MILLER MMIC

MM6004

V1.0.0

GaAs pHEMT MMIC
6-Bit Digital Control Phase Shifter
5-6GHz

MM6004

6-BIT DIGITAL CONTROL PHASE SHIFTER - MMIC 5-6GHz

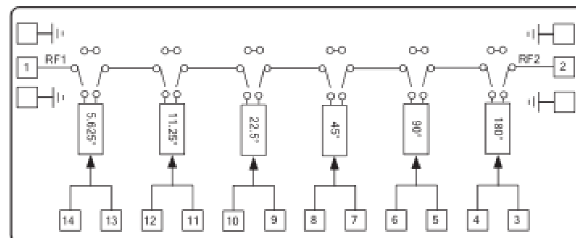
Features

- Phase Shift Range: 360 °
- Minimum Phase Shift: 5.625 °
- Phase Shift Accuracy RMS: 3.5°
- Insertion Loss: 5.2dB
- Phase-shifting Amplitude Modulation: ±0.5dB
- Impedance: 50Ω
- Die Size: 4 x 1.5 x 0.1 mm

Typical Applications

- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Functional Block Diagram

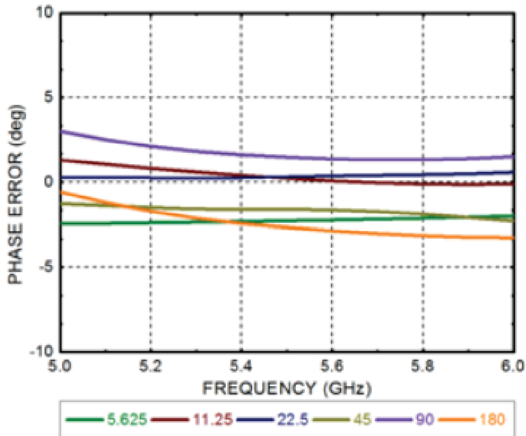


Electrical Specifications

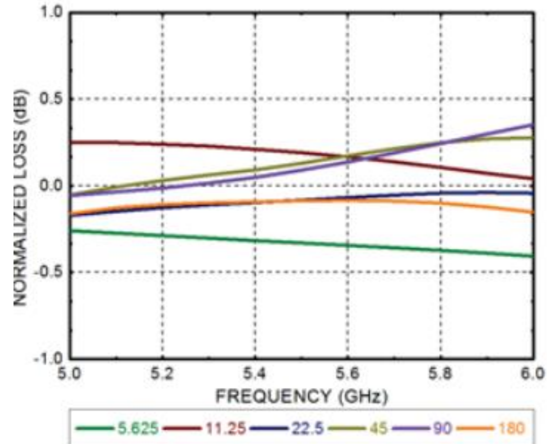
TA = +25°C, Vctl = 0/-5V

Parameters	Min.	Typ.	Max.	Units
Frequency		5-6		GHz
Insertion Loss		5.2		dB
Phase Shift Accuracy RMS		3.5		°
Phase-shifting Amplitude Modulation		±0.5		dB
Return Loss		15		dB
Input 1dB Compression (P1dB)		24		dBm
Switching Speed		30		ns

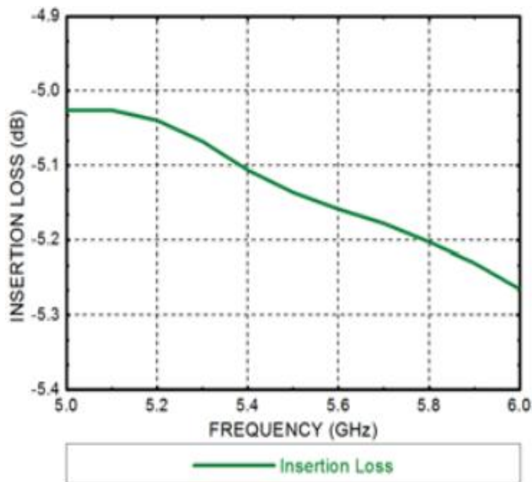
Phase Shift Accuracy(Basic State)



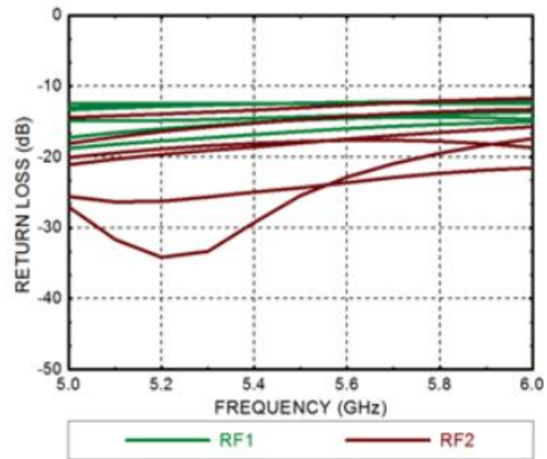
Amplitude Modulation(Basic State)



