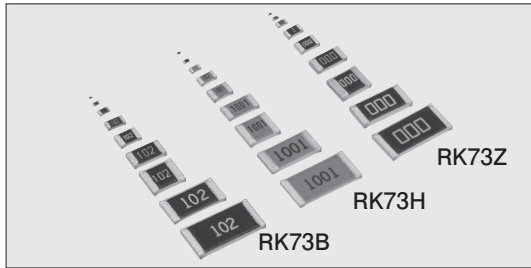


# THICK FILM (ANTI SULFURATION)



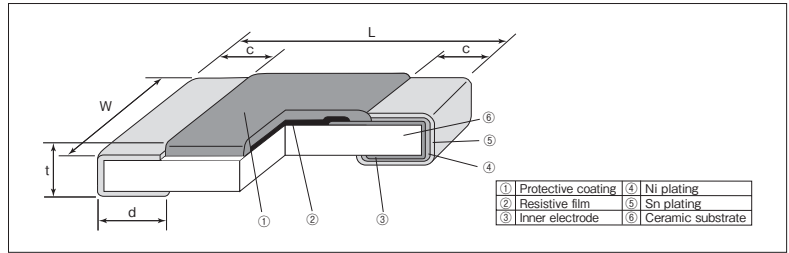
## RK73B·RK73H·RK73Z-RT ■ Flat Chip Resistors (Anti Sulfuration)



### Coating Color :

Black (RK73B 1F, 1H, 1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)  
 (RK73H 1F, 1H) (RK73Z 1J, 2A, 2B, 2E, W2H, W3A)  
 Blue (RK73H 1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)  
 Green (RK73Z 1H, 1E)

### ■ Construction



### ■ Dimensions

Type (Inch Size Code)	Dimensions (mm)					Weight(g) (1000pcs)
	L	W	c	d	t	
1F (01005)	0.4±0.02	0.2±0.02	0.1±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	0.5 ±0.3	0.6±0.1	4.54
2B (1206)	3.2±0.2	1.6±0.2	0.5 ±0.3			0.4 <sup>+0.1</sup> <sub>-0.1</sub>
2E (1210)		2.6±0.2		15.5		
W2H (2010)	5.0±0.2	2.5±0.2	0.65±0.15	0.65±0.15	0.6±0.1	24.3
W3A (2512)	6.3±0.2	3.1±0.2				37.1
W3A2 (2512) <sup>※1</sup>						

※1 Exemption RK73Z

### ■ Features

- Excellent anti-sulfuration characteristic due to using high sulfuration-proof inner top electrode material.
- 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.
- Suitable for both flow and reflow solderings.
- This products meet EU-RoHS requirements. EU-RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- AEC-Q200 Tested. (Exemption 1F)

### ■ Applications

- Car electronics, Power supply, Industrial robot

### ■ Reference Standards

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

### ■ Type Designation

#### Example

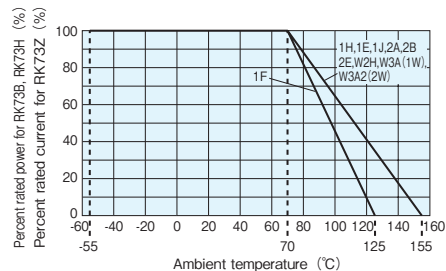
RK73H	2A	R	T	TD	1002	F
<b>Product Code</b>	<b>Power Rating</b>	<b>Characteristic</b>	<b>Terminal Surface Material</b>	<b>Taping</b>	<b>Nominal Resistance</b>	<b>Resistance Tolerance</b>
RK73B RK73H	1F: 0.03W 1H: 0.05W 1E: 0.1W 1J: 0.1W 0.125W 2A: 0.25W 2B: 0.25W 2E: 0.5W W2H: 0.75W W3A: 1W W3A2: 2W <sup>※3</sup>	R: Anti sulfuration	T: Sn	TX: 4mm width-1mm pitch plastic embossed TBL-TCM: 2mm pitch press paper TPL-TP: 2mm pitch punch paper TD: 4mm pitch punch paper TE: 4mm pitch plastic embossed BK: Bulk	RK73B: 3 digits RK73H: 4 digits	D: ±0.5% F: ±1% G: ±2% J: ±5%

