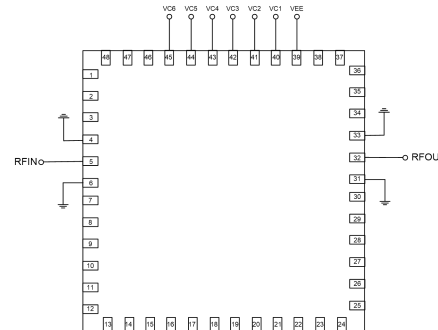


GaAs MMIC 6-bit digitally controlled phase shifter chip , 0.9-1.4 GHz

Performance characteristics

- Frequency range: 0.9 - 1.4 GHz
- Insertion loss: 5.0dB (Typ.)
- Insertion loss fluctuation : 1.0 dB
- RMS Phase Error : 1.1 °
- Integrated control logic
- Supply voltage: -5V
- 50Ohm input / output
- 100% on-wafer testing
- Chip size : QFN 6X6

Block Diagram



Product Introduction

GPS-009014-6B-PD-PQ6 is a GaAs MMIC 6-bit digital phase shifter chip with a frequency range of 0.9 GHz to 1.4 GHz , an insertion loss of 5.0 dB , and a phase shift accuracy of 1.1 ° . The chip is powered by -5V and controlled by 0/+5V logic. The digital attenuator uses a 6X6mm surface-mount leadless plastic tube shell with pin pads.

The surface is gold-plated and is suitable for reflow soldering installation.

Use restriction parameter ¹

Maximum input power	+25dBm
Control voltage range	-0.5V ~ + 6V
Supply voltage range	- 6V
Operating temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

【1】 Exceeding any of these maximum limits may cause permanent damage.

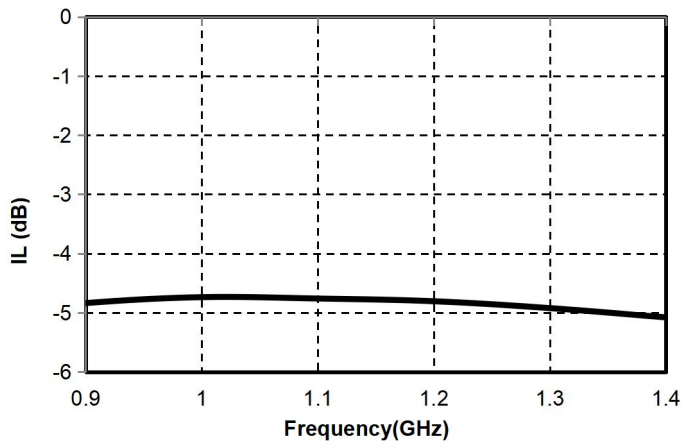
Electrical performance parameters (TA = +25°C)

Index	Minimum	Typical Value	Maximum	Unit
Frequency Range	0.9-1.4			GHz
Insertion loss	-	5.0	-	dB
Insertion loss fluctuation	-	1.0	-	dB
Phase shift accuracy (RMS)	-	1.1	-	degree
Input return loss	-	20	-	dB
Output return loss	-	18	-	dB
Switching time		50		ns
P-1		21		dBm
Control voltage	0	-	+ 5	V
Control current	-	3	-	mA
voltage	-	-5V	-	V
Quiescent Current	-	15	-	mA

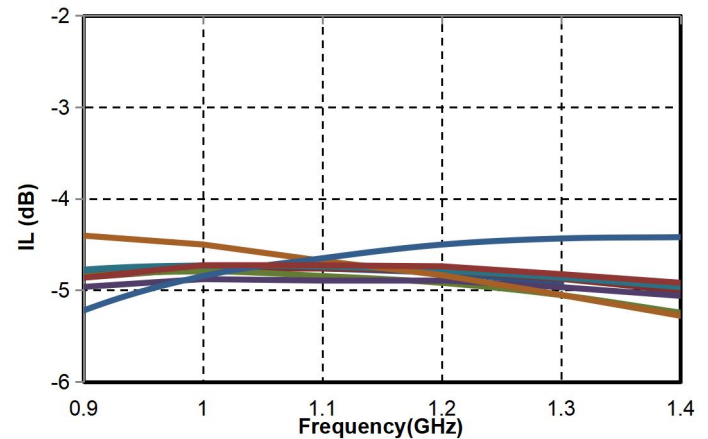
GaAs MMIC 6-bit Digitally Controlled Phase Shifter Chip , 0.9 - 1.4 GHz

