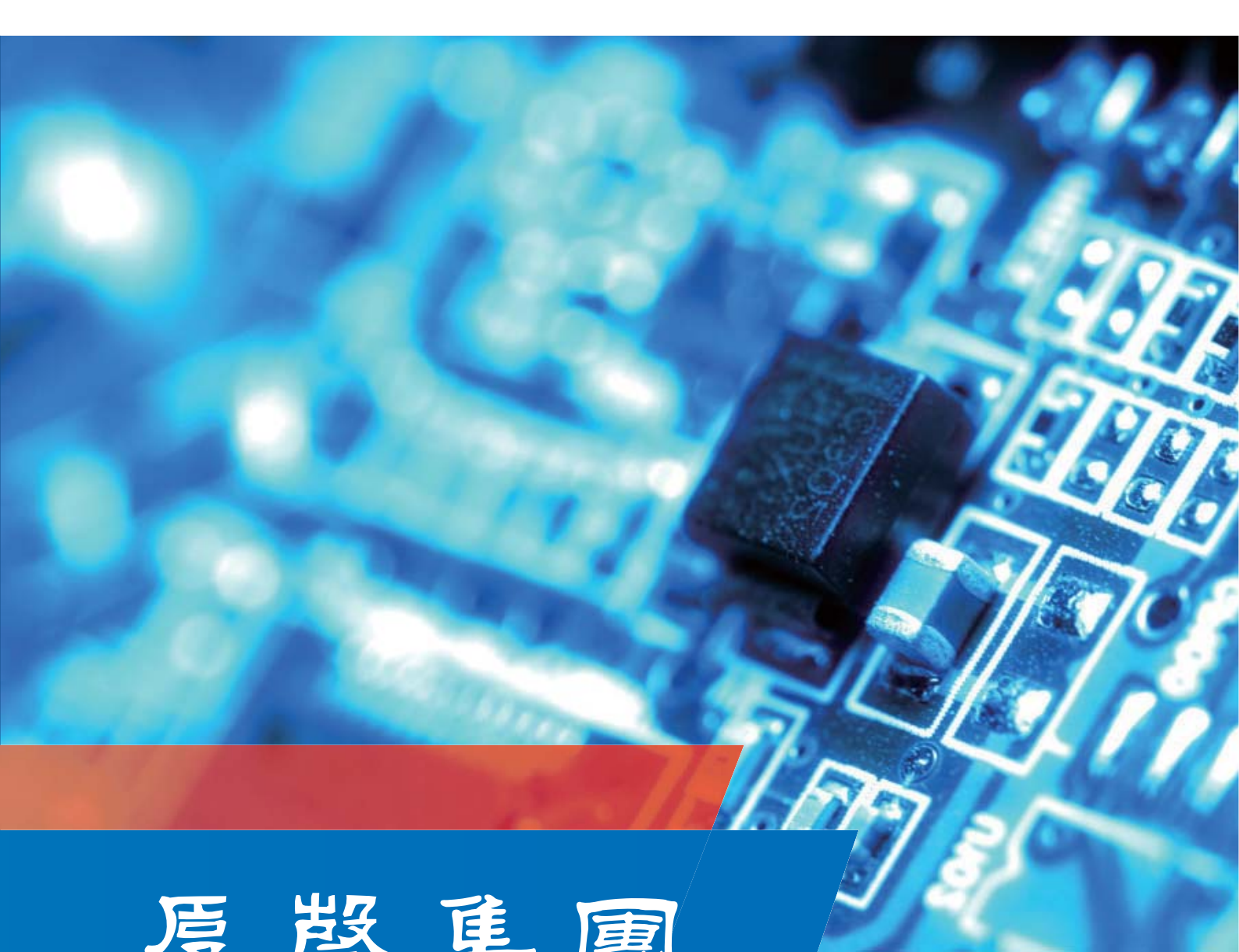




厚聲集團

Uni-Royal

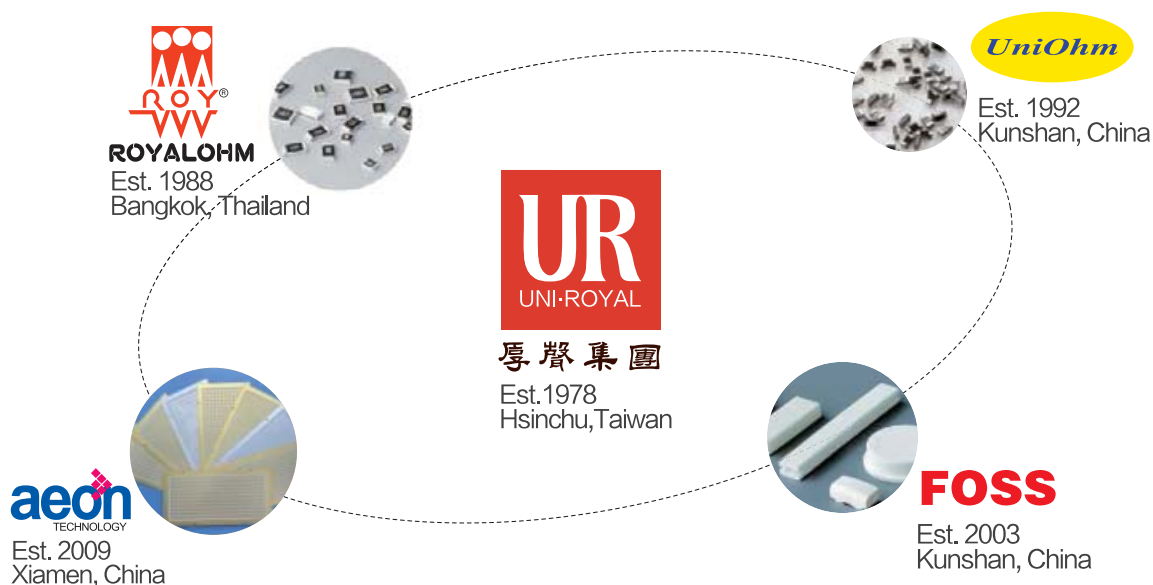
以产品和服务成为电子制造业卓越的全球供货商。

做客户、企业成员、合作伙伴的尊敬企业。



2017 ~ 2018

厚聲電阻



Our Mission :

By providing reliable products and services for customers, business members and partners to create greatest value.

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 outstanding global supplier of products and services to the electronics manufacturing industry, as a respected enterprises to customer, corporate members 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、合作伙伴的尊敬企业。



昆山厚声电子工业总部 (Kunshan HQ)

Uni-Royal Group is the world's leading chip resistor and dip resistor industry leader, founded in 1978 in Hsinchu, Taiwan. With more than 38 years of development and experience, the global electronics industry has a deep insight and innovative leadership capabilities. Uni-Royal has a complete R&D team in Taiwan, Kunshan, Xiamen, Shenzhen and Southeast Asia (Thailand), manufacturing plants and sales teams all over the world in the global marketing service network. Group's four famous brands: ROYALOHM, UNIOHM, FOSS, AEON, has become the world's industry customers most preferred, and reliable passive components of the important suppliers and preferred partners.

Uni-Royal has qualified in the ISO9001, ISO14001, TL9000 and TS16949 and other international quality system certification, products and services are widely used in the global electronics industries markets, chips, computers, civil and military and many other high-tech