

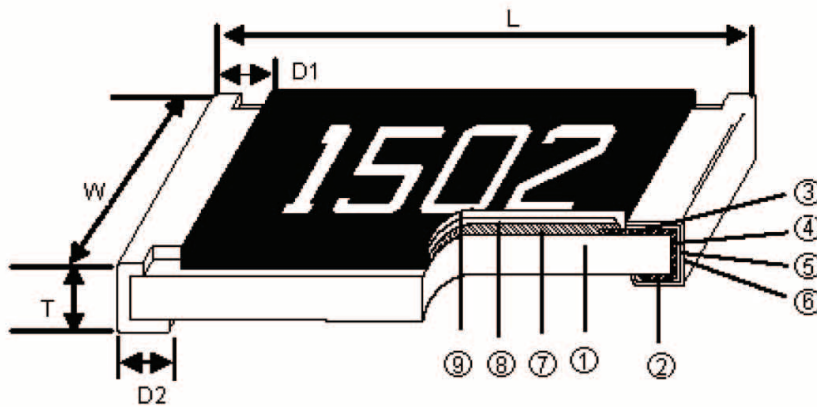
Thick Film Chip Resistor



Features:

- Small size and light weight.
- Highly reliable multilayer electrode construction.
- Compatible with all soldering process.

Construction



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

Thick Film Chip Resistor



Applications:

Telecommunication equipments.
 Radio and tape recorders, TV tuners.
 Video cameras, watches, pocket calculators.
 Automotive industry.
 Computers, instruments.
 Medical and military equipment.

Dimensions

Size (Inch)	L	W	T	D1	D2	Weight (g) (1000 pcs)
0201	0.60±0.03	0.3±0.03	0.23±0.03	0.15±0.05	0.15±0.05	0.150
0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.20±0.10	0.620
0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
1210	3.20±0.20	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20	15.959
2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
2512	6.35±0.20	3.20±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

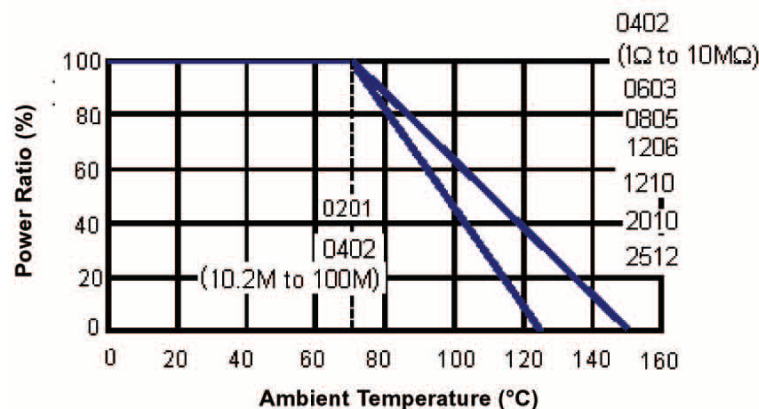
Unit: mm

Part Number Explanation:

MC *	1210	S3 *	F	287J	T5E
	Dimensions (LxW)	S3	Resistance Tolerance	Resistance	
	0201	W2	F: ±1%	3 Significant Digits	
	0402	W4	J: ±5%		
	0603			Last digit represents The number of zeroes to follow.	
	0805			J = 0.1 Multiplier	
	1206			4101 = 4.10 kohm	
	1210			4100 = 410 ohm	
	2010			410J = 41 ohm	
	2512			R000 = Jumper	

*Multicomp Reference Only

Derating Curve



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Standard Electrical Specifications

