

## FEATURES

- Broadband, Q,V,E, and W-band
- <6 dB insertion loss
- 20 dB dynamic range
- Absorbing / matched in OFF-state

## TYPICAL APPLICATIONS

- E-band point-to-point radio
- Active imaging
- Automotive radar
- Instrumentation

## DESCRIPTION

gSSD0011 is a single pole double through switch that operates from 32 to 110+ GHz . The switch is absorbing, so that the ports are matched in both ON- and OFF-state.

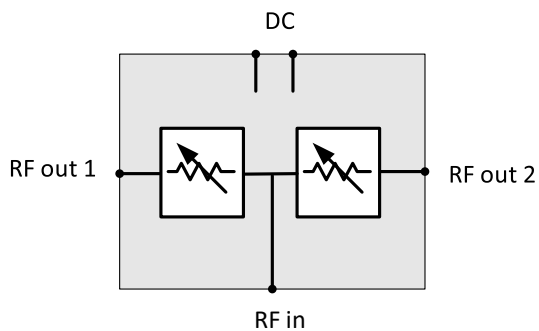


Figure 1. Block diagram of the SPDT switch

## ELECTRICAL PERFORMANCE

Table 1. Electrical performance  $T_A=25^\circ\text{C}$

Parameter	Min	Typ	Max	Unit
RF frequency	32		110	GHz
Minimum insertion loss	18	21	23	dB
Maximum insertion loss (OFF)	4.5	5	6.5	dB
Isolation output ports		TBD		dB
Dynamic range	17	20	25	dB
P1dB		TBD		dBm
PSAT		TBD		dBm
OIP3		TBD		dBm
OIP2		TBD		dBm
Input return loss, output 2 open	8	10		dB
Output 1 return loss, output 2 open	7	8	20	dB
Power consumption		0		mW

## MEASURED PERFORMANCE

Measurements have been performed on-wafer with a 110 GHz VNA.

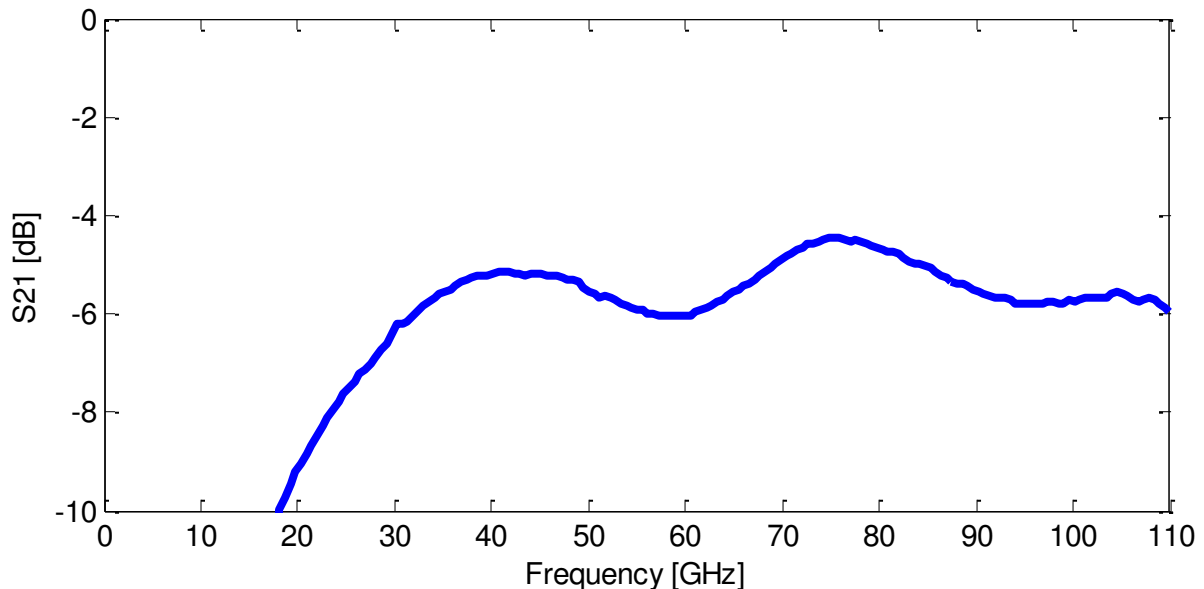


Figure 1. Insertion loss Input port to Output port 1, ON-state. Port 2 open.  $V_{G1} = -1.2\text{ V}$ ,  $V_{G2} = 0\text{ V}$ .

