

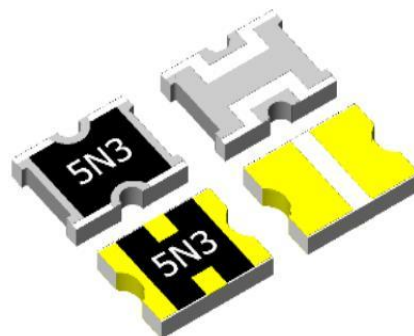
WTCA Series Temperature Variable Attenuators

1、 Introduction

The WTCA series temperature variable attenuator is a passive device fabricated using thick-film technology. It features high reliability, compact size (0.8 mm × 0.85 mm), no distortion, no phase shift, and attenuation that varies with temperature. It is 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 WTCA series temperature variable attenuators from Smiths Interconnect.

2、 Features

- ★ Attenuation Values Available: 1-9 in 1dB Increments
- ★ VSWR: ≤ 1.3 (typical)
- ★ Attenuation Accuracy: ±0.5 dB
- ★ Maximum Operating Frequency: 20 GHz
- ★ Rated Power: 0.2 W
- ★ Operating Temperature Range: -55°C to +150°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
WTCA	20	03	N	9	WB2	S
①	②	③	④	⑤	⑥	⑦

① WTCA: Denotes the temperature variable attenuator, "WTCA" stands for miniaturized temperature compensated attenuator.

② Frequency: Represented by two significant digits, unit in GHz, e.g., "20" denotes 20GHz.

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

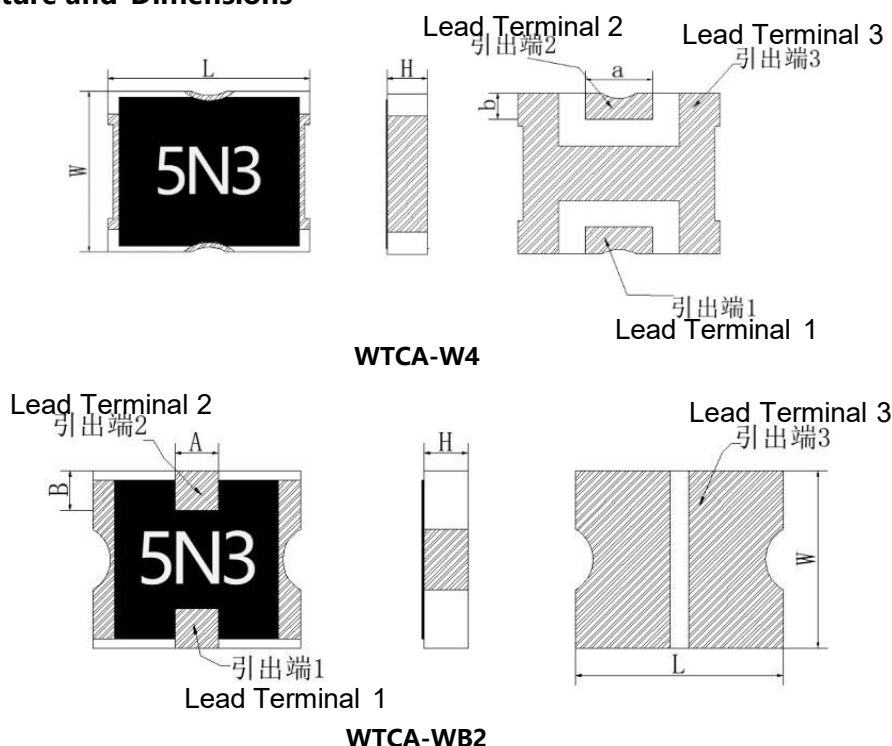
④ TCA Slope: "N" indicates negative temperature coefficient compensation.

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

⑥ Mounting Style: "WB2" denotes gold electrodes with double-sided grounding; "W4" denotes SnPb electrodes with four-sided wrapping.

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.

