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※ The company's products meet the RoHS Directive and REACH regulations。

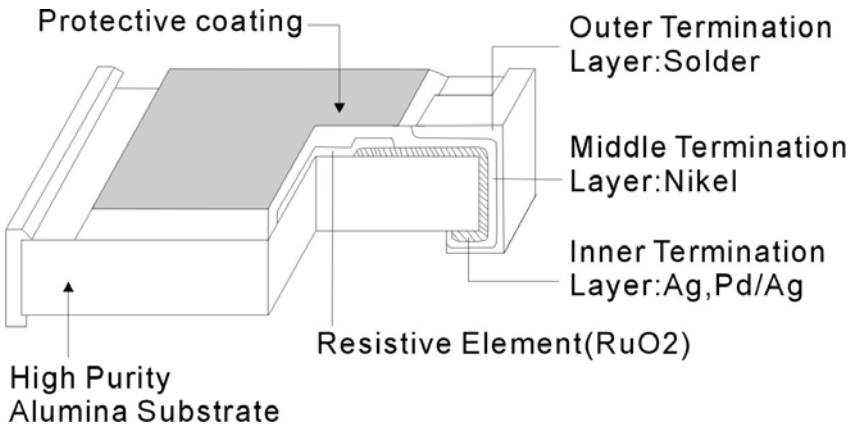
1 Scope:

This specification applies for the thick film chip resistors (Lead Free) made by SHI MENG ELECTRONIC CO., LTD.

2. Features:

- Extremely thin and light
- Highly reliable multiplayer electrode construction
- Compatible with all soldering process
- Highly stable in auto-placement surface mounting applications
- Barrier layer end termination
- Zero Ohm Jumper is available
- Available in 8mm Tape and Reel per EIA RS481

3. Construction:

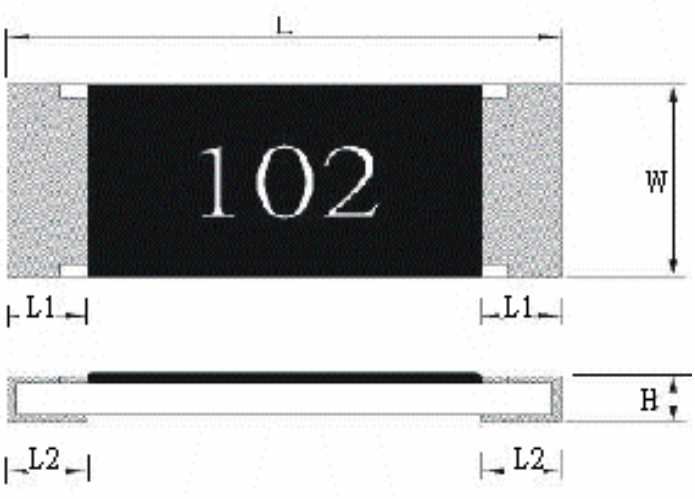


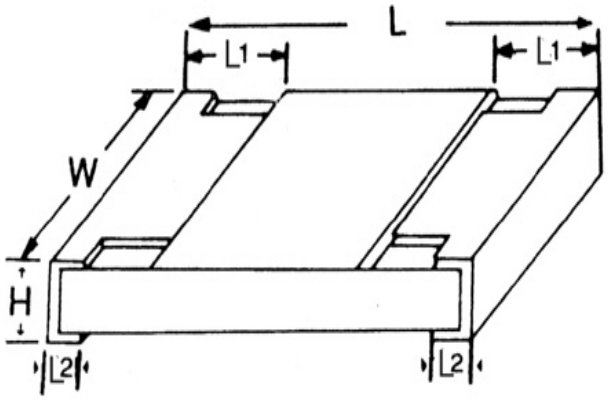
4. How To Order:

SMD	0805	J	47K
a	b	c	d

a: code number　　a: 名稱
b: rated power　　b: 額定功率
c: tolerance　　c: 容許誤差
d: resistance value　　d: 電阻值

5. Dimensions:





unit：mm

Type	L	W	H	L1	L2
0402	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
0805	2.00±0.15	1.25±0.10	0.55±0.10	0.40±0.20	0.40±0.20
1206	3.10±0.15	1.55±0.10	0.55±0.10	0.45±0.25	0.45±0.20
1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20
2010	5.00±0.10	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20
2512	6.35±0.10	3.20±0.15	0.55±0.10	0.60±0.25	0.50±0.20

