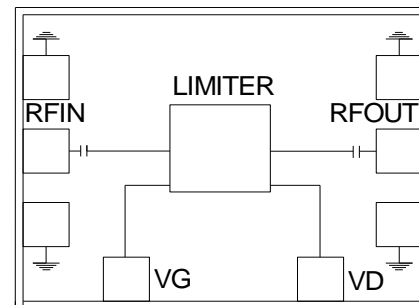


## 2-20 GHz Power Limiter

### Features

- ◆ Frequency Range: 2-20 GHz
- ◆ 0 dB insertion loss
- ◆ 3 dBm power limiting
- ◆ 5-15 dBm limiting range
- ◆ Input Return Loss > 10 dB
- ◆ Output Return Loss > 10 dB
- ◆ DC decoupled input and output
- ◆ 0.15  $\mu\text{m}$  InGaAs pHEMT Technology
- ◆ Chip dimension : 1.6 x 1.6 x 0.1 mm

Functional Diagram



### Typical Applications

- ◆ Limiting amplifiers
- ◆ Protective circuitry

### Description

The ASL11001 is an amplifier limiter MMIC designed to work from 2 to 20 GHz. The limiter has a limiting range of 5-15 dBm. The insertion gain is a nominal 3 dB and varies within  $\pm 1.5$  dB over the frequency range. The input /output return losses are better than 10 dB over the entire frequency band. The die is fabricated using a reliable 0.15  $\mu\text{m}$  InGaAs pHEMT technology and has small footprint.

### Absolute Maximum Ratings <sup>(1)</sup>

Parameter	Absolute Maximum	Units
RF Input Power	20	dBm
Drain Voltage ( $V_D$ )	5.5	V
Gate Voltage ( $V_G$ )	0 to -1	V
Operating Temperature	-55 to +85	$^{\circ}\text{C}$
Storage Temperature	-65 to +120	$^{\circ}\text{C}$

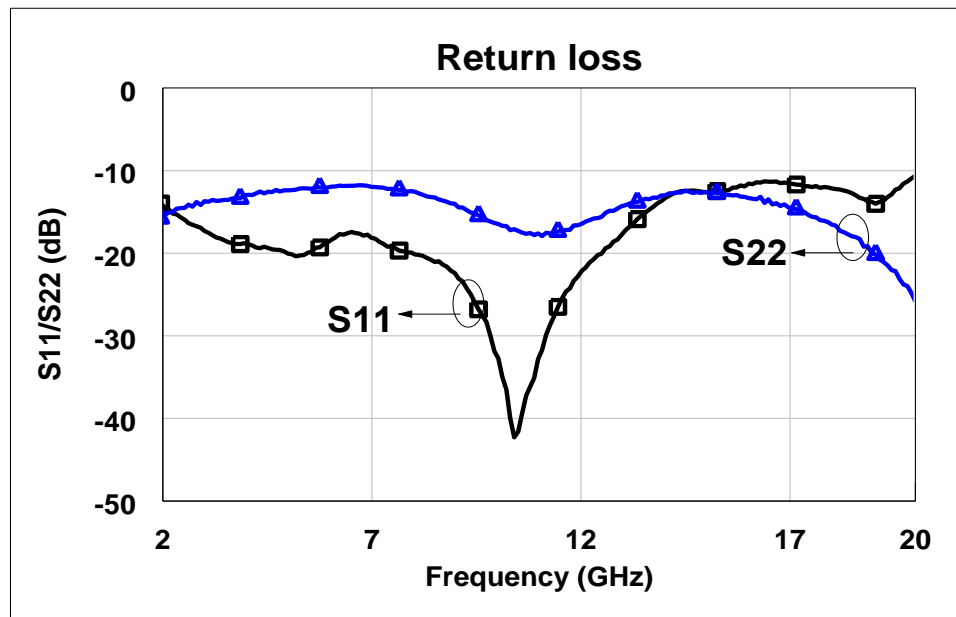
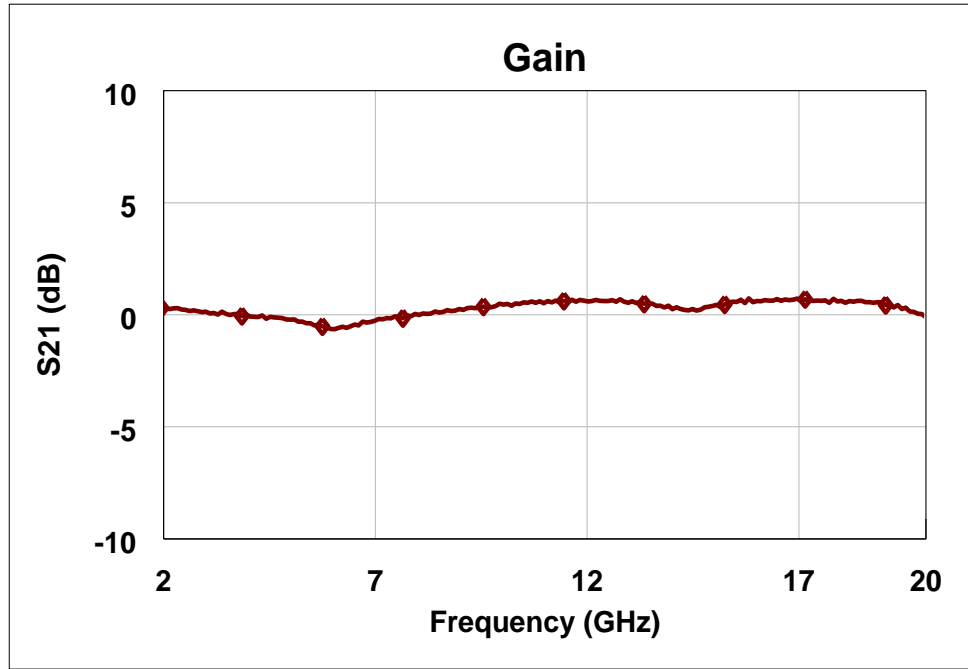
1. Operation beyond these limits may cause permanent damage to the component