fields. In the past 38 years, the global economy continues to develop, scientific modernization, especially the rapid development of the electronics industry applications. Uni-Royal has always been to leading-edge technology, with the excellent products and industry-leading solutions. Providing the world's many well-known industry customers, for the electronic device-related products and services in full range of needs.

厚声集团是全球晶片电阻与插件电阻行业的领导者，1978年始创于台湾新竹。凭借逾三十八年的发展历程与经验，对全球电子行业拥有着深刻的行业洞察与创新领导的能力。厚声在台湾、昆山、厦门、深圳与东南亚（泰国）拥有完善的电阻研发团队、制造工厂及遍布全球的销售团队和营销服务网络。集团旗下四大著名品牌：ROYALOHM、UNIOHM、FOSS、AEON，已成为全球行业客户的首选，且备受信赖的被动元器件的重要供货商及首选合作伙伴。

厚声先后获得 ISO9001、ISO14001、TL9000 与 TS16949 等多项国际体系认证，产品广泛应用于全球电子——微电子、计算机、民用与军工等众多高科技领域。在过去的三十八年中，随着全球经济的不断发展、现代化的科技更替、特别是电子领域日新月异的应用革新，厚声始终以前沿的技术、出色的产品和领先的解决方案，向全球众多行业知名企业提供全方位的产品和服务。



Uni-Royal Group Growth

- 1978 (Hsinchu, Taiwan) Taiwan Uniroyal Electronics Industry Co., Ltd
- 1988 (Bangkok, Thailand) Royal Electronic Factory (Thailand) Co., Ltd.
- 1992 (Kunshan, China) Kunshan Uniroyal Electronics Industry Co., Ltd
- 2003 (Kunshan Optical Park) Kunshan Foss electronic materials
- 2004 to 2005 (Shenzhen, China) point of sale: Shenzhen Royal Electronics, Shenzhen Nanying Electronics
- 2005 (Kunshan High-tech Zone) Kunshan Uniroyal Electronics Industry Co., Ltd
- 2009 (Xiamen Xiang'an) Aeon technology (Xiamen)
- 2014 (Kunshan, China) Kunshan Uniroyal Optoelectronics technology
- 2016 (Kunshan, China) Sales HQ: Uniroyal International Trade (Kunshan), Xiamen Branch, Shenzhen Branch

