

THICK FILM ANTI-SURGE CHIP RESISTORS

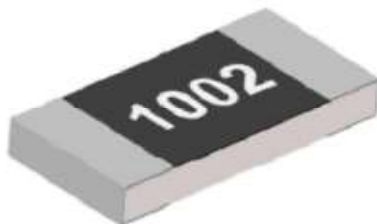
(RSC / RSP SERIES)

Features

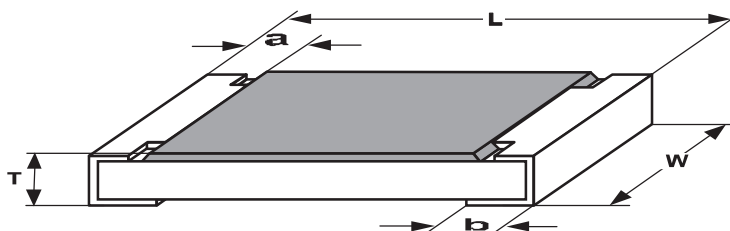
- * Suitable for withstanding circuit for surge voltage
- * Improved working voltage ratings
- * Highly stable in auto-placement surface mounting application.
- * RoHS Compliant & Halogen Free
- * AEC-Q200 Compliant

Applications

- * LCD video monitor
- * Medical Devices
- * Measurement instrument
- * Charger
- * Inverter
- * Automotive



Dimensions



Style			Dimensions					mm
			L	w	a	b	T	
RSC-04	RSP-04	0402	1.00 ±0.05	0.50 ±0.05	0.15 ±0.10	0.20 ±0.10	0.30 ±0.05	
RSC-06	RSP-06	0603	1.60 ±0.10	0.80 ±0.10	0.30 ±0.20	0.30 ±0.20	0.40 ±0.10	
RSC-10	RSP-10	0805	2.00 ±0.10	1.20 ±0.10	0.40 ±0.15	0.40 ±0.20	0.50 ±0.15	
RSC-18	RSP-18	1206	3.05 ±0.10	1.60±0.10	0.40 ±0.20	0.50±0.20	0.55 ±0.15	
RSC-20	RSP-20	1210	3.05 ±0.10	2.50±0.15	0.50 ±0.20	0.50±0.20	0.55 ±0.15	
RSC-22	RSP-22	2010	5.00 ±0.20	2.50 ±0.15	0.60 ±0.20	0.60 ±0.20	0.55 ±0.10	
RSC-24	RSP-24	2512	6.30 ±0.20	3.20 ±0.15	0.60 ±0.20	0.60±0.20	0.68 ±0.10	



General Specification

Standard Electrical Specification

Type	Size	Power Rating at 70° C	Max Working Voltage	Max Overload Voltage	TCR ppm/°C	Resistance Range	
						±1% (F)	±5% (J)
RSC-04	0402	1/10W	50V	100V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±300	---	10Ω ~ 1KΩ
					±200	10Ω ~ 1MΩ	1KΩ ~ 10MΩ
RSC-06	0603	1/8W	50V	100V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSC-10	0805	1/4W	150V	300V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSC-18	1206	1/3W	200V	400V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSC-20	1210	1/2W	200V	400V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSC-22	2010	3/4W	400V	800V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±150	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSC-24	2512	1.5W	500V	1000V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±150	10Ω ~ 1MΩ	10Ω ~ 10MΩ

