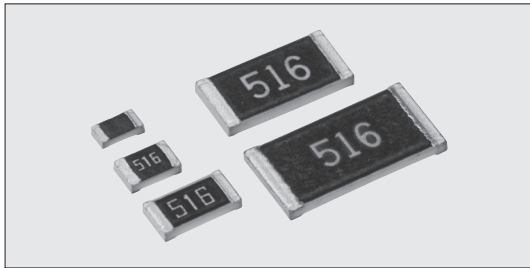


# THICK FILM (FOR HIGH VOLTAGE)

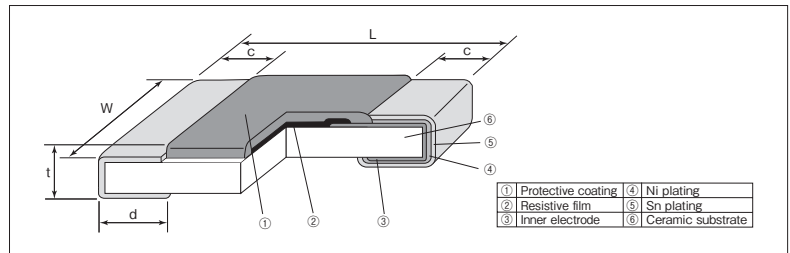


## HV73 Flat Chip Resistors For High Voltage



Coating color : Black

### Construction



### Features

- Superior to RK73 series in maximum working voltage.
- Suitable for flow and reflow solderings.
- Products meet EU-RoHS requirements. EU-RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.

### Applications

- Camera Strobe, LCD back-light, AC Adapters etc.

### Reference Standards

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

### Dimensions

| Type<br>(Inch Size Code) | Dimensions (mm) |          |         |                                     |       | Weight (g)<br>(1000pcs) |
|--------------------------|-----------------|----------|---------|-------------------------------------|-------|-------------------------|
|                          | L±0.2           | W        | c       | d                                   | t±0.1 |                         |
| 1J (0603)                | 1.6             | 0.8±0.1  | 0.3±0.1 | 0.3±0.1                             | 0.45  | 2.14                    |
| 2A (0805)                | 2.0             | 1.25±0.1 | 0.4±0.2 | 0.3 <sup>+0.2</sup> <sub>-0.1</sub> | 0.5   | 4.54                    |
| 2B (1206)                | 3.2             | 1.6±0.2  | 0.5±0.3 | 0.4 <sup>+0.2</sup> <sub>-0.1</sub> | 0.6   | 9.14                    |
| 2H (2010)                | 5.0             | 2.5±0.2  |         |                                     |       | 24.3                    |
| 3A (2512)                | 6.3             | 3.1±0.2  |         |                                     |       | 37.1                    |

### Type Designation

Example

| Product Code | Power Rating  | Terminal Surface Material | Taping  | Nominal Resistance               | Resistance Tolerance                   |
|--------------|---|---------------------------|---|----------------------------------|--|
| HV73         | 2B  | T                         | TD  | 1004                             | F                                      |
|              | 1J:0.1W<br>2A:0.25W<br>2B:0.25W<br>2H:0.5W<br>3A:1W | T : Sn                    | TD: 4mm pitch punch paper<br>TE: 4mm pitch plastic embossed<br>BK: Bulk | D, F: 4 digits<br>G, J: 3 digits | D: ±0.5%<br>F: ±1%<br>G: ±2%<br>J: ±5% |

