THICK FILM ANTI SULFURATED CHIP RESISTORS

(RAS / RASP SERIES)

Special contruction to prevent sulfuration under a sulfur containing evironment.

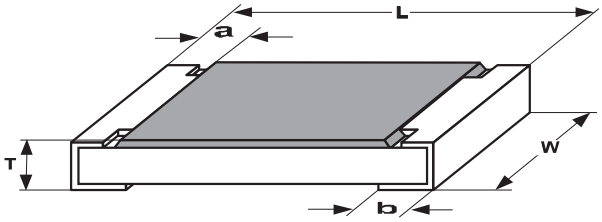
Features

* Small size and light wight.
* Excellent mechanical strength and electrical stability.
* Reduce assembly costs.
* 8mm tape carrier packaging available for automatic surface mounting.

Application

* Industrial Control, System Sensor, Netcom Station
* Navigation Equipment
* Measuring Instrument.
* Telecommunication Equipment, Railway Semaphore system.

Dimensional Specifications



Style			Dimensions mm				
			L	W	T	a	b
RAS-02	---	0201	0.60 ±0.03	0.30 ±0.03	0.23 ±0.03	0.10 ±0.10	0.20 ±0.10
RAS-04	RASP-04	0402	1.00 ±0.10	0.50 ±0.05	0.30 ±0.05	0.15 ±0.10	0.20 ±0.10
RAS-06	RASP-06	0603	1.60 ±0.20	0.80 ±0.15	0.40 ±.0.10	0.30 ±0.20	0.30 ±0.10
RAS-10	RASP-10	0805	2.00 ±0.20	1.25 ±0.15	0.50 ±0.15	0.30 ±0.15	0.40 ±0.15
RAS-18	RASP-18	1206	3.05 ±0.10	1.60±0.20	0.55 ±0.15	0.40 ±0.20	0.50±0.20
RAS-20	RASP-20	1210	3.05 ±0.10	2.50 ±0.20	0.55 ±0.15	0.50 ±0.20	0.50±0.20
RAS-22	RASP-22	2010	5.00 ±0.20	2.50 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60±0.20
RAS-24	RASP-24	2512	6.30 ±0.20	3.20 ±0.20	0.55 ±0.10	0.60 ±0.20	0.60±0.20
RAS-26	RASP-26	1812	4.50 ±0.10	3.10 ±0.20	0.55 ±0.05	0.55 ±0.20	0.70 ±0.20
RAS-28	RASP-28	1218	3.10 ±0.10	4.60 ±0.10	0.55 ±0.05	0.40 ±0.20	0.50 ±0.20

RoHS compliant

CINETECH SYMBOL OF QUALITY

General Specification

RAS SERIES (Thick Film Anti-Sulfur Chip Resistors)

Style \ Size		Rate Power at 70℃	Max working Voltage	Max Overload voltage	T.C.R. (PPM/ ℃)	Reistance Range	
						D(±0.5%)	F(±1%) , J(±5%)
RAS-02	0201	1/20W	25V	50V	±200	---	1Ω~10MΩ
RAS-04	0402	1/16W	50V	100V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-06	0603	1/10W	75V	150V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	1Ω~9.9Ω
RAS-10	0805	1/8W	150V	300V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-18	1206	1/4W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-20	1210	1/2W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-22	2010	3/4W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-24	2512	1W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RAS-26	1812	3/4W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ

Type	0201 -0402	0603	0805 -1206	1210	1812	2010	2512
Jumper Resistance value	50 mΩ Max.						
Jumper Rated Current	1A		2A	2.5A		3.5A	

RoHS compliant

CINETECH SYMBOL OF QUALITY

RASP SERIES (Thick Film Anti-Sulfur High Power Chip Resistors)

Style \ Size		Rate Power at 70℃	Max working Voltage	Max Overload voltage	T.C.R. (PPM/ ℃)	Reistance Range	
						D(±0.5%)	F(±1%) , J(±5%)
RASP-04	0402	1/10W	50V	100V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.76Ω, 10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-06	0603	1/8W	75V	150V	±400	---	1Ω~9.9Ω
					±200	---	10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-10	0805	1/4W	150V	300V	±400	---	1Ω~9.9Ω
					±200	---	10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-18	1206	1/2W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.9Ω, 1.02MΩ~10MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-20	1210	2/3W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-22	2010	1W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	1Ω~9.76Ω, 10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-24	2512	2W	200V	400V	±400	---	1Ω~9.9Ω
					±200	---	10.1MΩ~30MΩ
					±100	10Ω~1MΩ	10Ω~10MΩ
RASP-26	1812	1W	200V	400V	±400	---	1Ω~9.9Ω
					±100	10Ω~1MΩ	10Ω~10MΩ

Type	0402	0603	0805	1206	1210	1812-2010	2512
Jumper Resistance value	20 mΩ Max.						
Jumper Rated Current	2A	2.5A	3.5A	5A	6A	7A	10A
Max. Over Load Current < 1 seccond and 1 times	6A	9A	13A	16A	19A	22A	30A

