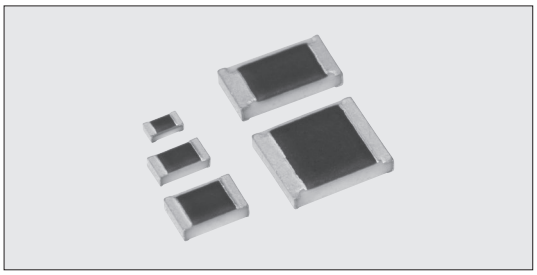
EU RoHS

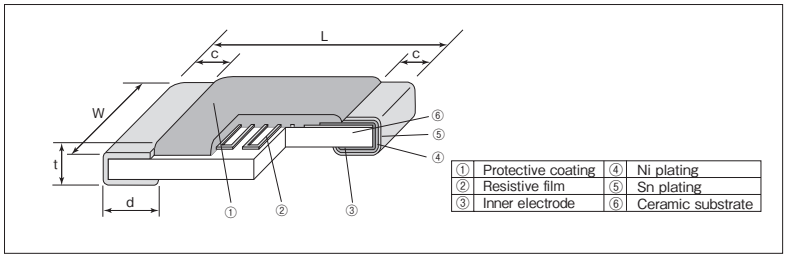
Flat Chip Resistors

RN73R Metal Film Flat Chip Resistors (High reliability)



Coating color : Black

■Construction



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

■Features

- SMD metal film resistors.
- High precision type ±0.05% is also available as standard.
- High performance T.C.R. $\pm 5\times10^{-6}$/K is also available as standard.
- Low current noise.
- Operating temperature range ～155℃.
  Rated ambient temperature : 85℃
- High reliability with ΔR of ±0.1%～±0.25% in the long-term reliability test.
- Endurance at 85℃ (1,000h) : ΔR of ±0.1%
- Improved moisture resistance by high humidity protective coating.
- Suitable for control circuits in various industrial equipment.
- Suitable for both flow and reflow solderings.
- Products meet EU-RoHS requirements.
- AEC-Q200 Tested.
- Sulfur resistance verified according to ASTM B 809-95.

■Applications

- Automotive electronics
- Industrial equipment
- Measurement equipment

※For higher precision, RN73H series is available.

■Reference Standards

IEC 60115-8
JIS C 5201-8
EIAJ RC-2133A

■Dimensions

Type (Inch Size Code)	Dimensions (mm) L	W	c	d	t	Weight (g) (1000pcs)
1E (0402)	$1.0^{+0.1}_{-0.05}$	0.5±0.05	0.25±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±0.2	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)		2.5±0.2				14.5

■Type Designation

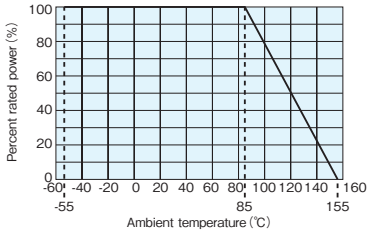
Example

RN73R	2B	T	TD	1002	B	25
Product Code	Power Rating	Terminal Surface Material	Taping	Nominal Resistance	Resistance Tolerance	T.C.R. (×10⁻⁶/K)
	1E:0.063W 0.1W 1J:0.1W 0.125W 2A:0.125W 0.25W 2B:0.25W 0.4W 2E:0.25W 0.5W	T:Sn	TP:2mm pitch punch paper TD:4mm pitch paper TE:4mm pitch plastic embossed BK:Bulk	4 digits	A:±0.05% B:±0.1% C:±0.25% D:±0.5% F:±1%	05 10 25 50 100

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.

