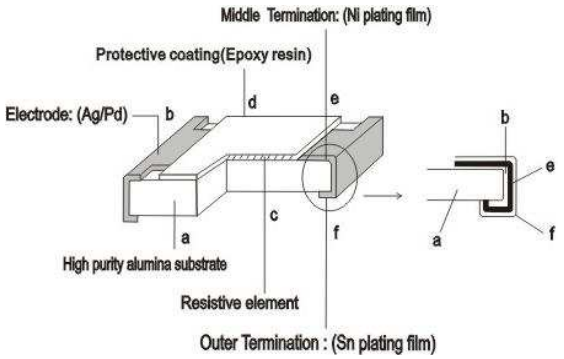
THICK FILM CHIP RESISTOR

CONSTRUCTION



APPLICATION

Entertainment: stereo, TV tuners, tape recorder

Appliance: Air conditioner, refrigerator

Computer & relative products: Main board, PDA

Communication equipment: cell phone, Fax machine

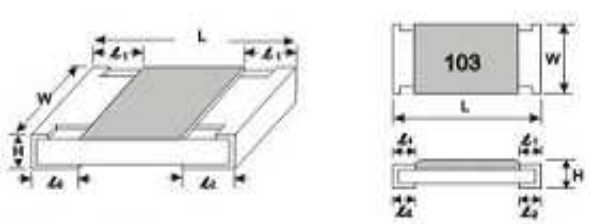
Power equipment: power supply, illumination equipment

Measuring instrument: Electric meter, Navigation equipment

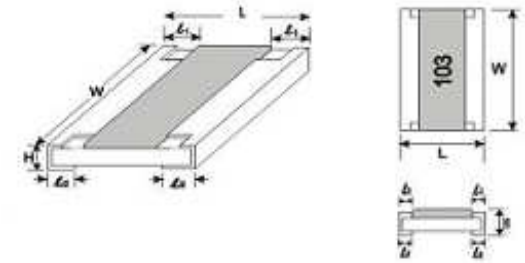
FEATURES

Small size and light weight Reduction of assembly costs and matching with placement machines Reliability, High quality and Fast Delivery

R0201 / R0402 / R0603 / R0805 / R1206 / R1210
R1812 / R2010 / R2512



R1218 / R2030



DIMENSION **Unit: mm**

TYPE	L	W	H	l_1	l_2
R0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.05	0.15 ± 0.05	0.15 ± 0.05
R0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.20 ± 0.10	0.20 ± 0.10
R0603	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.15
R0805	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.35 ± 0.15	0.35 ± 0.15
R1206	3.20 ± 0.20	1.60 ± 0.20	0.55 ± 0.15	0.45 ± 0.20	0.45 ± 0.20
R1210	3.20 ± 0.20	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20
R1812	4.50 ± 0.10	3.00 ± 0.10	0.55 ± 0.05	0.55 ± 0.10	0.80 ± 0.10
R2010	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
R1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.05	0.45 ± 0.10	0.40 ± 0.10
R2512	6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
R2030	5.10 ± 0.10	7.60 ± 0.10	0.60 ± 0.05	0.80 ± 0.10	0.70 ± 0.10

THICK FILM CHIP RESISTOR

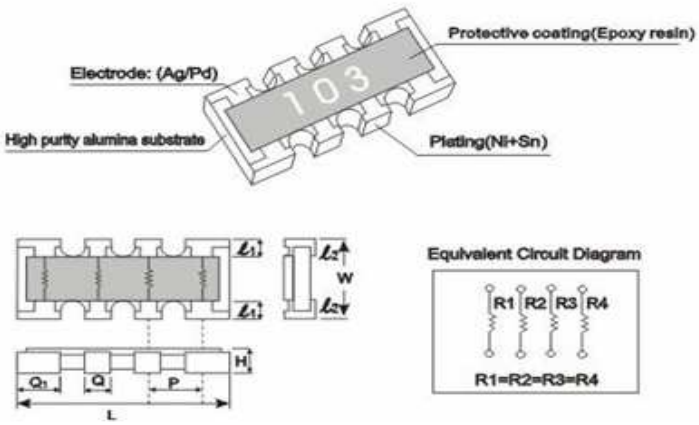
General Electrical Specifications of CHIP RESISTOR

