

GaAs monolithic integrated CNC attenuator
DC~12GHz

key indicator

- Frequency range: DC~12GHz
- Root mean square attenuation accuracy: 0.6dB
- 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

AY1863 is a GaAs broadband 6-bit digital attenuator

Chip, frequency coverage DC~12GHz, low insertion loss

At 3.2dB, the basic attenuation is 0.5dB, 1dB, 2dB, 4dB,

8dB, 16dB, the total attenuation is 31.5dB. The core The slice

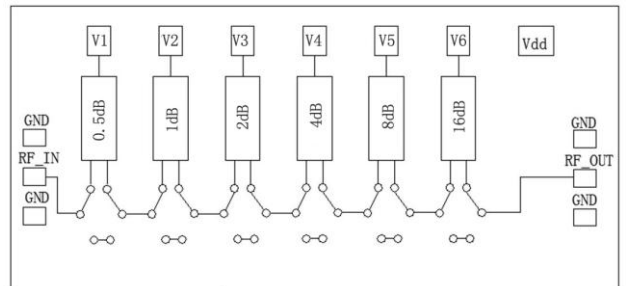
uses 0/+5 logic to control attenuation.

The chip uses an on-chip metallization process to ensure a good connection

Ground, easy to use and convenient to use, the back of the chip is metallized,

Suitable for eutectic sintering or conductive adhesive bonding process.

Functional block diagram



Electrical performance ($T_A=25^\circ\text{C}$, $V_D=-5\text{V}$, control level=0/+5V, 50 Ω system)

index	Minimum	Typical value	Max	unit
frequency	DC~12			GHz
Input return loss	-	-20	-	dB
Output return loss	-	-20	-	dB
Insertion loss	-	-2.5	-3.2	dB
Phase fluctuation	-3	-	3	°
Attenuation accuracy	-	± 2	-	dB
Root mean square attenuation accuracy	-	0.6	1.5	dB

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

attenuation	V1	V2	V3	V4	V5	V6
Zero state	0	0	0	0	0	0
0.5dB	5	0	0	0	0	0
1dB	0	5	0	0	0	0
2dB	0	0	5	0	0	0
4dB	0	0	0	5	0	0
8dB	0	0	0	0	5	0
16dB	0	0	0	0	0	5
31.5dB	5	5	5	5	5	5

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Absolute maximum rating

Maximum input power	+23dBm	Operating temperature	-55 °C ~ + 85 °C
Maximum input voltage	-8V	Storage temperature	-65 °C ~ + 150 °C

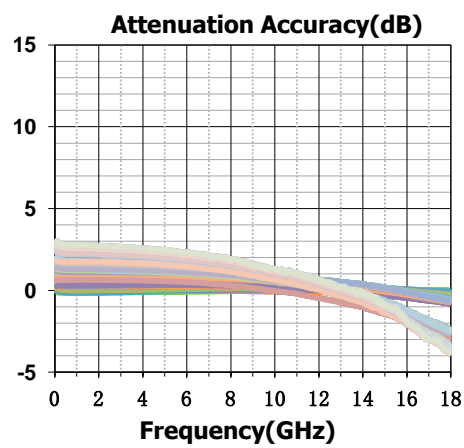
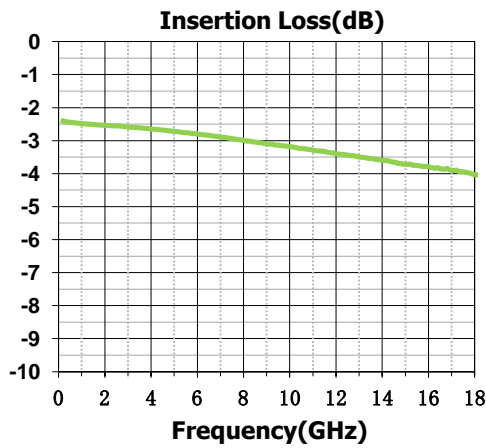
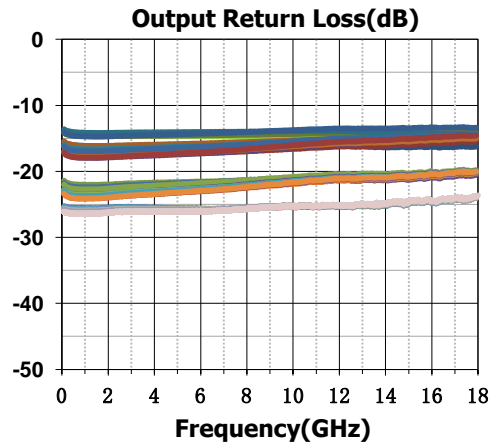
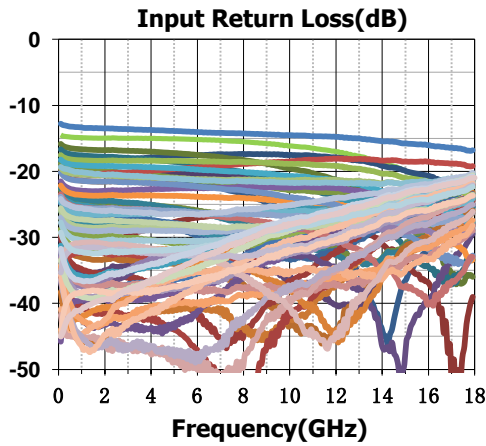
Control voltage

