

PRELIMINARY DATASHEET

CGY2890SUH/C1 6 – 18 GHz SPDT Switch

DESCRIPTION

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

The CGY2890UH/C1 has a low insertion loss of 1.5 dB, with a better than 50 dB isolation across the operating frequency range. It is part of Ommic's new 6 - 18 GHz chipset that is dedicated to Radar, Telecommunication and Instrumentation applications.

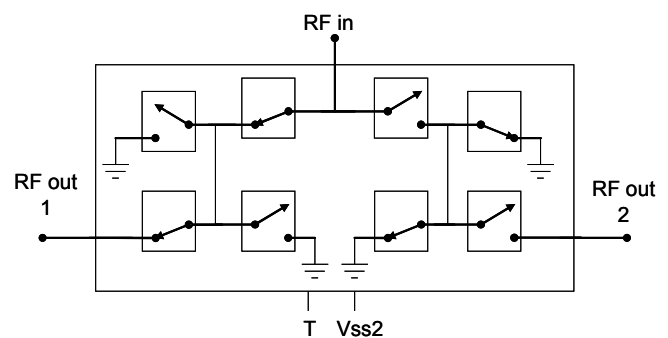
The die is manufactured using ED02AH OMMIC's 0.18 μm gate length PHEMT process. The MMIC uses gold bonding pads, backside metallization and is fully protected with Silicon Nitride passivation to obtain the highest level of reliability. This technology has been evaluated for Space applications and is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

APPLICATIONS

- ▶ Radar
- ▶ Telecommunication
- ▶ Instrumentation

FEATURES

- ▶ Operating Range : 6 GHz to 18 GHz
- ▶ Insertion Loss = 1.5 dB @ 12 GHz
- ▶ Isolation > 50 dB
- ▶ $S_{11} < -15$ dB
- ▶ $S_{22} < -15$ dB
- ▶ 0 / +5V Control Lines
- ▶ Chip size = 1500 x 1200 μm
- ▶ Tested, Inspected Known Good Die (KGD)
- ▶ Samples Available
- ▶ Space and MIL-STD Available



6 - 18 GHz SPDT Switch Block Diagram



LIMITING VALUES

$T_{amb} = 25\text{ °C}$ unless otherwise noted

Symbol	Parameter	Conditions	MIN.	MAX.	UNIT
T	Switch Control Input		0	+5,5	V
V_{SS}	Source supply voltage	V_{SS2} pad is open	-5	0.5	V
V_{SS2}	Source supply voltage	V_{SS} pad is open	-7	0.5	V
P_{IN}	Input power	At RF_{IN}		TBD	dBm
T_{amb}	Ambient temperature		-40	+85	° C
T_j	Junction temperature			+150	° C
T_{stg}	Storage temperature		-55	+150	° C

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	UNIT
$R_{th(j-a)}$	Thermal resistance from junction to ambient ($T_a = 25\text{ °C}$)	TBD	° C/W

CHARACTERISTICS

$V_{SS2} = -5\text{ V}$; $I_{SS2} = 11\text{ mA}$; $T_{amb} = 25\text{ °C}$, measured on reference.

Symbol	Parameter	Conditions	MIN.	TYP.	MAX.	UNIT
<i>Supplies</i>						
V_{SS2}	Source supply voltage	V_{SS} pad is open	-7	-5	-4	V
I_{SS2}	Source supply current			11		mA
V_{SS}	Source supply voltage	V_{SS2} pad is open	-5	-3,5	-3	V
I_{SS}	Source supply current			11		mA
BW	Bandwidth		6		18	GHz
<i>RF Performance for BW unless otherwise stated</i>						
IL	Insertion Loss at 12 GHz			1.5		dB
ISO	Isolation			50		dB
S_{11}	Input Return Loss, All States	50 Ω source		-15		dB
S_{22}	Output Return Loss, All States	50 Ω load		-15		dB

