

GSR1323S: CMOS SOI SPDT Switch

0.01 – 7.2 GHz

Applications

- WLAN 802.11a/b/g/n/ac/ax networks
- ISM band radios
- Low power T/R systems
- Low insertion loss (0.50dB @ 2.5GHz, 0.58dB @ 5.8GHz)
- High isolation (25dB @ 2.5GHz)
- Low delay, switch time: 75~125nS
- 1.0mm × 1.0mm QFN Package (MSL3, 260°C per JEDEC-J-STD-020)

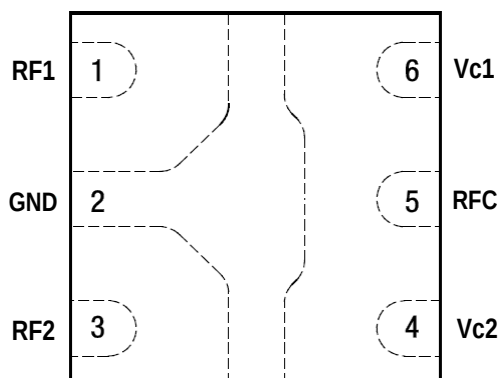
Features

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

Description

Using advanced switching technologies, the GSR1323S is a single pole dual throw (SPDT) high power switch in a low cost miniature 1.0 mm × 1.0 mm package. The GSR1323S 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 7.2 GHz required 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. GSR1323S Pin-Def.
(Top View)

Table 1. GSR1323S Pin Definition

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

Table 2. GSR1323S Absolute Maximum Ratings

Parameter	Absolute Maximum
Max Input Power (0.01 – 7.2 GHz, 3.3 V control)	+32.5 dBm
Operating Voltage	+4.2 V
Thermal resistance (Θ_{JC})	25 °C/W
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

Table 3. GSR1323S Recommended Operating Conditions

Parameter	Symbol	Minimum	Typical	Maximum	Units
Operating frequency	f_0	0.01		7.2	GHz
Control voltage:					
Low	Vc_L	0	0	0.2	V
High	Vc_H	1.6	3.3	3.6	V
Operating temperature	T _{oper.}		25		°C

Truth Table and Pin Out

Table 4. GSR1323S Truth Table

Mode	Vc1	Vc2	RFC—RF1	RFC—RF2
1	1	0	Insertion loss	Isolation
2	0	1	Isolation	Insertion loss

Note: "1" indicates 1.6 to 3.6 V, "0" indicates 0 to 0.2 V.

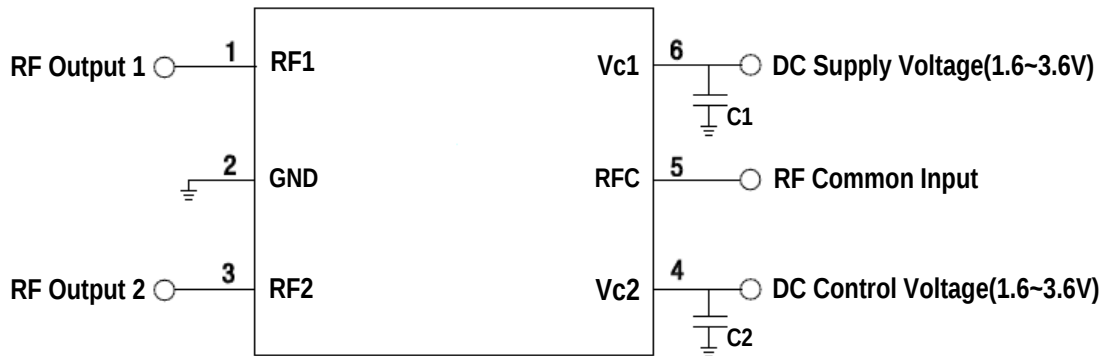


Figure 2. GSR1323S Pin Out

C1 and C2 are optional bypass capacitors (0.1pF or 0.2pF). The RF path should use DC block capacitor if it's with any dc voltage.