TYPE	Rated Power at 70℃		Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/℃)	Resistance Range			Operating Temperature Range
	Standard Power	High Power				B(±0.1%) D(±0.5%)	F(±1%) G±(2%)	J(±5%) K(±10%)	
R0201	0.05 W	**0.05 W**	25V	50V	±200		10Ω~1MΩ	10Ω~1MΩ	-55℃ ~ +155℃
R0402	0.063 W	**0.1 W**	50V	100V	+500~--200		1Ω~9.9Ω	1Ω~9.9Ω	
					±300		10Ω~990Ω	10Ω~990Ω	
					±200	10Ω~1MΩ	1KΩ~10MΩ	1KΩ~10MΩ	
R0603	0.1 W	**0.125 W**	50V	100V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R0805	0.125 W	**0.25 W**	150V	300V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R1206	0.25 W	**0.33 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R1210	0.33 W	**0.66 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R1812	0.5 W	**0.66 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R2010	0.5 W	**1 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R1218	1 W	**2 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R2512	1 W	**2 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		
R2030	2 W	**4 W**	200V	400V	±400		1Ω~9.9Ω	1Ω~9.9Ω	
					±200			10Ω~10MΩ	
					±100	10Ω~1MΩ	10Ω~10MΩ		

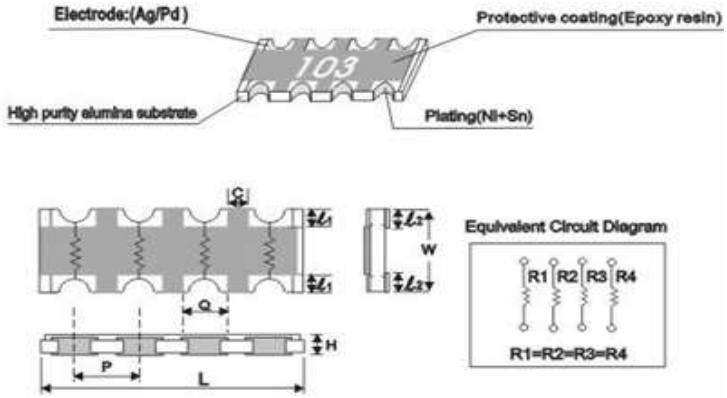
TYPE	R0201	R0402	R0603	R0805	R1206	R1210	R1812	R2010	R1218	R2512	R2030
Jumper Resistance Value	50mΩMax										
Jumper Rated Current	0.5A	1A			2A						

THICK FILM CHIP ARRAYS

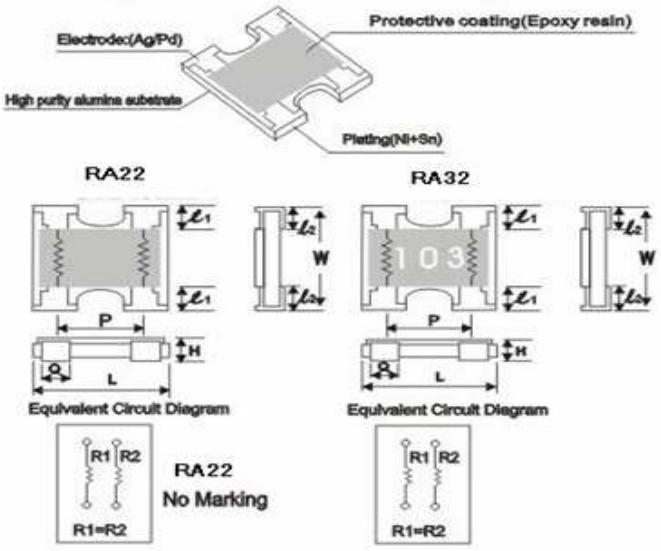
CHIP ARRAY RESISTOR CONVEX
RA24 (0402*4)/ RA34 (0603*4)



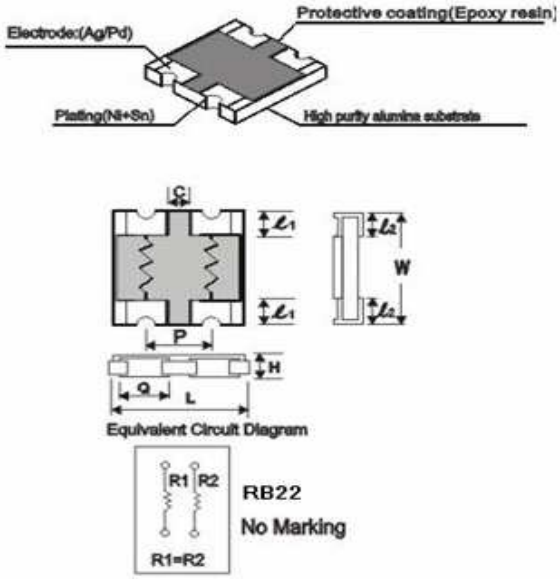
CHIP ARRAY RESISTOR CONCAVE
RB24 (0402*4)/ RB34 (0603*4)



CHIP ARRAY RESISTOR CONVEX
RA22 (0402*2)/ RA32 (0603*2)



CHIP ARRAY RESISTOR CONCAVE
RB22 (0402*2)