Dimension Table

Series	Dimensions (mm)						
	L	W	H	A	B	a	b
WTCA-W4	1.91 ±0.15	1.52 ±0.15	0.41 ±0.15	/	/	0.64 ±0.15	0.25 ±0.15
WTCA-WB2	1.78 ±0.15	1.52 ±0.15	0.41 ±0.15	0.38 ±0.15	0.38 ±0.15	/	/

Terminal Definitions

Lead Terminal No.	Function Symbol	Function Description
1	RF I/O	Signal Input/Output
2	RF I/O	Signal Input/Output
3	GND	Signal Ground

6、WTCA Series Selection Table

Model	Frequency Range (GHz)	Attenuation Value (dB)	TCA (dB/dB/°C)	Rated power (W)	Mounting Option
WTCA2001N*WB2	DC-20	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
WTCA2002N*WB2	DC-20	2		0.2	Micro-assembly
WTCA2003N*WB2	DC-20	3		0.2	Micro-assembly
WTCA2004N*WB2	DC-20	4		0.2	Micro-assembly
WTCA2005N*WB2	DC-20	5		0.2	Micro-assembly
WTCA2006N*WB2	DC-20	6		0.2	Micro-assembly
WTCA2007N*WB2	DC-20	7		0.2	Micro-assembly
WTCA2008N*WB2	DC-20	8		0.2	Micro-assembly
WTCA2009N*WB2	DC-20	9		0.2	Micro-assembly
WTCA2001N*W4S	DC-20	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
WTCA2002N*W4S	DC-20	2		0.2	SMT
WTCA2003N*W4S	DC-20	3		0.2	SMT
WTCA2004N*W4S	DC-20	4		0.2	SMT
WTCA2005N*W4S	DC-20	5		0.2	SMT
WTCA2006N*W4S	DC-20	6		0.2	SMT
WTCA2007N*W4S	DC-20	7		0.2	SMT
WTCA2008N*W4S	DC-20	8		0.2	SMT
WTCA2009N*W4S	DC-20	9		0.2	SMT

Temperature Coefficient Note:

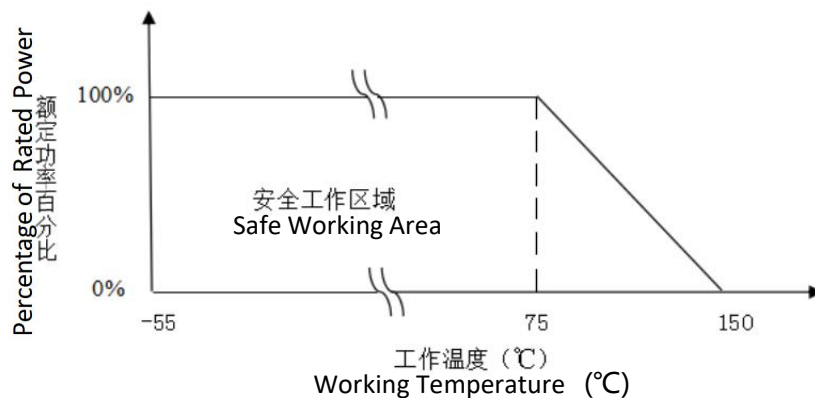
"N" value indicates the change in attenuation per 1°C temperature change equals nominal attenuation × coefficient value. For example, "6N3" means attenuation changes by 6 × 0.003 dB per 1°C.

Availability: N8 and N9 options are not offered for 1 dB and 2 dB models.

7、Main Parameter Curves

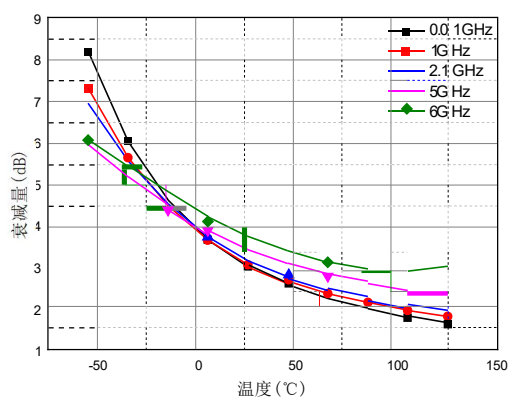
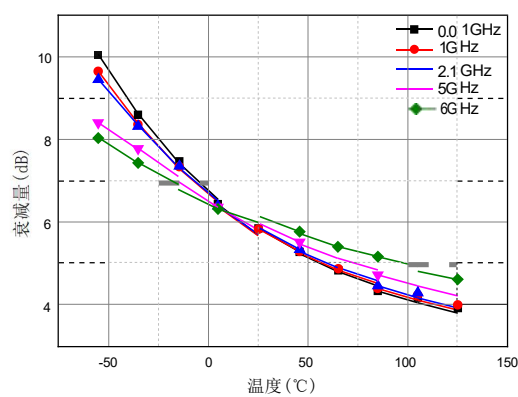
Power Derating Curve:

It can be used at full power when the temperature range is $-55^{\circ}\text{C} \sim 75^{\circ}\text{C}$. When temperature exceeds 75°C , power must be derated according to the specified curve.



