上海馥莱电子有限公司
021-5291 8556
137 6444 1515
sales@fulai-elec.com
www.fulai-elec.com

gSSS0013
V- and W-band SPST switch / variable attenuator
40 – 110+ GHz

FEATURES

- Full V, E, and W-band coverage
- Good return loss >15 dB
- 2.5 dB insertion loss

DESCRIPTION

The gSSS0013 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.

It may also be used as a voltage variable attenuator.

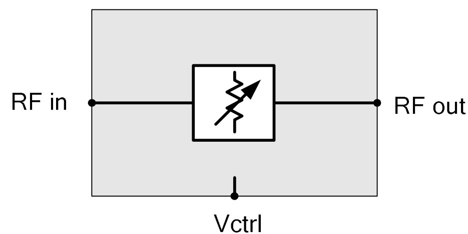


Figure 1. Block diagram of gSSS0013

TYPICAL APPLICATIONS

- 60 GHz UWB wireless communication.
- V-, E- and W-.and point to point communication links.
- 77 GHz automotive radar
- Instrumentation for V to W-band applications
- Other 40 to 110 GHz applications

Data and specification are subject to change without notice © 2017 Gotmic AB
Gotmic AB, Arvid Hedvalls Backe 4, S-411 33 Göteborg, Sweden. Tel: +46 (0) 31 184 030
http://www.gotmic.se/

上海馥莱电子有限公司
021-5291 8556
137 6444 1515
sales@fulai-elec.com
www.fulai-elec.com

Electrical Performance

Table 1. Electrical performance T_A=25C

Parameter	Min	Typ	Max	Unit
RF Frequency	40		110+	GHz
Insertion loss		2.5		dB
Dynamic range/isolation		25		dB
Power consumption		0		mW
OIP3		TBD		dBm
Input return loss	>12			dB
Output return loss	>10			dB

Measured Performance

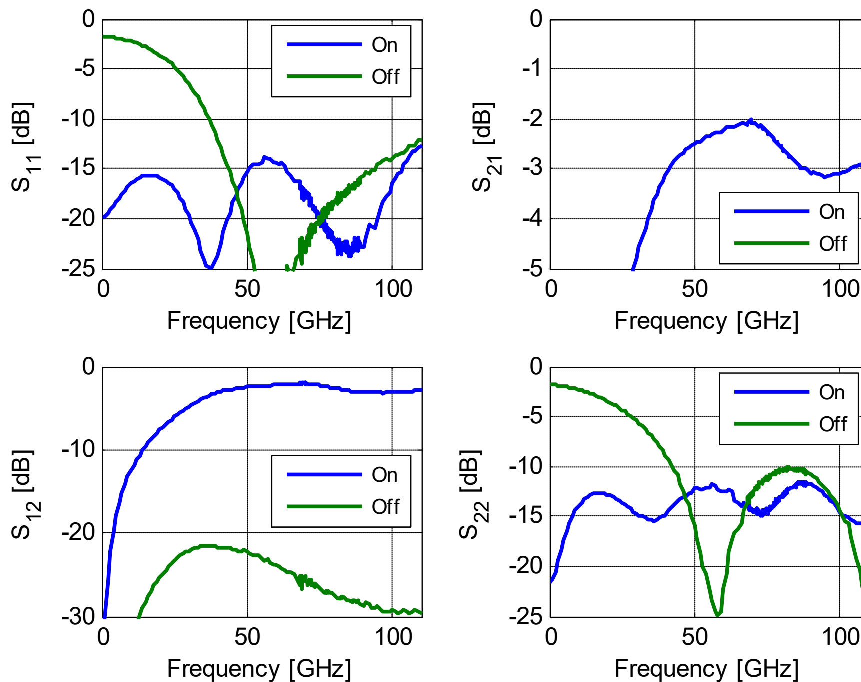


Figure 1. (Upper Left) Input return loss, (Upper Right) Min insertion loss, (Lower Left) Output return loss, (Lower Right) Insertion loss (On/Off) from 0 to 110 GHz.

