

产品系列 Product Series

客户料号 Material ID	种类 Type	额定功率 Rated Power	阻值范围 Range		精度 Tol.	产品规格 Descriptions	备注 Remarks
			MIN	MAX			
	SQK	5W	1K Ω	500K Ω	$\pm 5\%$	SQK 5W **R J	Power Film
	SQK	10W	1 Ω	2000 Ω	$\pm 5\%$	SQK 10W **R J	wire wound
	SQK	10W	2K Ω	500K Ω	$\pm 5\%$	SQK 10W **K J	power film
	SQK	15W	1 Ω	500K Ω	$\pm 5\%$	SQK 15W **R J	
	SQK	20W	1 Ω	500K Ω	$\pm 5\%$	SQK 20W **K J	
	SQK	25W	1 Ω	500K Ω	$\pm 5\%$	SQK 25W **R J	
	SQK	30W	1 Ω	500K Ω	$\pm 5\%$	SQK 30W **K J	

说明 Remarks:

1. 1K Ω = 1,000 Ω ;
2. 如电阻有特殊要求, 需单独提供规格书;
If the requirements are special, the specification is special;

产品外观 Product appearance



I. 产品类别说明/Production Statement

1 订货方式/ How to order

依据产品种类、额定功率、特性、阻值、误差、加工/包装方式等分别注明。例如:

According the type, Power, features, resistance value, range, etc. e.g:

SQK	10W		10R	J	
种类	额定功率	特性	阻值	误差	包装方式
Type	Rated power	Feature	Resistance	Tolerance	Package

2 种类/Type

同向脚片式水泥功率电阻器用 SQK 表示。

This type cement resistor is called by SQK.

3 额定功率/Rated Power

额定功率(W)以数字表示.颖发公司常规功率范围为 5W ~ 50W.

Power(W) is marked with number. The power range of SQK made by YINGFA is from 5W to 50W.

4 特性/Feature

依据其 GB/T 5729:2003 或 IEC60115-1:2001 电气特性为适用原则

According to GB/T 5729:2003,or IEC60115-1:2001

根据不同的使用产品，选择不同的加工方式

Different productions with different manufacture methods.

如果客户方面有产品要求或产品图纸，根据产品图纸生产。

We can produce the resistors according to the requirements of CUSTOMER.

5 电阻值/ Resistance Value

Ω (R),K Ω (K)为单位,以电桥法测定,依据 GB/T 5729 为测定原则.

The unit of value is Ω (R),K Ω (K), which is according the method IEC60115-1.

5 误差范围/ Value Tolerance

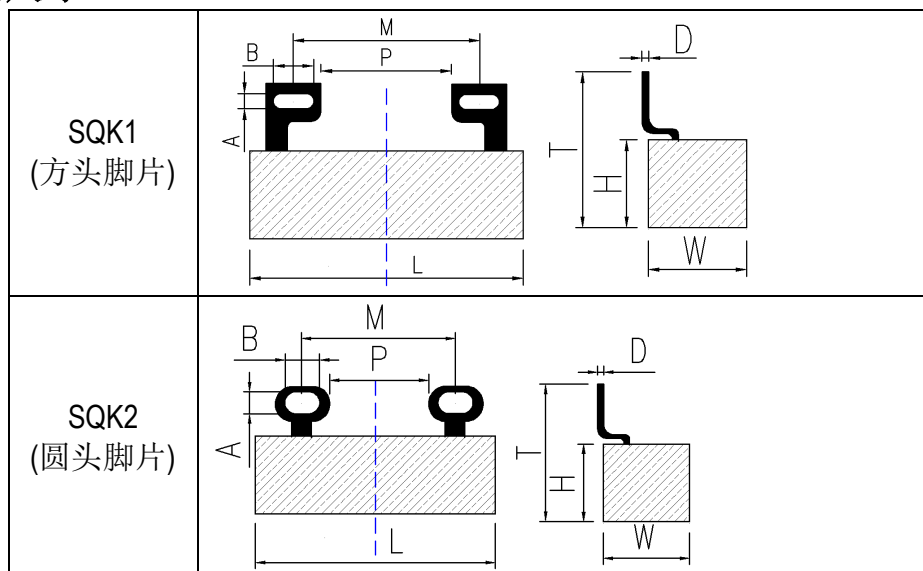
在室温中,采用电桥测量,电阻阻值应在指定的容许误差范围以内.