High Power Rating Electrical Specification

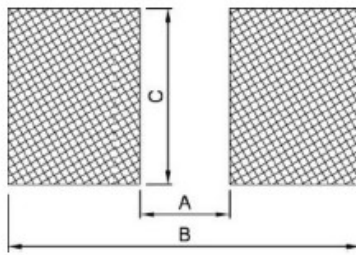
Type	Size	Power Rating at 70° C	Max Working Voltage	Max Overload Voltage	TCR ppm/°C	Resistance Range	
						±1% (F)	±5% (J)
RSP-04	0402	1/8W	50V	100V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±300	---	10Ω ~ 1KΩ
					±200	10Ω ~ 1MΩ	1KΩ ~ 10MΩ
RSP-06	0603	1/4W	150V	200V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSP-10	0805	2/5W	150V	300V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSP-18	1206	1/2W	200V	400V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSP-20	1210	3/4W	200V	400V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±100	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSP-22	2010	1W	400V	800V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±150	10Ω ~ 1MΩ	10Ω ~ 10MΩ
RSP-24	2512	2W	500V	1000V	±400	1Ω ~ 10Ω	1Ω ~ 10Ω
					±150	10Ω ~ 1MΩ	10Ω ~ 10MΩ

* For non-standard parts, please contact our sales dept.

* Operating Temperature Range : -55 °C ~ +155 °C.



Recommend Land Pattern Design

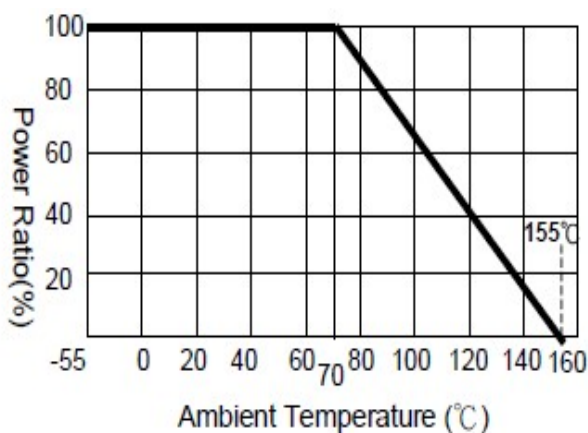


Unit: mm

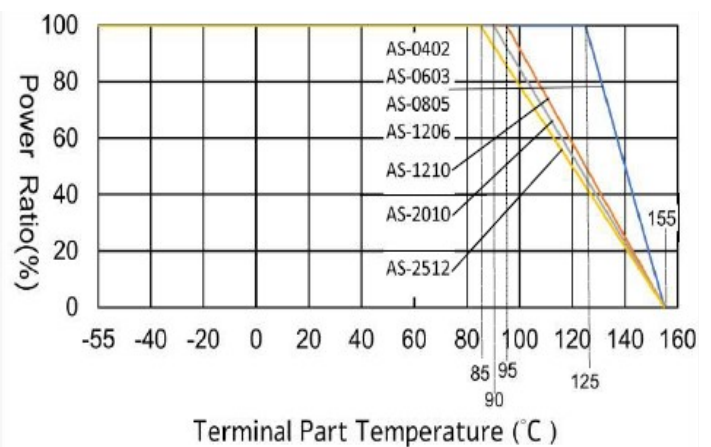
Type	0402	0603	0805	1206	1210	2010	2512
A	0.60	0.80	1.30	2.20	2.00	3.80	4.90
B	1.60	2.40	2.90	4.20	4.40	6.60	8.10
C	0.70	1.00	1.40	1.70	2.70	2.70	3.40

* Power Derating Curve

DERATING CURVE



* Terminal part temperature



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.

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

* 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:

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

E=Rated voltage(V)

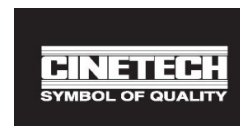
P=Power rating(W)

R=Nominal resistance(Ω)



