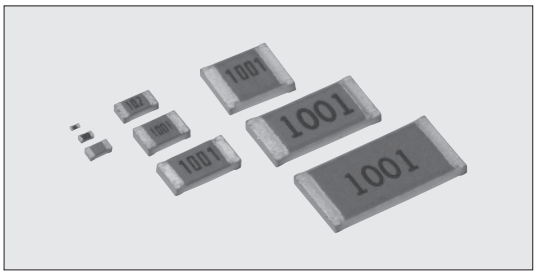
THICK FILM (PRECISION)

EU RoHS

RK73H Flat Chip Resistors (Precision Grade)



Coating color : Black (1F, 1H),
Blue (1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2)

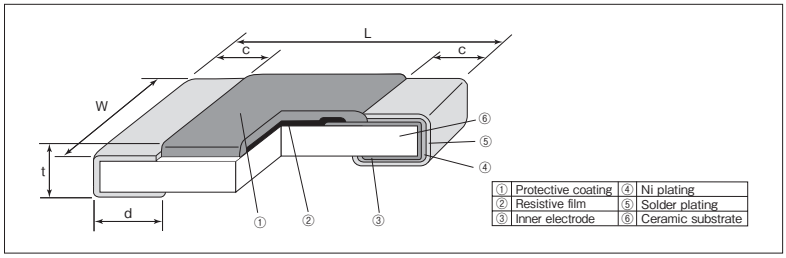
■Features

- 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.
- AEC-Q200 qualified (Exemption 1F).

■Reference Standards

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

■Construction



①	Protective coating	④	Ni plating
②	Resistive film	⑤	Solder plating
③	Inner electrode	⑥	Ceramic substrate

■Dimensions

Type (Inch Size Code)	Dimensions (mm) L	W	c	d	t	Weight (g) (1000pcs)
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)	$1.0^{+0.1}_{-0.05}$	0.5±0.05	0.2±0.1	$0.25^{+0.05}_{-0.1}$	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	$0.3^{+0.2}_{-0.1}$	0.5±0.1	4.54
2B (1206)	3.2±0.2	1.6±0.2	0.5±0.3	$0.4^{+0.2}_{-0.1}$	0.6±0.1	9.14
2E (1210)		2.6±0.2				15.5
W2H (2010) ※1	5.0±0.2	2.5±0.2		0.65±0.15		24.3
W3A (2512) ※1	6.3±0.2	3.1±0.2				37.1
W3A2 (2512) ※1						

※1 RK73H 2H, 3A and 3A2 are also still available (different "d" dimensions=$0.4^{+0.2}_{-0.1}$mm)

■Type Designation

Example

RK73H	2B	T	TD	1002	F
Product Code	Power Rating	Terminal Surface Material	Taping	Nominal Resistance	Resistance Tolerance
	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※5	T : Sn G : Au※2 (L : Sn/Pb※3)	TX : 4mm width-1mm pitch plastic embossed 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 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, 1H, W2H, W3A, W3A2 only T is available as the terminal surface material.
The terminal surface material lead free is standard.
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.

