

# GSR1303S: CMOS SOI SPDT Switch

## 0.1 – 3.0 GHz

### Applications

- WLAN 802.11a/b/g/n/ac/ax networks
- ISM band radios
- Low power T/R systems
- Low insertion loss (0.4dB @ 2.5GHz)
- High isolation (24dB @ 2.5GHz)
- Low DC power consumption

### Features

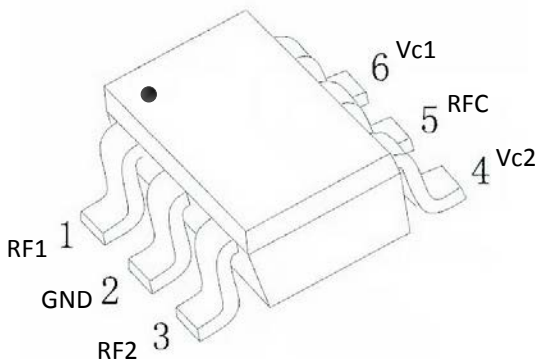
- $P_{0.1dB}$  +32dBm typical @ +3.3V

- SC-70 6 lead Package (MSL1, 260°C per JEDEC-J-STD-020)
- ESD: 1.5 kV HBM on all pins

### Description

The GSR1303S is a CMOS SOI single pole dual throw (SPDT) high power switch in a low cost miniature SC-70 6 lead package. The GSR1303S is ideally suited for applications where high power, low insertion loss, and small size are required. Typical applications are for handset systems that connect separate transmit and receive functions to a common antenna, as well as other related handset and general purpose applications. This part can be used in all systems operating up to 3 GHz requiring high power at low control voltage.

### Function and Pin Definition



GSR products are compliant with all applicable legislation and are halogen-free. For additional information, refer to GSR Microelectronics RoHS Compliance Declaration.

**Figure 1. GSR1303S Pin-Def.**  
**(Top View)**

**Table 1. GSR1303S Pin Definition**

Pin #	Name	Description	Pin #	Name	Description
1	RF1	RF port 1	4	Vc2	Logic control 2
2	GND	Ground	5	RFC	Common Port
3	RF2	RF port 2	6	Vc1	Logic control 1

**Table 2. GSR1303S Absolute Maximum Ratings**

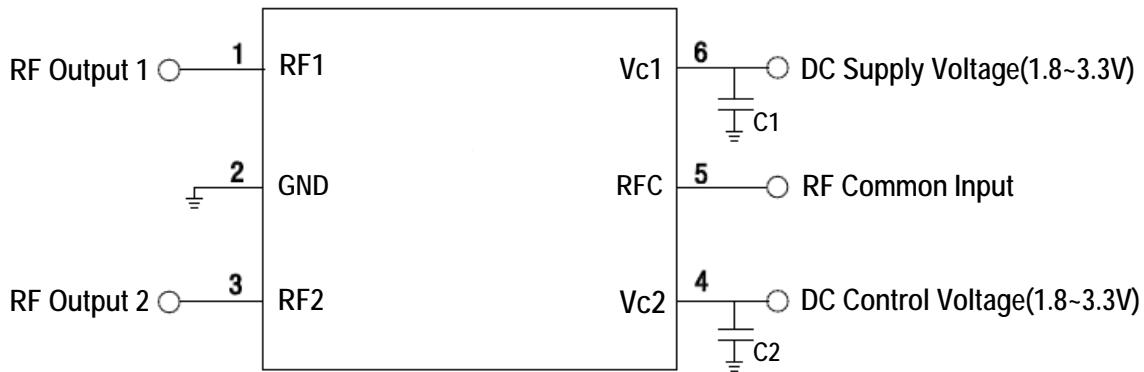
Parameter	Absolute Maximum
Max Input Power (0.1 - 3 GHz, 3.3 V control)	+32.5 dBm
Operating Voltage	+4.2 V
Thermal resistance ( $\Theta_{JC}$ )	25 °C/W
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

## Truth Table and Pin Out

**Table 3. GSR1303S Truth Table**

Vc1	Vc2	RFC—RF1	RFC—RF2
1	0	Isolation	Insertion loss
0	1	Insertion loss	Isolation

**Note:** “1” = +1.8V to 3.3V. “0” = 0V to +0.2V.



**Figure 2. GSR1303S Pin Out**

C1 and C2 are optional bypass capacitors (100pF). The RF path should use DC block capacitor if it's with any dc voltage.

