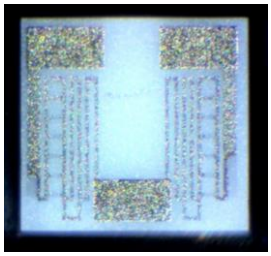
Thin Film Products

Dual Chip Resistors – PD Series

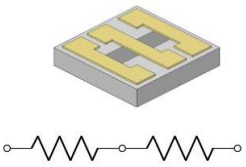
Product Features



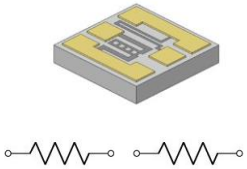
- Two resistors on a single chip area.
- Available styles are common or isolated node.
- The nature of this design lends itself to tightly matched TCR and electrical tolerance, with resistance ratios within 0.01% possible (value dependent).
- Can be used in Non-Magnetic Applications

Product Specifications

Resistance Range	2Ω - 1MΩ per resistor (Silicon or Quartz) 2Ω - 160kΩ per resistor (Al_2O_3, BeO, or AlN)
Resistance Tolerance	±0.01% to ±20% value dependent
Standard Size	30 mil x 30 mil x 10 mil 0.03” x 0.03” x 0.01”



Common Node Configuration



Isolated Node Configuration

Part Numbering

P D T – 35 – 30×30 – 10000–20000 – A J Q K

- P = Passive Plus
- Resistive Material *See Table*
- Length & Width (mils)
- Termination *See Table*
- TCR *See Table*
- Resistor Style *See Table*
- Substrate *See Table*
- Resistance for First & Second Resistors
- Resistance Tolerance *See Table*
- Resistance Ratio

Resistor Style

Code	Style
D	Common Node
I	Isolated Node

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%
N	**NiChrome (NiCr)**	SiO_2	5 to 250	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
28	Aluminum Nitride (AlN)	0.005" - 0.010"	6µ" - 8µ"	8.0 - 9.1	4.6 - 5.7 (25°C to < 1000°C)	170
25	Beryllium Oxide (BeO)	0.005" - 0.010"	<5µ"	6.76	9 (25°C to < 1000°C)	285
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)
20	Quartz (Fused Silica)	0.005" - 0.010"	60/40 Optical Polish	3.826	0.55 (25°C to < 1000°C)	1.38

Resistance Tolerance Codes

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

Terminations

Code	Top Side		Bottom Side	
	Metallization	Attachement Options	Metallization	Attachement Options
A	Pd/Au	Wirebond, Non-Cond. Epoxy	–	–
R	Flip Chip (Ti/Pt/Au)	Cond. Epoxy Non-Cond. Epoxy Eutectic Attach Solder	–	–
D	Pd/Au	Wirebond Non-Cond. Epoxy	Ta/Pd/Au	Cond. Epoxy Non-Cond. Epoxy Eutectic Attach Solder

Temperature Coefficient of Resistance

Code	TCC	Material	
		Tantallum Nitride (TaN)	NiChrome (NiCr)
Q	±150 PPM/°C	Standard	---
V	±100 PPM/°C	Yes	---
W	±50 PPM/°C	Yes	Yes
X	±25 PPM/°C	---	Standard
Y	±10 PPM/°C	---	Yes
Z	±5 PPM/°C	---	Yes

Resistance Ratio Codes

Code	Tolerance to Other Resistors	Code	Tolerance to Other Resistors
G	±0.01%	**M**	±0.50%
H	±0.05%	**N**	±1.00%
J	±0.10%	**R**	No Ratio
K	±0.25%		

Power Handling Range by Material

Case Size mils (inches)	Alumina (35)	Silicon (22)	AlN (28)	BeO (25)	Quartz (20)
30 x 30 (0.030 x 0.030)	125 mW	125 mW	500 mW	1.0 W	25 mW

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Packaging

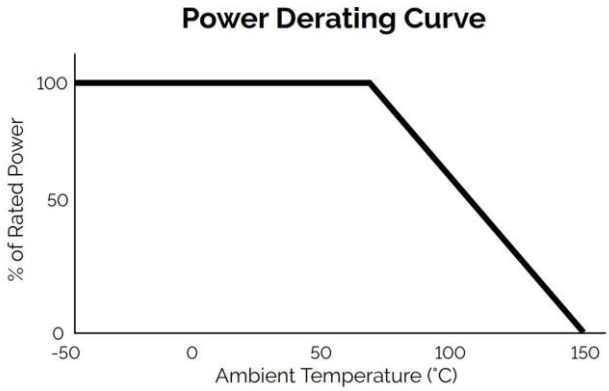
Code	Style
W	Waffle Pack (Standard)

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.

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.