■Ratings

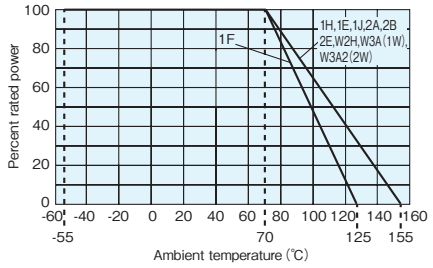
Type	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (×10⁻⁶/K)	Resistance Range (Ω) D:±0.5% E24・E96	F:±1% E24・E96	Max. Working Voltage	Max. Overload Voltage	Packaging & Q'ty/Reel (pcs) TX	TBL	TC・TCM	TPL・TP	TD	TE
1F	0.03W	70℃	—	±200	—	100k～2M※4	20V	30V	40,000	20,000	—	—	—	—
				±250		10～91k※4								
1H	0.05W	70℃	125℃	±200	10～1M	10～10M※4	25V	50V	—	—	TC : 10,000 TCM : 15,000	—	—	—
				±400	—	1～9.1※4								
1E	0.1W	70℃	125℃	±100	10～1M	10～1M	75V	100V	—	—	—	TPL : 20,000 TP : 10,000	—	—
				±200	—	1～9.76 1.02M～10M								
1J	0.1W	70℃	125℃	±100	1.02k～1M	1.02k～1M			—	—	—	TP : 10,000	5,000	—
				±200	—	1.02M～10M								
	0.125W			±100	10～1k	10～1k								
				±200	—	1～9.76								
2A	0.25W	70℃	125℃	±100	10～1M	10～1M	150V	200V	—	—	—	TP : 10,000	5,000	4,000
				±200	—	1～9.76								
				±400		1.02M～10M								
2B	0.25W	70℃	125℃	±100	10～1M	10～1M	200V	400V	—	—	—	—	5,000	4,000
				±200	—	1～9.76 1.02M～5.6M								
				±400		5.62M～10M								
2E	0.5W	70℃	125℃	±100	10～1M	10～1M			—	—	—	—	5,000	4,000
				±200	—	1～9.76 1.02M～5.6M								
				±400		5.62M～10M								
W2H	0.75W	70℃	125℃	±100	10～1M	10～1M			—	—	—	—	—	4,000
				±200	—	1～9.76 1.02M～5.6M								
				±400		5.62M～10M								
W3A	1W	70℃	125℃	±100	10～1M	10～1M	200V	400V	—	—	—	—	—	4,000
				±200	—	1～9.76 1.02M～5.6M								
				±400		5.62M～10M								
W3A2	2W※5	70℃	95℃	±100	10～1M	10～1M	200V	400V	—	—	—	—	—	4,000
				±200	—	1～9.76 1.02M～5.6M								
				±400		5.62M～10M								

Operating Temperature Range : −55℃～+125℃ (1F)、−55℃～+155℃ (1H・1E・1J・2A・2B・2E・W2H・W3A・W3A2)
Rated voltage= $\frac{\text{Power Rating} \times \text{Resistance value or Max. working voltage, whichever is lower.}}{\text{Max. working voltage}}$
For flat chip jumper resistor, please refer to RK73Z series.
※4 The nominal resistance value for RK73H1F (F : ±1%) and RK73H1H (1Ω≦R≦9.1Ω, 1MΩ≦R≦10MΩ) is E24.
※5 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 next page.
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.

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 automotives, medical equipment and aerospace equipment.
Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

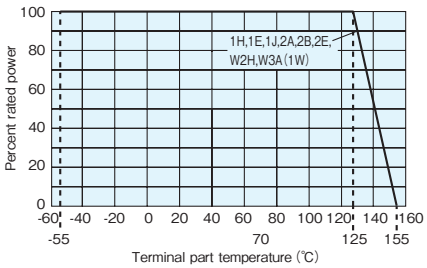
■Derating Curve

Ambient temperature



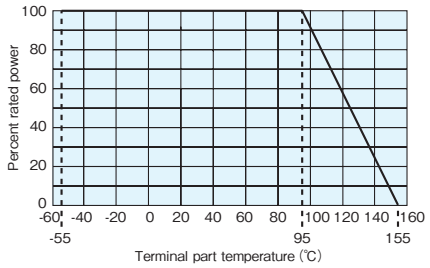
For resistors operated at an ambient temperature of 70℃ or higher, the power shall be derated in accordance with the above derating curve.

Terminal part temperature



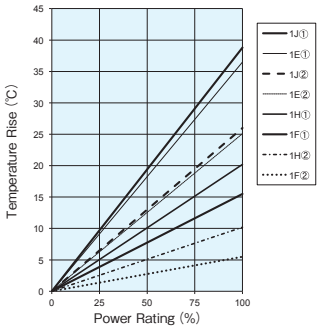
When the terminal part temperature of the resistor exceeds the rated terminal part temperature shown above, the power shall be derated according to the derating curve.
※Please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog before use.

