Product Specification

RS1322 High Isolation SPDT

General Description

The RS1322 is a silicon-based, high power, 5 MHz to 5.0 GHz, silicon, single-pole, double-throw (SPDT) absorptive switch in a leadless, surface-mount package. The switch is ideal for high power and cellular infrastructure applications, such as long-term evolution (LTE) base stations.

The RS1322 has a low insertion loss of 0.91 dB typical to 2.0 GHz, a high isolation 62 dB to 2.0 GHz.

On-chip circuitry operates at a single positive supply voltage of 3.3 V at a typical supply current of 230 uA. The RS1322 comes in an RoHS compliant, compact, 16-lead, 4 mm × 4 mm QFN Competitive Advantage.

Applications

- Wireless infrastructure
- Military and high reliability applications
- Test equipment
- Pin diode replacement

Features

- Absorptive, 50 Ω design
- Low insertion loss: 0.91 dB typical to 2.0 GHz
- High Isolation: 62 dB to 2GHz
- Single positive supply: 3.3 V/5V
- Positive control, 1.2/1.8V/3.3V/5V compatible
- 16-lead, 4 mm × 4 mm QFN package

Functional Block Diagram

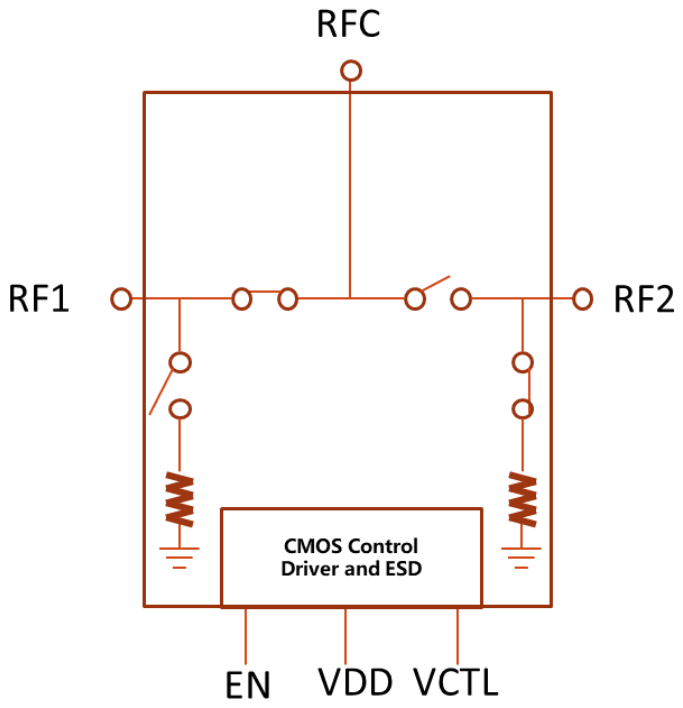


Figure 1

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Absolute Maximum Ratings

Table 1

Parameter	Conditions	Min	Max	Units
Supply Voltage		-0.3	6	V
VCTL/EN to GND		-0.3	6	V
Storage Temperature Range		-65	150	℃
Input Power for any one selected RF through port.			35	dBm
RF Port terminated power			24	dBm
ESD Voltage– HBM		1000		V

Stresses above those listed above may cause permanent damage to the device. Functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Recommended Operating Conditions

Table 2

Parameter	Min	Typ	Max	Units
VDD to GND	2.7	3.3	5.5	V
VCTL/EN to GND（High）	1.2		VDD	V
VCTL/EN to GND（Low）	0		0.6	V
Input Power for any one selected RF through port.			30	dBm
RF Port terminated power			20	dBm
operating temperature range	-40	25	105	°C

Operation should be restricted to the limits in the Recommended Operating Conditions table. Operation between operating range maximum and absolute maximum for extended periods may reduce reliability.

Specification

Typical Application Circuit, Normal mode (VDD=3.3V), T_C = +25°C, Vctrl=0V/3.3V, Rload=50Ω, Pin=0dBm, PCB board trace and connector losses are de-embedded unless otherwise noted.

Table 3

Parameter	Conditions	Min	Typ	Max	Units
Operating frequency		5		5000	MHz
DC Current (VDD)	VDD=3.3V		230		μA
Insertion Loss	5M-1000MHz		0.85		dB
	1000M-2000MHz		0.91		
	2000M-3000MHz		0.95		
	3000M-4000MHz		0.95		
	4000M-5000MHz		1.1		
RFC - RFX Isolation	5M-1000MHz		70		dB
	1000M-2000MHz		63		
	2000M-3000MHz		57		
	3000M-4000MHz		54		
	4000M-5000MHz		49		
RFX - RFX Isolation	5M-1000MHz		65		dB
	1000M-2000MHz		54		
	2000M-3000MHz		50		
	3000M-4000MHz		47		
	4000M-5000MHz		44		
Return Loss (RFX on-state)	5MHz – 4000MHz		-18		dB
	> 4000MHz		-15		
Return Loss (RFX off-state)	5MHz – 4000MHz		-15		dB
	> 4000MHz		-15		
Input 1dB Compression	400MHz – 5000MHz		37		dBm
Input IP3	10dBm/Tone,@1.8GHZ		55		dBm
Switching Time	50% CTRL to 90% RF/50% CTRL to 10% RF		200		ns

