

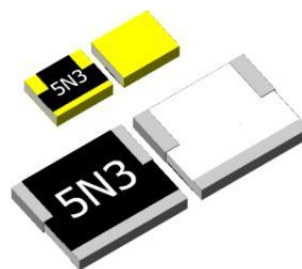
MTCA/TCA Series Temperature Variable Attenuators

1、Introduction

The MTCA/TCA series temperature variable attenuator is a passive device fabricated using thick-film technology. It features high reliability, small size, no distortion, no phase shift, and attenuation variation with temperature, they are widely used in microwave communication systems such as microwave power amplifiers, low noise amplifiers, T/R modules and active modules for gain adjustment. This series can directly replace MTVA/TVA series temperature variable attenuators from Smiths Interconnect.

2、Features

- ★ Attenuation Values Available: 1-10 in 1dB Increments
- ★ VSWR: ≤ 1.3 (typical)
- ★ Attenuation Accuracy: $\pm 0.5\text{dB}$
- ★ Maximum Operating Frequency: 18GHz
- ★ Rated Power: 2W
- ★ Operating Temperature: -55°C to $+150^{\circ}\text{C}$
- ★ Mounting Options: Surface Mount or Wire Bondable



3、Applications

- ★ Microwave communication modules
- ★ Wireless Local Area Network
- ★ Electronic Countermeasure
- ★ Broadcasting and television
- ★ Satellite communication
- ★ Internet of Things

4、How To Order

Model	Frequency	Attenuation Value	TCA Slope	TCA	Mounting Style	Lead Marking
MTCA	12	03	N	9	W3	S
①	②	③	④	⑤	⑥	⑦

① MTCA/TCA: Denotes the temperature variable attenuator, "MTCA" stands for miniaturized temperature compensated attenuator, "TCA" stands for high power temperature compensated attenuator.

② Frequency: Represented by two significant digits, unit in GHz, e.g., "12" denotes 12.4GHz.

③ Attenuation Value: Represented by two significant digits, unit in dB, e.g., "03" denotes 03dB.

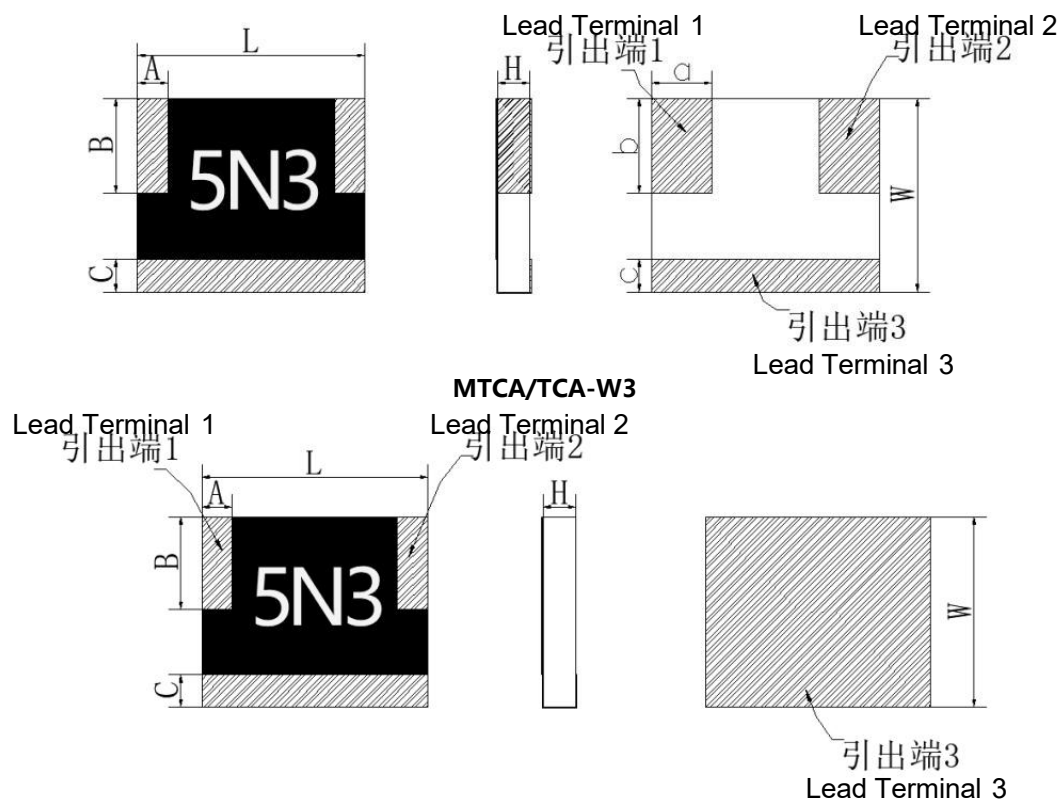
④ TCA Slope: "N" indicates negative temperature coefficient compensation.

