KOA SPEER ELECTRONICS, INC.

RN73H

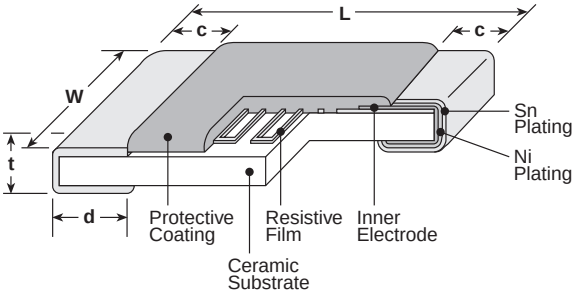
long term precision thin (metal) film flat chip resistors (high reliability, for automotive)

EU RoHS COMPLIANT

features

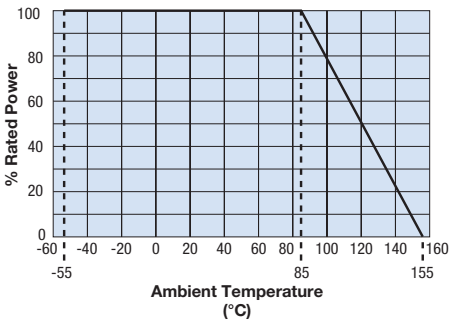
- High reliability with ΔR of ±0.1% in the long-term reliability test
- Endurance at 85°C (3,000h): ΔR of ±0.1% in Standard Mode
- Operating temperature range ~155°C
- Rated ambient temperature: 85°C
- High precision type ±0.05% is available
- Low current noise
- High reliability and high stability at elevated temperatures
- Improved moisture resistance by glass passivation layer
- Sulfur resistance verified according to ASTM B 809-95
- Products meet EU RoHS requirements
- AEC-Q200 Tested

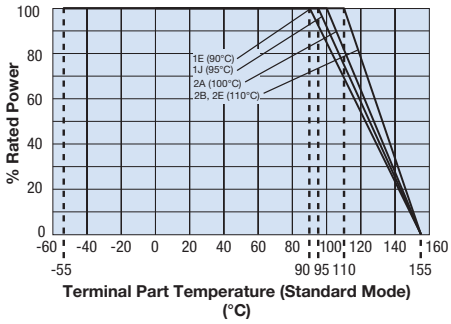
dimensions and construction

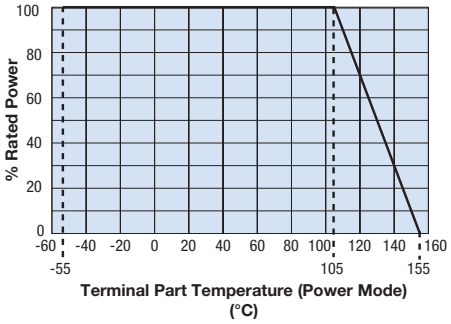


Type (Inch Size Code)	Dimensions inches (mm) L	W	c	d	t
1E (0402)	.039 $^{+.004}_{-.002}$ ($1.0^{+0.1}_{-0.05}$)	.020±.002 (0.5±0.05)	.010±.004 (0.25±0.1)	.010 $^{+.002}_{-.004}$ ($0.25^{+0.05}_{-0.1}$)	.014±.002 (0.35±0.05)
1J (0603)	.063±.008 (1.6±0.2)	.031±.004 (0.8±0.1)	.012±.004 (0.3±0.1)	.012±.004 (0.3±0.1)	.018±.004 (0.45±0.1)
2A (0805)	.079±.008 (2.0±0.2)	.049±.008 (1.25±0.2)	.016±.008 (0.4±0.2)	.012 $^{+.008}_{-.004}$ ($0.3^{+0.2}_{-0.1}$)	.02±.004 (0.5±0.1)
2B (1206)	.126±.008 (3.2±0.2)	.063±.008 (1.6±0.2)	.02±.012 (0.5±0.3)	.016 $^{+.008}_{-.004}$ ($0.4^{+0.2}_{-0.1}$)	.024±.004 (0.6±0.1)
2E (1210)		.098±.008 (2.5±0.2)			

Derating Curve







For resistors operated at an ambient temperature of 85°C or above, a power rating 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.

ordering information

RN73H	2B	T	TD	1002	B	25
Type	Size	Termination Material	Packaging	Nominal Resistance	Resistance Tolerance	T.C.R. (ppm/°C)
	1E 1J 2A 2B 2E	T: Sn G: Au (1E, 1J only)	TP: 0402 only: 7" 2mm pitch punched paper TD: 0603, 0805, 1206, 1210: 7" 4mm pitch punched paper TE: 0805, 1206, 1210: 7" embossed plastic For further information on packaging, please refer to Appendix A	3 significant figures + 1 multiplier "R" indicates decimal on value <100Ω	A: ±0.05% B: ±0.1% C: ±0.25% D: ±0.5% F: ±1.0%	05 10 25 50 100

