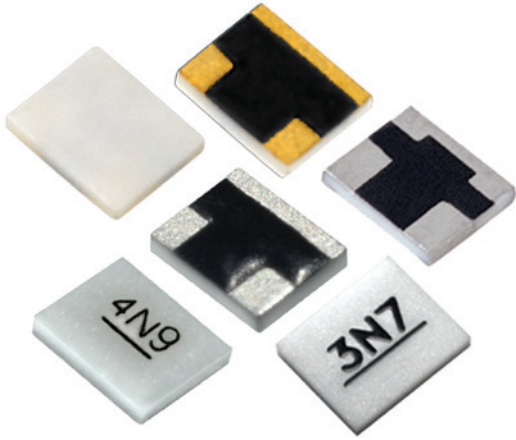


TVA Thermopad® Series

Attenuator Temperature Variable Chip 2 Watts



TVA Thermopad® Series offer proven performance and significant high reliability heritage in a commercial grade product.

Smiths Interconnect is the world leader in temperature variable chip attenuators offering the widest selection of products from DC through Ka band. Thermopad® products have been a highly reliable passive solution for over temperature gain compensation for more than 20 years. Smiths Interconnect is the leader in high reliability components.

The TVA platform offers significant heritage and proven performance in a cost effective commercial grade product. High reliability tested options are also available to ensure mission success in demanding applications. Rated for DC-6 GHz with excellent broadband response, the TVA series supports a wide range of applications. It is constructed on an Alumina substrate with rugged thick film terminations and thick film thermistor technology. The product also includes a protective coating for added protection from various environmental conditions. Multiple attenuation values, temperature shift options and mounting configuration are available to support both surface mount and wire bond applications. Various finish options are also available including RoHS compliant solutions.

Features and Benefits

- Small Footprint
- Multiple Mounting Configurations
- Broad Frequency Range
- Low VSWR
- Wide Range of Attenuation Values
- Multiple Temperature Shift Options
- Tight Attenuation Tolerance

Applications

- Amplifier Circuits
- Transmit/Receive Modules
- Up/Down Converters
- Instrumentation
- Satellite Communications
- Radar
- Broadcast

Technical Characteristics

Mounting Configuration Options	Planar	Single Wrap (W1)	Triple Wrap (W3)	Wire Bondable Gold (WB1)
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Electrical

Nominal Impedance	50 ohms			
Frequency Range	DC -6.0 GHz			
Attenuation Values Available	1-10 in 1 dB Increments			
Attenuation Accuracy	± 0.5 dB @ 1 GHz @ 25°C			
Temperature Coefficient of Attenuation (TCA) (dB/dB/°C) in 0.001 dB/dB/°C increments	Negative Shift Options -0.003 through -0.007 & -0.009 Positive Shift Options +0.003 through +0.009	Negative Shift Options -0.003 through -0.007 & -0.009 Positive Shift Options +0.003, +0.005, +0.006 and +0.007	Negative Shift Options -0.003 through -0.009 Positive Shift Options +0.003 through +0.009	Negative Shift Options -0.003 through -0.007 & -0.009
Temperature Coefficient Tolerance	± 0.001 dB/dB/°C			
Input Power CW	Negative Shift Options - 2 Watts Max up to 125°C (See derating curve) Positive Shift Options - 0.25 Watts Max up to 125°C (See derating curve)			
Peak Power	Negative Shift Options - 20 Watts based on 10 µS pulse width @ 1% Duty Cycle Positive Shift Options - 2.5 Watts based on 10 µS pulse width @ 1% Duty Cycle			
VSWR	1.30:1 Max @ 1 GHz			

Environmental

Operating Temperature	-55°C to +150°C
Storage Temperature	-65°C to +150°C
Moisture Sensitivity Level	MSL 1 - Unlimited

Mechanical

Substrate Material	Alumina (Al ₂ O ₃) 96%			
Resistive Film	Thick Film, Thermistor			
Terminal Material	Thick Film			Thick Film Bondable Gold Input/Output Pads, Solderable Platinum Gold Ground
Protective Coating	Polymer			
Finish Options	Blank	Solder Plated (Sn60/Pb40)	Solder Plated (Sn60/Pb40)	N/A
	-F	Silver Plated (RoHS Compliant)	Silver Plated (RoHS Compliant)	
	-S	Pretinned (Sn60/Pb40)	Pretinned (Sn60/Pb40)	
	-G	Gold (Thick Film)		

Marking

Unit Marking	dB Value (X), Direction of shift (N), & TCA value (X)	None	dB Value (X), Direction of shift (N), & TCA value (X)	None
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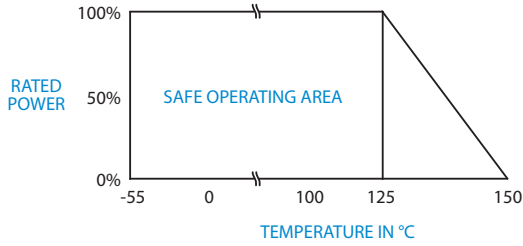
Quality Assurance