Electrical Specification

Table 5. GSR1323S electrical specifications at 25 °C (0 , +3.3 V)

Parameter	Test Condition	Min.	Typ.	Max.	Units
Insertion Loss	0.01GHz — 2.0GHz		0.38	0.55	dB
	2.0GHz — 2.5GHz		0.50	0.75	dB
	4.8GHz — 6.0GHz		0.58	0.78	dB
	6.0GHz — 7.2GHz		0.75	1.00	dB
Isolation (RFC to RF1/RF2)	0.01GHz — 2.0GHz		-32	-29	dB
	2.0GHz — 2.5GHz		-25	-22	dB
	4.8GHz — 6.0GHz		-24	-20	dB
	6.0GHz — 7.2GHz		-22	-20	dB
Isolation (RF1 to RF2)	0.01GHz — 2.0GHz		-34	-30	dB
	2.0GHz — 2.5GHz		-27	-24	dB
	4.8GHz — 6.0GHz		-25	-22	dB
	6.0GHz — 7.2GHz		-24	-22	dB
Return Loss	0.01GHz — 2.0GHz		-24	-18	dB
	2.0GHz — 2.5GHz		-16	-13	dB
	4.8GHz — 7.2GHz		-17	-14	dB
2 nd Hamonic	2.4GHz, Pin=+24dBm. Vc = 0V/3.3V		-55		dBm
3 rd Hamonic	2.4GHz, Pin=+24dBm. Vc = 0V/3.3V		-53		dBm
IP _{0.1dB}	2.0 – 7.2 GHz, Vc = 0V/3.3V	30	32		dBm
IP _{1dB}	2.0 – 7.2 GHz, Vc = 0V/3.3V	30.5	32.5		dBm
Vc1,Vc2	Control voltage	1.6	3.3	3.6	V
I _{vc}	Vc1=3.3V, Vc2=0V, Vc1 pin current		15	20	uA
	Vc1=0V, Vc2=3.3V, Vc2 pin current		15	20	uA
Trise, Tfall	10% to 90% RF, 90% to 10% RF		35		ns
Ton, Toff	50% control to 90% RF, and 50% control to 10% RF (Switching Time)		125		ns

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

2: Board loss de-embedded.

