

# Extra - High Power Thick Film Chip Resistor Kit

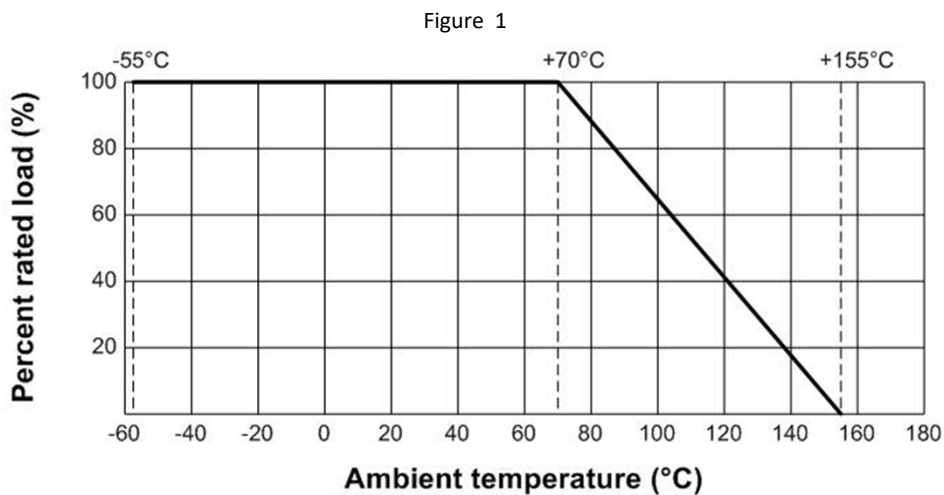


## 1. Ratings:

Type	RND 155SP123WJE024KIT
Power Rating at 70 °C	3 W
Max. Working Voltage	250 V
Max. Overload Voltage	500 V
Dielectric Withstand Voltage	500 V
Temperature Range	-55 ... 155 °C
Ambient Temperature	70 °C
Resistance Tolerance	5%
Power Rating	3 W
Resistance Range	1Ω ~ 10MΩ
Resistor Case Style	2512

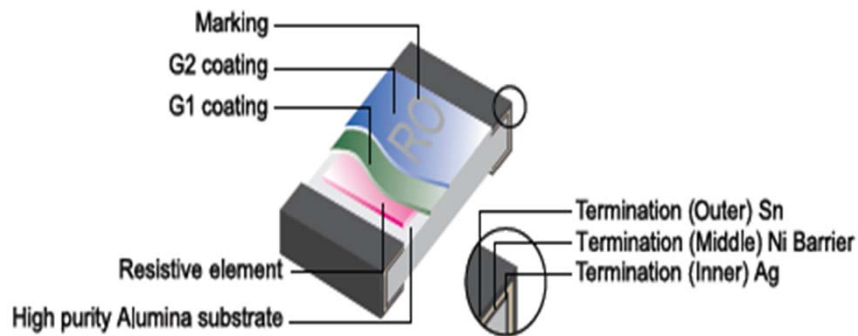
## 2.1 Power Rating:

Resistors should be rated for power based on continuous operation under an ambient temperature of 70°C. If the temperature exceeds 70°C, the load must be derated, as illustrated in Figure 1

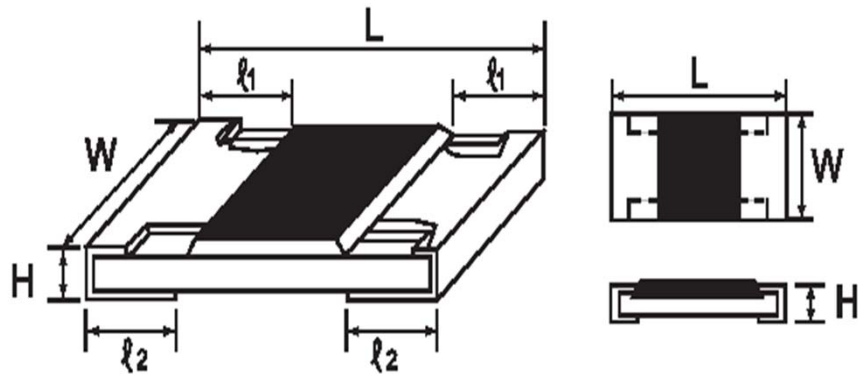


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## 3. Construction :



