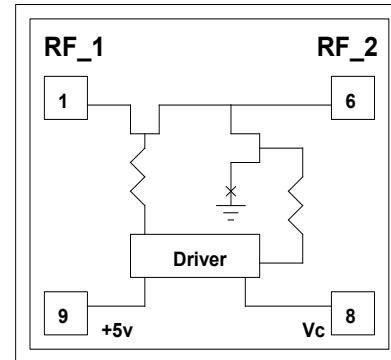


0.5 - 2.0GHz Voltage Variable Attenuator (Absorptive)

Features

- ◆ Single Positive Voltage Control: 0 to +5V.
- ◆ 30dB Attenuation Range
- ◆ Low Insertion Loss
- ◆ I/O VSWR < 1.5 :1
- ◆ Low DC power consumption
- ◆ No external matching required
- ◆ 0.5 μ m InGaAs pHEMT technology
- ◆ Chip dimension: 1.5 x 1.7 x 0.1 mm

Functional Diagram



Typical Applications

- ◆ Automatic gain/level control circuits
- ◆ Cellular
- ◆ GPS

Description

The ASL3000 is a GaAs MMIC Voltage Variable Absorptive Attenuator. It is fabricated using a reliable 0.5 μ m InGaAs pHEMT technology. The device is ideal in designs where an analog DC control signal is required to control RF signal levels over a 30 dB amplitude range. The chip features excellent I/O return losses. It is ideally suited for use where linear attenuation, fine-tuning and very low power consumption are required. The key feature of this attenuator is it requires only “positive” control voltage. DC blocking capacitors are required on both RF ports.

Absolute Maximum Ratings ⁽¹⁾

Parameter	Absolute Maximum	Units
RF Input Power	25	dBm
Control Voltage (VC)	7	Volts
Supply Voltage	7	Volts
Operating Temperature	-55 to 85	°C
Storage Temperature	-65 to 150	°C

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

Electrical Specifications @ $T_A = 25\text{ }^\circ\text{C}$, $Z_o = 50\text{ }\Omega$

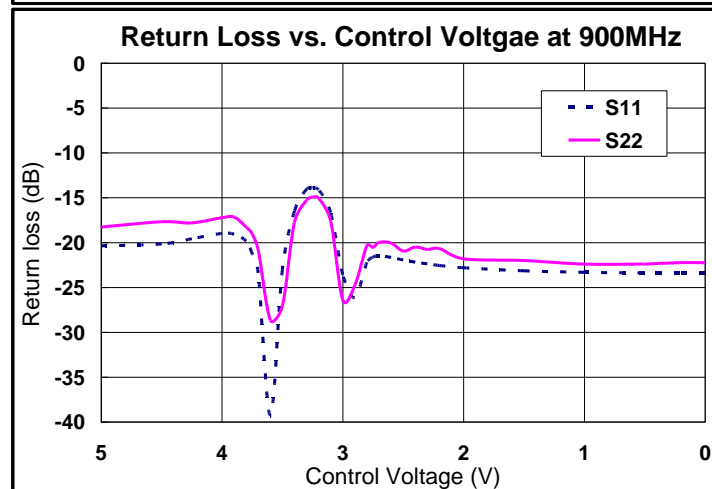
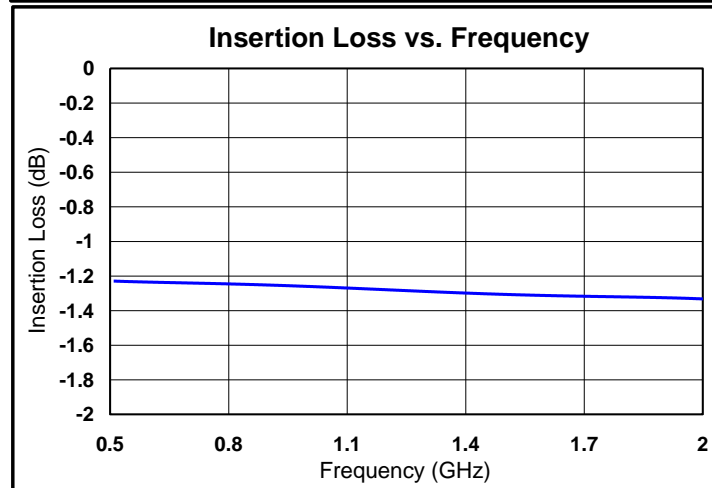
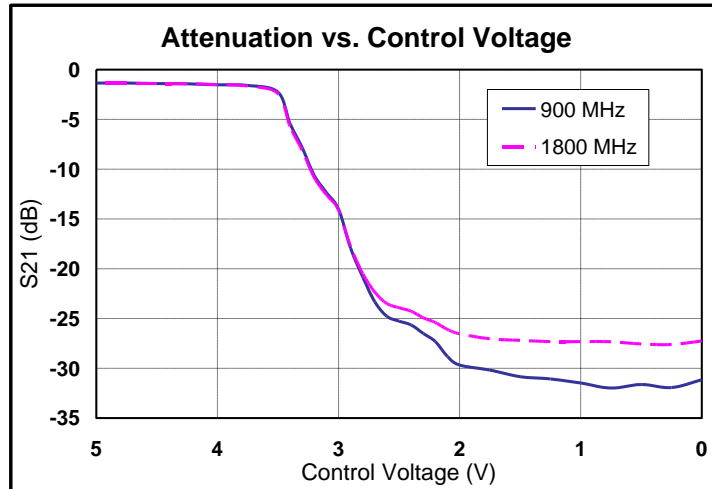
Parameter	Min.	Typ.	Max.	Units
Frequency range	0.5	-	2.0	GHz
Insertion Loss	1.3	1.4	1.5	dB
Attenuation	-	30	-	dB
Attenuation Flatness	-	+/- 1	-	dB
VSWR (max.)	-	1.5	-	Ratio