Package Dimensions

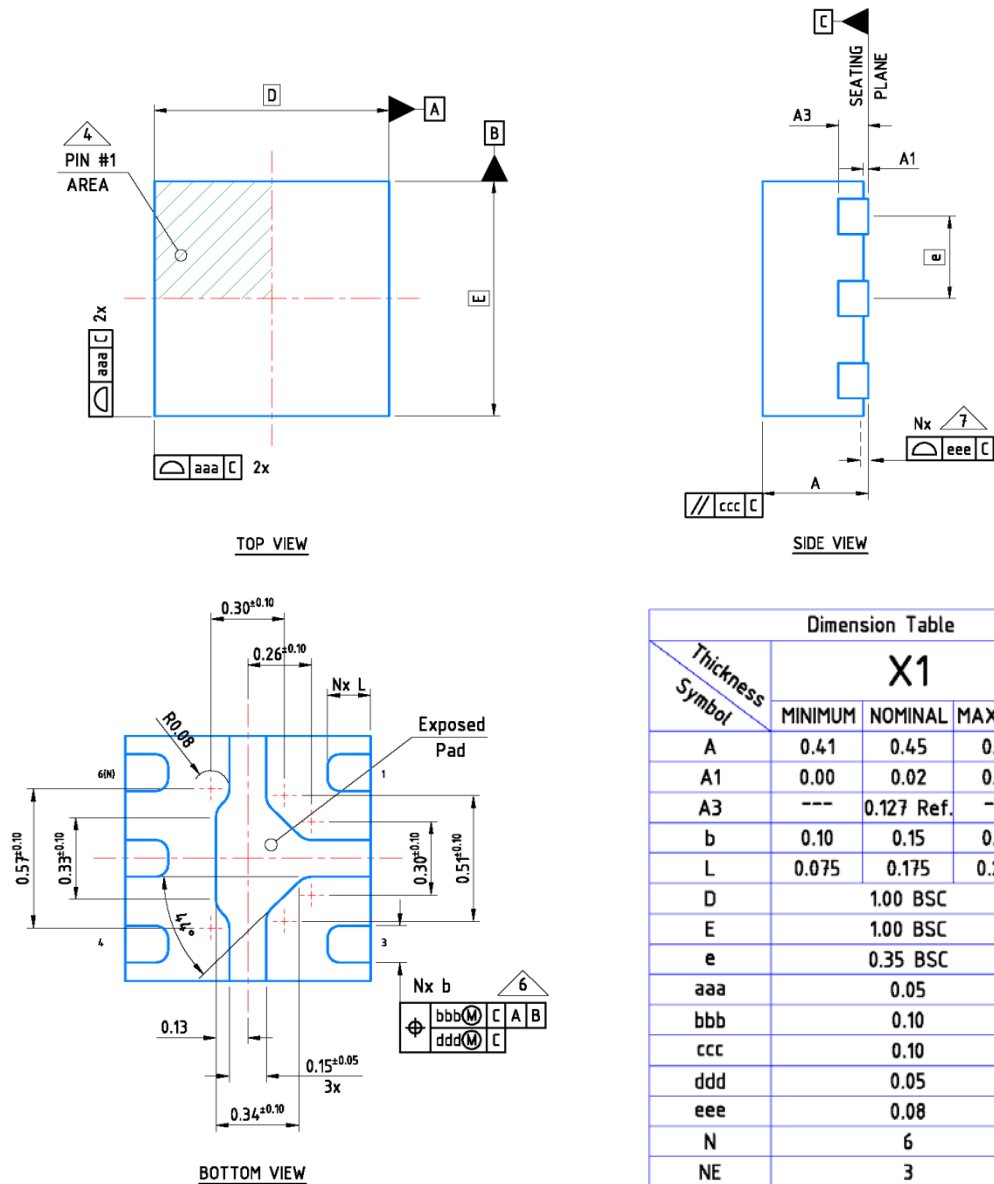


Figure 3. GSR1323S Package Dimensions

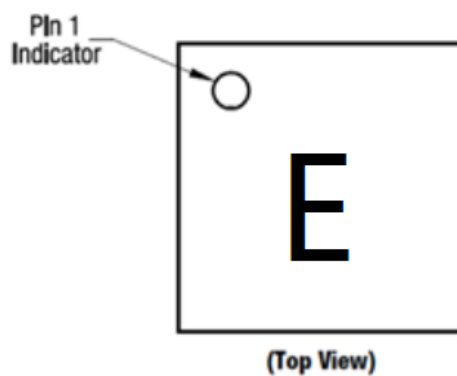
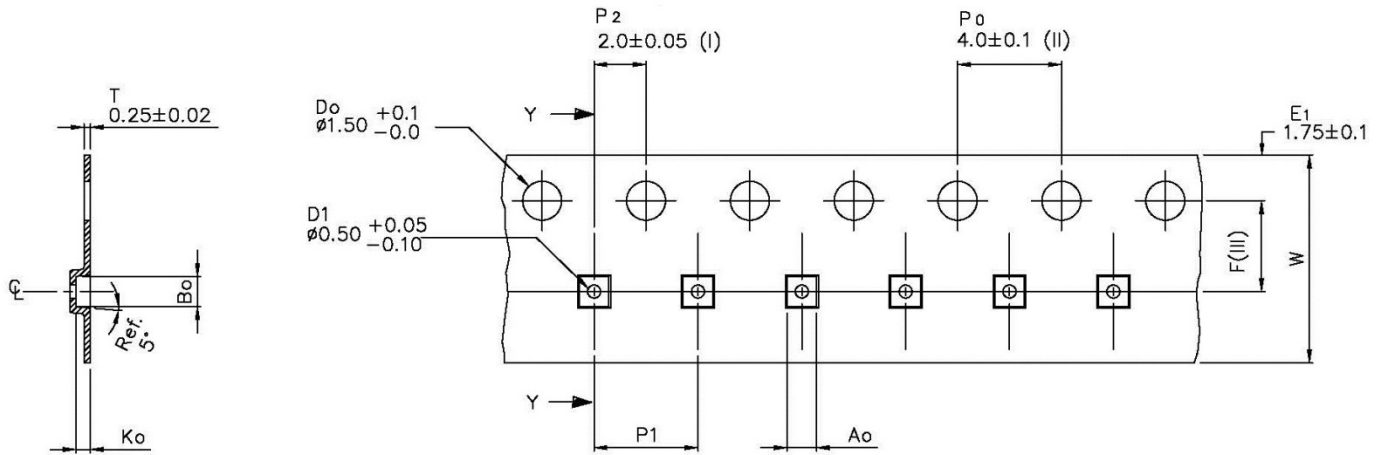