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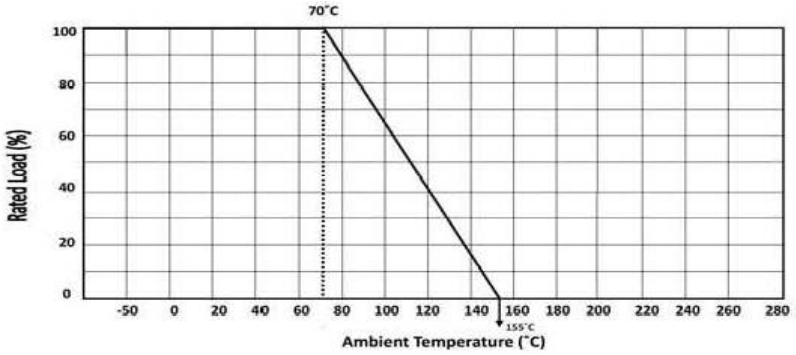
Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R.)	JIS- C- 5201-1 4.8 IEC-60115-1 4.8	At 25 / -55℃ and 25℃/ +125℃,25℃ is the reference temperature	As Spec
Insulation Resistance	JIS- C- 5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute	≧10G Ω
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 Sec.	F 1% and below :± (1.0% + 0.05Ω) J 5% : ± (2.0 %+ 0.10Ω)
Leaching	JIS- C- 5201-1 4.18 IEC-60068-2-58 8.2.1	260 ± 5℃ for 30 seconds.	Individual leaching area ≦5%, Total leaching area ≦10%
Resistance to Soldering Heat	JIS -C- 5201-1 4.18 IEC-60115-1 4.18	260 ± 5℃ for 10 seconds.	F 1% and below : ±(0.5% + 0.05Ω) J 5% : ± (1.0% + 0.05Ω)
Rapid Change of Temperature	JIS -C- 5201-1 4.19 IEC-60115-1 4.19	-55℃ to +155℃,5 cycles	F 1% and below : ±(0.5% + 0.05Ω) J 5% : ± (1.0 % + 0.10Ω)
Resistance to Solvent	JIS -C- 5201-1 4.29	The tested resistor be immersed into isopropyl alcohol of 20~25 ℃for 60 secs. Then the resistor is left in the room for 48 hrs.	F 1% and below : ±(0.5% + 0.05Ω) J 5% : ± (0.5% + 0.05Ω)
Damp Heat with Load	JIS -C- 5201-1 4.24 IEC-60115-1 4.24	40 ±2℃, 90~95% R.H RCWV or Max.working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"	F 1% and below : ±(1.0% + 0.05Ω) J 5% : ± (2.0% + 0.05Ω) value ＜1Ω : ± (2.0% + 0.05Ω)
Load Life (Endurance)	JIS -C- 5201-1 4.25 IEC-60115-1 4.25.1	70 ±2℃,RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"	F 1% and below : ±(1.0% + 0.05Ω) J 5% : ± (3.0% + 0.10Ω) value ＜1Ω : ± (3.0% + 0.10Ω)
Bending Strength	JIS -C- 5201-1 4.33 IEC-60115-1 4.33	Bending once for 60 seconds D: 0201 ~ 0805= 3mm; 1206 ,1210= 3mm 2010、2512 =2mm	F 1% and below : ±(1.0% + 0.05Ω) J 5% : ± (1.0 %+ 0.50Ω)

Derating Curve



The Operating Temperature Range: -55℃ ~ +155℃. Powr Rating is in the case based on continuous full-load at ambient temperature of 70℃. For operaton at ambient temperature in excess of 70℃, the load should be derated in accordance with figure or derating Curve.

* Rate voltage

Resistance range: ≧1Ω

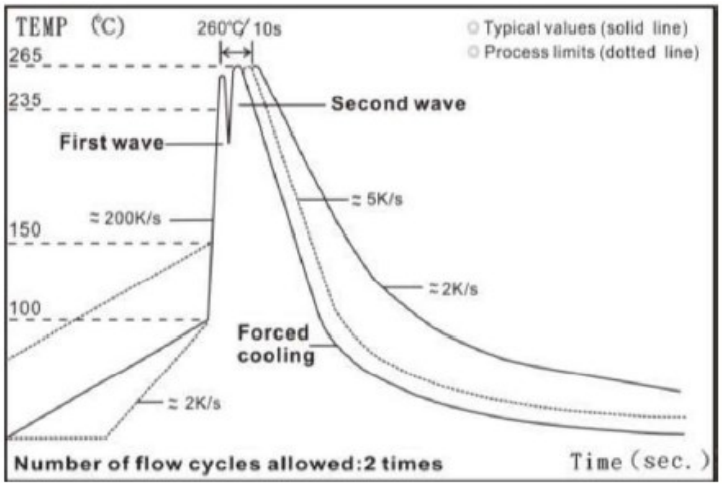
Rated voltaget: The resistor shall have a DC continuous working voltaget or a RMS AC(ms) continuous working voltage at commercial - line frequency and wave form corresponding to the power rating, as determined formula as following:

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

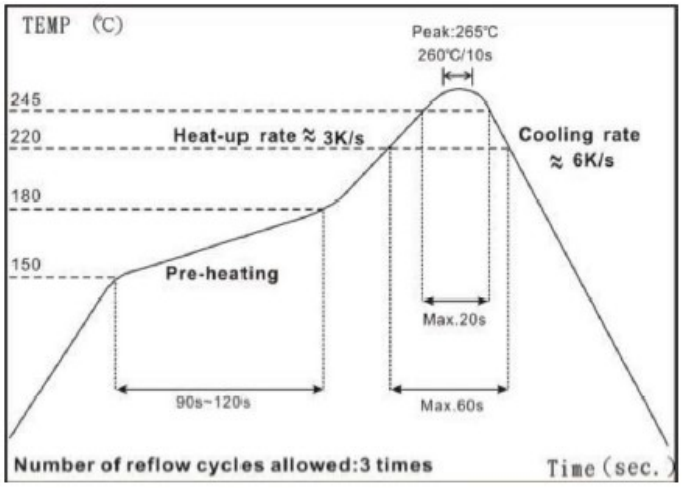
E=Rated voltage(V)
P=Power rating(W)
R=Nominal resistance(Ω)

Recommended Customer Soldering Parameters

∗ Wave solder Temperature Condition



∗ Solder reflow Temperature Condition

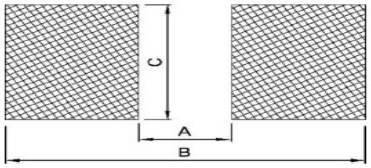


∗ Rework Temperature (hot air equipment: 350℃, 3~5 seconds

∗ Recommended reflow methods

IR, vapor phase oven, hot air oven
If reflow temp. exceed the recommended profile, devices may not meet the performance requirements.

∗ Recommend Land Pattern Design



Type	0402	0603	0805	1206	1210	1812	2010	2512
A	0.60	0.85	1.30	2.20	2.00	3.11	3.80	4.90
B	1.60	2.40	2.90	4.20	4.40	5.91	6.60	8.10
C	0.70	1.00	1.40	1.70	2.70	3.00	2.70	3.40

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Marking

※ 5%: marking code: 3 digits, please refer to E24 data form as below:

- First two digits are significant figure,
- Third digit is number of zeros.
- Letter R is decimal point.

EX: 120K, the marking code is 124 in E2

Value=10KΩ

RAS/RASP-06 (0603) **RAS/RASP-26 (1812)**
RAS/RASP-10 (0805) **RAS/RASP-22 (2010)**
RAS/RASP-18 (1206) **RAS/RASP-24 (2512)**
RAS/RASP-20 (1210)

※ 1%: Marking code: 4 digits, Please refer to E96 and E24 data form as below:

- First three digits are significant figure,
- Forth digit is number of zeros.
- Letter R is decimal point.

EX: 120K, the marking code is 1203 in E
121K, The marking code is 1213 in E96

Value=10KΩ

RAS/RASP-10 (0805) **RAS/RASP-26 (1812)**
RAS/RASP-18 (1206) **RAS/RASP-22 (2010)**
RAS/RASP-20 (1210) **RAS/RASP-24 (2512)**

※ 0201, 0402 no marking

RAS/RASP-02 (0201)
RAS/RASP-04 (0402)

※ 0603 1%: EIA-96 Marking. Please refer to data form as below:

RAS/RASP-06 (0603)

1%marking --> Value=12.4KΩ

Parts Number System

RAS -

Type

RAS Series-
Thick Film
Anti-Sulfur Chip
Resistors

RASP Series-
Thick Film
Anti-Sulfur High
Power Chip
Resistors

10 -

Size

02=0201
04=0402
06=0603
10=0805
18=1206
20=1210
22-2010
24=2512
26=1812
28=1218

102

Resistance

3 Digits: for 5%
10K=103
100K=104

4 Digits: for 0.5%, 1%
10K=1002
100K=1003

J

Tolerance

D=± 0.5%
J=± 5%
F=± 1%

R

Standard Packing

R=Paper tape reel
15Kpcs/Reel
size: 0201
10Kpcs/Reel
size: 0402
5Kpcs/Reel
size: 0603~1206
K=Embossed
plastic tape reel
4Kpcs/Reel
size: 2010~2512

- **5% tolerance: 3 digits, first 2 digits are significant figure, Third digit is number of zeros, Letter R is decimal point.**
- **1% tolerance: 4 digits, first three digits are significant figure, Forth digit is number of zeros, Letter R is decimal point.**

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