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.<br>(×10 <sup>-6</sup> /K) | Resistance Range (Ω) |                  |              |              | Max. Working Voltage | Max. Overload Voltage (D.C.) <sup>※1</sup> | Taping & Q'ty/Reel (pcs) |       |
|------|--------------|---------------------|---------------------------|----------------------------------|----------------------|------------------|--------------|--------------|----------------------|--|--------------------------|-------|
|      |              |                     |                           |                                  | D:±0.5%<br>E24·E96   | F:±1%<br>E24·E96 | G:±2%<br>E24 | J:±5%<br>E24 |                      |  | TD                       | TE    |
|      |              |                     |                           |                                  | 1J                   | 0.1W             | 70°C         | 80°C         |                      |  | ±100 <sup>※2</sup>       | —     |
| 2A   | 0.25W        | 70°C                | 100°C                     | ±100                             | 100k~1M              | 100k~10M         | 100k~10M     | 100k~10M     | 400V                 | 800V                                       | 5,000                    | —     |
|      |              |                     |                           | ±200                             | —                    | —                | —            | 11M~51M      |                      |  |                          |       |
| 2B   | 0.25W        | 70°C                | 100°C                     | ±100                             | 100k~1M              | 100k~10M         | 100k~10M     | 100k~10M     | 800V                 | 1000V                                      | 5,000                    | —     |
|      |              |                     |                           | ±200                             | —                    | —                | —            | 11M~51M      |                      |  |                          |       |
| 2H   | 0.5W         | 70°C                | 90°C                      | ±100                             | 100k~1M              | 100k~10M         | 100k~10M     | 100k~10M     | 2000V(D.C.)          | 3000V                                      | —                        | 4,000 |
|      |              |                     |                           | ±200                             | —                    | 10.2M~51M        | 11M~51M      | 11M~51M      |                      |  |                          |       |
|      |              |                     |                           | ±300                             | —                    | 51.1M~100M       | 56M~100M     | 56M~100M     |                      |  |                          |       |
| 3A   | 1W           | 70°C                | 105°C                     | ±100                             | 43k~1M               | 43k~10M          | 43k~10M      | 43k~10M      | 3000V(D.C.)          | 4000V                                      | —                        | 4,000 |
|      |              |                     |                           | ±200                             | —                    | 10.2M~20M        | 11M~20M      | 11M~51M      |                      |  |                          |       |

Operating Temperature Range : -55°C~+155°C

Rated voltage=√ Power Rating×Resistance value or Max. working voltage, whichever is lower.

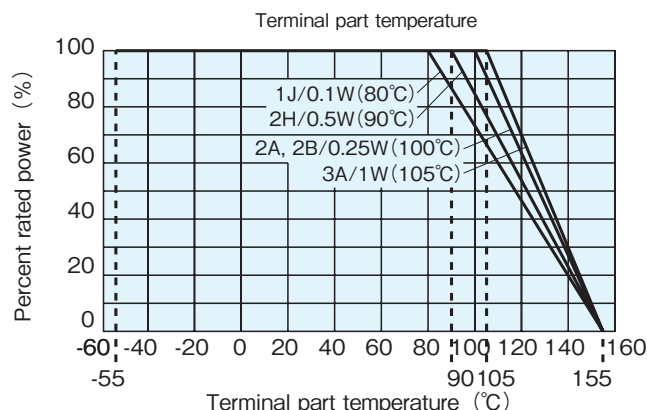
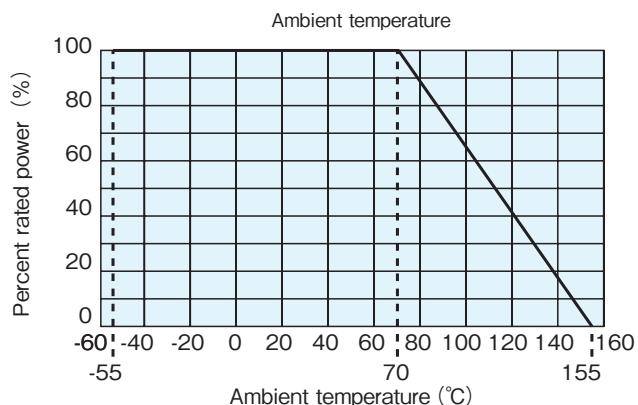
※1 Max. overload voltage is specified by D.C. voltage.

※2 Cold T.C.R. (-55°C~+25°C) of 1.02MΩ~10MΩ is ±200×10<sup>-6</sup>/K.

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.

