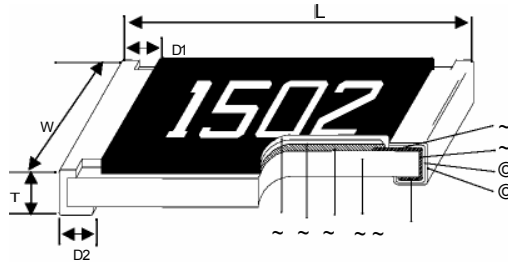


# Pulse Withstanding Chip Resistor – PWR Series



## 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

## Construction

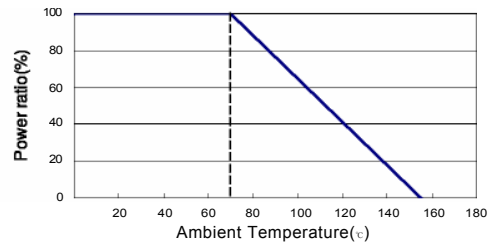
Ⓜ Alumina Substrate	Ⓜ Edge Electrode (NiCr)	Ⓜ Resistor Layer (RuO <sub>2</sub> /Ag)
~ Bottom Electrode (Ag)	Ⓜ Barrier Layer (Ni)	Ⓜ Primary Overcoat (Glass)
~ Top Electrode (Ag-Pd)	~ External Electrode (Sn)	( ) Secondary Overcoat (Epoxy)

## Dimensions

Unit: mm

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

## Derating Curve



## Part Numbering

PWR	12	J	T	E	A	1001	N
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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: $\pm 100$ F: $\pm \dots$	A: 1.5W O: 1/3W Q: 3/4W T: 1W U: 1/2W V: 1/4W W: 1/8W	1001: 1Kfl 1004: 1Mfl 1005: 10Mfl	: 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)	1/8W	-55 ~ +155 C	150V			10fl - 299fl 300fl - 20Mfl			$\pm 200$ $\pm 100$
PWR06 (1206)	1/3W	-55 ~ +155 C	200V			10fl - 299fl 300fl - 20Mfl			$\pm 200$ $\pm 100$
PWR10 (2010)	3/4W	-55 ~ +155 C	400V			10fl - 20fl 20.1fl - 20Mfl			$\pm 200$ $\pm 100$
PWR12 (2512)	1.5W	-55 ~ +155 C	500V			10fl - 20fl 20.1fl - 20Mfl			$\pm 200$ $\pm 100$

## High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Resistance Range		TCR (PPM/°C)
				±1%	±5%	
PWR05 (0805)	1/4W	-55 ~ +155 C	150V	10fl - 299fl	300fl - 20Mfl	±200 ±100
PWR06 (1206)	1/2W	-55 ~ +155 C	200V	10fl - 100fl		±100
PWR10 (2010)	1W	-55 ~ +155 C	400V	1Kfl - 10Kfl		±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.

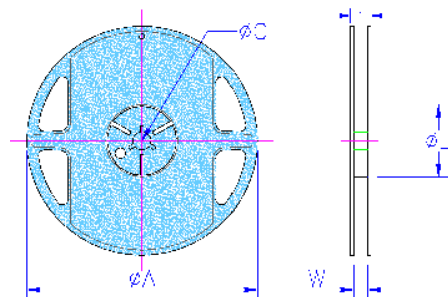
## Environmental Characteristics

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	>1000Mfl	Apply 100V <sub>DC</sub> for 1 minute
Endurance	±1%	70.2C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±0.5%	40.2C, 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 +155C 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	±0.5%	260±5C for 10 seconds
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±3C; Humidity < 80%RH

## Packaging

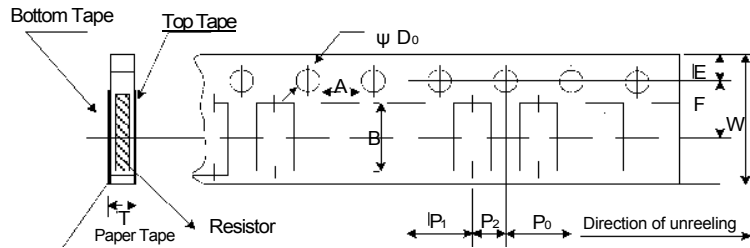
Reel Specifications & Packaging Quantity



Unit: mm

Type	Packaging Quantity	Tape width	Reel Diameter	ØA	ØB	ØC	W	T	
PWR05 PWR06	Paper	5K	8mm	7 inch	178.5±1.5	60 <sup>+1/-0</sup>	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 <sup>+1/-0</sup>	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

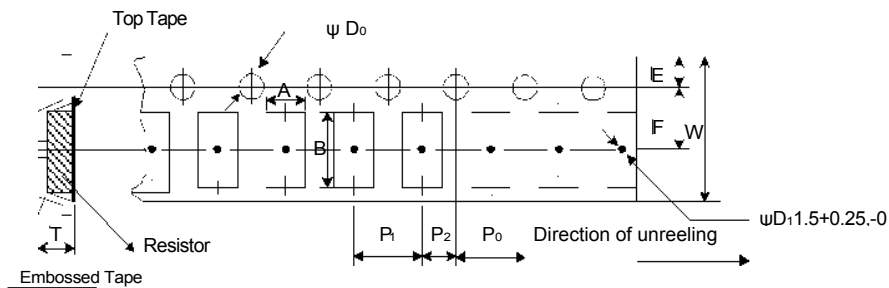
### Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	OD <sub>0</sub>	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 <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	OD <sub>0</sub>	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 <sup>+0</sup>
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 <sup>+0</sup>

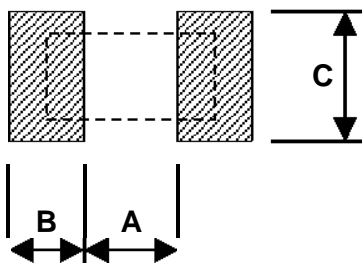
### Marking

0805~2512 4 digits marking for Example

Resistance	100C)	2.2KC)	10KC)	49.9KC)	100KC)
marking	1000	2201	1002	4992	1003

### 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