⑤ TCA: Represented by one significant digits, unit in dB/dB/°C, e.g., "9" denotes 0.009 dB/dB/°C.

⑥ Mounting Style: "W3" denotes tin-lead electrode with wrap-around, all terms; "WB1" denotes gold electrode with wrap-around wire bondable.

⑦ Lead Marking: "S" indicates lead-containing material; gold-electrode versions do not carry this mark.

5、Structure and Dimensions



Note: The attenuator is identified by three characters, where the first digit represents the nominal attenuation at room temperature, "N" indicates the attenuator has negative temperature coefficient compensation, and the third digit represents the nominal attenuation temperature coefficient of the attenuator. For example, "5N3" means the attenuation at room temperature is 5dB, and the nominal attenuation temperature coefficient is -0.003dB/dB/°C.

Dimensions Table

Series	Dimensions (mm)								
	L	W	H	A	B	C	a	b	c
MTCA	1.96 ±0.15	1.55 ±0.15	0.41 ±0.15	0.38 ±0.15	0.64 ±0.15	0.25 ±0.15	0.53 ±0.12	0.64 ±0.12	0.38 ±0.12
TCA	3.73 ±0.15	3.12 ±0.15	0.53 ±0.15	0.49 ±0.15	1.52 ±0.15	0.76 ±0.15	0.38 ±0.12	1.57 ±0.12	0.38 ±0.12

Terminal Definitions

Lead Terminal No.	Function Symbol	Function Description
1	RF I/O	Signal input/output terminal
2	RF I/O	Signal input/output terminal
3	GND	Signal ground terminal

6、MTCA/TCA Attenuator Selection Table

Model	Frequency Range (GHz)	Attenuation Value (dB)	TCA (dB/dB/°C)	Rated power (W)	Mounting Option
TCA0801N*W3S	DC-8	1	*Denotes the Temperature Coefficient of Attenuation Vaule range (3, 4, 5, 6, 7, 8, 9) N3 : -0.003 N4: -0.004 N5 : -0.005 N6 : -0.006 N7 : -0.007 N8 : -0.008 N9 : -0.009	2	SMT
TCA0802N*W3S	DC-8	2		2	SMT
TCA0803N*W3S	DC-8	3		2	SMT
TCA0804N*W3S	DC-8	4		2	SMT
TCA0805N*W3S	DC-8	5		2	SMT
TCA0806N*W3S	DC-8	6		2	SMT
TCA0807N*W3S	DC-8	7		2	SMT
TCA0808N*W3S	DC-8	8		2	SMT
TCA0809N*W3S	DC-8	9		2	SMT
TCA0810N*W3S	DC-8	10		2	SMT
MTCA1201N*W3S	DC-12.4	1	*Denotes the Temperature Coefficient of Attenuation Vaule range (3, 4, 5, 6, 7, 8, 9) N3 : -0.003 N4: -0.004 N5 : -0.005 N6 : -0.006 N7 : -0.007 N8 : -0.008 N9 : -0.009	0.2	SMT
MTCA1202N*W3S	DC-12.4	2		0.2	SMT
MTCA1203N*W3S	DC-12.4	3		0.2	SMT
MTCA1204N*W3S	DC-12.4	4		0.2	SMT
MTCA1205N*W3S	DC-12.4	5		0.2	SMT
MTCA1206N*W3S	DC-12.4	6		0.2	SMT
MTCA1207N*W3S	DC-12.4	7		0.2	SMT
MTCA1208N*W3S	DC-12.4	8		0.2	SMT
MTCA1209N*W3S	DC-12.4	9		0.2	SMT
MTCA1210N*W3S	DC-12.4	10		0.2	SMT
TCA0801N*WB1	DC-8	1	*Denotes the Temperature Coefficient of Attenuation Vaule range (3, 4, 5, 6, 7, 8, 9) N3 : -0.003 N4: -0.004 N5 : -0.005	2	Micro-assembly
TCA0802N*WB1	DC-8	2		2	Micro-assembly
TCA0803N*WB1	DC-8	3		2	Micro-assembly
TCA0804N*WB1	DC-8	4		2	Micro-assembly
TCA0805N*WB1	DC-8	5		2	Micro-assembly
TCA0806N*WB1	DC-8	6		2	Micro-assembly

