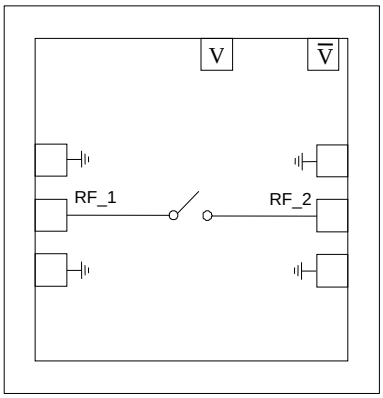
DC-20GHz Reflective SPST Switch

Features

- **DC-20GHz Broadband performance**
- **Low Insertion Loss:1.0dB@20GHz**
- **High Isolation: 40dB (min)**
- **1.2:1 Input/Output VSWR**
- **Pin @1dB 21dBm**
- **Fast Switching Speed**
- **0.15µm InGaAs pHEMTs Technology**
- **Chip size: 1.5 x 0.7x 0.1 mm**

Functional Diagram



Typical Applications

- **Broadband Communication**
- **Electronic warfare**
- **Military & Space**
- **Instrumentation Applications**

Description

The ASL8000 is a high performance Gallium Arsenide monolithic single pole single throw broadband RF switch. The switch features a very low insertion loss of 1dB at 20GHz and 40dB isolation up to 20GHz. The switch operates using -5/0 V complimentary control voltages.

The die is fabricated using a highly reliable and high performance InGaAs 0.15µm pHEMT Technology. This SPST switch is ideal for use in broadband communications.

Absolute Maximum Ratings (1)

Parameter	Absolute Maximum	Units
RF input Power	25	dBm
Max Control voltage	-8	V
Operating temperature	-55 to +85	°C
Storage Temperature	-65 to +150	°C

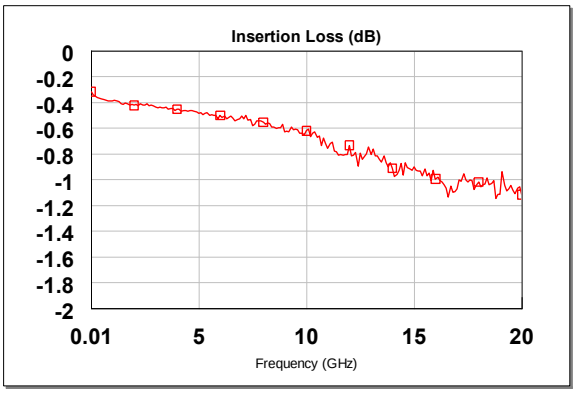
1. Operation beyond these limits may cause permanent damage to the component

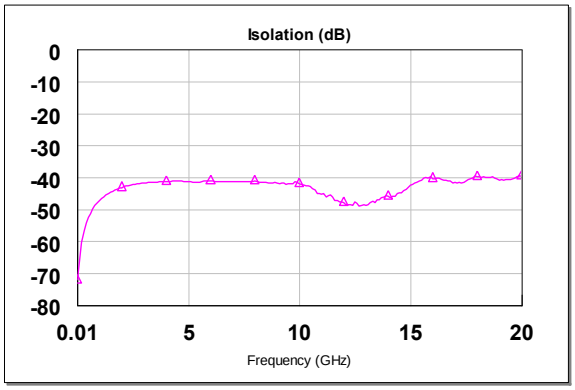
Electrical Specifications @ T_A = 25 °C, Z_o =50 Ω

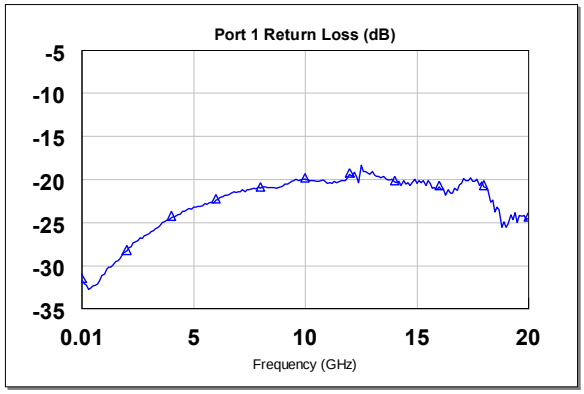
Parameter	Min.	Typ.	Max.	Units
Frequency	DC		20	GHz
Insertion Loss	-	1.0	-	dB
Isolation	-	40	-	dB
Input VSWR	-	1.2:1	-	Ratio
Output VSWR	-	1.2:1	-	Ratio
Input power @ P-1dB GCP	-	21	-	dBm
Control Voltage	-	-5 & 0	-	V
Switching speed	-	< 10	-	ns

