

GSR1314S: 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 (0.25dB @ 2.5GHz, 0.4dB @ 5.8GHz)
- High isolation (32dB @ 2.5GHz)
- Low delay, switch time: 75~125nS
- 1.5mm × 1.5mm QFN Package (MSL3, 260°C per JEDEC-J-STD-020)

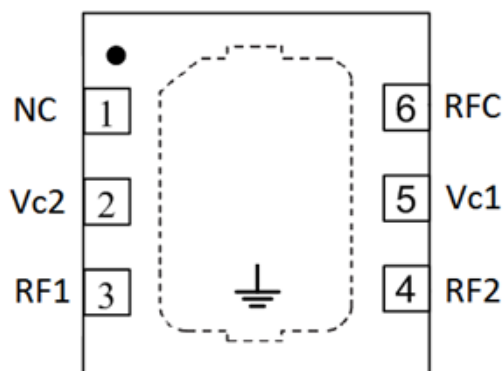
Features

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

Description

Using advanced switching technologies, the GSR1314S is a single pole dual throw (SPDT) high power switch in a low cost miniature 1.5 mm × 1.5 mm package. The GSR1314S 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 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. GSR1314S Pin-Def.
(Top View)

Table 1. GSR1314S Pin Definition

Pin #	Name	Description	Pin #	Name	Description
1	NC	No connection	4	RFC	Common Port
2	Vc2	Logic control 2	5	Vc1	Logic control 1
3	RF1	RF port 1	6	RF2	RF port 2

Table 2. GSR1314S 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

Truth Table and Pin Out

Table 3. GSR1314S Truth Table

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

Note: “1” = +1.8V to 3.6V. “0” = 0V to +0.2V.

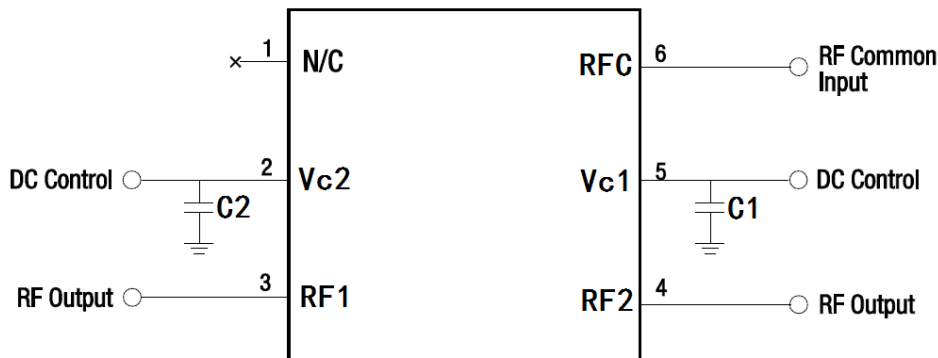


Figure 2. GSR1314S Pin Out

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

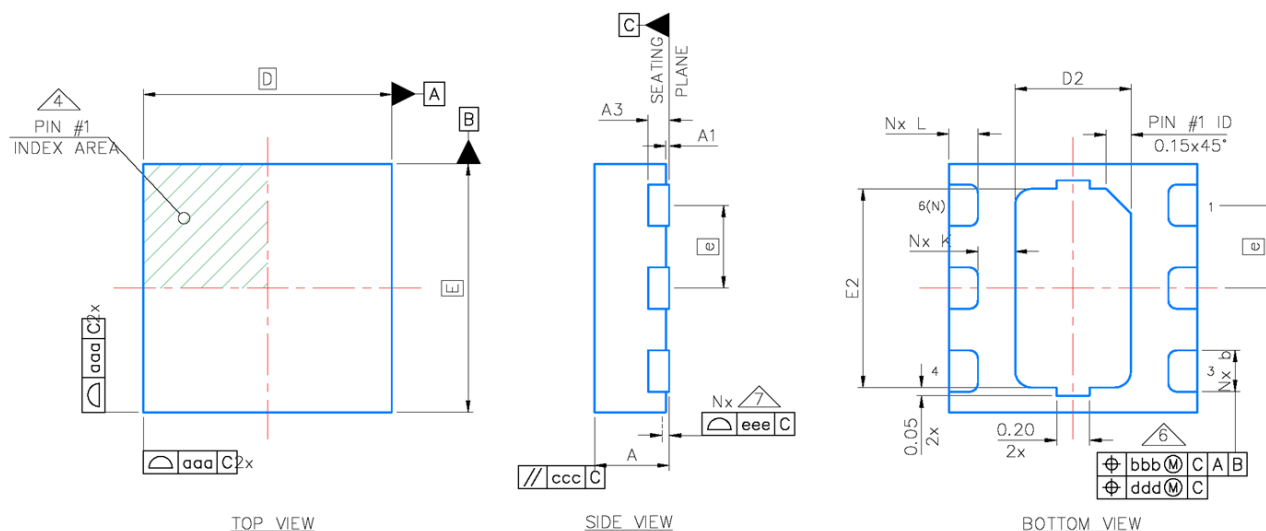
Table 4. GSR1314S electrical specifications at 25 °C (0 , +3.3 V)

