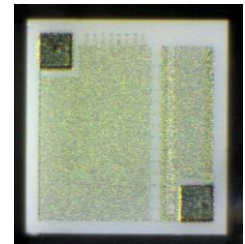


Standard Resistors

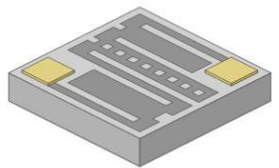
PR Series

- Wire-bondable Thin Film Resistors
- Operating frequencies from DC to 500 MHz
- Can be used in Non-Magnetic Applications



30x30 220kΩ
Fine Line Resistor

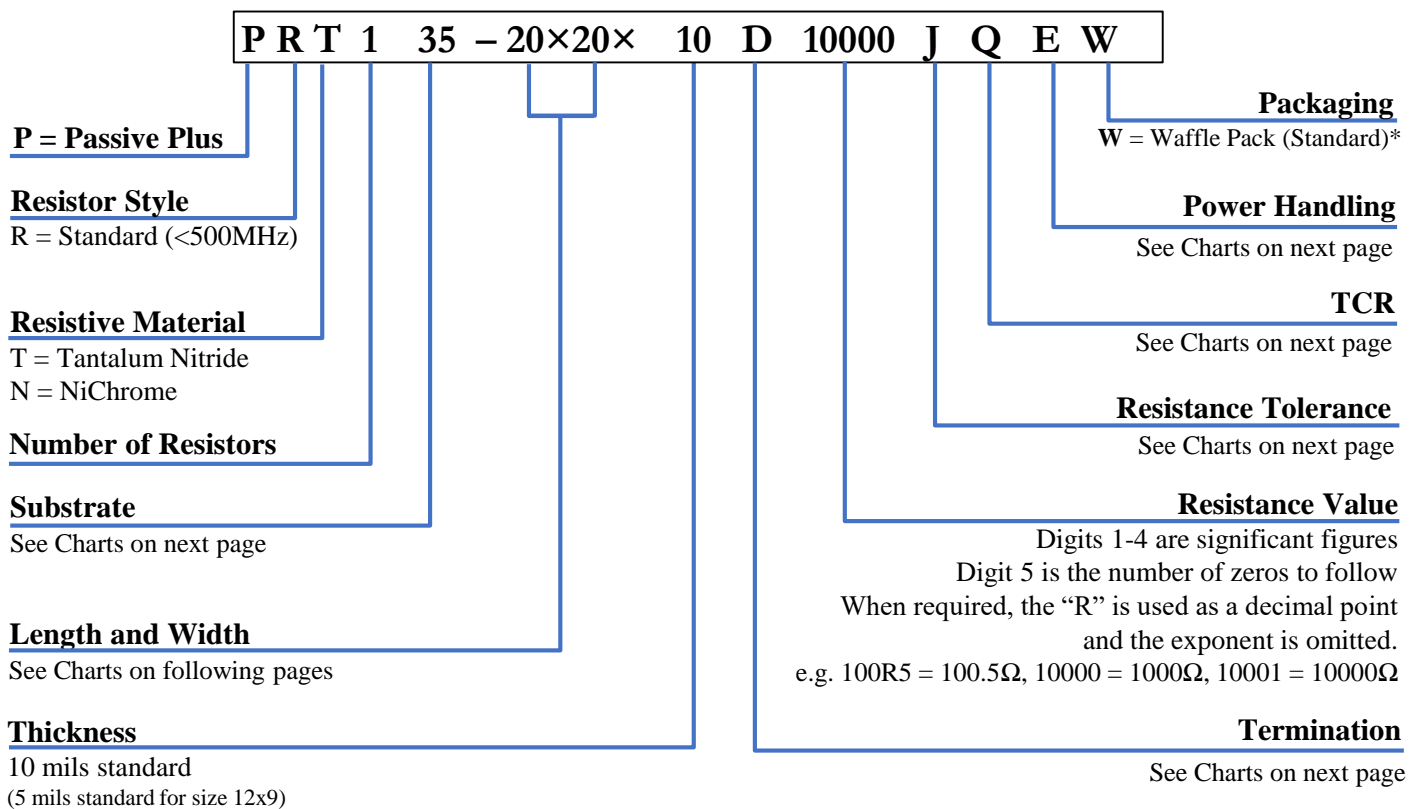
◆ Product Specifications



Resistance Range	0.5Ω to 35MΩ
Resistance Tolerance	±0.01% to ±20%, value dependent

◆ Part Numbering

Example shown: Standard Resistor, TaN resistive element, alumina substrate, case size 0.020" × 0.020" × 0.010", PdAu bonding pad, bottom side bare, resistance 1000Ω ± 5%, 150 ppm TCR, regular trim, 100 mW max power handling.