## Electrical Specification

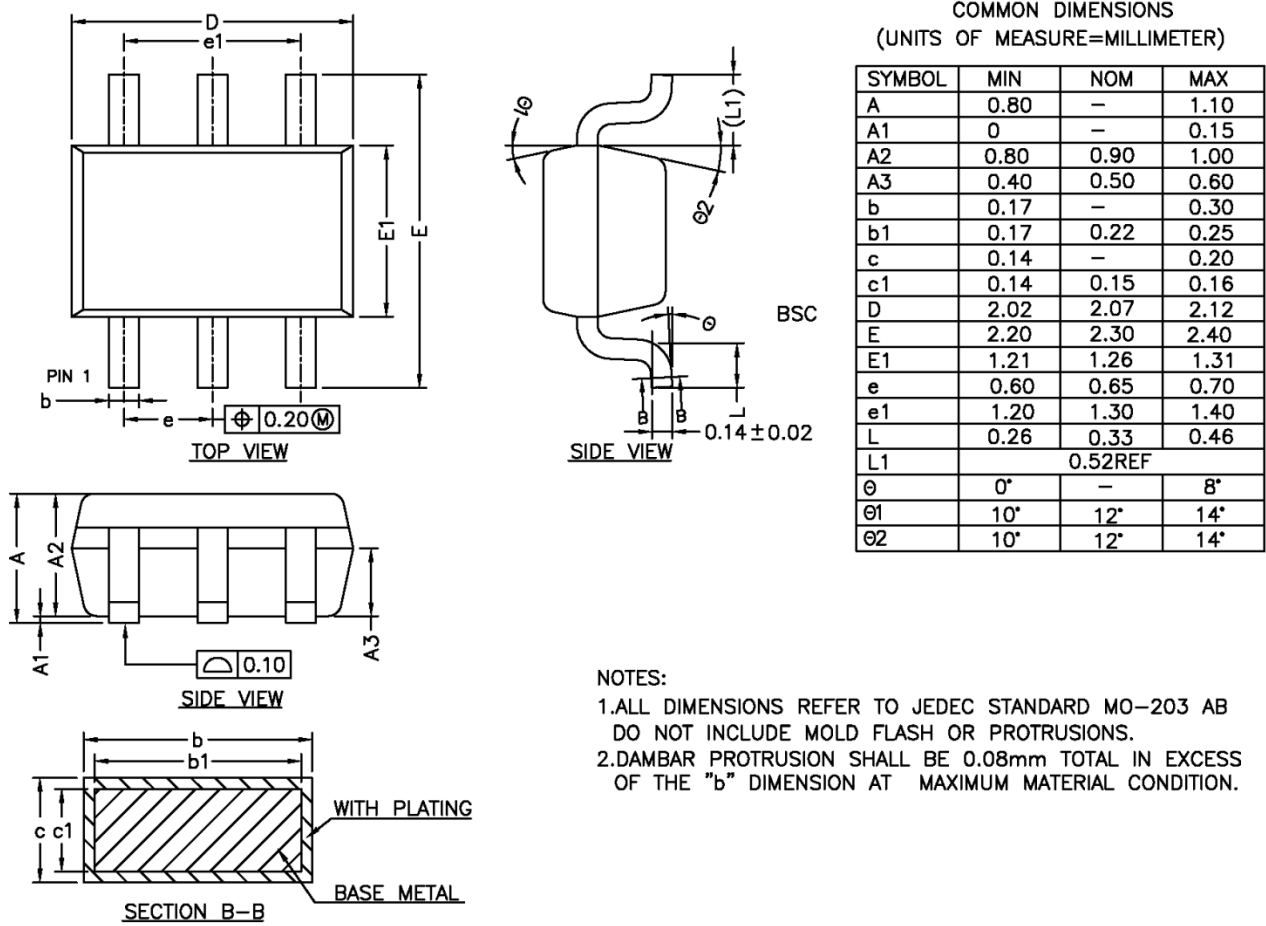
**Table 4. GSR1303S electrical specifications at 25 °C (0 , +3.3 V)**

