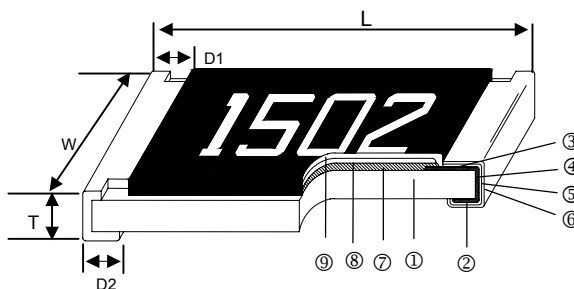


Construction



① Alumina Substrate	④ Edge Electrode (NiCr)	⑦ Resistor Layer (RuO ₂ /Ag)
② Bottom Electrode (Ag)	⑤ Barrier Layer (Ni)	⑧ Primary Overcoat (Glass)
③ Top Electrode (Ag-Pd)	⑥ External Electrode (Sn)	⑨ Secondary Overcoat (Epoxy)

Features

- High power rating
- Excellent surge withstanding & pulse withstanding performance
- Improved working voltage ratings
- Standard package sizes of 0603~2512

Applications

- Metering (Testing/Measurement)
- Medical Devices
- Automotive
- Power supply
- Charger
- Inverter
- LCD Video Monitors

Dimensions

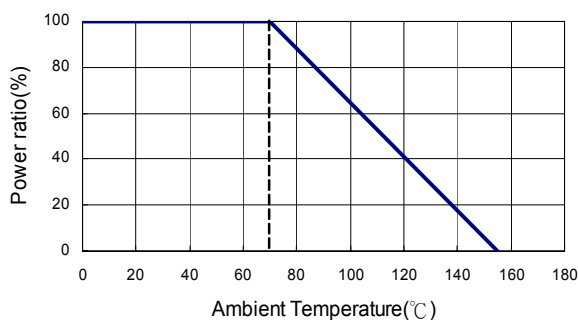
Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
CRSW	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
CRSW	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
CRSW	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
CRSW	1210	3.20±0.10	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20	15.959
CRSW	2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
CRSW	2512	6.35±0.20	3.20±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

Part Numbering

CRSW	0603	A	1001	J	E
Product Type	Dimensions	Power Rating	Resistance	Resistance Tolerance	TCR (PPM/°C)
	0603 0805 1206 1210 2010 2512	A: 1.5W O: 1/3W Q: 3/4W U: 1/2W V: 1/4W W: 1/8W	1001: 1Kohm 1004: 1Mohm 1005: 10Mohm	J: ±5% K: ±10% M: ±20%	E: ±100 F: ±200

Derating Curve



■Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range			TCR (PPM/°C)
				±5%	±10%	±20%	
CRSW (0603)	1/8W	-55 ~ +155°C	50V	10Ω - 299Ω			±200
				300Ω - 1MΩ			±100
CRSW (0805)	1/4W	-55 ~ +155°C	150V	1Ω - 299Ω			±200
				300Ω - 20MΩ			±100
CRSW (1206)	1/3W	-55 ~ +155°C	200V	1Ω - 20Ω			±200
				20.1Ω - 20MΩ			±100
CRSW (1210)	1/2W	-55 ~ +155°C	200V	1Ω - 20Ω			±200
				20.1Ω - 20MΩ			±100
CRSW (2010)	3/4W	-55 ~ +155°C	400V	1Ω - 20Ω			±200
				20.1Ω - 20MΩ			±100
CRSW (2512)	1.5W	-55 ~ +155°C	500V	1Ω - 20Ω			±200
				20.1Ω - 20MΩ			±100

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.

■Environmental Characteristics

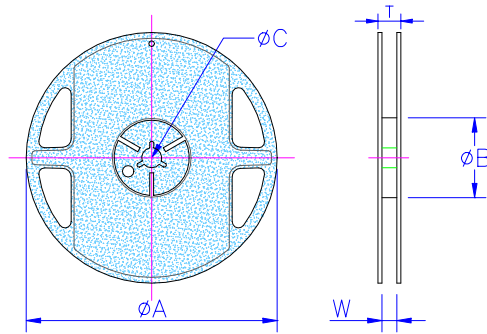
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	+25/-55/+25/+125/+25°C
Short Time Overload	±1%	RCWV*2.5 or Max. overload voltage for 5 seconds
Insulation Resistance	>1000MΩ	Apply 100V _{DC} for 1 minute
Endurance	±3%	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”
Damp Heat with Load	±3%	40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”
Dry Heat	±3%	at +155°C for 1000 hrs
Bending Strength	±1%	Bending amplitude 3mm for 10 seconds
Solderability	95% min. coverage	245±5°C for 3 seconds
Resistance to Soldering Heat	±1%	260±5°C for 10 seconds
Thermal Shock	±1%	-55°C ~150°C, 100 cycles

