Standard Circuit

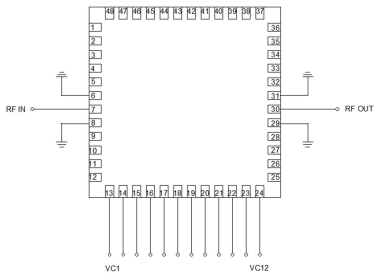
GPS - 0811-6E-CQ7M

GaAs MMIC 6-bit digitally controlled phase shifter chip , 8-11 GHz

Performance characteristics

- Frequency range: 8 - 11 GHz
- Insertion loss: 8.5dB (Typ.)
- Insertion loss fluctuation : 1.8 dB
- RMS Phase Error : 1.8 °
- Control voltage: 0V/-5V
- 50Ohm input / output
- Chip size : QFN 7X7

Block Diagram



Product Introduction

GPS-0811-6E-CQ7M is a GaAs MMIC 6-bit digitally controlled phase shifter chip with a frequency range of 8 GHz to 11 GHz , an insertion loss of 8.5 dB , and a phase shift the precision is 1.8o · The chip adopts 0/ -5V control. The phase shifter adopts 7X7mm ceramic surface mount package , and the surface of the pin pad is gold-plated, which is suitable for reflow soldering installation process.

Use restriction parameter [1]	
Maximum input power	+23dBm
Control voltage range	-8V ～ +0.5V
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		8-11		G Hz
Insertion loss	-	8.5	-	dB
Insertion loss fluctuation	-	1.8	-	dB
Phase shift accuracy (RMS)	-	1.8	-	degree
Input return loss	-	14	-	dB
Output return loss	-	11	-	dB
Switching time	-	20	-	ns
P-1	-	21	-	dBm
Control voltage	-	0/-5	-	V

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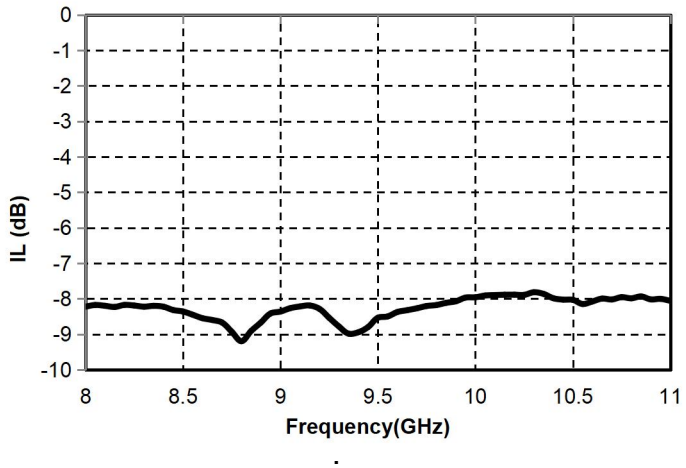
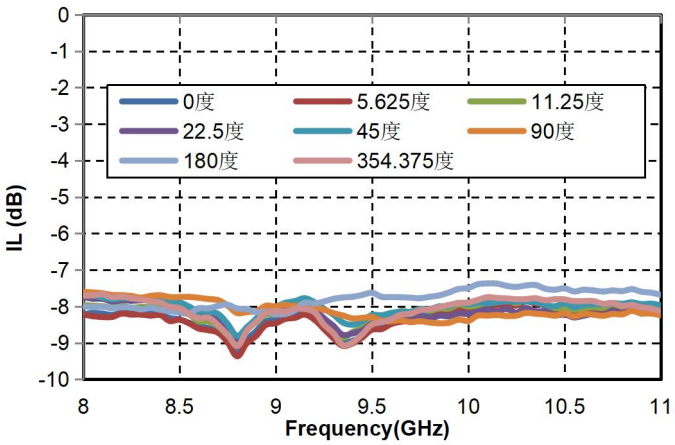
Main index test curve