6. Ratings & Characteristics :

Type	Power Rating At 70℃	Max Working Voltage	Max Overload Voltage	T.C.R (PPM/℃)	Resistance Range (Ω)				
					B ±0.1%	D ±0.5%	F ±1%	G ±2%	J ±5%
0402	1/16W	50 V	100 V	±200			10Ω~0MΩ	10Ω~10MΩ	10Ω~10MΩ
				+500 -200			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
0603	1/10W	50 V	100 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
0805	1/8W	150 V	300 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
1206	1/4W	200 V	400 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
1210	1/3W	200 V	400 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
2010	3/4W	200 V	400 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω
2512	1W	200 V	400 V	±100	10Ω~1MΩ	10Ω~1MΩ	10Ω~10MΩ		
				±200				10Ω~10MΩ	10Ω~10MΩ
				±400			0.1Ω~9.9Ω	0.1Ω~9.9Ω	0.1Ω~9.9Ω

0Ω THICK FILM CHIP RESISTERS

Type	Rated Current	Max Overload Current	Resistance Range
0402	1A	2A	50mΩ MAX
0603	1A	2A	50mΩ MAX
0805	1A	2A	50mΩ MAX
1206	2A	5A	50mΩ MAX
1210	2A	5A	50mΩ MAX
2010	2A	5A	50mΩ MAX
2512	2A	5A	50mΩ MAX

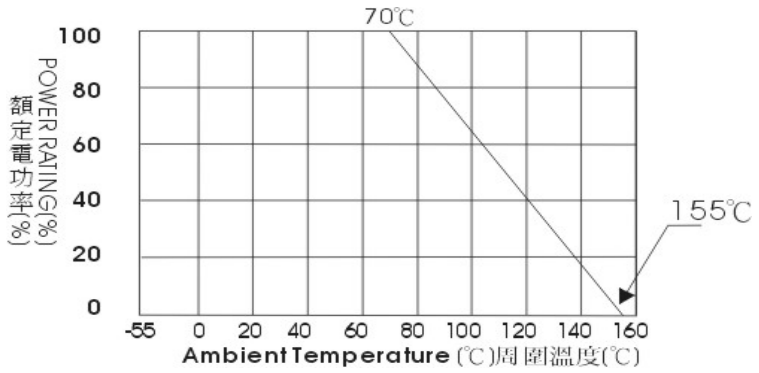
2.Operating Temp(℃): -55℃~ +125℃

Note: Except for the above standardized products,we also provide the customized products.

6.1 Power Derating Curve :

As resistors operated at ambient temperature over 70℃, power rating shall be derated in accordance with figure 1.