上海馥莱电子有限公司
021-5291 8556
137 6144 1515
sales@fulai-elec.com
www.fulai-elec.com

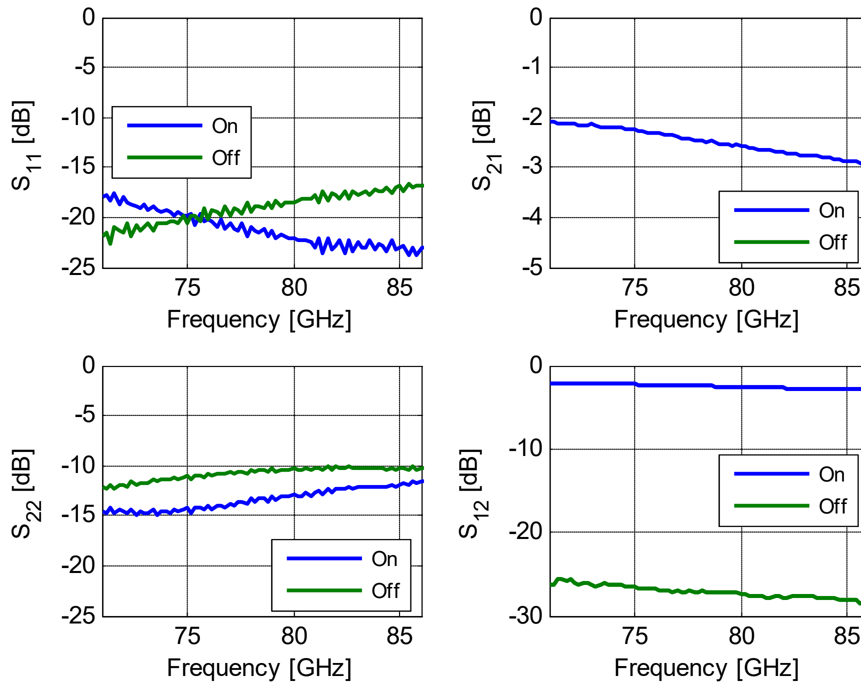


Figure 2. (Upper Left) Input return loss, (Upper Right) Min insertion loss, (Lower Left) Output return loss, (Lower Right) Insertion loss (On/Off) from 70 to 87 GHz.

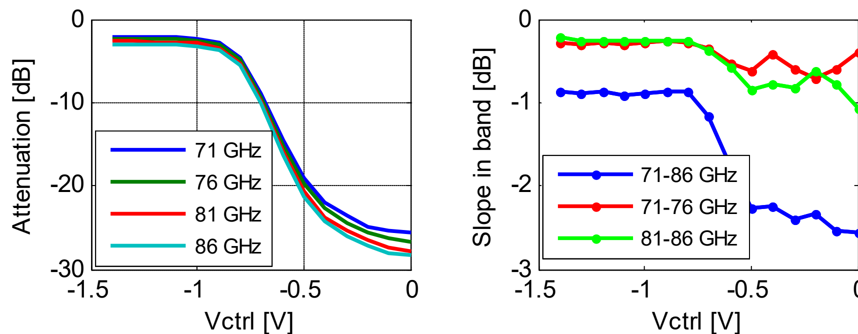


Figure 3. (Left) Attenuation vs control voltage at 71 to 86 GHz. (Right) In-band slope at different attenuations settings from 71 to 86 GHz.

RECOMMENDED OPERATING CONDITIONS

Bias should first be applied to the gates (VG…) followed by the drains (VD…). The gate voltages must be adjusted within the min/max range indicated in **Error! Reference source not found.**-5 to obtain the specified drain currents. The drain currents are stated with all input signals off.

