

Data Sheet

Customer: _____

Product: Thin Film Chip Resistor - RT Series _____

Size : 0402/0603/0805/1206 _____

Issued Date: 22-Sep.-2023 _____

Edition: Ver. 8 _____

Record of change

Date	Ver.	Description	Page
1-Apr.-2015	1		
10-Nov-2015	2	Adjustment of standard ohmic values range	
2-Sep-2016	3	Add low TCR items	
22-Nov-2016	4	Adjustment of standard ohmic value range and RCWW	
16-Nov-2017	5	Add 0603, 0805, 1206 high power	
30-Aug.2021	6	Add 0805, 1206 Ultra high power	
16-Aug.-2023	7	Revise size/part no./electrical specification/Marking	1 ~ 5
22-Sep.-2023	8	Revise Recommend Land Pattern	2

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Prepared by	Checked by	Approved by	Accepted by (customer)
22-Sep.-2023	22-Sep.-2023	22-Sep.-2023	
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THIN FILM CHIP RESISTORS

RT SERIES

■ Feature

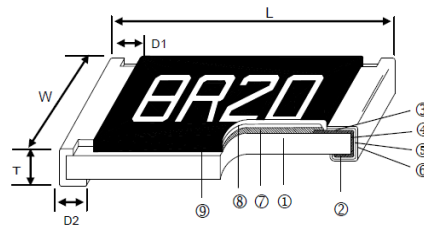
- Advanced thin film technology
- SMD Type designed for automatic insertion
- Wide resistance range $1\Omega \sim 2.49M\Omega$



■ Applications

- Medical Equipment
- Testing / Measurement Equipment
- Printer Equipment
- Automatic Equipment Controller
- Converters
- Communication Device, Cell Phone, GPS, PDA

■ Construction & Dimensions



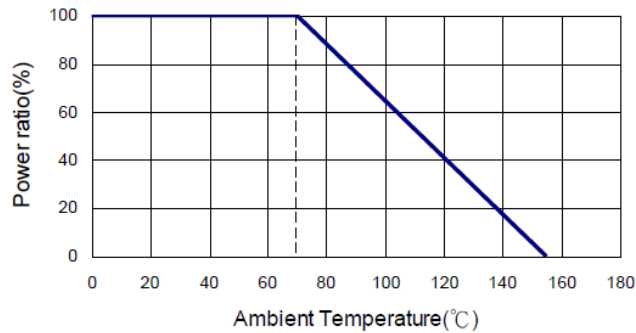
① Alumina Substrate	④ Edge Electrode	⑦ Resistor Layer
② Bottom Electrode	⑤ Barrier Layer	⑧ Overcoat
③ Top Electrode	⑥ External Electrode	⑨ Marking

Size	L	W	T	D1	D2
0402	1.00±0.05	0.50±0.05	0.30±0.10	0.20±0.10	0.20±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±0.15	0.50±0.10	0.30±0.20	0.40±0.20
1206	3.10±0.15	1.55±0.15	0.55±0.10	0.42±0.20	0.35±0.25

■ Part Numbering

<u>RT</u>	<u>0805</u>	<u>B</u>	<u>R</u>	<u>D</u>	<u>=</u>	<u>100R</u>
Series	Size	Tolerance	Packing style	TCR(ppm/°C)	Packing Code	Resistance Value for example:
	0402 0603 0805 1206	B: ±0.1% C: ±0.25% D: ±0.5% F: ±1%	R = Paper Tape	D: ±25 E: ±50	= = 7 inch Reel (Standard) V = 13 inch Reel	1R 4R99 10R 100R 499R 1KR 10KR 49K9R 1MR 4M7R

■ **Derating Curve**



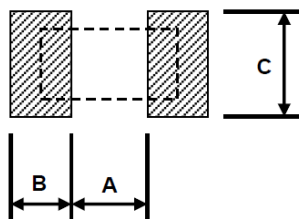
■ **Standard Electrical Specifications**

