MTVA Thermopad® Series

ATTENUATOR TEMPERATURE VARIABLE CHIP 200 MILLIWATTS



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. Backed by proven performance and significant heritage, Smiths Interconnect is the leader in high reliability components.

The MTVA 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 high reliability applications. Rated for DC-18 GHz with excellent broadband response, the MTVA series of products has 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 compliance.

MTVA Thermopad®
Series offer a passive
solution for gain
compensation over
temperature with proven
high reliability heritage.

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

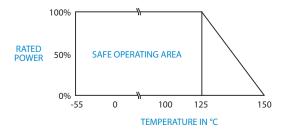
- Amplifier Circuits
- Transmit/Receive Modules
- Up/Down Converters
- Instrumentation
- Satellite Communications
- Radar
- Broadcast



Technical Characteristics

## Strive Film ## Solder Plated (Sn60/Pb40)	Mounting Configuration Options	Planar	Single Wrap (W1)	Triple Wrap (W3)	Wire Bondable Gold (WB1)				
DC -18 GHz (-0.001 through -0.005 dB/dB/C) DC -12.4 GHz DC -	Electrical								
through -0.005 d8/d8/*C Co-12.4 CHz (-0.006 through -0.009 d8/d8/*C Co-12.4 CHz (-0.006 through -0.009 d8/d8/*C Co-9 in 1 d8 Increments 1-8 in 1 d8 Increments 1-9 in 1 d8 Increments Co-9 in 1 d8 Increment	Nominal Impedance	50 ohms							
2 0.5 dB @ 1 GHz @ 25°C	Frequency Range	through -0.005 dB/dB/°C) DC- 12.4 GHz (-0.006							
Temperature Coefficient of Attenuation (TCA) -0.009 dB/dB/°C in 0.001dB/dB/°C in 0.001dB/dB/°C in 0.001dB/dB/°C in 0.001dB/dB/°C increments Temperature Coefficient Tolerance 1	Attenuation Values Available	O-9 in 1 dB Increments	1-8 in 1 dB Increments	1-9 in 1 dB Increments	0-9 in 1 dB Increments				
Co.009 dB/dB/°C in 0.001dB/dB/°C in 0.001dB/°C in 0.001dB	Attenuation Accuracy	± 0.5 dB @ 1 GHz @ 25°C							
Tolerance Input Power CW Peak Power 2 00 Milliwatts Max up to 125°C (See derating curve) Peak Power 2 Watts based on 10 µS pulse width @ 1% Duty Cycle 1.30:1 Max @ 1 GHz Environmental Operating Temperature Storage Temperature Moisture Sensitivity Level MSL 1 - Unlimited Mechanical Substrate Material Resistive Film Thick Film Intermistor Terminal Material Thick Film Thick Film Thick Film Solder Plated (Sn60/Pb40) Solder Plated (Sn60/Pb40) Solder Plated (RoHS Compliant) (ROHS Compliant) Solder Nore Sol		-0.009 dB/dB/°C in 0.001dB/dB/°C	0.009 dB/dB/°C in & -0.009 dB/dB/°C & -0.009 d 0.001dB/dB/°C in 0.001dB/dB/°C in 0.001dB,		-0.003 through -0.009 dB/dB/°C in 0.001dB/ dB/°C increments				
Peak Power VSWR 1.30:1 Max @ 1 GHz Environmental Operating Temperature Moisture Sensitivity Level MSL 1 - Unlimited Mechanical Substrate Material Thick Film (Relim Thermistor) Terminal Material Polymer Finish Options Blank -F Silver Plated (RoHS Compliant) -G Gold (Thick Film) Marking Marking Marking Marking Sample visual and mechanical inspection - 1.0 AQL per mechanical grade products. High reliability tested products are available per MIL-PRF-53342. TCA Calculation Method - Neasure Attenuation @ DC every 20°C over the temperature range of -55°C to 4150°C Attenuation @ 25°C	•	± 0.001 dB/dB/°C							
Storage Temperature -55°C to +150°C Storage Temperature -65°C to +150°C -65°C to +150°	Input Power CW								
Environmental Operating Temperature Storage Temperature Moisture Sensitivity Level MSL 1 - Unlimited Mechanical Substrate Material Resistive Film Thick Film, Thermistor Terminal Material Polymer Finish Options Blank Solder Plated (Sn60/Pb40) -5 Pretinned (Sn60/Pb40) -6 Gold (Thick Film) Marking Unit Marking Marking Marking 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-PRR-55342. TCA Calculate TCA using the following formula: TCA = Slope Attenuation @ 25°C	Peak Power	2 Watts based on 10 μ S pulse width @ 1% Duty Cycle							
Comparating Temperature Comparative Co	VSWR	1.30:1 Max @ 1 GHz							
Storage Temperature Moisture Sensitivity Level MSL 1 - Unlimited	Environmental								
