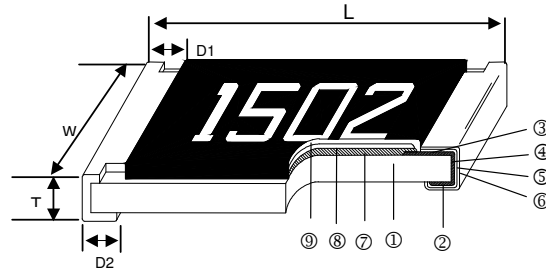
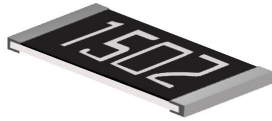


Pulse Withstanding Thick Film Chip Resistor – PWR Series

Construction



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

Features

- Tolerance from $\pm 0.5\%$ ~5%
- High power rating
- Excellent pulse withstanding performance
- Improved working voltage ratings
- Standard package sizes of 0805 ~ 2512

Applications

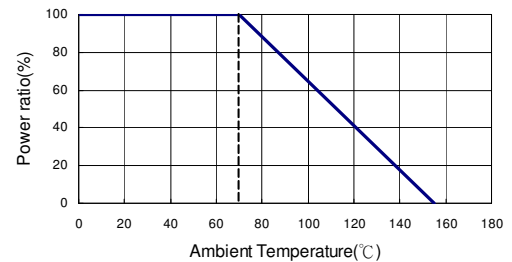
- Metering (Testing/Measurement)
- Diagnostic Equipment
- Medical Devices
- Industrial Controls
- Plasma
- LCD Video Monitors

Dimensions

Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
PWR05	0805	2.00 \pm 0.10	1.25 \pm 0.10	0.50 \pm 0.10	0.35 \pm 0.20	0.40 \pm 0.20	4.368
PWR06	1206	3.10 \pm 0.10	1.55 \pm 0.10	0.55 \pm 0.10	0.50 \pm 0.25	0.50 \pm 0.20	8.947
PWR10	2010	5.00 \pm 0.20	2.50 \pm 0.15	0.55 \pm 0.10	0.60 \pm 0.25	0.50 \pm 0.20	24.241
PWR12	2512	6.35 \pm 0.20	3.20 \pm 0.15	0.55 \pm 0.10	0.60 \pm 0.25	0.50 \pm 0.20	39.448

Derating Curve



Part Numbering

PWR	12	J	T	E	A	1001	N
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
	05: 0805 06: 1206 10: 2010 12: 2512	D: $\pm 0.5\%$ F: $\pm 1\%$ G: $\pm 2\%$ H: $\pm 3\%$ J: $\pm 5\%$	T: Taping Reel B: Bulk	E: ± 100 F: ± 200	A: 1.5W O: 0.33W Q: 0.75W W: 0.125W	1001: 1K Ω 1004: 1M Ω 1005: 10M Ω	: Standard Marking N: No Marking

Electrical Characteristics Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range					TCR (PPM/°C)
				$\pm 0.5\%$	$\pm 1\%$	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$	
PWR05 (0805)	0.125W	-55 ~ +155°C	150V	10 Ω - 299 Ω 300 Ω - 20M Ω					± 200 ± 100
PWR06 (1206)	0.33W	-55 ~ +155°C	200V	10 Ω - 299 Ω 300 Ω - 20M Ω					± 200 ± 100
PWR10 (2010)	0.75W	-55 ~ +155°C	400V	10 Ω - 20 Ω 20.1 Ω - 20M Ω					± 200 ± 100
PWR12 (2512)	1.5W	-55 ~ +155°C	500V	10 Ω - 20 Ω 20.1 Ω - 20M Ω					± 200 ± 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	±0.5%	RCWV*2.5 or Max. overload voltage for 5 seconds
Insulation Resistance	>1000MΩ	Apply 100V _{DC} for 1 minute
Endurance	±1%	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±0.5%	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	±0.5%	at +155°C for 1000 hrs
Bending Strength	As Spec.	Bending amplitude 3mm for 10 seconds
Solderability	95% min. coverage	245±5°C for 3 seconds
Resistance to Soldering Heat	±0.5%	260±5°C for 10 seconds
Dielectric Withstand Voltage	As Spec.	Apply Max. overload voltage for 1 minute
Thermal Shock	±0.5%	-55°C ~150°C, 100 cycles
Low Temperature Operation	±0.5%	1 hour, -65°C followed by 45 minutes of RCWV