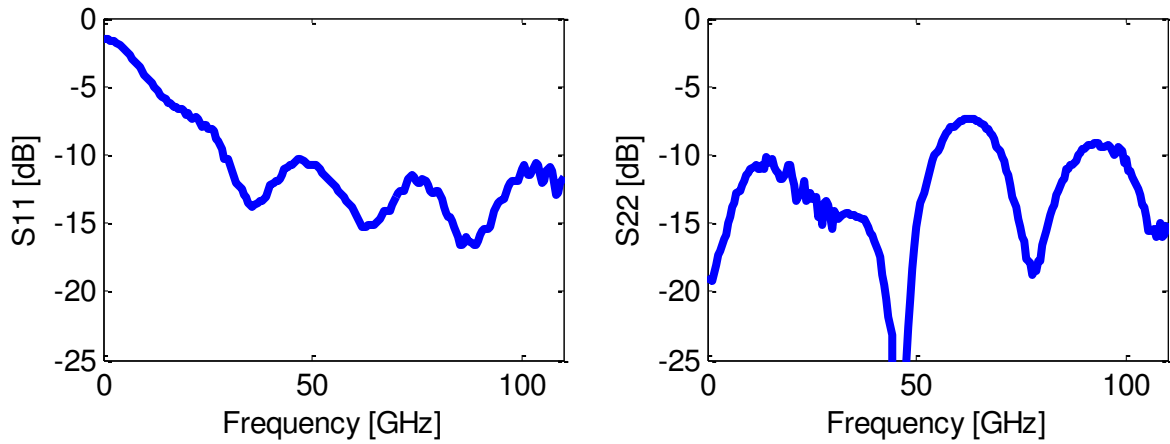


Figure 2. (Left): Input matching of the RF in-port. (Right): Output matching of the RF out 1 port.

