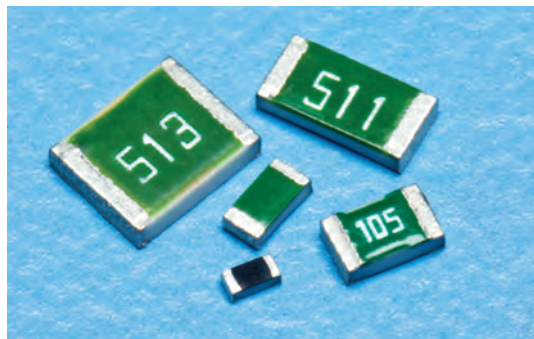
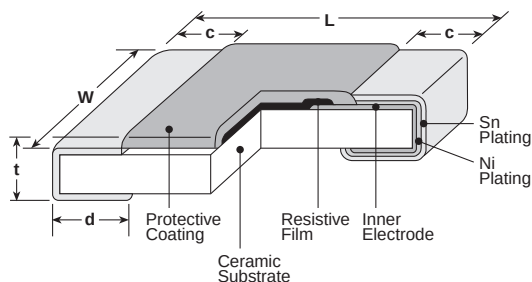




### features

- Superior to RK73B/RK73H series in surge withstanding voltage and high power
- ESD withstanding; down to  $\pm 0.5\%$  tolerance
- Suitable for both reflow and flow solderings
- Products with lead-free terminations meet EU RoHS requirements. EU RoHS regulation is not intended for Pb-glass contained in electrode, resistor element and glass.
- AEC-Q200 Tested

### dimensions and construction



| Type<br>(Inch Size Code)      | Dimensions inches (mm)                                                           |                                     |                                                                                 |                                                                                  |                                      |
|-------------------------------|----------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------|
|                               | L                                                                                | W                                   | c                                                                               | d                                                                                | t                                    |
| SG73S1E<br>(0402)             | .039 <sup>+.004</sup> <sub>-.002</sub><br>(1.0 <sup>+.01</sup> <sub>-.05</sub> ) | .02 $\pm$ .002<br>(0.5 $\pm$ 0.05)  | .006 $\pm$ .004<br>(0.15 $\pm$ 0.1)                                             | .010 <sup>+.002</sup> <sub>-.004</sub><br>(0.25 <sup>+.05</sup> <sub>-.1</sub> ) | .014 $\pm$ .002<br>(0.35 $\pm$ 0.05) |
| SG73S1J<br>(0603)             | .063 $\pm$ .008<br>(1.6 $\pm$ 0.2)                                               | .031 $\pm$ .004<br>(0.8 $\pm$ 0.1)  | .012 $\pm$ .004<br>(0.3 $\pm$ 0.1)                                              | .012 $\pm$ .004<br>(0.3 $\pm$ 0.1)                                               | .018 $\pm$ .004<br>(0.45 $\pm$ 0.1)  |
| SG73S1J AT<br>(0603)          |                                                                                  |                                     | .014 $\pm$ .006<br>(0.35 $\pm$ 0.15)                                            | .02 $\pm$ .008<br>(0.5 $\pm$ 0.2)                                                |                                      |
| SG73S2A<br>(0805)             | .079 $\pm$ .008<br>(2.0 $\pm$ 0.2)                                               | .049 $\pm$ .004<br>(1.25 $\pm$ 0.1) | .012 <sup>+.008</sup> <sub>-.004</sub><br>(0.3 <sup>+.02</sup> <sub>-.1</sub> ) | .012 <sup>+.008</sup> <sub>-.004</sub><br>(0.3 <sup>+.02</sup> <sub>-.1</sub> )  | .02 $\pm$ .004<br>(0.5 $\pm$ 0.1)    |
| SG73S2A AT<br>(0805)          |                                                                                  |                                     | .018 $\pm$ .010<br>(0.45 $\pm$ 0.25)                                            | .024 $\pm$ .008<br>(0.6 $\pm$ 0.2)                                               |                                      |
| SG73S2B<br>(1206)             | .126 $\pm$ .008<br>(3.2 $\pm$ 0.2)                                               | .063 $\pm$ .008<br>(1.6 $\pm$ 0.2)  | .016 <sup>+.008</sup> <sub>-.004</sub><br>(0.4 <sup>+.02</sup> <sub>-.1</sub> ) | .016 <sup>+.008</sup> <sub>-.004</sub><br>(0.4 <sup>+.02</sup> <sub>-.1</sub> )  | .024 $\pm$ .004<br>(0.6 $\pm$ 0.1)   |
| SG73S2B AT<br>(1203)          |                                                                                  |                                     | .022 $\pm$ .014<br>(0.55 $\pm$ 0.35)                                            | .031 $\pm$ .008<br>(0.8 $\pm$ 0.2)                                               |                                      |
| SG73S2E<br>SG73S2E1<br>(1210) |                                                                                  | .102 $\pm$ .008<br>(2.6 $\pm$ 0.2)  | .016 <sup>+.008</sup> <sub>-.004</sub><br>(0.4 <sup>+.02</sup> <sub>-.1</sub> ) | .016 <sup>+.008</sup> <sub>-.004</sub><br>(0.4 <sup>+.02</sup> <sub>-.1</sub> )  |                                      |