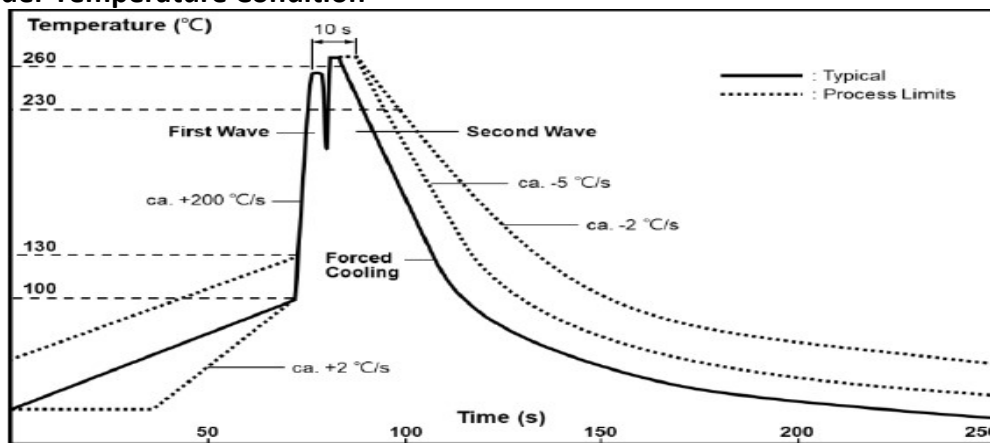
Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R.)	JIS C 5201-1 4.8 IEC-60115-1 4.8	At 25 °C / - 55°C and 25°C / +155°C, 25°C is the reference temperature	Refer to Ratings
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.	$\pm(1.0\%+0.05\Omega)$
Single pulse high voltage overload	IEC-60115	Severity No. 4: $U=10\sqrt{P_{70} \times R}$ or $U=2 \times U_{Max}$; Whichever is the less severe. One pulse per minute, 10 pulses 10/700 μ s.	$\pm(1.0\%+0.05\Omega)$
Insulation Resistance	JIS C 5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute	$\geq 10G\Omega$
Resistance to Soldering Heat	JIS C 5201-1 4.18 IEC-60115-1 4.18	260 $\pm$ 5°C for 10 seconds.	$\geq 5\%$: $\pm(1.0\%+0.05\Omega)$ $< 5\%$: $\pm(0.5\%+0.05\Omega)$
Leaching	JIS C 5201-1 4.18 IEC-60068-2-58 8.2.1	260 $\pm$ 5°C for 30 seconds	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$
Rapid Change of Temperature	JIS C 5201-1 4.19 IEC-60115-1 4.19	-55°C to +155°C, 5 cycles	$\geq 5\%$: $\pm(1.0\%+0.05\Omega)$ $< 5\%$: $\pm(0.5\%+0.05\Omega)$
Resistance to Solvent	JIS C 5201-1 4.29	The tested resistor be immersed into isopropyl alcohol of 20-25°C for 60 secs. Then the resistor is left in the room for 48 hrs.	$\pm(0.5\%+0.05\Omega)$
Damp Heat with Load	JIS C 5201-1 4.24 IEC-60115-1 4.24	40 $\pm$ 2°C, 90~95% R.H. RCWV or Max. working voltage whichever is less for 1000hrs with 1.5hrs "ON" and 0.5hr "OFF"	$\geq 5\%$: $\pm(2.0\%+0.05\Omega)$ $< 5\%$: $\pm(0.5\%+0.05\Omega)$
Load Life (Endurance)	JIS C 5201-1 4.25 IEC-60115-1 4.25.1	70 $\pm$ 2°C, RCWV or Max. working voltage whichever is less for 1000hrs with 1.5hrs "ON" and 0.5hr "OFF"	$\geq 5\%$: $\pm(3.0\%+0.05\Omega)$ $< 5\%$: $\pm(0.5\%+0.05\Omega)$
Terminal Bending Strength	JIS C 5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds D: 0402, 0603、0805=5mm 1206、1210=3mm 1210、2512=2mm	$\pm(1.0\%+0.05\Omega)$