TCA0807N*WB1	DC-8	7	N6 : -0.006 N7 : -0.007 N8 : -0.008 N9 : -0.009	2	Micro-assembly
TCA0808N*WB1	DC-8	8		2	Micro-assembly
TCA0809N*WB1	DC-8	9		2	Micro-assembly
TCA0810N*WB1	DC-8	10		2	Micro-assembly
MTCA1201N*WB1	DC-12.4	1	*Denotes the Temperature Coefficient of Attenuation Vaule range (3, 4, 5, 6, 7, 8, 9) N3 : -0.003 N4 : -0.004 N5 : -0.005 N6 : -0.006 N7 : -0.007 N8 : -0.008 N9 : -0.009	0.2	Micro-assembly
MTCA1202N*WB1	DC-12.4	2		0.2	Micro-assembly
MTCA1203N*WB1	DC-12.4	3		0.2	Micro-assembly
MTCA1204N*WB1	DC-12.4	4		0.2	Micro-assembly
MTCA1205N*WB1	DC-12.4	5		0.2	Micro-assembly
MTCA1206N*WB1	DC-12.4	6		0.2	Micro-assembly
MTCA1207N*WB1	DC-12.4	7		0.2	Micro-assembly
MTCA1208N*WB1	DC-12.4	8		0.2	Micro-assembly
MTCA1209N*WB1	DC-12.4	9		0.2	Micro-assembly
MTCA1210N*WB1	DC-12.4	10		0.2	Micro-assembly

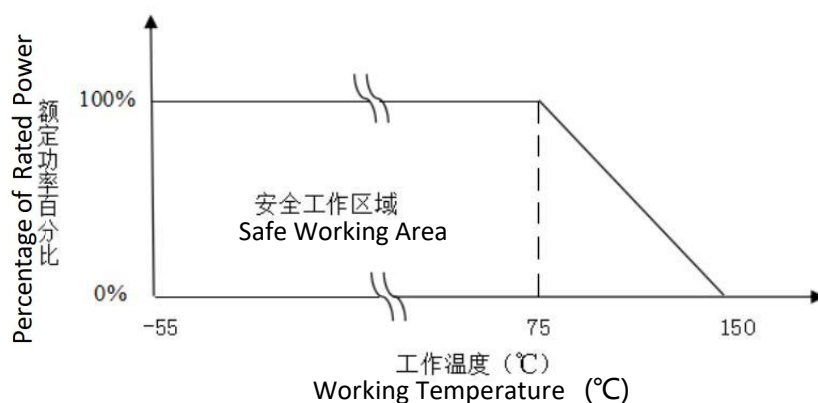
Temperature Coefficient Note:

"N" value indicates the change in attenuation per 1°C temperature change equals nominal attenuation × coefficient value. For example, "6N3" means attenuation changes by 6 × 0.003 dB per 1°C.