### ordering information

| SG73S | 2B                                |                                             | T                    | TD                                                                                                                                                        | 1001                                                                                                                                                                                                                    | F                                                              |
|-------|-----------------------------------|---------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| Type  | Size                              | Characteristic                              | Termination Material | Packaging                                                                                                                                                 | Nominal Resistance                                                                                                                                                                                                      | Tolerance                                                      |
| SG73S | 1E<br>1J<br>2A<br>2B<br>2E<br>2E1 | Nil: Standard<br>A: Heat shock resistance * | T: Sn                | TP: 0402, 0603, 0805: 7" 2mm pitch punch paper<br>TD: 0603, 0805, 1206, 1210: 7" 4mm pitch punched paper<br>TE: 0805, 1206, 1210: 7" 4mm embossed plastic | $\pm 0.5\%$ , $\pm 1\%$ : 3 significant figures + 1 multiplier "R" indicates decimal on value <100 $\Omega$<br>$\pm 2\%$ , $\pm 5\%$ : 2 significant figures + 1 multiplier "R" indicates decimal on value <10 $\Omega$ | D: $\pm 0.5\%$<br>F: $\pm 1\%$<br>G: $\pm 2\%$<br>J: $\pm 5\%$ |

\* With type A, only T is available as the terminal surface material.

Contact us when you have control request for environmental hazardous material other than the substance specified by EU RoHS.

For further information on packaging, please refer to Appendix A

## applications and ratings

| Part Designation | Power Rating | Rated Ambient Temp. | Rated Terminal Part Temp. | T.C.R. (ppm/°C) Max. | Resistance Range (Ω) |                    |                     | Maximum Working Voltage | Maximum Overload Voltage | Operating Temp. Range |
|------------------|--------------|---------------------|---------------------------|----------------------|----------------------|--------------------|---------------------|-------------------------|--------------------------|-----------------------|
|                  |              |                     |                           |                      | (E-24)/E-96 (D±0.5%) | (E-24)/E-96 (F±1%) | (E-24) (G±2%, J±5%) |                         |                          |                       |
| SG73S1E (0402)   | 0.125W       | 70°C                | 125°C                     | ±200                 | 10 - 1M              | 1 - 1M             | 1 - 10M             | 75V                     | 100V                     | -55°C to +155°C       |
|                  | 0.33W        | —                   | 105°C                     |                      |                      |                    |                     |                         |                          |                       |
| SG73S1J (0603)   | 0.2W         | 70°C                | 135°C                     | ±100                 | 510 - 576k           | 510 - 576k         | 510 - 560k          | 150V                    | 200V                     |                       |
|                  |              |                     |                           | ±100*1               | 10 - 499 590k - 1M   | 1 - 499 590k - 1M  | 1 - 470 620k - 10M  |                         |                          |                       |
|                  | 0.5W         | —                   | 105°C                     | ±100                 | 510 - 576k           | 510 - 576k         | 510 - 560k          |                         |                          |                       |
|                  |              |                     |                           | ±100*1               | 10 - 499 590k - 1M   | 1 - 499 590k - 1M  | 1 - 470 620k - 10M  |                         |                          |                       |
| SG73S2A (0805)   | 0.25W        | 70°C                | 125°C                     | ±200                 | 10 - 1M              | 1 - 1M             | 1 - 10M             | 400V                    | 600V (800V)*2            |                       |
|                  | 0.75W        | —                   | 105°C                     |                      |                      |                    |                     |                         |                          |                       |
| SG73S2B (1206)   | 0.33W        | 70°C                | 125°C                     | ±200                 | 10 - 1M              | 1 - 1M             | 1 - 10M             | 200V                    | 400V                     |                       |
|                  | 1W           | —                   | 105°C                     |                      |                      |                    |                     |                         |                          |                       |
| SG73S2E (1210)   | 0.5W         | 70°C                | 125°C                     | ±200                 | 10 - 1M              | 1 - 1M             | 1 - 10M             | 200V                    | 400V                     |                       |
|                  | 1.5W         | —                   | 105°C                     |                      |                      |                    |                     |                         |                          |                       |
| SG73S2E1 (1210)  | 1.5W         | —                   | 105°C                     | ±200                 | 10 - 1M              | 1 - 1M             | 1 - 10M             | 200V                    | 400V                     |                       |

\*<sup>1</sup> Cold T.C.R. (-55°C ~ +25°C) is +150 x 10<sup>-6</sup>/K

\*<sup>2</sup> Applies when power rating is 0.4W or lower.

