MILLER MMIC

MM7004

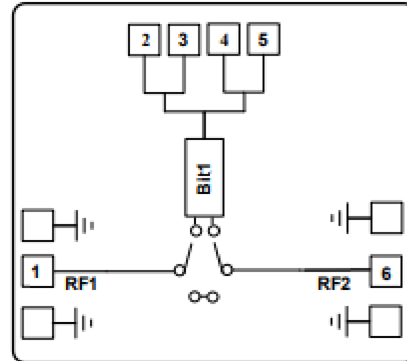
V1.0.0

GaAs pHEMT MMIC
1-Bit True Time Delay
1-10GHz

Features

- Delay Range: 444.44 ps / 1440 ° @ 9 GHz
- Delay Accuracy RMS: ± 10 ps
- Delay Phase Accuracy: ± 30 °
- Insertion Loss: 6 dB
- Phase Shift Amplitude Modulation: ±0.8 dB
- Input/Output: 50 Ohm
- Die Size: 2.5x 2.5x 0.075 mm

Functional Block Diagram



Typical Applications

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

Electrical Specifications
TA = +25ºC, Vctl = 0/+5V

Parameters	Min.	Typ.	Max.	Units
Frequency		1-10		GHz
Insertion Loss		6		dB
Time Delay Accuracy RMS		±10		ps
Phase Shift Amplitude Modulation		±0.8		dB
Input and Output SWR		1.4		-
Input 1dB Compression		24		dBm
Switching Time		30		ns

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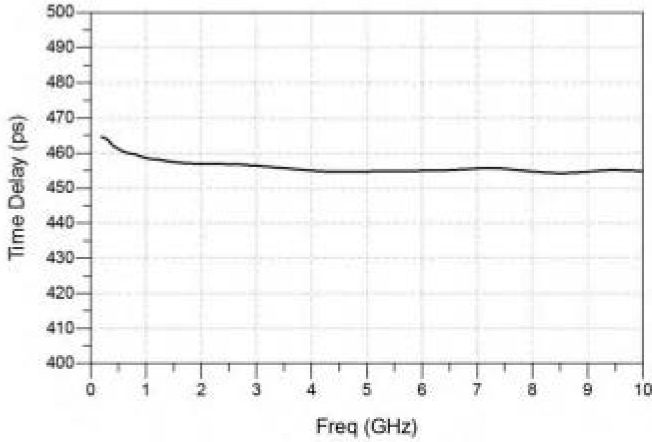
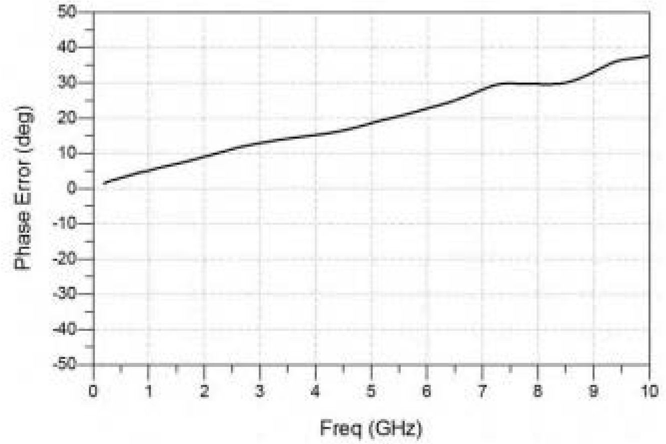
1-Bit True TIME DELAY - MMIC 1-10GHz