厚声集团成长

- 1978 年 (台湾新竹) 台湾厚声电子工业
- 1988 年 (泰国曼谷) 泰国厚声电子工业
- 1992 年 (中国昆山) 昆山厚声电子工业
- 2003 年 (昆山光电园) 福仕电子材料
- 2004 年 ~2005 年 (中国深圳) 销售点: 深圳市泰伸科技、深圳市南瀛电子
- 2005 年 (昆山高新区) 昆山厚声电子科技
- 2009 年 (厦门翔安) 翔声科技 (厦门)
- 2014 年 (中国昆山) 昆山厚声光电科技
- 2016 年 (中国昆山) 销售总公司: 厚声国际贸易 (昆山)、厦门分公司、深圳分公司

泰国一厂 (Thailand 1988)

厦门厂 (Xiamen 2009)



昆山福仕厂 (Kunshan 2003)

泰国二厂 (Thailand 2015)



Resistor

Resistors are used in all electronic circuits to limit current. Uni-royal production of the resistance products include thin-film, thick-film, metal oxide film, carbon film and winding technology of a single (discrete) resistors, cement-type high-power resistors and various special areas of custom resistors.

电阻器

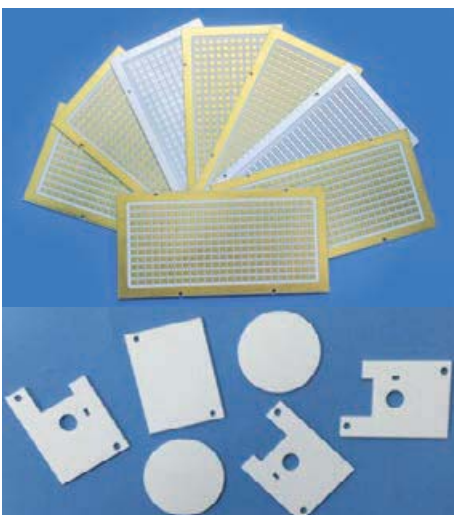
电阻器被用于所有的电子电路中来限制电流。厚声生产的电阻产品包括薄膜、厚膜、金属氧化物膜、碳膜和绕线技术的单个（分立）电阻器、水泥型大功率电阻器与各类特殊领域客制化电阻器。

Ceramic Materials

The world 's major manufacturers of high-quality materials suppliers, product including the resistance of the end products and semi-finished products; ceramic parts, cement resistance products shell; white porcelain rods, all kinds of traditional dip resistance matrix; component rods, other materials, film rods, tin-plated cap; all kinds of traditional dip resistor semi-finished products.

陶瓷材料

全球各大电阻厂商的优质材料供货商，产品包括电阻产品前段工艺和半成品；陶瓷件、水泥电阻产品外壳；白瓷棒、各类传统插件电阻基体；组分棒、各类传统插件电阻半成品；其他材料、着膜棒、镀锡铁帽、压帽白棒等。



To provide high-quality high-precision ceramic substrate to meet the consumer industry trends and high-end application requirements, used in high-end lighting industry, indoor and outdoor display and special lighting and other industries.

提供优质高精度陶瓷散热基板，满足消费行业发展趋势和高端应用需求，应用于高端照明行业、室内外显示屏及特殊照明等行业。



High-Precision Thin Film Chip Resistors-TC

The product uses precision thin film sputtering technology, By sputtering of high purity alloy target , the film structure is very compact & Ion arraying regular, With the excellent temperature stability and noise coefficient, high reliability, products can be widely used for medical equipment, precision measurement equipment, 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。

Anti-Sulfurized Thick Film Chip Resistors – NS

The resistor uses precision thick film printing technology; through the material and manufacture special process, the product has excellent corrosion resistance and anti-sulfurized performance, the product can be widely used in automotive electronics, petrochemical instrument, mining machinery, farm equipment and electronic equipment containing high sulfide gas zone.

抗硫化厚膜晶片电阻器

电阻采用精密厚膜印刷技术，通过特殊的材料及制做工艺，使产品具有极好的耐腐蚀性能及抗硫化性能，产品可广范应用于汽车电子，石化仪表，矿山机械，农场设备及含高硫化气体区域的电子设备。



A series of resistive networks and arrays in which multiple resistors are packaged together are also fabricated. Non-linear resistors for voltage rise due to temperature and voltage variations, as well as variable resistors, including potentiometers, Position sensors and electromagnetic encoders.

厚声生产将多个电阻封装在一起的电阻网络及排列电阻，另外还生产用于抑制由于温度和电压变化导致电压增高的非线性型电阻器，以及可变电阻器，包括电位器、调整器、位置传感器和电磁编码器。

High-Voltage Thick Film Chip Resistors-HV

The resistor uses precision thick film printing technology, By the special product design and manufacturing process, have superior to voltage performance, Superior Max. working voltage is more than 2 times normal thick film chip, Could save SMT cost & size, and can effectively reduce the size of the final equipment .