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

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

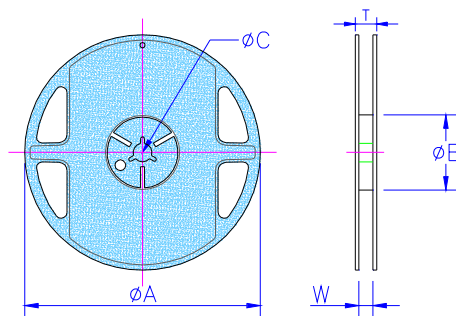
Marking

0805~2512 4 digits marking for Example

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

Packaging

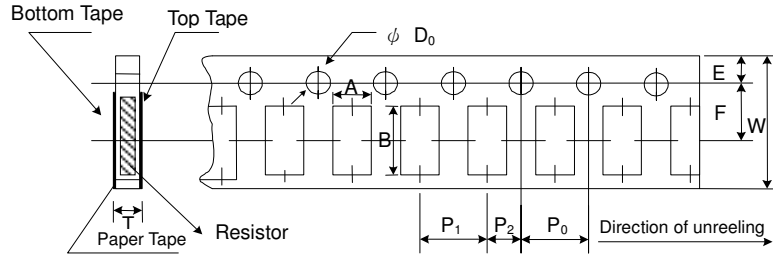
Reel Specifications & Packaging Quantity



Unit: mm

Type	Packaging Quantity	Tape width	Reel Diameter	ΦA	ΦB	ΦC	W	T	
PWR05 PWR06	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
		10K		10 inch	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
		20K		13 inch	330±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
PWR10 PWR12	Embossed	4K	12mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.5	13.0±0.5	15.5±0.5
		8K		10 inch	250±1	62±0.5	13.0±0.5	12.5±0.5	16.5±0.5

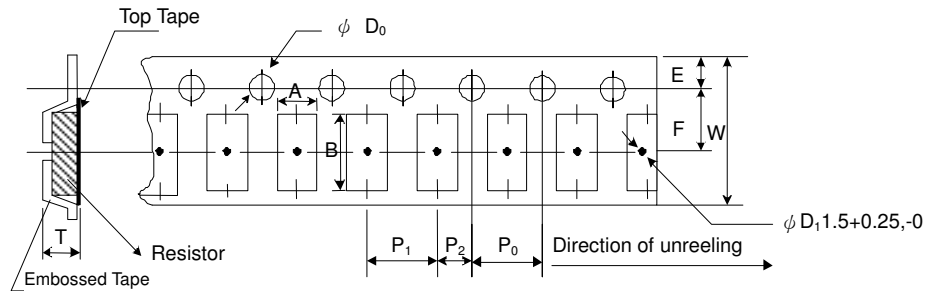
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
PWR05	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
PWR06	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

Embossed Plastic Tape Specifications

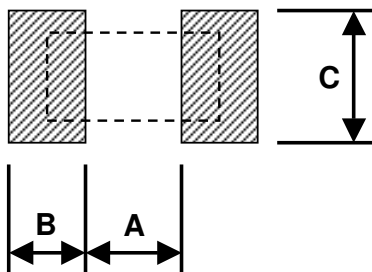


Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
PWR10	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
PWR12	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

Recommend Land Pattern

Unit: mm



Type	A	B	C
PWR05	1.20	0.70	1.30
PWR06	2.00	0.90	1.60
PWR10	3.80	0.90	2.80
PWR12	3.80	1.60	3.50