Parameter	Test Condition	Min.	Typ.	Max.	Units
Insertion Loss	0.01GHz — 2.0GHz		0.22	0.32	dB
	2.0GHz — 2.5GHz		0.25	0.35	dB
	4.8GHz — 6.0GHz		0.40	0.60	dB
	6.0GHz — 7.2GHz		0.60	0.80	dB
Isolation	0.01GHz — 2.0GHz		-34	-30	dB
	2.0GHz — 2.5GHz		-32	-29	dB
	4.8GHz — 6.0GHz		-21	-18	dB
	6.0GHz — 7.2GHz		-18	-16	dB
Return Loss	0.01GHz — 2.0GHz		-25	-20	dB
	2.0GHz — 2.5GHz		-25	-18	dB
	4.8GHz — 7.2GHz		-20	-15	dB
2 nd Hamonic	2.4GHz, Pin=+24dBm. Vc = 0V/3.3V		-70		dBm
3 rd Hamonic	2.4GHz, Pin=+24dBm. Vc = 0V/3.3V		-63		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
Vc	Control voltage	1.8	3.3	3.6	V
I _{vc}	Vc=1.8V, Vc pin current		9	15	uA
	Vc=3.3V, Vc pin current		13	20	uA
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 (Switching Time)		125		ns

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

2: Board loss de-embedded.

Package Dimensions



Dimension Table				
Thickness Symbol	X1			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	0.41	0.45	0.50	
A1	0.00	0.02	0.05	
A3	---	0.127 Ref	---	
b	0.18	0.25	0.30	6
D	1.50 BSC			
E	1.50 BSC			
e	0.50 BSC			
D2	0.55	0.70	0.80	
E2	1.05	1.20	1.30	
K	0.15	---	---	
L	0.125	0.175	0.225	
aaa	0.05			
bbb	0.10			
ccc	0.10			
ddd	0.05			
eee	0.08			
N	6			3
NE	3			5
NOTES	1, 2			

NOTE:

1. Dimensioning and tolerancing conform to ASME Y14.5-2009.
2. All dimensions are in millimeters.
3. N is the total number of terminals.

4. The location of the marked terminal #1 identifier is within the hatched area.

5. NE refers to the maximum number of terminals on E side.

6. Dimension b applies to the metalized terminal. If the terminal has a radius on the end of it, dimension b should not be measured in that radius area.

