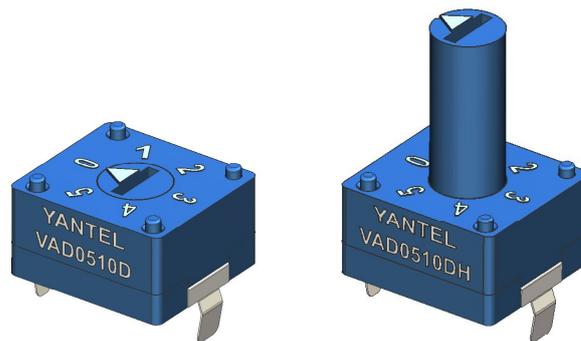## Miniature Variable Attenuator
VAD Series
- ◆DC to 2.5GHz
- ◆0 to 5 dB in 1.0 dB Step
- ◆125 mW
- ◆Resin DIP package

Features

- SMD package, ultra-small size, able to be mounted or soldered on the PCB.
- Wide frequency range
- Low reflection coefficient
- Low insertion loss, high attenuation accuracy.
- Replaceable of digital attenuator, easier to fix and adjust
- At least 360 times (60 circles,6 times as a circle) tuning operation
- Compared with digital attenuators, zero distortion, no extra IP3, lower noise, higher reliability
- High performance, competitive price.
- Customized attenuation values available.
- Wide attenuation range.
- Power handling: 125mW
- 1.0dB step
- 6 attenuation values

Specifications

Frequency Range	DC to 2.5GHz
Attenuation	0 to 5.0 dB
Step Value	1.0 dB
Insertion loss at 0dB	DC to 2GHz 0.5dB
	2GHz to 2.5GHz 1.0dB
Nominal Impedance	50 Ohm
Average Power	125 mW
Operating Temperature	-40℃ to +105℃

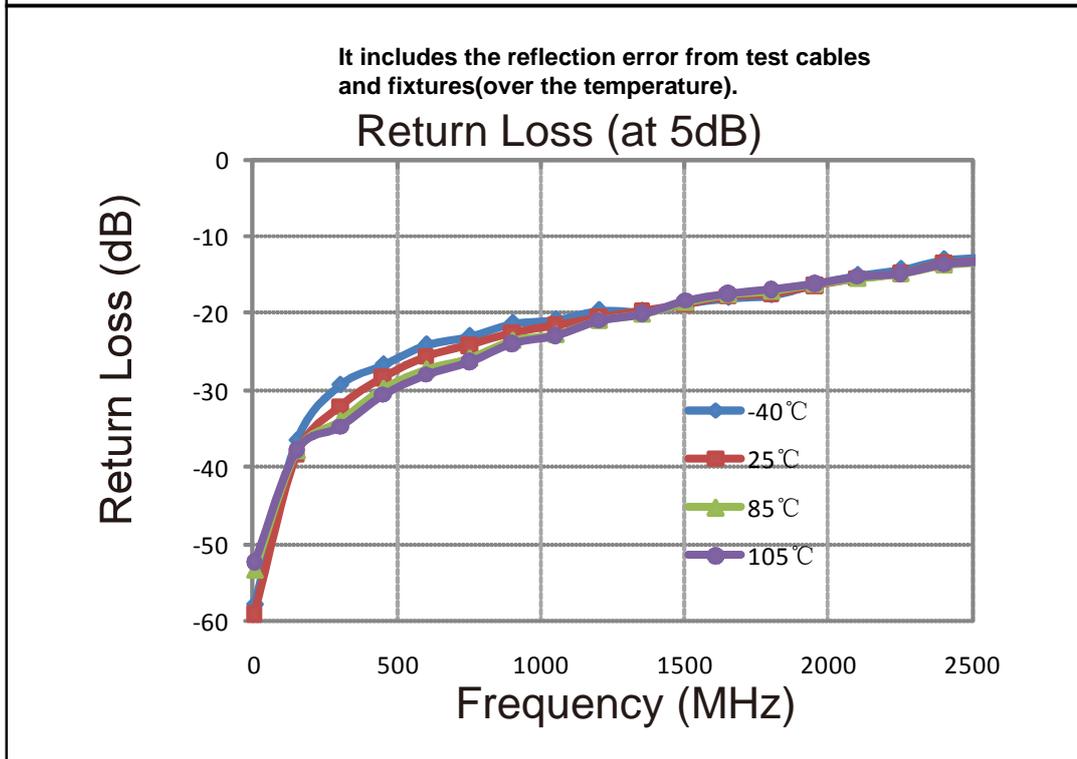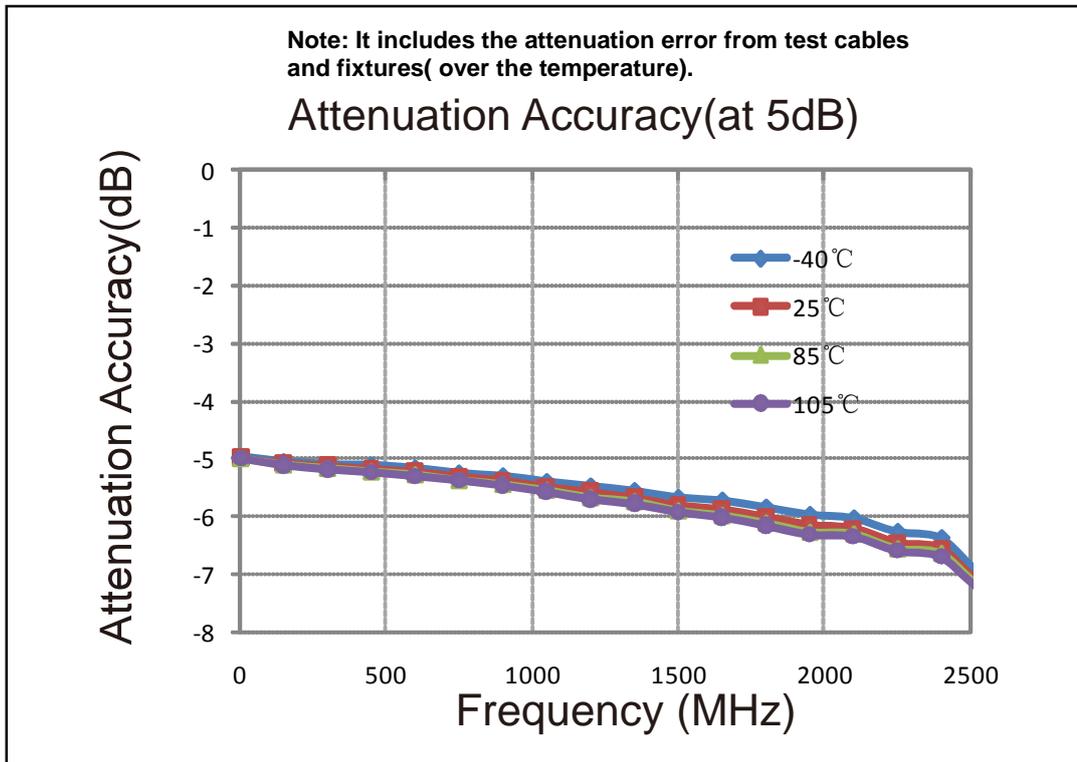| FREQ. RANGE (GHz)	Attenuation Accuracy(dB)
DC to 2	1.3
2 to 2.5	1.8