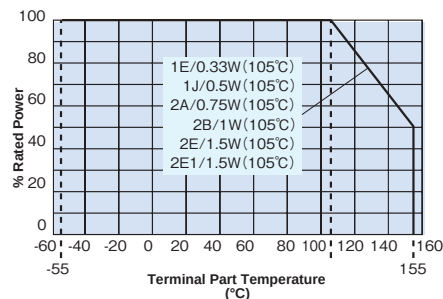
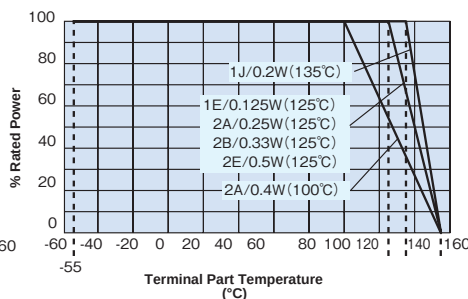
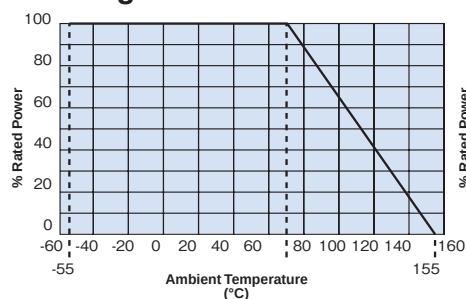
Rated voltage =  $\sqrt{\text{Power rating} \times \text{resistance value}}$  or max. working voltage, whichever is lower

Please contact KOA Speer for how to handle a specific surge/pulse

If any questions should arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature," please give priority to the "Rated Terminal Part Temperature." Prior to use and for more details refer to "Introduction of the derating curves on the terminal part temperature" in the beginning of the catalog.

## environmental applications

### Derating Curve



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

For resistors operated at a terminal part temperature of described for each size or above, a power rating shall be derated in accordance with the derating curve.

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

If you want to use the rated power of \*<sup>2</sup>, please use the derating curve based on the terminal part temperature above.

Additional environmental applications can also be found at [www.koaspeer.com](http://www.koaspeer.com)

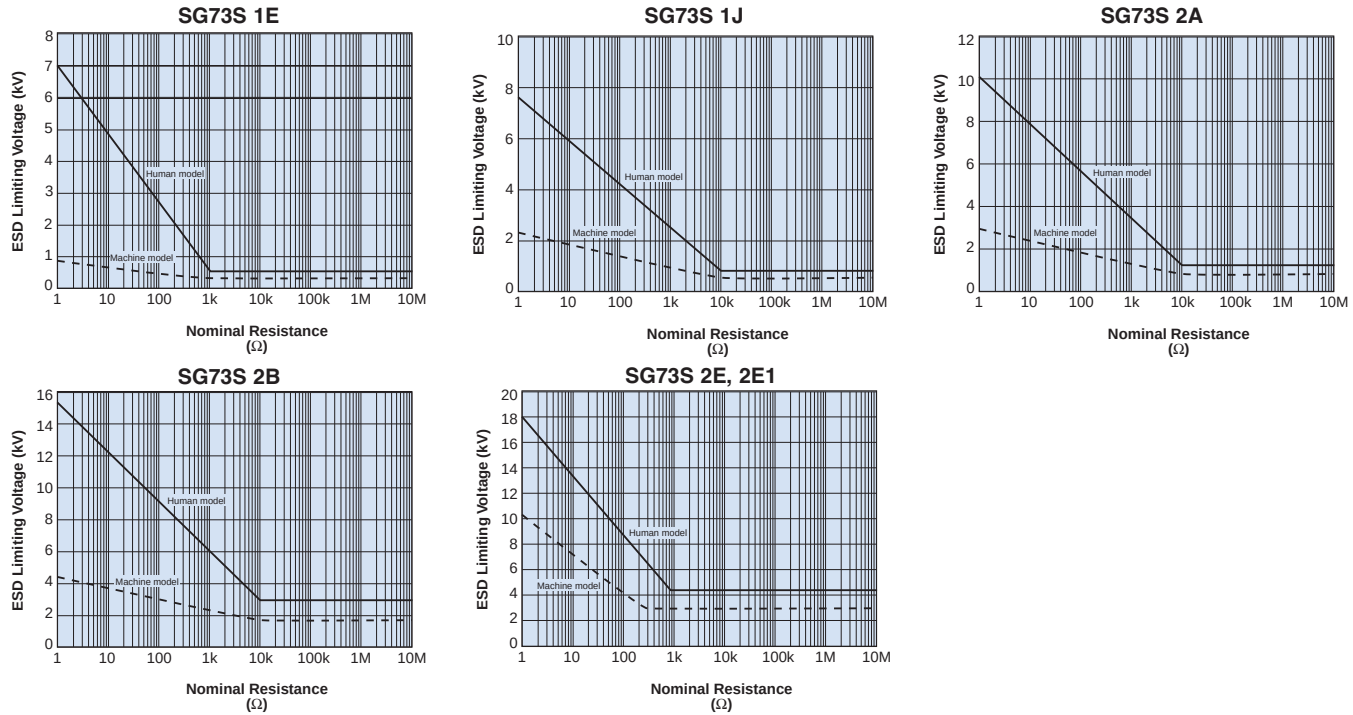
Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