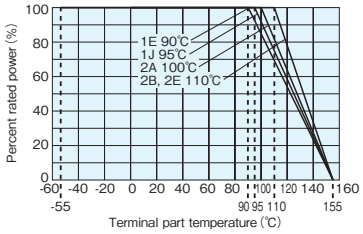
■Derating Curve

Ambient temperature

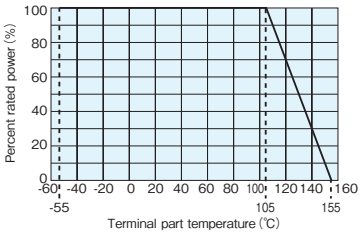


For resistors operated at an ambient temperature of 85℃ or higher, the power shall be derated in accordance with the above derating curve.

Terminal part temperature (Standard mode)



Terminal part temperature (Power mode)



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

Type	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (×10⁻⁶/K)	Resistance Range (Ω) E24・E96・E192 A:±0.05%	B:±0.1%	C:±0.25%	D:±0.5%	F:±1%	Max. Working Voltage	Max. Overload Voltage	Taping & Q'ty/Reel (pcs) TP	TD	TE
1E	0.063W	85℃	90℃	±10	–	47~10k	47~10k	47~10k	47~10k	50V	100V	10,000	–	–
				±25	–	47~300k	47~300k	10~300k	10~300k					
				±50	–	47~300k	47~300k	10~300k	10~300k					
NEW	0.1W	85℃	105℃	±10	–	47~10k	47~10k	47~10k	47~10k	50V	100V	10,000	–	–
				±25	–	47~300k	47~300k	47~300k	47~300k					
				±50	–	47~300k	47~300k	47~300k	47~300k					
1J	0.1W	85℃	95℃	±5	100~59k	100~59k	–	–	–	75V	150V	–	5,000	–
				±10	47~59k	47~59k	47~59k	47~59k	47~59k					
				±25	47~59k	15~1M	15~1M	10~1M	10~1M					
				±50	–	15~1M	15~1M	10~1M	10~1M					
				±100	–	–	–	10~1M	10~1M					
NEW	0.125W	85℃	105℃	±5	100~59k	100~59k	–	–	–	75V	150V	–	5,000	–
				±10	47~59k	47~59k	47~59k	47~59k	47~59k					
				±25	47~59k	47~1M	47~1M	47~1M	47~1M					
				±50	–	47~1M	47~1M	47~1M	47~1M					
				±100	–	–	–	47~1M	47~1M					
2A	0.125W	85℃	100℃	±5	100~100k	100~100k	–	–	–	150V	300V	–	5,000	4,000
				±10	47~100k	47~100k	47~100k	47~100k	47~100k					
				±25	47~100k	15~1.5M	15~1.5M	10~1.5M	10~1.5M					
				±50	–	15~1.5M	15~1.5M	10~1.5M	10~1.5M					
				±100	–	–	–	10~1.5M	10~1.5M					
NEW	0.25W	85℃	105℃	±5	100~100k	100~100k	–	–	–	150V	300V	–	5,000	4,000
				±10	47~100k	47~100k	47~100k	47~100k	47~100k					
				±25	47~100k	47~1.5M	47~1.5M	47~1.5M	47~1.5M					
				±50	–	47~1.5M	47~1.5M	47~1.5M	47~1.5M					
				±100	–	–	–	47~1.5M	47~1.5M					
2B	0.25W	85℃	110℃	±5	100~300k	100~300k	–	–	–	200V	400V	–	5,000	4,000
				±10	47~300k	47~300k	47~300k	47~300k	47~300k					
				±25	47~300k	15~1M	15~1M	10~1M	10~1M					
				±50	–	15~1M	15~1M	10~1M	10~1M					
				±100	–	–	–	10~1M	10~1M					
NEW	0.4W	85℃	105℃	±5	100~300k	100~300k	–	–	–	200V	400V	–	5,000	4,000
				±10	47~300k	47~300k	47~300k	47~300k	47~300k					
				±25	47~300k	47~1M	47~1M	47~1M	47~1M					
				±50	–	47~1M	47~1M	47~1M	47~1M					
				±100	–	–	–	47~1M	47~1M					
2E	0.25W	85℃	110℃	±10	100~510k	100~510k	100~510k	100~510k	100~510k	200V	400V	–	5,000	4,000
				±25	51~510k	15~1M	15~1M	10~1M	10~1M					
				±50	–	15~1M	15~1M	10~1M	10~1M					
				±100	–	–	–	10~1M	10~1M					
NEW	0.5W	85℃	105℃	±10	100~510k	100~510k	100~510k	100~510k	100~510k	200V	400V	–	5,000	4,000
				±25	51~510k	47~1M	47~1M	47~1M	47~1M					
				±50	–	47~1M	47~1M	47~1M	47~1M					
				±100	–	–	–	47~1M	47~1M					

