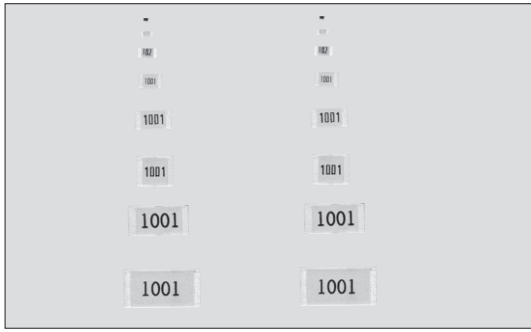


# THICK FILM (PRECISION)



## RK73H 矩形片式电阻器 (精密级) Flat Chip Resistors (Precision Grade)

矩形片式电阻器  
Flat Chip Resistors



外观颜色: 黑色 (1H)  
蓝色 (1E, 1J, 2A, 2B, 2E, W2H, W3A)  
Coating color: Black (1H),  
Blue (1E, 1J, 2A, 2B, 2E, W2H, W3A)

### 特点 Features

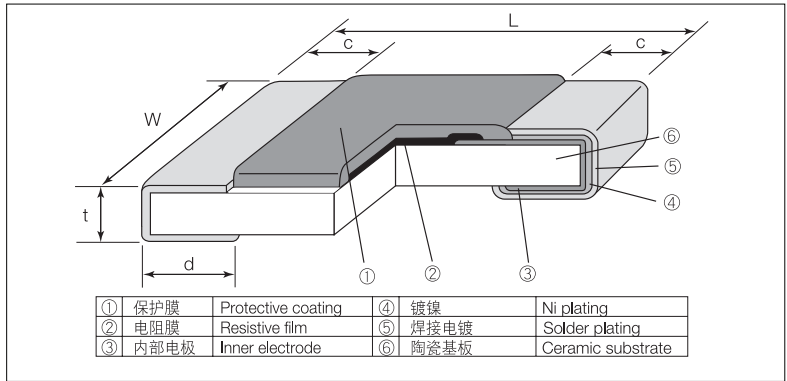
- 小型·轻量。
- 由于电阻保护膜使用了金属釉厚膜, 因此耐热性·耐候性良好。
- 电极三层结构, 具有稳定性和高信赖性。
- 对应编带、散装箱方式等各种自动安装机。
- 对应回流焊、波峰焊接。
- 端子无铅品, 对应欧盟RoHS。电极、电阻膜层、玻璃中所含铅玻璃, 不包含在欧盟RoHS指令中。
- Small size and light weight.
- Excellent heat resistance and weather resistance are ensured by the use of metal glaze thick film.
- High stability and high reliability with the triple-layer structure of electrode.
- Applicable to various kinds of automatic mounters for taping, etc.
- Suitable for both flow and reflow solderings.
- Products with lead free termination meet EU-RoHS requirements. EU-RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.

### 品名构成 Type Designation

实例 Example	实例 Example	实例 Example	实例 Example	实例 Example	实例 Example
RK73H	2B	T	TD	1002	F
品种 Product Code	额定功率 Power Rating	端子表面材质 Terminal Surface Material	二次加工 Taping	公称电阻值 Nominal Resistance	阻值允许偏差 Resistance Tolerance
	1F: 0.03W 1H: 0.05W 1E: 0.063W 1J: 0.1W 2A: 0.125W 2B: 0.25W 2E: 0.33W 0.5W W2H: 0.75W W3A: 1W	T: Sn G: Au <sup>※2</sup> (L: Sn/Pb <sup>※3</sup> )	TX: 4mm width-1mm pitch plastic embossed TA: 1mm pitch press paper TBL·TC·TCM: 2mm pitch press paper TPL·TP: 2mm pitch punch paper TD: 4mm pitch punch paper TE: 4mm pitch plastic embossed BK: Bulk	4 digits	D: ±0.5% F: ±1%

※2 镀金电极, 有1E、1J、2A (10Ω~1MΩ) 对应  
由于规格不同, 请到本公司商谈。  
※3 对于1F和1H类型, 端子表面材质只有T标记对应。  
※2 Products with gold plated electrodes are also available with 1E, 1J and 2A types (10Ω~1MΩ), so please consult with us.  
※3 With type 1F and 1H, only the symbol T is available as the terminal surface material.  
端子表面材质, 以无铅品为准。  
预知关于此产品含有的环境负荷物质详情 (除EU-RoHS以外), 请与我们联系。  
编带细节参照卷末附录C。  
The terminal surface material lead free is standard.  
For further information on taping, please refer to APPENDIX C on the back pages.

