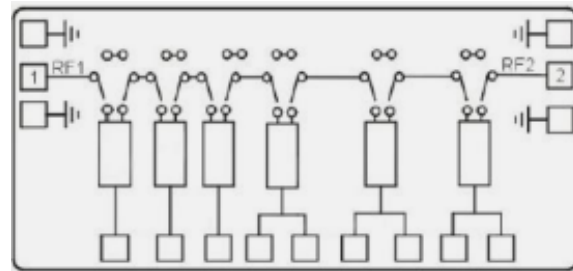


**Features**

- Frequency: 0.1-20GHz
- Insertion Loss: 5.8dB
- Attenuation Range: 0.5-31.5dB
- Control Bit: 6
- Attenuation Accuracy: 0.4dB (RMS)
- Additional Phase Shift:  $\pm 9^\circ$
- Input/Output: 50 $\Omega$
- Die Size: 3.4 x 1.4 x 0.1 mm

**Functional Block Diagram**

**Typical Applications**

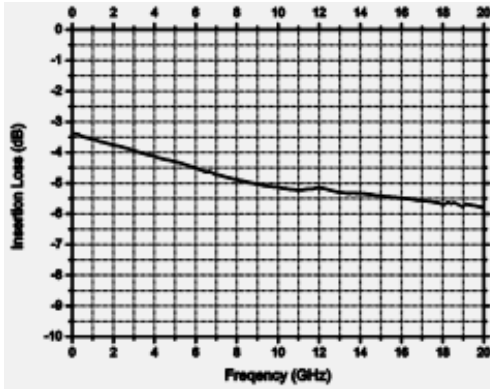
- Test Instrumentation
- Microwave Radio & VSAT
- Military & Space
- Telecom Infrastructure
- Fiber Optics

**Electrical Specifications**
**TA = +25°C**

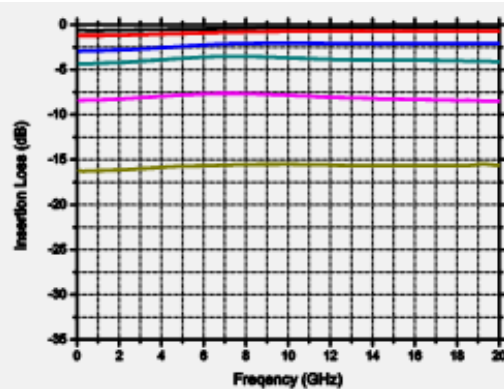
Parameters	Min.	Typ.	Max.	Units
Frequency	0.1-20			GHz
Insertion Loss	-	-	5.8	dB
Attenuation Range	0.5-31.5			dB
Attenuation Step	0.5			dB
Attenuation Error	-	0.4 (RMS)	0.5 (RMS)	dB
Attenuation Additional Phase Shift	-	-	$\pm 9$	Degree
Input Return Loss	-	14	-	dB
Output Return Loss	-	14	-	dB
Switching Speed	-	-	30	ns
P1dB	21	25	-	dBm



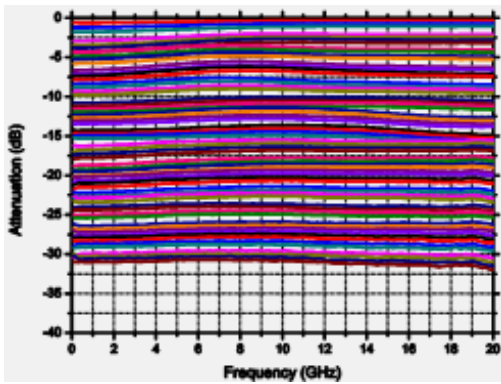
### Reference State Insertion Loss vs. Frequency



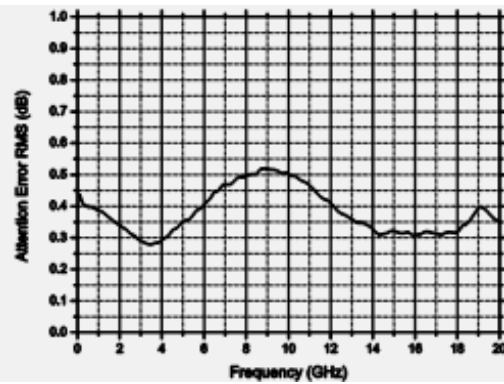
### Basic Attenuation State vs. Frequency



