aluminum Content 70%, 80%, 85% (70%, 80%, 85% 含铝量白瓷棒)
- Electronic Ceramic parts in superior performance
  (属于优良的电子陶瓷产品)
- Suitable for producing in different types of Wire-wound resistors
  (适合生产绕线电阻)



1. Ceramic（瓷棒）
2. Cap (iron) （铁帽 . 铁 ）
3. Cap (copper) （铁帽 . 铜层 ）
4. Cap (tin) （铁帽 . 锡层 ）

Dimension (尺寸) (单位: mm)

NO	Size 规格	Capped Ceramic Rod 压帽瓷棒		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	
1	1.3×2.7	1.54~1.66	2.86~3.16	2
2	1.7×5.2	2.03~2.17	5.36~5.76	3
3	1.7×5.5	2.03~2.17	5.66~6.16	3
4	1.7×6.0	2.03~2.17	6.16~6.66	3
5	2.0×7.5	2.33~2.58	7.66~8.27	5
6	2.0×8.0	2.33~2.57	8.16~8.77	5
7	2.5×8.0	2.82~3.08	8.16~8.77	6
8	3.0×8.0	3.32~3.58	8.16~8.77	6
9	3.0×10	3.32~3.58	10.06~10.89	6
10	3.5×10	3.81~4.08	10.06~10.89	6
11	4.0×14	4.31~4.59	14.06~14.89	6
12	5.0×16	5.41~5.59	16.16~16.89	6
13	7.0×23	7.39~7.61	22.96~24.09	6

Ordering Procedure (Example: OSC14014000000)

订购方式 (例如 :4.0×14规格 70% 组帽瓷棒)

O S C 1 4 0 1 4 0 0 0 0 0 0 0

Product Name
表示品名 :
OS= Ceramic Rod for Wire-wound
绕线用瓷棒

Type 表示类别 :
C= Capped Ceramic Rod 组帽

Alumina Content
表示瓷棒含铝量 :
1=Alumina (含铝量) 70%
2=Alumina (含铝量) 80%
3=Alumina (含铝量) 85%
4=Alumina (含铝量) 25%
5=Alumina (含铝量) 55%
6=Alumina (含铝量) 75%
7=Alumina (含铝量) 92%
8=Alumina (含铝量) 98%

Size of Rod 表示瓷棒规格 :

1327=1.3×2.7	1752=1.7×5.2
1755=1.7×5.5	1760=1.7×6.0
2075=2.0×7.5	2080=2.0×8.0
2580=2.5×8.0	3080=3.0×8.0
3010=3.0×10	3510=3.5×10
4014=4.0×14	5016=5.0×16
7023=7.0×23	

0=Standard 标准品

Remark: can produce other Alumina content product according to customer's request.
备注 : 可根据客户的要求订制其他含铝量的产品 .

Technical parameter of Capped Rods in various film

各类膜层组帽棒技术参数

ROYALOHM
www.royalohm.com

Type 膜层类型	Characteristic 膜层特点	Resistance range 电阻值范围 (Ω)	T.C.R. 电阻温度系数 (ppm/°C)	Limit of short time over load 短时间过载变化率
Film ceramic rods of carbon film resistor 碳膜	Conductive film made of high-heat temperature decompose carbon material 高温热分解碳质导电膜层 Ceramic rod with high-conduction material 高导热材料基体 Low cost 低成本	1Ω ~2.5Ω 2.6Ω ~800Ω 801Ω ~5KΩ 5.1KΩ ~ 120KΩ	±300 ±450 0 ~ -700 0 ~ -1500	≦ (1%+0.05Ω)
Film ceramic rods of metal film resistor 金属膜	Vacuum sputtering film ceramic rod adopted 采用真空溅射完成膜层 Ceramic rod with high-conduction material 高导热材料基体 Low current noise & T.C.R. 低电流噪声、低电阻温度系数 Wide resistance range:1Ω ~20KΩ 电阻值范围可达 :1Ω ~20KΩ	0.5Ω ~20KΩ	±15 ±25 ±50	≦ (0.5%+0.05Ω)
Film ceramic rods of metal oxide film **resistor** 金属氧化膜	Conductive film made of metal oxide fired at high temperature 金属氧化物高温烧成膜层 Good overload capacity 具有高温负荷能力 Ceramic rod with high-conduction material 高导热材料基体	2Ω ~500Ω	±350	Normal size 正常尺寸 ≦ (1%+0.05Ω) Small size 小尺寸≦ (2%+0.05Ω)
Film ceramic rods of Chemical Deposited Film resistors 化学沉积膜	Conductive film made of chemical plated metal 化学镀金属导电膜层 Ceramic rod with high-conduction material 高导热材料基体 Low cost 低成本	0.02Ω ~1.3Ω	±200	Normal size 正常尺寸 ≦ (1%+0.05Ω) Small size 小尺寸≦ (2%+0.05Ω)
Film ceramic rods of Metal Glaze film **resistors** 玻璃釉膜	Conductive film made of high temperature 高温烧成贵金属氧化物导电膜层 With high overload capacity 具有高过负荷能力 Wide resistance range:15Ω ~2.5MΩ 阻值范围 :15Ω ~2.5MΩ Small T.C.R.: ±100~200ppm/°C 温度系数小 :±100~200ppm/°C	15Ω ~2.5MΩ	±100 ±200	≦ (1%+0.05Ω)
0Ω resistors 零欧电阻	Conductive film made of chemical plated copper 化学镀铜导电膜层 Ceramic rod with high-conduction material 高导热材料基体 Low cost 低成本	≦ 50mΩ	/	/

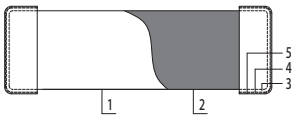
Carbon Film Capped Ceramic Rod

碳膜组帽棒



Feature (特性)

- Filming in CVD technology (采用 CVD 技术成膜)
- Low cost, good performance at High Frequency (低成本 , 高频特性好)
- Wide IRV range, can be sorted accurately (初值范围宽 , 并可以精准分类)



1. Ceramic（瓷棒)
2. Film（膜层)
3. Cap (iron) （铁帽 . 铁)
4. Cap (copper) （铁帽 . 铜层)
5. Cap (tin) （铁帽 . 锡层)

Dimension (尺寸) (单位: mm)

