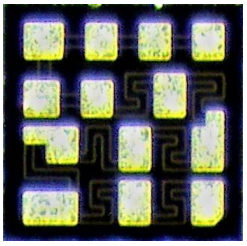
Thin Film Products

Network Resistor Array – PN Series

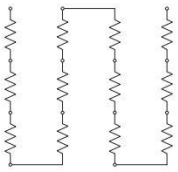
Product Features



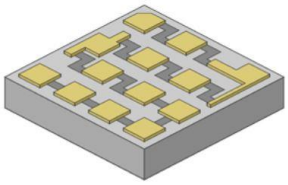
- Multiple resistances in a single, space saving chip.
- Single chip geometry offers excellent TCR tracking and resistance ratio tracking.
- PPI offers chips with 12 or 20 resistive elements as standard.
- Other configurations are available upon request.
- Can be used in Non-Magnetic Applications

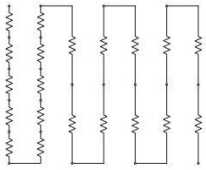
Product Specifications

Resistive Material	Tantalum Nitride
Ratio Tolerance	To 0.01% value dependent



12 Resistor Configuration





20 Resistor Configuration

Part Numbering

P N T 20 35 – 38 × 38 × 10 A 200R0 J Q C W

- P = Passive Plus
- Resistor Style *See Table*
- Resistive Material *See Table*
- Number of Resistors *12 or 20*
- Substrate *See Table*
- Length & Width
- Thickness
- Termination *See Table*
- Resistance Value
- Resistance Tolerance *See Table*
- TCR *See Table*
- Power Handling *See Table*
- Packaging *See Table*

Resistor Style

Code	Style
N	Network Array

Resistive Materials

Code	Material	Passivation	Sheet Resistivity (Ω/ Sq)	Abs. Tolerance	Ratio Tolerance
T	**Tantalum Nitride (TaN)**	Self Passivating Ta_2O_5	5 to 270	From ±0.01%	From ±0.01%

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Substrate Materials

Code	Material	Thickness	Surface Finish	Dielectric Constant (@ 1MHz)	Coefficient of Thermal Expansion (x 10^6/ °C)	Thermal Conductivity (W/m*K)
35	Alumina (Al_2O_3)	0.005" - 0.010"	2µ" - 3µ"	9.9	7 (25°C to < 300°C)	26.9
22	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)

Terminations

Code	Metallization	
	Top Side	Bottom Side
A	Pd / Au	–
D	Pd / Au	Ta/Pd/Au
K	Pd/ Au	Au Sputtered

Resistance Range

Code	Size	Substrate Metallization	Resistance Range	Resistance Distribution
12	30x30 (0.030"x0.030")	Silicon	80Ω to 240kΩ	R_1 to R_7 = R_t/8 R_8 to R_{12} = R_t/40
		Alumina	80Ω to 50kΩ	
20	38x38 (0.038"x0.038")	Silicon	550Ω to 500kΩ	R_1 to R_{10} = R_t/110 R_{11} to R_{20} = R_t/11
		Alumina	550Ω to 50kΩ	

Resistance Tolerance Codes

Code	J	K	M
Tolerance	± 5%	± 10%	± 20%

Temperature Coefficient of Resistance

Code	TC	Material
Q*	±150 ppm/°C	Tantalum Nitride (TaN)
V	±100 ppm/°C	

**Standard*

Power Handling

Code	Rating
C	250mW

Packaging

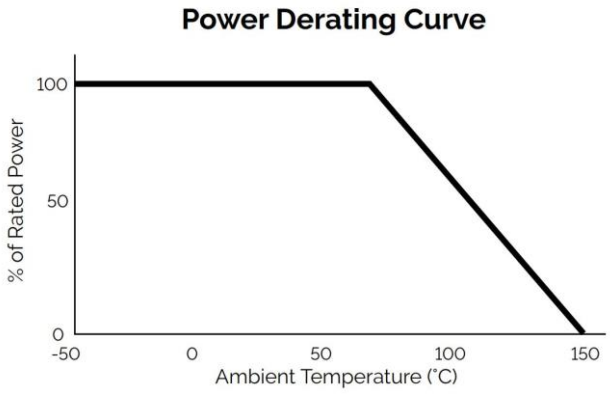
Code	Style
W	Waffle Pack (Standard)
G	Gel Pack

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

Network Resistor Array – PN Series

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 available. Please contact sales@passiveplus.com.