Item Size	Power Rating @ 70°C	Operating Temperature Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range				TCR (ppm/°C)
					±0.1%	±0.25%	±0.5%	±1%	
0402	1/16W	-55~+155°C	50V	100V	4.7Ω ~ 255KΩ				±25 ±50
0603	1/10W	-55~+155°C	75V	150V	1Ω ~ 1MΩ				±25 ±50
0805	1/8W	-55~+155°C	150V	300V	1Ω ~ 2MΩ				±25 ±50
1206	1/4W	-55~+155°C	200V	400V	1Ω ~ 2.49MΩ				±25 ±50

**Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.

**Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

■ **Recommend Land Pattern**



Size	A	B	C
0402	0.50	0.50	0.60±0.2
0603	0.80	1.00	0.90±0.2
0805	1.00	1.00	1.35±0.2
1206	2.00	1.15	1.70±0.2

■ **Environmental Characteristics**

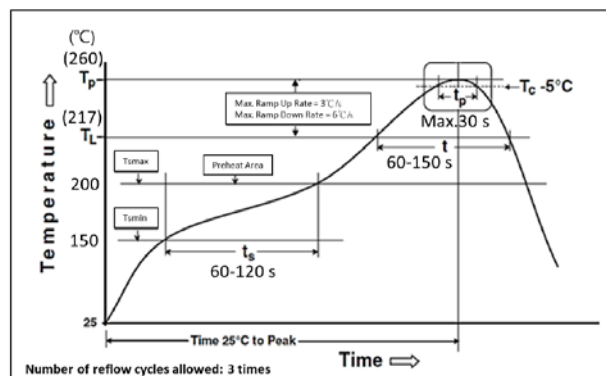
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R)	As Spec.	MIL-STD-202 Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	$\Delta R \pm 0.2\%$	JIS-C-5201 4.13 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
Insulation Resistance	>9999 MΩ	MIL-STD-202 Method 302 Apply 100V _{DC} for 1 minute
Endurance	$\Delta R \pm 0.5\%$	MIL-STD-202 Method 108A 70±2°C, RCWV for 1000 hrs with 1.5hrs "ON" and 0.5hrs "OFF"
Damp Heat with Load	$\Delta R \pm 0.5\%$	MIL-STD-202 Method 103B 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Bending Strength	$\Delta R \pm 0.1\%$	JIS-C-5201-1 4.33 Bending amplitude 3mm for 10 seconds
Solderability	95% min. coverage	MIL-STD-202 Method 208H 245±5°C for 3 seconds
Resistance to Soldering Heat	$\Delta R \pm 0.1\%$	MIL-STD-202 Method 210E 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type	MIL-STD-202 Method 301 Max. overload voltage for 1 minute
Thermal Shock	$\Delta R \pm 0.2\%$	MIL-STD-202 Method 107G -55°C ~ 150°C , 100 cycles
Low Temperature Operation	$\Delta R \pm 0.5\%$	JIS-C-5201-1 4.36 1 hour, -65°C, followed by 45 minutes of RCWV
High Temperature Exposure	$\Delta R \pm 0.5\%$	MIL-STD-202 Method 108 at +155°C for 1000 hrs

** RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower

** Storage Temperature : 15 ~ 28°C ; Humidity < 80% RH

** Shelf Life : 2 years from production date.

■ **Soldering Condition(IPC/JEDEC J-STD-020)**

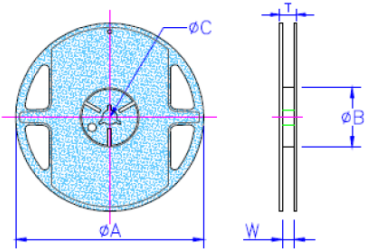


THIN FILM CHIP RESISTORS

RT SERIES

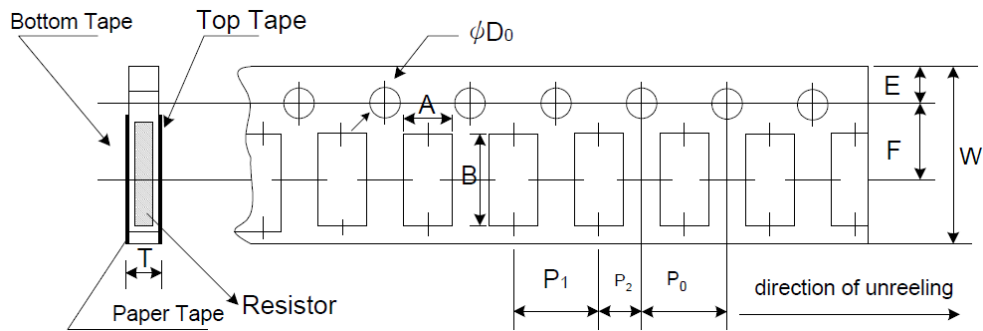
■ Packaging

Packing Quantity & Reel Specifications :



Size	øA	øB	øC	W	T	Paper Tape(EA)
0402	178±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000
0603	178±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000
0805	178±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000
1206	178±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000

Paper Tape Specifications :

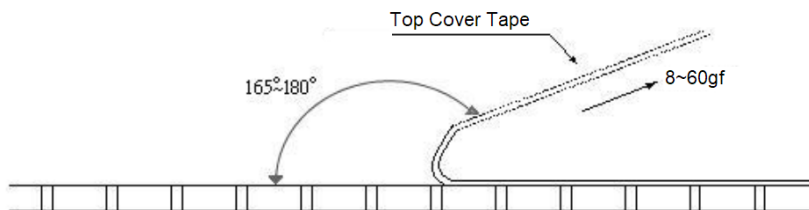


Size	A	B	W	E	F	P ₀	P ₁	P ₂	øD ₀	T
0402	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
0603	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
0805	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
1206	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05

Peel force of top cover tape

The peel speed shall be about 300mm/min±5%

The peel force of top cover tape shall be between 8gf to 60gf

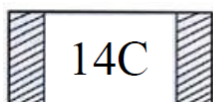


THIN FILM CHIP RESISTORS

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■ Marking

0603 3digit marking



3digit marking for Example: 14C=13K7Ω 13C=13K3Ω
68B=4K99Ω 68X=49.9Ω

Marking Table

Code	E96	Code	E96	Code	E96	Code	E96				
01	100	25	178	49	316	73	562				
02	102	26	182	50	324	74	576				
03	105	27	187	51	332	75	590				
04	107	28	191	52	340	76	604				
05	110	29	196	53	348	77	619				
06	113	30	200	54	357	78	634				
07	115	31	205	55	365	79	649				
08	118	32	210	56	374	80	665				
09	121	33	215	57	383	81	681				
10	124	34	221	58	392	82	698				
11	127	35	226	59	402	83	715				
12	130	36	232	60	412	84	732				
13	133	37	237	61	422	85	750				
14	137	38	243	62	432	86	768				
15	140	39	249	63	442	87	787				
16	143	40	255	64	453	88	806				
17	147	41	261	65	464	89	825				
18	150	42	267	66	475	90	845				
19	154	43	274	67	487	91	866				
20	158	44	280	68	499	92	887				
21	162	45	287	69	511	93	909				
22	165	46	294	70	523	94	931				
23	169	47	301	71	536	95	953				
24	174	48	309	72	549	96	976				
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

0603 3digit marking for E24

Example: 101=100Ω 102=1KΩ

E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47	51	56	62	68	75	82	91
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0805~1206 4digit marking

Example

Resistance	100Ω	2.2KΩ	10KΩ	49.9KΩ	100KΩ
marking	1000	2201	1002	4992	1003