RK73Z	2A	R	T	TD
<b>Product Code</b>	<b>Current Rating</b>	<b>Characteristic</b>	<b>Terminal Surface Material</b>	<b>Taping</b>
RK73Z	1H: 0.5A 1E: 1A 1J: 1A 2A: 2A 2B: 2A 2E: 2A W2H: 2A W3A: 2A	R: Anti sulfuration	T: Sn	TCM: 2mm pitch press paper TPL-TP: 2mm pitch punch paper TD: 4mm pitch punch paper TE: 4mm pitch plastic embossed BK: Bulk

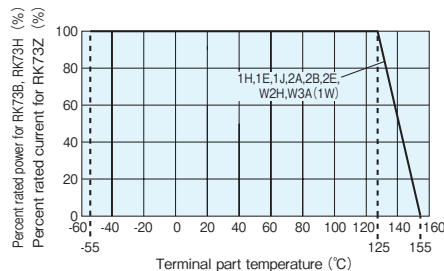
Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS. For further information on taping, please refer to APPENDIX C on the back pages.

### ■ Derating Curve

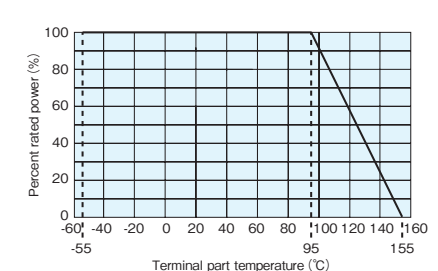
RK73B · RK73H · RK73Z-RT  
Ambient temperature



RK73B · RK73H · RK73Z-RT  
Terminal part temperature



RK73B · RK73H-RT  
Terminal part temperature W3A2



For resistors operated at an ambient temperature of 70°C or higher, the power (for RK73B, RK73H) or a current rating (for RK73Z) shall be derated in accordance with the above derating curve.

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.

※Please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog before use.