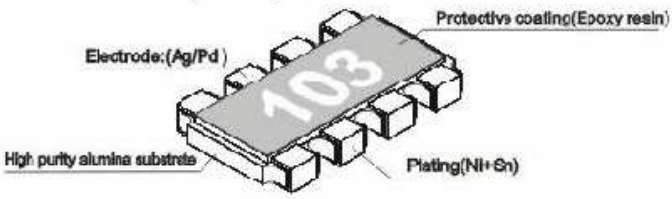


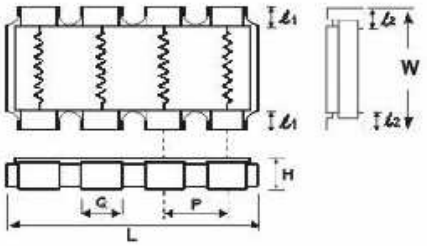
Dimensions Unit: mm

DIMENSION / TYPE	L	W	H	l_1	l_2	P	Q	Q1	C
RA24 (0402x4)	2.00±0.10	1.00±0.10	0.40±0.10	0.20±0.10	0.20±0.10	0.50±0.10	0.30±0.10	0.43±0.10	---
RA34(0603x4)	3.20±0.20	1.60±0.15	0.50±0.10	0.30±0.20	0.30±0.20	0.80±0.20	0.50±0.10	0.61±0.10	---
RB24(0402x4) Concave	2.00±0.10	1.00±0.10	0.40±0.10	0.15±0.10	0.20±0.10	0.50±0.10	0.35±0.10	---	0.15± 0.10
RB34(0603x4) Concave	3.20±0.20	1.60±0.20	0.50±0.10	0.35±0.20	0.40±0.20	0.80±0.10	0.40±0.10	---	0.30± 0.10
RA22 (0402x2)	1.00±0.10	1.00±0.10	0.33±0.05	0.15±0.10	0.25±0.10	0.67±0.10	0.34±0.10	---	---
RA32 (0603x2)	1.60±0.15	1.60±0.15	0.50±0.04	0.30±0.10	0.30±0.10	0.99±0.10	0.61±0.10	---	---
RB22(0402x2) Concave	1.00±0.10	1.00±0.10	0.30±0.10	0.25±0.15	0.25±0.15	0.50±0.10	0.35±0.10	---	0.15± 0.10

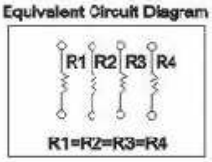
THICK FILM CHIP ARRAYS

CHIP ARRAY RESISTOR CONVEX
RA64 (1206*4)

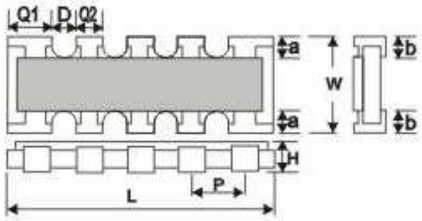




Equivalent Circuit Diagram



CHIP ARRAY RESISTOR CONVEX RA17 (0402*8)



Type	Circuit diagram
R	MARK:R
S	MARK:S

Dimensions Unit: mm

DIMENSION / TYPE	L	W	H	l_1	l_2	P	Q	---	---
RA64	5.10±0.20	3.10±0.20	0.55±0.15	0.55±0.15	0.55±0.15	1.30±0.20	0.90±0.10	---	---
DIMENSION / TYPE	L	W	H	D	Q1	Q2	a	b	P
RA17	3.20±0.20	1.60±0.10	0.55±0.10	0.32±0.10	0.53±0.10	0.32±0.10	0.30±0.15	0.30±0.15	0.64±0.10

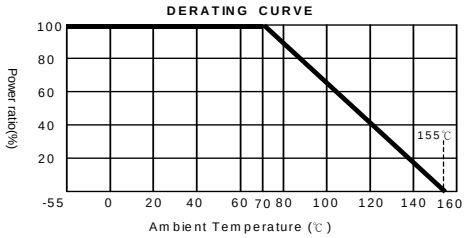
THICK FILM CHIP ARRAYS

General Electrical Specifications

TYPE	Rating Power at 70℃	Rate Current of Jumper(A)	Max Working Voltage(Vw)	Max Over Load Voltage(Vo)	TCR (PPM/℃)	Resistance Tolerance (%)	Resistance Range (Ω)	Operating Temperature (℃)
RA22 RA22 RA24 RA24	0.063 W	1A	25V	50V	±200	±1% ±5%	JUMPER below 50m 10R~1M	-55℃ ~ +155℃
RA34 RB34 RA32	0.1 W		50V	100V				
RA64	0.25 W	2A	200V	400V				
RA17	0.063 W	---	25V	50V		±5%	10R~1M	

PERFORMANCE CHARACTERISTICS

POWER DERATING CURVE



In case resistors operating ambient temperature in excess of the temperature range -55℃~+155℃ power ratio will be derated in accordance with the figure as shown on the right.