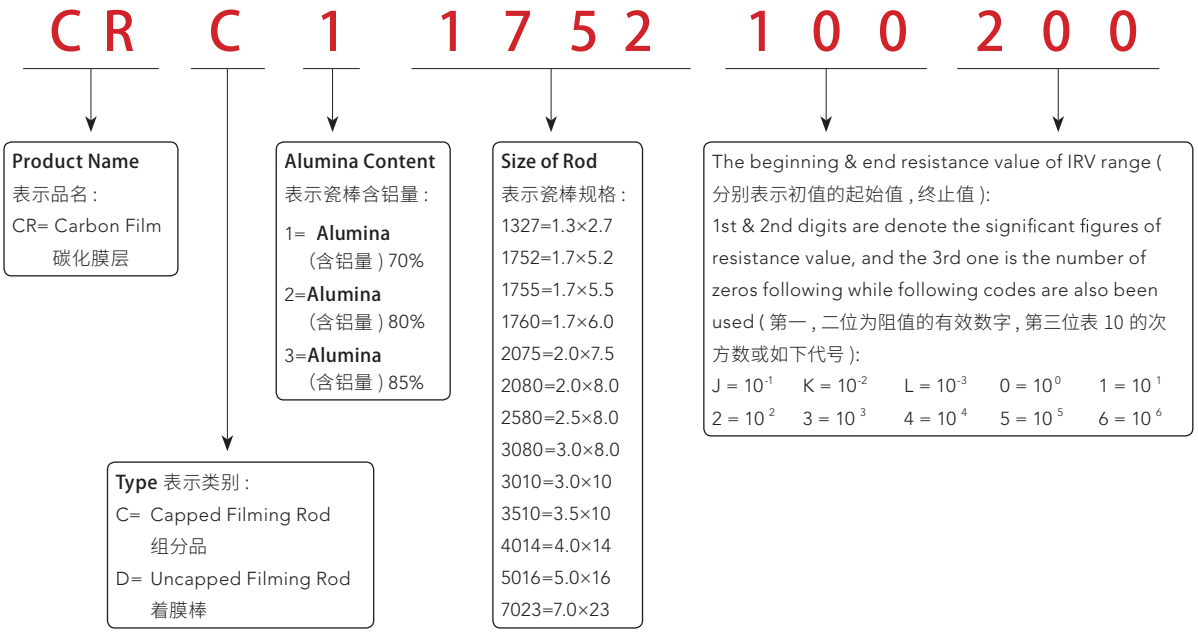
NO	Size 规格	Uncapped Filming Rod 着膜棒		Capped Filming Rod 组分品		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	D 直径	L 长度	
1	1.3×2.7	1.30± 0.02	2.7±0.1	1.54~1.66	2.86~3.16	2
2	1.7×5.2	1.70± 0.03	$5.2^{+0.1}_{-0.2}$	2.03~2.17	5.36~5.76	3
3	1.7×5.5	1.70± 0.03	5.5±0.2	2.03~2.17	5.66~6.16	3
4	1.7×6.0	1.70± 0.03	6.0± 0.2	2.03~2.17	6.16~6.66	3
5	2.0×7.5	$2.00^{+0.04}_{-0.03}$	7.5±0.2	2.33~2.58	7.66~8.27	5
6	2.0×8.0	2.00±0.03	8.0± 0.2	2.33~2.57	8.16~8.77	5
7	2.5×8.0	2.50±0.04	8.0± 0.2	2.82~3.08	8.16~8.77	6
8	3.0×8.0	3.00±0.04	8.0± 0.2	3.32~3.58	8.16~8.77	6
9	3.0×10	3.00±0.04	10.0±0.3	3.32~3.58	10.06~10.89	6
10	3.5×10	$3.50^{+0.04}_{-0.05}$	10.0±0.3	3.81~4.08	10.06~10.89	6
11	4.0×14	4.00±0.05	14.0± 0.3	4.31~4.59	14.06~14.89	6
12	5.0×16	5.00±0.05	16.0± 0.3	5.41~5.59	16.16~16.89	6
13	7.0×23	7.00±0.07	23.0± 0.5	7.39~7.61	22.96~24.09	6

IRV (Initial Resistance Value) Range (初值范围)

1Ω-2Ω	8Ω-13Ω	60Ω-100Ω	500Ω-800Ω	4KΩ-7KΩ	30KΩ-60KΩ
1.5Ω-2.5Ω	10Ω-20Ω	80Ω-130Ω	600Ω-900Ω	5KΩ-10KΩ	
2Ω-3.5Ω	15Ω-25Ω	100Ω-200Ω	800Ω-1.3KΩ	6KΩ-12KΩ	
3Ω-5Ω	20Ω-30Ω	150Ω-250Ω	1KΩ-2KΩ	8KΩ-16KΩ	
4Ω-7Ω	30Ω-50Ω	200Ω-400Ω	1.5KΩ-2.5KΩ	10KΩ-20KΩ	
5Ω-8Ω	40Ω-60Ω	300Ω-500Ω	2KΩ-4KΩ	15KΩ-30KΩ	
6Ω-10Ω	50Ω-80Ω	400Ω-600Ω	3KΩ-5KΩ	20KΩ-40KΩ	

Ordering Procedure (Example: CRC11752100200)

订购方式 (例如: CR 70% 1.7×5.2 10-20E)

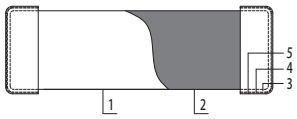


Metal Film Capped Ceramic Rod
金属膜组帽棒



Feature (特性)

- Filming in PCD technology. (采用 PCD 成膜技术).
- Excellent Temperature coefficient, very low current noise. (温度系数范围低 , 电流噪声小).
- Wide IRV range, suitable to produce high precision product. (初值范围宽 , 适用于生产高精度产品)



1. Ceramic (瓷棒)
2. Film (膜层)
3. Cap (iron) (铁帽 . 铁)
4. Cap (copper) (铁帽 . 铜层)
5. Cap (tin) (铁帽 . 锡层)

Dimension (尺寸) (单位: mm)

