Features

Freq: DC～12GHz

0.5dB LSB Steps to 31.5dB

RMS of Attenuation Accuracy: 1 dB

Insertion Loss: 2.5dB

Control Voltage: 0/-5V

Chip Size: 3.3mm×1.64mm×0.1mm

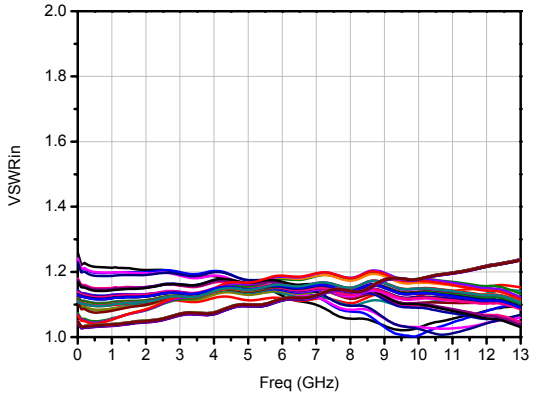
General Description

The HG165SC-1 is a 6-bit GaAs pHEMT digital attenuator. Covering DC to 12 GHz, the insertion loss is 2.5dB and the attenuator bit values are 0.5 dB, 1.0 dB, 2 dB, 4dB, 8dB, 16dB, 31.5dB for a total attenuator of 31.5 dB. RMS of Attenuation Accuracy is excellent at 1 dB. The attenuator operates using a negative control voltage of 0/-5V to select each attenuation state and requires no bias supply.

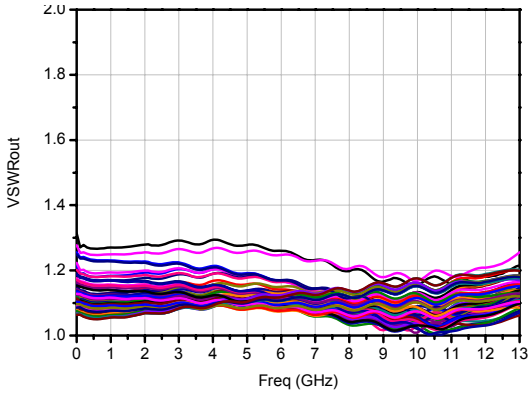
Electrical Specifications(T_A=25℃)

Parameter	Min.	Typ.	Max.
Frequency Range(GHz)		DC～12	
Input VSWR	-	1.2	-
Output VSWR	-	1.2	-
Insertion Loss(dB)	-	2.5	-
Attenuation Accuracy(dB)	-	-0.5~2.5	-
RMS of Attenuation Accuracy(dB)	-	1	-
Phase Variation (°)	-	-1～9	-