## Derating Curve

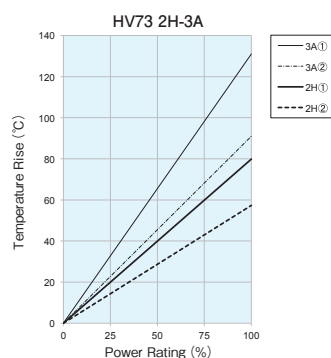
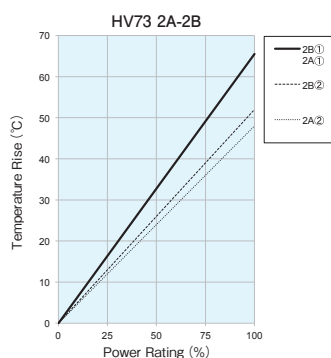
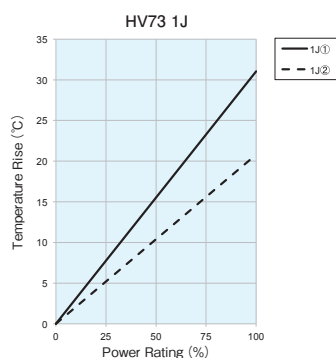


For resistors operated at an ambient temperature of 70°C or higher, the power shall be derated in accordance with the above derating curve.

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.

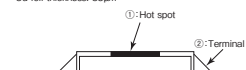
\*Please refer to "Introduction of the derating curves based on the terminal part temperature" on the beginning of our catalog before use.

## Temperature Rise

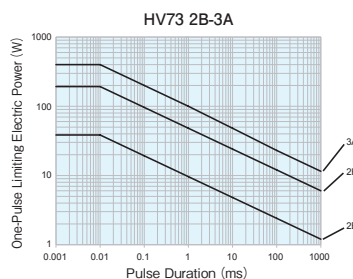
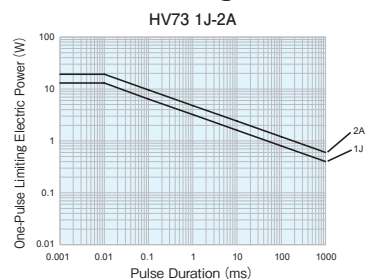


Regarding the temperature rise, the value of the temperature varies per conditions and board for use since the temperature is measured under our measuring conditions.

Measurement condition  
Room temperature: 25°C  
PCB: FR-4t = 1.6mm  
Cu foil thickness: 35µm



## 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.

## Performance

| Test Items   | Performance Requirements $\Delta R \pm$ (%+0.1Ω)  |   | Test Methods   |
|--|---|---|--|
|  | Limit   | Typical   |  |
| Resistance   | Within specified tolerance                        | —   | 25°C   |
| T.C.R.   | Within specified T.C.R.                           | —   | +25°C/-55°C and +25°C/+125°C   |
| Overload (Short time)                                | 2   | 0.5   | Rated voltage (D.C.) × 2.5 for 5s  |
| Resistance to soldering heat                         | 1   | 0.5   | 260°C±5°C, 10s±1s  |
| Rapid change of temperature                          | 0.5 : (10kΩ ≤ R ≤ 10MΩ)<br>1 : (10MΩ < R ≤ 100MΩ) | 0.3 : (10kΩ ≤ R ≤ 10MΩ)<br>0.5 : (10MΩ < R ≤ 100MΩ) | -55°C (30min.) / +125°C (30min.) 100 cycles                                      |
| Moisture resistance                                  | 2   | 0.75  | 40°C±2°C, 90%~95%RH, 1000h<br>1.5h ON/0.5h OFF cycle                             |
| Endurance at 70°C or rated terminal part temperature | 2   | 0.75  | 70°C±2°C or rated terminal part temperature ±2°C 1000h<br>1.5h ON/0.5h OFF cycle |
| High temperature exposure                            | 2   | 0.3   | +155°C, 1000h  |

## Precautions for Use

- Max. overload voltage is specified by D.C. voltage. When using in A.C. voltage, the peak value of A.C. voltage shall not exceed the Maximum overload voltage.
- 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 2H/3A 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 1J~2B, but the crack tends to occur in the types of 2H/3A. 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.