Features

- Full V and E-band coverage
- 2.5 dB insertion loss
- 25 dB dynamic range
- Very fast switching speed
- Absorbing / matched in ON and OFF-state

Typical applications

- E-band point-to-point radio
- Active imaging
- Automotive radar
- Fiber over radio
- Test and measurements

Description

The gSSS0015 is a Single Pole Single Throw Switch with wideband characteristics. It features good insertion loss and excellent isolation up into the W-band. The return loss is also good across the entire band 40 to +110 GHz in both ON and OFF-state
It also works as a voltage variable attenuator.

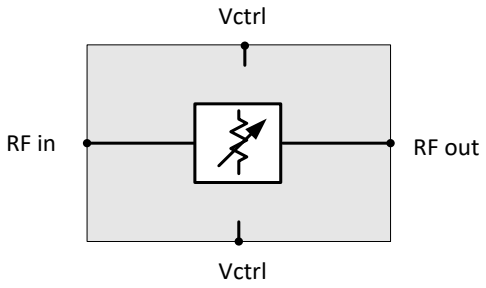

Figure 1. Block diagram of the switch

Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden.
http://www.gotmic.se/

Electrical performance

Table 1. Electrical performance T_A=25°C

Parameter	Min	Typ	Max	Unit
RF bandwidth	40		110	GHz
Insertion loss		2.5		dB
Input return loss		>12		dB
Input return loss		>12		dB
Isolation, max		26		dB
Linearity OIP3 ON/OFF		25 / -7		dBm
Switching time, estimated		20		ps
Control voltage	-1.5		0	V
Max input power		15		dBm
Dynamic range		25		dB
Power consumption		0		mW

Measured performance

Measurements have been performed on-wafer with VNA, T_A = 25°C and typical bias settings if not specified differently.