Pin Diagram

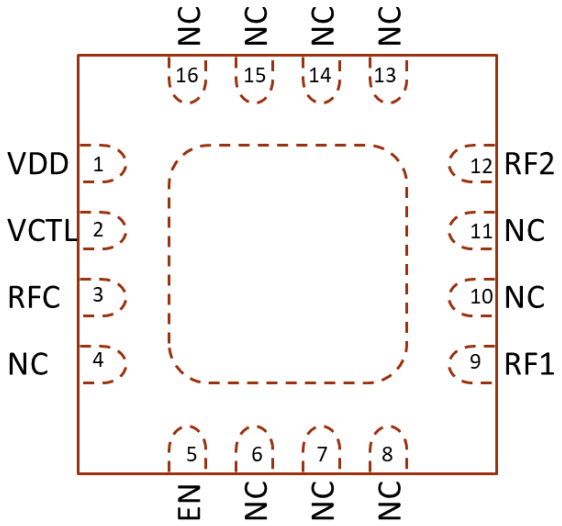


Figure 2

Pin Description

Table 4

Pin No.	Label	Description
4, 6, 7, 8, 10, 11,13,14,15,16	NC	Ground
1	VDD	Positive power supply voltage
2	VCTL	Digital control logic input
3	RFC	RF common port
5	EN	Digital control logic input
9	RF1	RF port 1
12	RF2	RF port 2

Control Logic

Table 5

Control port		States	
VCTL	EN	RFC to RF1	RFC to RF2
0	0	Off	On
1	0	On	Off
0	1	Off	Off
1	1	Off	Off