Moisture Sensitivity Level MeChanical Substrate Material Resistive Film Thick Film Thick Film Protective Coating Polymer Finish Options Blank -F Silver Plated (RoHS Compliant) -F Gold (Thick Film) Pretinned (Sn60/Pb40) -F Gold (Thick Film) Marking Unit Marking MB Value (X), Direction of shift (N), & TCA value (X) Page 10 Again 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 Calculate TCA using the following formula: TCA = Slope Attenuation @ 25°C Packaging	Operating Temperature	-55°C to +150°C							
Mechanical Substrate Material Alumina (Al₂O₃) 96% Resistive Film Thick Film Thick Film Thick Film Bondable Input/Output Pads, able Platinum Gold	Storage Temperature								
Alumina (Al ₂ O ₃) 96% Thick Film Thick Film Bondable Input/Output Pads, able Platinum Gold Platinum Gold Platinum Gold Platinum Gold Platinum Gold (RoHS Compliant) Thick Film Bondable Platinum Gold (RoHS Compliant) Thick Film Bondable Platinum Gold Plat	Moisture Sensitivity Level	MSL 1 - Unlimited							
Thick Film, Thermistor Thick Film Bondabl Input/Output Pads, able Platinum Gold Protective Coating Finish Options Blank -F Silver Plated (Sn60/Pb40) -F Silver Plated (RoHS Compliant) -F Ogold (Thick Film) Pretinned (Sn60/Pb40) -G Gold (Thick Film) Marking Unit Marking dB Value (X), Direction of shift (N), & TCA value (X) Quality Assurance 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 @ De every 20°C over the temperature range of -55°C to Calculate TCA using the following formula: TCA = Slope Attenuation @ 25°C Packaging	Mechanical								
Thick Film, Thermistor Terminal Material Thick Film Thick Film Bondabl Input/Output Pads, able Platinum Gold Protective Coating Polymer Finish Options Blank Solder Plated (Sn60/Pb40) Silver Plated (Sn60/Pb40) Silver Plated (RoHS Compliant) Pretinned (Sn60/Pb40) Gold (Thick Film) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Blank Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb40) Marking Unit Marking Blank Blank Blank All Value (Sn60/Pb40) Pretinned (Sn60/Pb40)	Substrate Material	Alumina (Al ₂ O ₂) 96%							
Thick Film Thick Film Thick Film Input/Output Pads, able Platinum Gold Protective Coating Polymer Finish Options Blank Solder Plated (Sn60/Pb40) Silver Plated (RoHS Compliant) Pretinned (Sn60/Pb40) Gold (Thick Film) Pretinned (Sn60/Pb40) Gold (Thick Film) Pretinned (Sn60/Pb40) Thit Marking Marking Marking Marking Marking AB Value (X), Direction of shift (N), & TCA value (X) Pretinned (Sn60/Pb40) None Marking Mone AB Value (X), Direction of shift (N), & TCA value (X) Pretinned (Sn60/Pb40) Pretinned (S	Resistive Film	2 3							
Solder Plated (Sn60/Pb40) Solder Plated (Sn60/Pb40) Solder Plated (Sn60/Pb40) Solder Plated (Sn60/Pb40) Solder Plated (RoHS Compliant)	Terminal Material	Thick Film	Thick Film Bondable Gold Input/Output Pads, Solder- able Platinum Gold Ground						
Silver Plated (RoHS Compliant) Pretinned (Sn60/Pb40) Pretinned (Sn60/Pb4	Protective Coating	Polymer							
(RoHS Compliant) Pretinned (Sn60/Pb40) Gold (Thick Film) Marking Unit Marking MB Value (X), Direction of shift (N), & TCA value (X) Periodic electrical inspection performed for commerical 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 Calculate the slope of the curve using linear regression. Calculate TCA using the following formula: TCA = Slope Attenuation @ 25°C Packaging	Finish Options Blank	Solder Plated (Sn60/Pb40)	Solder Plated (Sn60/Pb4	0)	N/A				
Unit Marking dB Value (X), Direction of shift (N), & TCA value (X) Quality Assurance 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 Calculate the slope of the curve using linear regression. Calculate TCA using the following formula: TCA = Slope Attenuation @ 25°C	- s	(RoHS Compliant) Pretinned (Sn60/Pb40)	`						
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	Packaging								
Standard Packaging Tape and Reel or Waffle Pack	Standard Packaging	Tago and Pool or Wafflo Pack							