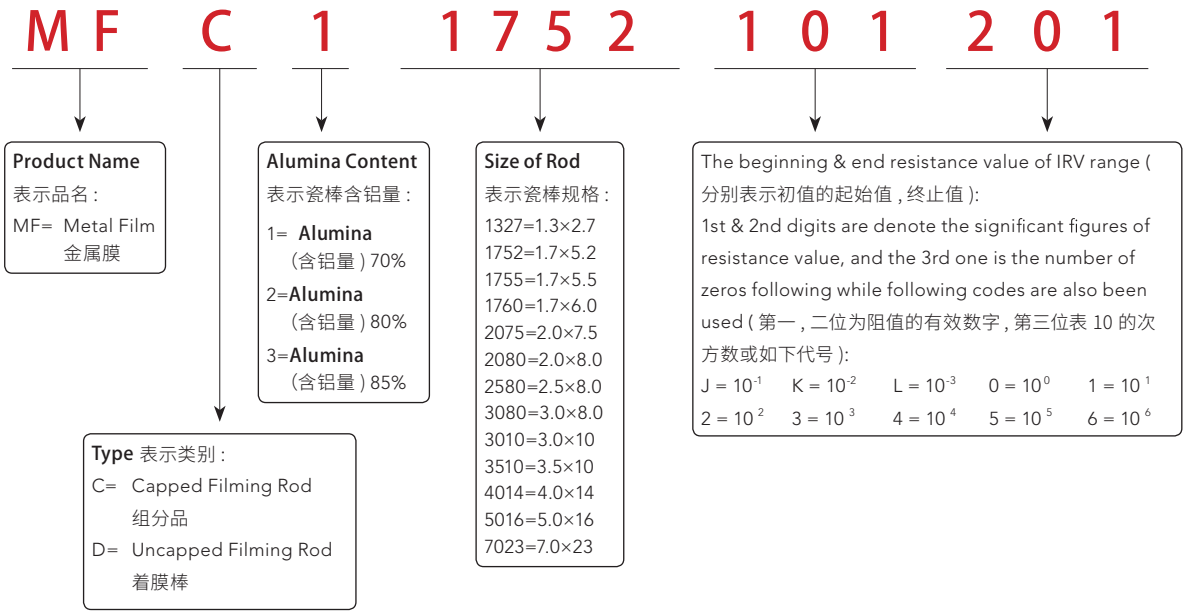
NO	Size 规格	Uncapped Filming Rod 着膜棒		Capped Filming Rod 组分品		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	D 直径	L 长度	
1	1.3x2.7	1.30± 0.02	2.7±0.1	1.54~1.66	2.86~3.16	2
2	1.7x5.2	1.70± 0.03	5.2 $^{+0.1}_{-0.2}$	2.03~2.17	5.36~5.76	3
3	1.7x5.5	1.70± 0.03	5.5±0.2	2.03~2.17	5.66~6.16	3
4	1.7x6.0	1.70± 0.03	6.0± 0.2	2.03~2.17	6.16~6.66	3
5	2.0x7.5	2.00 $^{+0.04}_{-0.03}$	7.5±0.2	2.33~2.58	7.66~8.27	5
6	2.0x8.0	2.00±0.03	8. 0± 0.2	2.33~2.57	8.16~8.77	5
7	2.5x8.0	2.50±0.04	8. 0± 0.2	2.82~3.08	8.16~8. 77	6
8	3.0x8.0	3.00±0.04	8. 0± 0.2	3.32~ 3.58	8.16~8.77	6
9	3.0x10	3.00±0.04	10.0±0.3	3.32~3.58	10.06~10.89	6
10	3.5x10	3.50 $^{+0.04}_{-0.05}$	10.0±0.3	3.81~4.08	10.06~10.89	6
11	4.0x14	4.00±0.05	14. 0± 0.3	4.31~4.59	14.06~14.89	6
12	5.0x16	5.00±0.05	16. 0± 0.3	5.41~5.59	16.16~16.89	6
13	7.0x23	7.00±0.07	23. 0± 0.5	7.39~7.61	22.96~24.09	6

IRV (Initial Resistance Value) Range (初值范围)

0.5Ω-0.8Ω	4Ω-7Ω	20Ω-30Ω	100Ω-200Ω	600Ω-900Ω	4KΩ-7KΩ
0.8Ω-1.3Ω	5Ω-8Ω	30Ω-50Ω	150Ω-250Ω	800Ω-1.3KΩ	5KΩ-10KΩ (1.3×2.7初值范围)
1Ω-2Ω	6Ω-10Ω	40Ω-60Ω	200Ω-400Ω	1KΩ-2KΩ	6KΩ-12KΩ
1.5Ω-2.5Ω	8Ω-13Ω	50Ω-80Ω	300Ω-500Ω	1.5KΩ-2.5KΩ	8KΩ-16KΩ
2Ω-3.5Ω	10Ω-20Ω	60Ω-100Ω	400Ω-600Ω	2KΩ-4KΩ	10KΩ-20KΩ
3Ω-5Ω	15Ω-25Ω	80Ω-130Ω	500Ω-800Ω	3KΩ-5KΩ	

Ordering Procedure (Example: MFC11752101201)

订购方式 (例如: MF 70% 1.7×5.2 100-200Ω)



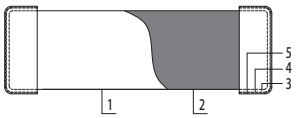
Metal Oxide Film Capped Ceramic Rod

金属氧化膜组帽棒



Feature (特性)

- Conductive Film Layer produced under High Temperature (高温烧成导电膜层)
- Good Performance under High Temperature environment (高温负荷能力强)
- First Choice for Power type resistor materials (功率型产品优选原料)



1. Ceramic（瓷棒）
2. Film（膜层）
3. Cap (iron)（铁帽 . 铁）
4. Cap (copper)（铁帽 . 铜层）
5. Cap (tin)（铁帽 . 锡层）

Dimension (尺寸) (单位: mm)