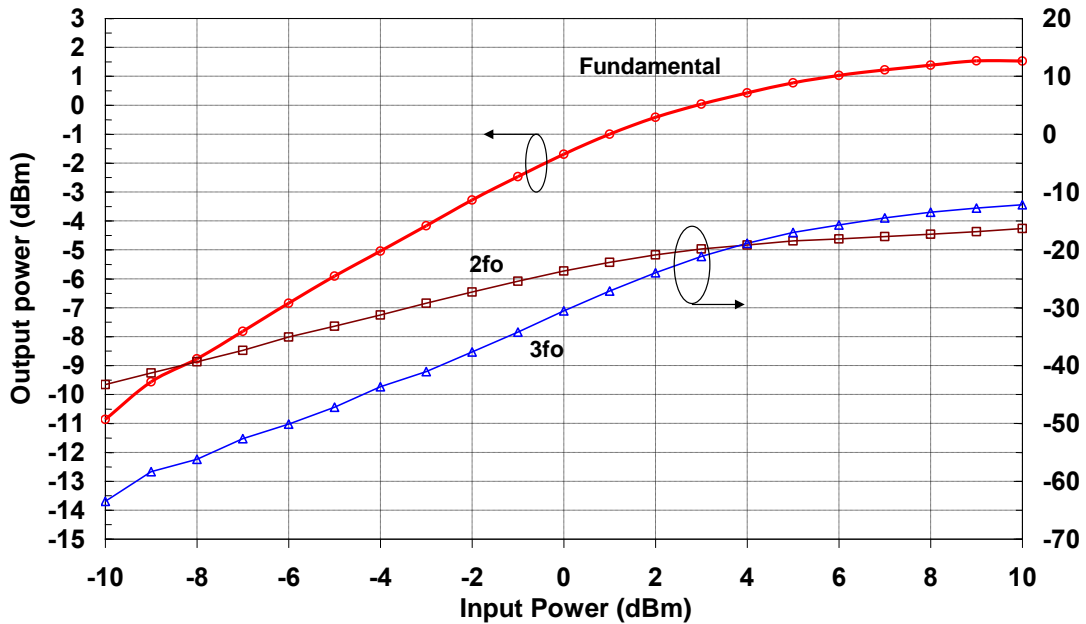
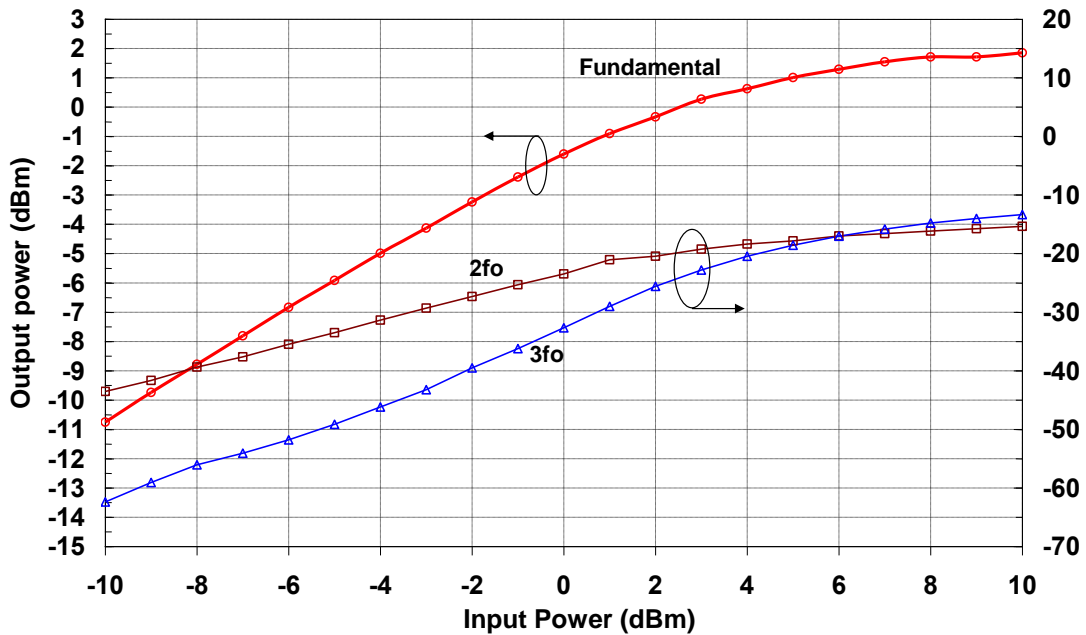
**Electrical Specifications <sup>(1)</sup> @ T<sub>A</sub> = 25 °C, V<sub>D</sub>=+1V, V<sub>G</sub>=-0.3V, Z<sub>o</sub> =50 Ω**