* All parts are supplied in waffle packs. Other packaging may be available. Contact PPI for additional packaging options.

The standard dimensional tolerance for length and width is ± 2 mils.
The standard dimensional tolerance for thickness is ± 1 mil.

Standard Resistors

◆ Resistive Materials & Temperature Coefficient of Resistance (TCR)

Resistive Materials					TCR					
Material	Passivation	Sheet Resistivity (Ω/ Sq)	Abs. Tolerance	Ratio Tolerance	±150 ppm/°C	±100 ppm/°C	±50 ppm/°C	±25 ppm/°C	±10 ppm/°C	±5 ppm/°C
Tantalum Nitride (TaN)	Self Passivating Ta ₂ O ₅	5 to 270	From ±0.01%	From ±0.01%	Q	V	W	X	Y	Z
					Standard	Yes	---	---	---	---
NiChrome (NiCr)	SiO ₂	5 to 250	From ±0.01%	From ±0.01%	---	---	Yes	Standard	Yes	Yes

◆ Substrate Materials

Material	Thickness	Surface Finish	Dielectric Constant (@ 1MHz)	Coefficient of Thermal Expansion (x 10 ⁶ / °C)	Thermal Conductivity (W/m*K)	Code
Alumina (Al ₂ O ₃)	0.005" - 0.010"	2μ" - 3μ"	9.9	⁷ (25°C to < 300°C)	26.9	35
Aluminum Nitride (AlN)	0.005" - 0.010"	6μ" - 8μ"	8.0 - 9.1	4.6 - 5.7 (25°C to < 1000°C)	170	28
Beryllium Oxide (BeO)	0.005" - 0.010"	< 5μ"	6.76	⁹ (25°C to < 1000°C)	285	25
Silicon (Si) (with 12kÅ SiO ₂)	0.005" - 0.010"	Chemical Polish	N/A (SiO ₂ K=1.38)	2.49 - 4.44 (25°C to < 1000°C)	149 (SiO ₂ 1.38)	22
Quartz (Fused Silica)	0.005" - 0.010"	60/40 Optical Polish	3.826	0.55 (25°C to < 300°C)	1.38	20

◆ Resistance Tolerance Codes

Tolerance*	B	D	F	G	H	J	K	L	M	Q	S
Code	± 0.1%	± 0.5%	± 1%	± 2%	± 3%	± 5%	± 10%	± 15%	± 20%	± 0.05%	± 0.01%

* Limit of ± 50mΩs

◆ Terminations

Metallization		Code
Top Side	Bottom Side	
Pd/Au	—	A
Flip Chip (Ti/Pt/Au)		R
Pd/Au	Ta/Pd/Au	D

◆ Power Handling Codes

Watts	Code	Watts	Code
50 mW	C	750 mW	J
75 mW	D	1.0 W	K
100 mW	E	1.4 W	U
125 mW	I	2.0 W	L
150 mW	F	2.8 W	Y
200 mW	O	3.0 W	N
250 mW	G	4.0 W	P
350 mW	M	5.0 W	Q
400 mW	R	6.0 W	2
500 mW	H	10 W	S

