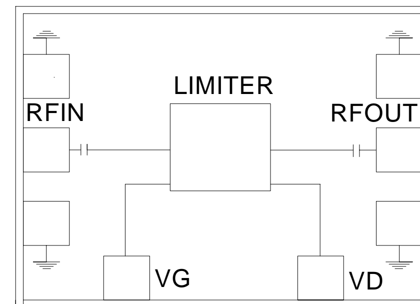
2-20 GHz Power Limiter

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 µm InGaAs pHEMT Technology**
- **Chip dimension: 1.6 x 1.6 x 0.1 mm**

Functional Diagram



Typical Applications

- **Limiting amplifiers**
- **Protective circuitry**

Description

The AMT1762011 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 ±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 µm InGaAs pHEMT technology and has small footprint.

Absolute Maximum Ratings (1)

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	°C
Storage Temperature	-65 to +120	°C

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

Electrical Specifications [1] @ T_A = 25 °C, V_D=+1V, V_G=-0.3V, Z_o =50 Ω

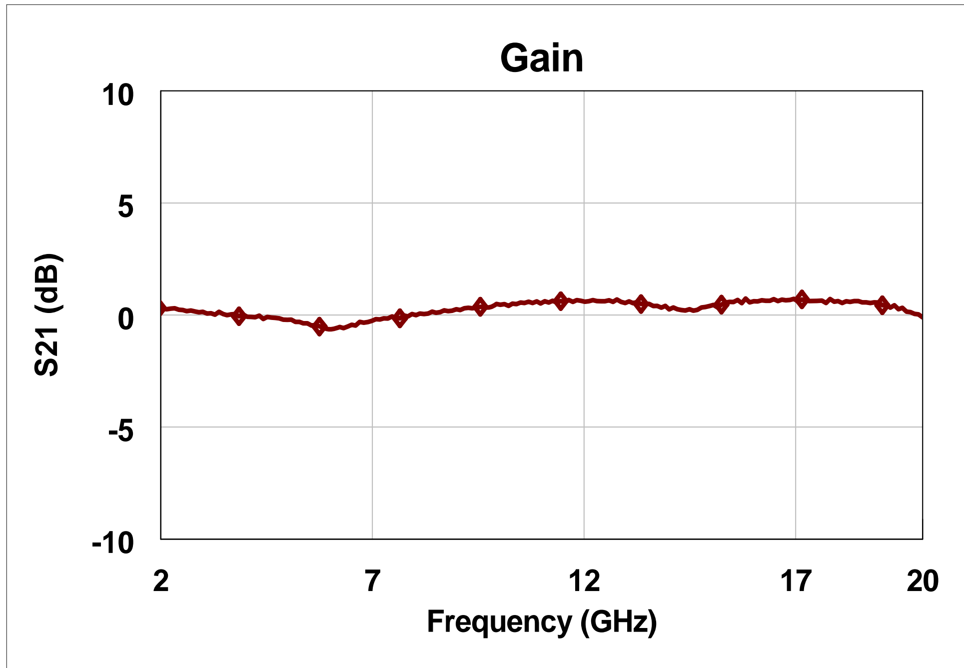
Parameter	Value	Units
Bandwidth	2 - 20	GHz
Limiting range	5 – 15	dBm
Insertion Gain (typ.)	0.2±0.5	dB
Output power	3	dBm
Input Return loss (max.)	-10	dB
Output Return Loss(max.)	-10	dB
Voltage	Vd=+1, Vg=-0.3	V
Current	Id=8	mA

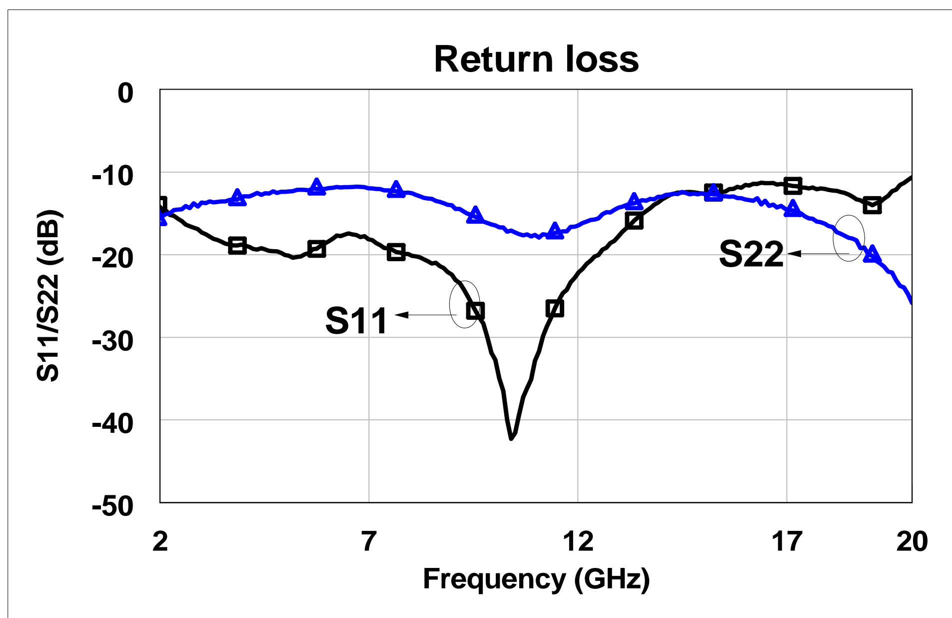
Note:

1. Electrical specifications as measured in test fixture.

Test fixture data

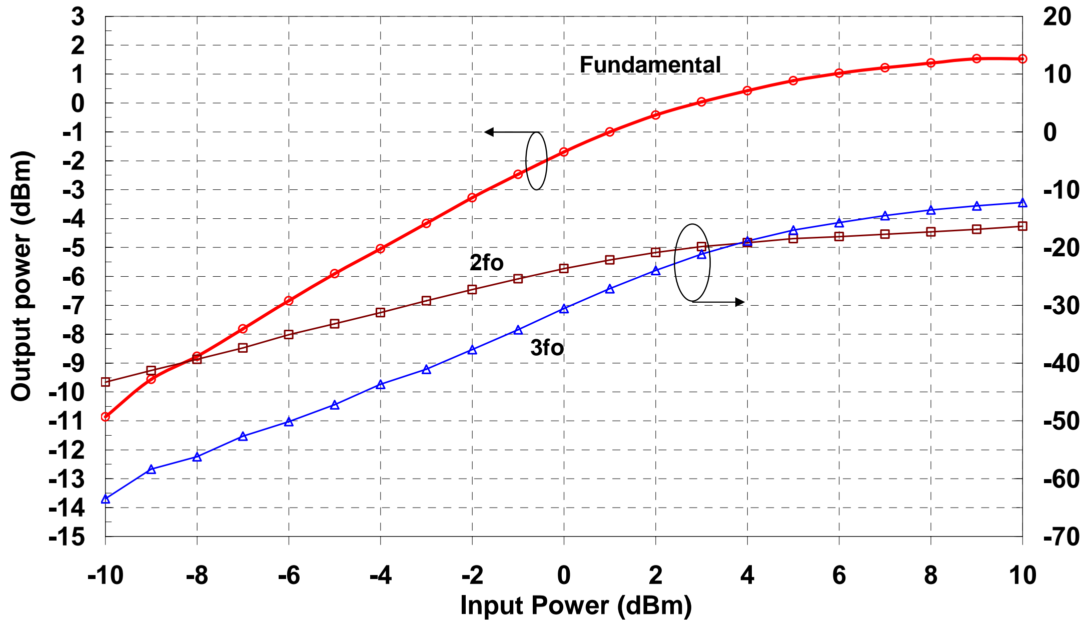
V_D=1V, V_G=-0.3V, T_A = 25 °C

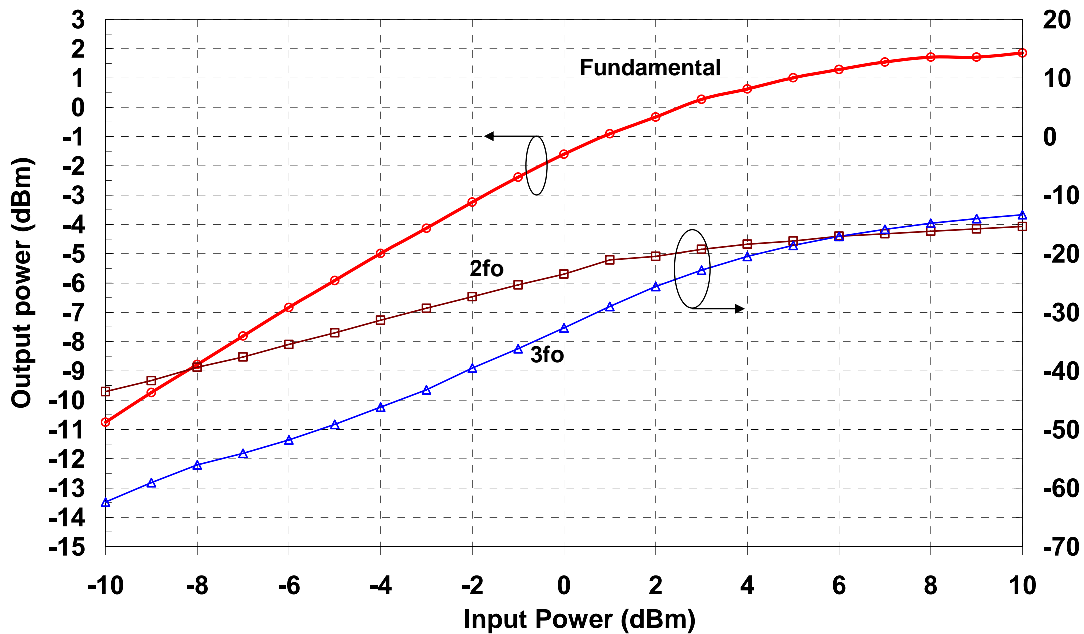




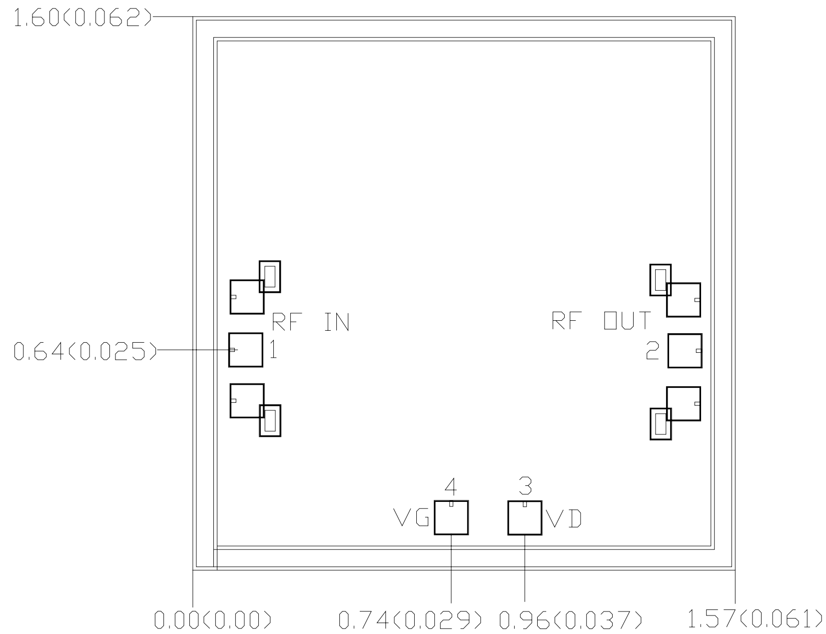
Test fixture data

V_D=1V, V_G=-0.3V, T_A = 25 °C





Mechanical Characteristics