VOLTAGE RATING OR CURRENT RATING

Resistance Range: ≧1Ω

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:

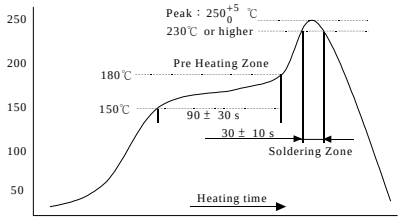
$E=\sqrt{RxP}$

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

OPERATION AND STORAGE TEMEPERATURE

	MIN	MAX
Operation temperature	-55℃	70℃
Storage temperature	20℃	30℃
Storage humidity	30%	70%

SOLDERING PROFILE



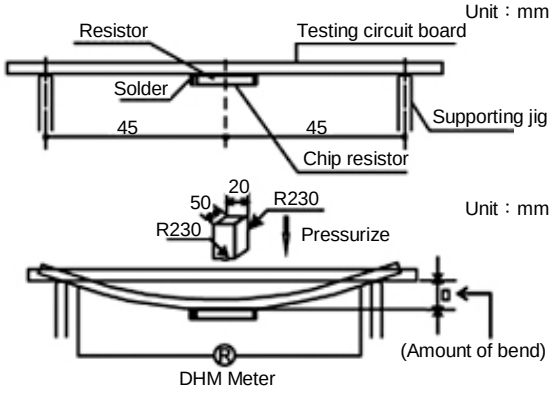
Equipments Applicable:

Our company's products are produced under low temperature processing applicable to IR reflow surface mounting devices. It is comparatively not applicable to wave soldering which will have the possibility of the risk ablating the element protection layer and the front conductor that shall cause the drift of the resistance value and ablation of the markings.

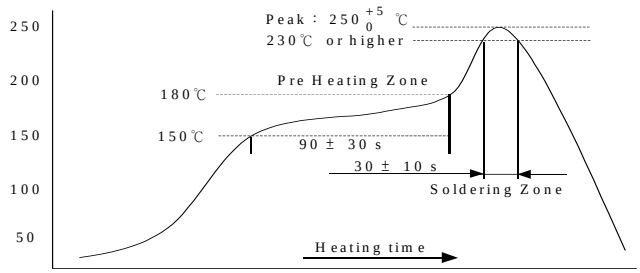
Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-feet probe to touch at the back of both electrodes. Supposed different testing points or methods are requested, please advise beforehand and customed-made production is available.

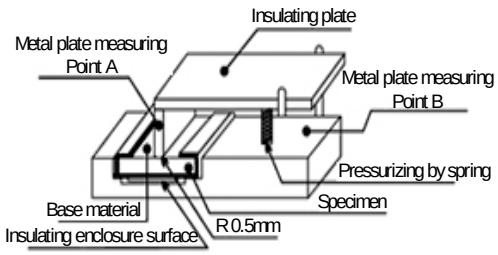
MECHANICAL PERFORMANCE TEST

Test Item	Test Methods	Description
Terminal Bending Strength	Solder tested resistor on the PC board. Add force in the middle down, and under load measured its resistance variance rate. D：R0402、R0603、R0805=5mm R1206、R1210、R1812=3mm R1218、R2010、 =2mm 	JIS C 5201-1 clause 4.33 (1) Variance rate on resistance Resistance Range：≧1Ω △R%=±(1.0%+0.05Ω) (2) No evidence of mechanical damage. No terminal peel off and core body cracked.