Data and specification are subject to change without notice © 2017 Gotmic AB

上海馥莱电子有限公司
021-5291 8556
137 6144 1515
sales@fulai-elec.com
www.fulai-elec.com

Table 2. Electrical settings on connector P1

Connector P1	Pad No.	Interface	I/O
GND	1		Ground
RF	2	Z_0 = 50 Ohm, AC coupled	Output/ Input
GND	3		Ground

Table 3. Electrical settings on connector P2

Connector P1	Pad No.	Interface	I/O
GND	4		Ground
RF	5	Z_0 = 50 Ohm, AC coupled	Input/ Output
GND	6		Ground

Table 4. Electrical settings on connector P3

Connector P2	Pad No.	Bias settings (V/mA)			I/O
		Min	Typ	Max	
VCTRL	7	-1.5	-	0	Input
GND	8				Ground

Absolute Maximum Ratings

Table 5. Absolute Maximum Ratings

Gate bias voltage	-2 to + 0.7 V
Drain bias voltage	4.5 V
Max input power	+ 15 dBm
Operating temperature	-40 to + 85 C
Storage temperature	-65 to +150 C

上海馥莱电子有限公司
021-5291 8556
137 6444 1515
sales@fulai-elec.com
www.fulai-elec.com

OUTLINE DRAWING

Distances are in µm. Drawing is also available in dxf-file format on the web. The substrate thickness is 50 µm (GaAs).