Parameter	Test Condition	Min.	Typ.	Max.	Units
Insertion Loss	0.1GHz — 0.5GHz		0.3	0.4	dB
	0.5GHz — 1.5GHz		0.4	0.55	dB
	1.5GHz — 2.7GHz		0.45	0.6	dB
	2.7GHz — 3.0GHz		0.5	0.65	dB
Isolation Isolation	0.1GHz — 0.5GHz		-40	-35	dB
	0.5GHz — 1.5GHz		-30	-25	dB
	1.5GHz — 2.7GHz		-24	-22	dB
	2.7GHz — 3.0GHz		-22	-20	dB
Return Loss	0.1GHz — 0.5GHz		-30	-25	dB
	0.5GHz — 1.5GHz		-25	-20	dB
	1.5GHz — 2.7GHz		-25	-20	dB
	2.7GHz — 3.0GHz		-25	-20	dB
2 <sup>nd</sup> Hamonic	2.45GHz, Pin=+20dBm. Vc = 0V/3.3V		-48		dBm
	2.45GHz, Pin=+25dBm. Vc = 0V/3.3V		-40		dBm
3 <sup>rd</sup> Hamonic	2.45GHz, Pin=+20dBm. Vc = 0V/3.3V		-67		dBm
	2.45GHz, Pin=+25dBm. Vc = 0V/3.3V		-47		dBm
IP <sub>0.1dB</sub>	0.1 – 3 GHz, Vc = 0V/3.3 V		32		dBm
IP <sub>1dB</sub>	0.1 – 3 GHz, Vc = 0V/3.3 V		32.5		dBm
Trise, Tfall	10% to 90% RF, 90% to 10% RF		30		ns
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF		125		ns
Control Current	V <sub>low</sub> = 0 to 0.2 V V <sub>high</sub> = 3.3 V		14	20	uA

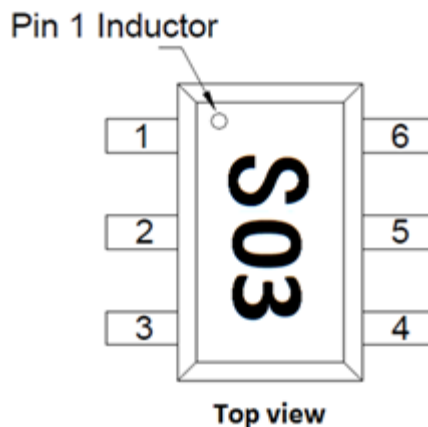
**Note 1:** Performance is guaranteed only under the conditions listed in this Table.

**2:** Board loss de-embedded.

## Package Dimensions



**Figure 3. GSR1303S Package Dimensions**



**Figure 4. Typical Case Markings**

## ESD Precautions

The GSR1303S is a static-sensitive electronic device. Do not operate or store near strong electrostatic fields. ESD protection circuitry is contended in this device, but special handling precautions are required.

Electrostatic discharge	Symbol	Typ.
Human Body Model (HBM), Class-1C	ESD	1500 V

## RoHS Compliant

The product does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE), and are therefore considered RoHS compliant.

## Revision History

Rev.	Date	Description
1.0	Dec. 1, 2022	Initial Release
1.1	Feb. 10, 2023	Modify Electrical Specifications