GaAs monolithic integrated digital phase shifter

0.9～1.3GHz

Key indicator

- Frequency range: 0.9～1.3GHz
- Phase shift accuracy root mean square: 1°
- Low insertion loss: 5dB
- Positive voltage control
- Chip size: 3.8mm×1.25mm×0.1mm

Typical application

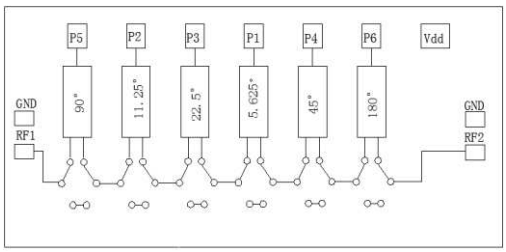
- Electronic Warfare
- Weather & Military Radar
- Satellite Communications
- Wave control module
- Phase modulation

Product Introduction

AY1169 is an L-band six-bit digital control phase shifter core Chip, made by GaAs 0.5μm-pHEMT process, phase shifted Step 5.625°, insertion loss less than 5dB, standing wave less than 1.3, 0/+5V logic level control phase shift.

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℃, V_D=-5V, Control level=0/+5V, 50Ω system）

Index	Minimum	Typical value	Max	Unit
Frequency		0.9～1.3		GHz
Input standing wave ratio	-	1.3	-	:1
Output standing wave ratio	-	1.3	-	:1
Insertion loss	-	-5	-	dB
Amplitude fluctuation	-0.5	-	0.3	dB
Phase shift accuracy	-0.5	-	2	°
Phase shift accuracy root mean square	-	1	-	°

Electric truth table (0:0V, 1:+5V)

Phase shift	P1	P2	P3	P4	P5	P6
Zero state	0	0	0	0	0	0
5.625°	1	0	0	0	0	0
11.25°	0	1	0	0	0	0
22.5°	0	0	1	0	0	0
45°	0	0	0	1	0	0
90°	0	0	0	0	1	0
180°	0	0	0	0	0	1
354.375°	1	1	1	1	1	1

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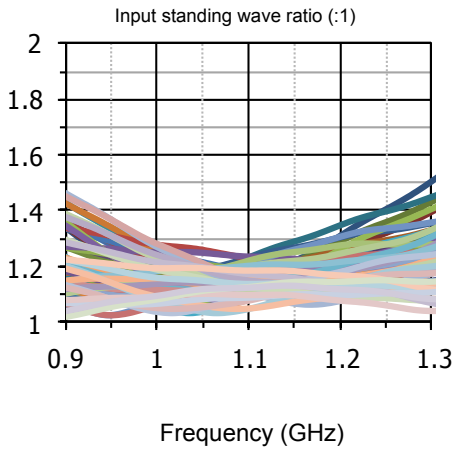
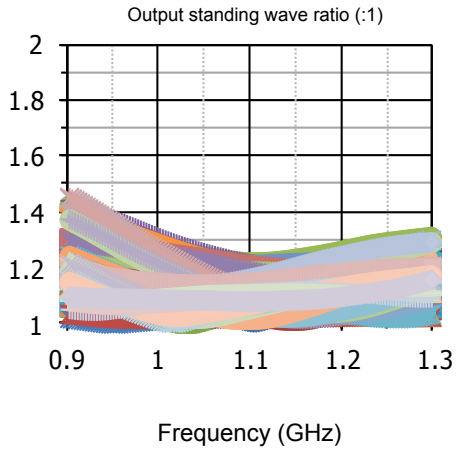
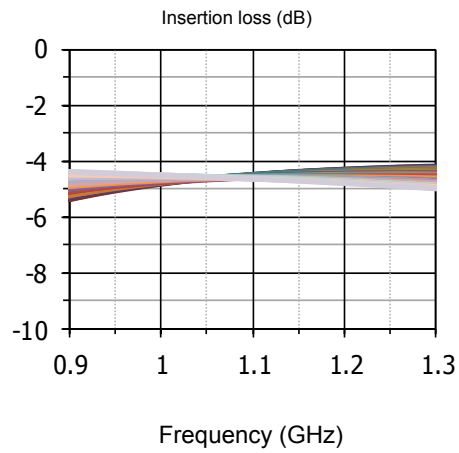
Absolute maximum rating

