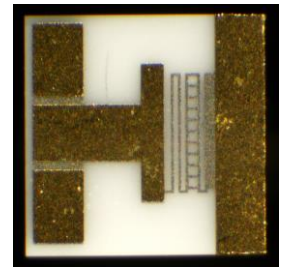


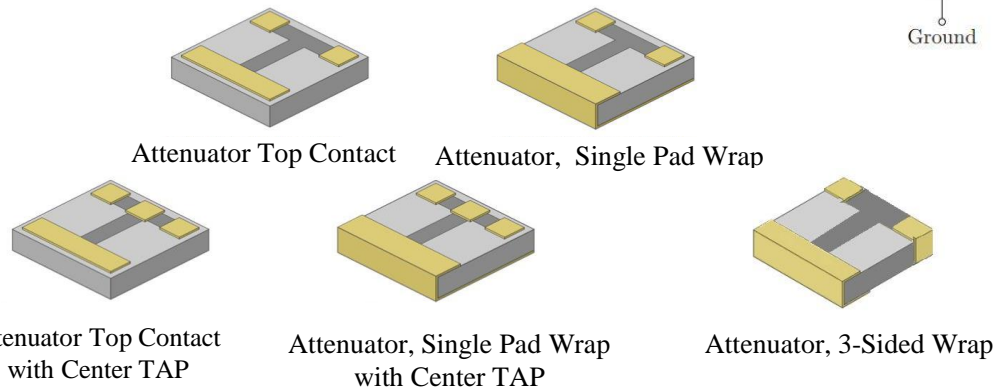
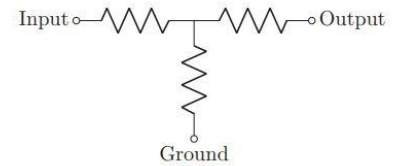
## Standard Thin Film Attenuators

### PAT Series

- Reduces amplitude or power of a signal by a known value. This is achieved with very little distortion of the signal, maintaining accuracy up to 40 GHz.
- Attenuators are available with or without center Taps
- Single wraps of the ground pad to a full gold backside available
- Additional Attenuator configurations, including balanced attenuators and triple wrap attenuators, are available as custom parts
- Can be used in Non-Magnetic Applications



50x50 0.5dB Top Contact Attenuator



### ◆ Part Numbering

**P A T S 35 – 50×50× 10 A 3R00 F Q G W**

**P = Passive Plus**

**Attenuator Style**

A = Attenuator

**Resistive Metallization**

T = Tantalum Nitride

**Attenuator Type**

T = T-Pattern with Center Tap

S = T-Pattern without Center Tap

**Substrate**

See Next Page for Specifications

**Length and Width**

See Next Page for Specifications

**Thickness**

See Next Page for Specifications

**Packaging**

W = Waffle Pack (Standard)\*

**Power Handling**

See Next Page for Specifications

**TCR**

See Next Page for Specifications

**Attenuation Tolerance**

See Next Page for Specifications

**Attenuation (dB)**

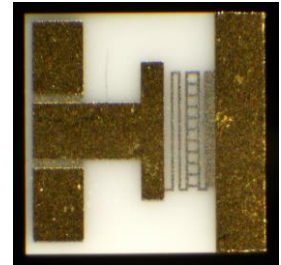
Digits 1-4 are significant figures  
“R” is used as a decimal point  
Values are available in 0.5dB increments

**Metallization Code**

See Next Page for Specifications

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

## Standard Thin Film Attenuators



### ◆ Properties by Material and Size

Dimensions (mils) (LxWxT)	Power (W)			Value	
	Al <sub>2</sub> O <sub>3</sub> (35)	AlN (28)	BeO (25)	Min	Max
50x50x10	250mW	1W	2W	0.5dB	24.5dB
80x60x15	250mW	1W	2W	0.5dB	24.5dB
150x120x25	2W	8W	16W	0.5dB	24.5dB

### ◆ Bond Pad & Wrap Configuration

Description	Code	Metallization
Top Only	A	Ta/Pd/Au
Single Wrap, Full GRD Plane	M	TiW/Ni/Au
Flip Chip	R	Ti/Pt/Au
3-sided Wrap	X	TiW/Ni/Au

### ◆ Power Handling Codes

Power	Code
250mW	G
1.0W	K
2.0W	L
8.0W	R
16.0W	Y

Power Ratings assume proper heat sinking is used.

### ◆ Attenuation Tolerance

Tolerance	Code
±0.1dB (-0.5 to -6.0dB)	F
±0.2dB (-6.5 to -24.5dB)	G

### ◆ Temperature Coefficient of Resistance

TCR	Availability	Code
±150ppm	Standard	Q
±100ppm	Optional	V

### ◆ Resistive Materials & Temperature Coefficient of Resistance (TCR)

Resistive Materials			TCR					
Material	Passivation	Sheet Resistivity (Ω/Sq)	±150 ppm/°C	±100 ppm/°C	±50 ppm/°C	±25 ppm/°C	±10 ppm/°C	±5 ppm/°C
Tantalum Nitride (TaN)	Self Passivating Ta <sub>2</sub> O <sub>5</sub>	5 to 270	Q	V	W	X	Y	Z
			Standard	Yes	---	---	---	---

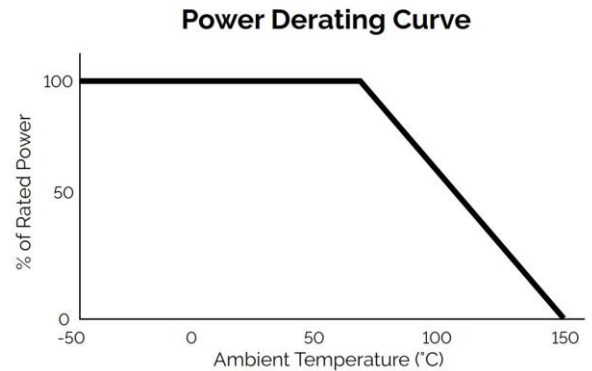
### ◆ Substrate Materials

Material	Thickness	Surface Finish	Dielectric Constant (@ 1MHz)	Coefficient of Thermal Expansion (x 10 <sup>6</sup> /°C)	Thermal Conductivity (W/m <sup>2</sup> *K)	Code
Alumina (Al <sub>2</sub> O <sub>3</sub> )	0.005" - 0.010"	2μ" - 3μ"	9.9	7 (25°C to < 300°C)	26.9	35
Aluminum Nitride (AlN)	0.005" - 0.010"	< 10μ"	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

## Standard Thin Film Attenuator

### ◆ General Properties

Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Operating Frequency	DC to 40 GHz
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](mailto:sales@passiveplus.com).

### ◆ Packaging

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