■ Reference Standards: MIL-STD-202, JIS-C 5201-1

■ Storage Temperature: 25±3°C; Humidity < 80%RH

Packaging

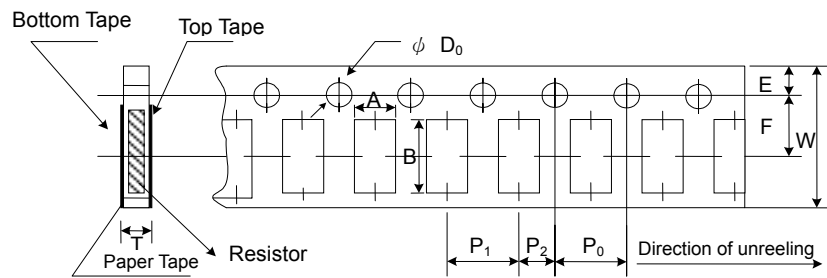
Reel Specifications & Packaging Quantity



Unit: mm

Size	Packaging Quantity		Tape Width	Reel Diameter	ΦA	ΦB	ΦC	W	T
0603	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
0805		10K		10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
1206		20K		13 inch	330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
1210									
2010	Embossed	4K	12mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.5	13.0±0.5	15.5±0.5
2512		8K		10 inch	250±1.0	62±0.5	13.0±0.5	12.5±0.5	16.5±0.5

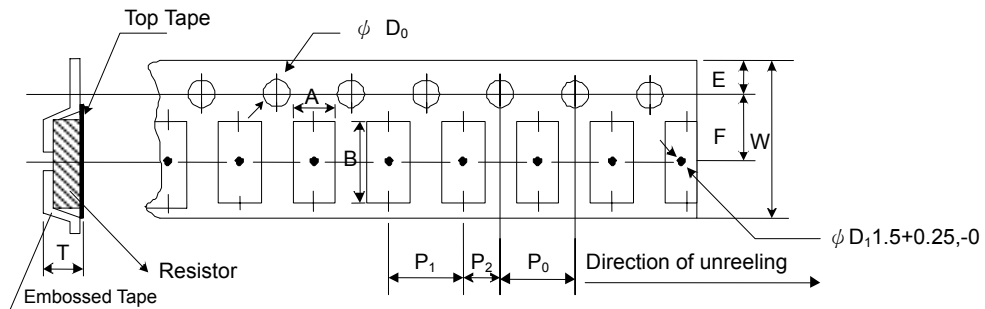
Paper Tape Specifications



Unit: mm

Size	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
0603	1.10±0.10	1.90±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.70±0.10
0805	1.60±0.10	2.40±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
1206	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
1210	2.80±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10

Embossed Plastic Tape Specifications



Unit: mm

Size	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
2010	2.8±0.20	5.5±0.20	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1,-0	1.2 ⁰
2512	3.5±0.20	6.7±0.20	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1,-0	1.2 ⁰

■Marking

0805~2512 4 digits marking for Example

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

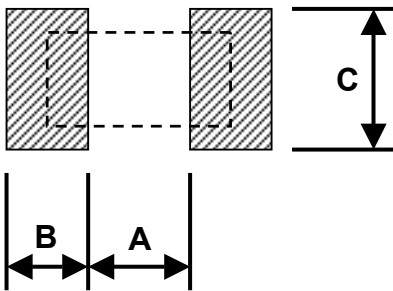
0603: 3 digits marking in E24

Example: 101=100Ω 102=1KΩ (1st and 2nd are E24 code and 3rd code is multiplier)

E24 code	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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■Recommend Land Pattern

Unit: mm



Size	A	B	C
0603	0.90	0.60	0.90
0805	1.20	0.70	1.30
1206	2.00	0.90	1.60
1210	2.00	0.90	2.80
2010	3.80	0.90	2.80
2512	3.80	1.60	3.50