## 4. Dimensions

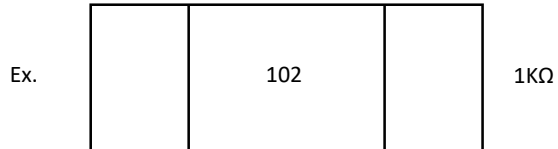


Type	Dimension (mm)				
	$L \pm 0.10$	$W \pm 0.15$	$H \pm 0.10$	$l1 \pm 0.25$	$l2 \pm 0.20$
RND 155SP123WJE024KIT	6.35	3.20	1.10	0.60	1.80

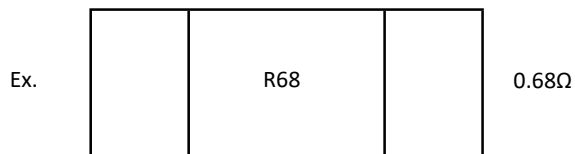
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5. Marking for Resistors - 5% in 2512 size : 3 Digits

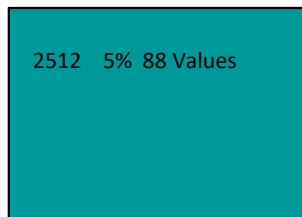
6. The first 2 digits are significant figures of resistance and the 3rd digit denoted number of zeros.



\*For ohmic values below 10  $\Omega$ , letter "R" is for decimal point.



## 6.1 Labels



# Extra - High Power Thick Film Chip Resistor Kit



7. Performance specification :		
Characteristics	Limits	Test Methods ( JIS C 5201-1 )
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down	4.7 Clamped in the trough of a 90°C metallic v-block and shall be tested at ac potential respectively specified in the type for 60-70 seconds
Temperature Coefficient	1Ω~10Ω ≤± 200PPM/°C 10.1Ω~10MΩ ≤± 100PPM/°C	4.8 Natural resistance change per temp. degree centigrade. $\frac{R2-R1}{R1(t2-t1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (T1) R2: Resistance value at room temp. plus 100 °C(T2) Test pattern: room temp. (T1), room temp. +100°C(T2)
Short time overload	Resistance change rate is ± (2.0% + 0.1Ω) Max.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds
Soldering temp. reference	Electrical characteristics shall be satisfied. Without distinct deformation in appearance. (95 % coverage Min.)	<p>Wave soldering condition: (2 cycles Max.)</p> <p>Pre-heat : 100 ~ 120 °C, 30 ± 5 sec. Suggestion solder temp.: 235 ~ 255 °C, 10 sec. (Max.) Peak temp.: 260 °C</p> <p>Reflow soldering condition: (2 cycles Max.)</p> <p>Pre-heat : 150 ~ 180 °C, 90 ~ 120 sec. Suggestion solder temp.: 235 ~ 255 °C, 20 ~ 40 sec. Peak temp.: 260 °C</p> <p>Hand soldering condition: _____</p> <p>The soldering iron tip temperature should be less than 300°C and maximum contact time should be 5 sec.</p>
Soldering heat	Resistance change rate is:± (1.0%+0.05Ω) Max.	4.18 Dip the resistor into a solder bath having a temperature of 260°C±3°C and hold it for 10±1 seconds.

