

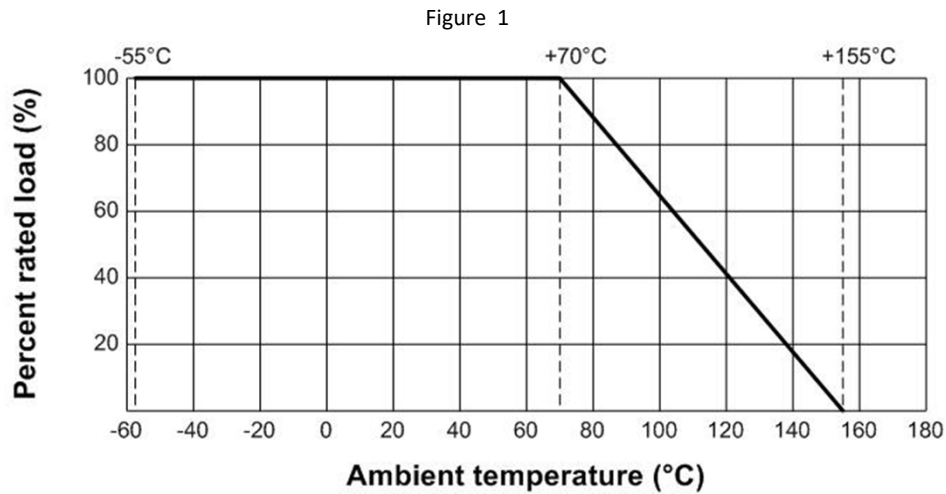
Extra - High Power Thick Film Chip Resistor Kit

1. Ratings:

Type	RND 155SP123WFE024KIT
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	1%
Power Rating	3 W
Resistance Range	1Ω ~ 10 MΩ
Resistor Case Style	2512

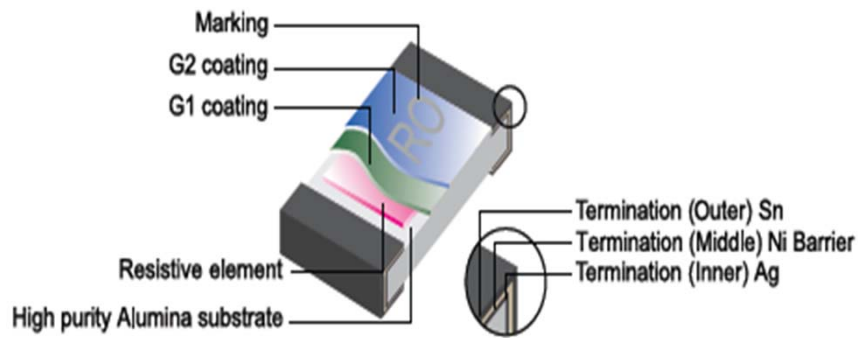
2.1 Power Rating:

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

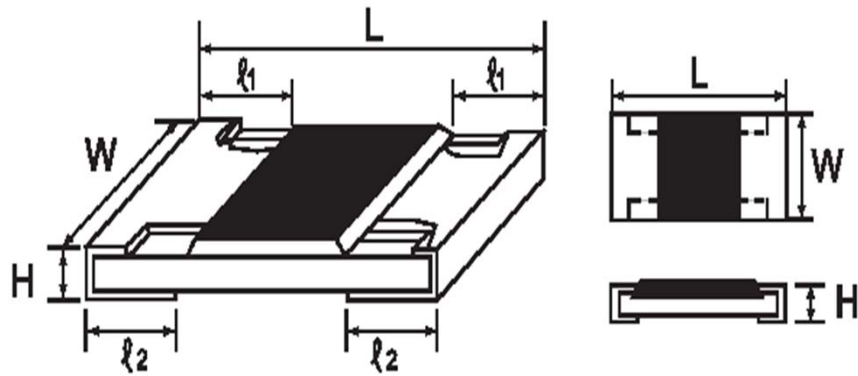


Extra - High Power Thick Film Chip Resistor Kit

3. Construction :



4. Dimensions

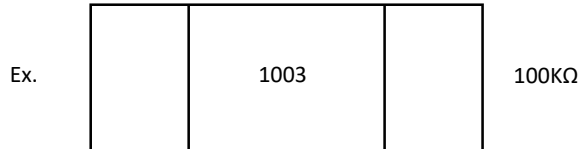


Type	Dimension (mm)				
	$L \pm 0.10$	$W \pm 0.15$	$H \pm 0.10$	$r1 \pm 0.25$	$r2 \pm 0.20$
RND 155SP123WFE024KIT	6.35	3.20	1.10	0.60	1.80

