

GaAs monolithic integrated CNC attenuator

DC~6GHz

key indicator

- Frequency range: DC~6GHz
- Root mean square attenuation accuracy: 0.8dB
- Insertion loss: 2.5dB
- Positive voltage control
- Chip size: 1.78mm×1.21mm×0.1mm

typical application

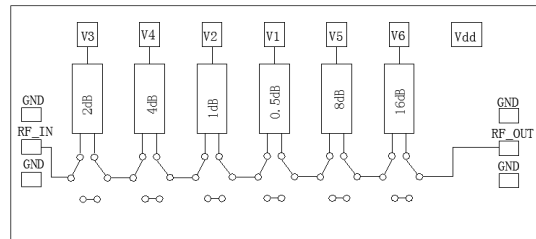
- Radar and electronic countermeasures
- RF/Microwave Circuit
- Military and aerospace
- test instrument
- Instrumentation

Product Introduction

AY1867G is a GaAs broadband 6-bit digital attenuator chip with a frequency range of DC~6GHz, insertion loss less than 2.5dB, basic attenuation of 0.5dB, 1dB, 2dB, 4dB, 8dB, 16dB, and a total attenuation of 31.5dB. The chip is compatible with LVTTTL level control attenuation

The chip adopts an on-chip metallization process to ensure good grounding, easy to use, and metallized on the back of the chip, suitable for eutectic sintering or conductive adhesive bonding process

Functional block diagram



Electrical performance (T_A=25°C, V_S=-5V, control level=0/+5V, 50Ω system)

index	Minimum	Typical value	Max	unit
frequency	DC~6			GHz
Input standing wave ratio	-	1.4	1.8	:1
Output standing wave ratio	-	1.4	1.8	:1
Insertion loss	-	-2.5	-3	dB
Phase fluctuation	-3	-	2.5	°
Attenuation accuracy	-0.3	-	0.5	dB
Root mean square attenuation accuracy	-	0.8	-	dB
Enter P ₁ dB	-	13(f=0.05GHz)	-	dBm
	-	18(f=3GHz)	-	
	-	18(f=6GHz)	-	

Attenuation control truth table

attenuation	V1	V2	V3	V4	V5	V6
Zero state	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1dB	0	1	0	0	0	0
2dB	0	0	1	0	0	0
4dB	0	0	0	1	0	0
8dB	0	0	0	0	1	0
16dB	0	0	0	0	0	1
31.5dB	1	1	1	1	1	1

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Absolute maximum rating

Maximum input power	+22dBm (0.5~6GHz)	Operating temperature	-55 °C ~ +85 °C
Maximum input voltage	-5.25V (V_s)	Storage temperature	-65 °C ~ +150 °C

Control voltage

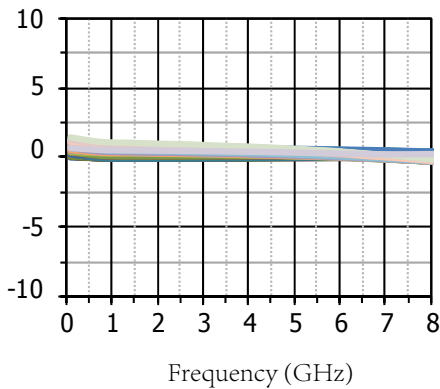
state	Bias condition
Low	0~0.25V
high	3.3~5.25V

Bias voltage vs. current

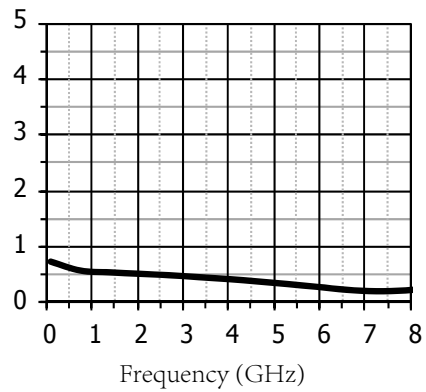
V_D	I_D
-5V	8mA (Typ.)