Item Type	Power Rating at 70°C Jumper Rated Current	Operating Temperature Range	Maximum Operating Voltage	Maximum Overload Voltage	Resistance Range		TCR (PPM/°C)
					±1%	±5%	
0201	1/20W	-55 to 125°C	25V	50V	1Ω to 10MΩ		±200
Jumper	1A				0Ω (<50mΩ)		-
0402	1/16W	-55 to 155°C	50V	100V	1Ω to 9.76Ω 10Ω to 1MΩ 1.02MΩ to 10MΩ		±200 ±100 ±200
		-55 to 125°C			10.2MΩ to 20MΩ 20.5MΩ to 100MΩ		±200 ±400
Jumper	1A	-55 to 155°C			0Ω (<50mΩ)		-
0603	1/10W	-55 to 155°C	50V	100V	1Ω to 9.76Ω 10Ω to 1MΩ 1.02MΩ to 20MΩ 20.5MΩ to 100MΩ		±200 ±100 ±200 ±400
Jumper	1A				0Ω (<50mΩ)		-
0805	1/8W	-55 to 155°C	150V	300V	1Ω to 9.76Ω 10Ω to 1MΩ		±200 ±100
1206	1/4W		200V	400V	1.02MΩ to 20MΩ 20.5MΩ to 100MΩ		±200 ±400
Jumper	2A		0Ω (<50mΩ)		-		
1210	1/3W	-55 to 155°C	200V	400V	1Ω to 9.76Ω 10Ω to 1MΩ 1.02MΩ to 20MΩ 20.5MΩ to 39MΩ		±200 ±100 ±200 ±400
Jumper	2.5A				0Ω (<50mΩ)		-
2010	3/4W	-55 to 155°C	200V	400V	1Ω to 9.76Ω 10Ω to 1MΩ 1.02MΩ to 20MΩ 20.5MΩ to 100MΩ		±200 ±100 ±200 ±400
Jumper	3.5A				0Ω (<50mΩ)		-
2512	1W	-55 to 155°C	250V	500V	1Ω to 9.76Ω 10Ω to 1MΩ 1.02MΩ to 20MΩ 20.5MΩ to 100MΩ		±200 ±100 ±200 ±400
Jumper	4A				0Ω (<50mΩ)		-

Thick Film Chip Resistor



Environmental Characteristics

Item	Requirement			Test Method
	±1% & Below	±5%	Jumper	
Temperature Coefficient of Resistance (TCR.)	As specification			-55°C to +125°C, 25° is the reference temperature
Short Time Overload	±(1.0% + 0.05Ω)	±(2.0% + 0.05Ω)	<50mΩ	RCWV* 2.5 or Maximum overload voltage for 5 seconds, 2 seconds for high power series
Insulation Resistance	≥10G			Maximum overload voltage for 1 minute
Endurance	±(2.0% + 0.10Ω)	±(3.0% + 0.10Ω)	<100mΩ	70 ±2°C, Maximum working voltage for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF"
Damp Heat with Load	±(2.0% + 0.10Ω)	±(3.0% + 0.10Ω)		40 ±2°C, 90 to 95% R.H. Maximum working voltage for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF"
Dry Heat	±(1.0% + 0.05Ω)	±(1.5% + 0.10Ω)	<50mΩ	at +125/+155°C for 1000 hrs
Bending Strength	±(1.0% + 0.05Ω)	±(1.0% + 0.05Ω)		Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% Minimum Coverage			245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5% + 0.05Ω)	±(1.0% + 0.05Ω)	<50mΩ	260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover			1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area ≤5% Total leaching area ≤10%			260±5°C for 30 seconds
Rapid Change of temperature	±(0.5% + 0.05Ω)	±(1.0% + 0.05Ω)	<50mΩ	-55°C to +125/+155°C, 5 cycles

Storage temperature : 25 ±3°C; Humidity <80%RH.

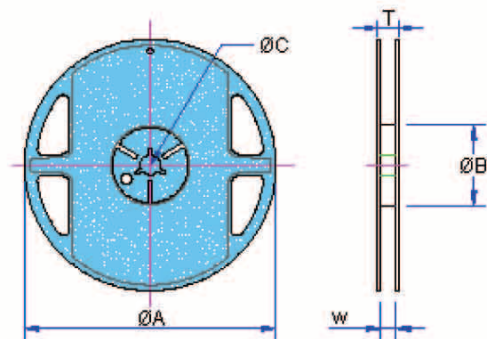
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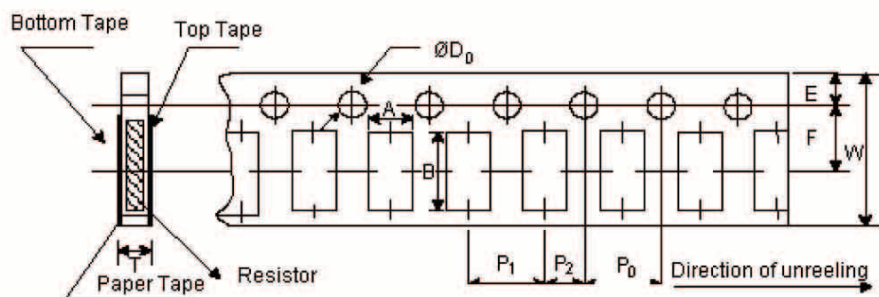
Packaging (Reel specifications and packaging quantity)

