

Switch SPDT 6 - 18 GHz



CGY2890SUH/C1

Rev. V1

Features

- Insertion Loss: 1.5 dB @ 12 GHz
- Isolation: 50 dB
- Input Return Loss: 18 dB
- Output Return Loss: 16 dB
- Control Voltage: 0 / +5 V
- Chip Size: 1500 x 1200 μm
- Tested, Inspected Known Good Die (KGD)
- Samples Available
- Space & MIL-STD Available
- RoHS* Compliant

Applications

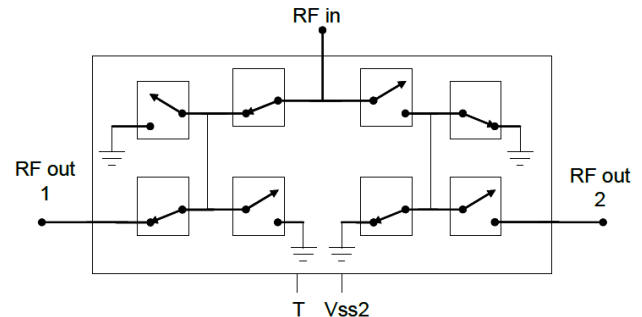
- Radar
- Telecommunication
- Instrumentation

Description

The CGY2890SUH/C1 is a high performance GaAs MMIC SPDT (Single-Pole Double-Throw) switch operating from 6 - 18 GHz.

The die is manufactured using the ED02AH 0.18 μm gate length pHEMT process. The MMIC uses gold bond pads, backside metallization and is fully protected with Silicon Nitride passivation to obtain the highest level of reliability. This technology has been evaluated for Space applications and is on the European Preferred Parts List of the European Space Agency .

Block Diagram



Ordering Information

Part Number	Package
CGY2890SUH/C1	DIE

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: Freq. = 6 - 18 GHz, $V_{SS2} = -5$ V, $I_{SS2} = 11$ mA, $T_A = +25^\circ\text{C}$

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Source Supply Voltage	VSS2 (V_{SS} pad is open) VSS (V_{SS2} pad is open)	V	-7.0 -5.0	-5.0 -3.5	-4.0 -3.0
Source Supply Current	—	mA	—	11	—
Insertion Loss	12 GHz	dB	—	1.5	—
Isolation	—	dB	—	50	—
Input Return Loss	All States, 50 Ω source	dB	—	18	—
Output Return Loss	All States, 50 Ω load	dB	—	16	—

Absolute Maximum Ratings^{1,2}

Parameter	Absolute Maximum
Input Power	TBD
Control Port	0 V to 5.5 V
Source Supply Voltage V_{SS} pad is open V_{SS2} pad is open	-7 V to 0.5 V -5 V to 0.5 V
Junction Temperature	+150°C
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +150°C

1. Exceeding any one or combination of these limits may cause permanent damage to this device.
2. MACOM does not recommend sustained operation near these survivability limits.

Logic Truth Table

$RF_{IN} = RF_{OUT1}$	On	Off
$RF_{IN} = RF_{OUT2}$	Off	On
T	0	1

Control Voltage (V)