FREQ. RANGE (GHz)	VSWR:1
DC to 2	1.45
2 to 2.5	1.65

Note: This product cannot withstand high temperature over 200℃,therefore lead free or lead reflow soldering is not suitable.
Otherwise, its performance and reliability would be greatly damaged.
Wave soldering should be adopted for this product.
Please click the link below to obtain the wave soldering profile for reference:
http://www.yantel-corp.com/asp_bin/downfile/201511/Wave%20Soldering%20Profile.pdf

Characteristic

The testing curves of VAD0510
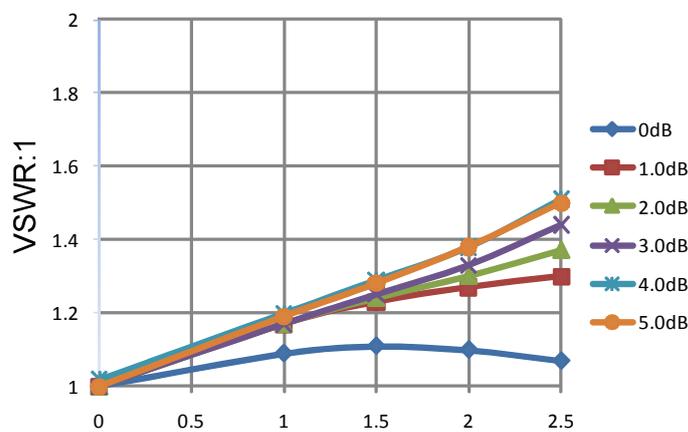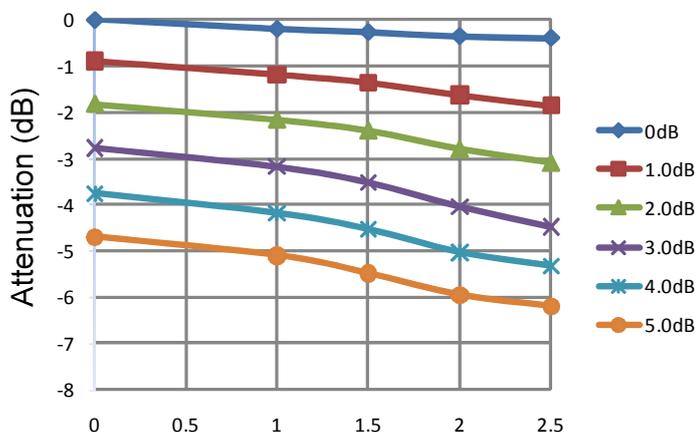
Typical Performance (-40°C, 25°C, 85°C,105°C: DC-2.5 GHz)