7、Main Parameter Curves

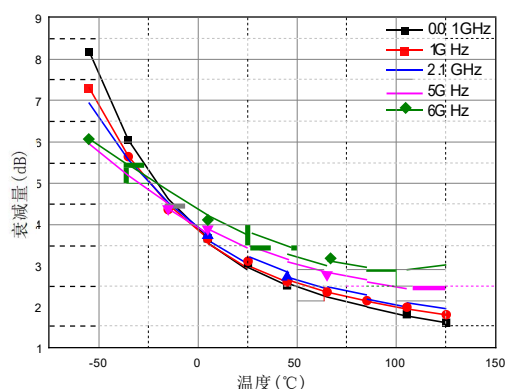
Power Derating Curve:

It can be used at full power when the temperature range is -55°C ~ 75°C. When temperature exceeds 75°C, power must be derated according to the specified curve.

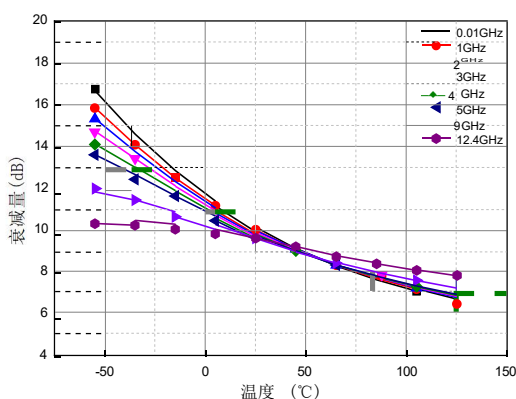


Rated Power Derating Curve

Typical Test Datas:



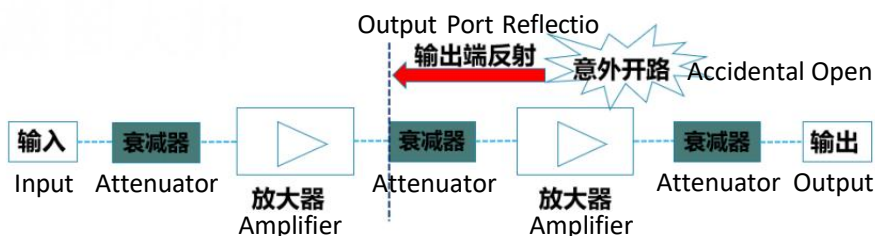
3N9



10N5

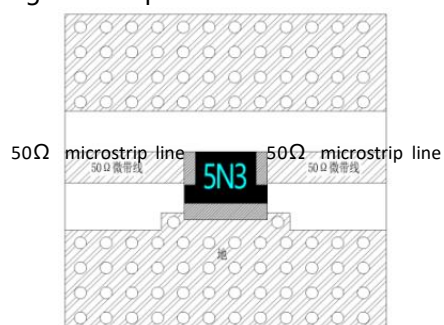
8. Typical Applications

Attenuators are used in radar, microwave communication and other fields, and play the role of power adjustment and isolation protection in microwave T/R modules and power modules.

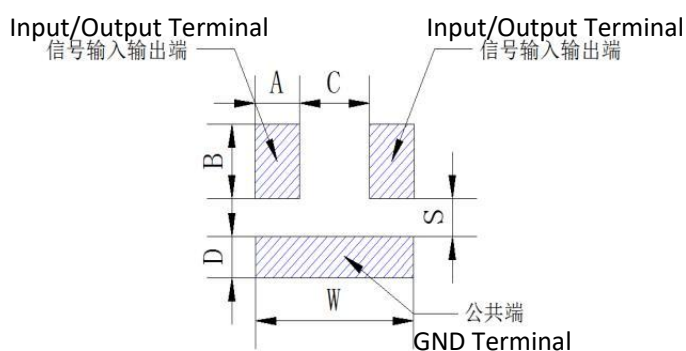


9. Mounting and Precautions

The recommended mounting method for products with W3 package structure is shown in the mounting diagram. The recommended pad structure and dimensions are shown in the pad diagram and pad dimension table.



W3 Structure Mounting Diagram



Pad Diagram

Pad Dimension Table (typical)

Series	Dimensions (mm)					
	A	B	C	D	S	W
MTCA	0.83	0.69	0.80	0.68	0.48	2.48
TCA	1.00	1.57	2.55	0.90	0.97	4.55