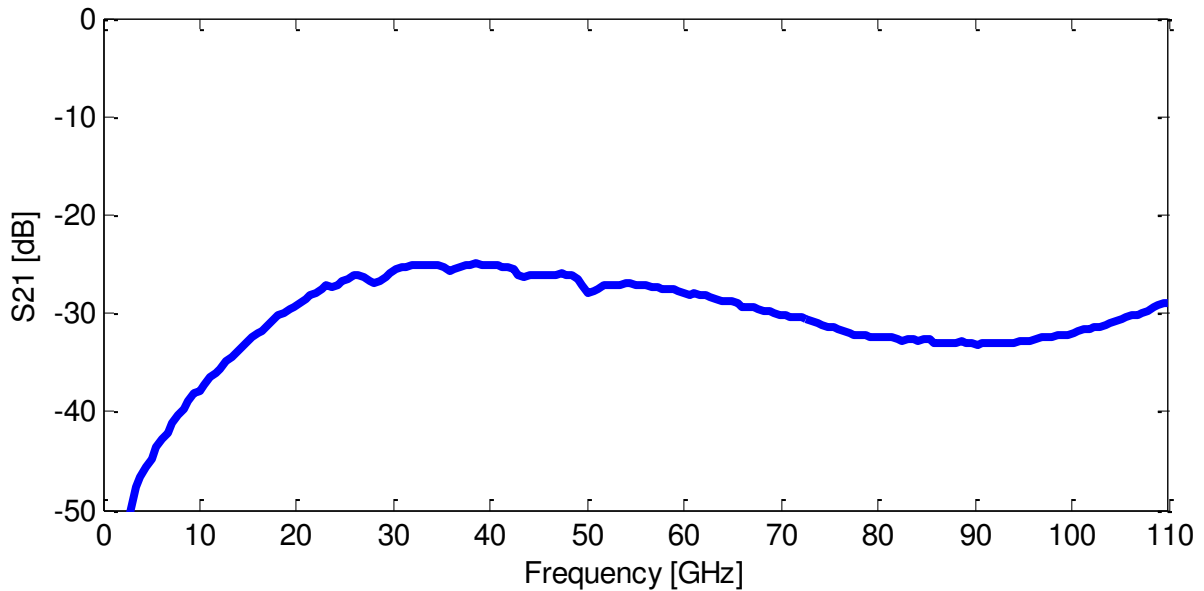


Figure 3. Insertion loss Input port to Output port 1, OFF-state. Port 2 open. VG1 = -0 V, VG2 = 0 V.

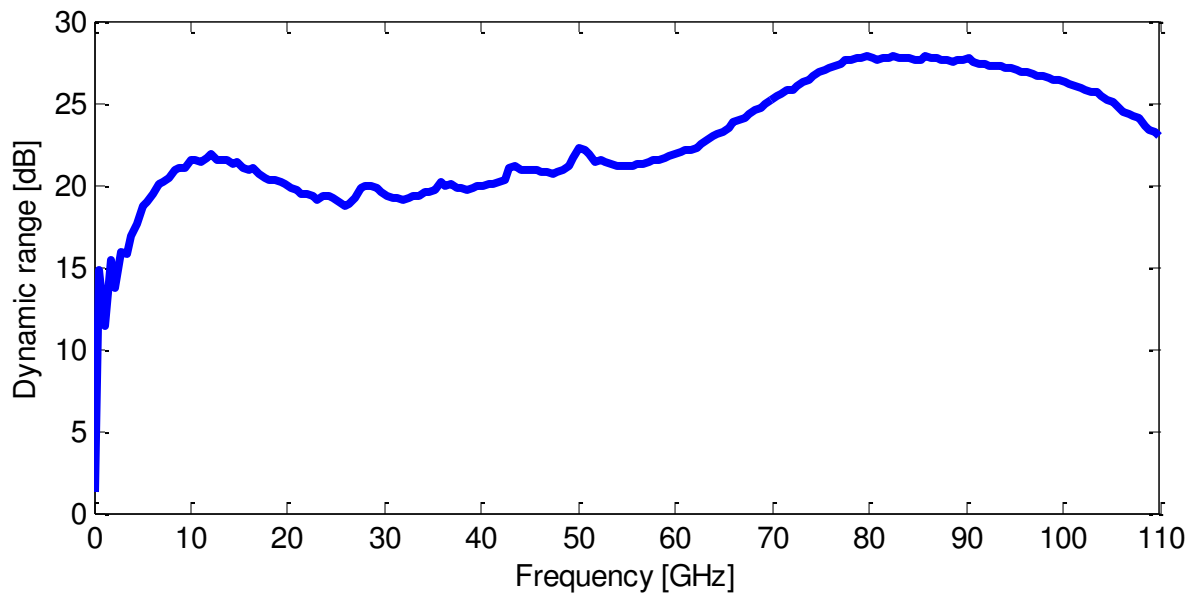


Figure 4. Insertion loss dynamic range (ON-OFF).

## SETTINGS

The bias sequence is to first apply all gates (VG...) followed by all drains (VD...). The typical drain current should be obtained by adjusting the corresponding gate. The stated drain currents are when all input signals are off.