According to the measurement, the resistance value must be within the range.

代码 Code	误差范围 Tolerance	代码 Code	误差范围 Tolerance
F	$\pm 1\%$	J	$\pm 5\%$
G	$\pm 2\%$	K	$\pm 10\%$

II. 产品性能说明 Product performance specification

1 产品尺寸 Production dimension



种类 Type	阻值 Resistance	尺寸 Dimension(mm)								备注 Remarks
		L±2	W±1	H±1	T±2	D±0.1	M±2	P±2	A*B	
SQK1-7W	0.1~500KΩ	48	10	10	25	0.5	32	17	6*11	
SQK1-15W	0.1~500KΩ	48	12.5	12.5	26	0.5	32	17	6*11	
SQK1-20W	0.1~500KΩ	63	12.5	12.5	26	0.5	45	30	6*11	
SQK2-7W	0.1~500KΩ	48	10	10	25	0.5	32	20	6*8	
SQK2-15W	0.1~500KΩ	48	12.5	12.5	26	0.5	32	20	6*8	
SQK2-20W	0.1~500KΩ	63	12.5	12.5	26	0.5	45	32	6*8	

2 材料清单 (主要原材料清单) /Bills of materials(Major materials)

序号 Items	构成部件 Parts	材质与规格 Specifications	品牌或厂商 Brand/Manufacturer
1	电阻芯 Core	陶瓷棒/ceramic rod(wire wound)	
		磁棒/Magnet rod(power film)	
2	引脚/Pin	脚片/Fe-support coated by tin	
3	外壳 Shell	陶瓷外壳 Cement container	
4	填充物 Filling	石英砂 Quartz, 环氧树脂 epoxy	

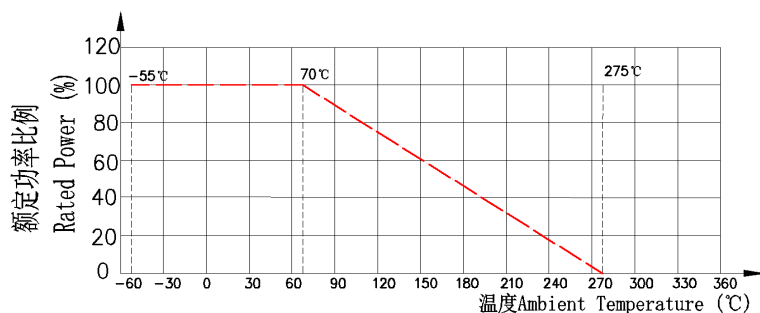
3 额定参数/ Rated Parameters

产品类别 Production Type	水泥电阻器 SQK SQK Cement Resistor
额定功率 Rated Power	5W ~ 50W
产品阻值及误差 Resistance & Tolerance	0.1 Ω ~ 500K Ω J(±5%)
使用温度范围 Ambient temperature	-55℃ ~ 200℃
使用环境 Atmosphere	大气压 P≥85Kpa, 湿度 H≤80%

3-1 额定功耗/ Attenuation of power

额定功率是周围温度 70℃ 以下(推荐工作区域), 可连续使用的负载功率的最大数值, 且应使机械性能与电气性能满足. 如周围温度超过 70℃ 时, 依照下图功率衰减曲线而定

Rated power is the highest value of overload power under 70℃ and continuous duty. At the same time, the overload power is fit for mechanical properties and electrical properties. When the temperature is over 70℃, the power is fade..



3-2 电压参数/Voltage parameters

额定功率 Rated Power	最高使用电压 Max working voltage	最高超载电压 Max overload voltage	绝缘耐压 Insulation voltage	阻值范围 Range
P<10W	Min(250V, $\sqrt{P \times R}$)	Min(450V, $\sqrt{10 \times P \times R}$)	1000V	0.1 Ω ~ 500K Ω
P≥10W	Min(350V, $\sqrt{P \times R}$)	Min(650V, $\sqrt{10 \times P \times R}$)	1500V	0.1 Ω ~ 500K Ω

3-3 额定电压补充说明/Rated Voltage

额定电压 U = $\sqrt{\text{额定功率} P \times \text{电阻值} R}$

Rated voltage U = $\sqrt{\text{Rated Power (P)} \times \text{Resistance Value (R)}}$

如额定电压超出最高使用电压,则以最高使用电压为连续使用额定电压。

If the rated-voltage > the highest-using-voltage, set the highest volage to be the rated voltage

4 机械特性/ Mechanical properties

4.1 引出端强度 Tail strength

按 GB/T 5729 4.16 条件,施加 20N 的拉力,时间 30 秒,电阻外形、内部结构无明显损伤。

Accroding to IEC60115-1 4.16:There is no damage form the resistor, under 20N pulling force, with 30s.