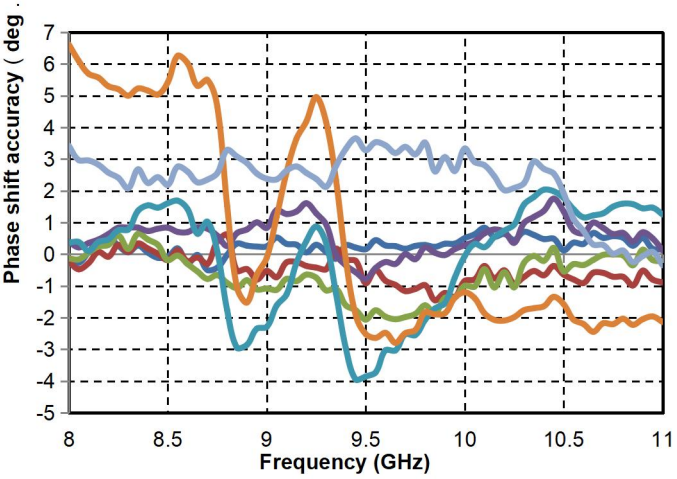
Baseline Insertion Loss vs. Operating Frequency



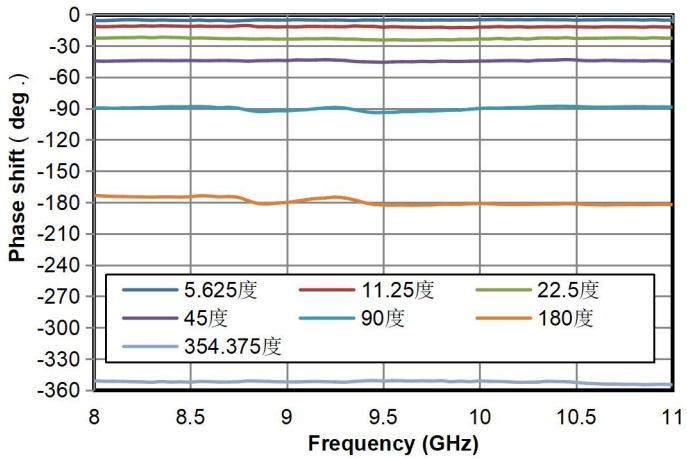
Insertion loss of main phase shift state vs. operating frequency



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



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



Reference state and main phase shift state input return loss vs. operating frequency

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

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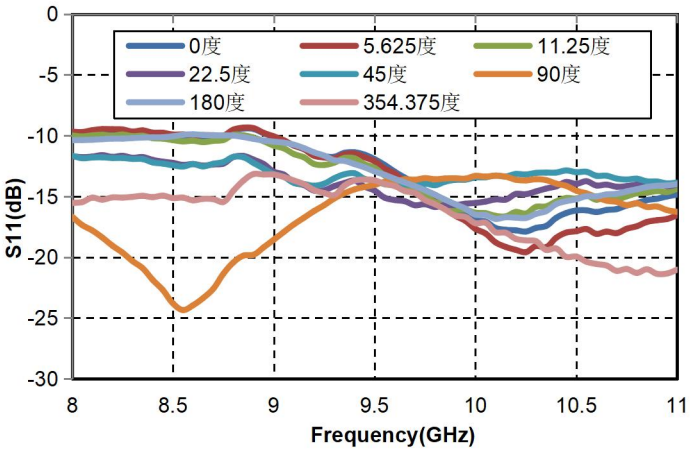