MECHANICAL PERFORMANCE TEST

<table>
<tr><th>Test Item</th><th>Test Methods</th><th>Description</th></tr>
<tr><td>IR Reflow</td><td> 
</td><td>Sony SS-00254
Resistance Range：≧1Ω
ΔR%=±(1.0%+0.05Ω)
No evidence of electrode damage.
No sides conductive peel off.</td></tr>
<tr><td>Wetting Balance Test</td><td><table>
<tr><td colspan="2">Testing conditions for wetting balance method with solder pot</td></tr>
<tr><td>Solder temperature</td><td>245±3℃</td></tr>
<tr><td>Immersion speed</td><td>1 to 5mm/s</td></tr>
<tr><td>Immersion depth</td><td>0.1mm</td></tr>
<tr><td>Immersion angle</td><td>Horizontal</td></tr>
<tr><td rowspan="2">Mass of solder ball</td><td>25mg→0402、0603</td></tr>
<tr><td>200mg→0805、1206、1210、2010、1218、2512、1812、2030</td></tr>
</table></td><td>Sony SS-00254
Solder coverage over 95%</td></tr>
<tr><td>Soldering Heat</td><td>Test Temp：260±5℃ Dip time：10 secs.
The pant gets through above step lasting 30 mins and than measure its resistance rate.</td><td>JIS C 5201-1 clause 4.18
Resistance Range：≧1Ω
±1%：ΔR%=±(0.5%+0.05Ω)
±5%：ΔR%=±(1.0%+0.05Ω)</td></tr>
<tr><td>Electric iron Test</td><td>Preheating temperature：350±5℃
Electric iron preheating time：3+1/-0 sec
Preheat the electric iron on electrode termination, as after that step place the iron over 60 mins and measure its resistance rate.</td><td>Sony SS-00254-5
Resistance Range：≧1Ω
ΔR%=±(1.0%+0.05Ω)
No evidence of electrode damage.
No sides conductive peel off.</td></tr>
<tr><td>Leaching Test</td><td>The tested resistor be immersed into molten solder of 260±5℃ for 30 seconds.
Then the resistor is left as placed under microscope to observed its solder area.</td><td>Sony SS-00254-9
1.Solder coverage over 95%.
2.The underlying material (such as ceramic) shall not be visible at the crest corner area of the electrode.</td></tr>
<tr><td>Steam</td><td>Put the resistor in the vessel of temperature 100℃ relative humidity 100% for 4 hrs then immerse it in solder pot at 230±5℃ for 3 secs.</td><td>JIS C 5201-1 clause 4.17
Solder coverage over 95%</td></tr>
<tr><td>Resistance to Solvent</td><td>The tested resistor be immersed into isopropyl alcohol of 20~25℃ for 60secs.
Then the resistor is left in the room for 48hrs.</td><td>JIS C 5201-1 clause 4.29
Resistance Range：≧1Ω ±(0.5%+0.05Ω)
No evidence of mechanical damage, no G2 over coating and Sn layer by leaching.</td></tr>
</table>

ELECTRICAL PERFORMANCE TEST

Test Item	Test Methods	Description
Temperature Coefficient of Resistance	TCR(ppm/℃)= $\frac{(R2-R1)}{R1(T2-T1)} \times 10^6$ R1：Resistance at room temperature R2：Resistance at -55℃ or +155℃ T1：Room temperature T2：Temperature -55℃ or +155℃	JIS C 5201-1clause 4.8 Refer to Ratings
Short Time Overload	2.5 times rated voltage or 2.5 times rated power voltage or MAX overload voltage with ever is less for 5 seconds.	JIS C 5201-1clause 4.13 Requirement：±1：±(1.0%+0.05Ω)Max ±5：±(2.0%+0.1Ω)Max No evidence of mechanical damage, no short or burned on the appearance
Insulation Resistance	Put the resistor in the fixture, add 100 VDC in ±≧10^9Ω terminal for 60 secs. Then measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base material.  	JIS C 5201-1clause 4.6 ≧10^9Ω

ENVIRONMENTAL TEST

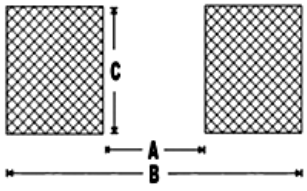
Test Item	Test Methods	Description
Temperature Cycling	Put the tested resistor in the chamber under the temperature cycle which shown in the following table shall be repeated 5 times consecutively. Then leaving the tested resistor in the room temperature for 1 hr, and measure its resistance variance rate.	JIS C 5201-1 clause 4.19 Resistance Range：≧1Ω 0.1%、0.5%、1%： ±(0.5%+0.05Ω) 2%、5% ： ±(1.0%+0.10Ω) No evidence of mechanical damage, no short or burned on the appearance
Load Life In Humidity	Put tested resistors in the chamber under temperature 40±2℃, relative humidity 90~95% for 90 minutes on, 30 minutes off, total 1000 hours. Leaving the tested resistor in the room temperature for 60 minutes, measure the resistance.	JIS C 5201-1 clause 4.24 Resistance Range：≧1Ω 0.1%、0.5%、1%：±(0.5%+0.05Ω) 2%、5% ：±(2.0%+0.05Ω) No evidence of electrode damage.
Load Life	Put the tested resistors in the chamber under temperature 70±2℃, and load the rated voltage for 90 minutes on, 30 minutes off, total 1000 hours. Then leaving the tested resistor in the room temperature for 60 minutes, and measure its resistance variance rate.	JIS C 5201-1 clause 4.25 Resistance Range：≧1Ω 0.1%、0.5%、1%： ±(1.0%+0.05Ω) 2%、5% ： ±(3.0%+0.10Ω) No evidence of electrode damage.