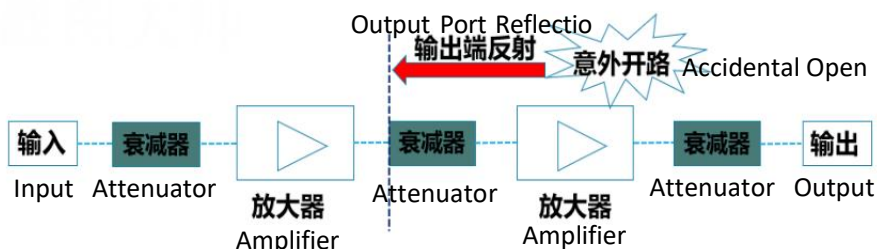
Rated Power Derating Curve

Typical Test Datas:



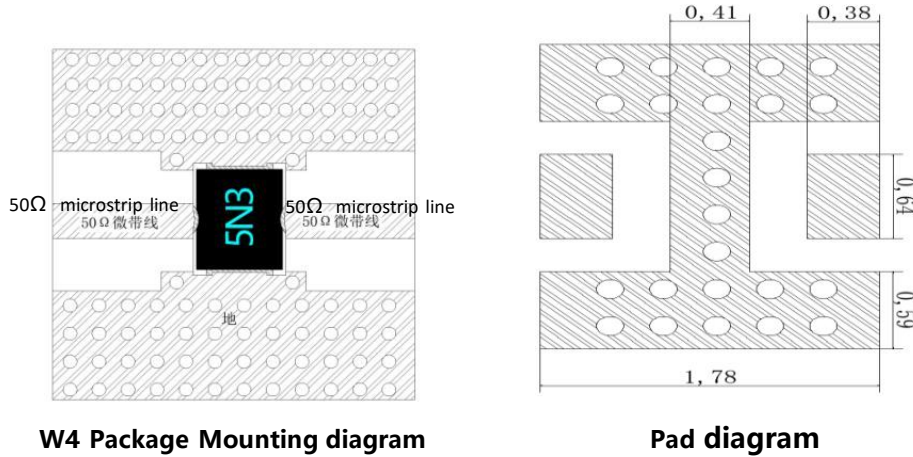
8、Typical Applications

Used in radar and microwave communications for power adjustment and isolation protection in T/R modules and power amplifier modules.



9、Mounting and Precautions

For products with the W4 package structure, the recommended mounting method is shown in the installation diagram. The recommended pad layout and dimensions are illustrated in the pad diagram and listed in the pad dimension table.

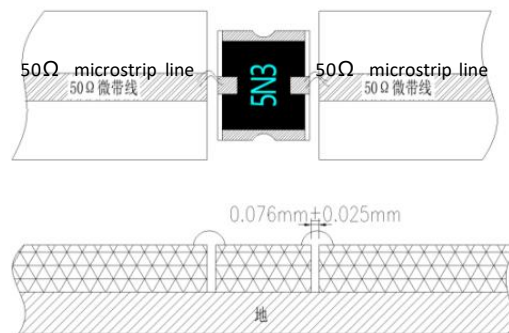


W4 Package Mounting diagram

Pad diagram

Precautions:

- (1)Reflow soldering recommended: peak time 15–60 seconds (max 90 s), peak temperature $\leq 245^{\circ}\text{C}$.
- (2)For manual soldering: soldering tip diameter $\leq 1\text{ mm}$; use temperature-controlled iron $\leq 300^{\circ}\text{C}$. If using standard iron, power $\leq 20\text{ W}$ and soldering time $\leq 5\text{ seconds}$.
- (3)Avoid rework soldering when possible.
- (4)For products with the WB2 package structure, the backside is grounded using conductive adhesive capable of withstanding extreme high and low temperatures (curing temperature must not exceed 200°C). The input and output terminals are connected via gold wire or gold ribbon bonding. The recommended mounting method is illustrated in the figure below.



WB2 Package Mounting diagram