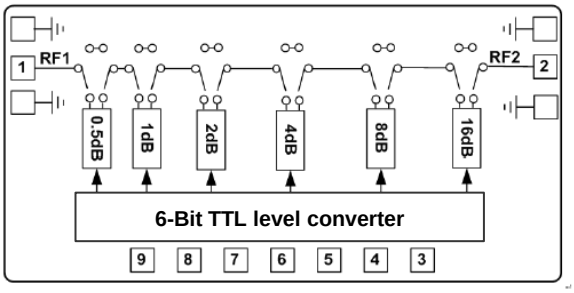
V1.0.0

GaAs pHEMT MMIC
6-Bit Digital Control Attenuator
DC-18GHz

Features

- Integrated 6-Bit TTL level converter circuit
- Attenuation Range: 0.5dB ~ 31.5dB
- Attenuation Accuracy: ±0.6dB
- Insertion Loss : 2.5dB
- Attenuation Additional Phase Shift: ±4°
- Power Supply: -5V @ 6mA
- Die Size: 2.5 x 1.0 x 0.075 mm

Functional Block Diagram



Typical Applications

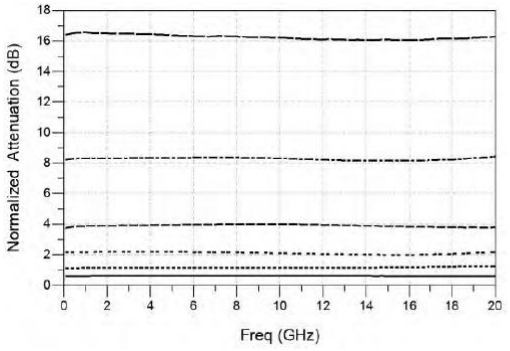
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

Electrical Specifications

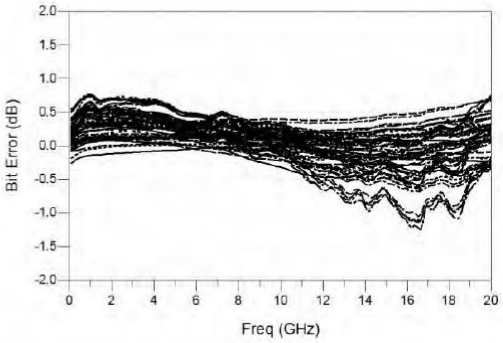
TA = +25ºC, VCTL = 0/+5V

Parameters	Min.	Typ.	Max.	Units
Frequency		DC-18		GHz
Insertion Loss		2.5		dB
Attenuation Accuracy		±0.6		dB
Attenuation Additional Phase Shift		±4		°
Return Loss		15		dB
Input power 1dB Compression @1-18GHz		24		dBm
Switching Speed		30		ns

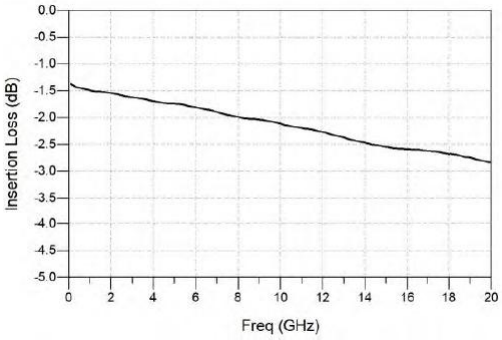
Basic State Attenuation



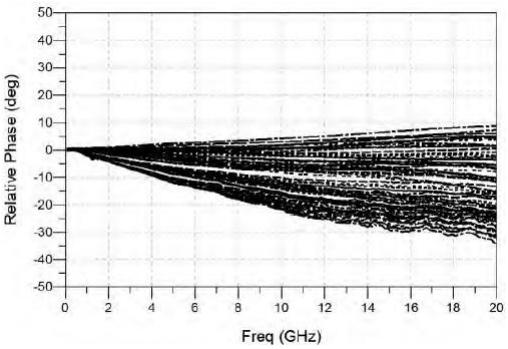
All State Attenuation Accuracy



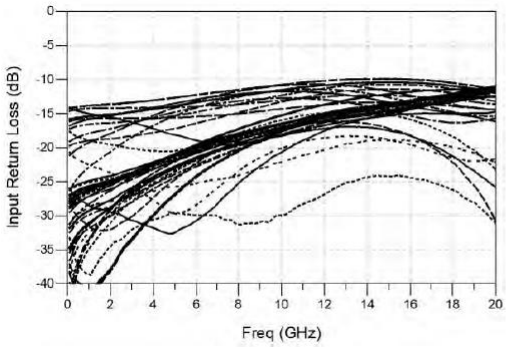
Insertion Loss



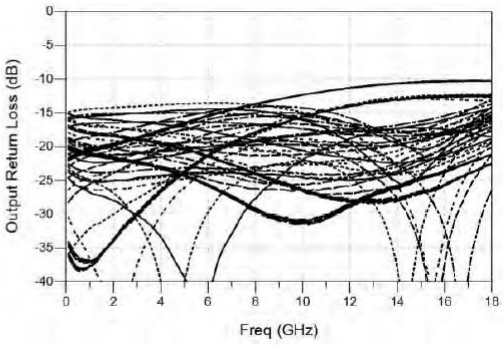
All State Attenuation Additional Phase Shift