Insertion Loss

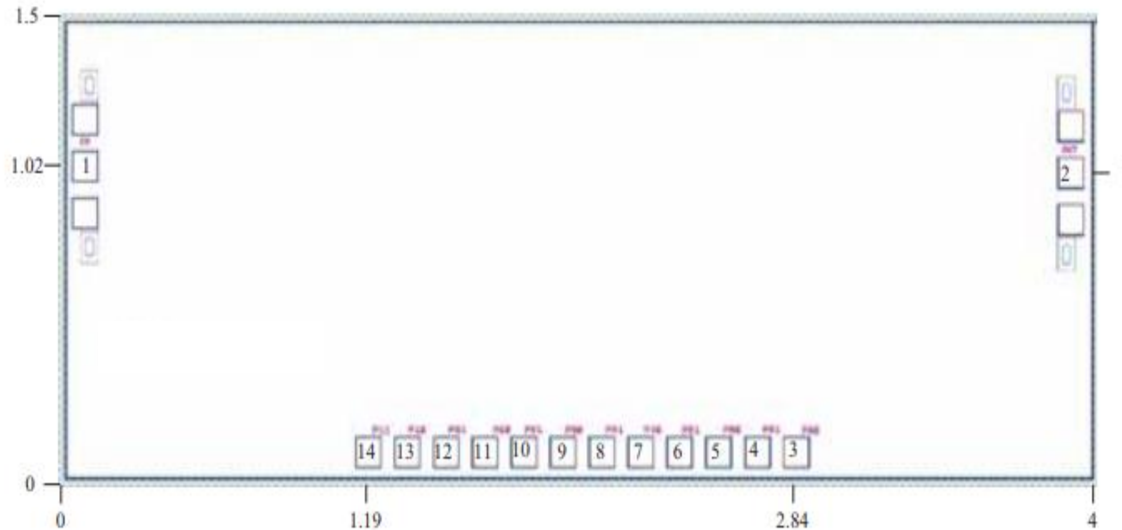


Return Loss(Basic State)



Outline Drawing:

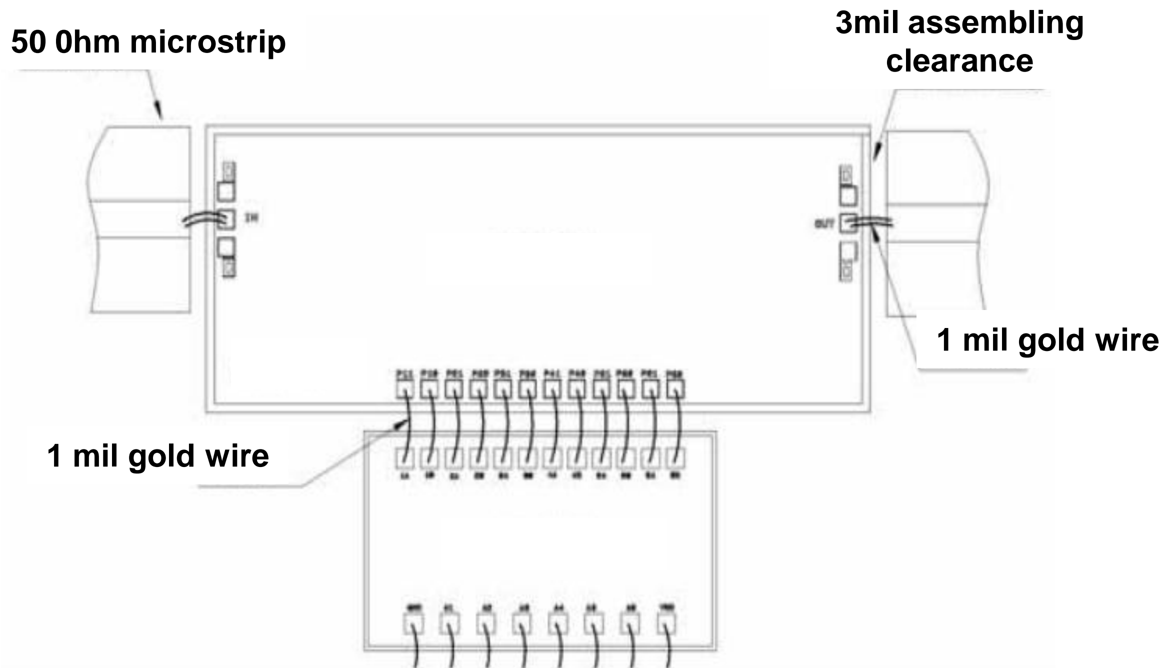
All Dimensions in mm



Pad Description

PAD	Function	Description
1	RF1	This pad is RF port and matches to 50Ω Impedance
2	RF2	This pad is RF port and matches to 50Ω Impedance
3,4	180° Control	0v, -5 v is 180 ° OFF;-5V, 0v is 180 ° ON
5,6	90° Control	0 v,-5v is 90 ° OFF;-5V, 0 v is 90 ° ON
7,8	45°Control	0v, -5 v is 45 ° OFF;-5V, -0v is 45 ° ON
9,10	22.5° Control	0v, -5v is 22.5 ° OFF;-5V, 0v is 22.5 ° ON
11,12	11.25° Control	0v, -5v is 11.25 ° OFF;-5V, 0v is 11.25 ° ON
13,14	5.625° Control	0v, -5v is 5.625 ° OFF;-5V, 0v is 5.625° ON
Die Bottom	GND	Die bottom must be connected to RF/DC ground

Assembly Drawing



Notes:
1. Die thickness: 100um
2. Typical bond pad is 100*100 μm²
3. Bond pad metalization: Gold
4. Backside metalization: Gold
5. Backside of the die (GND)
6. No connection required for unlabeled bond pads

Maximum Ratings:
1. RF input power: +24dBm
2. Storage temperature: -65℃ to +175℃
3. Operating temperature: -55℃ to +85℃