Operating Temperature Range：−55℃～+155℃

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

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.

METAL FILM (PRECISION)

■Performance

Test Items	Performance Requirements ΔR±(%+0.05Ω)		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	25℃
T.C.R.	Within specified T.C.R.	—	+25℃/+125℃ : T.C.R.=±5(×10⁻⁶/K) +25℃/−55℃ and +25℃/+155℃ : others
Overload (Short time)	Standard mode : 0.05	0.01	Rated voltage × 2.5 or Max. overload., whichever is less, for 5s
	Power mode : 0.05	0.01	1E, 1J : Rated voltage ×2.0 or Max overload voltage , whichever is less, for 5s 2A, 2B, 2E : Rated voltage ×1.5 or Max overload voltage, whichever is less, for 5s
Resistance to soldering heat	0.05※1	0.01	260℃±5℃, 10s±1s
Rapid change of temperature	0.1※1	0.04	1E, 1J, 2A : −55℃ (30min.)/+155℃ (30min.) 1000 cycles 2B, 2E : −55℃ (30min.)/+155℃ (30min.) 500 cycles
Moisture resistance	Standard mode : 0.25	0.07	85℃±2℃, 85%±5%RH, 1000h. Rated voltage or Max warking voltage, whichever is less. 1.5h ON/0.5h OFF cycle
	Power mode : 0.25	0.06	85℃±2℃, 85%±5%RH, 1000h. Rated power ×0.1 or Max warking voltage, whichever is less.
Endurance at 85℃	Standard mode : 0.1	0.04	Rated terminal part temp. ±2℃ or Rated ambient temp. 85℃±2℃, 1000h 1.5h ON/0.5h OFF cycle
	Power mode : 0.2	0.05	Rated terminal part temp. ±2℃ or Rated ambient temp. 85℃±2℃, 1000h 1.5h ON/0.5h OFF cycle
High temperature exposure	0.25	0.10	+155℃, 1000h

※1 Depends on resistance value.

■Precautions for Use

- The properly and electrostatically measured taping materials are used for the components, but attention should be paid to the fact that there is some danger the parts absorb on the top tapes to cause a failure in the mounting and the parts are destructed by static electricity (1J, 2A, 2B, 2E: 1kV and more, 1E: 0.5kV and more at Human Body Model 100pF, 1.5kΩ) to change the resistance in the conditions of an excessive dryness or after the parts are given vibration for a long time as they are packaged on the tapes. Similarly, care should be given not to apply the excessive static electricity when mounting on the boards.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. while perspiration and saliva include ionic impurities like sodium (Na^+), chlorine (Cl^-) etc. Therefore these kinds of ionic substances may induce electrolytic corrosion when they invade into the products. Either thorough washing or using RMA solder and flux are necessary since lead free solder contains ionic substances. Washing process is needed, before putting on moisture proof material in order to prevent electrolytic corrosion.
- When heat-resistant masking tapes are attached to the chip resistors at the time of mounting and then detached, there is a possibility of exfoliation of the top electrodes. It is known that the heat applied in the mounting process will enhance the adhesion strength of the tape adhesive so please avoid the use. If the use of masking tapes are unavoidable, then please be sure not to attach the tape adhesives directly on the products.
  When high-pressure shower cleaning is implemented, there is a possibility of exfoliation of the top electrodes caused by the water pressure stress so please avoid the implementation.
  If the implementation is unavoidable, then please evaluate the products beforehand.