Application Information

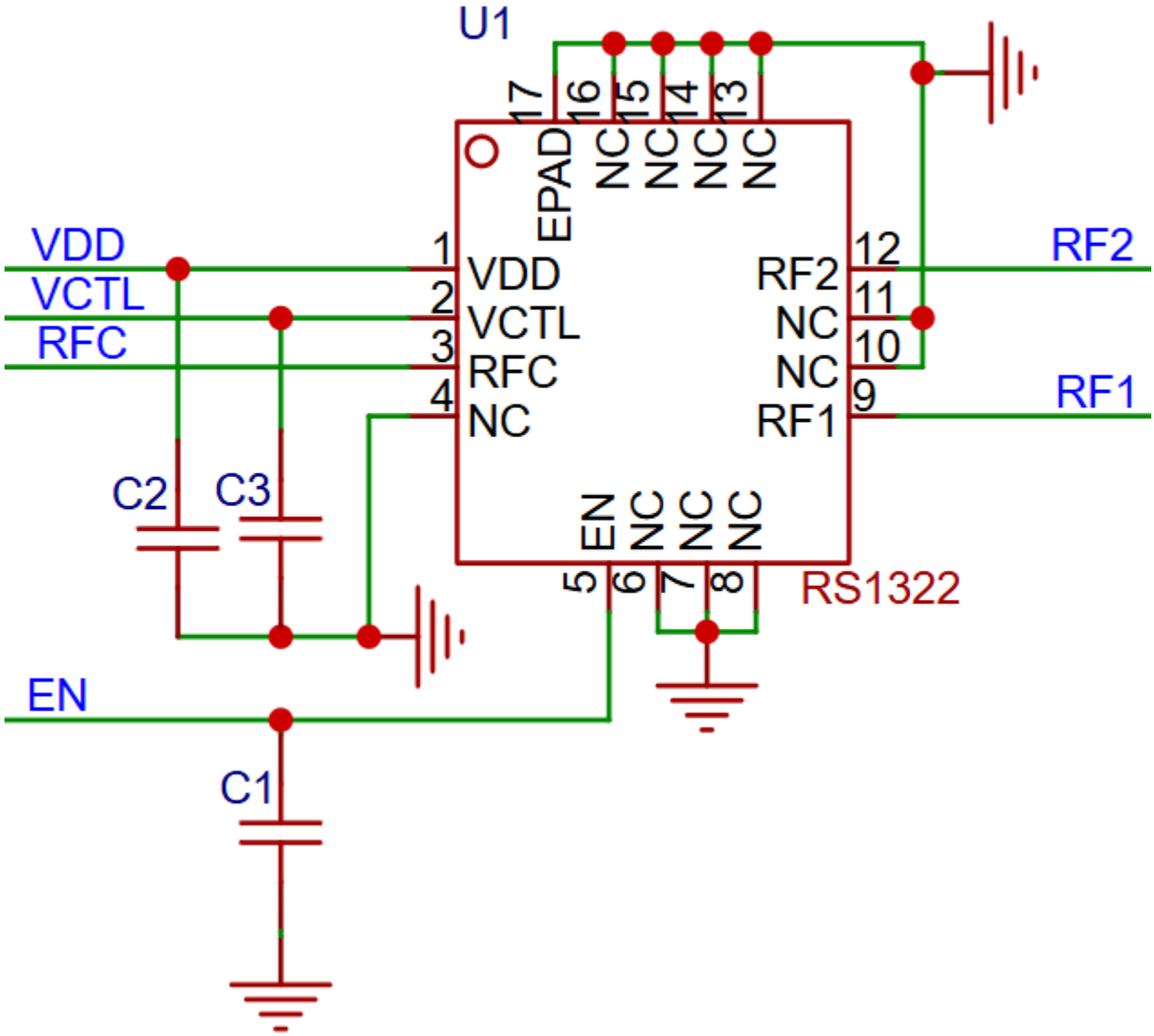


Figure 2

Note:

1. When the DC operating point of the each RF port is 0V, no blocking capacitors is required for each rf port .

2. When the DC operating point of the each RF port is not 0V， blocking capacitors is required for each rf port .

3. When the power supply is not powered on, the control port is in high resistance state, and the typical impedance is 1Mohm.

4. When the power supply is not powered on, the control port level cannot exceed 2.75V.

5. 1.8V control level, there is no sequential timing requirement for power and logic level.

Table 6

Item	Quantity	Reference	Part	Footprint
1	1	C2	100nF	C0402
2	2	C1,C3	NC	C0402
3	1	U1	RS1322	