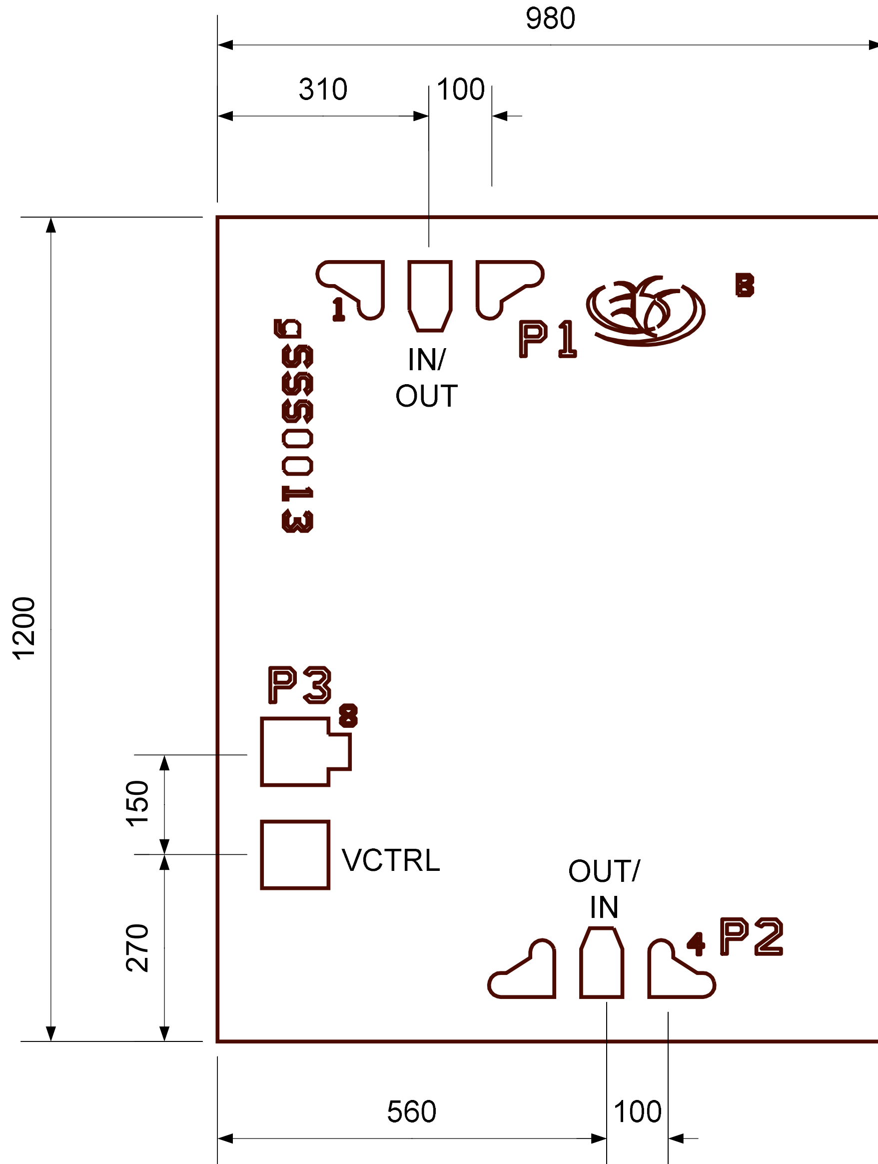
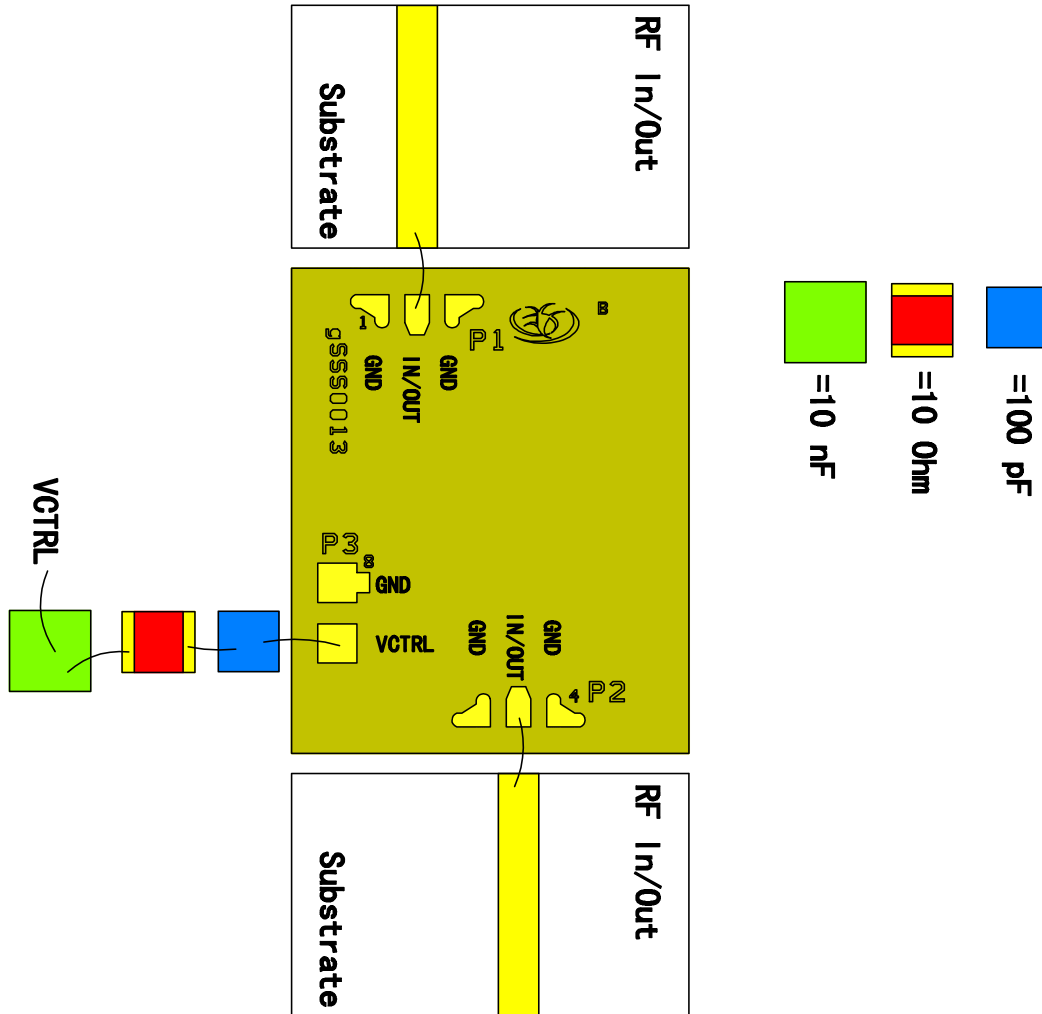


Figure 4. Outline drawing of the gSSS0013B.