Note: It includes the attenuation error from test cables and fixtures(over the temperature).

Attenuation Accuracy(at 5dB)

It includes the reflection error from test cables and fixtures(over the temperature).

Return Loss (at 5dB)

Model Description

VAD	**	**	*	*	*
	Attenuation Range	Step value	Impedance	Package	shaft

e.g.: VAD0102

Attenuation Range: 01 represent 0 ~ 1dB

Step value: 02 represent step value 0.2 dB,

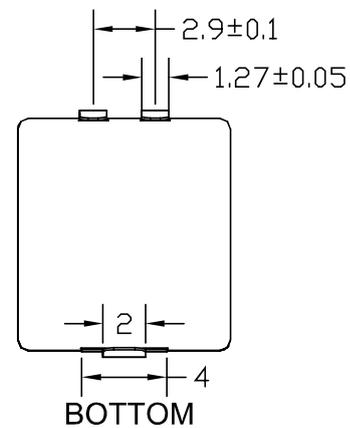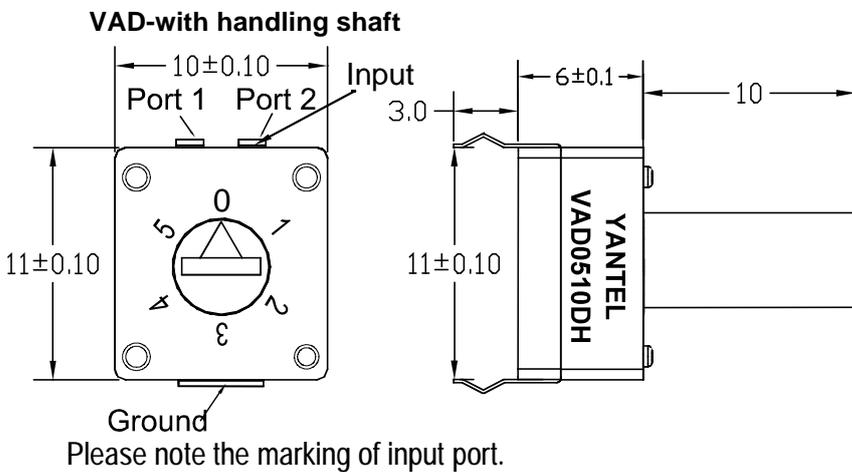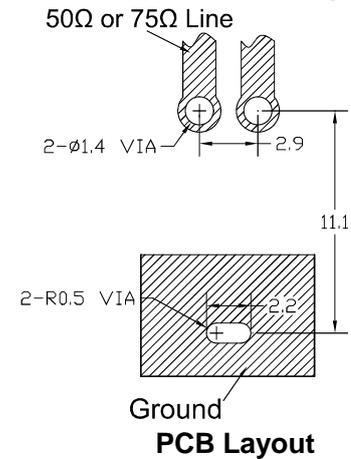**Impedance**: (-B) represents 75Ω impedance, (no code) represents 50Ω impedance.

Package: (-D) represents DIP package.

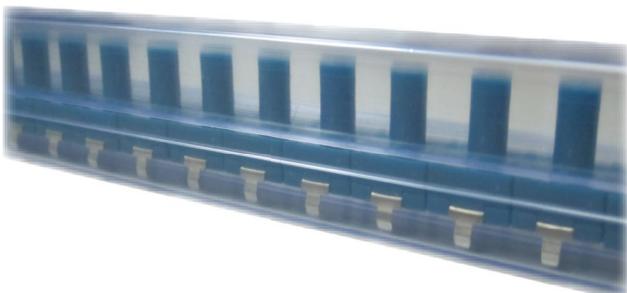**shaft**: (-H) represents a handling shaft , (no code) represents without handling shaft.