Figure 4. Typical Case Markings

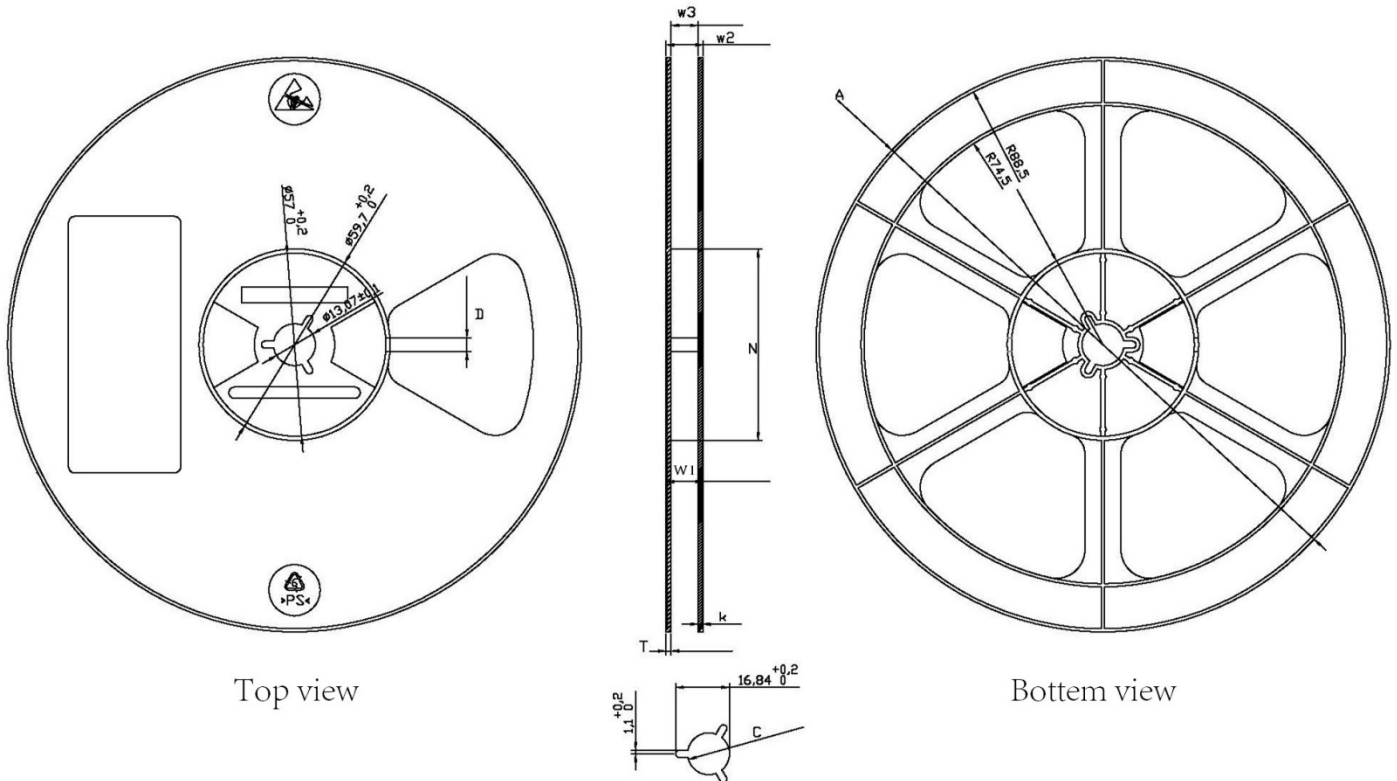


SECTION Y-Y

Ao	1.14 +/−0.05
Bo	1.17 +/−0.05
Ko	0.56 +/−0.05
F	3.50 +/−0.05
P1	4.00 +/−0.10
W	8.00 +0.3/−0.1

- (I) Measured from centreline of sprocket hole to centreline of pocket.
- (II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
- (III) Measured from centreline of sprocket hole to centreline of pocket.
- (IV) Other material available.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.



Top view

Bottom view

TYPE	A	N	C	D	w1	w2	w3	T	k
8MM	$\phi 180^{+2}_{-2}$	$\phi 60^{+1}_{-1}$	$\phi 13.1^{+0.2}_{-0.2}$	4,2±0,5	8,4 ⁺¹ ₋₀	11,6 ⁺¹ ₋₁	8,75 ⁺¹ ₋₁	1,5±0,15	1,25 ^{+0.1} _{-0.05}
12MM	$\phi 180^{+2}_{-2}$	$\phi 60^{+1}_{-1}$	$\phi 13.1^{+0.2}_{-0.2}$	4,2±0,5	12,5 ⁺¹ ₋₀	15,7 ⁺¹ ₋₁	12,7 ⁺¹ ₋₁	1,5±0,15	1,2±0,1

5000 /reel

Figure 5. GSR1323S Tape and Reel Dimensions

ESD Precautions

The GSR1323S is a static-sensitive electronic device. Do not operate or store near strong electrostatic fields. ESD protection circuitry is contained in this device, but special handling precautions are required.

Electrostatic discharge	Symbol	Typ.
Human Body Model (HBM), Class-1C	ESD	1800 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	Apr. 1, 2024	Initial Release
1.1	May. 8, 2024	Add Reel Information