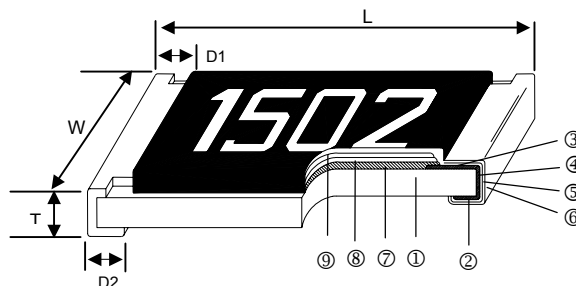


Anti-Corrosive Thin Film Precision Chip Resistor – PR Series

Construction



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

Features

- Long term life stability and demonstrated the Anti-Corrosion claims characterized by Ta₂N
- Special passivated NiCr film for Anti-Acid and Anti-Damp
- Tight tolerance down to $\pm 0.1\%$
- Extremely low TCR down to ± 15 PPM/ $^{\circ}$ C
- Wide resistance range 10ohm ~ 1Mega ohm

Applications

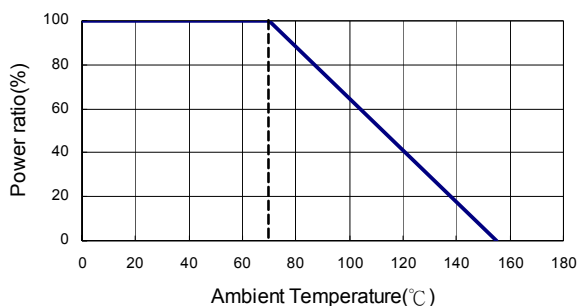
- Automotive
- High-end Computer
- Industrial Equipment
- Automatic Equipment Controller
- Medical Equipment
- Telecommunication Device
- High-end Multimedia Electronics
- Outdoor Electronic Applications

Dimensions

Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
PR02	0402	1.00 \pm 0.05	0.50 \pm 0.05	0.30 \pm 0.05	0.20 \pm 0.10	0.20 \pm 0.10	0.55
PR03	0603	1.55 \pm 0.10	0.80 \pm 0.10	0.45 \pm 0.10	0.30 \pm 0.20	0.30 \pm 0.20	1.85
PR05	0805	2.00 \pm 0.15	1.25 \pm 0.15	0.55 \pm 0.10	0.30 \pm 0.20	0.40 \pm 0.25	4.76
PR06	1206	3.05 \pm 0.15	1.55 \pm 0.15	0.55 \pm 0.10	0.42 \pm 0.20	0.35 \pm 0.25	9.11
PR10	2010	4.90 \pm 0.15	2.40 \pm 0.15	0.55 \pm 0.10	0.60 \pm 0.30	0.50 \pm 0.25	23.82
PR12	2512	6.30 \pm 0.15	3.10 \pm 0.15	0.55 \pm 0.10	0.60 \pm 0.30	0.50 \pm 0.25	38.46

Derating Curve



Part Numbering

PR	03	D	T	D	X	1000	N
Product Type	Dimensions	Resistance Tolerance	Packaging Code	TCR (PPM/ $^{\circ}$ C)	Power Rating	Resistance	Marking Code
	02: 0402 03: 0603 05: 0805 06: 1206 10: 2010 12: 2512	B: $\pm 0.1\%$ C: $\pm 0.25\%$ D: $\pm 0.5\%$	T: Taping Reel B: Bulk	N: ± 15 C: ± 25 D: ± 50	: Standard Y: 1/16W X: 1/10W W: 1/8W V: 1/4W U: 1/2W	1000: 100 Ω 2201: 2200 Ω 1001: 1K Ω 1004: 1M Ω	: Standard Marking for E96 / E24 N: No Marking

Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/°C)
					±0.1%	±0.25%	±0.5%	
PR02 (0402)	1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 12KΩ			±15
					25Ω - 25KΩ			±25 ±50
PR03 (0603)	1/16W	-55 ~ +155°C	50V	100V	25Ω - 332KΩ			±15 ±25 ±50
PR05 (0805)	1/10W	-55 ~ +155°C	100V	200V	10Ω - 1MΩ			±15 ±25 ±50
PR06 (1206)	1/8W	-55 ~ +155°C	150V	300V	10Ω - 1MΩ			±15 ±25 ±50
PR10 (2010)	1/4W	-55 ~ +155°C	150V	300V	25Ω - 1MΩ			±15
					10Ω - 1.5MΩ			±25 ±50
PR12 (2512)	1/2W	-55 ~ +155°C	150V	300V	25Ω - 1MΩ			±15
					10Ω - 1.5MΩ			±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.

High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/°C)
					±0.1%	±0.25%	±0.5%	
PR03 (0603)	1/10W	-55 ~ +155°C	75V	150V	25Ω - 220KΩ			±15 ±25 ±50
PR05 (0805)	1/8W	-55 ~ +155°C	150V	300V	25Ω - 680KΩ			±15 ±25 ±50
PR06 (1206)	1/4W	-55 ~ +155°C	200V	400V	25Ω - 1MΩ			±15 ±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.