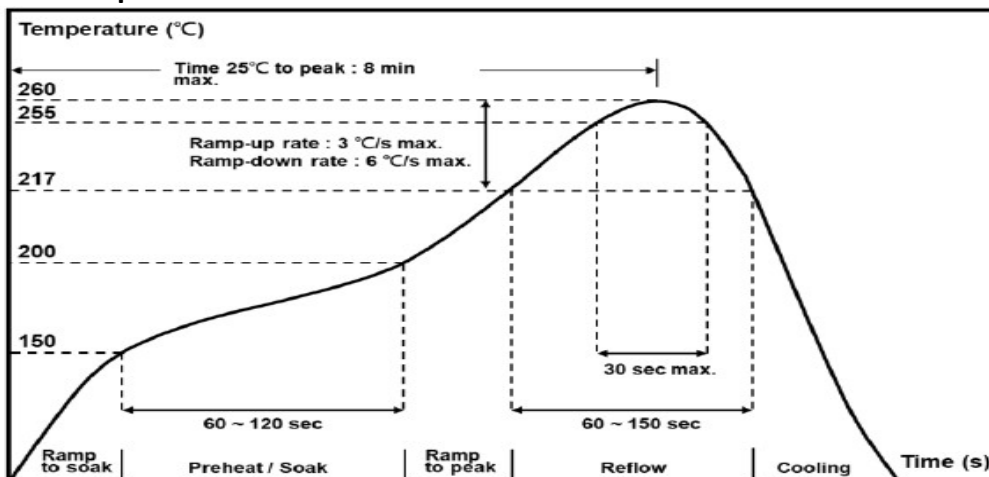


* Recommended Customer Soldering Parameters

Wave solder Temperature Condition



Solder reflow Temperature condition



* Rework temperature hot (air equipment): 350°C , 3~5seconds

Recommended reflow methods

IR, vapor phase oven, hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requiremer