高压厚膜晶片电阻器

电阻采用精密厚膜印刷技术，通过特有的产品设计及制做工艺，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。



Metal Strip Current Sensing Chip Resistors - MS

The products uses photolithography technology allowing patterns to be transfer on the substrate. The resistor layer uses metal alloy which provides excellent temperature stability and temperature coefficient of 30PPM/°C or even lower. This enables the product to be widely used for precision current dividing circuit and power management applications.

金属带电流检测片式电阻器

产品采用黄光影像转移技术，在陶瓷基板上形成电阻路，具有极好的温度稳定性，温度系数 30PPM/°C，甚至可以做到更低，产品可广范用于电流检测电路及电源管理电路中。

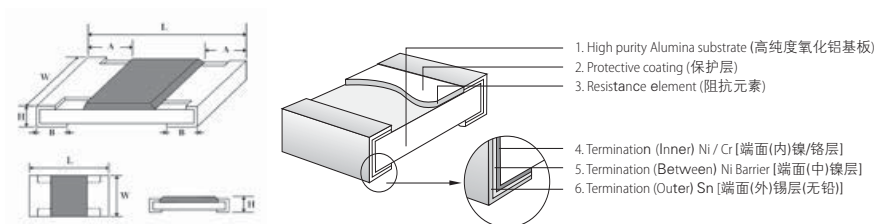
Product Name 名称	Product specifications 产品规格	Page
Thick Film Surface Mount Chip Resistors 厚膜表面贴装晶片电阻		
Ordinary Thick Film Resistors 普通厚膜晶片电阻器	01005, 0201, 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512	10
High Resistance Thick Film Resistors 高阻厚膜晶片电阻器	0603, 0805, 1206, 1210	13
High-Power Thick Film Chip Resistors-HP 高功率厚膜晶片电阻器	HP02, HP03, HP05, HP06, HP07, HP10, HP11, HP12, SP12	14
High-Voltage Thick Film Chip Resistors-HV 高压厚膜晶片电阻器	HV03, HV05, HV06, HV07, HV10, HV12	16
Anti-Surge Thick Film Chip Resistors-AS 抗浪涌厚膜晶片电阻器	AS03, AS05, AS06, AS07, AS10, AS12	18
High-Precision Anti-Surge Thick Film Chip Resistors-PS 高精度抗浪涌厚膜晶片电阻器	PS02, PS03, PS05, PS06, PS07, PS10, PS12	20
Low T.C.R Thick Film Chip Resistors - LT 低温度系数厚膜晶片电阻器	LT02, LT03, LT05, LT06	22
Wide Terminal Thick Film Chip Resistor-WR 宽电极厚膜晶片电阻器	WR08, WR12, WR18, WR20、WR25	24
Trimable Thick Film Chip Resistors-TR 可调厚膜晶片电阻器	TR03, TR05, TR06	26
Anti-Electro Static Discharge Thick Film Chip Resistors-ES 防静电膜晶片电阻器	ES01, ES02, ES03, ES05, ES06, ES07	28
Non-magnetic Thick Film Chip Resistors - NM 无磁厚膜晶片电阻器	NM02, NM03, NM05, NM06, NM12	30
Thick Film Surface Mount Lead Free Chip Resistors 厚膜表面贴装无铅晶片电阻		
Complete Pb-Free Thick Film Chip Resistor- PF 完全无铅厚膜晶片电阻器	PF0A, PF01, PF02, PF03, PF05, PF06, PF07, PF11, PF10, PF12	32
Thin Film Type Surface Mount Chip Resistors 薄膜类表面贴装晶片电阻		
High-Precision Thin Film Chip Resistors-TC 高精度薄膜晶片电阻器	TC02, TC03, TC05, TC06, TC07, TC10, TC12	34
Current Sensing Chip Resistors 电流检测晶片电阻器		
Current Sensing Chip Resistors-CS 晶片电流检测电阻器	CS02, CS03, CS05, CS06, CS07, CS10, CS11, CS12	36