### 结构图 Construction

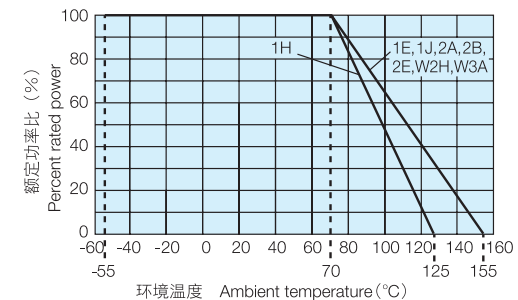


### 外形尺寸 Dimensions

型号 Type (Inch Size Code)	尺寸 Dimensions (mm)					Weight (g) (1000pcs)
	L	W	c	d	t	
1F (01005)	0.4±0.02	0.2±0.02	0.10±0.03	0.11±0.03	0.13±0.02	0.04
1H (0201)	0.6±0.03	0.3±0.03	0.1±0.05	0.15±0.05	0.23±0.03	0.14
1E (0402)	1.0 <sup>+0.1</sup> <sub>-0.05</sub>	0.5±0.05	0.2±0.1	0.25 <sup>+0.05</sup> <sub>-0.1</sub>	0.35±0.05	0.68
1J (0603)	1.6±0.2	0.8±0.1	0.3±0.1	0.3±0.1	0.45±0.1	2.14
2A (0805)	2.0±0.2	1.25±0.1	0.4±0.2	0.3 <sup>+0.2</sup> <sub>-0.1</sub>	0.5±0.1	4.54
2B (1206)	3.2±0.2	1.6±0.2	0.5±0.3	0.4 <sup>+0.2</sup> <sub>-0.1</sub>	0.6±0.1	9.14
2E (1210)		2.6±0.2				15.5
W2H (2010)	5.0±0.2	2.5±0.2		0.65±0.15		24.3
W3A (2512)	6.3±0.2	3.1±0.2		37.1		

※1 RK73H2H, RK73H3A 也可以对应  
※1 RK73H2H and RK73H3A are also available.

### 负荷特性曲线 Derating Curve



在环境温度70℃以上使用时, 应按照上图负荷特性曲线, 减小额定功率。  
For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

### 参考标准 Reference Standards

- IEC 60115-8
- JIS C 5201-8
- EIAJ RC-2134C

本样本手册中记载的产品规格如有变更, 恕不一一奉告。订购以及使用之前, 请仔细阅读规格表的内容。  
用于车载设备、医疗设备、航空设备以及其它涉及人身安全、或可能引起重大损失的设备上时, 请务必事先与我司联系。这些产品在这类用途中出现故障或失灵可能导致人身事故或严重损坏。  
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.  
Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment.  
Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

**■ 额定值 Ratings**

型号 Type	电阻温度系数 T.C.R. ( $\times 10^{-6}/K$ )	额定功率 Power Rating	电阻值范围 Resistance Range ( $\Omega$ )		最高使用电压 Max. Working Voltage	最高过电压 Max. Overload Voltage	二次加工和包装数 Packaging & Qty/Reel (pcs)								
			D: $\pm 0.5\%$ E24•E96	F: $\pm 1\%$ E24•E96			TX	TBL	TA	TC•TCM	TPL TP	TD	TE		
1F	$\pm 250$ $\pm 300$	0.03W	-	6.8k~1M <sup>※4</sup> 10~6.2k <sup>※4</sup>	15V	30V	40,000	20,000	-	-	-	-	-	-	
1H	$\pm 200$ $\pm 400$	0.05W	10~1M	10~10M <sup>※4</sup> 1.0~9.1 <sup>※4</sup>	25V	50V	-	-	35,000	TC : 10,000 TCM: 15,000	-	-	-	-	
1E	$\pm 100$ $\pm 200$	0.063W	10~1M	10~1M 1.0~9.76 1.02M~10M	50V	100V	-	-	-	-	TPL: 20,000 TP: 10,000	-	-	-	
1J	$\pm 100$ $\pm 200$	0.1W	10~1M	10~1M 1.0~9.76 1.02M~10M			-	-	-	-	-	TP: 10,000	5,000	-	-
2A	$\pm 100$ $\pm 200$ $\pm 400$	0.125W	10~1M	10~1M 1.0~9.76 1.02M~10M	150V	200V	-	-	-	-	TP: 10,000	5,000	4,000	-	
2B	$\pm 100$ $\pm 200$ $\pm 400$	0.25W	10~1M	10~1M 1.0~9.76 1.02M~5.6M 5.62M~10M	200V	400V	-	-	-	-	-	5,000	4,000	-	
2E	$\pm 100$	0.5W	10~1k	10~1k			-	-	-	-	-	-	5,000	4,000	-
	$\pm 200$	0.33W	1.02k~1M	1.02k~1M			-	-	-	-	-	-	-	-	-
	$\pm 400$	0.33W	-	1.0~9.76 1.02M~5.6M 5.62M~10M			-	-	-	-	-	-	-	-	-
W2H	$\pm 100$ $\pm 200$ $\pm 400$	0.75W	10~1M	10~1M 1.0~9.76 1.02M~5.6M 5.62M~10M	200V (500V $\times 5$ )	400V (500V $\times 5$ )	-	-	-	-	-	-	4,000	-	
W3A	$\pm 100$ $\pm 200$ $\pm 400$	1.0W	10~1M	10~1M 1.0~9.76 1.02M~5.6M 5.62M~10M			-	-	-	-	-	-	-	4,000	-

额定环境温度 Rated Ambient Temperature : +70°C

使用温度范围 Operating Temperature Range: -55°C~+125°C (1H), -55°C~+155°C (1E•1J•2A•2B•2E•W2H•W3A)