Standard Resistors

◆ Power Handling & Standard Resistance Ranges by Material and Case Size

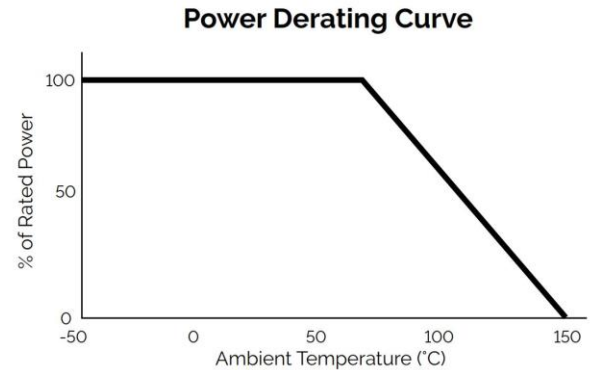
Power Handling						Resistance Range					
Case Size mils (inches)	Alumina (C-35)	Silicon (C-22)	AlN (C-28)	BeO (C-25)	Quartz (C-20)	Min (Ω)	Max (Ω) Alumina (C-35)	Max (Ω) Silicon (C-22)	Max (Ω) AlN (C-28)	Max (Ω) BeO (C-25)	Max (Ω) Quartz (C-20)
12 x 9 (0.012 x 0.009)	50 mW	50 mW	200 mW	400 mW	10 mW	1-3	25K	150K	25K	25K	150K
14 x 12 (0.014 x 0.012)	100 mW	100 mW	400 mW	800 mW	20 mW	1-3	40K	200K	40K	40K	200K
20 x 10 (0.020 x 0.010)	100 mW	100 mW	400 mW	800 mW	20 mW	1-3	60K	250K	60K	60K	250K
15 x 15 (0.015 x 0.015)	100 mW	100 mW	400 mW	800 mW	20 mW	1-2	70K	500K	70K	70K	500K
20 x 20 (0.020 x 0.020)	250 mW	250 mW	1.0 W	2.0 W	50 mW	1-2	125K	750K	125K	125K	750K
30 x 20 (0.030 x 0.020)	250 mW	250 mW	1.0 W	2.0 W	50 mW	1-2	200K	1M	200K	200K	1M
40 x 20 (0.040 x 0.020)	250 mW	250 mW	1.0 W	2.0 W	50 mW	1-2	250K	1.5M	250K	250K	1.5M
30 x 30 (0.030 x 0.030)	250 mW	250 mW	1.0 W	2.0 W	50 mW	1-2	275K	2M	275K	275K	2M
35 x 35 (0.035 x 0.035)	250 mW	250 mW	1.0 W	2.0 W	50 mW	1-2	300K	3M	300K	300K	3M
40 x 40 (0.040 x 0.040)	350 mW	350 mW	1.4 W	2.8 W	70 mW	1-2	500K	5M	500K	500K	5M
50 x 25 (0.050 x 0.025)	350 mW	350 mW	1.4 W	2.8 W	70 mW	1-2	300K	3M	300K	300K	3M
60 x 30 (0.060 x 0.030)	500 mW	500 mW	2.0 W	4.0 W	100 mW	1-2	500K	6M	500K	500K	6M
50 x 50 (0.050 x 0.050)	500 mW	500 mW	2.0 W	4.0 W	100 mW	1-2	700K	7M	700K	700K	7M
60 x 60 (0.060 x 0.060)	500 mW	500 mW	2.0 W	4.0 W	100 mW	1-2	2M	15M	2M	2M	15M
80 x 50 (0.080 x 0.050)	500 mW	500 mW	2.0 W	4.0 W	100 mW	1-2	2M	20M	2M	2M	20M
100 x 50 (0.100 x 0.050)	500 mW	500 mW	2.0 W	4.0 W	100 mW	1-2	2.5M	25M	2.5M	2.5M	25M
120 x 60 (0.120 x 0.060)	750 mW	750 mW	3.0 W	6.0 W	125 mW	1-2	3M	30M	3M	3M	30M
100 x 100 (0.100 x 0.100)	750 mW	750 mW	3.0 W	6.0 W	125 mW	1-2	3.5M	35M	3.5M	3.5M	35M

Typical PPI commercial testing includes 100% visual inspection, 100% electrical testing with short time overload, and TCR sampling. Our parts meet or exceed additional MIL-PRF-55342 and MIL-STD-202 requirements.

Standard Resistors

◆ General Properties

Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Operating Frequency	DC to 500 MHz
Voltage Rating	100V maximum
Power Derating (See Chart at Right)	Full power up to 70°C Derated linearly to zero power at 150°C



◆ Testing

Testing Performed	Specification / Standard
Visual Inspection	MIL-PRF-55342 MIL-STD-883
Mechanical Inspection	MIL-PRF-55342
DC Resistance	MIL-PRF-55342 MIL-STD-202
Resistance Temperature Characteristics (TCR)	MIL-PRF-55342
Short Time Overload	MIL-PRF-55342
High Temperature Exposure	MIL-PRF-55342
Thermal Shock	MIL-PRF-55342 MIL-STD-202
Resistance to Bonding Exposure	MIL-PRF-55342
Wire Bonding Integrity	MIL-PRF-55342
Life Test	MIL-PRF-55342 MIL-STD-202

◆ Performance Specifications

Higher power ratings, additional sizes, and custom resistors may be available. Please contact sales@passiveplus.com.

◆ Packaging

ESD waffle packs are standard. Film rings and gel pack packaging may be available upon request.