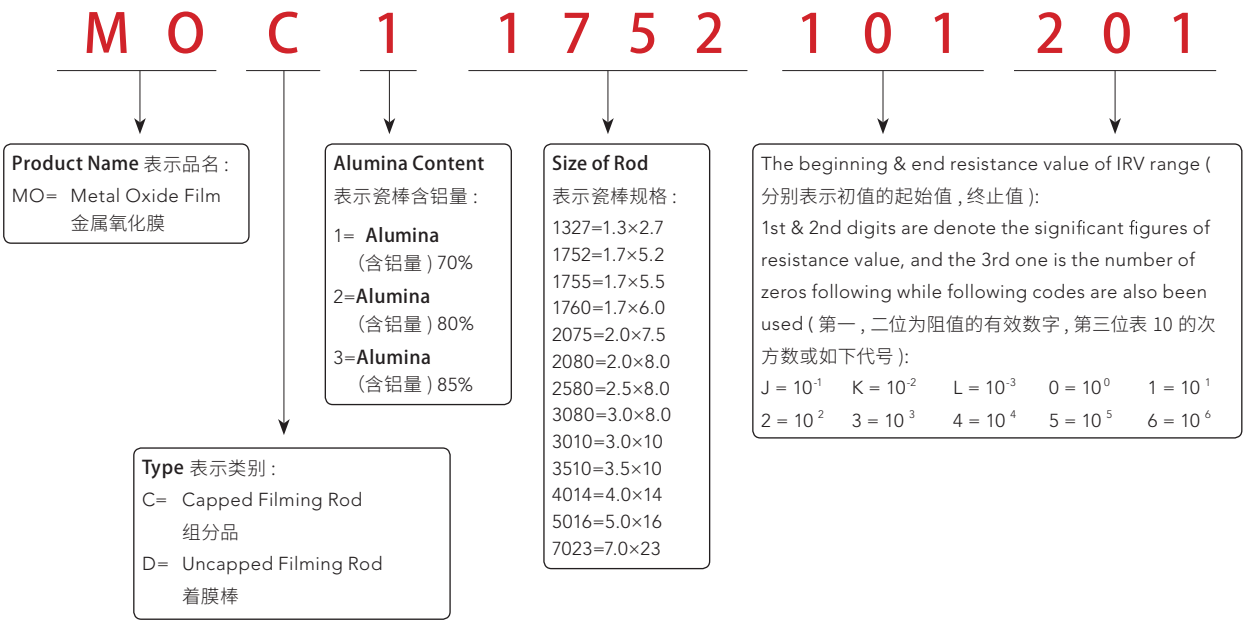
NO	Size 规格	Uncapped Filming Rod 着膜棒		Capped Filming Rod 组分品		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	D 直径	L 长度	
1	1.3×2.7	1.30±0.02	2.7±0.1	1.54~1.66	2.86~3.16	2
2	1.7×5.2	1.70±0.03	$5.2^{+0.1}_{-0.2}$	2.03~2.17	5.36~5.76	3
3	1.7×5.5	1.70±0.03	5.5±0.2	2.03~2.17	5.66~6.16	3
4	1.7×6.0	1.70±0.03	6.0±0.2	2.03~2.17	6.16~6.66	3
5	2.0×7.5	$2.00^{+0.04}_{-0.03}$	7.5±0.2	2.33~2.58	7.66~8.27	5
6	2.0×8.0	2.00±0.03	8.0±0.2	2.33~2.57	8.16~8.77	5
7	2.5×8.0	2.50±0.04	8.0±0.2	2.82~3.08	8.16~8.77	6
8	3.0×8.0	3.00±0.04	8.0±0.2	3.32~3.58	8.16~8.77	6
9	3.0×10	3.00±0.04	10.0±0.3	3.32~3.58	10.06~10.89	6
10	3.5×10	$3.50^{+0.04}_{-0.05}$	10.0±0.3	3.81~4.08	10.06~10.89	6
11	4.0×14	4.00±0.05	14.0±0.3	4.31~4.59	14.06~14.89	6
12	5.0×16	5.00±0.05	16.0±0.3	5.41~5.59	16.16~16.89	6
13	7.0×23	7.00±0.07	23.0±0.5	7.39~7.61	22.96~24.09	6

IRV (Initial Resistance Value) Range (初值范围)

2Ω-3.5Ω	8Ω-13Ω	40Ω-60Ω	150Ω-250Ω
3Ω-5Ω	10Ω-20Ω	50Ω-80Ω	200Ω-400Ω
4Ω-7Ω	15Ω-25Ω	60Ω-100Ω	300Ω-500Ω
5Ω-8Ω	20Ω-30Ω	80Ω-130Ω	400Ω-600Ω
6Ω-10Ω	30Ω-50Ω	100Ω-200Ω	500Ω-800Ω

Ordering Procedure (Example: MOC11752101201)

订购方式 (例如: MO 70% 1.7×5.2 100-200Ω)



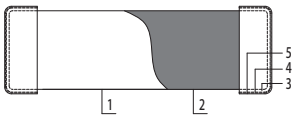
Metal Glaze Capped Ceramic Rod

玻璃釉膜组帽棒



Feature (特性)

- Good performance agains t Humidity environ ment 耐湿特性好)
- Wide IRV range, can be sorted accurately
  (初值范围宽 , 并可以精准分类)
- Best choice for Anti-surg e product (抗浪涌型产品的优选原料)



1. Ceramic（瓷棒）
2. Film（膜层）
3. Cap (iron) （铁帽 . 铁 ）
4. Cap (copper) （铁帽 . 铜层 ）
5. Cap (tin) （铁帽 . 锡层 ）

Dimension (尺寸) (单位: mm)