### Full Attenuation State vs. Frequency

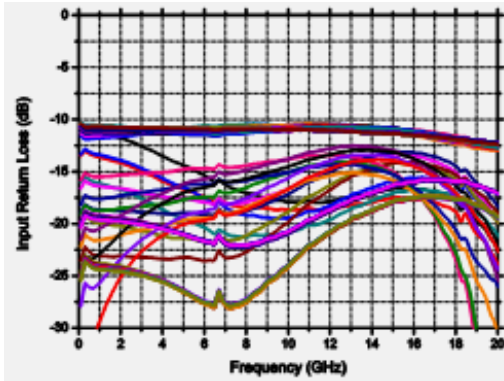


### Attenuation Error vs. Frequency

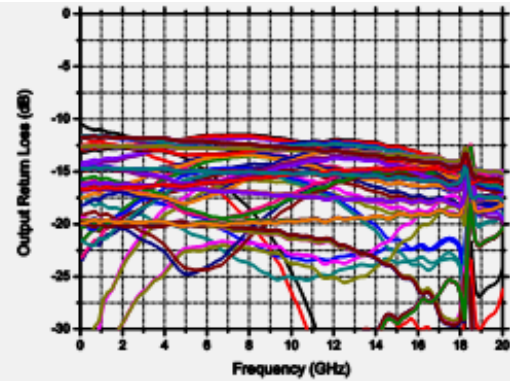




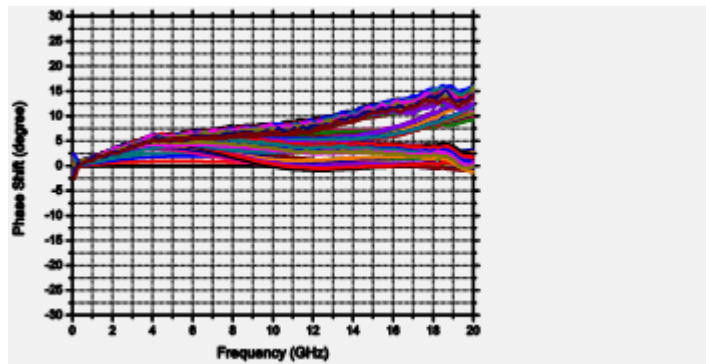
### Input Return Loss vs. Frequency



### Output Return Loss vs. Frequency

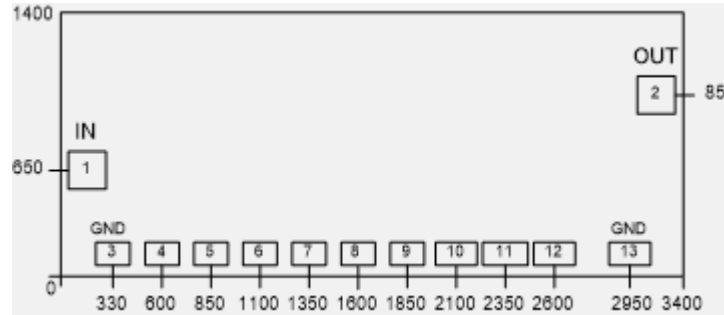


### Additional Phase Shift vs. Frequency





**Outline Drawing:**  
All Dimensions in  $\mu\text{m}$



**Pad Description**

Pad	Function	Description	Equivalent Circuit
1	RF IN	Signal input terminal, connected to 50Ω circuit; blocking capacitor not integrated internally.	
2	RF OUT	Signal output terminal, connected to 50Ω circuit; blocking capacitor not integrated internally	
3, 13	GND	Connected to ground.	
4-12	Vc	Attenuation control pad. See the Truth Table for detail of attenuation control.	
Die bottom	GND	Die bottom must be connected to RF/DC ground.	

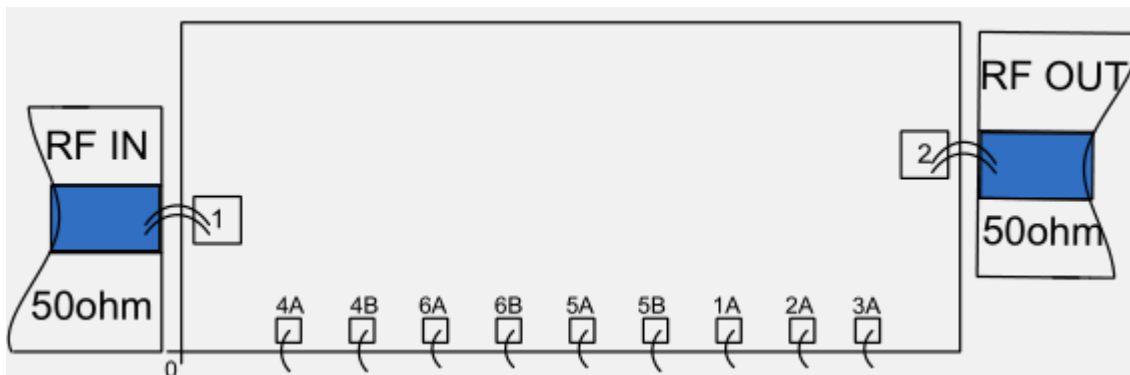


### Truth Table

Truth Table									
0.5bit	1bit	2bit	4bit		8bit		16bit		State
1A	2A	3A	4A	4B	5A	5B	6A	6B	
-5	-5	-5	-5	0	-5	0	-5	0	Ref. State
0	-5	-5	-5	0	-5	0	-5	0	0.5dB
-5	0	-5	-5	0	-5	0	-5	0	1dB
-5	-5	0	-5	0	-5	0	-5	0	2dB
-5	-5	-5	0	-5	-5	0	-5	0	4dB
-5	-5	-5	-5	0	0	-5	-5	0	8dB
-5	-5	-5	-5	0	-5	0	0	-5	16dB



### Assembly Drawing



#### Notes:

1. Die thickness: 100um
2. Typical bond pad is 100\*100  $\mu\text{m}^2$
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. Control voltage: -8V-+0.5V
2. Maximum input power: +30dBm
3. Operating temperature: -55°C to +85°C
4. Storage temperature: -65°C to +150°C