Metal Strip Current Sensing Chip Resistors - MS 金属带电流检测片式电阻器	MS05, MS06, MS07, MS10, MS11, MS12, MS17, MS20, MS27	38
Ultra Low Chip Resistors-LR 超低晶片电阻器	LR06、LR10、LR12	40
Chip Resistors Shunt -RS 贴片分流电阻器	RS06、RS12、RS21、RS31	42
AEC-Q200 Relevant Provision Resistor AEC-Q200 相关条款电阻器		
Anti-Sulfurized Thick Film Chip Resistors (Automotive Grade) – NS 抗硫化厚膜晶片电阻器 (汽车级) – NS	NS01, NS02, NS03, NS05, NS06, NS07, NS10, NS12	44
AEC-Q200 Version Chip Resistors - HQ 汽车用晶片电阻器	HQ02, HQ03, HQ05, HQ06, HQ07, HQ10 , HQ12	46
High Quality Anti-Sulfurized Thick Film Chip Resistors - NQ 高品质抗硫化厚膜电阻器 -NQ	NQ01, NQ02, NQ03, NQ05, NQ06, NQ07, NQ10, NQ12	48
Anti-Sulfurized Thick Film Chip Resistor Array-Convex Terminal 抗硫化厚膜晶片排列电阻器	2S02, 4S02, 4S03	50
Array-Convex Terminal & Network Resistors 排列 & 网络电阻		
Chip Resistor Array 晶片排列电阻器	2F01, 4F01, 2C02, 4C02, 4C03, 2D02, 2D03, 4D02, 4D03, 4DP3, 16P8	52
Thick Film Chip Resistors Network 厚膜晶片网络电阻器	8R06, 8S06, 10P8, 10S8, 10T8, 10E9	54
Packing of Surface Mount Resistors 表面贴装式电阻器包装	Packing of Surface Mount Resistors	55
Through Hole Category-Film Resistors 插件类 - 膜层电阻		
Carbon Film Fixed Resistors 碳膜电阻器	CFR, CPR	57
Precision Metal Film Fixed Resistors 精密金属膜电阻器	MF	59
Power Metal Fixed Resistors 功率型金属膜固定电阻器	PMR	61
Metal Oxide Film Fixed Resistors 金属氧化膜固定电阻器	MOR	63
Terminal Type Metal Oxide Film Resistors 端片型金属氧化膜电阻器	TMOR, TMOV, TMOl	65
Metal Glaze Film Fixed Resistors 金属玻璃釉膜固定电阻器	MGR	66
Fusible Resistors 保险丝电阻器	FRN	68
Through Hole Category-Wire-wound Resistors 插件类 - 绕线电阻		
Wire-Wound Fixed Resistors 绕线型固定电阻器	KNP, KNH, KNS	70
Wire-Wound Non-Inductive Fixed Resistors 绕线型无感电阻器	KNPN	72
Wire-Wound Anti-Surge Fixed Resistors 绕线耐脉冲电阻器	KNPA	74
Wire-Wound Fusible Resistors 绕线保险丝型电阻器	KNPU	76
Wire-Wound Power Resistors 高功率绕线型电阻器	WPR	78
Thermal Fusing Wire-wound Fixed Resistors 绕线型温度保险丝电阻器	TFR	80
Through Hole Category-Special type &Forming process Resistors 插件类 - 特殊型别 & 成型加工电阻		
Jumper Wires & Zero-Ohm Resistors 跳线及零欧姆电阻器	ZW, ZOC、ZOT	81
Copper Plated Steel Lead Wire Type & Cutting Type 铜包钢导线型及切割半成品型	CP, CO	82
Vertical Taping 立式编带	Panasert, Avisert (AVI-1, AVI-2, AVI-3)	83
M & F Forming Type (M 型 & F 型 < 成型 >)	F, F1, F2, F3, M, MB, MC, MK, T	86