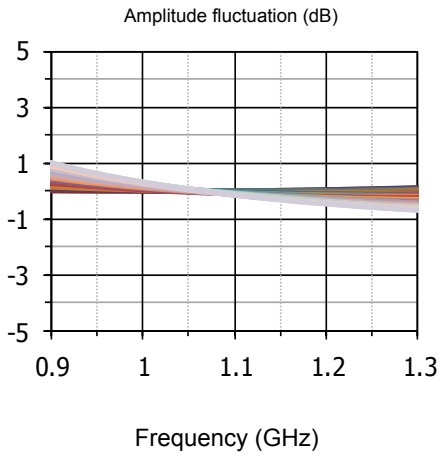
Maximum input power	+18dBm	Operating temperature	-55℃～+85℃
Maximum input voltage	-8V~+0.5V	Storage temperature	-65℃～+150℃

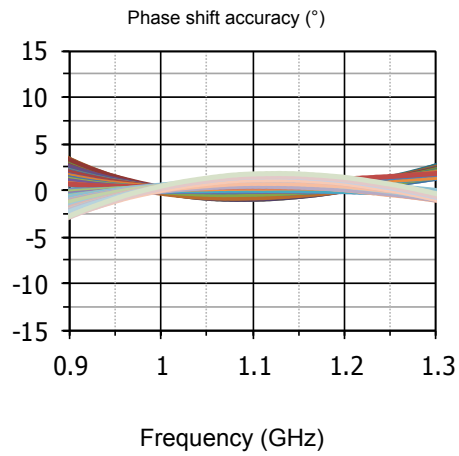
Typical test curve

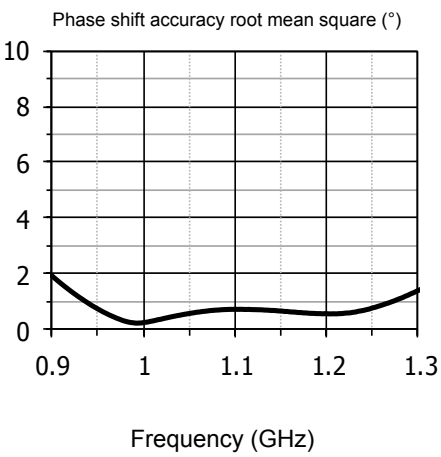












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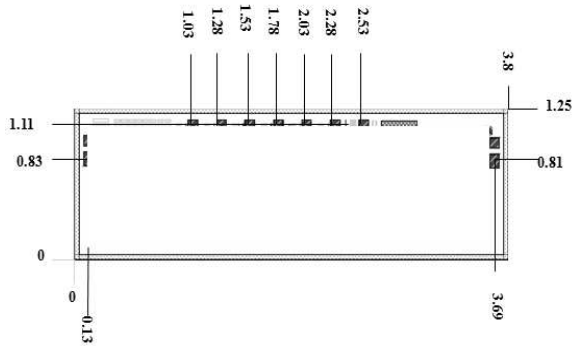
Control voltage

State	Bias condition
Low	0~ 0.2V
High	4.5~5.5V

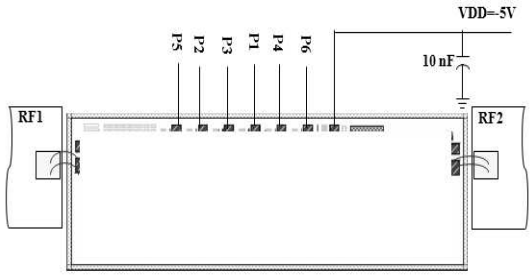
Bias voltage & current

V_D	I_D
-5V	8mA

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 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 Φ25μm double gold wire for bonding. The recommended length of gold wire is 250～400μm;5. The chip is sensitive to static electricity, so pay attention to anti-static during storage and use.