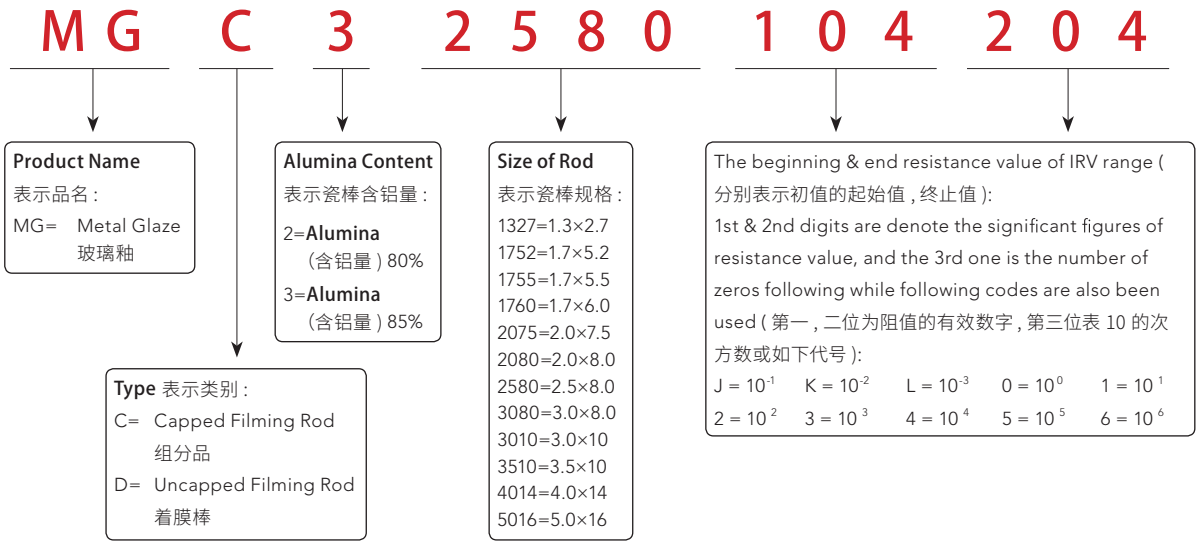
NO	Size 规格	Uncapped Filming Rod 着膜棒		Capped Filming Rod 组分品		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	D 直径	L 长度	
1	1.3×2.7	1.30± 0.02	2.7±0.1	1.54~1.67	2.86~3.16	2
2	1.7×5.2	1.70± 0.03	$5.2^{+0.1}_{-0.2}$	2.03~2.18	5.36~5.76	3
3	1.7×5.5	1.70± 0.03	5.5±0.2	2.03~2.18	5.66~6.16	3
4	1.7×6.0	1.70± 0.03	6.0± 0.2	2.03~2.18	6.16~6.66	3
5	2.0×7.5	$2.00^{+0.04}_{-0.03}$	7.5±0.2	2.33~2.73	7.66~8.27	5
6	2.0×8.0	2.00±0.03	8.0± 0.2	2.33~2.60	8.16~8.77	5
7	2.5×8.0	2.50±0.04	8.0± 0.2	2.82~3.11	8.16~8.77	6
8	3.0×8.0	3.00±0.04	8.0± 0.2	3.32~3.60	8.16~8.77	6
9	3.0×10	3.00±0.04	10.0±0.3	3.32~3.60	10.06~10.89	6
10	3.5×10	$3.50^{+0.04}_{-0.05}$	10.0±0.3	3.81~4.10	10.06~10.89	6
11	4.0×14	4.00±0.05	14.0± 0.3	4.31~4.67	14.06~14.89	6
12	5.0×16	5.00±0.05	16.0± 0.3	5.41~5.62	16.16~16.89	6

IRV (Initial Resistance Value) Range (初值范围)

10Ω-20Ω	150Ω-250Ω	2KΩ-4KΩ	30KΩ-60KΩ	400KΩ-700KΩ
15Ω-25Ω	200Ω-400Ω	3KΩ-5KΩ	40KΩ-80KΩ	500KΩ-800KΩ
20Ω-30Ω	300Ω-500Ω	4KΩ-7KΩ	50KΩ-100KΩ	600KΩ-900KΩ
30ΩE-50Ω	400Ω-600Ω	5KΩ-10KΩ	60KΩ-120KΩ	800KΩ-1.3MΩ
40Ω-60Ω	500Ω-800Ω	6KΩ-12KΩ	80KΩ-160KΩ	1MΩ-2MΩ
50Ω-80Ω	600Ω-900Ω	8KΩ-16KΩ	100KΩ-200KΩ	
60Ω-100Ω	800Ω-1.3KΩ	10KΩ-20KΩ	150KΩ-300KΩ	
80Ω-130Ω	1KΩ-2KΩ	15KΩ-30KΩ	200KΩ-400KΩ	
100Ω-200Ω	1.5KΩ-2.5KΩ	20KΩ-40KΩ	300KΩ-500KΩ	

Ordering Procedure (Example: MGC32580104204)

订购方式 (例如: MG 85% 2.5×8.0 100-200KΩ)



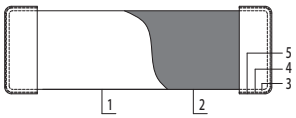
Chemical Nickel - Plating Film Capped Ceramic Rod

化学沉积膜组帽棒



Feature (特性)

- Conductive layer (Ni) deposited by Chemical method (化学镀镍形成导电膜层)
- Extremely Low Resistance value (超低阻值)
- Specially used for Low Resistance range product (其他膜层低阻部分的替代品)



1. Ceramic（瓷棒）
2. Film（膜层）
3. Cap (iron)（铁帽 . 铁）
4. Cap (copper)（铁帽 . 铜层）
5. Cap (tin)（铁帽 . 锡层）

Dimension (尺寸) (单位: mm)

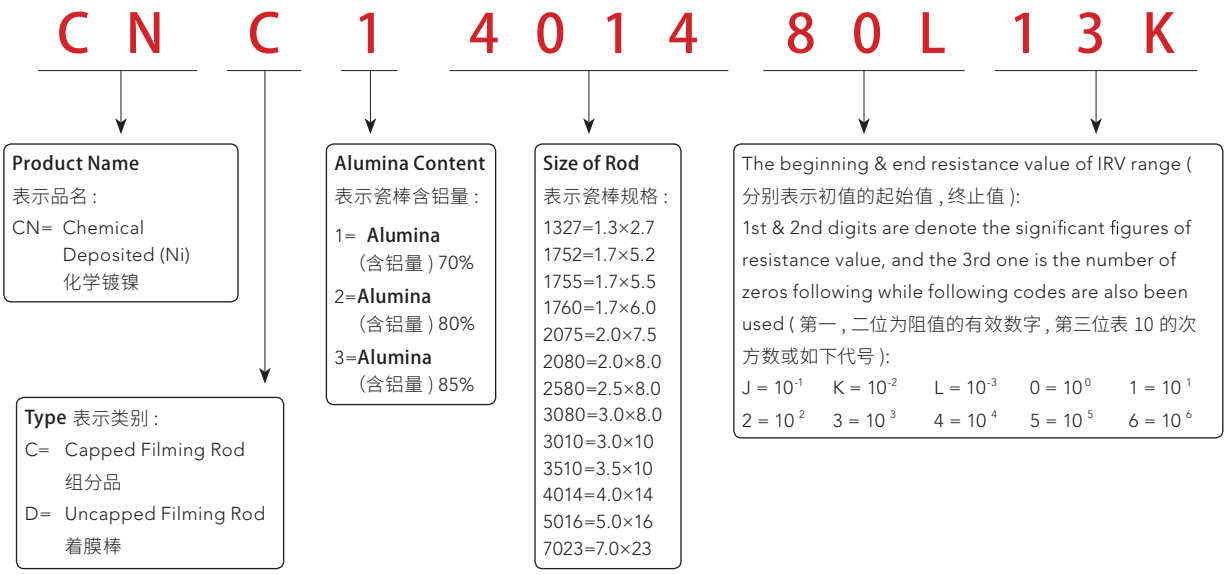
NO	Size 规格	Uncapped Filming Rod 着膜棒		Capped Filming Rod 组分品		MIN PULLING FORCE 最小拉力 (KG)
		D 直径	L 长度	D 直径	L 长度	
1	1.3×2.7	1.28~1.33	2.7±0.1	1.54~1.67	2.86~3.16	2
2	1.7×5.2	1.67~1.74	$5.2^{+0.1}_{-0.2}$	2.03~2.18	5.36~5.76	3
3	1.7×5.5	1.67~1.74	5.5±0.2	2.03~2.18	5.66~6.16	3
4	1.7×6.0	1.67~1.74	6.0±0.2	2.03~2.18	6.16~6.66	3
5	2.0×7.5	1.97~2.19	7.5±0.2	2.33~2.73	7.66~8.27	5
6	2.0×8.0	1.97~2.06	8.0±0.2	2.33~2.60	8.16~8.77	5
7	2.5×8.0	2.46~2.57	8.0±0.2	2.82~3.11	8.16~8.77	6
8	3.0×8.0	2.96~3.06	8.0±0.2	3.32~3.60	8.16~8.77	6
9	3.0×10	2.96~3.06	10.0±0.3	3.32~3.60	10.06~10.89	6
10	3.5×10	3.45~3.56	10.0±0.3	3.81~4.10	10.06~10.89	6
11	4.0×14	3.95~4.13	14.0±0.3	4.31~4.67	14.06~14.89	6
12	5.0×16	4.95~5.08	16.0±0.3	5.41~5.62	16.16~16.89	6
13	7.0×23	6.93~7.10	23.0±0.5	7.39~7.64	22.96~24.09	6