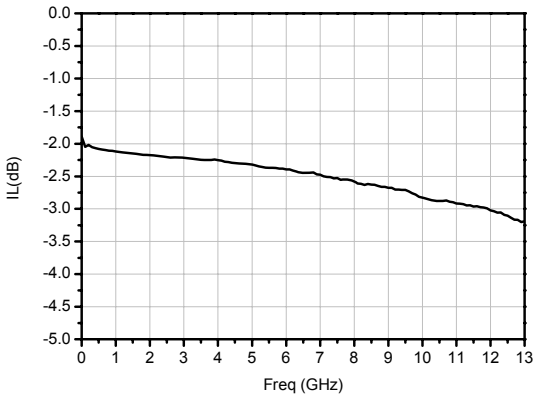
Input VSWR



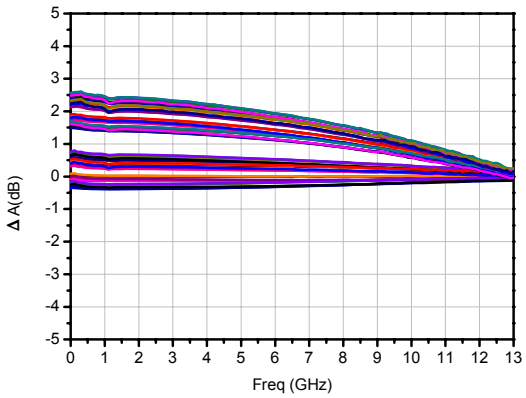
Output VSWR



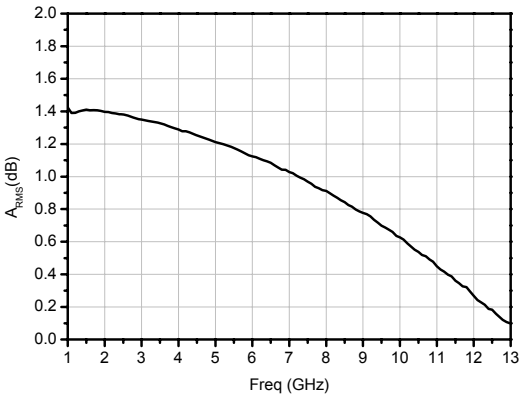
Insertion Loss



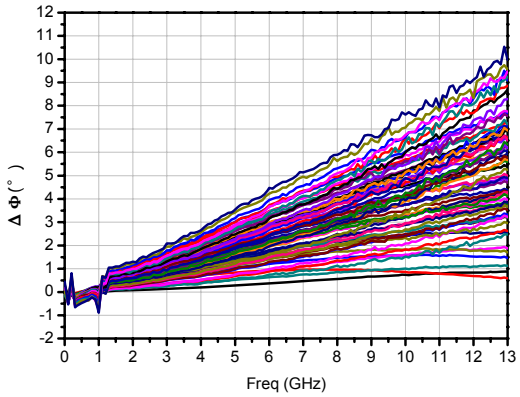
Attenuation Accuracy



RMS of Attenuation Accuracy



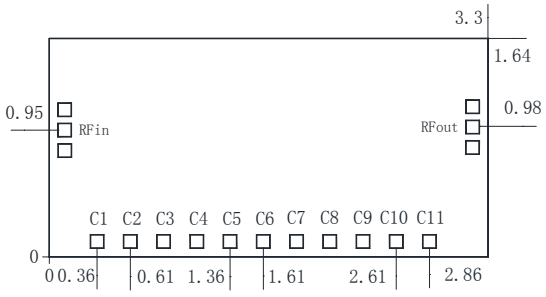
Phase Variation



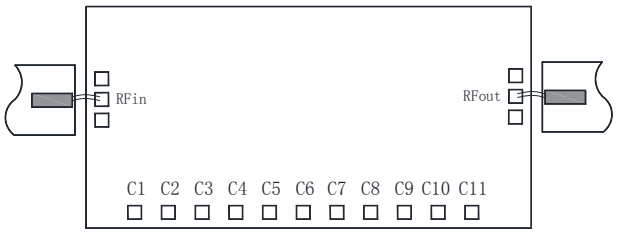
Truth Table(0: 0V, 1: -5V)

State	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
	16dB		8dB		0.5dB	4dB		2dB		1dB	
0	0	-5V	0	-5V	-5V	0	-5V	0	-5V	0	-5V
-0.5dB	0	-5V	0	-5V	0	0	-5V	0	-5V	0	-5V
-1dB	0	-5V	0	-5V	-5V	0	-5V	0	-5V	-5V	0
-2dB	0	-5V	0	-5V	-5V	0	-5V	-5V	0	0	-5V
-4dB	0	-5V	0	-5V	-5V	-5V	0	0	-5V	0	-5V
-8dB	0	-5V	-5V	0	-5V	0	-5V	0	-5V	0	-5V
-16dB	-5V	0	0	-5V	-5V	0	-5V	0	-5V	0	-5V
-31.5dB	-5V	0	-5V	0	0	-5V	0	-5V	0	-5V	0

Outline Drawing (mm)



Assembly Diagram



Absolute Maximum Ratings

Control Voltage	-5.5V
RF Input Power	+27dBm
Operating Temperature	-55℃～125℃
Storage Temperature	-65℃～150℃

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℃, 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.