## Ratings

### RK73B, RK73H

Type	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. ( $\times 10^{-5}/K$ )	Resistance Range ( $\Omega$ )				Max. Working Voltage	Max. Overload Voltage	Packaging & Q'ty/Reel (pcs)						
					RK73H		RK73B				TX	TBL	TCM <sup>#5</sup>	TPL-TP	TD	TE	
					D : $\pm 0.5\%$ E24-E96	F : $\pm 1\%$ E24-E96	G : $\pm 2\%$ E24	J : $\pm 5\%$ E24									
1F	0.03W	70°C	-	$\pm 200$	-	100k~2M <sup>#2</sup>	100k~1M	100k~10M	20V	30V	40,000	20,000	-	-	-	-	
				$\pm 250$	-	10~91k <sup>#2</sup>	10~91k	10~91k									
				0~1300	-	1~9.1	1~9.1	1~9.1									
1H	0.05W	70°C	125°C	$\pm 200$	100~100k	100~1M	-	100~1M	25V	50V	-	-	15,000	-	-	-	-
				$\pm 250$	-	10~97.6	-	-									
				$\pm 300$	-	10~1M	-	10~91									
1E	0.1W	70°C	125°C	$\pm 200$	-	1.02M~10M	10~10M	1~10M	75V	100V	-	-	-	-	-	-	-
				$\pm 250$	-	1.02M~1M	-	-									
				$\pm 100$	100~1k	10~1k	-	-									
1J	0.1W 0.125W	70°C	125°C	$\pm 200$	-	1.02M~10M	1.1k~10M	1.1k~10M	150V	200V	-	-	-	-	-	-	-
				$\pm 250$	-	10~1k	-	-									
				$\pm 100$	100~1M	10~1M	-	-									
2A	0.25W	70°C	125°C	$\pm 200$	100~1M	10~1M	10~10M	1~10M	200V	400V	-	-	-	-	-	-	-
				$\pm 250$	-	1.02M~10M	10~10M	1~10M									
				$\pm 100$	100~1M	10~1M	-	-									
2B	0.25W	70°C	125°C	$\pm 200$	-	10~1M	-	-	200V	400V	-	-	-	-	-	-	-
				$\pm 250$	-	1.02M~10M	10~10M	1~10M									
				$\pm 100$	100~1M	10~1M	-	-									
2E	0.5W	70°C	125°C	$\pm 200$	-	10~1M	10~1M	1~1M	200V	400V	-	-	-	-	-	-	-
				$\pm 250$	-	10~1M	-	-									
				$\pm 100$	10~1M	10~1M	-	-									
W2H	0.75W	70°C	125°C	$\pm 200$	-	1~9.76 1.02M~10M	1~10M	1~10M	200V	400V	-	-	-	-	-	-	4,000
				$\pm 250$	-	10~1M	-	-									
				$\pm 100$	10~1M	10~1M	-	-									
W3A	1W	70°C	125°C	$\pm 200$	10~1M	10~1M	10~10M	1~10M	200V	400V	-	-	-	-	-	-	4,000
				$\pm 250$	-	1.02M~10M	10~10M	1~10M									
				$\pm 100$	10~1M	10~1M	-	-									
W3A2	2W <sup>#3</sup>	70°C	95°C	$\pm 200$	-	1.02M~10M	10~10M	1~10M	200V	400V	-	-	-	-	-	-	4,000
				$\pm 250$	-	10~1M	-	-									
				$\pm 100$	10~1M	10~1M	-	-									

Operating Temperature Range :  $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$  (1F),  $-55^{\circ}\text{C} \sim +155^{\circ}\text{C}$  (1H·1E·1J·2A·2B·2E·W2H·W3A·W3A2)

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

※2 The nominal resistance value for RK73H1F (F:  $\pm 1\%$ ) is E24.

※3 If you use at the rated power, please keep the condition that the terminal of the resistor is below the rated terminal part temperature. Please refer to the derating curves based on the terminal temperature of right side on the previous page.

※4 Standard packaging : TD(4mm pitch punch paper)

※5 Standard taping specification of 1H is TCM. Previously available "TC(10,000pcs/Reel)" is not recommended for new designs.

If any questions arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature" in your usage conditions, please give priority to the "Rated Terminal Part Temperature".

For more details, please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog.

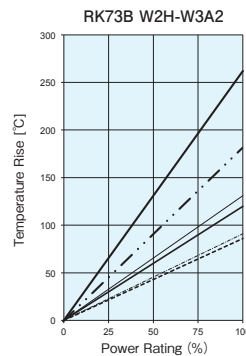
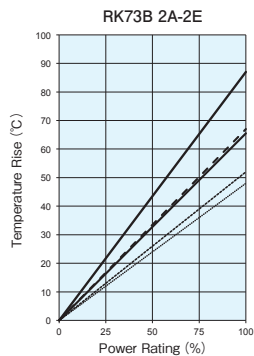
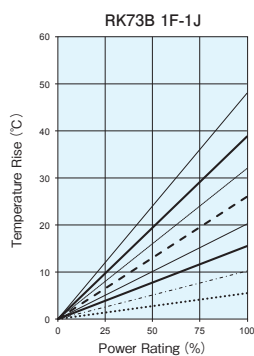
While using under high power, the temperature of the product may increase depending on the condition of heat dissipation from PCB.

Be sure to check the terminal part temperature as well as precautions to use on delivery specifications before use.