Product Name 名称	Product specifications 产品规格	Page
Heat-Shrinkable Tube Wrapped Forming Type 套热缩管加工成型	TZ1, TZ2, TZ3, TM, TF	87
Carbon Film Leadless Fixed Resistors 碳膜无引线固定电阻器	MC12、MC24、MC27、MC39	89
Metal Film Leadless Fixed Resistors 金属膜无引线固定电阻器	M12、M24、M27、M39	90
Current Sense Resistors 电流检测电阻	CSRA、CSRB、CSRC、CSR D、CSRE、CSSA、CSSB、CSSC	93
Standard Packing of Coated Type Resistors 涂装型电阻器包装标准	Tape/Box, Tape/Reel, Bulk/Box	95
Thick Film Printing Through Hole Category-Network Resistors 厚膜印刷插件类 - 网络电阻		
Resistor Network - SIP Series 网络电阻器 - SIP 系列	RNL、RPL、RNM、RPH	104
Special Network -SIP Series 特殊网络电阻器 - SIP 系列	SN0001, SN0002, SN0003, SN0004, RCH, RCN, CNM, CNH	108
High Voltage Flat Resistors 高压扁平式电阻器	HFR	109
Through Hole Category-Traditional Cement Resistors 插件类 - 水泥电阻		
Axial Leaded Type Cement Fixed Resistors-PRW Series 轴向导线型水泥固定电阻器 -PRW 系列	PRW、PRWC、PRWC-1、PRWA	110
Radial Type Cement Fixed Resistors-PRM&PRS Series 立式水泥固定电阻器 -PRM&PRS 系列	PRM、PRMA、PRMB、PRM、PRMT、	112
Power Flat Alloy Resistors-PFA Series 功率型合金箔扁平电阻器 -PFA 系列	PFAS、PFAP、PFAT	114
Radial Terminal Type Cement Fixed Resistors-PRT&PRU Series 立式端片型水泥固定电阻器 -PRT&PRU 系列	PRU0、PRUA、PRUB、PRT0、PRTA、PRTB	116
Cement Power Type Resistors 水泥功率型电阻		
Radial Terminal Type Cement Fixed Resistors 立式端片型水泥固定电阻器	PRVA、PRVB、PRZA、PRZA-1、PRZA-2、PRZC、PRZC-1、PRZD	118
Terminal Type-With metal mounting bracket 立式端片型带金属安装支架	PRS、PRTC、PRTD、PRTM	119
Lead Type Cement Fixed Resistors 导线型水泥固定电阻器	PHF-1、PHF-2、PHF-3、PRWI	120
Power Dissipation Mount Fixed Resistors- 铝外壳电阻器	PDM、PDM-1、PDMS	121
High Power Wire-wound Aluminum Case Resistors 高功率绕线铝壳电阻器	HBWR、HEWR	122
Power Alloy Wire-wound Resistors- 功率合金绕线电阻器	QH、QL、QR、QRZG	124
Custom Resistors-Automotive 定制型电阻 - 汽车类		
Custom Resistors-Automotive-1 定制型电阻器 - 汽车 -1	BCR、ASSY	126
Custom Resistors-Automotive-2 定制型电阻器 - 汽车 -2	HFWR	127
Custom Resistors-Power Supply, Industrial Control 定制型电阻 - 电源、工控类		
Custom -Power Supply, Industrial Control-1 定制型电阻器 - 电源、工控 -1	PHF、FTR、TFRC	128
Custom -Power Supply, Industrial Control-2 定制型电阻器 - 电源、工控 -2	QHO、KNHW、KNHB	129
Custom -Power Supply, Industrial Control-3 定制型电阻器 - 电源、工控 -3	HPWR、HAWF	130
Custom -Power Supply, Industrial Control-4 定制型电阻器 - 电源、工控 -4	HAWR	131
Test Methods and Explanation 测试方法和注释		
Test Methods 检测方法		135
Standard Nominal Resistance Values 标准阻值		136
Explanation of Part No. System 料号系统注释		139
Standard Color Code System 标准色码系统		141
电阻材料 Resistor material		
Ceramic Rod 瓷棒	OPD、OSD	144
Capped Ceramic Rod 组帽瓷棒	OSC	146
Carbon Film Capped Ceramic Rod 碳膜组帽棒	CRC、CRD	148
Metal Film Capped Ceramic Rod 金属膜组帽棒	MFC、MFD	150
Metal Oxide Film Capped Ceramic Rod 金属氧化膜组帽棒	MOC、MOD	152
Metal Glaze Capped Ceramic Rod 玻璃釉膜组帽棒	MG C、MGD	154
Chemical Nickel - Plating Film Capped Ceramic Rod 化学沉积膜组帽棒	CNC、CND	156
Zero ohm Copper Plated Rod 瓷棒镀铜膜	ZOC	158
Zero ohm-Tinned Iron Rod 0Ω 镀锡铁棒	TOEO	158
Tin-Plated Steel Cap 铁帽	TOC	160
Ceramic Case 瓷壳	CKO、CGO	161
LED Ceramic Substrate LED 陶瓷基板		
Thin-Film Ceramic Substrate - DPC 薄膜陶瓷基板	114.3*114.3mm*0.25/0.28/0.38/0.5/1.0mm	165
Thick-Film Ceramic Substrate- DPC 厚膜陶瓷基板	114.3x114.3x0.5mm	168