 额定电压是 $\sqrt{\text{额定功率} \times \text{公称电阻值}}$ 所算出的值或表中最高使用电压两者中小的值为额定电压。

 Rated voltage =  $\sqrt{\text{Power Rating} \times \text{Resistance value or Max. working voltage, whichever is lower.}}$ 

 ※4 RK73H1H (F:  $\pm 1\%$ ) 及 RK73H1H ( $1\Omega \leq R \leq 9.1\Omega$ ,  $1.0M\Omega \leq R \leq 10M\Omega$ , F:  $\pm 1\%$ ) 的公称阻值为 E24。

※5 ( ) 内最大工作电压和最大负荷电压请和我们商议。

 ※4 The nominal resistance value for RK73H1H (F:  $\pm 1\%$ ) and RK73H1H ( $1\Omega \leq R \leq 9.1\Omega$ ,  $1.0M\Omega \leq R \leq 10M\Omega$ , F:  $\pm 1\%$ ) is E24.

※5 Please consult with us about the Max. working voltage and the Max. overload voltage with ( ).

**■ 性能 Performance**

试验项目 Test Items	标准值 Performance Requirements $\Delta R \pm (\% + 0.05 \Omega)$		试验方法 Test Methods
	保证值 Limit	代表值 Typical	
电阻值 Resistance	在规定的允许偏差内 Within specified tolerance		25°C
电阻温度系数 T.C.R.	在规定的允许偏差内 Within specified T.C.R.		+25°C/-55°C and +25°C/+125°C
过载 (短时间) Overload (Short time)	2	1: 1F 0.5: another	额定电压 $\times 2.5$ 倍施加5秒钟 (2B: 额定电压 $\times 2$ 倍) Rated voltage $\times 2.5$ for 5s
耐焊接热 Resistance to soldering heat	1: 1E~W3A ( $10\Omega \leq R \leq 1M\Omega$ ) 3: 1E~W3A ( $R < 10\Omega$ , $R > 1M\Omega$ )	0.75: 1F, 1H ( $10\Omega \leq R \leq 1M\Omega$ ) 1: 1E~W3A ( $R < 10\Omega$ , $R > 1M\Omega$ ) 0.5: another	260°C $\pm 5^\circ\text{C}$ , 10s $\pm 1$ s
温度突变 Rapid change of temperature	1: 1F 0.5: another	0.5: 1F 0.3: another	-55°C (30min.) / +125°C (30min.) 100 cycles
耐湿负荷 Moisture resistance	2: 1J, 2A, 2B 3: another	0.75: 1J, 2A, 2B 1.5: 1F 1: another	40°C $\pm 2^\circ\text{C}$ , 90%~95%RH, 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
在70°C时的耐久性 Endurance at 70°C	2: 1J, 2A, 2B 3: another	0.75: 1J, 2A, 2B 1: another	70°C $\pm 2^\circ\text{C}$ , 1000h 1.5小时ON、0.5小时OFF的周期 1.5h ON/0.5h OFF cycle
高温放置 High temperature exposure	1	0.5: 1F 0.3: another	+125°C, 1000h: 1F, 1H +155°C, 1000h: 1E, 1J, 2A, 2B, 2E, W2H, W3A

**■ 使用注意事项 Precautions for Use**

- 片状电阻器的基材是氧化铝，由于和安装基板的热膨胀系数不同，在反复施加热循环等热应力时，连接部的焊缝会发生裂纹。特别是大型尺寸W2H/W3A，由于热膨胀大，而且本身发热也大，使环境温度变动有较大反复时，载荷的ON/OFF有反复时，需要注意裂纹的发生。用环氧树脂印刷电路板 (FR-4)，在使用温度范围的上、下限进行一般性的热循环试验时，1H~2E的类型不容易发生裂纹，而W2H/W3A型则有容易发生裂纹的倾向。因热应力而发生裂纹，取决于所安装的区域的大小、焊接量、安装基板的散热性等，因此应设想到环境温度的大的变化和载荷的ON/OFF那样的使用条件，充分注意后进行设计。
- RK73H1F在需要注意组装工序中的静电发生产品容易被打坏。
- The substrate of chip resistors is alumina. Cracks may occur at the connection of solder (solder fillet portion) due to the difference of the coefficient of thermal expansion from amounting board when heat stress like heat cycle, etc. are repeatedly given to them. Care should be taken to the occurrence of the cracks when the change in ambient temperature or ON/OFF of load is repeated, especially when large types of W2H/W3A which have large thermal expansion and also self heating. By general temperature cycle test using glass-epoxy (FR-4) boards under the maximum/minimum temperatures of operating temperature range, the crack does not occur easily in the types of 1H~2E, but the crack tends to occur in the types of W2H/W3A. The occurrence of the crack by heat stress may be influenced by the size of a pad, solder volume, heat radiation of mounting board etc., so please pay careful attention to designing when a big change in ambient temperature and conditions for use like ON/OFF of load can be assumed.
- Care should be taken that RK73H1F may be damaged when static electricity occurs and is applied in the equipment.