Step	Temperature(℃)	Time (minute)
1	-55±3	30
2	25±3	3
3	155±3	30
4	25±3	3

RECOMMEND LAND PATTERN DESIGN (For Reflow Soldering)

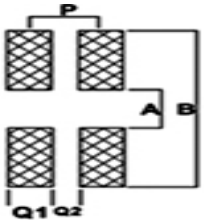
SMD Chip Resistor & Array

THICK FILM CHIP RESISTORS

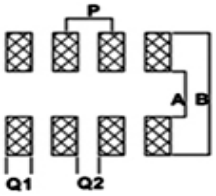


TYPE / DIM.	R0201	R0402	R0603	R0805	R1206	R1210	R1812	R2010	R1218	R2512	R2030
A	0.25	0.60	0.80	1.30	2.20	2.00	3.11	3.80	2.04	4.90	3.50
B	1.10	1.60	2.40	2.90	4.20	4.40	5.91	6.60	4.24	8.10	7.50
C	0.32	0.70	1.00	1.40	1.70	2.70	3.00	2.70	4.50	3.40	7.80

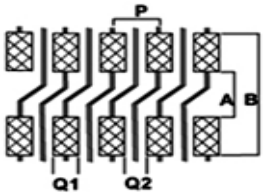
THICK FILM CHIP ARRAYS



RA22
RA32
RB22



RA24 RB24
RA34 RB34



RA17

TYPE / DIM.	RA22	RA32	RA24 RB24	RA34 RB34	RA17	RB22
A	0.50	1.00	0.50	1.00	3.10	0.50
B	2.00	2.60	2.00	2.60	2.60	2.00
P	0.67	0.95	0.50	0.80	0.30	0.50
Q1	0.33	0.62	0.28	0.40	0.40	0.33
Q2	0.34	0.38	0.22	0.40	0.40	0.17

PARTS NUMBER EXPLANATION

CHIP RESISTOR P/N EXAMPLE

R	0603	J	10R	T	G
1-1.	1-2.	1-3.	1-4.	1-5.	1-6.

1-1. **R** **1. UWA THICK FILM CHIP RESISTOR**

1-2. **24** **2. DIMENTION**

CODE	SIZE
0402	1005
0603	1608

1-3. **J** **3. RESISTANCE TOLERANCE**

TOLERANCE	CODE
±1%	F
±5%	J

1-4. **10R** **4. RESISTANCE**

CODE	RESISTANCE
10R	10
4K7	4.7K

1-5. **T** **5. QUANTITY**

CODE	QUANTITY
7"	A- 15K
	T- 5K

1-6. **G** **6. MATERIAL OPTION**

CODE	Description of CODE
G	Sn-Pb Plating

ARRAY RESISTOR P/N EXAMPLE:

RA	24	J	8P4	N	10R	T	G
1-1.	1-2.	1-3.	1-4.	1-5.	1-6.	1-7.	1-8.

1-1. **RA** **1. UWA THICK FILM CHIP ARRAY RESISTOR**

SCHEMATIC: RA (Convex), RB (Concave)

1-2. **24** **2. DIMENTION**

CODE	SIZE	TYPE
22	0402*2	4P2R
24	0402*4	8P4R

1-3. **J** **3. RESISTANCE TOLERANCE**

TOLERANCE	CODE
±1%	F
±5%	J

1-4. **8P4** **4. PIN NUMBER & RESISTOR NUMBER**

CODE	Description of CODE
8P4	8 Pin 4 Resistor

1-5. **N** **5. SCHEMATICS TYPE**

CODE	Description of CODE
N	Standard Type

1-6. **10R** **6. RESISTANCE**

CODE	RESISTANCE
10R	10
4K7	4.7K

1-7. **T** **7. QUANTITY**

CODE	QUANTITY
7"	A- 15K
	T- 5K

1-8. **G** **8. MATERIAL OPTION**

CODE	Description of CODE
G	Sn-Pb Plating

0603 E-96 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

XX X Example: 10.2KΩ = 102 x 10^2Ω =02C

Multiplier Code 02 C

Resistance Code 33.2Ω = 332 x 10^{-1}Ω =51X

51 X

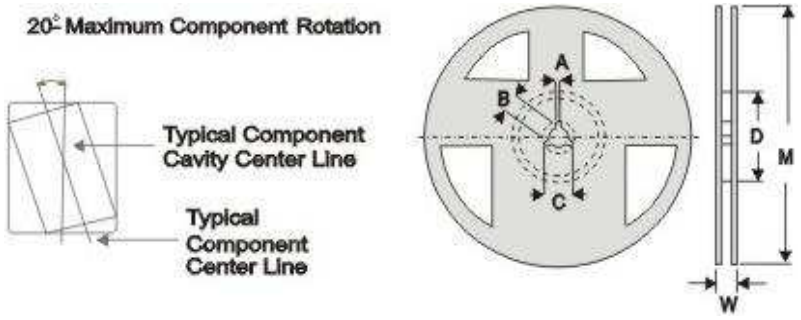
CR0603 STANDARD E-96 VALUES AND 0603 RESISTANCE CODES