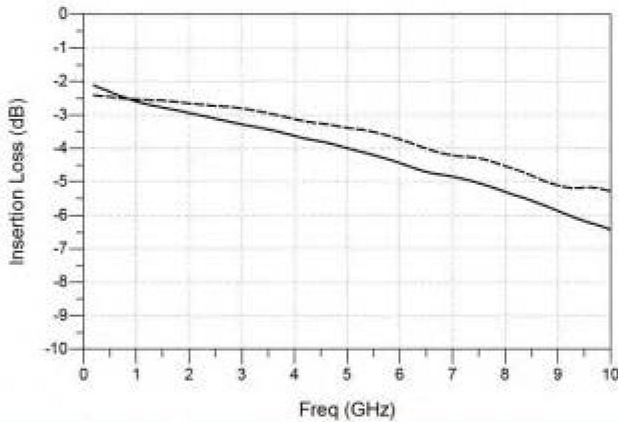
Time Delay



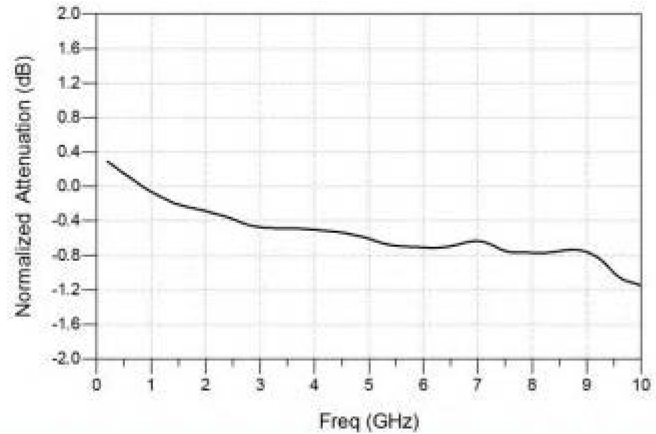
Delay Phase Error



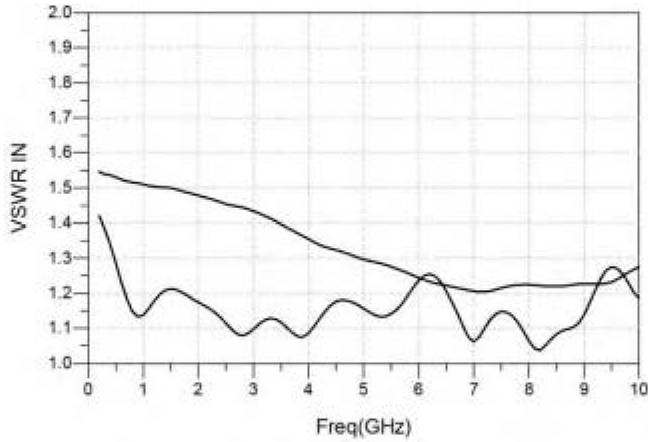
Insertion Loss



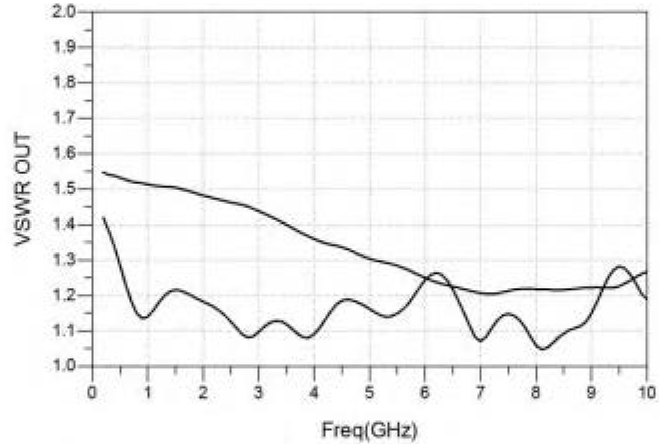
Amplitude Modulation



VSWR RF1

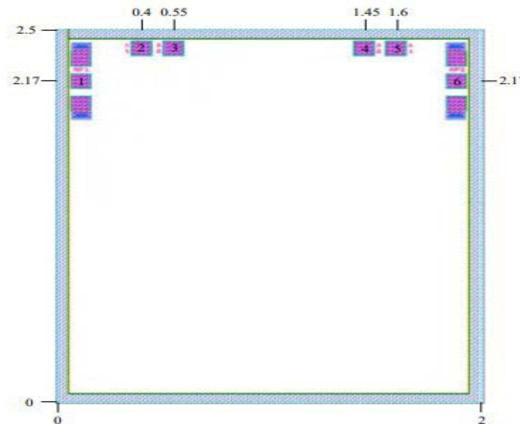


VSWR RF2



Outline Drawing:

All Dimensions in mm



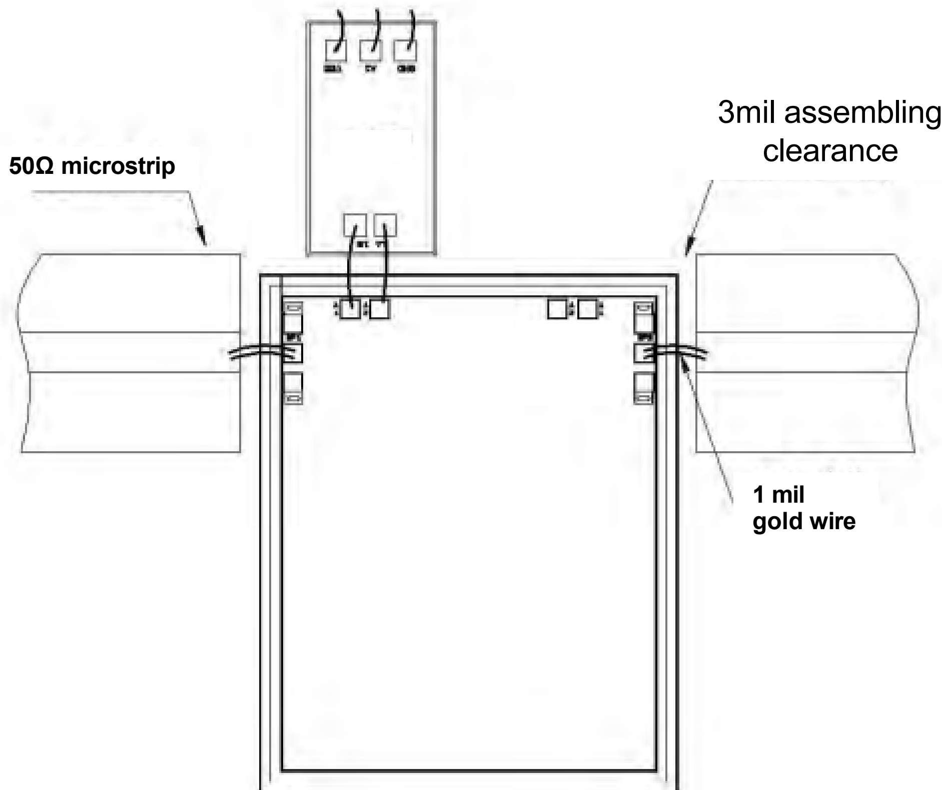
Pad Description

Pad Number	Function	Description
1，6	RF1, RF2	The pad is an RF port, DC coupled and matched with 50 Ohm. If the RF potential is not 0V, an external isolation capacitor is required.
2,，5	A1	When A1=0V, A2=-5V,444.44ps OFF; When A1=-5V, A2=0V,444.44ps ON. When using, choose one between pad2 and pad5, choose one between pad3 and pad4.
3，4	A2	
Die bottom	GND	Die bottom must be connected to RF/DC ground.

True Value Table

State	444.44ps	
	A1	A2
Reference State	0	1
444.44ps	1	0
"0" level range: 0 ~ -0.2V; "1" level range: -3 ~ -6V		

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 is grounded
6. No connection required for unlabeled bond pads

Maximum Ratings:
1. RF input power: +24dBm
2. Storage temperature: -65℃ to +150℃
3. Operating temperature: -55℃ to +85℃