	<p>Sample visual and mechanical inspection - 1.0 AQL per mechanical drawing requirements. Periodic electrical inspection performed for commercial grade products. High reliability tested products are available per MIL-PRF-55342. TCA Calculation Method - Measure Attenuation @ DC every 20°C over the temperature range of -55°C to +125°C Calculate the slope of the curve using linear regression. Calculate TCA using the following formula: $TCA = \frac{Slope}{Attenuation @ 25^\circ C}$</p>
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Packaging

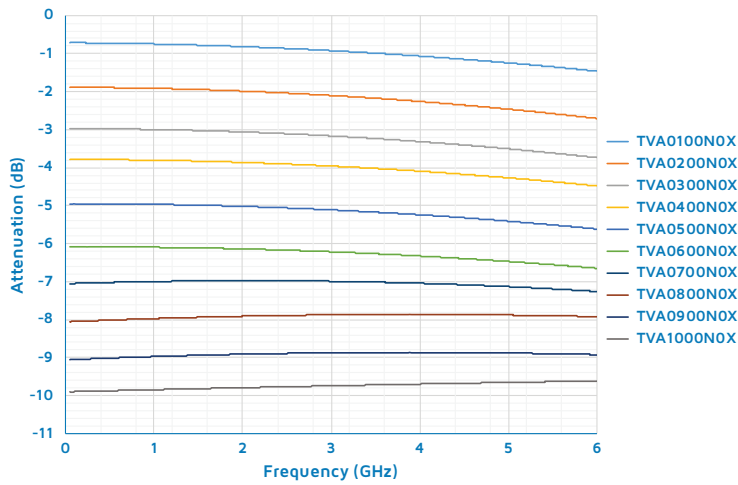
Standard Packaging	Tape and Reel or Waffle Pack
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Power Derating Curve