Figure 1



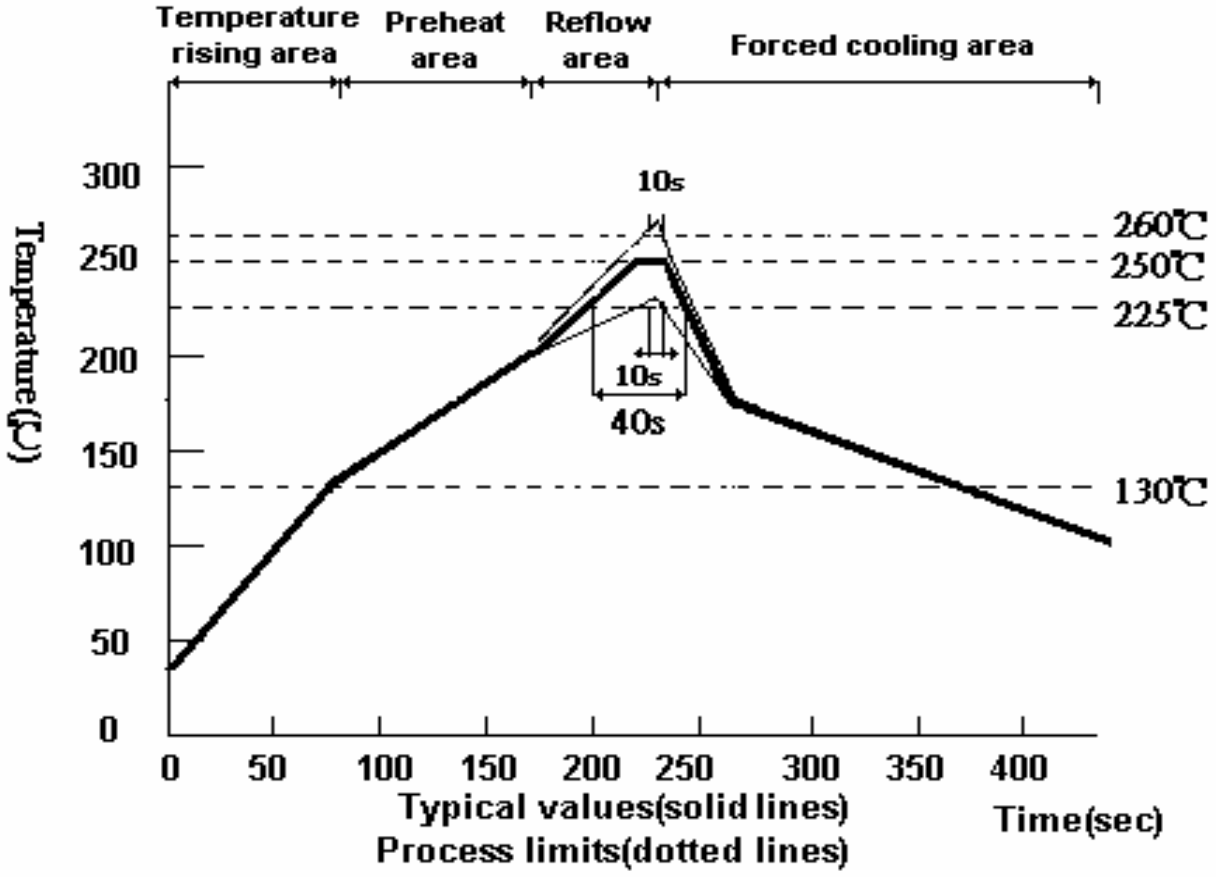
6.2 Rated Voltage:

The rated voltage is calculated by the following formula:

$$E=\sqrt{P*R}$$

E=Rated Voltage (V)
P=Rated Power (W)
R=Resistance Value (Ω)

6.3 Lead Free soldering Profile:



7. Environmental Characteristics

<table>
<tr><th rowspan="2">Test Items</th><th rowspan="2">Condition of Test</th><th colspan="2">Test Limits</th></tr>
<tr><th>1% Tolerance</th><th>5% Tolerance</th></tr>
<tr><td>Temperature Coefficient</td><td>-55℃to+155℃</td><td colspan="2">Refer 6.0</td></tr>
<tr><td>Short Time overload</td><td>2.5 times RCWV for 5 seconds</td><td>±(1.0%R+0.05Ω)</td><td>±(2.0% R +0.05Ω)</td></tr>
<tr><td>Insulation resistance</td><td>Apply 500V DC Between Protective Coating and Termination for 1 minute, Then measure</td><td colspan="2">1,000MΩ or More</td></tr>
<tr><td>Load Life</td><td>1000 hours at rated power, 70±2℃,1.5 hours “on”0.5 hours “off”</td><td>±(1.0%R+0.05Ω)</td><td>±(3.0%R+0.05Ω)</td></tr>
<tr><td>Load Life with Humidity</td><td>1000 hours at rated power 40±2℃, 90~95%RH, 1.5 hours “on”0.5hurs “off”</td><td>±(1.0%R+0.05Ω)</td><td>±(3.0%R+0.05Ω)</td></tr>
<tr><td>Solder ability</td><td>245±5℃ for 2 ±0.5 seconds</td><td>95% min coverage</td><td>95% min coverage</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Soldered to test board at 260±5℃ for 10±1 seconds</td><td>±(0.5%R+0.05Ω)</td><td>±(1.0%R+0.05Ω)</td></tr>
<tr><td>Rapid change of Temperature</td><td>-55℃ (30min.) / +125℃ (30min.) 5 cycles</td><td>±(0.5%R+0.05Ω)</td><td>±(1.0%R+0.05Ω)</td></tr>
<tr><td>Dielectric withstanding voltage (voltage proof)</td><td>0402 & 0603: 300V;
The order: 500V;
For 60 seconds</td><td colspan="2">No abnormalities such as flashover, burning dielectric breakdown shall appear</td></tr>
<tr><td rowspan="3">Bending Strength</td><td colspan="3">Mount the specimen on a test board as shown in the figure. Slowly apply the force till the board is bent to specified for 5±1sec,and measure the △R/R(%) at this position.</td><td colspan="2">±(1.0%R+0.05Ω)</td></tr>
<tr><td>Type</td><td>0201</td><td>0402</td><td>0603</td><td>0805</td><td>1206</td><td>1210</td><td>2010</td><td>2512</td></tr>
<tr><td>Bent distance</td><td>3mm</td><td>3mm</td><td>5mm</td><td>5mm</td><td>5mm</td><td>2mm</td><td>2mm</td><td>2mm</td></tr>
</table>