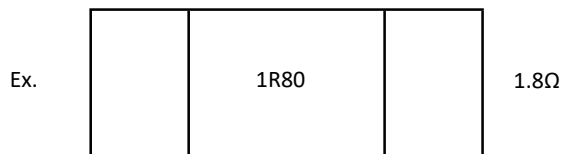
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Marking for Resistors 1% in 2512 size : 4 Digits

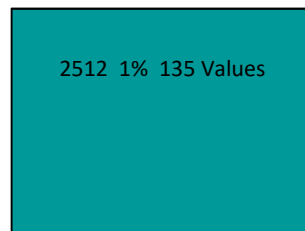
The first 3 digits are significant figures of resistance and the 4th digit denoted number of zeros.



*For ohmic values below 100 Ω , 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 ± (1.0% + 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><u>Wave soldering condition: (2 cycles Max.)</u> Pre-heat : 100 ~ 120 °C, 30 ± 5 sec. Suggestion solder temp.: 235 ~ 255 °C, 10 sec. (Max.) Peak temp.: 260 °C</p> <p><u>Reflow soldering condition: (2 cycles Max.)</u> Pre-heat : 150 ~ 180 °C, 90 ~ 120 sec. Suggestion solder temp.: 235 ~ 255 °C, 20 ~ 40 sec. Peak temp.: 260 °C</p> <p><u>Hand soldering condition:</u> The soldering iron tip temperature should be less than 300°C and maximum contract 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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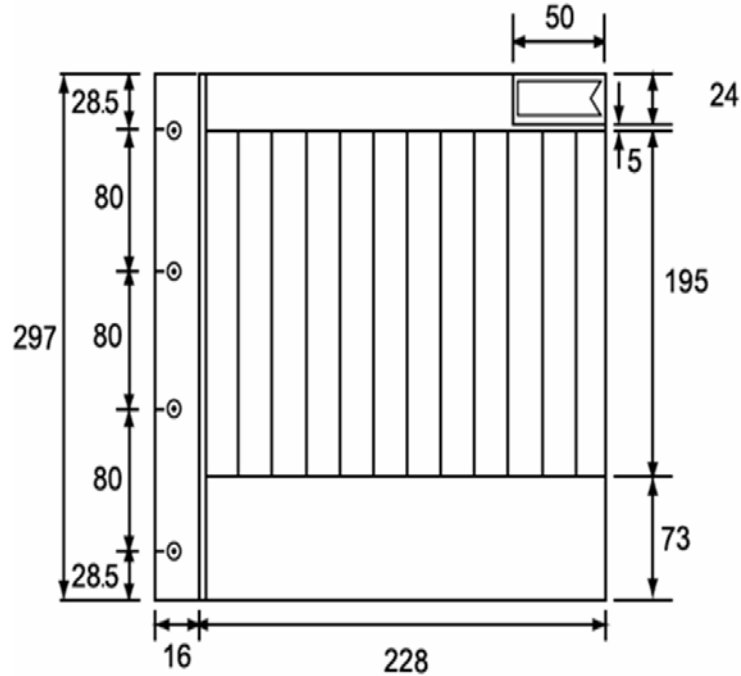
7. Performance specification :																	
Characteristics	Limits	Test Methods (JIS C 5201-1)															
Temperature cycling	Resistance change rate is \pm (0.5% + 0.1 Ω) Max.	4.19 Resistance change after continuous 5 cycles for duty cycle specified below :															
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C \pm 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 \pm 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 (0.5% + 0.1 Ω) 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 (1.0% + 0.1 Ω) 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 (1.0% + 0.1 Ω) 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 Ω) Max.	4.33 Twist of Test Board : Y/X = 3/90 mm for 60 seconds															