IRV (Initial Resistance Value) Range (初值范围)

0.02Ω-0.03Ω	0.10Ω-0.20Ω	0.80Ω-1.3Ω
0.03Ω-0.05Ω	0.20Ω-0.30Ω	1.0Ω-2.0Ω
0.05Ω-0.07Ω	0.30Ω-0.50Ω	
0.07Ω-0.10Ω	0.50Ω-0.80Ω	

Ordering Procedure (Example: CNC1401480L13K)

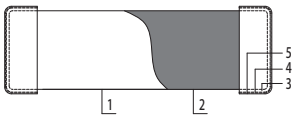
订购方式 (例如: CN 70% 4.0×14 0.08-0.13Ω)





Feature (特性)

- Conductive layer formed by Copper Plating (or Tin plating) process (电镀铜层或锡层作为导电膜层)
- Resistance value can be lowest to mini ohm range (阻值可低至 mΩ)
- Ceramic rod core or Alloy rod core (陶瓷棒或合金棒作为基体材料)

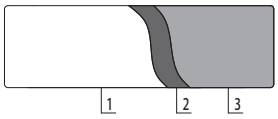


1. Ceramic（瓷棒）
2. Film（膜层）
3. Cap (iron) （铁帽 . 铁 ）
4. Cap (copper) （铁帽 . 铜层 ）
5. Cap (tin) （铁帽 . 锡层 ）

Copper Film Ceramic Rod 镀铜瓷棒 (单位: mm)

NO	Size 规格	Copper Film Ceramic Rod 镀铜瓷棒		Copper Film Capped Ceramic Rod 镀铜组帽棒	
		D 直径	L 长度	D 直径	L 长度
1	1.3x2.7	1.30±0.02	2.7±0.1	1.60~1.70	2.89~3.14
2	1.7x5.2	1.70±0.03	$5.2^{+0.1}_{-0.2}$	2.09~2.21	5.39~5.74

Tinned Iron Rod (镀锡铁棒)



1.Fe 铁棒 2.Cu 铜层 3.Sn 锡层

Tinned Iron Rod (镀锡铁棒) (单位: mm)

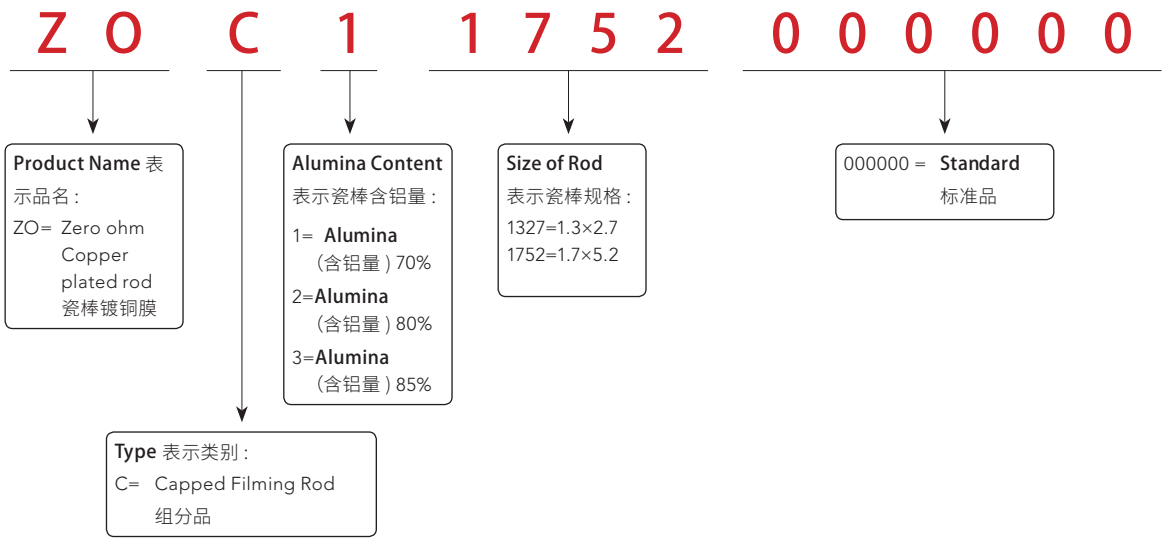
NO	Size 规格	Tinned Iron Rod 镀锡铁棒	
		D 直径	L 长度
1	1.3x2.7	1.50 ± 0.05	3.00 ± 0.05
2	1.7x5.2	2.00 ± 0.05	5.60 ± 0.05

IRV (Initial Resistance Value) Range (初值范围)

Standard resistance value <=50mE, other value or special structure can be specially provided
标准品阻值 ≤50mΩ, 其他阻值或特殊结构的要求可以特别提供