Note: RCWV=Rated continuous working voltage

8. Marking:

(1) For 0402 Size: Due to the very small size of the resistors body, There is no marking on the body.

Example:

(2) ±5% Tolerance: The first two digits are significant figures of resistance and the third denotes number of zeros following.

Example:

333 → 33000 → 33kΩ

(3) ±5% Tolerance: Below 10Ω show as following, Read alphabet "R" as decimal point.

Example:

2.2Ω

(4) ±1% Tolerance: 4 Digits, first three digits are significant, fourth digit is number of zeros. Letter "R" is decimal point.

Example:

2701 → 2700 → 2.7kΩ

10.5Ω

(5) When the marking space is too small in such small-sized resistors as 0603 ±1% Tolerance, the marking cannot made by 4 digits and may be made by two digits combined with one English capital.

Multiplier Code:

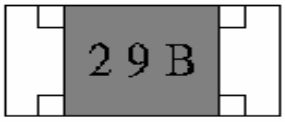
Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^{-1}	10^{-2}	10^{-3}

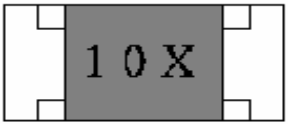
Coding Formula :

First two digits ----------Resistance Code

Third digit ----------Multiplier Code

Example: 1.96KΩ=196*10^1 -------29B 12.4Ω=124*10^{-1}Ω-------10X





Standard E-96 Values and 0603 Resistance Code

Ω Value	Code	Ω Value	Code	Ω Value	Code	Ω Value	Code
100	01	178	25	316	49	562	73
102	02	182	26	324	50	576	74
105	03	187	27	332	51	590	75
107	04	191	28	340	52	604	76
110	05	196	29	348	53	619	77
113	06	200	30	357	54	634	78
115	07	205	31	365	55	649	79
118	08	210	32	374	56	665	80
121	09	215	33	383	57	681	81
124	10	221	34	392	58	698	82
127	11	226	35	402	59	715	83
130	12	232	36	412	60	732	84
133	13	237	37	422	61	750	85
137	14	243	38	432	62	768	86
140	15	249	39	442	63	787	87
143	16	255	40	453	64	806	88
147	17	261	41	464	65	825	89
150	18	267	42	475	66	845	90
154	19	274	43	487	67	866	91
158	20	280	44	499	68	887	92
162	21	287	45	511	69	909	93
165	22	294	46	523	70	931	94
169	23	301	47	536	71	953	95
174	24	309	48	549	72	976	96

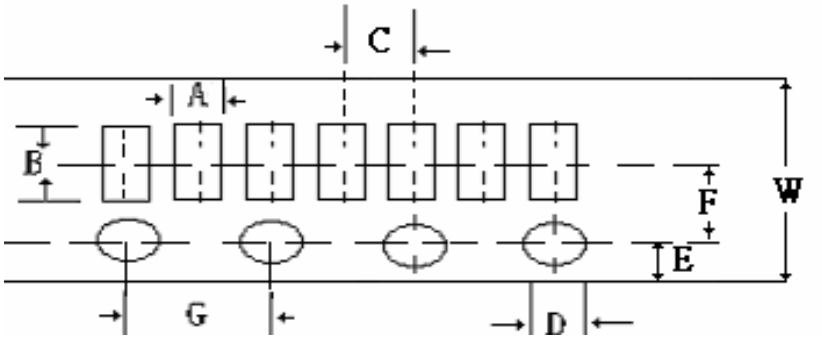
Notes:

When the resistance value is not in the list of E96, 3 digitals with underline in E-24 series in used as mark.