Extra - High Power Thick Film Chip Resistor Kit

8. Kit resistors :

8.1 Insert for Chip Kit

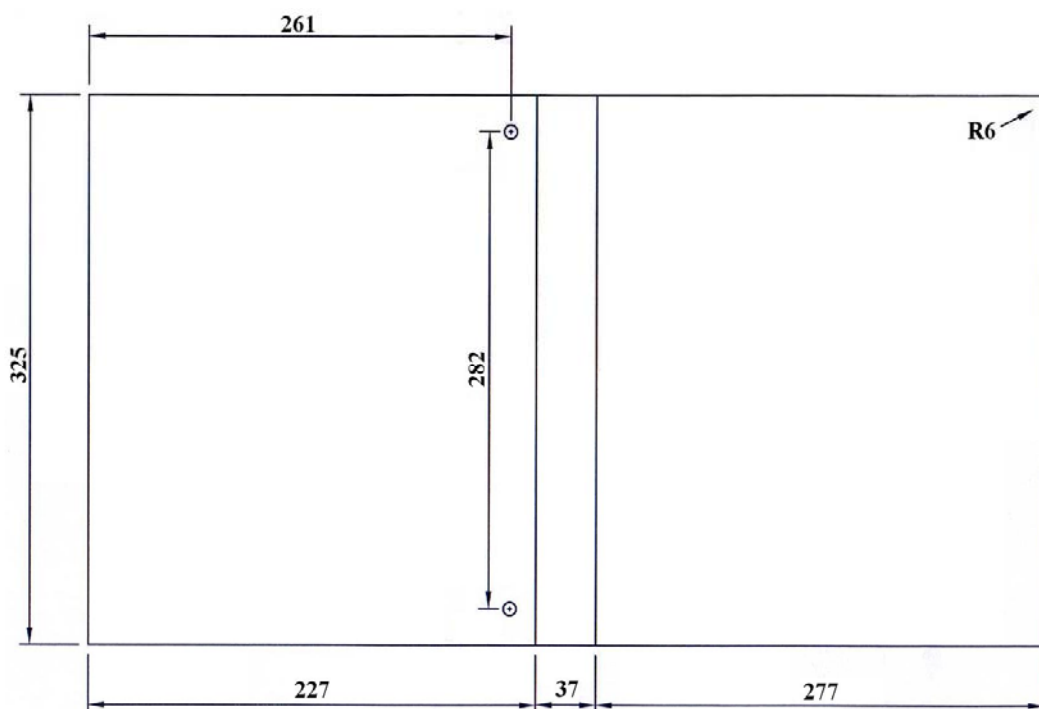
Dimension (mm)



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.

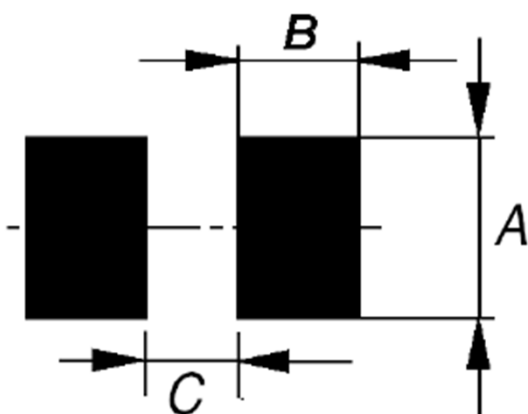
Storage Condition (MSL1)

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 Cl_2 , H_2S , NH_3 , SO_2 , or 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 155SP123WFE024KIT

Contents: 135 values of resistors (1R to 10M and 0R)(2 strips - with 50 PCS resistors each)

NO.	Value
1	0E
2	1E
3	1.5E
4	2.2E
5	3.3E
6	4.7E
7	5.1E
8	6.8E
9	10E
10	11E
11	12E
12	13E
13	15E
14	16E
15	18E
16	20E
17	22E
18	24E
19	27E
20	30E
21	33E
22	36E
23	39E
24	43E
25	47E
26	51E
27	56E
28	62E
29	68E
30	75E
31	82E
32	91E
33	100E
34	110E
35	120E
35	130E

NO.	Value
36	130E
37	150E
38	160E
39	180E
40	200E
41	220E
42	240E
43	270E
44	300E
45	330E
46	360E
47	390E
48	430E
49	470E
50	510E
51	560E
52	620E
53	680E
54	750E
55	820E
56	910E
57	1K
58	1.1K
59	1.2K
60	1.3K
61	1.5K
62	1.6K
63	1.8K
64	2K
65	2.2K
66	2.4K
67	2.7K
68	3K
69	3.3K
70	3.6K
71	3.9K

NO.	Value
71	3.9K
72	4.3K
73	4.7K
74	5.1K
75	5.6K
76	6.2K
77	6.8K
78	7.5K
79	8.2K
80	9.1K
81	10K
82	11K
83	12K
84	13K
85	15K
86	16K
87	18K
88	20K
89	22K
90	24K
91	27K
92	30K
93	33K
94	36K
95	39K
96	43K
97	47K
98	51K
99	56K
100	62K
101	68K
102	75K
103	82K
104	91K
105	100K
106	110K

NO.	Value
106	110K
107	120K
108	130K
109	150K
110	160K
111	180K
112	200K
113	220K
114	240K
115	270K
116	300K
117	330K
118	360K
119	390K
120	430K
121	470K
122	510K
123	560K
124	620K
125	680K
126	750K
127	820K
128	910K
129	1M
130	1.5M
131	2.2M
132	3.3M
133	4.7M
134	6.8M
135	10M