Package Outlines(mm)

VAD

Recommended PCB Layout

50Ω or 75Ω Line

2-Ø1.4 VIA

2-R0.5 VIA

PCB Layout

VAD-with handling shaft
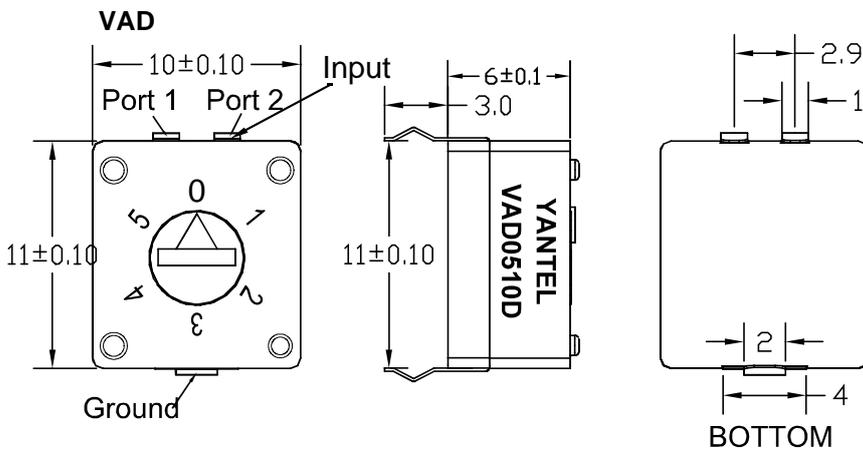
Please note the marking of input port.

Tape and Reel Drawing
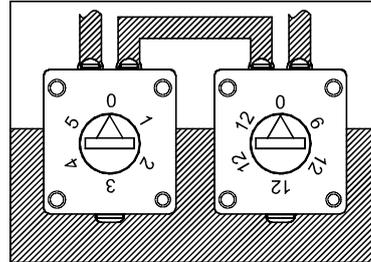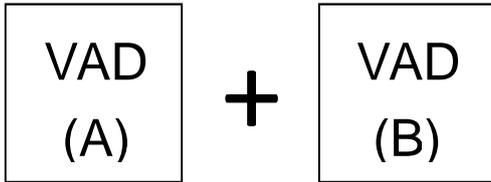
Application Note:

0~XXdB (＞5dB)　　1dB/step
2 pieces of VAD
The total attenuation range can meet XXdB(such as 17 dB or 20dB)

Example 1:
You need 2 sets(pieces) of VAD,it can meet the attenuation range:0 to 17 dB by 1dB/step

VAD (A) **+** VAD (B)

VAD(A): 0,1,2,3,4,5dB;
VAD(B): 0, 6,12,12,12,12dB;
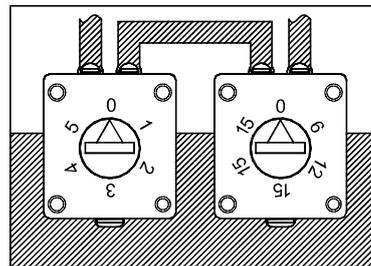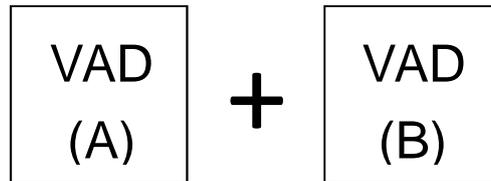You can get the attenuation value are:A+B=M dB
Application 1: When A=0, 1, 2, 3, 4, or 5dB, B=0dB, then M=A+B=0, 1, 2, 3, 4 or 5dB;
Application 2: When A=0, 1, 2, 3, 4, or 5dB, B=6dB, then M=A+B=6, 7, 8, 9, 10 or 11dB;
Application 3: When A=0, 1, 2, 3, 4, or 5dB, B=12dB, then M=A+B=12, 13, 14, 15, 16 or 17dB;

Example 2:
You need 2 sets(pieces) of VAD,it can meet the attenuation range:0 to 20 dB by 1dB/step

VAD (A) **+** VAD (B)

VAD(A): 0,1,2,3,4,5dB;
VAD(B): 0, 6,12,15,15,15dB;
You can get the attenuation value are:A+B=M dB
Application 1: When A=0, 1, 2, 3, 4, or 5dB, B=0dB, then M=A+B=0, 1, 2, 3, 4 or 5dB;
Application 2: When A=0, 1, 2, 3, 4, or 5dB, B=6dB, then M=A+B=6, 7, 8, 9, 10 or 11dB;
Application 3: When A=0, 1, 2, 3, 4, or 5dB, B=12dB, then M=A+B=12, 13, 14, 15, 16 or 17dB;
Application 4: When A=0, 1, 2, 3, 4, or 5dB, B=15dB, then M=A+B=15, 16, 17, 18, 19 or 20dB;

Recommended PCB Layout