Parts Number System

RSC -

Type

RSC- Thick Film
Anti-Surge Chip
Resistor

RSP- High Power
Chip Resisor

10 -

Size

04=0402
06=0603
10=0805
18=1206
20=1210
22=2010
24=2512

102

Resistance

3 Digits: for 5%
First 2 digits are
significant
figure third
Digits is number
of aero
4 Digits:
for 1%, 0.5%
10K=1002

J

Tolerance

J=± 5%
F=± 1%

R

Standard Packing

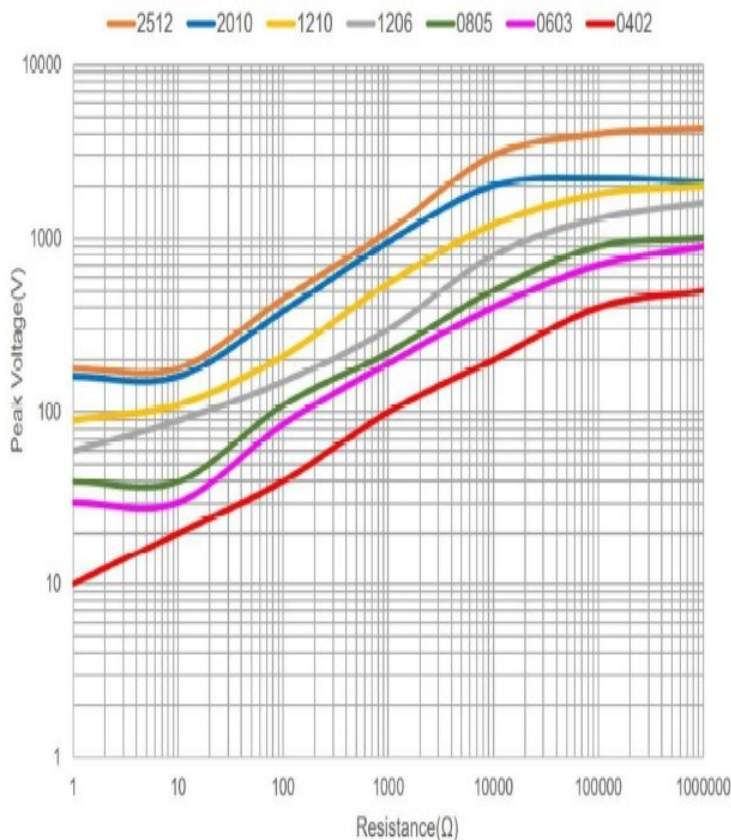
R=Paper tape
reel

K=Embossed
plastic tape
reel

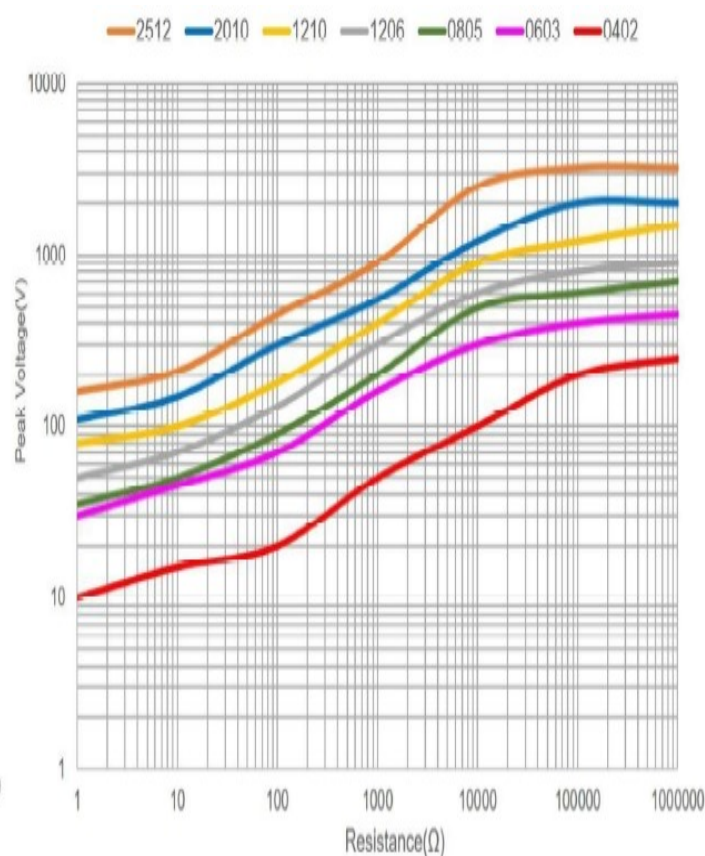


Lightning Surge

*** 1.2/50us Lightning Surge**

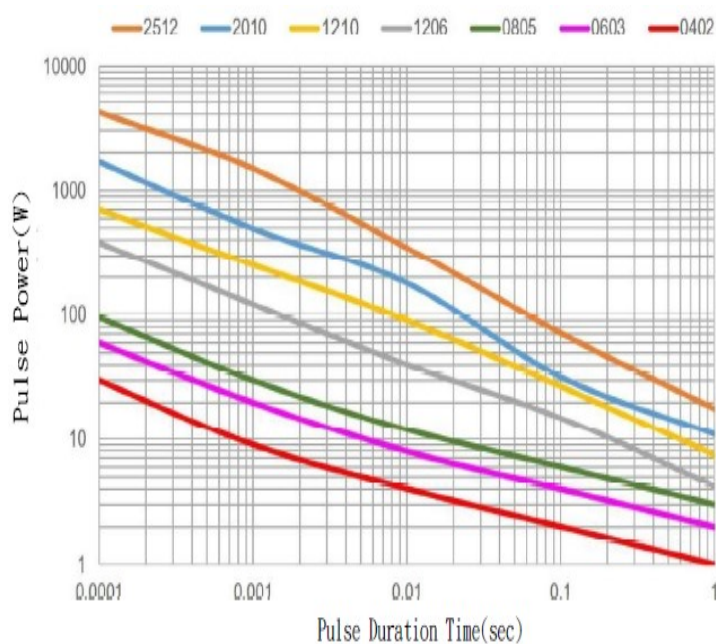


*** 10/700us Lightning Surge**



Single Pulse Power

*** Single Pulse Power - 100 ohm**



Continuous Pulse Power

*** Continuous Pulse Power - 100 ohm**