7. Coplanarity applies to the terminals and all other bottom surface metalization.

Figure 3. GSR1314S Package Dimensions

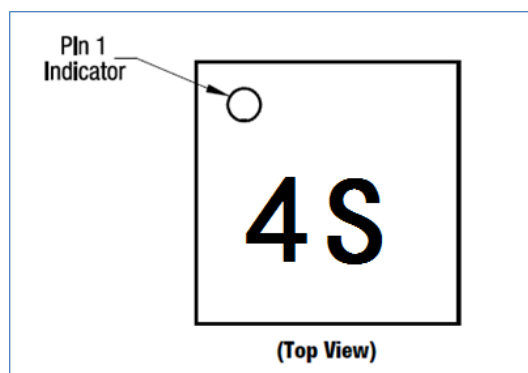
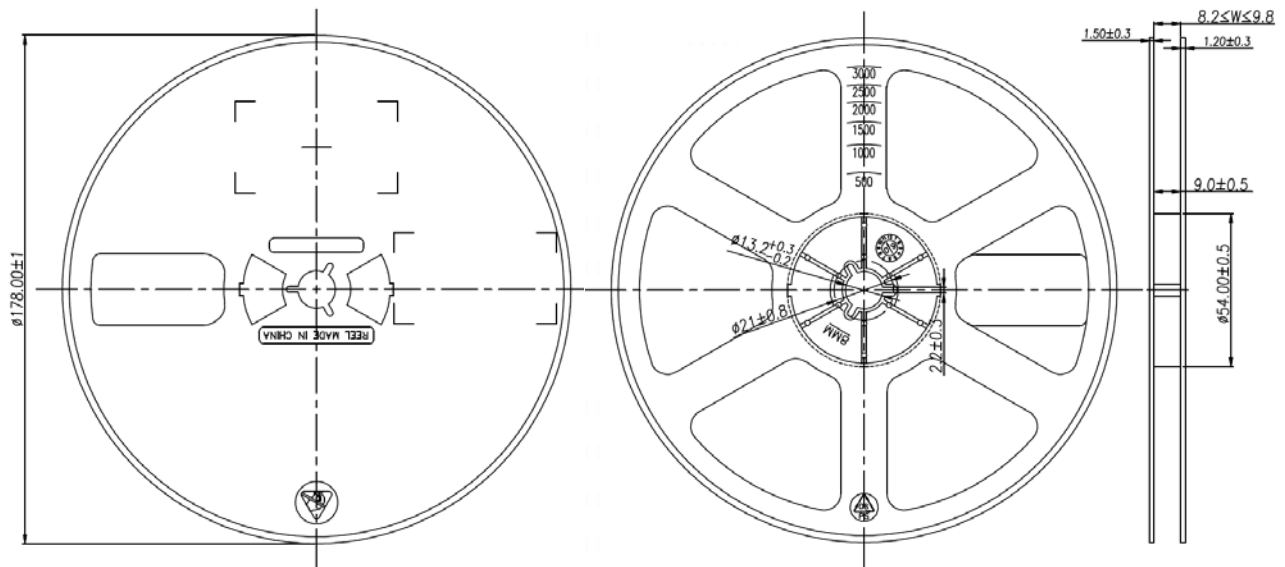
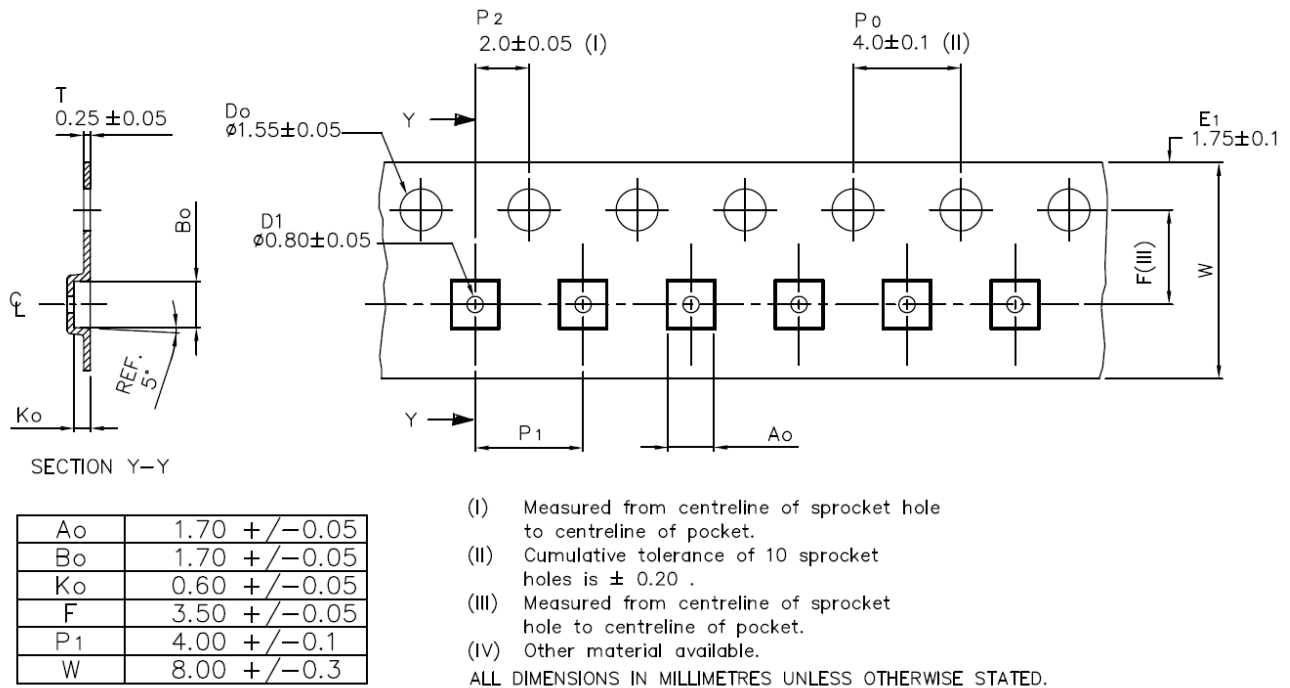


Figure 4. Typical Case Markings



5000 /reel

除非另有说明, 否则公差按下表:			7×8 JEDEC REEL		昆山欧嘉塑胶有限公司 OGA PLASTIC Co., LTD			
尺寸标注	长度	公差	型号	材料	PS	BSD值	10' - 10''	
X	±0.5	±0.5°	料号	444439	颜色	黑色	用量	
X.X	±0.3		文件位置					
X.XX	±0.25		版本	A	比例	1比例	单位	mm 图幅 A3
设计 陈正荣			第三角度投影				第	张共 张
审核 钟期								
批准 李新林								

Figure 5. GSR1314S Tape and Reel Dimensions

ESD Precautions

The GSR1314S 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	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	Feb. 20, 2023	Initial Release
1.1	Nov. 8, 2023	Modify The Package Dimensions
1.2	Apr. 4, 2024	Add tape and reel dimensions