State	Min.	Max.
Low (0)	0	1
High (1)	4	6

Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

Switch SPDT

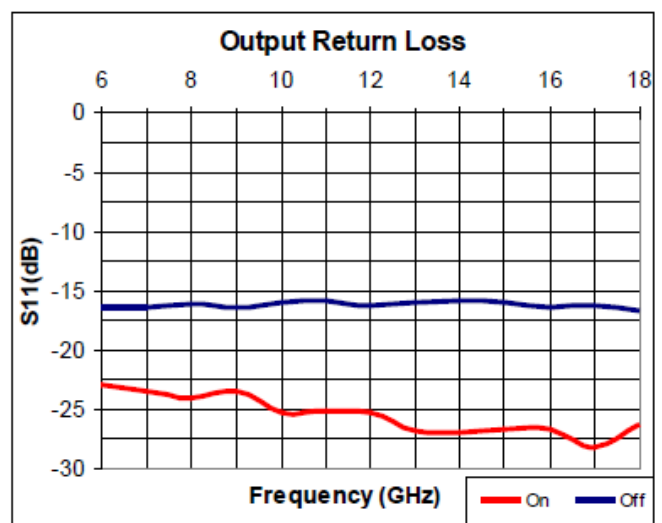
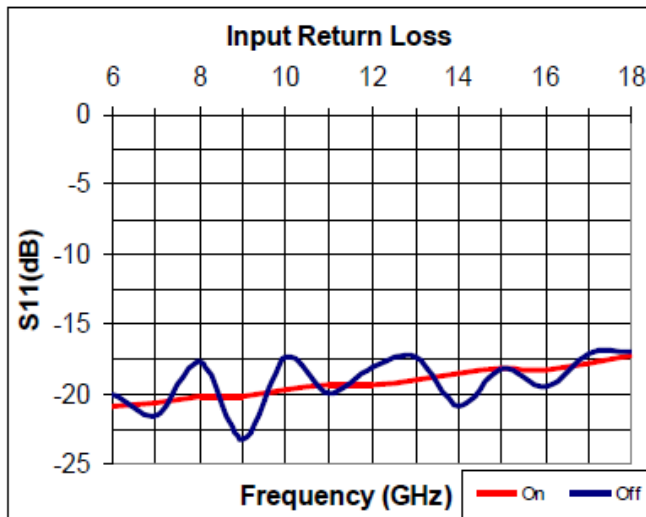
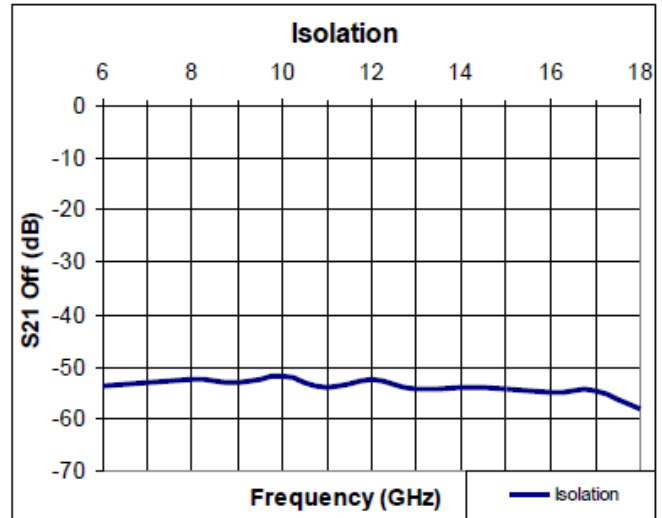
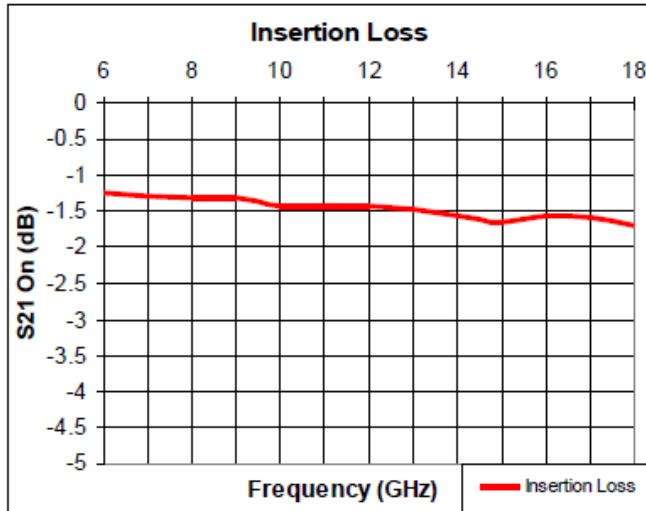
6 - 18 GHz



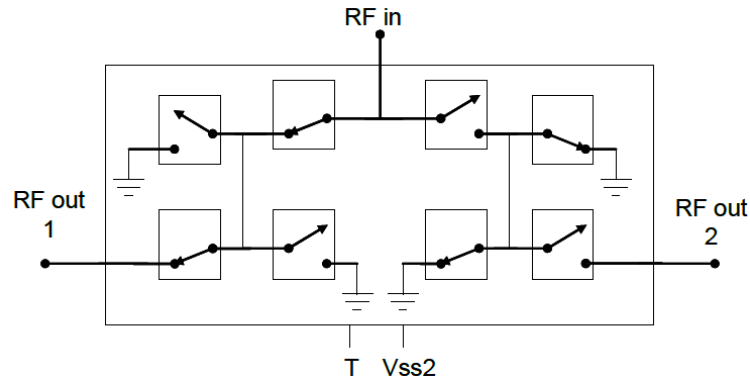
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Typical Performance Curves: On Wafer, $V_{SS2} = -5$ V