R-Value	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147	150	154	158	162	165	169	174
Code	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

R-Value	178	182	187	191	196	200	205	210	215	221	226	232	237	243	249	255	261	267	274	280	287	294	301	309
Code	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
R-Value	316	324	332	340	348	357	365	374	383	392	402	412	422	432	442	453	464	475	487	499	511	523	536	549
Code	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72
R-Value	562	576	590	604	619	634	649	665	681	698	715	732	750	768	787	806	825	845	866	887	909	931	953	976
Code	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96

PACKAGING

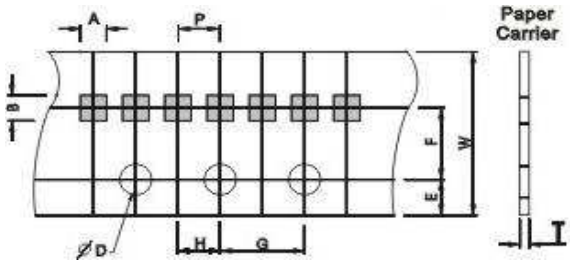
REEL DIMENSIONS (mm)



Unit: mm

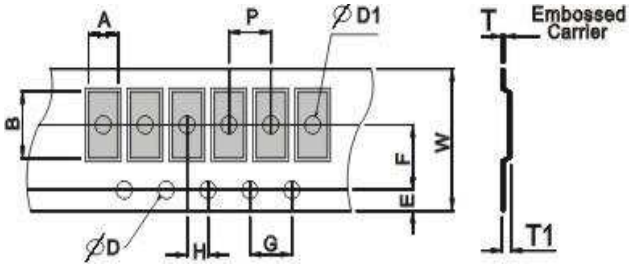
TYPE	SIZE		A	B	C	D	W	M
R0603	7”	5K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	11.5±2.0	178±2.0
R0805	10”	10K/Reel	2.0±0.5	13.5±2.0	21±0.5	80±0.5	11.5±2.0	254±2.0
R1206	13”	20K/Reel	2.0±0.5	13.5±2.0	21±0.5	80±0.5	11.5±2.0	330±2.0
R1210 RA32 RA34 RB34 RA17	7”	5K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	11.5±2.0	178±2.0
R0201 R0402 RA22 RA24 RB24	7”	10K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	11.5±2.0	178±2.0
R2010 R2512	7”	4K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	16.0±2.0	178±2.0
R1812 R1218	7”	4K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	16.0±2.0	178±2.0
RA64	11”	5K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	16.0±2.0	278
R2030	7”	1K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	19.0±2.0	178±2.0
RB22	7”	10K/Reel	2.0±0.5	13.5±2.0	21±0.5	60±0.5	11.5±2.0	178±2.0

TAPPING SPECIFICATION



Unit: mm

Packaging	Size	A	B	W	E	F	G	H	T	ØD	P
Paper Type	R0201	0.45±0.10	0.75±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.35±0.10	1.50±0.10	2.0±0.1
	R0402	0.70±0.10	1.20±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.45±0.10	1.50±0.10	
	RA22	1.25±0.10	1.25±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.45±0.10	1.50±0.10	
	RB24	1.20±0.10	2.20±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.60±0.10	1.50±0.10	
	RA24	1.20±0.10	2.20±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.60±0.10	1.50±0.10	
	RB22	1.25±0.10	1.25±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.45±0.10	1.50±0.10	
	R0603	1.05±0.20	1.80±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.60±0.10	1.50±0.10	4.0±0.1
	R0805	1.55±0.20	2.30±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	R1206	1.90±0.20	3.50±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	R1210	2.85±0.20	3.50±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	RA17	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	RA32	1.80±0.20	1.80±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	RB34	1.90±0.20	3.45±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	
	RA34	1.90±0.20	3.45±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10	1.50±0.10	