LOGIC TRUTH TABLE

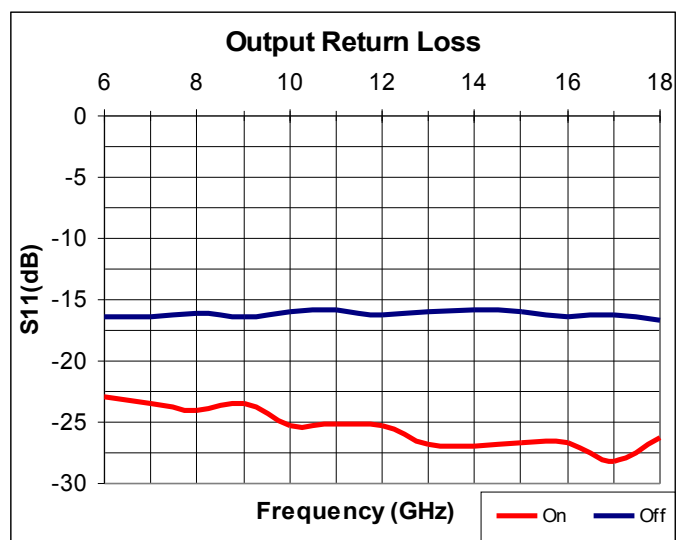
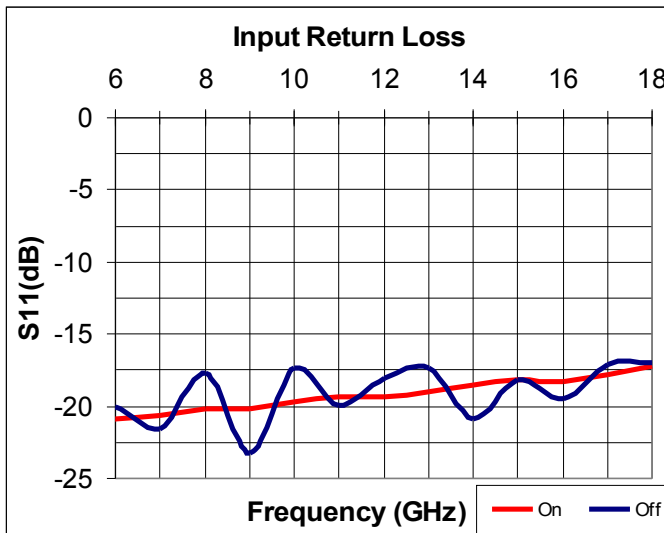
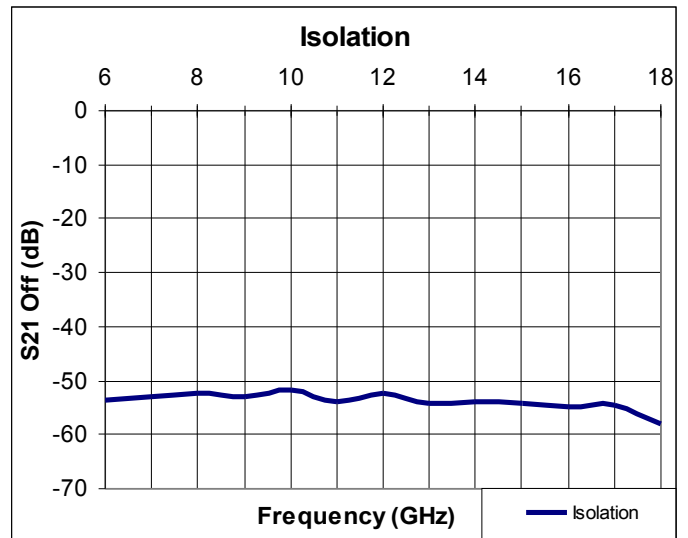
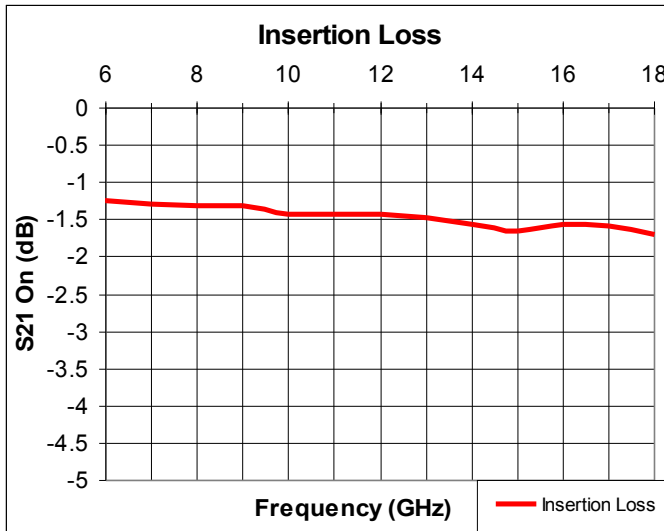
RF in ==> Out 1	On	Off
RF in ==> Out 2	Off	On
T	0	1