Data and specification are subject to change without notice © 2017 Gotmic AB

上海馥莱电子有限公司
021-5291 8556
sales@fulai-elec.com
www.fulai-elec.com



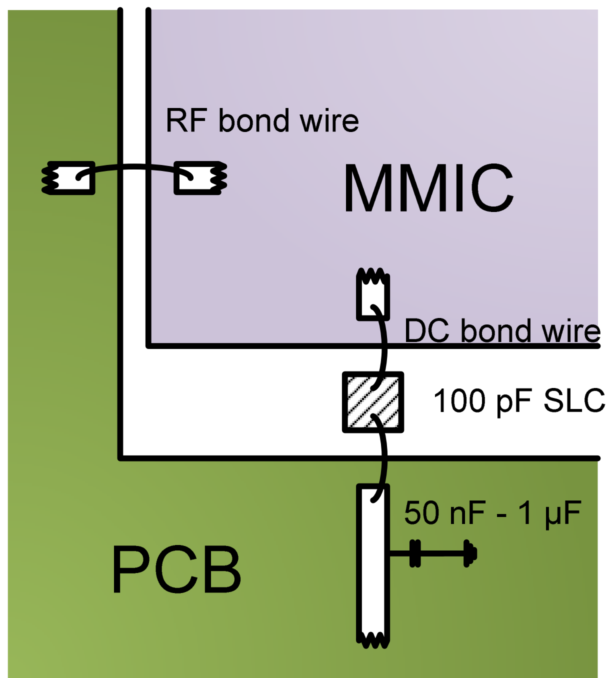
上海馥莱电子有限公司
021-5291 8556
137-6444-1515
sales@fulai-elec.com
www.fulai-elec.com

DIE ATTACH

The die mounting surface must be clean and flat. Our MMICs are all back metalized which also serves as ground. The back side must be both electrically and thermally connected using soldering or epoxy with high thermal and electrical conductivity. Using conductive silver filled epoxy, recommended epoxies are DieMat DM6030HK-PT/H579. Apply sufficient epoxy to meet required epoxy bond line thickness, epoxy fillet height and epoxy coverage around total die periphery. The thickness of our MMICs is 50 µm (2 mil). For the best RF performance, the circuit board line should be at the same height. It is recommended to use antistatic die pick up tools only.

WIRE BONDING

Bond pad openings in the surface passivation above the bond pads are provided to allow wire bonding to the square gold bond pads. Bond force, time, ultrasonic power and temperature are all critical parameters for good attachment.



We recommend using 25 µm (1 mil) diameter bond wires or 75 µm × 12.5 µm (3 × 0.5 mil) ribbons. The width of the RF pads on the MMIC is 72 µm and DC is 90 µm. All RF bondwires should be kept as short as possible and not exceeding 300 µm. Long bond wires will result in an undesirable series inductance that is difficult to compensate for over large bandwidths. Bondwires to DC pads should preferably also be kept as short as possible.

Figure 1. Assembly diagram

To the DC pads, we recommended first bonding to a 100 pF SLC capacitor and then to a 50 nF-1 µF capacitor onto the circuit board.

Table 1. Typical wire dimensions for wedge bonding

Parameter	Min	Typ	Max	Unit
RF bond wire diameter	17	25	25	um
RF bond wire length	0	150	300	um
DC bond wire diameter	17	25	75	um
DC bond wire length	0	300	2000	um