state	Bias condition
Low	0~0.5V
high	4.5~5.5V

Bias voltage vs current

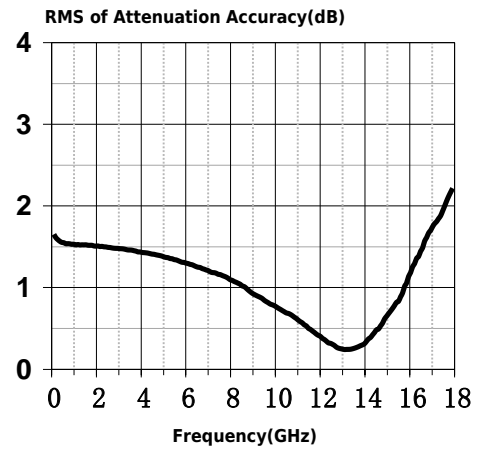
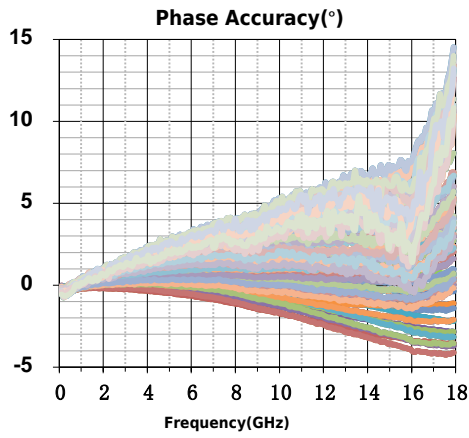
V_D	I_D
-5V	4mA

Typical test curve

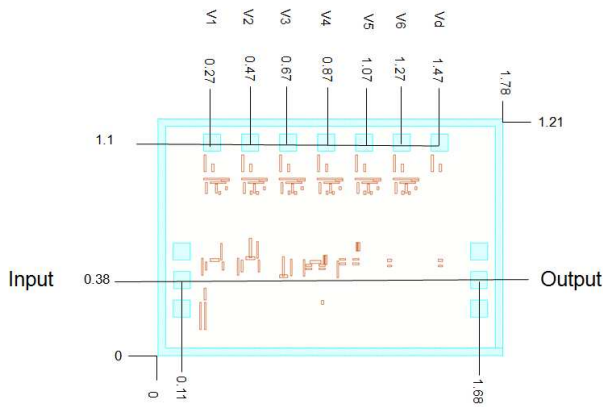


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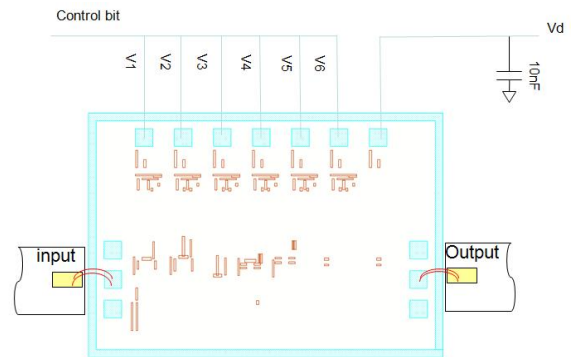
DC~12GHz



Shape and port size (mm)



Recommended assembly drawing



Precautions

1. The chip is stored in a dry, nitrogen environment and used in an ultra-clean environment;
2. GaAs material is relatively 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.