

## DC-20GHz High Power GaN SPDT Switch

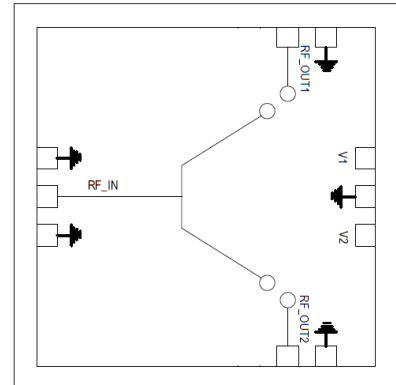
### Features

- ◆ Frequency Range: DC- 20GHz
- ◆ Low Insertion Loss: 2.5 dB (Max)
- ◆ Isolation: >45 dB
- ◆ Input & Output Return Loss: > 10 dB
- ◆ Input P1dB: 5Watt
- ◆ Die Size:2.2mm×2.0mm×0.1mm

### Typical Applications

- ◆ Radar
- ◆ Military & Space
- ◆ Instrumentation

Functional Diagram



### Description

The GaN based ASL 8008 is a high power wide band Reflective single pole double through (SPDT) Switch covering DC-20GHz. The Switch features greater than 45dB Isolation and <2.0dB insertion loss up to 20GHz. The input power for 1dB compression is 5watt at midband. The Switch operates on 0 & -40V for ON & OFF states.

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

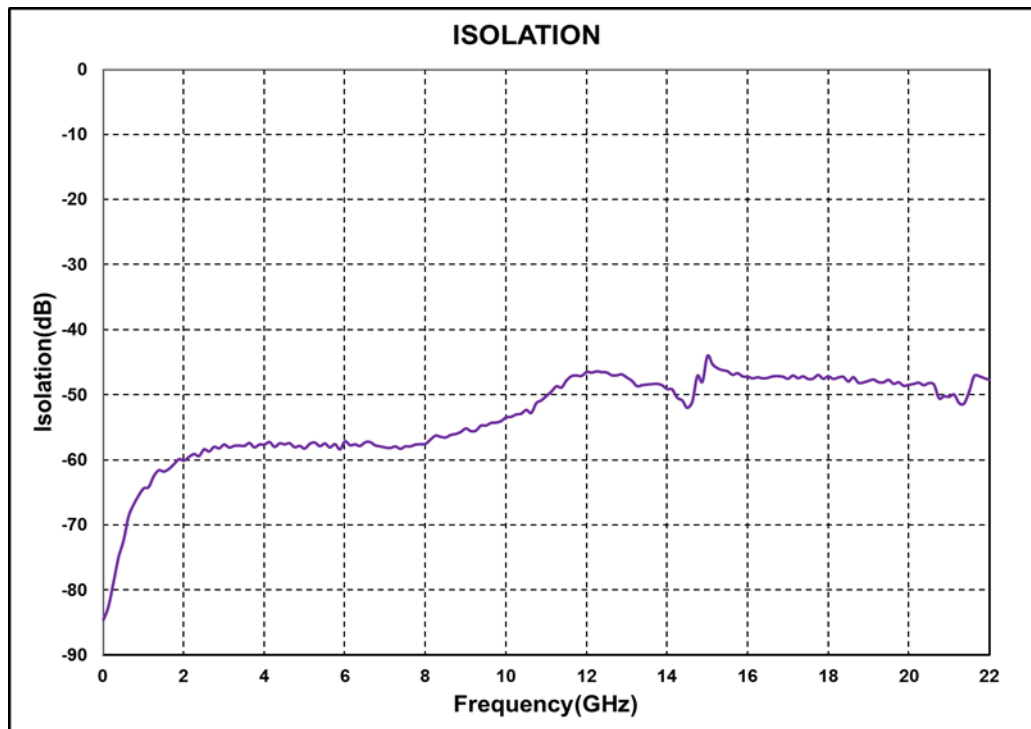
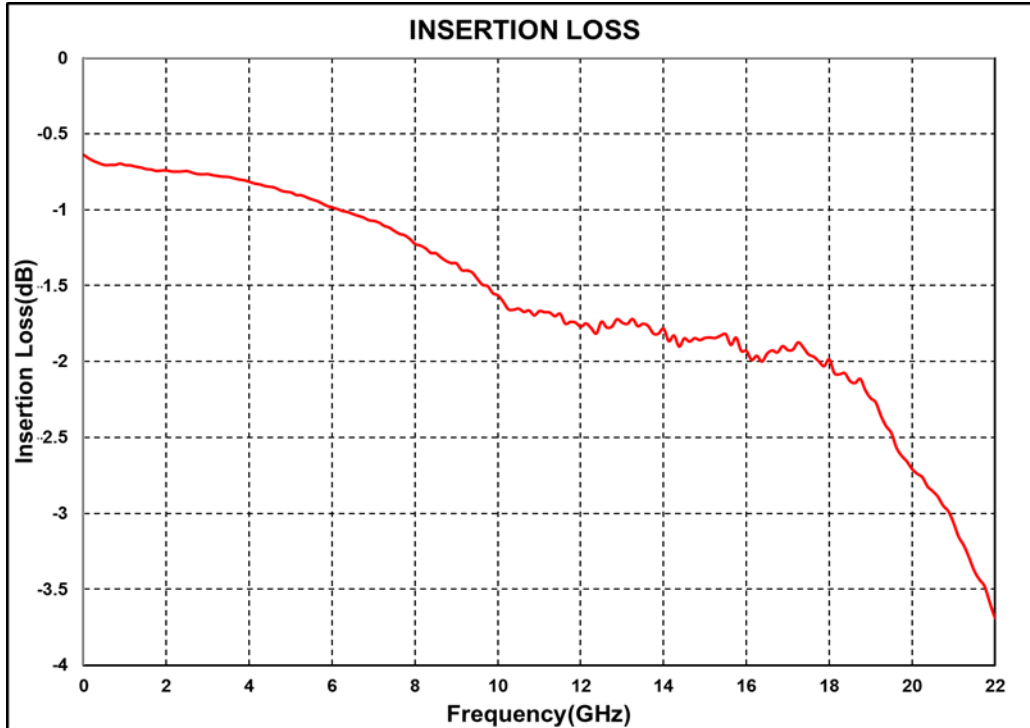
Parameter	Absolute Maximum	Units
RF Input Power	+42	dBm
Control Voltage		
ON State	2	V
OFF State	-60	V
Operating temperature	-50 to +85	°C
Storage Temperature	-65 to +150	°C