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applications and ratings

Part Designation	Power Rating @ 85°C	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range (Ω) E-24, E-96, E-192* (A±0.05%)	(B±0.1%)	(C±0.25%)	(D±0.5%)	(F±1.0%)	Maximum Working Voltage	Maximum Overload Voltage
RN73H1E (0402) NEW>	0.063W	85°C	90°C	±5	—	220~10k	—	—	—	50V	100V
				±10	—	47~100k	47~100k	47~100k	47~100k		
				±25	—	47~300k	47~300k	47~300k	47~300k		
				±50	—	47~300k	47~300k	10~300k	10~300k		
	0.1W †	85°C	105°C	±5	—	220~10k	—	—	—	50V	100V
				±10	—	47~100k	47~100k	47~100k	47~100k		
				±25	—	47~300k	47~300k	47~300k	47~300k		
				±50	—	47~300k	47~300k	47~300k	47~300k		
RN73H1J (0603) NEW>	0.1W	85°C	95°C	±5	100~59k	100~59k	—	—	—	75V	150V
				±10	47~59k	47~360k	47~360k	47~360k	47~360k		
				±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		
	0.125W †	85°C	105°C	±5	100~59k	100~59k	—	—	—	75V	150V
				±10	47~59k	47~360k	47~360k	47~360k	47~360k		
				±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		
RN73H2A (0805) NEW>	0.125W	85°C	100°C	±5	100~100k	100~100k	—	—	—	150V	300V
				±10	47~100k	47~1M	47~1M	47~1M	47~1M		
				±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		
	0.25W †	85°C	105°C	±5	100~100k	100~100k	—	—	—	150V	300V
				±10	47~100k	47~1M	47~1M	47~1M	47~1M		
				±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		
RN73H2B (1206) NEW>	0.25W	85°C	110°C	±5	100~300k	100~300k	—	—	—	200V	400V
				±10	47~300k	47~1M	47~1M	47~1M	47~1M		
				±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		
	0.4W †	85°C	105°C	±5	100~300k	100~300k	—	—	—	200V	400V
				±10	47~300k	47~1M	47~1M	47~1M	47~1M		
				±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		
RN73H2E (1210) NEW>	0.25W	85°C	110°C	±10	100~510k	100~510k	100~510k	100~510k	100~510k	200V	400V
				±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		
	0.5W †	85°C	105°C	±10	100~510k	100~510k	100~510k	100~510k	100~510k	200V	400V
				±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		

* No marking on E-192 values. Operating Temperature: -55°C to +155°C. At the maximum power in power mode, terminal temperature must be at or below the rated terminal part temperature.

† See the Performance Characteristics table below for use of the resistor in Power Mode

environmental applications - Performance Characteristics

Parameter	Requirement Δ R ± (%+0.05Ω) Limit	Typical	Test Method
Resistance	Within specified tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	+25°C/+125°C: T.C.R. +5 (x10⁻⁶K); +25°C/-55°C and +25°C/+155°C: others
Overload (Short time)	Standard Mode: ±0.05%	±0.01%	Rated Voltage x 2.5 or Max. overload voltage, whichever is less, for 5 seconds
	Power Mode: ±0.05%	±0.01%	1E, 1J: Rated voltage × 2.0 or Max overload voltage, whichever is less, for 5 seconds 2A, 2B, 2E: Rated voltage × 1.5 or Max overload voltage, whichever is less, for 5 seconds
Resistance to Solder Heat	±0.05%**	±0.01%	260°C ± 5°C, 10 seconds ± 1 second
Rapid Change of Temperature	±0.1%**	±0.02%	1E, 1J, 2A: -55°C (30 minutes) / +155°C (30 minutes), 1000 cycles 2B, 2E: -55°C (30 minutes), +155°C (30 minutes), 500 cycles
Moisture Resistance	Standard Mode: ±0.1%**	±0.05%	85°C ± 2°C, 85% ± 5%RH, 1000 hours. Rated voltage or Max working voltage, whichever is less.1.5 hr ON, 0.5 hr OFF cycle
	Power Mode: ±0.1%**	±0.04%	85°C ± 2°C, 85% ± 5%RH, 1000 hours. Rated power × 0.1 or Max working voltage, whichever is less
Endurance at 85°C	Standard Mode: 0.1%	±0.03%	Rated terminal part temp. ± 2°C or Rated ambient temp. 85°C ± 2°C, 3000 hours 1.5 hr ON, 0.5 hr OFF cycle
	Power Mode: ±0.2%	±0.04%	Rated terminal part temp. ± 2°C or Rated ambient temp. 85°C ± 2°C, 3000 hours 1.5 hr ON, 0.5 hr OFF cycle
High Temperature Exposure	±0.1%**	±0.05%	+155°C, 1000 hours

** Depends on resistance value, please contact KOA Speer for details.

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 electrical 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 electrical corrosion.
- The upper electrodes could be peeled off when a heat-resistant masking tape is attached to the mounted chip resistors and then detached from them. It is confirmed that the adhesiveness gets stronger due to the exposure to heat under mounting. Accordingly, we recommend the use of masking tape be refrained. If the use of heat-resistant masking tape is unavoidable, please make sure that the adhesives on the tape do not directly come in contact with the product.
- 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.

For Surface Temperature Rise Graph see Environmental Applications. Additional environmental applications can also be found at www.koaspeer.com

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use. 1/20/25