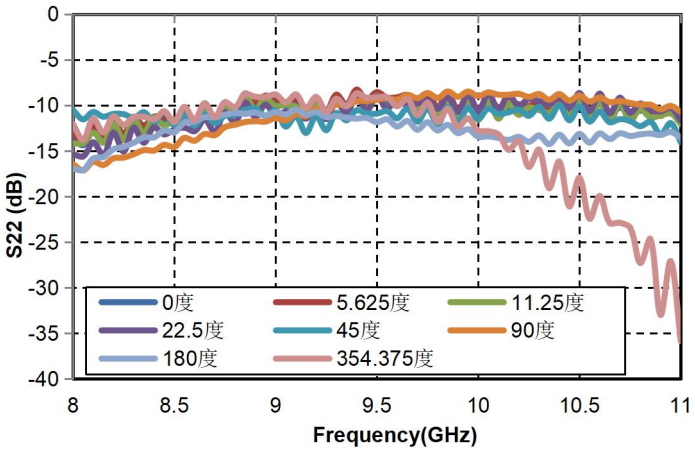

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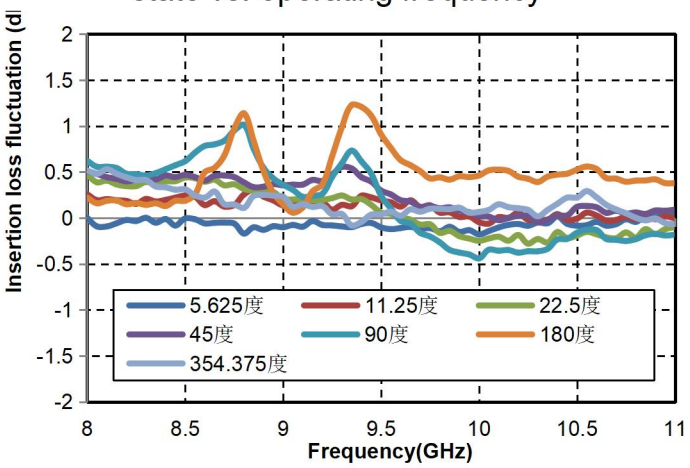
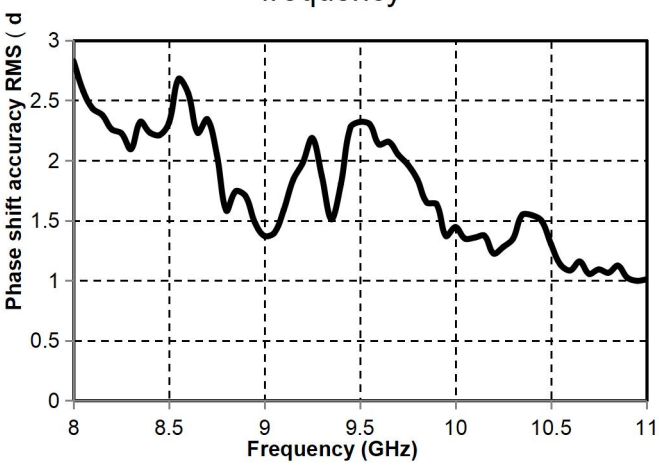
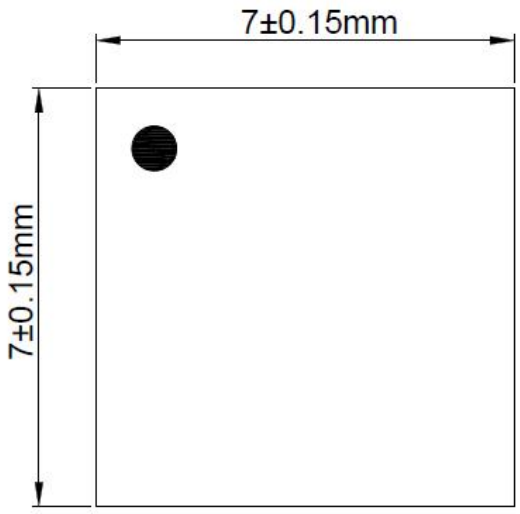
Insertion loss fluctuation of main phase shift state vs. operating frequency