Note:

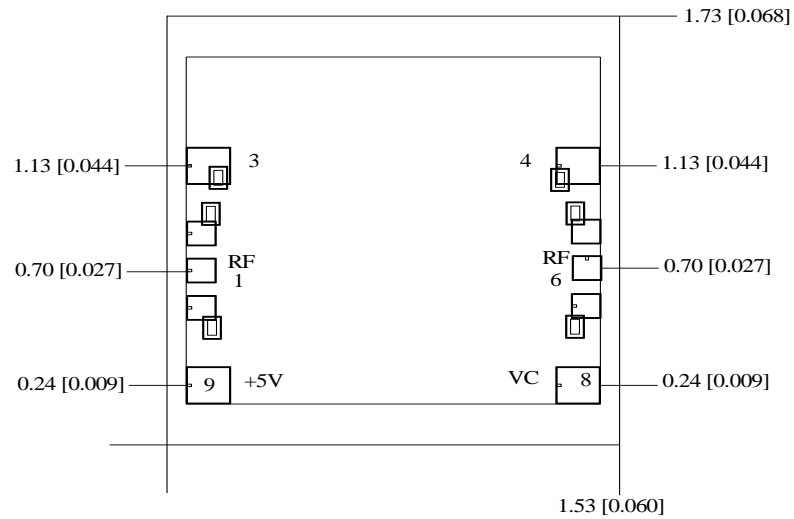
1. Supply +5V @600 μ A maximum.
2. VC = 0 to +5V @2mA maximum.
3. External DC blocking capacitors are required on all RF ports.

Test fixture data

Operating Conditions: Supply Voltage = +5V, control Voltage = 0 - +5V



Mechanical Characteristics



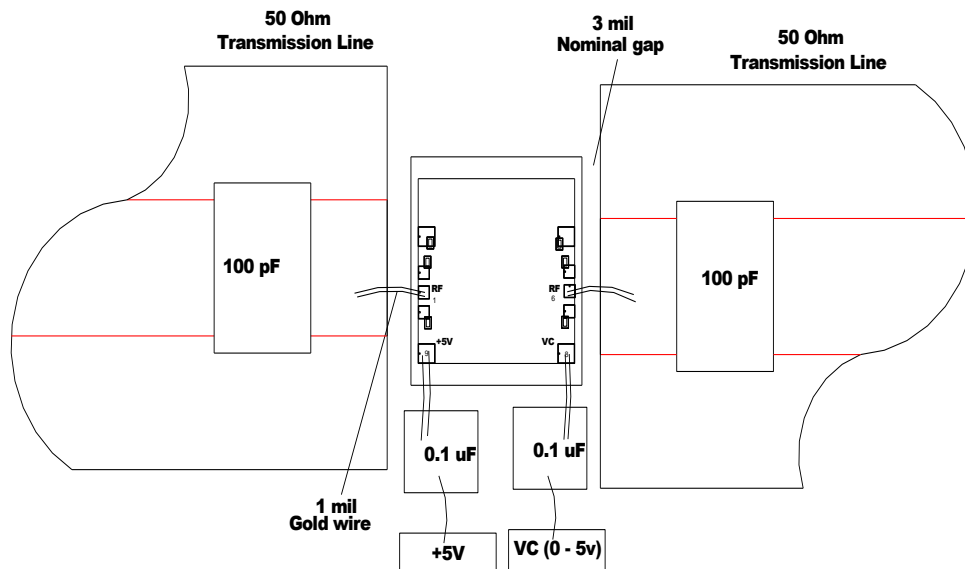
Units: millimeters (inches)

All RF and DC bond pads are 100 μ m x 100 μ m

Note:

1. Pad no. 1 : RF
2. Pad no. 3 : GND
3. Pad no. 4 : GND
4. Pad no. 6 : RF
5. Pad no. 8 : VC (0 – 5V)
6. Pad no. 9 : +5V

Recommended Assembly Diagram



Note:

1. DC blocking capacitors of 100- 200 pF are required on both RF ports.
2. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input and output.
3. Two 1 mil (0.0254mm) bond wires of minimum length should be used from chip bond pad to 100pF capacitor.
4. Input and output 50 ohm lines are on 5/10 mil substrate.
5. 0.1 μ 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 μ m length of wedge bonds is advised. Single Ball bonds of 250-300 μ 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