Main index test curve

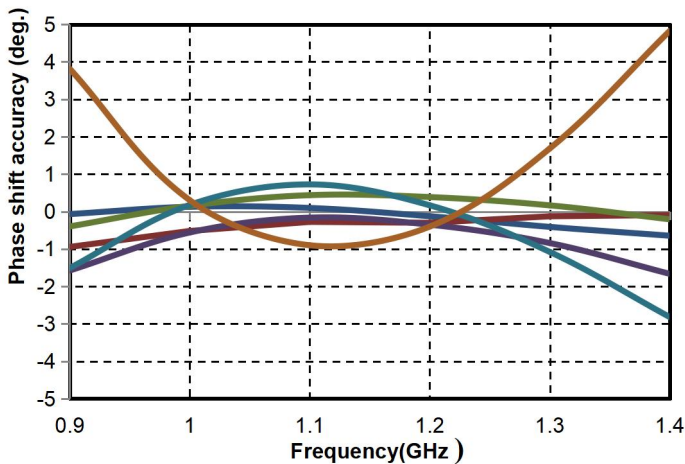
Insertion Loss vs. Operating Frequency



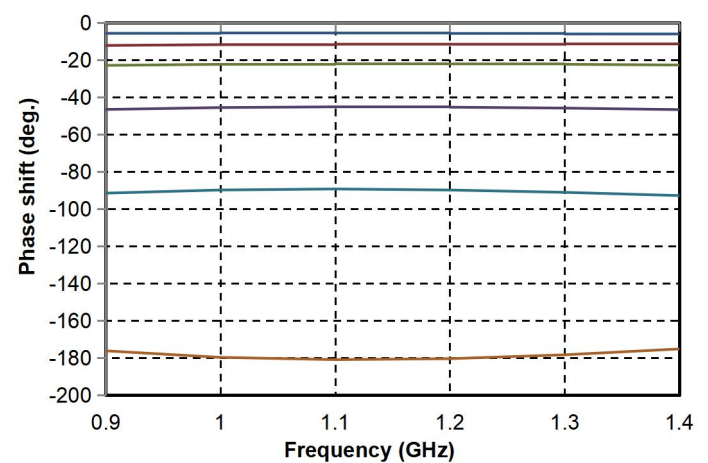
Insertion loss of main phase shift state vs. operating frequency



Phase shift accuracy (absolute value) of main phase shift states vs. operating frequency

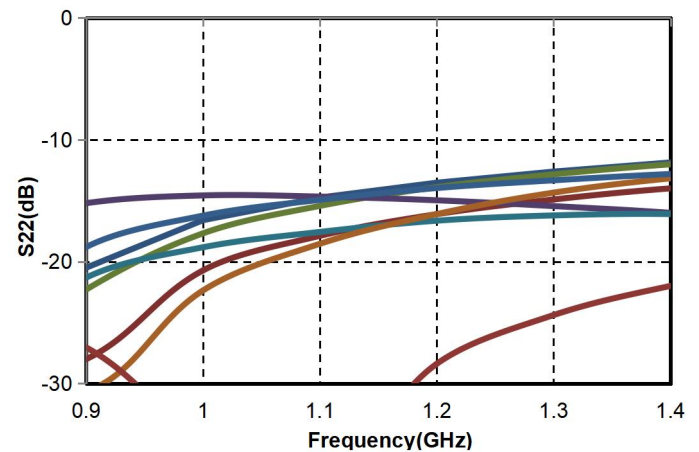
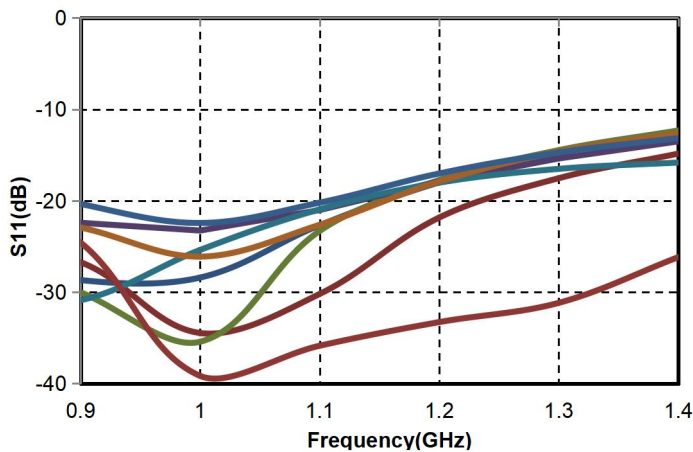