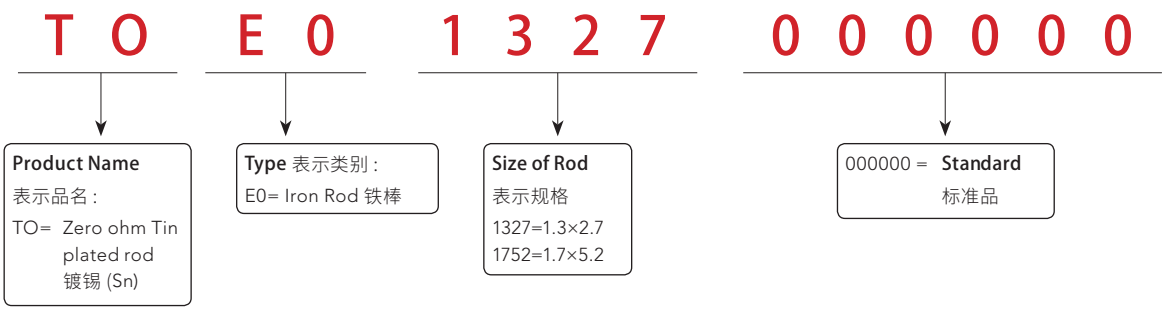
Ordering Procedure (Example: ZOC11752000000)

订购方式 (例如: ZO 70% 1.7×5.2 0Ω)



OrderingProcedure (Example: TOE01327000000)

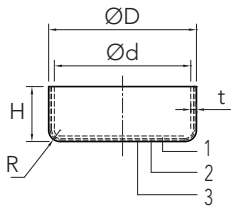
订购方式 (例如 :0Ω 1.3×2.7 镀锡铁棒)





Feature (特性)

- Suitable for many different kinds of Electronic parts (适用各类电子产品)
- Full series in different size (规格齐全)
- Surface treatments in Tin & Copper Plating (表面经过镀铜镀锡处理)



1.Fe 铁
2.Cu 铜层
3.Sn 锡层

Dimension (尺寸) (单位: mm)

NO	Size 规格	ØD 直径	Ød 内径	H 高度	R(Max. 最大)	t±0.02
1	1.26 × 0.95	1.62±0.02	1.265±0.02	0.95±0.02	0.15	0.15
2	1.64 × 1.42	2.10±0.02	1.64±0.02	1.42±0.04	0.20	0.20
3	1.95 × 1.74	2.51±0.02	1.93±0.02	1.74±0.03	0.25	0.25
4	1.95 × 1.85	2.51±0.02	1.93±0.02	1.85±0.03	0.25	0.25
5	2.45 × 1.95	3.00±0.02	2.44±0.02	1.95±0.05	0.25	0.25
6	2.90 × 2.00	3.50±0.03	2.92±0.02	2.00±0.05	0.25	0.25
7	2.90 × 2.10	3.50±0.03	2.92±0.02	2.10±0.05	0.25	0.25
8	3.41 × 2.35	4.00±0.03	3.41±0.02	2.35±0.05	0.25	0.25
9	3.91 × 2.35	4.50±0.03	3.91±0.03	2.35±0.05	0.25	0.25
10	4.90 × 2.85	5.48±0.02	4.88±0.03	2.85±0.05	0.25	0.25
11	6.90 × 3.45	7.50±0.02	6.90±0.03	3.45±0.05	0.25	0.25

Ordering Procedure (Example: TOCA12600000FS)

订购方式 (例如: 镀锡铁帽 Ø1.26)

T O C A 1 2 6 0 0 0 0 0 F S

Product Name
表示品名 :
TO= 镀锡 (Sn)

Type
表示类别 :
C= **Cap** 铁帽

Thickness 表示厚度
A=0.15mm 厚 B=0.20mm 厚 C=0.25mm 厚

Size 表示铁帽尺寸 :

1260= Ø1.26	1640 = Ø1.64
1950 = Ø1.95	2450= Ø 2.45
2900 = Ø2.90	3910 = Ø3.91
4900 = Ø4.90	6900= Ø6.90

0000 for Steel Cap product.
Can indicate the specified height in case for non-standard cap
无需描述添 0 补足 ---0000
指定高度 , 例 :
1900--- H1.90mm

FS= **For reference**
特殊标志

Remark: Special size can be provided according to customer's request
备注 : 特殊尺寸可以按客户的要求订制

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瓷壳

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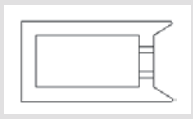
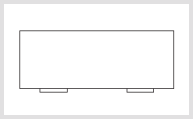
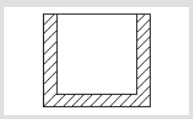
Feature (特性)

- Superior Talc Material (优质滑石瓷原料)
- Full series in different size (规格齐全)
- Hot-briquetting & Dry-pressing two different process (热压和干压两种成形方式)

Type & Dimension (类型及尺寸) (单位: mm)

Type (类型)		功率	2W	3W	5W	7W	10W	15W	20W	25W	30W	40W
	PRW	L 长	18	22	22	35	49	49	60	64	-	-
		W 宽	7	8	10	10	10	12.5	14.5	14.5	-	-
		H 高	7	8	9	9	9	11.5	13.5	13.5	-	-
	PRM	L 长	20	25	25	38	50	-	45	-	-	-
		W 宽	11.5	12.5	12.5	12.5	12.5	-	20	-	-	-
		H 高	7.5	8.5	9	9	9	-	13.5	-	-	-
	PRV	L 长	-	22	27/25	35	48	48	63	-	-	-
		W 宽	-	10	10	10	10	12.5	12.5	-	-	-
		H 高	-	9	9	9	9	11.5	13.5	-	-	-
	PRT	L 长	-	-	-	-	48	48	63	-	75	90
		W 宽	-	-	-	-	10	12.5	12.5	-	19	19
		H 高	-	-	-	-	9	11.5	13.5	-	19	19
	PFA	L 长	13 / 26	13 / 26	14 / 26	26	26	-	-	-	-	-
		W 宽	5	5	5	5	-	-	-	-	-	-
		H 高	8.5 / 9	13.5 / 13	18	20	18	-	-	-	-	-