4.2 耐振性/ Resistance to vibration

按 GB/T 5729 4.22 条件,以 10~55HZ 和 0.75mm 的振幅均匀震动 6 小时,外形结构无可见损伤。

Accroding to IEC60115-1 4.22:There is no damage by frequency 10HZ~50HZ, vibration 0.75mm, time 6H.

4.3 耐焊接热/ Weldability

按 GB/T 5729 4.18.2 条件试验:电阻引出端浸入 350℃±5℃焊料中,时间为 3±0.5 秒,浸入深度距电阻体 2+0.05mm,电阻值变化在±(1%R+0.05Ω)内,外观无可见损伤。

According to IEC60115-1 4.18: Put the tail of resistor to tin heater, with temperature is 350℃±5℃, time is 3s±0.5s. depth is 2+0.05mm which is away from resistor. There is no damage, and the range of resistance value is in ±(1%R+0.05Ω).

4.4 可焊性/ Solderability

按 GB/T 5729 4.17 条件:测试焊料温度为 235℃±5℃,浸入焊料时间为 5±0.5 秒。接线端子处表面覆盖一层光滑明亮的焊料层;电阻引出端表面占焊率在 95%以上。

According to IEC60115-1 4.17: Immerge into the 235℃±5℃ tin stcve for 5s. The soldering area is over 95%.

5 电气性能/ Electrical properties

5.1 温度系数/ Temperature coefficient(Tcr)

按 GB/T 5729 4.8 条件,温度系数不超过±350PPM/℃

According to IEC60115-1 4.8,Tcr is in ± 350PPM/℃;

$$\text{温度系数 TCR} = \frac{R - R_0}{R_0} \times \frac{1}{T - T_0} \times 10^6 \quad \text{PPM/}^\circ\text{C}$$

R₀: 室温(T₀)时测试电阻阻值/Resistance of normal temperature(T₀).

R: 测试温度(T = T₀ + 100℃)时的阻值/Resistance of test temperature(T = T₀ + 100℃).

5.2 短时间过负载/ Overload voltage in short time

按 GB/T 5729 4.13 条件,额定功率 10 倍过负载(最高超载电压为上限),时间 5 秒,测试前后冷态阻值变化在±(2%R+0.1Ω)。

According to IEC60115-1 4.13: The range of resistance value is in ±(2%R+0.1Ω), under the time is 5s, and the voltage value is 10 times rated power, the upper limit is the max overload voltage.

5.3 绝缘电阻值/ Insulation resistance value

按 GB/T 5729 4.6 条件,将电阻器放在 V 型多属槽内试验,加载以 DC500V 的绝缘电压计测量。绝缘电阻值不低于 1000MΩ。

According to IEC60115-1 4.6: There is no damage with the test voltage DC500V, the value is over 1000MΩ.

5.4 绝缘耐压/ Withstand voltage

按 GB/T 5729 4.7 条件:以电阻两端导线置于 V 型槽上,加载绝缘耐压电压(3-2 项),时间 60S。无可见损伤,无燃烧,无飞弧击穿或飞弧有效电流<0.5mA。

According to IEC60115-1 4.7: There is no damage and no warning(current<0.5mA) with the insulation voltage (3-2 Item) for 60s,which is tested in the V-type testing container.

5.5 断续过负载/ Pulse overload

按 GB/T 5729 4.28 条件:额定电压*4 倍(但不超过负荷电压),通电 1S,断电 25S,反复 10000 次。

According to IEC60115-1 4.28:With 4 times rated voltage or max overload voltage(the lower one), testing 10000 cycles: power on for 1s, power off for 25s.