### RK73Z

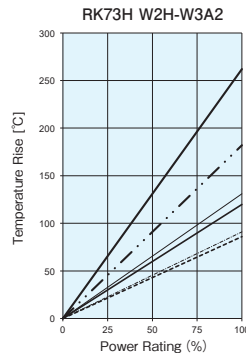
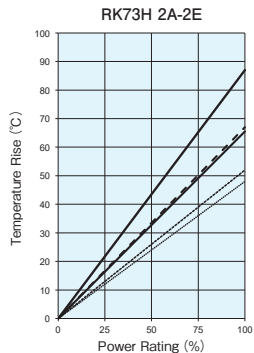
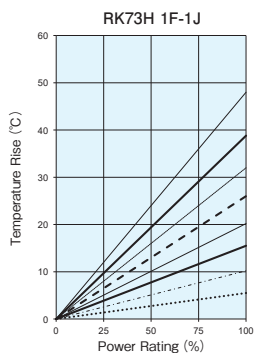
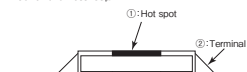
Type	Rated Ambient Temperature	Rated Terminal Part Temp.	Resistance	Current Rating	Max. Overload Current	Operating Temp. Range	Packaging & Q'ty/Reel (pcs)			
							TCM <sup>#5</sup>	TPL-TP	TD	TE
1H	70°C	125°C	100m $\Omega$ max.	0.5A	1A	$-55^{\circ}\text{C} \sim +155^{\circ}\text{C}$	15,000	-	-	-
1E	70°C	125°C	50m $\Omega$ max.	1A	2A		-	TPL: 20,000 TP: 10,000	-	-
1J							-	TP: 10,000 <sup>#4</sup>	5,000	-
2A	70°C	125°C	50m $\Omega$ max.	2A	10A		-	TP: 10,000 <sup>#4</sup>	5,000	4,000 <sup>#4</sup>
2B							-	-	5,000	4,000 <sup>#4</sup>
2E							-	-	5,000	4,000 <sup>#4</sup>
W2H							-	-	-	4,000
W3A	-	-	-	4,000						

## Temperature Rise

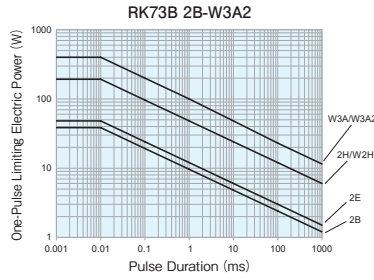
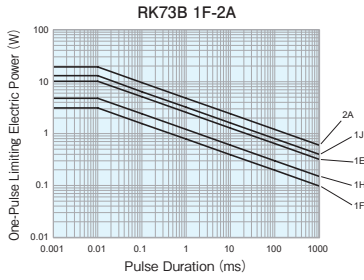


Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions.

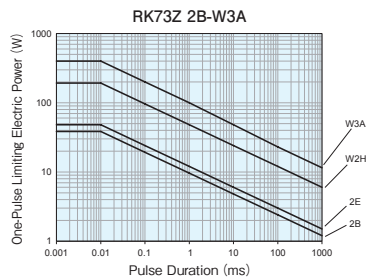
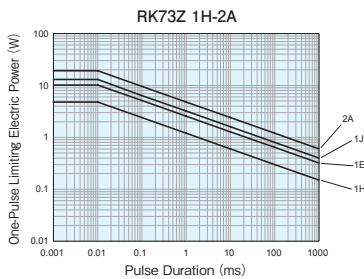
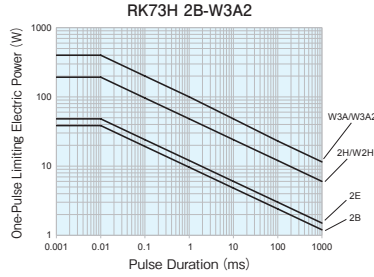
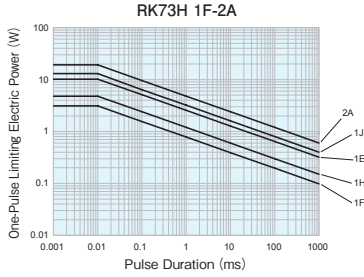
Measurement condition  
Room temperature: 25°C  
PCB: FR-4t = 1.6mm  
Cu foil thickness: 35 $\mu\text{m}$



## One-Pulse Limiting Electric Power



The maximum applicable voltage is equal to the max. overload voltage. Please ask us about the resistance characteristic of continuous applied pulse. The pulse endurance values are not assured values, so be sure to check the products on actual equipment when you use them.