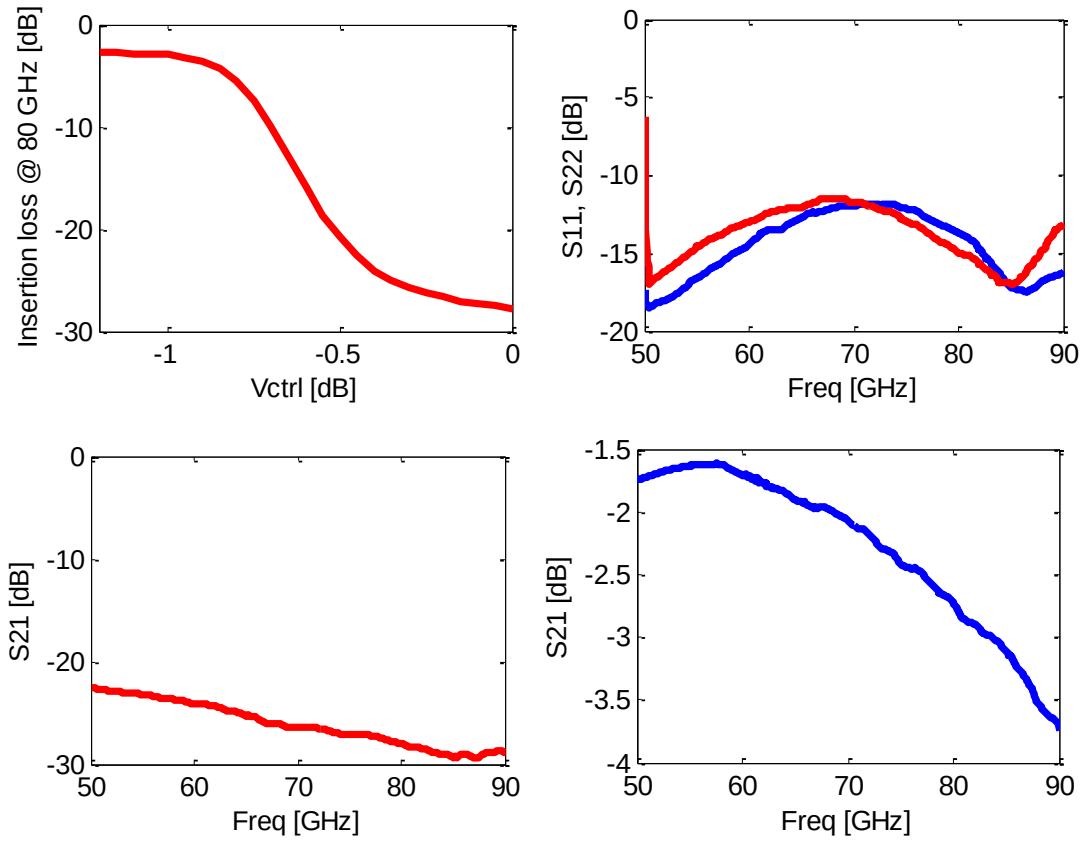

Figure 1. (Upper left): Insertion loss vs control voltage @ 80 GHz
(Upper right) Return loss.
(Lower left): Insertion loss OFF state (Vctrl = -1.2 V).
(Lower right) Insertion loss ON state.

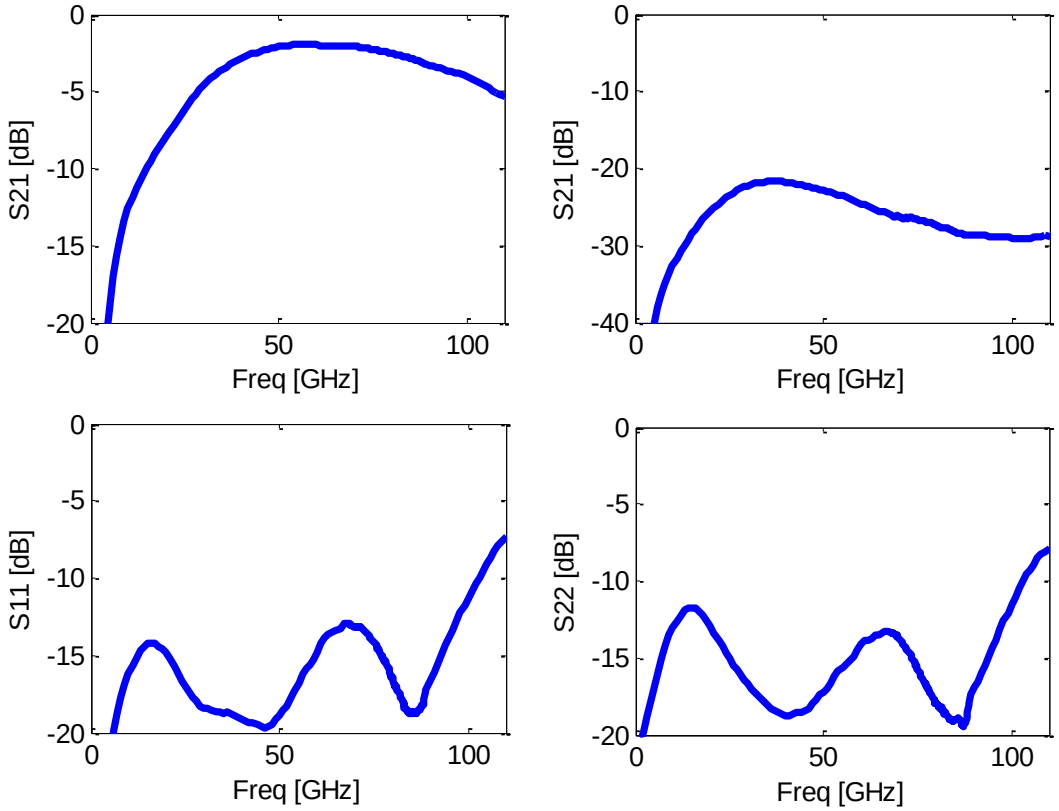

Figure 2. (Upper left): Insertion loss ON state, 0 – 110 GHz
(Upper right): Insertion loss ON state, 0 – 110 GHz
(Lower left): Input return loss
(Lower right) Input return loss