Environmental Characteristics

Item	Requirement		Test Method
	Size 0603 / 0805 / 1206 2010 / 2512	Size 0402	
Short Time Overload	$\leq \pm 0.02\%$	$\leq \pm 0.1\%$	RCWV*2.5 or Max. overload voltage for 2 seconds
	$\leq \pm 0.2\%$ for high power rating		
Endurance	$\leq \pm 0.05\%$	$\leq \pm 0.25\%$	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\leq \pm 0.25\%$ for high power rating		
Damp Heat with Load	$\leq \pm 0.05\%$	$\leq \pm 0.5\%$	40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
	$\leq \pm 0.25\%$ for high power rating		
Solderability	95% min. coverage		245±5°C for 3 seconds
Resistance to Soldering Heat	$\leq \pm 0.02\%$	$\leq \pm 0.1\%$	260±5°C for 10 seconds
Thermal Shock	$\leq \pm 0.02\%$	$\leq \pm 0.1\%$	-55°C~150°C, 100 cycles

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

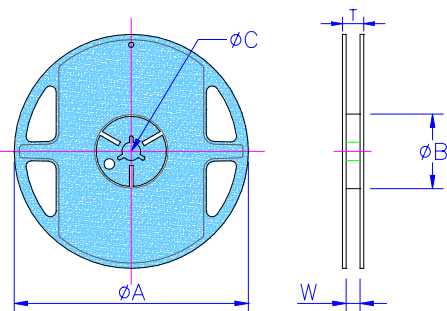
■ Storage Temperature: 25±3°C; Humidity < 80%RH

■ Packaging

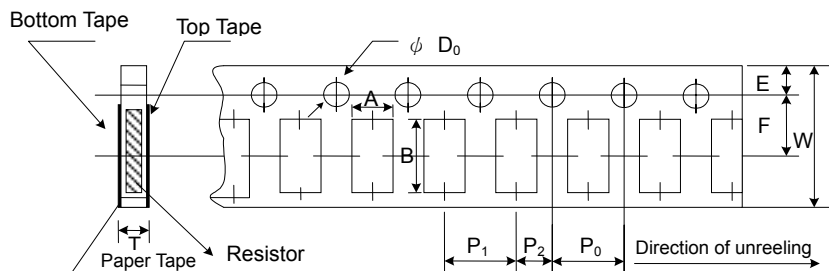
Packaging Quantity & Reel Specifications

Unit: mm

Type	ΦA	ΦB	ΦC	W	T	Paper Tape (EA)	Embossed Plastic Tape (EA)
PR02	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	10,000	-
PR03	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-
PR05	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-
PR06	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	9.5 ± 1.0	11.5 ± 1.0	5,000	-
PR10	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	13.5 ± 1.0	15.5 ± 1.0	-	4,000
PR12	178.0 ± 1.0	60.0 + 1.0	13.5 ± 0.7	13.5 ± 1.0	15.5 ± 1.0	-	4,000



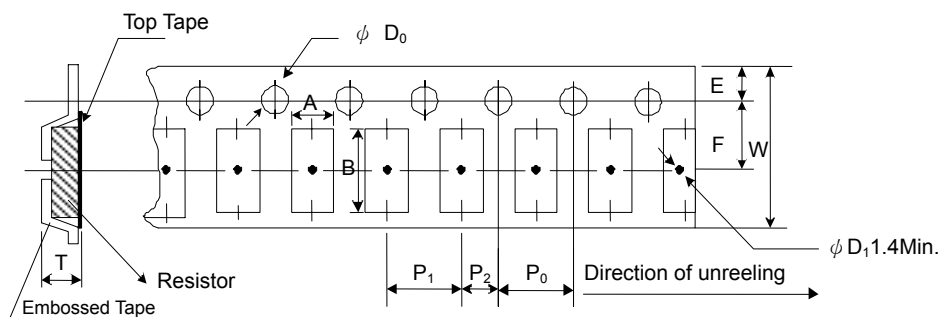
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
PR02	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
PR03	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
PR05	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
PR06	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

Embossed Plastic Tape Specifications

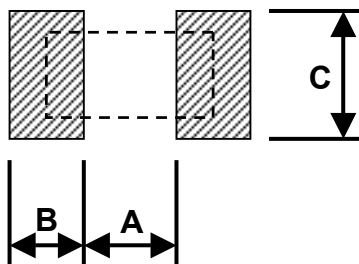


Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
PR10	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20
PR12	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20

■ Recommend Land Pattern

Unit: mm



Type	A	B	C
PR02	0.50	0.50	0.60±0.2
PR03	0.80	1.00	0.90±0.2
PR05	1.00	1.00	1.35±0.2
PR06	2.00	1.15	1.70±0.2
PR10	3.60	1.40	2.50±0.2
PR12	4.90	1.60	3.10±0.2