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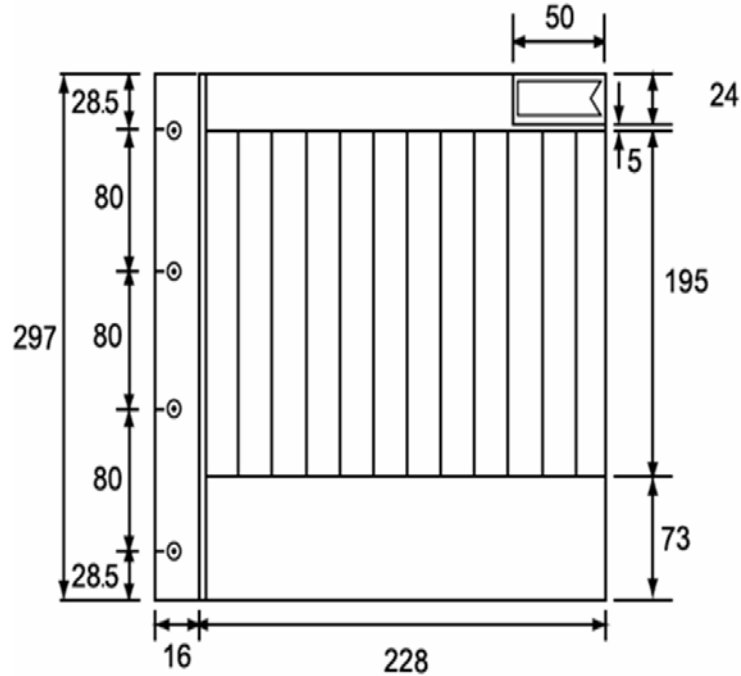
7. Performance specification :																	
Characteristics	Limits	Test Methods ( JIS C 5201-1 )															
Temperature cycling	Resistance change rate is $\pm$ (1.0% + 0.1 $\Omega$ ) Max.	4.19 Resistance change after continuous 5 cycles for duty cycle specified below :															
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C <math>\pm</math> 3°C</td> <td>30 mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> <tr> <td>3</td> <td>+155°C <math>\pm</math> 2°C</td> <td>30 mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C $\pm$ 3°C	30 mins	2	Room temp.	10~15 mins	3	+155°C $\pm$ 2°C	30 mins	4	Room temp.	10~15 mins
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		2	Room temp.	10~15 mins													
3	+155°C $\pm$ 2°C	30 mins															
4	Room temp.	10~15 mins															
Humidity	Resistance change rate is $\pm$ (3.0% + 0.1 $\Omega$ ) Max.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40 $\pm$ 2° C and 90-95% relative humidity															
Load life in humidity	Resistance change rate is $\pm$ (3.0% + 0.1 $\Omega$ ) Max.	7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off" ) at RCWV in a humidity chamber controlled at 40°C $\pm$ 2°C and 90 to 95 % relative humidity															
Load Life	Resistance change rate is $\pm$ (3.0% + 0.1 $\Omega$ ) Max.	4.25.1 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of (1.5 hours"on", 0.5 hour"off") at 70°C $\pm$ 2°C ambient															
Terminal bending	Resistance change rate is $\pm$ (1.0% + 0.05 $\Omega$ ) Max.	4.33 Twist of Test Board : Y/X = 3/90 mm for 60 seconds															

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## 8. Kit resistors :

### 8.1 Insert for Chip Kit

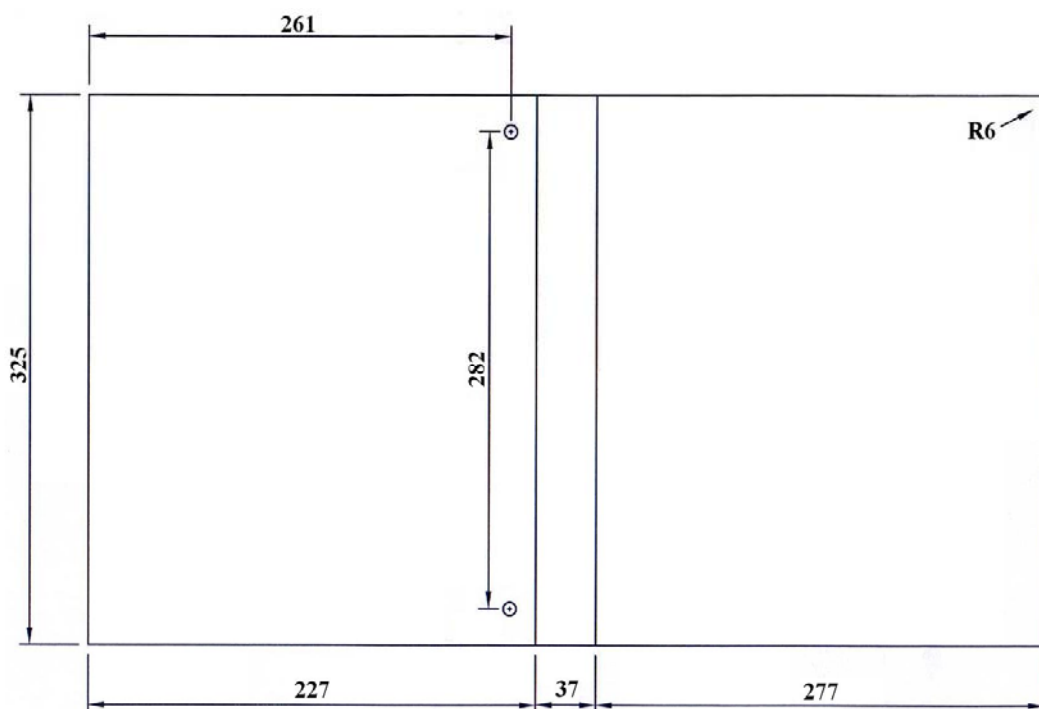
Dimension (mm)