Table 2. Electrical settings on connector P1

Connector P1	Pad No.	Settings	Function
GND	1		Ground
RF_OUT2	2	Z <sub>0</sub> = 50 Ohm, AC coupled	Output
GND	3		Ground

Table 3. Electrical settings on connector P2

Connector P2	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
VG2	1	-1.2 (ON)		0 (OFF)	Input
N/A	2				
GND	3				Ground
N/A	4				
VG2	5	-1.2		0	Input

Table 4. Electrical settings on connector P3

Connector P3	Pad No.	Settings	Function
GND	1		Ground
RF_OUT2	2	$Z_0 = 50 \text{ Ohm}$ , AC coupled	Output
GND	3		Ground

Table 5. Electrical settings on connector P4

Connector P4	Pad No.	Settings	Function
GND	1		Ground
RF_IN	2	$Z_0 = 50 \text{ Ohm}$ , AC coupled	Output
GND	3		Ground

Table 6. Absolute maximum ratings

Gate-source voltage	-2 to +0.7 V
RF input power	+15 dBm
Operating temperature	-40 to + 85°C
Storage temperature	-65 to +150°C

## OUTLINE DRAWING

Mechanical drawing with pad locations is also available in dxf-file format on the web. Substrate thickness is 50  $\mu\text{m}$  (GaAs).

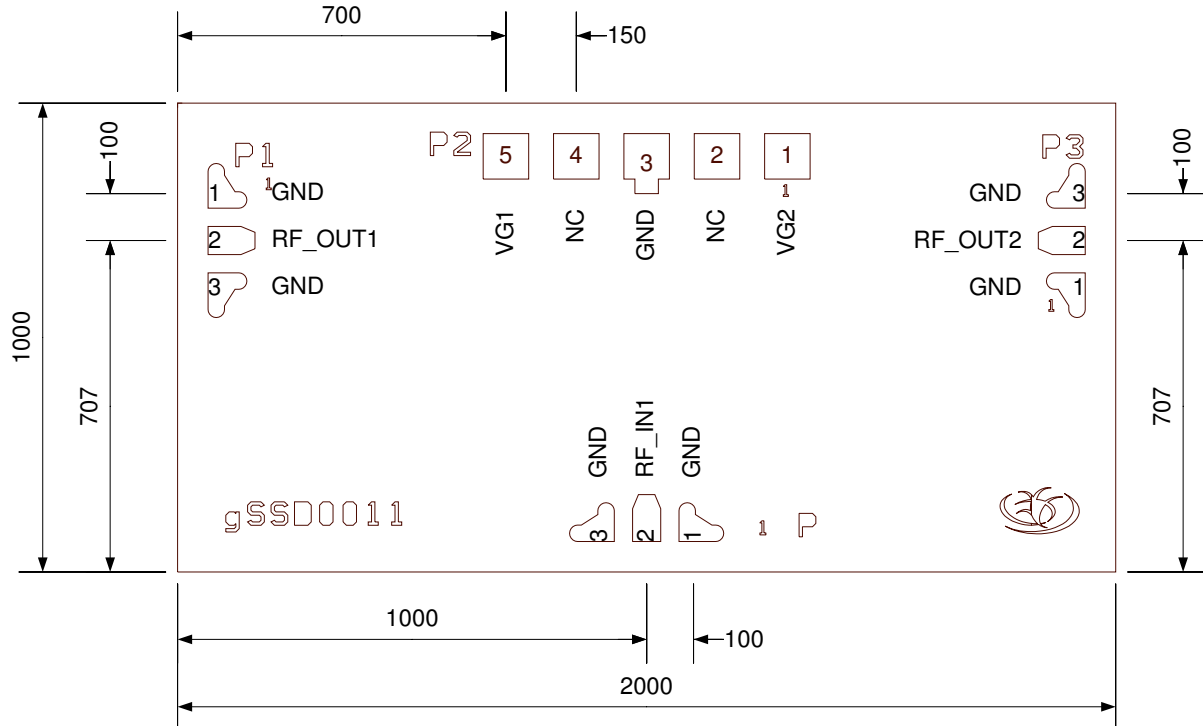


Figure 5. Outline drawing of the gSSD0011 MMIC. Dimensions are in  $\mu\text{m}$ .