Please ask us about the resistance characteristic of continuous applied pulse. Please calculate One-Pulse Limiting Electric Power using upper limit of resistance (50mΩ or 100mΩ) for applied current. The pulse endurance values are not assured values, so be sure to check the products on actual equipment when you use them.

## Performance

Test Items	RK73H, RK73B		RK73Z		Test Methods
	Performance Requirements	$\Delta R \pm (\% + 0.1 \Omega)$	Performance Requirements	Performance Requirements	
Resistance	Within specified tolerance	—	Limit $R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	Typical $R \leq 90m\Omega : 1H$ $R \leq 40m\Omega : \text{others}$	25°C
T.C.R.	Within specified T.C.R.	—	—	—	+25°C / -55°C and +25°C / +125°C
Overload (Short time)	2	1 : 1F 0.8 : others	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	$R \leq 90m\Omega : 1H$ $R \leq 40m\Omega : \text{others}$	RK73B, RK73H : Rated voltage $\times 2.5$ for 5s (1E, 2B, W3A2: Rated voltage $\times 2$ for 5s) Max. overload current, 5s
Resistance to soldering heat	1 : $10\Omega \leq R \leq 1M\Omega$ 3 : $R < 10\Omega, R > 1M\Omega$	1 : $R < 10\Omega, R > 1M\Omega$ 0.5 : others	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	$R \leq 90m\Omega : 1H$ $R \leq 40m\Omega : \text{others}$	260°C $\pm 5^\circ\text{C}$ , 10s $\pm 1$ s
Rapid change of temperature	1 : 1F 0.5 : others	0.5 : 1F 0.3 : others	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	$R \leq 90m\Omega : 1H$ $R \leq 40m\Omega : \text{others}$	-55°C (30min.) / +125°C (30min.) 100 cycles
Moisture resistance	2 : 1J, 2A, 2B 3 : others	0.75 : 1J, 2A, 2B 1.5 : 1F 1 : others	$R \leq 150m\Omega : 1H$ $R \leq 100m\Omega : \text{others}$	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	40°C $\pm 2^\circ\text{C}$ , 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle
Endurance at 70°C or rated terminal part temperature	2 : 1J, 2A, 2B 3 : others	0.75 : 1J, 2A, 2B 1 : others	$R \leq 150m\Omega : 1H$ $R \leq 100m\Omega : \text{others}$	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	70°C $\pm 2^\circ\text{C}$ or rated terminal part temperature $\pm 2^\circ\text{C}$ 1000h 1.5h ON/0.5h OFF cycle
High temperature exposure	1	0.5	$R \leq 150m\Omega : 1H$ $R \leq 100m\Omega : \text{others}$	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	+125°C, 1000h : 1F +155°C, 1000h : 1H, 1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2
Sulfuration test	5	0.3 : 1F, 1H 0.2 : others	$R \leq 150m\Omega : 1H$ $R \leq 100m\Omega : \text{others}$	$R \leq 100m\Omega : 1H$ $R \leq 50m\Omega : \text{others}$	Soaked in industrial oil with sulfur substance 3.5% contained 105°C $\pm 3^\circ\text{C}$ 500h

## Precautions for Use

- 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 a mounting 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/W3A2 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 1F~2E, but the crack tends to occur in the types of W2H/W3A/W3A2. 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 RK73B1F and RK73H1F may be damaged when static electricity occurs and is applied in the equipment assembly process.