Block Diagram

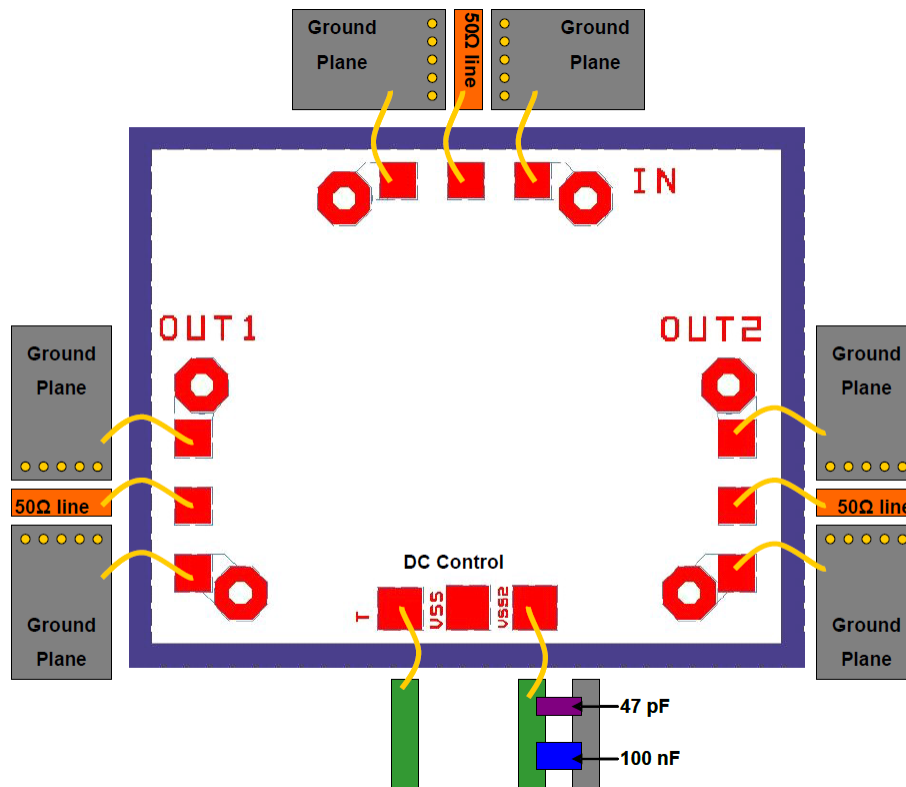


Pad Position³

Pad Name	Coordinate		Description
	X	Y	
GND	150	205	Ground (connected to MMIC back side metal)
RF _{OUT1}	150	355	RF Output 1
GND	150	505	Ground (connected to MMIC back side metal)
GND	600	1080	Ground (connected to MMIC back side metal)
RF _{IN}	750	1080	RF Input
GND	900	1080	Ground (connected to MMIC back side metal)
GND	1350	205	Ground (connected to MMIC back side metal)
RF _{OUT2}	1350	355	RF Output 2
GND	1350	505	Ground (connected to MMIC back side metal)
T	600	130	Switch Control
V _{SS}	750	130	V _{SS} supply voltage, V _{SS2} not connected
V _{SS2}	900	130	V _{SS2} supply voltage, V _{SS} not connected

3. Only V_{SS} or V_{SS2} is to be connected. For example, if V_{SS2} is connected, V_{SS} must be left open.

Bonding Diagram & Assembly Information



The RF interfacing bond wires or ribbon should be kept as short as possible. The RF lines should be 300 μm wide or less to minimize discontinuities associated with the connection to the MMIC bond pads.

The power supply (V_{SS} or V_{SS2}) must be decoupled to the ground with capacitors as close as possible to the chip.

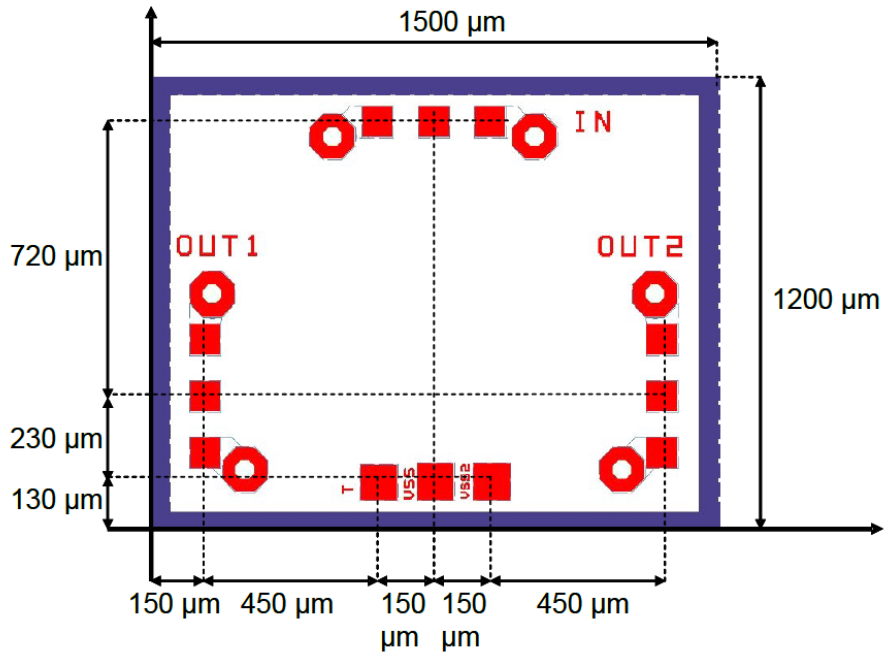
No decoupling on digital control pads.

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Die Outline



Chip Size = 1500 x 1200 μm
DC Pads = 100 x 100 μm spacing = 150 μm, top metal = Au
RF Pads = 100 x 100 μm spacing = 150 μm, top metal = Au
Chip Thickness = 100 μm

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