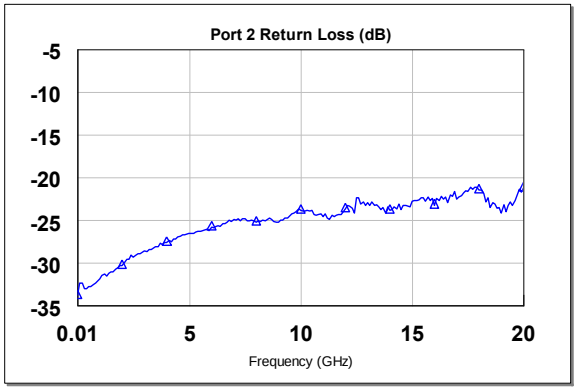
On-Wafer Measured data

T_A = 25 °C, Z_0 = 50Ω, Control Voltages = -5 & 0V





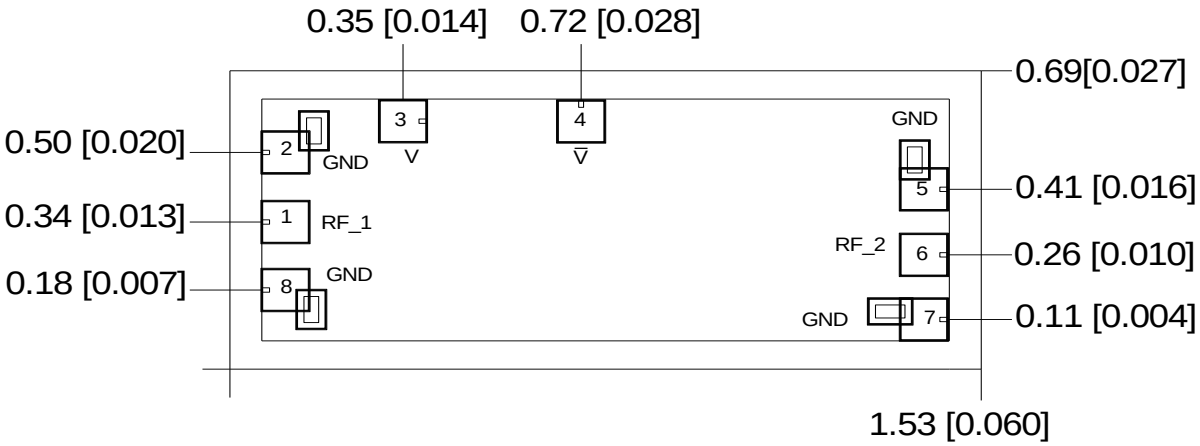




Truth Table

V	$\overline{V}$	RF_1 to RF_2
0V	-5V	Insertion loss
-5V	0V	Isolation

Mechanical Characteristics



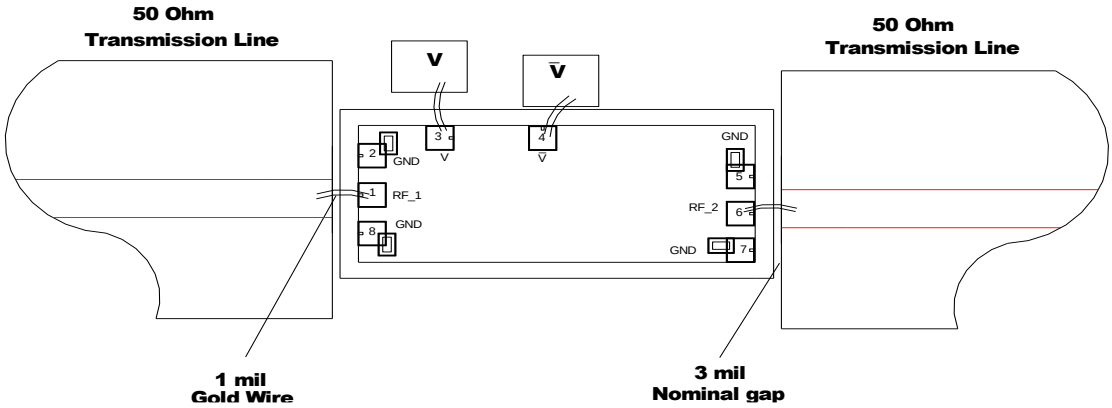
Units: millimeters (inches)

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

Note:

1. **Pad no. 1 : RF_1**
2. **Pad no. 3 : V (-5/0 V)**
3. **Pad no. 4 : $\overline{V}$ (0/-5 V)**
4. **Pad no. 6 : RF_2**

Recommended Assembly Diagram



Note:

1. All bond wire lengths should be of minimum length (~ 250µm).

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