

**Features**

- Freq: DC~18GHz
- 0.25dB LSB Steps to 15.75dB
- RMS of Attenuation Accuracy: 0.3dB
- Insertion Loss: 3dB
- Supply Voltage: -5V
- Control Voltage: 0/+5V
- Chip Size: 1.95mm×1.04mm×0.1mm

**General Description**

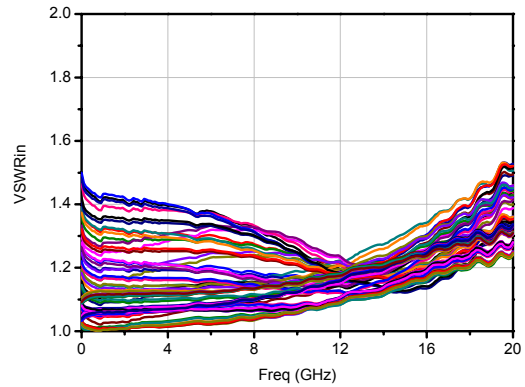
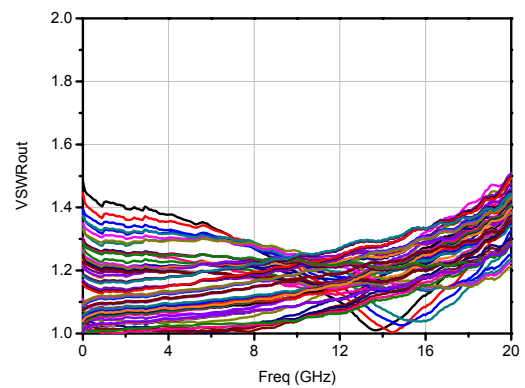
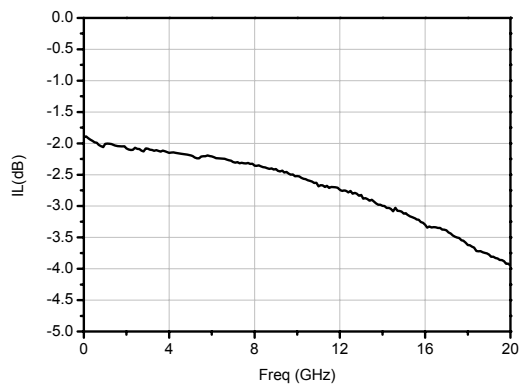
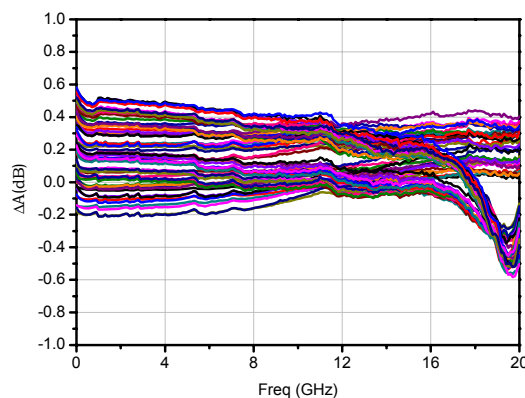
The HG166SE is a 6-bit GaAs pHEMT digital attenuator. Covering DC to 18 GHz, the insertion loss is less than 3dB and the attenuator bit values are 0.25 dB, 0.5dB, 1dB, 2dB, 4dB, 8dB,15.75dB for a total attenuator of 15.75dB. RMS of Attenuation Accuracy is excellent at 0.3dB. It integrates control driver function. The attenuator operates using a positive control voltage of 0/+5V to select each attenuation state and requires -5V bias supply.

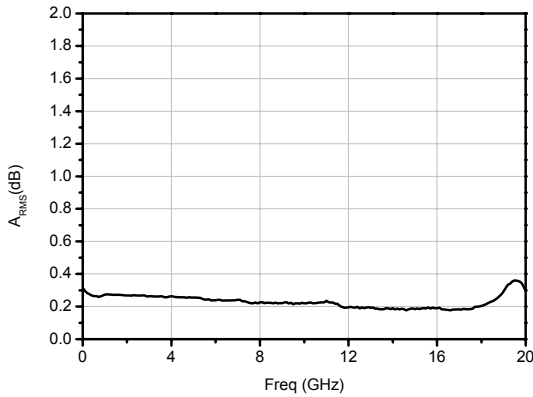
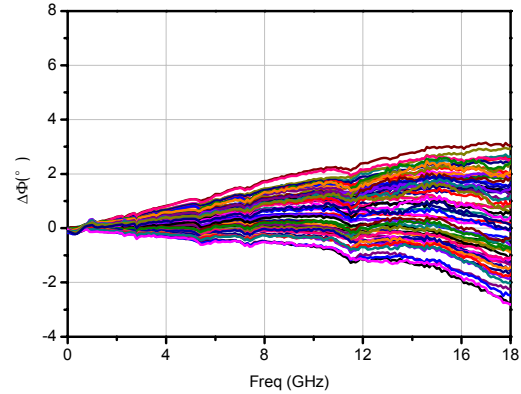
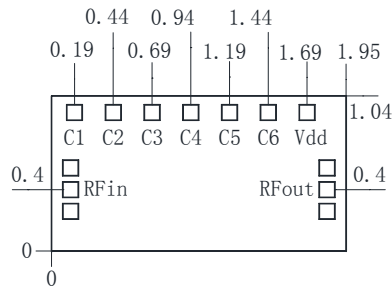
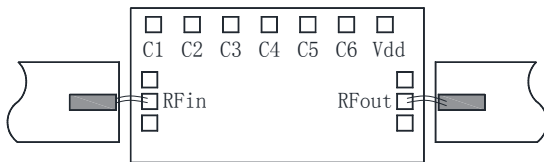
**Electrical Specifications( $T_A=25^{\circ}C, V_{dd}=-5V$ )**

Parameter	Min.	Typ.	Max.
Frequency Range(GHz)	DC~18		
Input VSWR	-	1.3	-
Output VSWR	-	1.3	-
Insertion Loss(dB)	-	3	-
Attenuation Accuracy(dB)	-	-0.2~5	-
RMS of Attenuation Accuracy(dB)	-	0.3	-
Phase Variation (°)	-	-3~3	-

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

State	C1	C2	C3	C4	C5	C6
0	0	0	0	0	0	0
-0.25dB	1	0	0	0	0	0
-0.5dB	0	1	0	0	0	0
-1dB	0	0	1	0	0	0
-2dB	0	0	0	1	0	0
-4dB	0	0	0	0	1	0
-8dB	0	0	0	0	0	1
-15.75dB	1	1	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  $\Phi 25\mu\text{m}$  double gold wire bonding, suggested length of gold wire 250~400 $\mu\text{m}$ .
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.