6 可靠性说明/ Reliability Description

6.1 耐久性(额定负荷) /Durability(Rated load)

按 GB/T 5729 4.25.2 条件, 在室温的环境温度下, 施加额定电压, 1 小时通电, 0.5 小时断电, 如此循环。1000 小时以后, 电阻外观无可见损伤, 阻值变化在 $\pm(5\%R+0.1\Omega)$ 以内。

According to IEC60115-1 4.25: Under the normal temperature, load the rated voltage to the resistor, with the cycle of 1H on and 30min off. After 1000H testing, there is no damage to the resistor, and the range of resistor value is in $\pm(5\%R+0.1\Omega)$.

6.2 耐久性(耐湿负荷) / Durability(Humidity rated load)

按 GB/T 5729 4.25 条件, 在相对湿度为 90~95%, 温度为 40°C 的环境下, 将电阻置于恒温恒湿槽中加额定电压, 60 分钟通, 30 分钟断, 循环试验。1000 小时以后, 电阻器外观无明显损伤, 阻值变化在 $\pm(5\%R+0.1\Omega)$ 以内。

According to IEC60115-1 4.25: Under the 40°C temperature and the 90~95 % humidity, load the rated voltage to the resistor in a box, with the cycle of 1H on and 30min off. After 1000H testing, there is no damage to the resistor, and the range of resistor value is in $\pm(5\%R+0.1\Omega)$.

6.3 温度快速变化/ Quick temperature variation

按 GB/T 5729 4.19 条件, 电阻在 -25°C 环境下放置 30 分钟, 放入 25°C 环境 30 分钟, 放入 125°C 环境 30 分钟, 放入 25°C 环境 30 分钟, 经过这样 5 次循环后, 电阻外观无明显损伤, 阻值变化在 $\pm(2\%R+0.1\Omega)$ 以内。

According to IEC60115-1 4.19: Under the 5 cycles of the -25°C with 30min, 25°C with 30min, 125°C with 30min, and the 25°C with 30min, there is no damage to the resistor, at the same time, the range of resistance value is in $\pm(2\%R+0.1\Omega)$.

6.4 耐振性/ Vibration

耐振试验后, 电阻变化率应在 $\pm(0.25\%+0.05\Omega)$ 以内, 无机械损伤。

After 6h vibrated testing, the shift resistance value is in the range of $\pm(0.25\%+0.05\Omega)$, and no damage.

6.5 不燃特性/Nonflammability

电阻加载 16 倍额定功率, 时间 5 分钟, 电阻不发生燃烧现象。

There is no fire for the resistor under the testing condition: load 16 times rated power, and the time is 5min.

6.6 表面温升/ The surface temperature rise

将电阻固定在 300mm*300mm*3.0mm 的散热铝板上, 对电阻加载额定功率的电压 60min, 电阻体表面温升不超过 450°C。

Mount the resistor to an aluminum heatsink plate of 300mm*300mm*3mm, and load the rated power to the resistor for 60min. The highest temperature of surface is less than 450°C.

6.7 可靠性检验标准/ Reliability standard

可焊性 Weldability Standard:	IEC60068-2-20
环境标准 Environment Standard:	SJ/T 11363-2006, ROHS 2011/65/EU
检验标准 QC standard:	MIL-STD-105E, GB/T 2828.1-2003
产品性能 Performance:	IEC60115-2008, GB/T5729-2003

III. 包装说明 Packaging Description

1 产品标识 / Production Logo

明确产品型号、品牌 LOGO、产周期、产品规格标识等。

Make sure the type, LOGO, brand, produce times, and so on:

2 符合 ROHS /REACH 申明 Meet ROHS/REACH standards

本产品材质均符合国家相关材质要求, 符合 ROHS 2011/65/EU 环保要求。

The products are fit to GB standards, and meet the standards of ROHS2011/65/EU.

3 包装说明/Package labels



深圳市颖发电子有限公司

SHENZHEN YINGFA ELECTRONICS CO.,LTD

应标明产品型号、名称、数量、生产日期、承制方名称及出厂检验章、符合 ROHS 标识。

Printed with TYPE, NAME, QUANTITY, PRODUCTION DATE, MANUFACTURER, QA LABEL, ROHS-marks.

内外标签盖 QA 检验章，标明生产日期 With QA-label inside/outside. With produced date

----- END -----