CONTROL VOLTAGE

State	MIN.	MAX.	UNIT
Low (0)	0	1	V
High (1)	+4	+6	V

ON WAFER MEASUREMENTS – S PARAMETERS

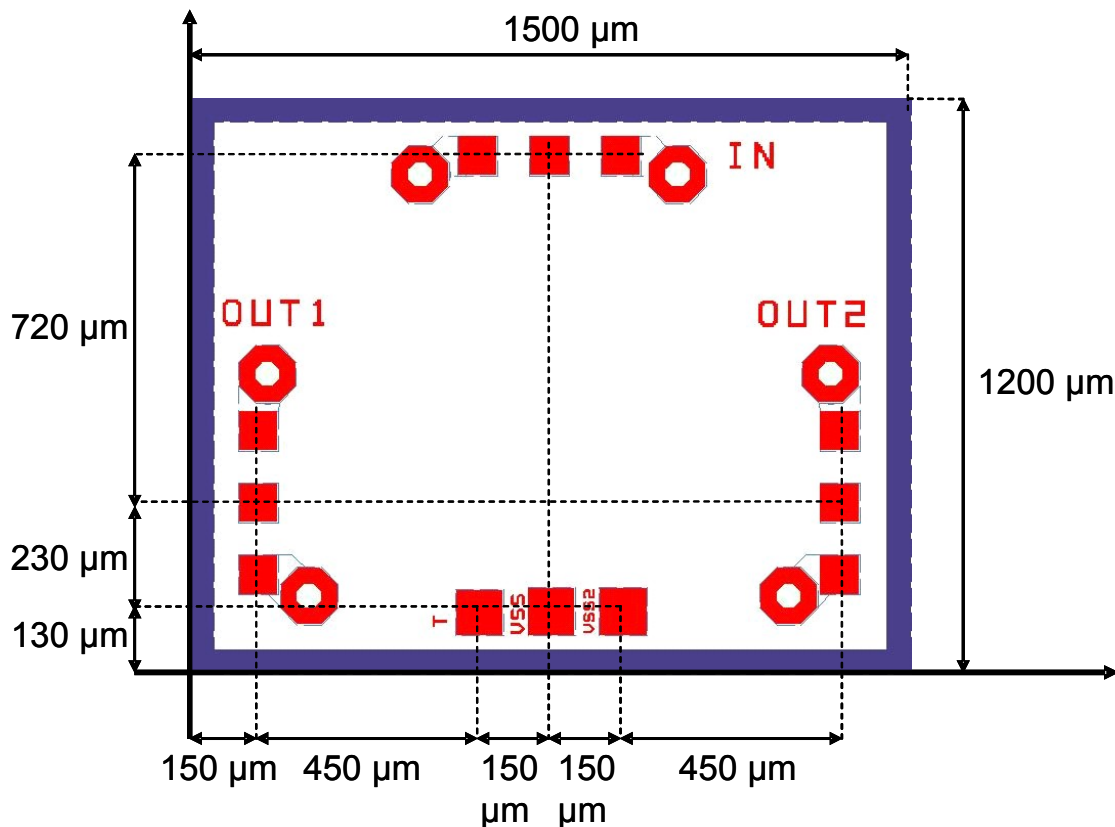
Supply voltage : $V_{SS2} = -5\text{ V}$