Terminal part temperature
RK73H W3A2

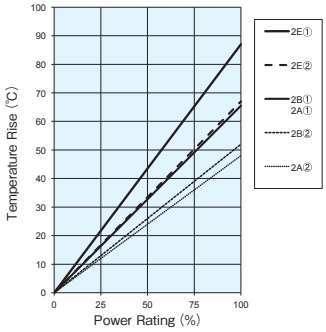


■Temperature Rise

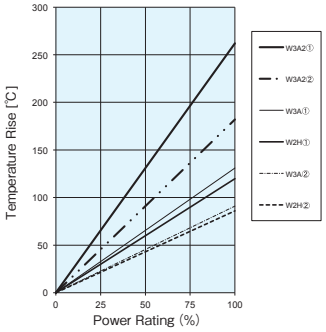
RK73H 1F-1J



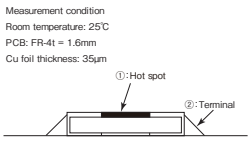
RK73H 2A-2E



RK73H W2H-W3A2

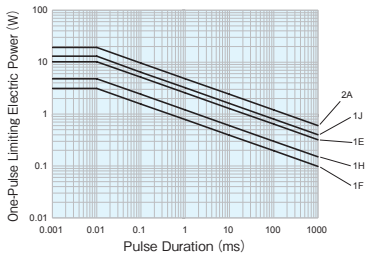


Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions.

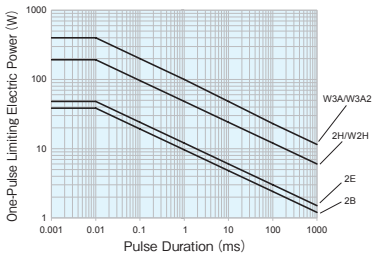


■One-Pulse Limiting Electric Power

RK73H 1F-2A



RK73H 2B-W3A2



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.

■Performance

Test Items	Performance Requirements ΔR± (%+0.1Ω)		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	25℃
T.C.R.	Within specified T.C.R	—	+25℃/−55℃ and +25℃/+125℃
Overload (Short time)	2	1 : 1F 0.5 : others	Rated voltage×2.5 for 5s (1E, 2B, W3A2 : Rated voltage×2 for 5s)
Resistance to soldering heat	1 : 1F~W3A (10Ω≦R≦1MΩ) 3 : 1H~W3A (R<10Ω, R>1MΩ)	0.5 : 1F~W3A (10Ω≦R≦1MΩ) 1 : 1H~W3A (R<10Ω, R>1MΩ)	260℃±5℃, 10s±1s
Rapid change of temperature	1 : 1F 0.5 : others	0.5 : 1F 0.3 : others	−55℃ (30min.) /+125℃ (30min.) 100 cycles
Moisture resistance	2 : 1J, 2A, 2B 3 : others	0.75 : 1J, 2A, 2B 1.5 : 1F 1 : others	40℃±2℃, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle
Endurance at 70℃ or rated terminal part temperature	2 : 1J, 2A, 2B 3 : others	0.75 : 1J, 2A, 2B 1 : others	70℃±2℃ or rated terminal part temperature ±2℃ 1000h 1.5h ON/0.5h OFF cycle
High temperature exposure	1	0.5 : 1F 0.3 : others	+125℃, 1000h : 1F +155℃, 1000h : 1H, 1E, 1J, 2A, 2B, 2E, W2H, W3A, W3A2

■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 RK73H1F may be damaged when static electricity occurs and is applied in the equipment.

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 automotives, medical equipment and aerospace equipment.
Malfunction or failure of the products in such applications may cause loss of human life or serious damage.