Typical performance test curve

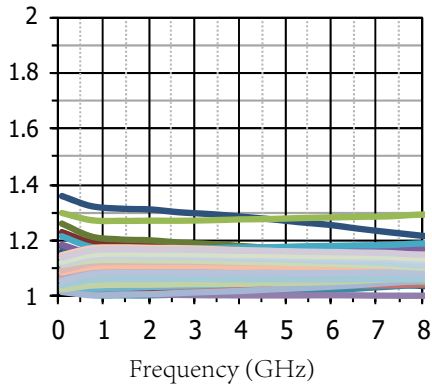
Attenuation accuracy (dB)



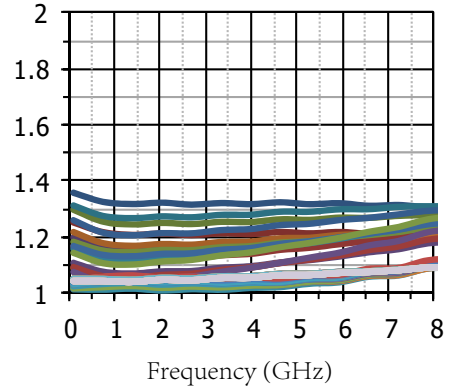
Root mean square attenuation accuracy (dB)



Input VSWR

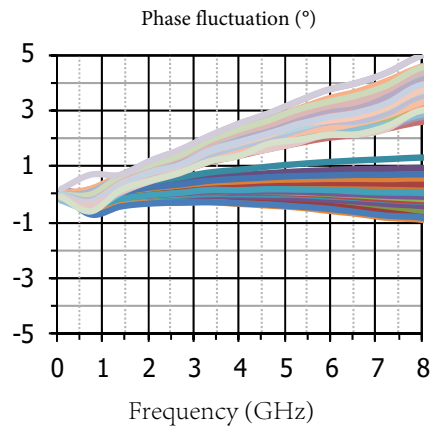
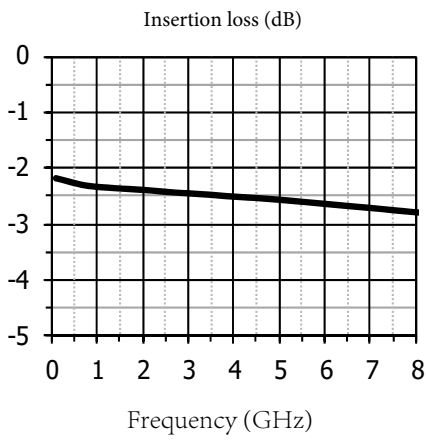


Output VSWR

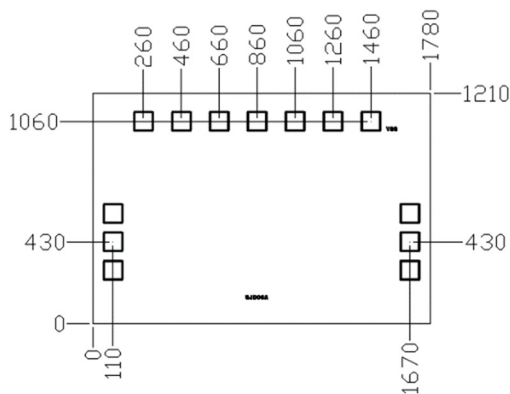


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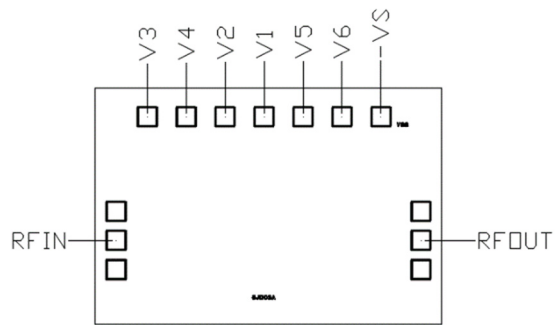
DC ~ 6GHz



Shape and port size (mm)



Pin function definition



Precautions

1. The chip is stored in a dry, nitrogen environment and used in an ultra-clean environment;
2. GaAs material is brittle and cannot touch the surface of the chip, so you must be careful when using it;
3. Chips are sintered with conductive glue or alloy (the alloy temperature cannot exceed 300°C, and the time cannot exceed 30 seconds) to make it fully grounded;
4. The gap between the microwave port of the chip and the substrate should not exceed 0.05mm. Use $\Phi 25\mu\text{m}$ double gold wire for bonding. The recommended length of gold wire is 250~400 μm ;
5. The chip is sensitive to static electricity, so pay attention to anti-static during storage and use.