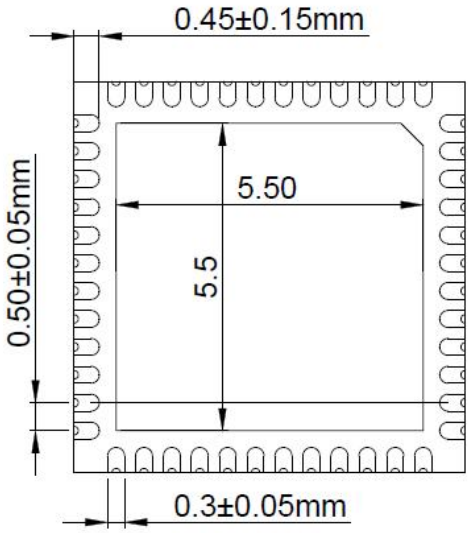


Phase shift accuracy (RMS) vs. operating frequency



Appearance structure





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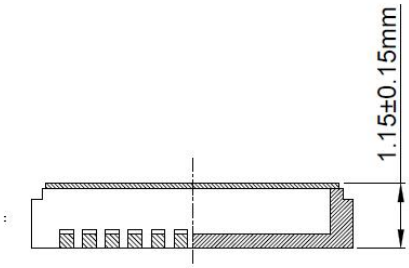
Top view

Bottom view



Side View

The units in the figure are all millimeters. If no tolerance is specified, it is ±0.13mm.

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Pin Definition		
Solder point number	Function Symbol	Functional Description
7	RFIN	RF signal input terminal
30	R FOUT	RF signal output terminal
13~24	V C	Control port, see truth table
6, 8, 29, 31	G	The pins need to be well grounded to the RF and DC grounds
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC
Other	N C	No welding required

Truth Table												
	VC1	VC2	VC3	VC4	VC5	VC6	VC7	VC8	VC9	VC10	VC11	VC12
0 state	0	-5	0	-5	0	-5	0	-5	0	-5	0	-5
-5.625°	-5	0	0	-5	0	-5	0	-5	0	-5	0	-5
-11.25°	0	-5	-5	0	0	-5	0	-5	0	-5	0	-5
-22.5°	0	-5	0	-5	-5	0	0	-5	0	-5	0	-5
-45°	0	-5	0	-5	0	-5	-5	0	0	-5	0	-5
-90°	0	-5	0	-5	0	-5	0	-5	-5	0	0	-5
-180°	0	-5	0	-5	0	-5	0	-5	0	-5	-5	0
-354.375°	-5	0	-5	0	-5	0	-5	0	-5	0	-5	0

Recommended Circuit

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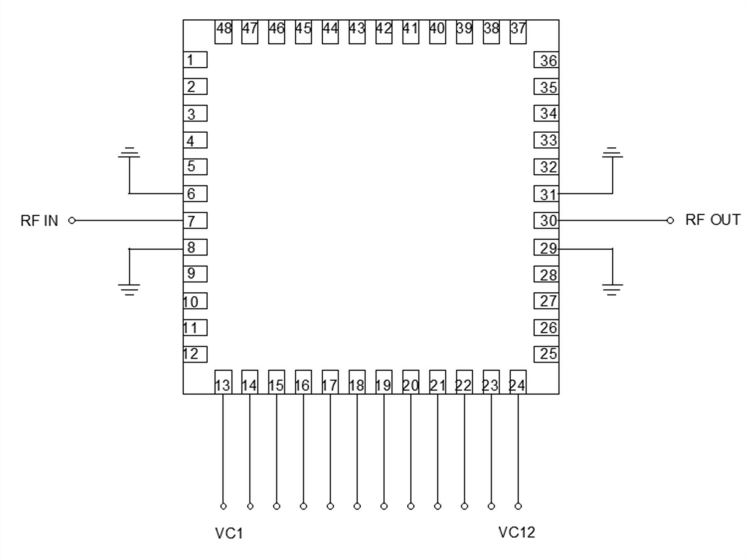

Precautions for use

- Sealing material : Ceramic material that meets ROSH standards
- Lead surface plating: gold, gold layer thickness 1.5 um MIN
- Maximum reflow peak temperature: 260 ℃