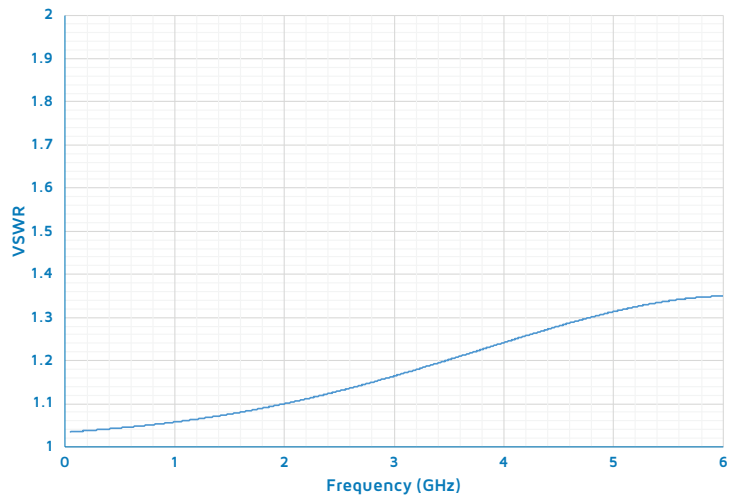


Typical Data

TVA0X00N0X Planar

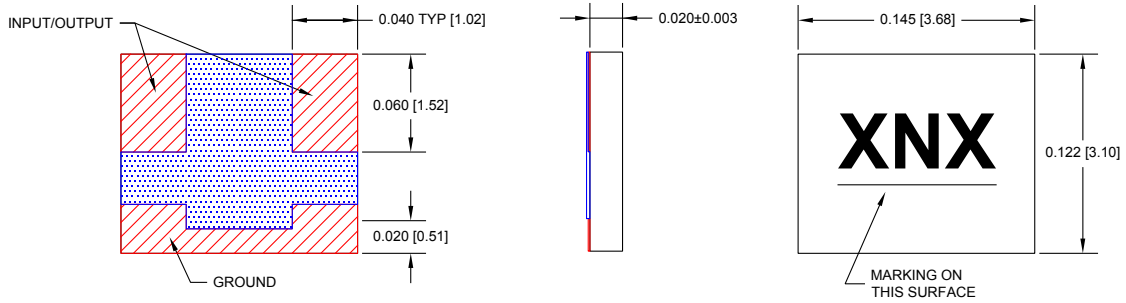


TVA0X00N0XW3 Triple Wrap

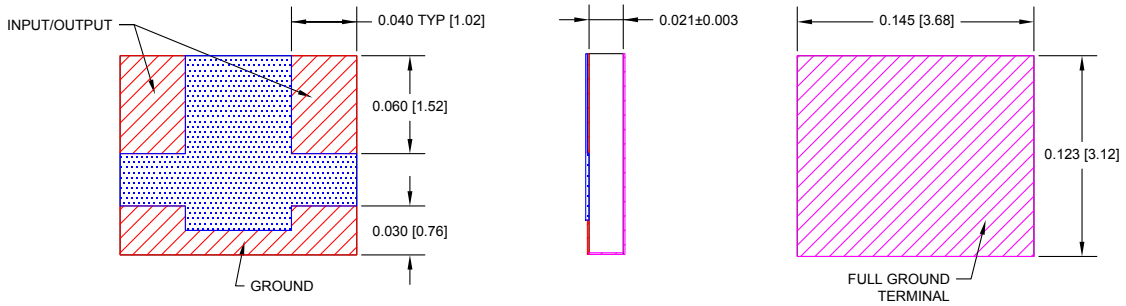


Mechanical

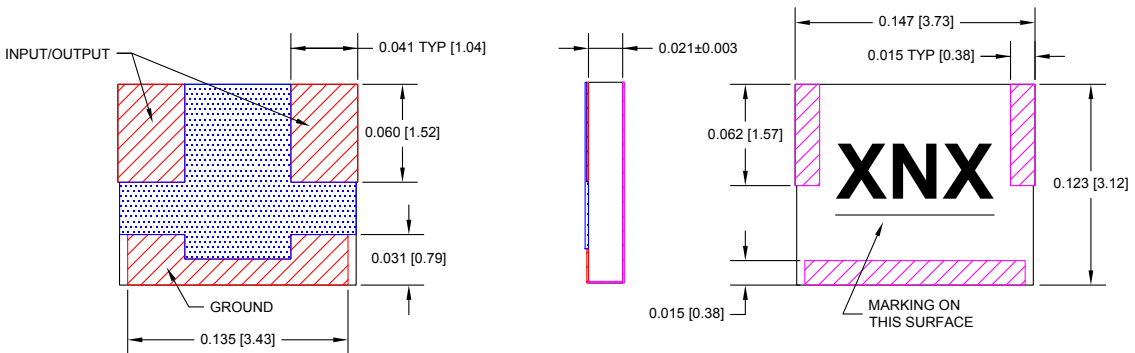
TVA - Planar Option



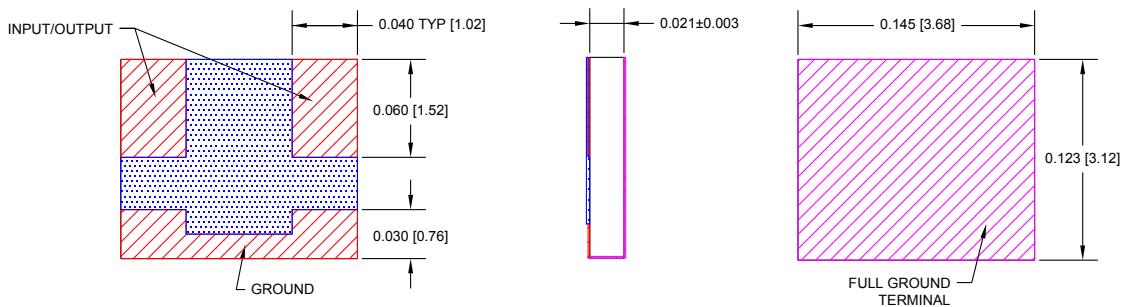
TVA - Single Wrap Option



TVA - Triple Wrap Option



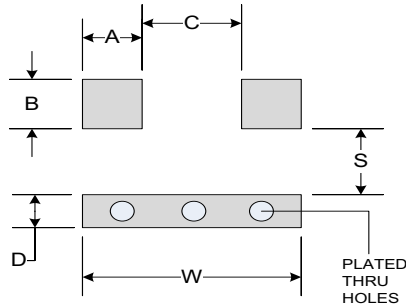
TVA - Wire Bondable Gold Option



*Dimensions apply before solder, allow 0.015" max for all pretinned surfaces
 Unless otherwise specified, tolerance: X.XXX = ±0.005"

Suggested Mounting Footprint

Part Number	Inches						MM					
	A	B	C	D	S	W	A	B	C	D	S	W
TVA0X00NOX (Planar) and TVA0X00NOXW3 (Triple Wrap)	0.043	0.063	0.067	0.035	0.032	0.152	1.09	1.60	1.70	0.89	0.81	3.86



How To Order

Specify Model Number: **TVA0X00NXXXXXX**

	TVA	00	00	■	0	■ ■ ■	■
	1	2	3	4	5	6	7
1 Series Name	TVA Series						
2 Attenuation Value	00 00 dB through 10 10 dB						
3 EMC Code	00 EMC Code						
4 TCA Slope	N Negative P Positive						
5 TCA Shift Option (dB/dB/°C)	03 03=0.003 04 04=0.004 05 05=0.005 06 06=0.006 07 07=0.007 08 08=0.008 09 09=0.009						
6 Options	■ Planar W1 Single Wrap Ground W3 Triple Wrap - All Ports WB1 Wire Bondable						
7 Terminal Finish	■ Standard S Pretinning F RoHS G Gold						

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