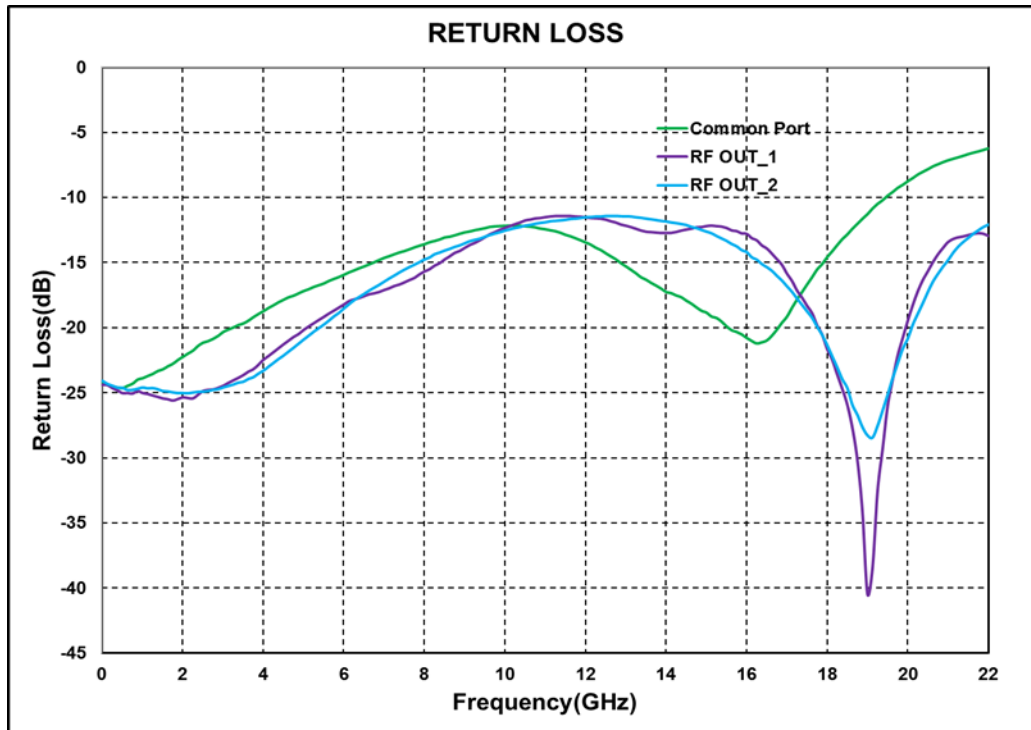
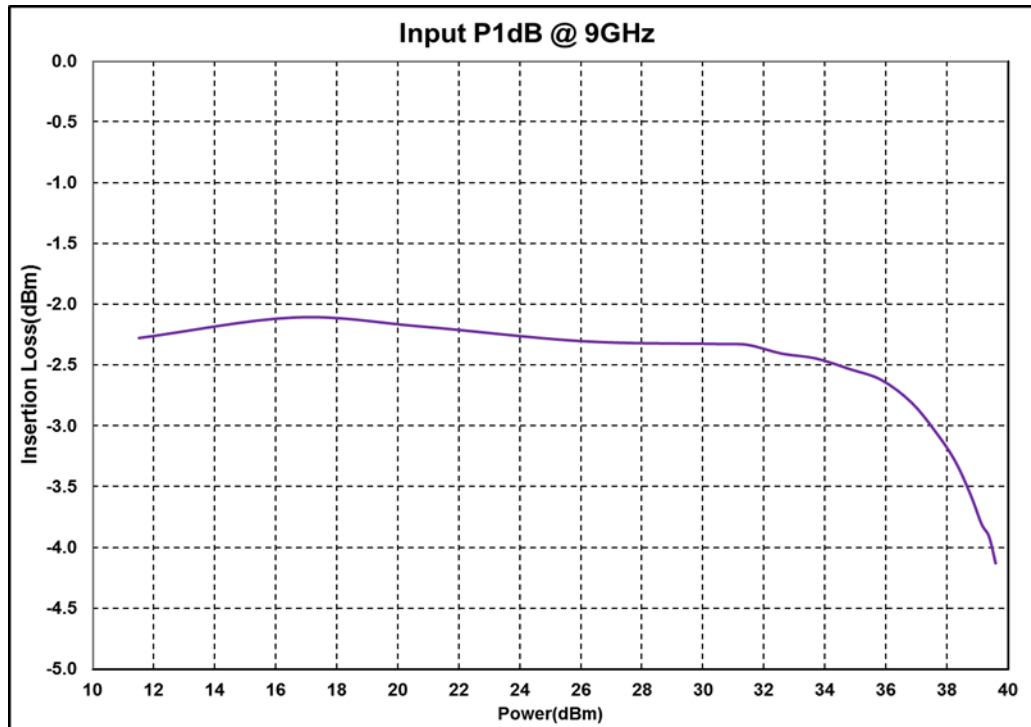
1. Operation beyond these limits may cause permanent damage to the component