Feature (特性)

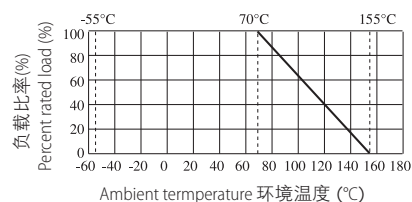
- Small size & light weight 短小轻薄
- Reduction of assembly costs and matching with placement machine.
可降低装置成本及配合机器组装
- Suitable for both wave & re-flow soldering. 适合波峰焊与回流焊
- Applications: Navigator (GPS), Mobile Phone, Telecom, PDA, Setbox, Meter.
应用于GPS, 移动电话, PDA, 机顶盒, 仪表

Figures (形状)



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	-	-	100V	300V	500V	500V	500V	500V	500V	500V
Operating Temperature 工作温度范围	-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	-55~+155°C

Type 类型		01005	0201	0402	0603	0805	1206	1210	1812	2010	2512
Dimension 尺寸	L(mm)	0.40±0.02	0.60±0.03	1.00±0.10	1.60±0.10	2.0±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}	2.60±0.20	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

Type 类型	01005	0201	0402	0603	0805	1206	1210	1812	2010	2512		
Power Rating at 70°C 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									
Resistance Range of 1%,2%(E-96) 1%,2% 的阻值范围 (E-96)	10Ω ~ 10MΩ	1Ω~ 10MΩ	0.1Ω~ 10MΩ	0.1Ω≤R< 10MΩ	0.02Ω ≤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			0.1Ω~ 10MΩ	0.1Ω≤R< 10MΩ	0.02Ω ≤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)

- For 01005, 0201, 0402 size, no marking on the body due to the small size of the resistor.
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字，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

153 = 15000Ω = 15KΩ

6R8

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

2372

2372 = 23700Ω = 23.7KΩ

3R24

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
Multiplier 指 数	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):

29B

1.96KΩ = 196 × 10¹ Ω = 29B

10X

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

122 = 1200 = 1.2 KΩ

680

680 = 68Ω

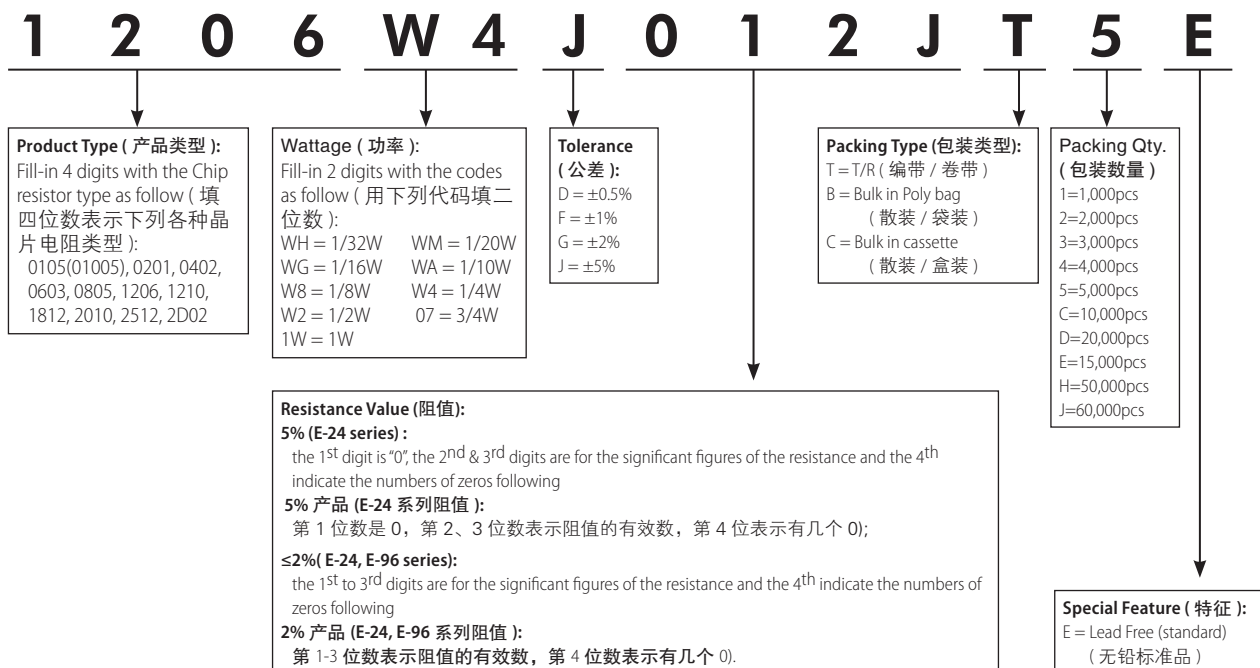
Performance Specifications (性能)