Example: 0603 120Ω ±1% Marking is 121

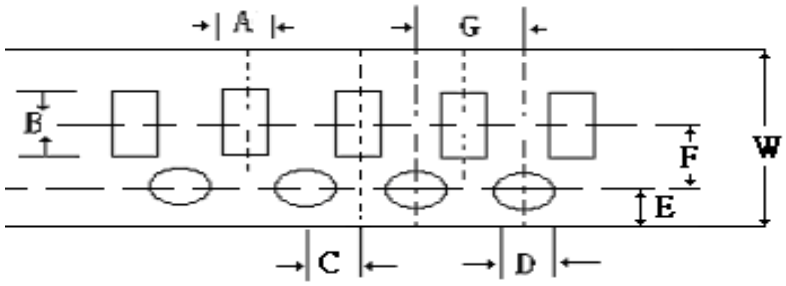
9. Taping & Reel

9.1 Taping Dimensions



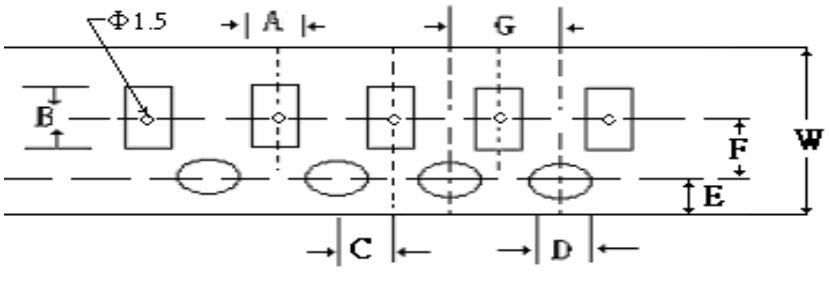
unit : mm

Type	A±0.2	B±0.2	C±0.05	ΦD+1/-0	E±0.1	F±0.05	G±0.1	W±0.2
0402	0.65	1.15	2.00	1.50	1.75	3.50	4.00	8.00



unit : mm

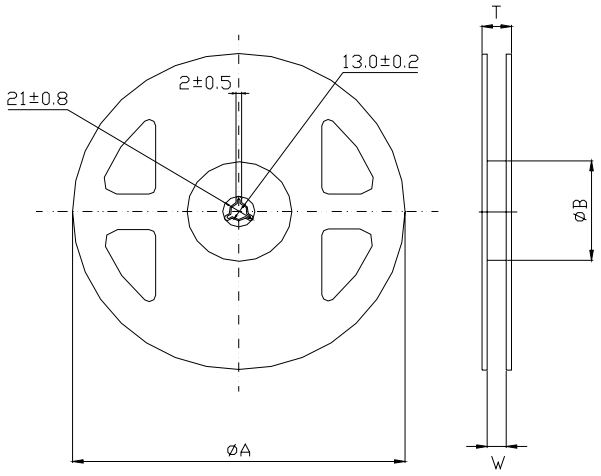
Type	A±0.2	B±0.2	C±0.05	ΦD+1/-0	E±0.1	F±0.05	G±0.1	W±0.2
0603	1.10	1.90	2.00	1.50	1.75	3.50	4.00	8.00
0805	1.65	2.40	2.00	1.50	1.75	3.50	4.00	8.00
1206	2.00	3.60	2.00	1.50	1.75	3.50	4.00	8.00
1210	2.80	3.50	2.00	1.50	1.75	3.50	4.00	8.00



unit : mm

Type	A±0.2	B±0.2	C±0.05	ΦD+1/-0	E±0.1	F±0.05	G±0.1	W±0.2
2010	2.90	5.60	2.00	1.50	1.75	5.50	4.00	12.00
2512	3.50	6.70	2.00	1.50	1.75	5.50	4.00	12.00

9.2 Reel Specifications



Unit：mm

Style	Packaging	Tape width	ØA	ØB	W	T
0201/0402/0603 0805/1206/1210	Paper	8mm	180^{+0}_{-3}	60^{+1}_{-0}	9.0±0.3	11.4±1
2010/2512	Embossed	12mm	180^{+0}_{-3}	60^{+1}_{-0}	13.0±0.3	15.4±1

9.3 Storage Conditions:

The resistors with appropriate package would have a preservative duration of 1 year.
Temperature: 5℃~35℃, Humidity: 40~75%

9.4 Peel off Strength

Peel-off force of paper and blister tape is in accordance with "JIS-C5202"
That is,0.1 to 0.7 N at a peel-off speed of 300 mm / minute.