Size (Inch)	Packaging Quantity		Tape Width mm	Reel Diameter inch	ØA	ØB	ØC	W	T
0201	Paper	15K	8	7	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
0201 0402	Paper	10K	8	7	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
		20K							
		40K		10	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
0603 0805 1206 1210	Paper	5K	8	13	330±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		10K							
		20K		10	250±1	62±0.5	13.0±0.5	13.0±0.5	16.5±0.5
2010 2512	Embossed	4K	12	7	178.5±1.5	60 ^{+1/-0}	13.0±0.5	13.0±0.5	15.5±0.5
	8K	10		250±1	62±0.5	13.0±0.5	13.0±0.5	16.5±0.5	

Dimensions : Millimetres (Inches)



Paper tape specifications



Size (Inch)	A	B	W	E	F	P ₀	P ₁	P ₂	ØD ₀	T
0201	0.38±0.05	0.68±0.05	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.50+0.1,-0	0.42±0.2
0402	0.65±0.10	1.15±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.50+0.1,-0	0.42±0.1
0603	1.10±0.10	1.90±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.70±0.1
0805	1.60±0.10	2.40±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1
1206	1.90±0.10	3.50±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1
1210	2.80±0.10	3.50±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1

Dimensions : Millimetres

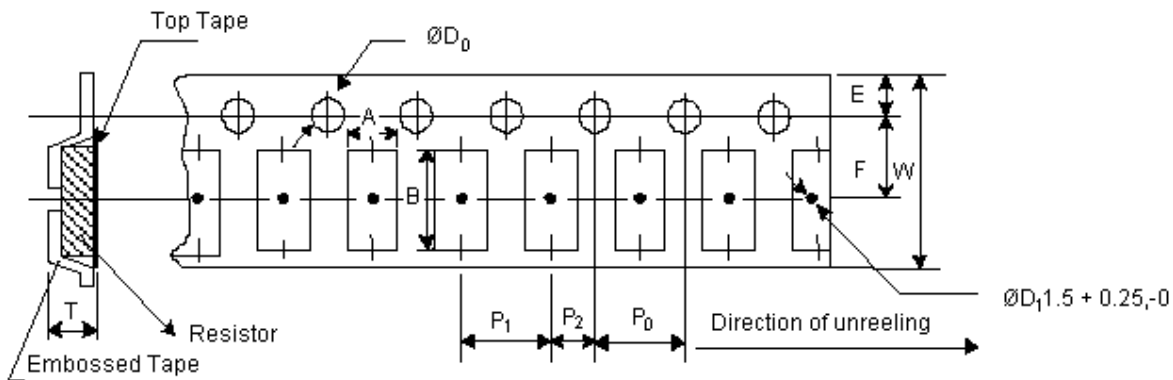
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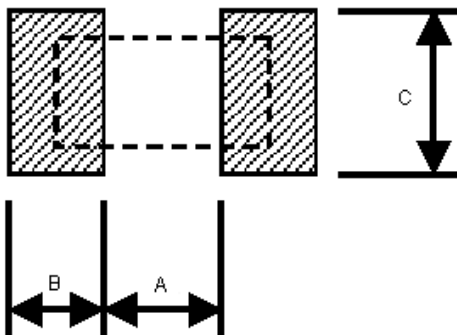
Embossed Plastic Tape Specifications



Size (Inch)	A	B	W	E	F	P ₀	P ₁	P ₂	ØD ₀	T
2010	2.8±0.20	5.5±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 ⁺⁰
2512	3.5±0.20	6.7±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 ⁺⁰

Dimensions : Millimetres

Recommend Land Pattern



Size (Inch)	A	B	C
0201	0.30	0.25	0.30
0402	0.50	0.45	0.60
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

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