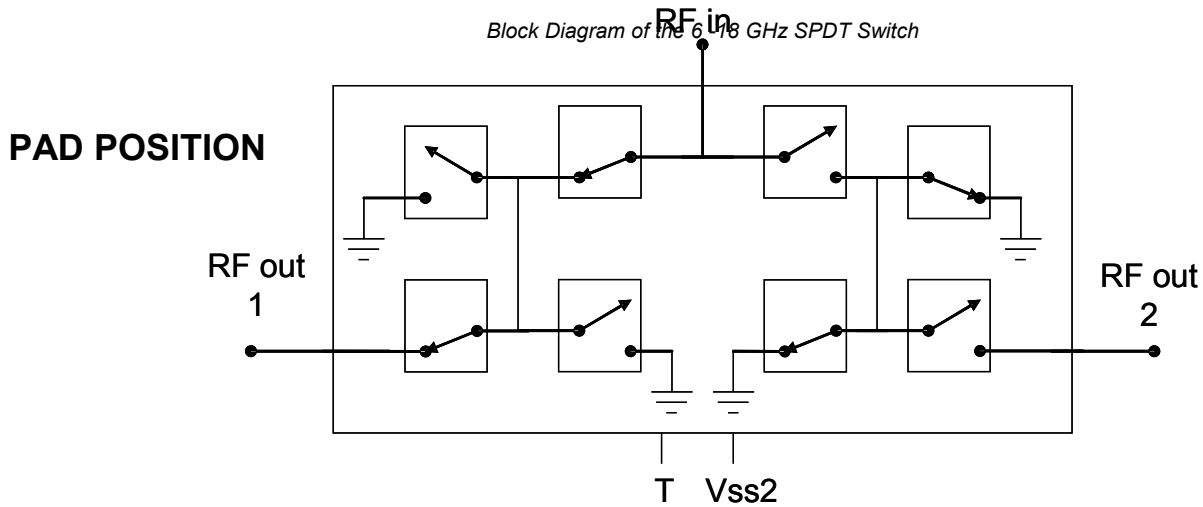
MECHANICAL INFORMATION

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



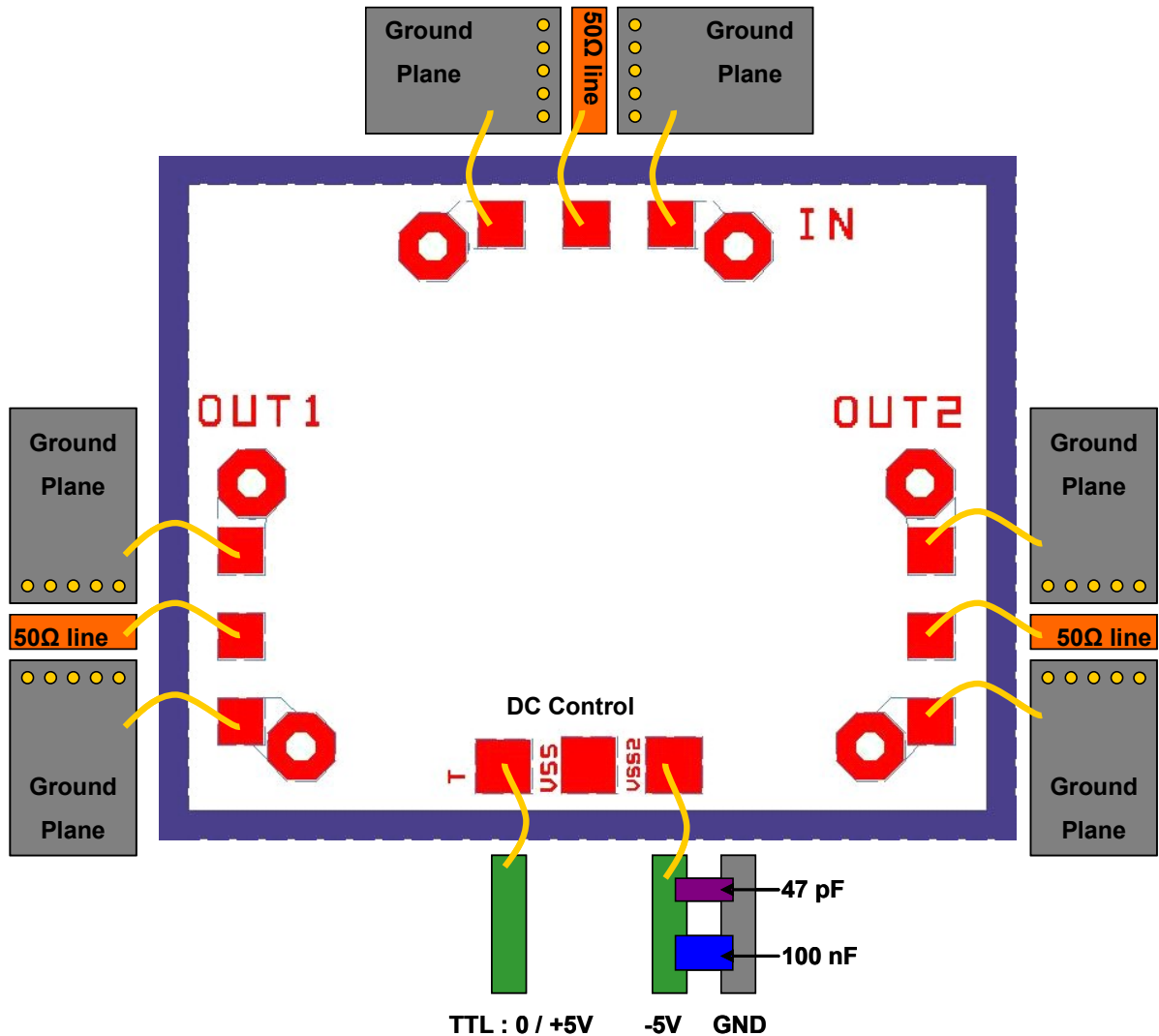
Caution : This device is a high performance RF component and can be damaged by inappropriate handling. Standard ESD precautions should be followed. OMMIC document "OM-CI-MV/ 001/ PG" contains more information on the precautions to take.

BLOCK DIAGRAM AND PIN CONFIGURATION


PAD NAME	COORDINATES		DESCRIPTION
	X	Y	
GND	150	205	Ground (connected to MMIC back side metal)
RF _{OUT 1}	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 _{OUT 2}	1350	355	RF Output 2
GND	1350	505	Ground (connected to MMIC back side metal)
T	600	130	Switch control
VSS	750	130	V _{SS} supply voltage, V _{SS2} not connected
VSS2	900	130	V _{SS2} supply voltage, V _{SS} not connected

NOTE

1. 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 AND ASSEMBLY INFORMATION


The RF interfacing bond wires or ribbon should be kept as short as possible.

The RF lines should be 300um wide or less to minimize discontinuities associated with the connection to the MMIC bond pads.

The power supply (VSS or VSS2) must be decoupled to the ground with capacitors as close as possible to the chip.

Decoupling BOM:

	VSS2 (or VSS)
Chip SMD capacitor 1	47pF or 100pF
Chip SMD capacitor 2	100nF


NO DECOUPLING ON DIGITAL CONTROL PADS

DEFINITIONS
Limiting values definition

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information

Applications that are described herein for any of these products are for illustrative purposes only. OMMIC makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

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ORDERING INFORMATION

Generic Type	Package type	Version	Sort Type	Description
CGY2890S	UH	C1		6 – 18 GHz SPDT Switch


Document History : Version 1.0, Last Update 12/06/2013