9/04/24

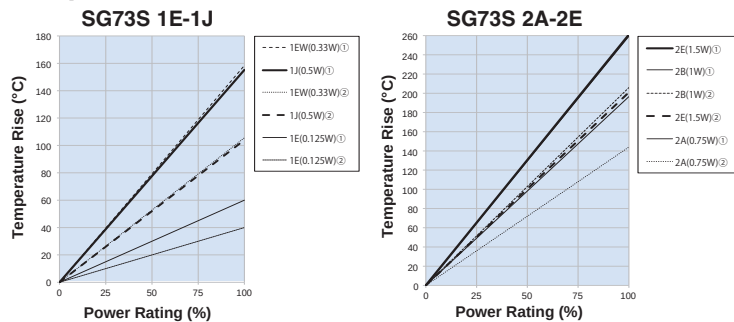
# anti-surge endured surge voltage thick film chip resistor

## environmental applications (continued)

### ESD Limiting Voltage

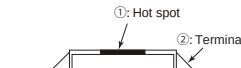


### Temperature Rise



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



①: Hot spot  
②: Terminal

### Performance Characteristics

| Parameter                   | Requirement Δ R ±(%+0.1Ω)                                                             |                                                                                         | Test Method                                                                                                                                                          |       |        |             |    |    |     |
|-----------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------------|----|----|-----|
|                             | 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%                                                                                   | Overload for 5s                                                                                                                                                      |       |        |             |    |    |     |
|                             |                                                                                       |                                                                                         | Type                                                                                                                                                                 | 1E    | 1J     | 2A          | 2B | 2E | 2E1 |
|                             |                                                                                       |                                                                                         | Overload                                                                                                                                                             | 1.25W | 2.063W | 2W (1.6W*2) | 3W | 4W | 4W  |
| Resistance to Solder Heat   | ±1%                                                                                   | ±0.75%                                                                                  | 260°C ± 5°C, 10 seconds ± 1 second                                                                                                                                   |       |        |             |    |    |     |
| Rapid Change of Temperature | ±0.5%: Characteristic (Nil) Standard<br>±1%: Characteristic (A) Heat Shock Resistance | ±0.3%: Characteristic (Nil) Standard<br>±0.5%: Characteristic (A) Heat Shock Resistance | Characteristic (Nil) Standard: -55°C (30 min.)/+125°C (30 min.) 100 cycles<br>Characteristic (A) Heat Shock Resistance: -55°C (30 min.)/+125°C (30 min.) 1000 cycles |       |        |             |    |    |     |
| Moisture Resistance         | ±3%                                                                                   | ±0.75%                                                                                  | 40°C ± 2°C, 90%~95%RH, 1000 hours; 1.5 hr ON, 0.5 hr OFF cycle                                                                                                       |       |        |             |    |    |     |
| Endurance at 70°C           | ±3%                                                                                   | ±0.75%                                                                                  | 70°C ± 2°C or rated terminal part temp. ± 2°C 1000 hours; 1.5 hr ON, 0.5 hr OFF cycle                                                                                |       |        |             |    |    |     |
| High Temperature Exposure   | ±1%                                                                                   | ±0.3%                                                                                   | +155°C, 1000 hours                                                                                                                                                   |       |        |             |    |    |     |

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

8/09/24