Input Return Loss

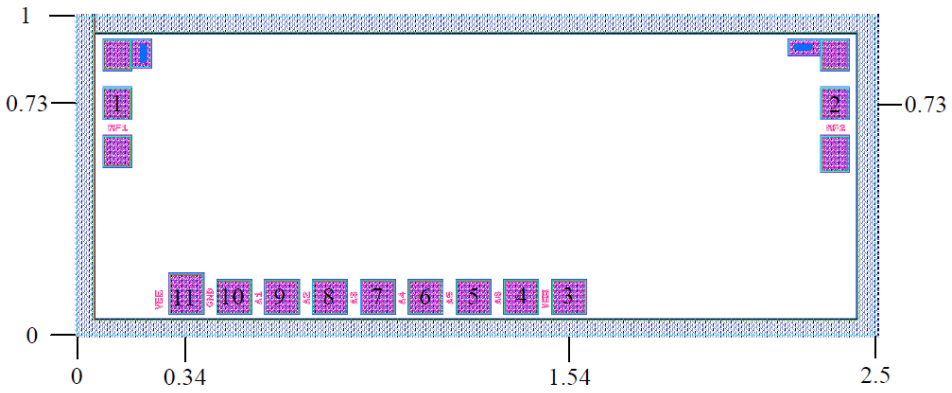


Output Return Loss



Outline Drawing:

All Dimensions in mm



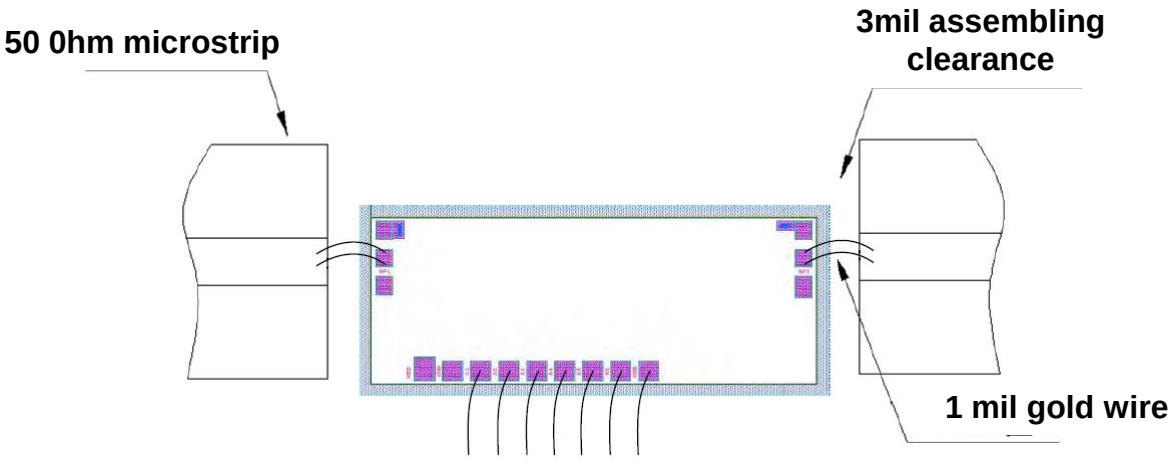
Pad Description

PAD	Function	Description
1, 2	RF1, RF2	This pad is RF port, DC coupling and matched to 50Ω. If RF voltage is not 0V, then blocking capacitor is required externally.
3	VEE	This pad is TTL level converter power supply, connected to -5V.
4	16dB Attenuation Control Bit A6	When A6=0V, 16dB Attenuator OFF When A6=5V, 16dB Attenuator ON
5	8dB Attenuation Control Bit A5	When A5=0V, 8dB Attenuator OFF When A5=5V, 8dB Attenuator ON
6	4dB Attenuation Control Bit A4	When A4=0V, 4dB Attenuator OFF When A4=5V, 4dB Attenuator ON
7	2dB Attenuation Control Bit A3	When A3=0V, 2dB Attenuator OFF When A3=5V, 2dB Attenuator ON
8	1dB Attenuation Control Bit A2	When A2=0V, 1dB Attenuator OFF When A2=5V, 1dB Attenuator ON
9	0.5dB Attenuation Control Bit A1	When A1=0V, 0.5dB Attenuator OFF When A1=5V, 0.5dB Attenuator ON
Die Bottom	GND	Die bottom must be connected to RF/DC ground

True Table

State	0.5dB	1dB	2dB	4dB	8dB	16dB
	A1	A2	A3	A4	A5	A6
Reference State	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1dB	0	1	0	0	0	0
2dB	0	0	1	0	0	0
4dB	0	0	0	1	0	0
8dB	0	0	0	0	1	0
16dB	0	0	0	0	0	1
“0” level range: 0~0.8V, “1” level range: 2.3~5V						

Assembly Drawing



Notes:

1. Die thickness: 75um
2. Typical bond pad is 100*100μm²
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 +150℃
3. Operating temperature: -55℃ to +85℃