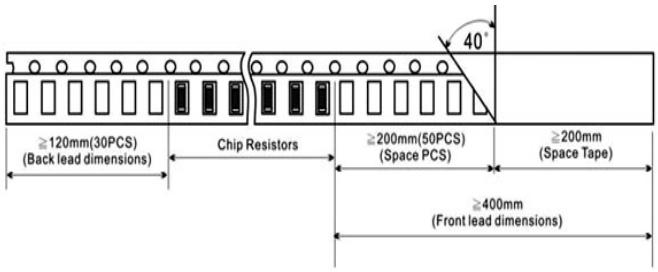


Unit: mm

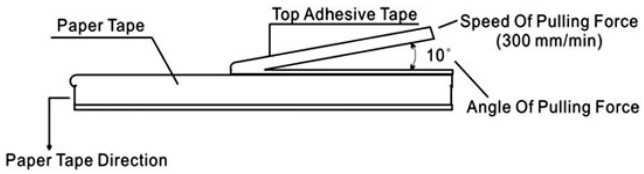
Packaging	Size	A	B	W	E	F	G	H	T	ØD	ØD1	T1	P
Embossed Type	R2010	2.80±0.20	5.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.15	1.50±0.10	1.50±0.10	0.85±0.15	4.0±0.1
	R2512	3.40±0.20	6.70±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.15	1.50±0.10	1.50±0.10	0.85±0.15	
	R1812	3.30±0.20	4.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.15	1.50±0.10	1.50±0.10	0.85±0.15	
	R1218	3.30±0.20	4.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.15	1.50±0.10	1.50±0.10	0.85±0.15	

PACKING MATERIAL DATA/STORAGE DATA

FRONT & BACK LEAD DIMENSIONS

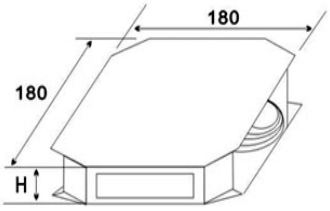


Top Adhesive Peel Off Strength：10~70g

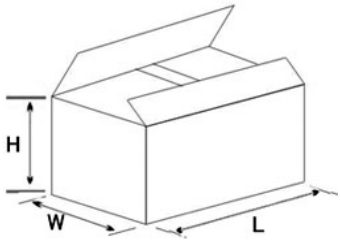


Package

Inner Box Size	
Reel	Size H(mm)
1	13
2	24
3	36
5	60
10	113



External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



Storage Date：
Storage time at the environment temp：25±5℃、humidity：50±20%
is valid for one year, from the date of delivery.

STANDARD RESISTANCE VALUES IN A DECADE

Marking code:
Type: R0603/ R0805/ R1206/ R1210/ R1812/ R2010/ R1218
R2030/ RA34/ RA32/ RA24/ RB24/ RA34/ RA17

1%: marking code, please refer to E96 and E24 data form as below
Ex: 120K, The marking code is 1203 in E24
121K, The marking code is 1213 in E96
5%: marking code, please refer to E24 data form as below
Ex: 120K, The marking code is 124 in E24

Note: R0201/ R0402/ RA22/ RB22 resistor has no marking code.
Type: R0603 1% marking code, please refer to E-96 multiplier code.

E192	E96	E48	E192	E96	E48	E192	E96	E48	E192	E96	E48	E192	E96	E48
100	100	100	169	169	169	287	287	287	487	487	487	825	825	825
101			172			291			493			835		
102	102		174	174		294	294		499	499		845	845	
104			176			298			505			856		
105	105	105	178	178	178	301	301	301	511	511	511	866	866	866
106			180			305			517			876		
107	107		182	182		309	309		523	523		887	887	
109			184			312			530			898		
110	110	110	187	187	187	316	316	316	536	536	536	909	909	909
111			189			320			542			920		
113	113		191	191		324	324		549	549		931	931	
114			193			328			556			942		
115	115	115	196	196	196	332	332	332	562	562	562	953	953	953
117			198			336			569			965		
118	118		200	200		340	340		576	576		976	976	
120			203			344			583			988		
121	121	121	205	205	205	348	348	348	590	590	590			
123			208			352			597					
124	124		210	210		357	357		604	604		E24	E12	E6	E3
126			213			361			612			10	10	10	10
127	127	127	215	215	215	365	365	365	619	619	619	11			
129			218			370			626			12	12		
130	130		221	221		374	374		634	634		13			
132			223			379			642			15	15	15	
133	133	133	226	226	226	383	383	383	649	649	649	16			
135			229			388			657			18	18		
137	137		232	232		392	392		665	665		20			
138			234			397			673			22	22	22	22
140	140	140	237	237	237	402	402	402	681	681	681	24			
142			240			407			690			27	27		
143	143		243	243		412	412		698	698		30			
145			246			417			706			33	33	33	
147	147	147	249	249	249	422	422	422	715	715	715	36			
149			252			427			723			39	39		
150	150		255	255		432	432		732	732		43			
152			258			437			741			47	47	47	47
154	154	154	261	261	261	442	442	442	750	750	750	51			
156			264			448			759			56	56		
158	158		267	267		453	453		768	768		62			
160			271			459			777			68	68	68	
162	162	162	274	274	274	464	464	464	787	787	787	75			
164			277			470			796			82	82		
165	165		280	280		475	475		806	806		91			
167			284			481			816						

According to IEC publication 63

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