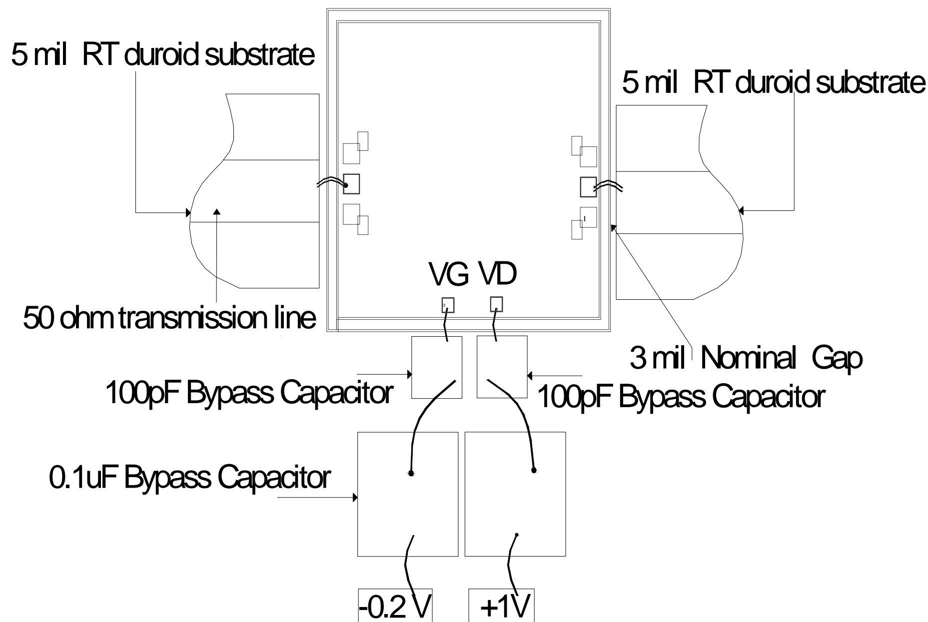
Units: Millimeters [Inches]

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 µF 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 - 200µm length of wedge bonds is advised. Single Ball bonds of 250-300µm 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

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