

Features

- Freq: 5~15GHz
- 2dB LSB Steps to 32dB
- RMS of Attenuation Accuracy: 1dB
- Insertion Loss: 2.5dB
- Supply Voltage: -5V
- Control Voltage: 0/+5V
- Chip Size: 1.54mm×0.84mm×0.1mm

General Description

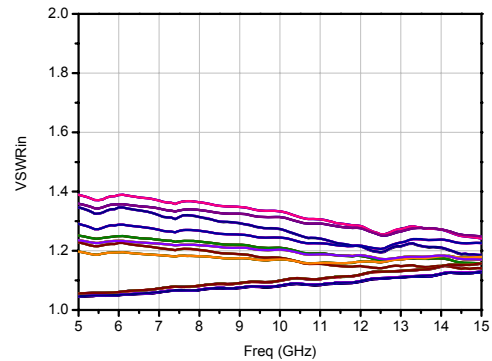
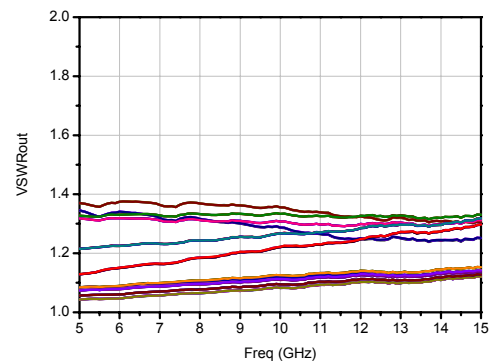
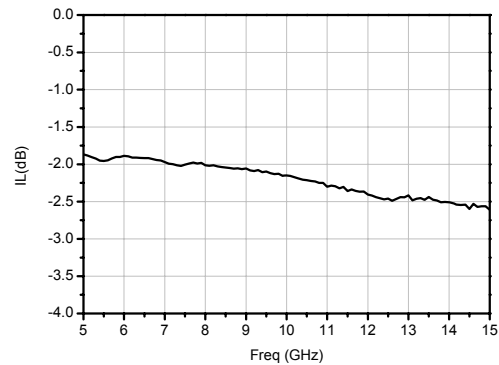
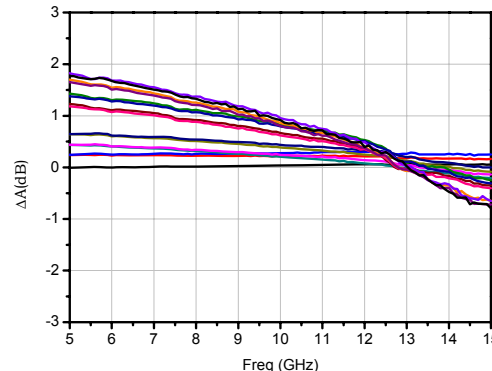
The HG146SA is a 4-bit GaAs pHEMT digital attenuator. Covering 5 to 15 GHz, the insertion loss is 2.5 dB and the attenuator bit values are 2dB, 4dB, 1.0 dB, 8dB, 16dB for a total attenuator of 32dB. RMS of Attenuation Accuracy is excellent at 1dB. It integrates control driver function. The attenuator operates using a positive control voltage of 0/+5V to select each attenuation state and requires -5V bias supply.

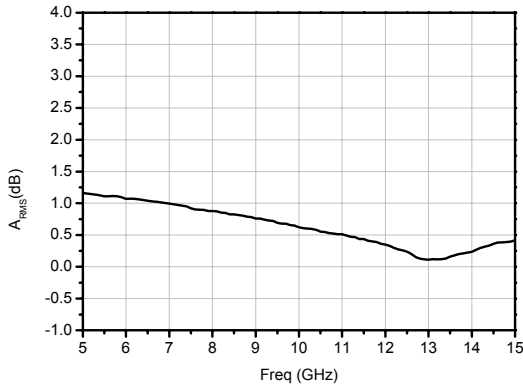
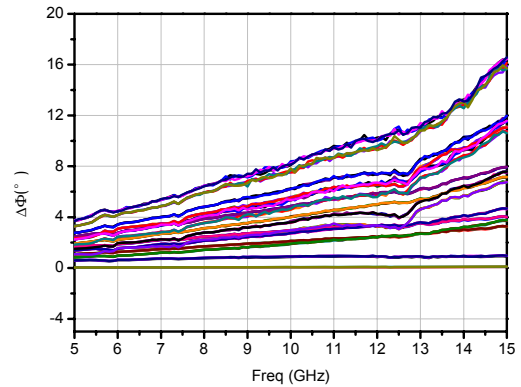
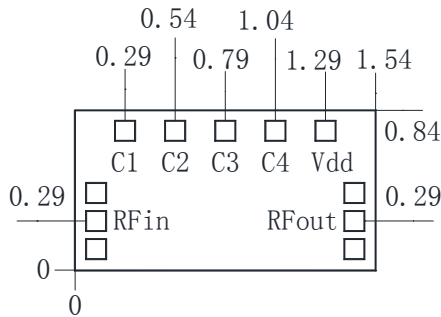
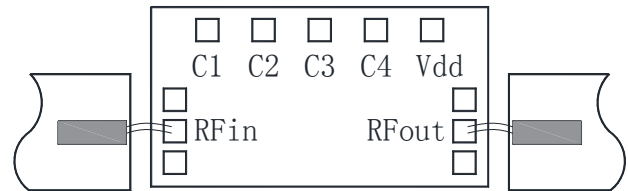
Electrical Specifications ($T_A=25^\circ\text{C}$, $V_{dd}=-5\text{V}$)

Parameter	Min.	Typ.	Max.
Frequency Range(GHz)	5~15		
Input VSWR	-	1.1	-
Output VSWR	-	1.1	-
Insertion Loss(dB)	-	1.4	-
Attenuation Accuracy(dB)	-	± 0.2	-
RMS of Attenuation Accuracy(dB)	-	0.1	-
Phase Variation ($^\circ$)	-	-5.5~0	-

Truth Table (0: 0V, 1: +5V)

State	C1	C2	C3	C4
0	0	0	0	0
-0.25dB	1	0	0	0
-0.5dB	0	1	0	0
-1dB	0	0	1	0
-2dB	0	0	0	1
-3.75dB	1	1	1	1

Input VSWR

Output VSWR

Insertion Loss

Attenuation Accuracy


RMS of Attenuation Accuracy

Phase Variation

Outline Drawing (mm)

Assembly Diagram

Absolute Maximum Ratings

Supply Voltage	-5.5V	
RF Input Power	+27dBm	
Control Voltage	Low Level: 0~0.5V	High Level: 3.7~5V
Operating Temperature	-55°C ~ 125°C	
Storage Temperature	-65°C ~ 150°C	

Notes:

1. The chip should be stored in a dry and nitrogen environment, and used in a clean environment.
2. GaAs material is brittle, can not touch the surface of the chip, must be careful when using.
3. The chip is welding with conductive adhesive or alloy (alloy temperature should not exceed 300°C, and no more than 30 sec.), and should make it fully grounded.
4. The chip microwave port and substrate gap is not exceeding 0.05mm, with Φ25μm double gold wire bonding, suggested length of gold wire 250~400μm.
5. Chip microwave port without DC blocking capacitor.
6. The chip is sensitive to static electricity, and should be protected against static electricity during storage and use.