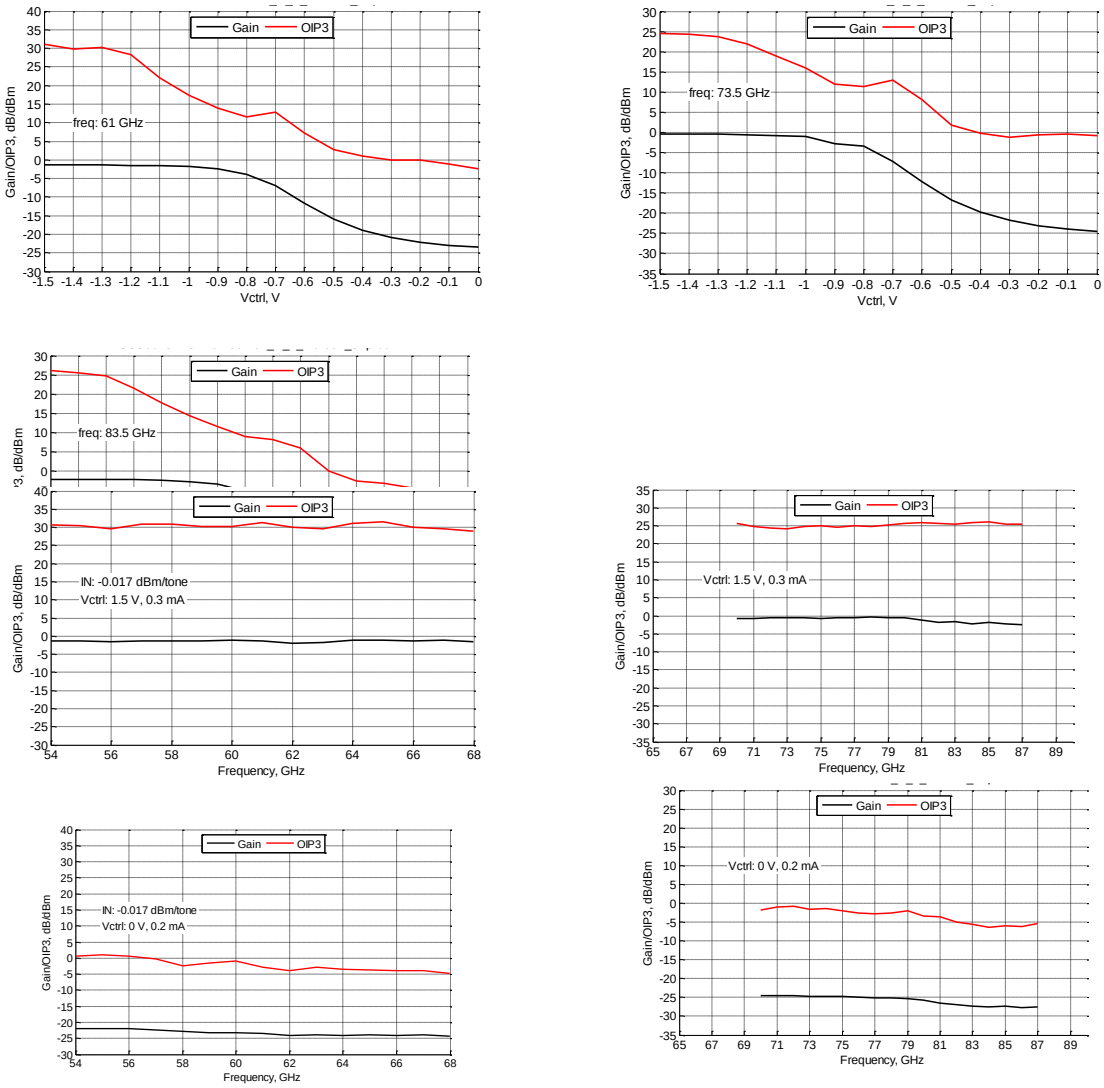

Figure 3. (Upper left): Gain and OIP3 vs Vctrl @ 61 GHz
(Upper right): Gain and OIP3 vs Vctrl @ 73.5 GHz
(Lower left): Gain and OIP3 vs Vctrl @ 83.5 GHz

Figure 4. (Upper): Gain and OIP3 vs freq in ON
(Lower): Gain and OIP3 vs freq in 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 RF in (West)

Connector P1	Pad No.	Settings	Function
GND	1		Ground
RF	2	Z_0 = 50 Ohm, AC coupled	Output
GND	3		Ground

Table 3. Electrical settings on connector P2 (North)

Connector P2	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
GND	1		Ground		
VCTRL	1	-1.5	-1.2 – 0	0	Input
GND	1		Ground		

Table 4. Electrical settings on connector P3 (East)

Connector P3	Pad No.	Settings	Function
GND	1		Ground
RF	2	Z_0 = 50 Ohm, AC coupled	Output
GND	3		Ground

Table 5. Electrical settings on connector P4 (South)

Connector P4	Pad No.	Bias settings (V / mA)			Function
		Min	Typ	Max	
GND	1		Ground		
VCTRL	1	-1.5	-1.2 – 0	0	Input
GND	1		Ground		

Table 6. Absolute Maximum Ratings

Control 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 µm (GaAs).