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

Parameter	Typical Values	Units
Frequency Range	DC - 20.0	GHz
Insertion Loss	2.5	dB
Input Return Loss	10	dB
Output Return Loss	10	dB
Isolation	45	dB
Input P1dB	5	Watt
Control Voltages ON State OFF State	0 -40	V

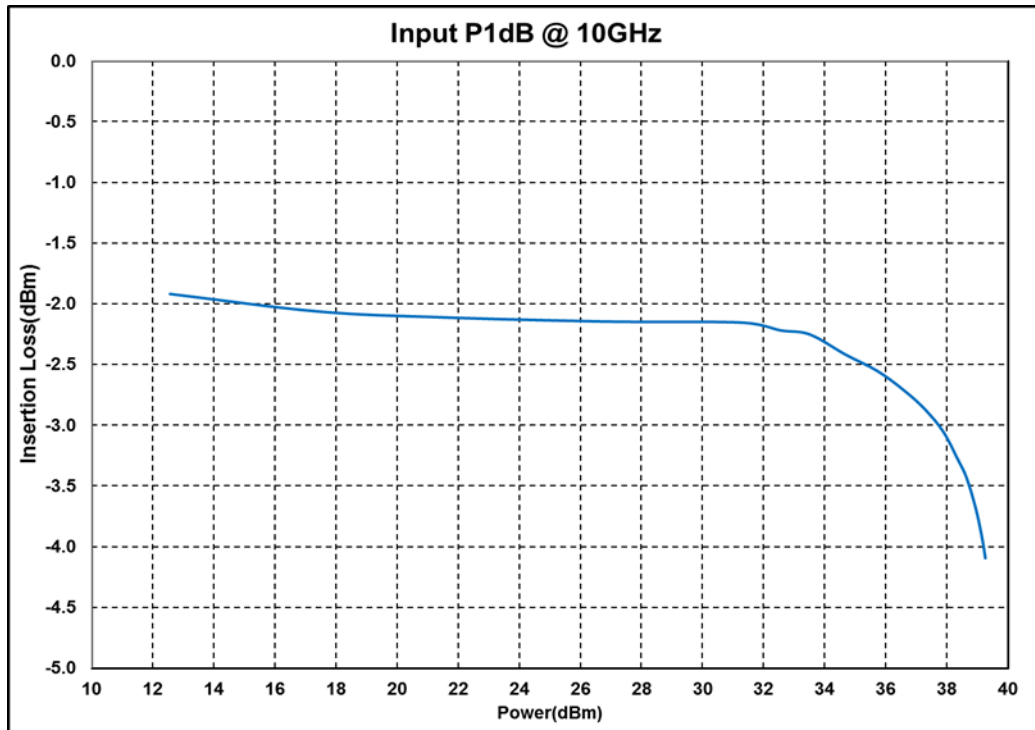
**Note:** The Input P1dB is measured at 9 & 10GHz