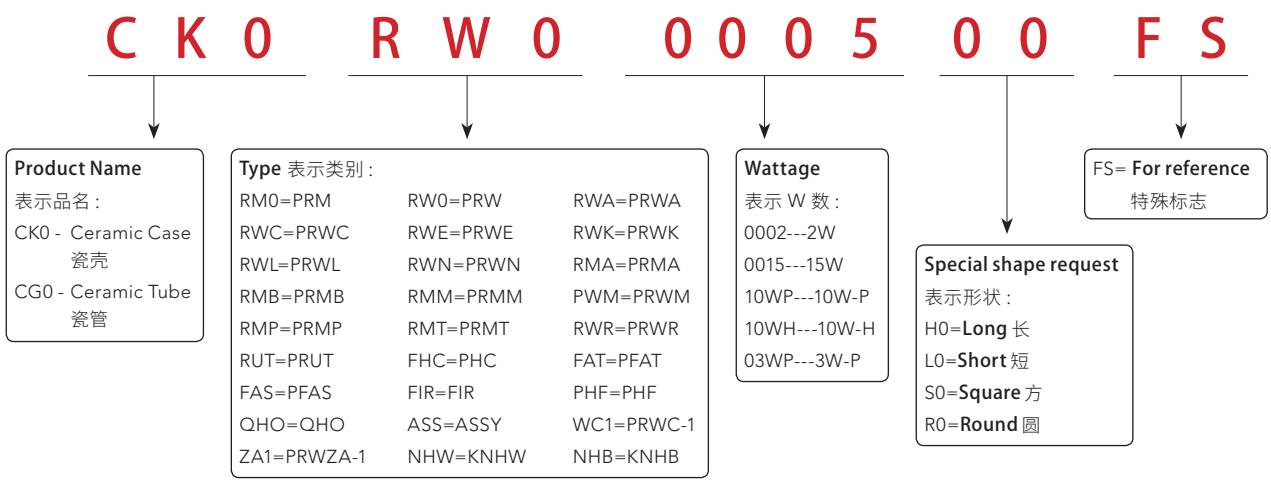
Remark: Special type and dimension can be orded by customer's request.
备注 : 特殊尺寸可以按客户的要求订制

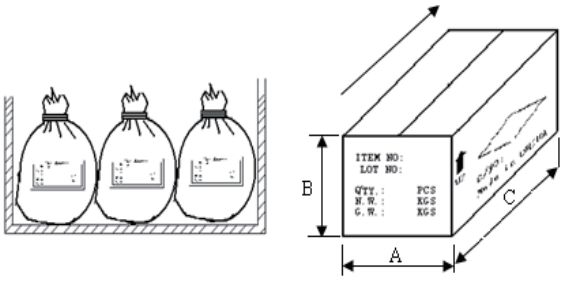
Performance Specifications (性能)

Item	项目	Unit 单位	Specification 标准
Bulk Density	体积密度	g/cm^3	≥ 2.8
Flexural Strength	抗折强度	MPa	139
Coefficient of Linear Thermal Expansion	线膨胀系数 (20~100°C)	$\times 10^{-6}/°C$	7.3
Permittivity	介电常数 (1MHz 20°C)	F/M	6.2
Dielectric Loss Tangent	介质损耗角正切值	$\times 10^{-4}$	13
Volume Resistivity	体积电阻率 (100°C)	Ω.cm	$\geq 10^{12}$
Dielectric Strength	击穿强度	K v /mm	≥ 20

Ordering Procedure (Example: CK0PRW0000500FS)

订购方式 (例如 :PRW5W 瓷壳)





Packing (标准包装方式)						
Tpye (类 型)		Size (尺寸) (mm)			Quantity (数量) (KPCS)	
Aluminum Content (瓷棒)						
		A	B	C	袋	盒
1	1.3 × 2.7	25	20	45	600	1800
2	1.7 × 5.2	25	20	45	200	600
3	1.7 × 5.5	25	20	45	200	600
4	1.7 × 6.0	25	20	45	200	600
5	2.0 × 7.5	25	20	45	100	300
6	2.0 × 8.0	25	20	45	100	300
7	2.5 × 8.0	25	20	45	60	180
8	3.0 × 8.0	25	20	45	40	120
9	3.0 × 10	25	20	45	40	120
10	3.5 × 10	25	20	45	25	75
11	4.0 × 14	25	20	45	12.5	37.5
12	5.0 × 16	25	20	45	7.5	22.5
13	7.0 × 23	25	20	45	2.5	7.5
Capped Ceramic Rod (组帽棒)						
1	1.3 × 2.7	25	20	45	600	1800
2	1.7 × 5.2	25	20	45	200	600
3	1.7 × 5.5	25	20	45	200	600
4	1.7 × 6.0	25	20	45	200	600
5	2.0 × 7.5	25	20	45	100	300
6	2.0 × 8.0	25	20	45	100	300
7	2.5 × 8.0	25	20	45	60	180
8	3.0 × 8.0	25	20	45	40	120
9	3.0 × 10	25	20	45	40	120
10	3.5 × 10	25	20	45	25	75
11	4.0 × 14	25	20	45	12.5	37.5
12	5.0 × 16	25	20	45	7.5	22.5
13	7.0 × 23	25	20	45	2.5	7.5

Packing (标准包装方式)						
Tpye (类 型)	Size (尺寸) (mm)				Quantity (数量) (KPCS)	
Zero Ohm product (0Ω 产品)						
Copper plated 0 ohm in Ceramic core 镀铜瓷棒	1.3 × 2.7	25	20	45	600	1800
Tin plated 0 ohm in Ceramic core 镀铜瓷棒	1.7 × 5.2	25	20	45	200	600
Copper plated 0 ohm in Steel core 铁棒鍍銅鍍錫	1.3 × 2.7	25	20	45	300	900
Tin plated 0 ohm in Steel core 铁棒鍍銅鍍錫	1.7 × 5.2	25	20	45	100	300
Tin-Plated Steel Cap (铁帽)						
1	1.26 × 0.95	25	20	45	1800	5400
2	1.64 × 1.42	25	20	45	900	2700
3	1.95 × 1.85	25	20	45	600	1800
4	2.45 × 1.95	25	20	45	250	750
5	2.90 × 2.10	25	20	45	200	600
6	3.41 × 2.35	25	20	45	150	450
7	3.91 × 2.35	25	20	45	120	360
8	4.90 × 2.85	25	20	45	80	240
9	6.90 × 3.45	25	20	45	40	120

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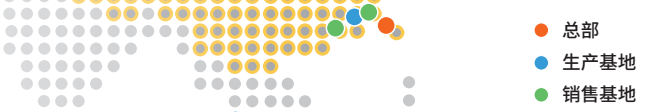

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