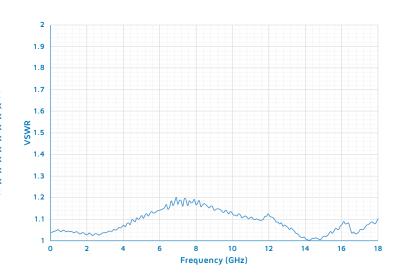
Power Derating Curve



Typical Data

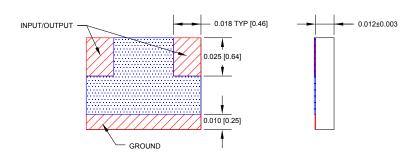
MTVAXX00N0X Series Attenuation

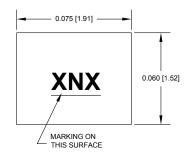
MTVAXX00N0X Series VSWR



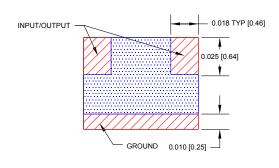
Mechanical

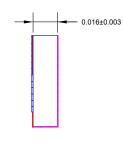
MTVA - Planar Option

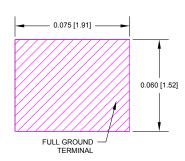




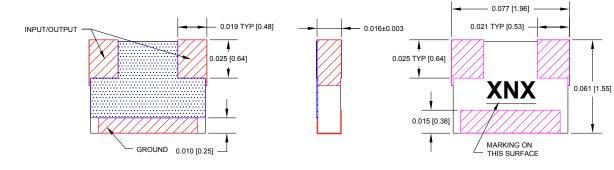
MTVA - Single Wrap Option



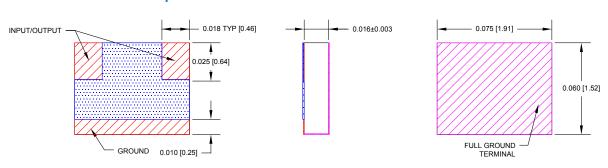




MTVA - Triple Wrap Option



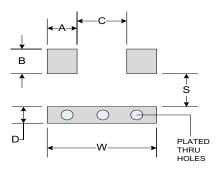
MTVA - Wire Bondable Gold Option



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

Suggested Mounting Footprint

	Inches				MM							
Part Number	Α	В	С	D	S	W	Α	В	С	D	S	W
MTVA0X00N0X (Planar) and	0.022	0.028	0.041	0.013	0.026	0.075	0.56	0.71	1.04	0.33	0.66	1.91
MTVAOXOONOXW3 (Triple Wrap)												



How To Order

Specify Model Number: MTVAXX00N0X

MTVA		00	N	0		
1	2	3	4	5	6	7
1 Series Name	MTVA	Series				
2 Atttenuation Value	0 01 00 dB	through 0	9 10 dB			
3 EMC Code	0 0 EMC Co	ode				
4 TCA Slope	N Negative					
5 TCA Shift Option (dB/dB/°C)	0 0 06=0.0	006 0 7 0			0 4 04=0.004	0 5 05=0.005
6 Options	Planar	W 1	Single Wrap G	iround		
	W 3 Triple	Wrap - All P	orts W	B 1 Wire	Bondable	
7 Terminal Finish	Standard	S Pret	inning	F RoHS	G Gold	

Global Support

UK Headquarters

London, UK +44 20 7004 1600 info.uk@smithsinterconnect.com

US Headquarters

■ Stuart, FL +1 772 286 9300 info.us@smithsinterconnect.com

Americas

- Costa Mesa, CA +1 714 371 1100 info.us@smithsinterconnect.com
- Milpitas, CA +1 408 957 9607 x-1125 info.us@smithsinterconnect.com
- Stuart, FL +1 772 286 9300 info.us@smithsinterconnect.com
- Hudson, MA +1 978 568 0451 info.us@smithsinterconnect.com
- Northampton, MA +1 413 582 9620 info.northampton@smithsinterconnectinc.com
- Tampa, FL + 1 813 901 7200 info.tampa@smithsinterconnectinc.com
- Kansas City, KS +1 913 342 5544 info.us@smithsinterconnect.com
- Salisbury, MD +1 800 780 2169 info.us@smithsinterconnect.com
- Thousand Oaks, CA +1 805 267 0100 info.thousandoaks@smithsinterconnectinc.com

Europe

- Deggendorf, Germany +49 991 250 120 info.de@smithsinterconnect.com
- Genova, Italy +39 0 10 60361 info.it@smithsinterconnect.com
- Dundee, UK +44 1382 427 200 info.dundee@smithsinterconnect.com
- Rouen, France +33 2 32 96 91 76 info.fr@smithsinterconnect.com
- Elstree, UK +44 20 8236 2400 info.uk@smithsinterconnect.com

Asia

- Shanghai, China +86 21 3318 4650 info.asia@smithsinterconnect.com
- Suzhou, China +86 512 6273 1188 info.asia@smithsinterconnect.com
- Singapore +65 6846 1655 info.asia@smithsinterconnect.com

