



APPROVAL SHEET

Product Name : Anti-Sulfur Thick Film Array Chip Resistor
Part No. : TSA
Description : Size 0402X4 0603X4

For more contact information, please refer to our website: www.rideetech.com

Anti-Sulfur Thick Film Array Chip Resistor – TSA Series

■ Applications

- Computer
- Mobile phone
- Portable audio
- Power equipment
- Hard Disk Driver



■ Features

- High density packaging provides higher productivity.
- Stable convex terminal reduces assembly costs.
- RoHS compliant & Halogen Free.

■ Part Number Explanation

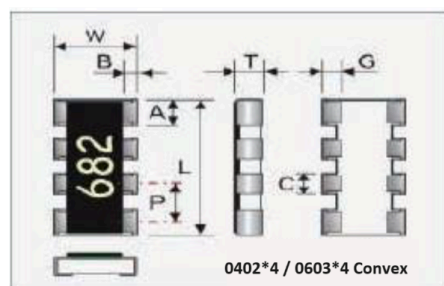
TSA	024RA	J	10R0	T	S
Product	Size (Inch)	Tolerance	Resistance	Packaging	Functional
Anti-Sulfur Thick Film Array Chip Resistor	024RA: 0402*4R, Convex 034RA: 0603*4R, Convex	F : $\pm 1.0\%$ J : $\pm 5.0\%$	1 Ω =1R00 10 Ω =10R0 100 Ω =100R 1K Ω =1001 1M Ω =1004	T=Tape & Reel	S=Standard

■ Standard Electrical Specifications

Item Type	Termination Construction	Rated Power at 70°C	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/°C)	Resistance Range	
						F (±1%)	J (±5%)
TSA 024RA	Convex	0.063 W	25V	50V	±200	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 1M\Omega$
TSA 034RA	Convex	0.1 W	50V	100V	±200	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 1M\Omega$

- Functional code: S
- Beyond the above specification also can meet the special requirements. For detailed questions, please contact us freely.

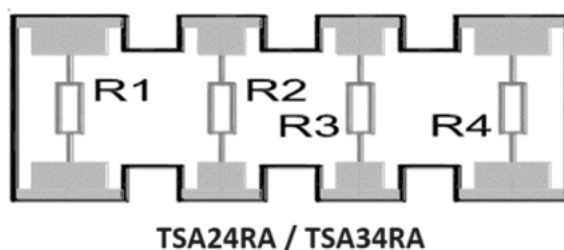
■ Dimension



Unit: mm

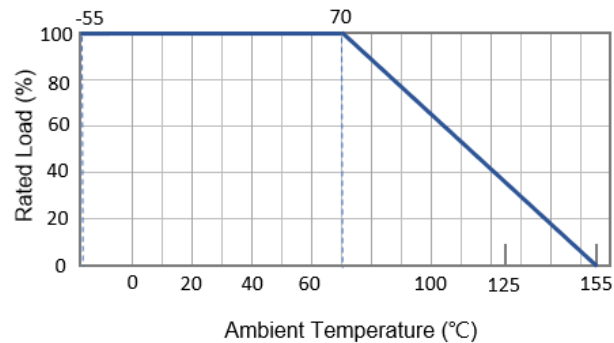
Size	L	W	T	B	G	P	C	A
024RA	2.00±0.10	1.00±0.10	0.45±0.10	0.22±0.15	0.22±0.15	0.50±0.05	0.30±0.10	0.40±0.10
034RA	3.20±0.15	1.60±0.15	0.55±0.10	0.30±0.15	0.30±0.15	0.80±0.05	0.50±0.15	0.65±0.15

■ Circuit



■ Power Derating Curve

Operating Temperature Range: -55 to +155°C



■ Voltage Rating or Current Rating

Resistance Range: $\geq 1\Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)

P=Power rating(W)

R=Nominal resistance(Ω)

■ Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	IEC-60115-1 4.8	At 25 / -55℃ and 25℃ /+155℃, 25℃ is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds. measure resistance after 30 minutes	J: $\Delta R \leq \pm (2\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$
DC Resistance	IEC 60115-1 4.5 JIS C 5201-1 4.5	Measure the resistance value..	J : $\pm 5\%$, F: $\pm 1\%$
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260 $\pm$ 5℃ for 10 seconds.	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$ No mechanical damage
Temperature Cycling	JIS-C-5201-1 4.19 IEC-60115-1 4.19	Repeat 5 cycles as follow -55℃ (30 min.) + 25℃ (2~3 min.)+155℃ (30 min.) + 25℃ (2~3 min.)	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Damp Heat	JIS-C-5201-1 4.24 IEC-60115-1 4.24	Maintain the temperature of the resistor at 40 $\pm$ 2℃ and 90 ~95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for 0.5 hour for 1000+48/-0 hours. After 1~4 hour, measure the resistance value.	J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (2\% + 0.05\Omega)$
Load Life	JIS-C-5201-1 4.25 IEC-60115-1 4.25.	Permanent resistance change after 1000+48/-0 hours (1.5 hours ON , 0.5 hour OFF) at RCWV or Max. Keep the resistor at 70 $\pm$ 2℃ ambient"	J: $\Delta R \leq \pm (3\% + 0.1\Omega)$ F: $\Delta R \leq \pm (2\% + 0.05\Omega)$
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Test voltage: 100 $\pm$ 15V	$\geq 10G\Omega$
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bend:3mm for TSA024RA, TSC034RA	J: $\Delta R \leq \pm (1\% + 0.1\Omega)$ F: $\Delta R \leq \pm (1\% + 0.05\Omega)$
Solderability	JIS-C-5201-1 4.17 IEC-60115-1 4.17	After immersing flux, dip in the 235 $\pm$ 2℃ molten solder bath for 2 $\pm$ 0.5 sec	Over 95% of termination must be covered with solder
Sulfuration Test	ASTM B-809 EIA-977	105℃, 1000hrs	$\Delta R \leq \pm (2.0\% + 0.05\Omega)$ No mechanical damage.

■ Recommended Customer Soldering Parameters

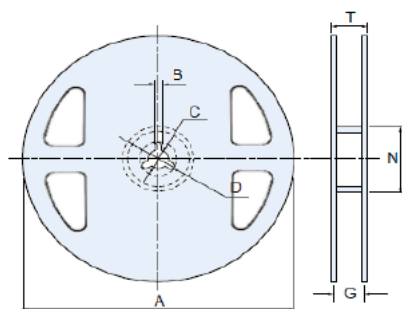
■ Recommended IR Reflow Soldering Conditions

Preliminary heating: 150°C~200°C, 120s max

Liquidous temperature: 217°C, 150s max

Peak temperature: 235°C

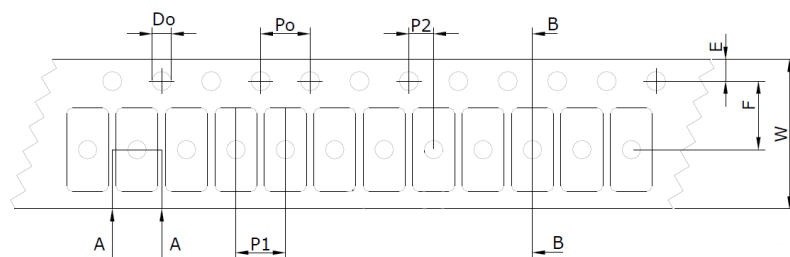
■ Packaging Information



Unit: mm

Size	Type		A	N	C	D	B	G	T
0402*4	7"	10K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max
0603*4	7"	5K/Reel	178±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9 max

■ Tapping Specification



Unit: mm

Packaging	Size	A	B	W	E	F	P1	P2	D0	P0
Paper Type	0402*4	1.20±0.10	2.20±0.10	8.00±0.20	1.75±0.10	3.50±0.05	2.00±0.10	2.00±0.05	1.50+0.10/-0	4.00±0.10
	0603*4	1.95±0.10	3.50±0.10	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.10	2.00±0.05	1.50+0.10/-0	4.00±0.10

■ Marking

■ TSA034RA, TSA024RA 1% (non E24): 4 digits marking

Resistance	2.49KΩ
3 digits code	2491

■ TSA034RA, TSA024RA 1%, 5% (E24) : 3 digits marking

Resistance	100Ω
3 digits code	101