### 8.2 Album for Chip Kit

Dimension (mm)

\* Green Album



# Extra - High Power Thick Film Chip Resistor Kit

## Environment Related Substance

This product complies to EU RoHS directive, EU PAHs directive, EU PFOS directive and Halogen free.

Ozone layer depleting substances.

Ozone depleting substances are not used in our manufacturing process of this product.

This product is not manufactured using Chloro fluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs), Hydrobromofluorocarbons (HBFCs) or other ozone depleting substances in any phase of the manufacturing process.

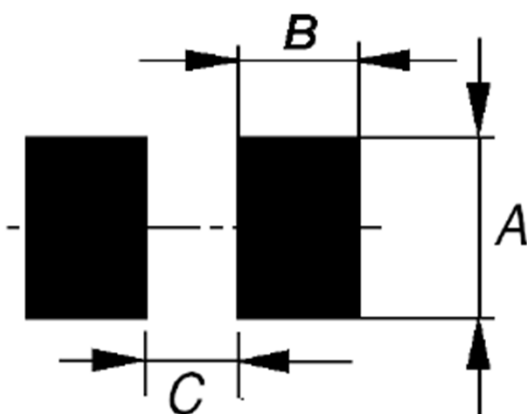
## Storage Condition (MSL1)

The performance of these products, including the solderability, is guaranteed for a year from the date of arrival at your company, provided that they remain packed as they were when delivered and stored at a temperature of  $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$  and a relative humidity of  $60\%RH \pm 10\%RH$ , chemical and dust free atmosphere

Even within the above guarantee periods, do not store these products in the following conditions. Otherwise, their electrical performance and/or solderability may be deteriorated, and the packaging materials (e.g. taping materials) may be deformed or deteriorated, resulting in mounting failures.

1. In salty air or in air with a high concentration of corrosive gas, such as  $\text{Cl}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{NH}_3$ ,  $\text{SO}_2$ , or  $\text{NO}_2$
2. In direct sunlight

## Recommended solder pad



A	B	C
3.7 mm	2.8 mm	2.7 mm

4 layers PCB specification:

- 1) Outside 2 layers (Top and Bottom) with copper foil thickness at 2oz.
- 2) Inside 2 layers (Middle layers) with copper foil thickness at 4 oz.

# Extra - High Power Thick Film Chip Resistor Kit



PRODUCT:RND 155SP123WJE024KIT

Contents: 88 values of resistors (1R to 10M and 0R)(2 strips - with 50 PCS resistors each)

NO.	Value
1	0E
2	1E
3	1.2E
4	1.5E
5	1.8E
6	2.2E
7	2.7E
8	3.3E
9	3.9E
10	4.7E
11	5.6E
12	6.8E
13	8.2E
14	10E
15	12E
16	15E
17	18E
18	22E
19	27E
20	33E
21	39E
22	47E

NO.	Value
23	56E
24	68E
25	82E
26	100E
27	120E
28	150E
29	180E
30	200E
31	220E
32	270E
33	300E
34	330E
35	390E
36	470E
37	560E
38	680E
39	820E
40	1K
41	1.2K
42	1.5K
43	1.8K
44	2.2K

NO.	Value
45	2.7K
46	3.3K
47	3.9K
48	4.7K
49	5.6K
50	6.8K
51	8.2K
52	10K
53	12K
54	15K
55	18K
56	22K
57	27K
58	33K
59	39K
60	47K
61	56K
62	68K
63	82K
64	100K
65	120K
66	150K

NO.	Value
67	180K
68	220K
69	270K
70	330K
71	390K
72	470K
73	560K
74	680K
75	820K
76	1M
77	1.2M
78	1.5M
79	1.8M
80	2.2M
81	2.7M
82	3.3M
83	3.9M
84	4.7M
85	5.6M
86	6.8M
87	8.2M
88	10M