Phase shift amount of main phase shift state vs. operating frequency



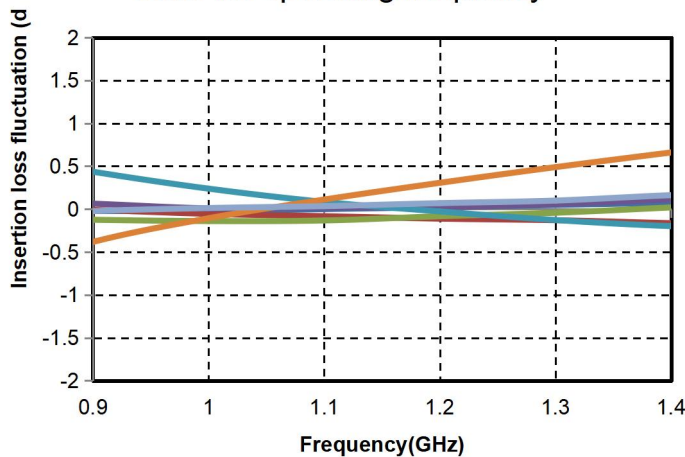
vs. operating frequency for reference and main phase shift states

Reference and main phase shift output return loss vs. operating frequency

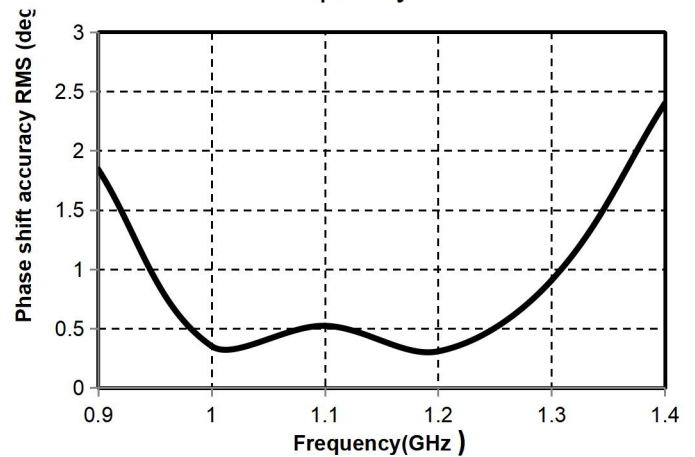


GaAs MMIC 6-bit Digitally Controlled Phase Shifter Chip , 0.9 - 1.4 GHz

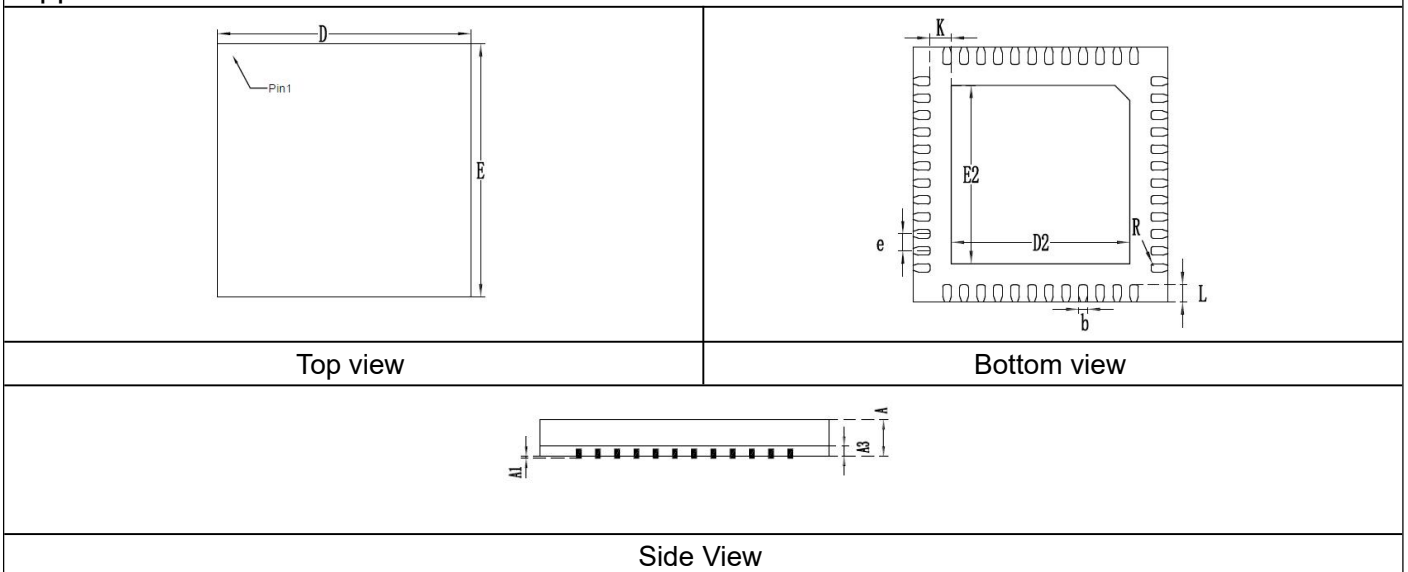
Insertion loss fluctuation of main phase shift state vs. operating frequency



Phase shift accuracy (RMS) vs. operating frequency



Appearance structure



	(mm)		
	Min	TYP	Max
A	0.650	0.750	0.850
A1	0.000	0.020	0.050
A3	--	0.203	--
b	0.175	0.200	0.225
D	5.900	6.000	6.100
E	5.900	6.000	6.100
e		0.400	
D2	--	4.200	--
E2	--	4.200	--
L	--	0.400	--
K	--	0.500	--
R	--	0.050	--

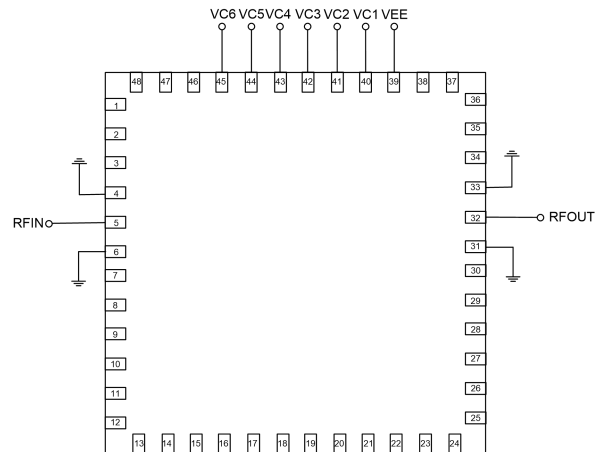
The units in the figure are all millimeters. If no tolerance is specified, it is $\pm 0.05\text{mm}$.

GaAs MMIC 6-bit Digitally Controlled Phase Shifter Chip , 0.9 - 1.4 GHz

Pin Definition		
Pin number	Function Symbol	Functional Description
5	RF IN	RF signal input terminal
32	RF OUT	RF signal output terminal
39	VEE	Device power supply
40 ~ 45	VC	Control port, see truth table
4, 6, 31, 33	GND	The pins need to be in good contact with the RF and DC grounds.
Chip bottom	GND	Needs to be in good contact with the RF and DC grounds
Other	NC	The pin is left floating and can be grounded

Truth Table							
	VEE	VC6	VC5	VC4	VC3	VC2	VC1
0 state	-5	0	0	0	0	0	0
-5.265°		0	0	0	0	0	5
-11.25°		0	0	0	0	5	0
-22.5°		0	0	0	5	0	0
-45°		0	0	5	0	0	0
-90°		0	5	0	0	0	0
-180°		5	0	0	0	0	0
-354.375°		5	5	5	5	5	5

Recommended Circuit



Precautions for use

- Sealing material : Low-pressure injection molding plastic that meets ROHS specifications
- Lead frame material: copper alloy
- Lead surface plating: 100% matte tin
- Maximum reflow peak temperature: 260 °C