Temperature coefficient	温度系数	01005: $1\Omega \leq R \leq 10\Omega$: $\pm 600\text{ppm}/^\circ\text{C}$ $10\Omega < R \leq 100\Omega$: $\pm 400\text{ppm}/^\circ\text{C}$ $> 100\Omega$: $\pm 250\text{ppm}/^\circ\text{C}$	0805: $0.02\Omega < R \leq 0.030\Omega$: $\pm 1000\text{ppm}/^\circ\text{C}$ $0.03\Omega < R < 1\Omega$: $\pm 800\text{ppm}/^\circ\text{C}$ $1\Omega \leq R \leq 10\Omega$: $\pm 400\text{ppm}/^\circ\text{C}$ $> 10\Omega$: $\pm 100\text{ppm}/^\circ\text{C}$
		0201: $1\Omega \leq R \leq 10\Omega$: $-100 \sim +350\text{ppm}/^\circ\text{C}$ $> 10\Omega$: $\pm 200\text{ppm}/^\circ\text{C}$	1206, 1210, 1812, 2010, 2512: $0.01\Omega \leq R \leq 0.015\Omega$: $\pm 1500\text{ppm}/^\circ\text{C}$ $0.015\Omega < R \leq 0.03\Omega$: $\pm 1000\text{ppm}/^\circ\text{C}$ $0.03\Omega < R < 1\Omega$: $\pm 800\text{ppm}/^\circ\text{C}$ $1\Omega \leq R \leq 10\Omega$: $\pm 400\text{ppm}/^\circ\text{C}$ $> 10\Omega$: $\pm 100\text{ppm}/^\circ\text{C}$
Short-time overload	短时间过负荷	0402: $0.1\Omega \leq R < 1\Omega$: $\pm 800\text{ppm}/^\circ\text{C}$ $1\Omega \leq R \leq 10\Omega$: $\pm 400\text{ppm}/^\circ\text{C}$ $> 10\Omega$: $\pm 100\text{ppm}/^\circ\text{C}$	
		0603: $0.1\Omega \leq R < 1\Omega$: $\pm 800\text{ppm}/^\circ\text{C}$ $1\Omega \leq R \leq 10\Omega$: $\pm 400\text{ppm}/^\circ\text{C}$ $10\Omega < R \leq 100\Omega$: $\pm 200\text{ppm}/^\circ\text{C}$ $> 100\Omega$: $\pm 100\text{ppm}/^\circ\text{C}$	
Insulation resistance	绝缘电阻	$\geq 1,000\text{ M}\Omega$	
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	$\pm(1.0\% + 0.05\Omega)$ Max(最大).	
Soldering heat	耐焊接热	$\pm(1.0\% + 0.05\Omega)$ Max(最大).	
Solderability	可焊性	Min. 95% coverage (最少 95% 覆盖率)	
Temperature cycling	温度循环	$\pm 5\%$, $\pm 2\%$: $\pm(1.0\% + 0.05\Omega)$ Max(最大). $\pm 1\%$, $\pm 0.5\%$: $\pm(0.5\% + 0.05\Omega)$ Max(最大).	
Humidity (Steady State)	恒定湿热	$\pm 5\%$, $\pm 2\%$: $\pm(3.0\% + 0.1\Omega)$ Max(最大). $\pm 1\%$, $\pm 0.5\%$: $\pm(0.5\% + 0.1\Omega)$ Max(最大).	
Load life in humidity	湿度寿命	$\pm 5\%$, $\pm 2\%$: $\pm(3.0\% + 0.1\Omega)$ Max(最大). $\pm 1\%$, $\pm 0.5\%$: $\pm(1\% + 0.1\Omega)$ Max(最大).	
Load life	负载寿命	$\pm 5\%$, $\pm 2\%$: $\pm(3.0\% + 0.1\Omega)$ Max(最大). $\pm 1\%$, $\pm 0.5\%$: $\pm(1\% + 0.1\Omega)$ Max(最大).	

• 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)

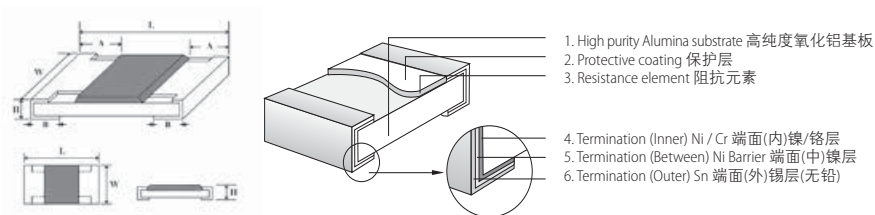
订购方式 (例如: 1206 1/4W 5% 1.2 Ω T/R-5000)



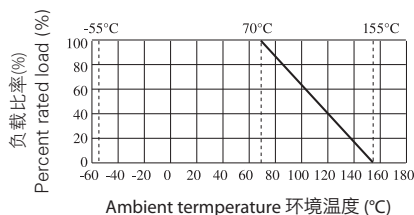
Feature (特性)

- High Resistance 高阻值
- Suitable for reflow & wave 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, 照相机快门等.

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
0603	75V	150V	300V	-55~+155°C
0805	150V	300V	500V	
1206	200V	400V	500V	
1210	200V	500V	500V	

Type 类型	Size 尺寸	Power (功率) (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range (阻值范围) 5% (E24)
0603	1608	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	10M~100M
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	2.60±0.20	0.55±0.10	0.50±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	±(2.0%+0.1Ω) Max (最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	Min 95% coverage (最少 95% 覆盖率)
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) Max (最大)
Temperature cycling	温度循环	±(1.0%+0.05Ω) Max (最大)
Load Life in humidity	湿度寿命	±(3.0%+0.1Ω) Max (最大)
Load life	负载寿命	±(3.0%+0.1Ω) Max (最大)
Humidity (steady state)	恒定湿热	±(3.0%+0.1Ω) Max (最大)
Insulation resistance	绝缘电阻	≥1,000 MΩ

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[1206W4F5231T5E](#) [1210W2J0620T5E](#) [201007J0822T4E](#) [0201WMF1005TCE](#) [0201WMF1212TCE](#) [0201WMF1373TCE](#) [0201WMF1400TCE](#)
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