**On Wafer Probed Data** $T_A = 25^\circ\text{C}$ ,  $Z_o = 50\ \Omega$ 

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**Test Fixture Data**
 $T_A = 25^\circ\text{C}$ ,  $Z_o = 50\ \Omega$ 


### Test Fixture Data

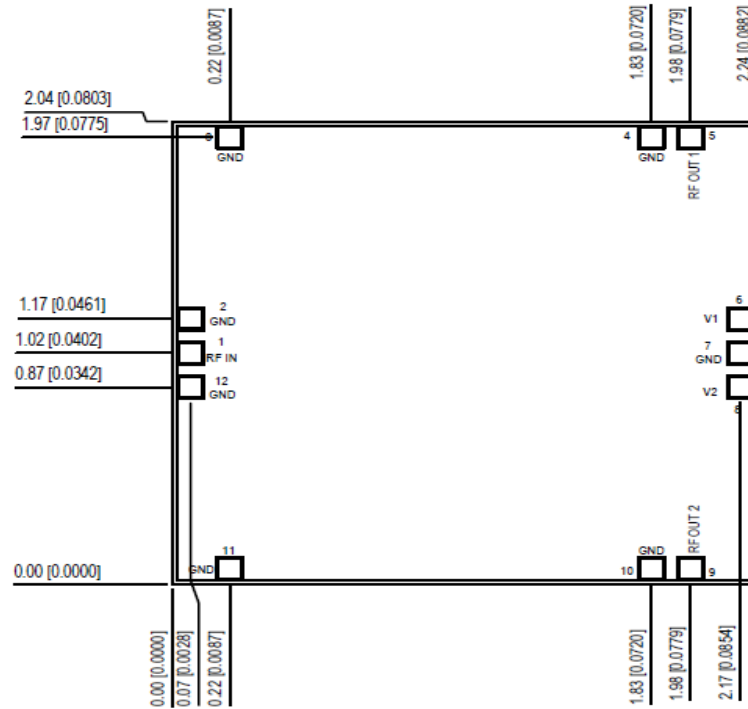
$T_A = 25\text{ }^\circ\text{C}$ ,  $Z_o = 50\ \Omega$



## Truth Table

Control Input		Signal Path	
V1	V2	RF IN to RF OUT1	RF IN to RF OUT2
0	-40	ON	OFF
-40	0	OFF	ON

## RF and DC Pad Details

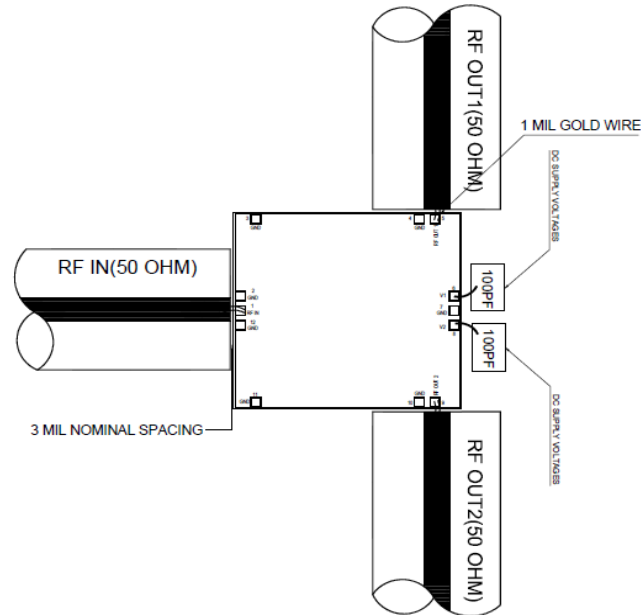


**Units** : millimeters (inches)

**Note:**

1. All RF and DC bond pads are 100 $\mu$ m x 100 $\mu$ m
2. Pad no. 1 : RF IN
3. Pad no. 2,3,4,7,10,11 : GND
4. Pad no. 5 : RF OUT1
5. Pad no.6 : V1
6. Pad no.8 : V2
7. Pad no.9 : RFOUT2

## Recommended Assembly Diagram


**Note:**

1. Two 1 mil (0.0254mm) bond wires of minimum length should be used for RF input, RF output.
2. Input and output 50 ohm lines are preferably on 5mil or 10mil RT Duroid substrate.
3. The RF input & output ports are DC decoupled on-chip.
4. Coefficient of thermal expansion matching is recommended for reliability purpose.
5. Use high thermal conductive material for die mounting for long term reliability.
6. Maintain base plate temperature less than 70°C under RF operation for optimum performance.

**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 flux less 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.



***GaN 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. Before using the product, please download and refer to latest datasheet from website.