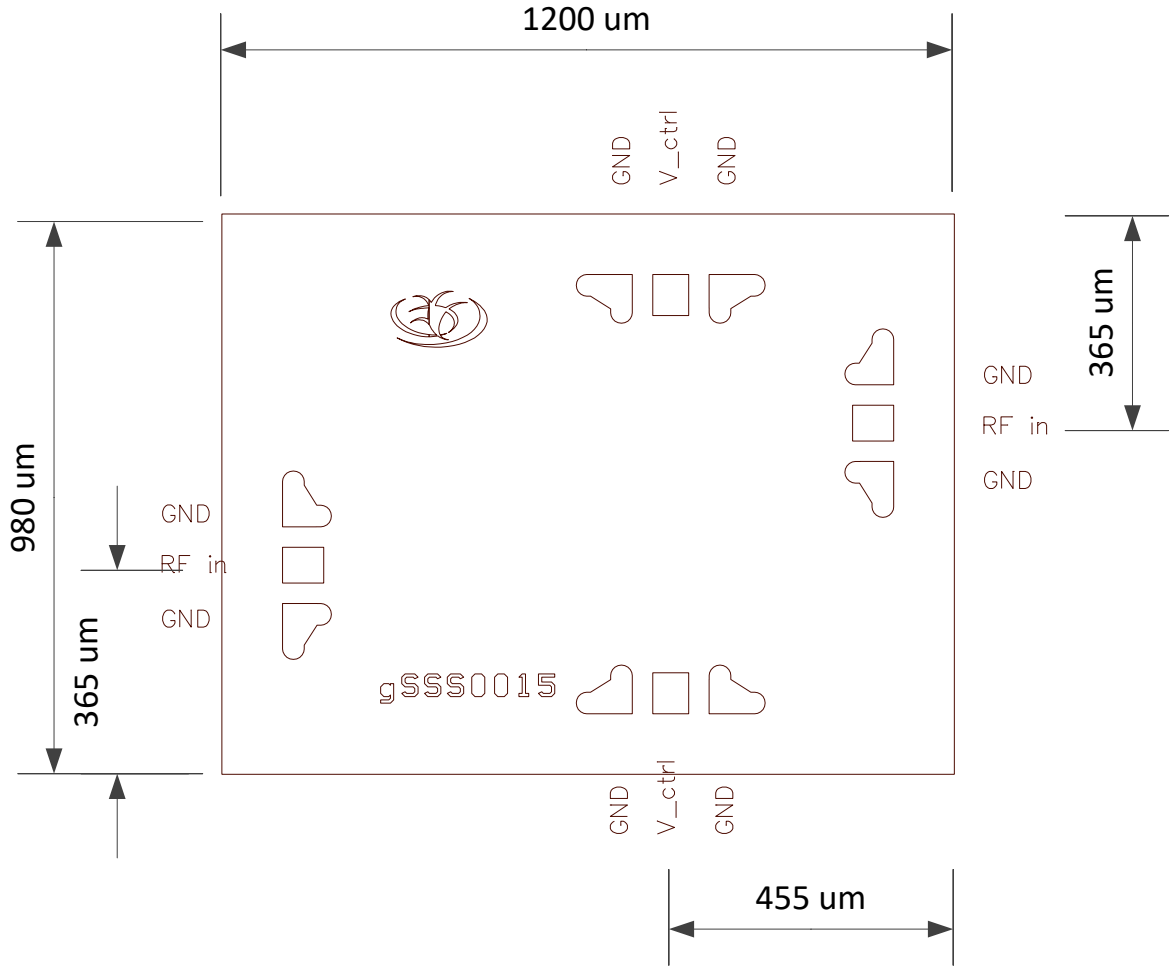

Figure 2. Outline drawing of the MMIC. Dimensions are in um.