Parameter	Value	Units
Bandwidth	2 - 20	GHz
Limiting range	5 – 15	dBm
Insertion Gain (typ.)	0.2±0.5	dB
Output power	3	dBm
Input Return loss (max.)	-10	dB
Output Return Loss(max.)	-10	dB
Voltage	V <sub>d</sub> =+1, V <sub>g</sub> =-0.3	V
Current	I <sub>d</sub> =8	mA

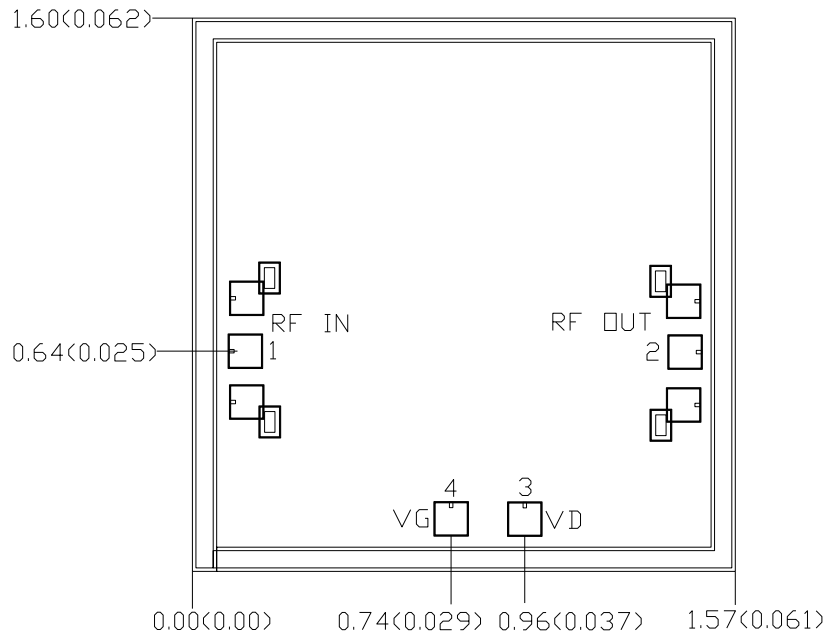
**Note:**

1. Electrical specifications as measured in test fixture.

**Test fixture data**
 $V_D=1V, V_G=-0.3V, T_A = 25^\circ C$ 


**Test fixture data**
 $V_D = 1V, V_G = -0.3V, T_A = 25^\circ C$ 
**Power characteristics @ 2 GHz**

**Power characteristics @ 6 GHz**


## Mechanical Characteristics



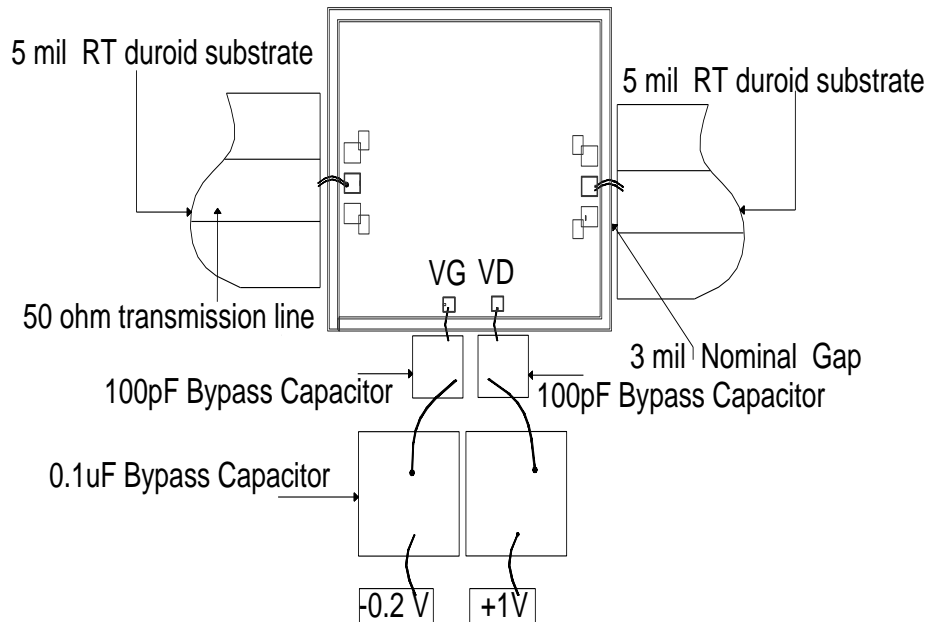
**Units: Millimeters [Inches]**

**All RF and DC bond pads are 100µm x 100µm**

**Note:**

1. Pad no. 4: VG
2. Pad no. 3: VD
3. Pad no. 1 : RF Input
4. Pad no. 2 : RF Output

## Recommended Assembly Diagram



### Note:

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input and output.
2. Two 1 mil (0.0254mm) bond wires of minimum length should be used from chip bond pad to 100pF capacitor.
3. Input and output 50 ohm lines are on 5 mil substrate.
4. 0.1  $\mu$ F capacitors may be additionally used as a second level of bypass for reliable operation.

**Die attach:** For Epoxy attachment, use of a two-component conductive epoxy is recommended. An epoxy fillet should be visible around the total die periphery. If Eutectic attachment is preferred, use of fluxless AuSn (80/20) 1-2 mil thick preform solder is recommended. Use of AuGe preform should be strictly avoided.

**Wire bonding:** For DC pad connections use either ball or wedge bonds. For best RF performance, use of 150 - 200 $\mu$ m length of wedge bonds is advised. Single Ball bonds of 250-300 $\mu$ m though acceptable, may cause a deviation in RF performance.



**GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing**

All information and Specifications are subject to change without prior notice