Typical Performance Characteristics

Figure4. Insertion Loss

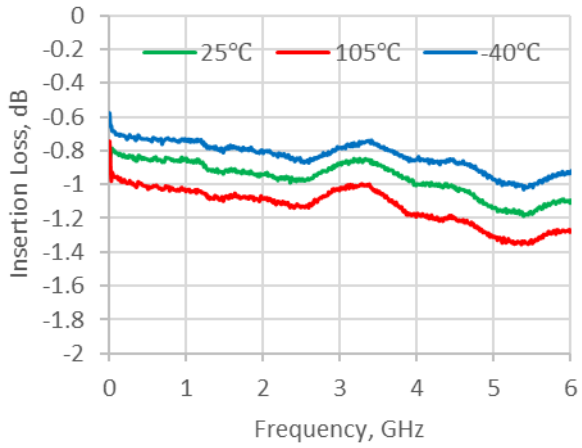


Figure 5. Input Return Loss

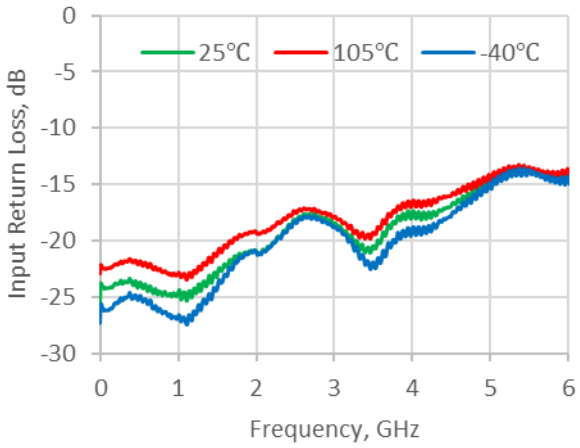


Figure6. Output Return Loss

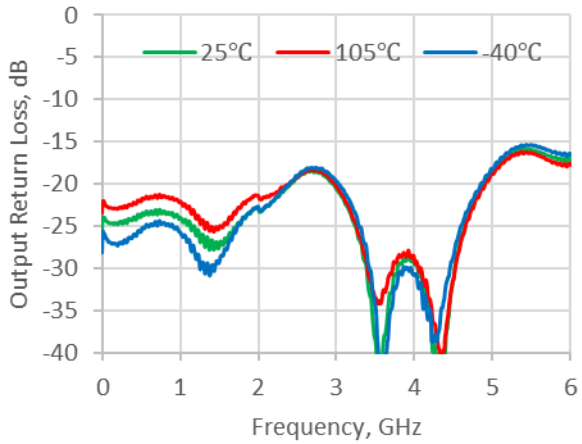


Figure 7. Isolation

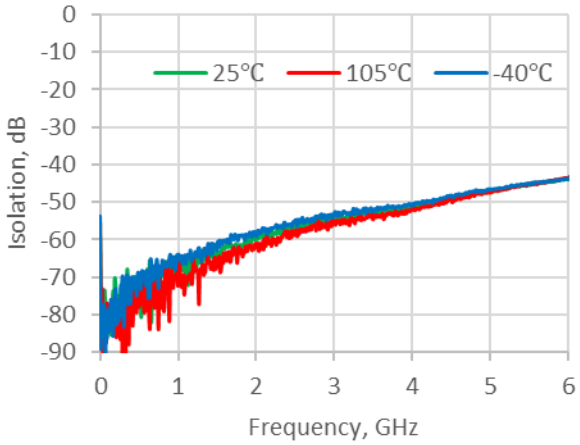


Figure8. Spurs @0-100MHz,BW=RBW=100HZ

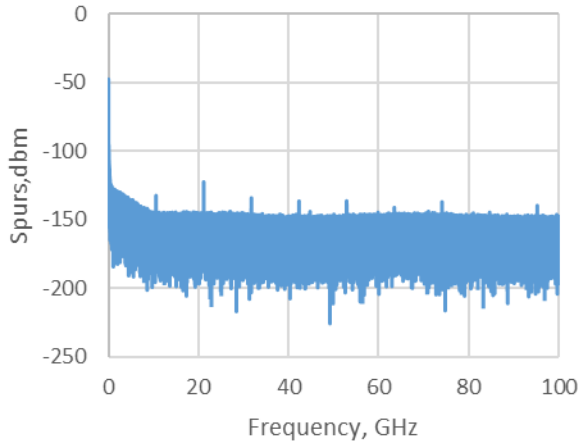
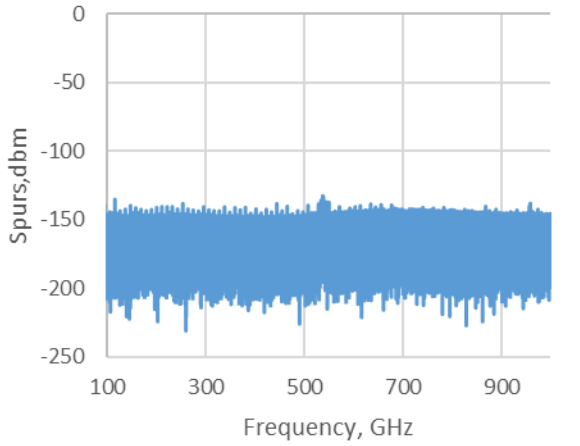
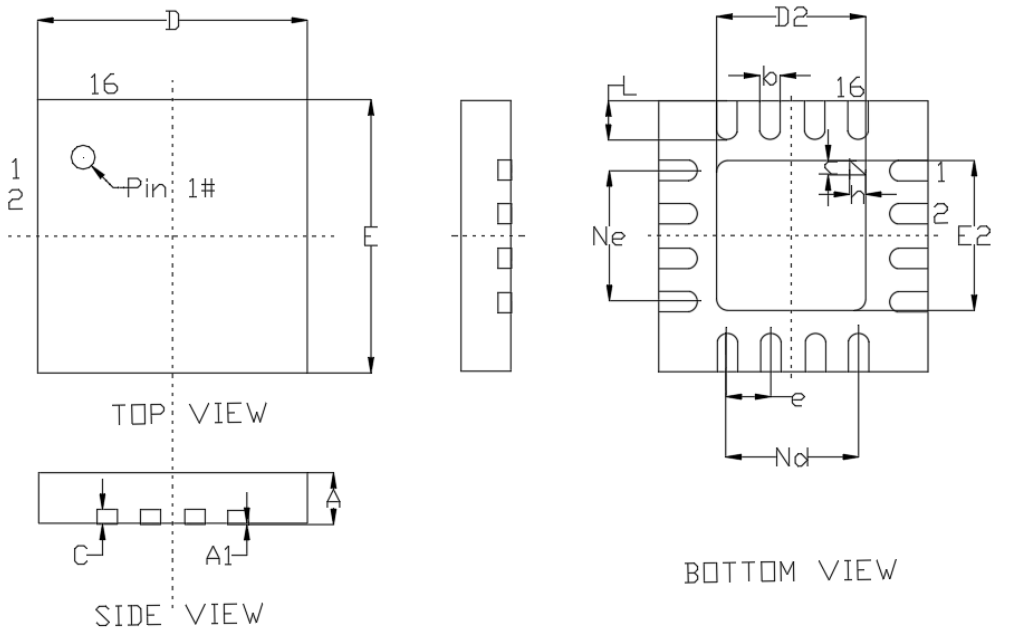


Figure 9. Spurs @100-1000MHz,BW=RBW=100HZ



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Package Drawing



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.80	0.85	0.90
A1		0.02	0.05
b	0.25	0.30	0.35
c	0.15	0.20	0.25
D	3.90	4.00	4.10
D2	2.10	2.20	2.30
e	0.65BCS		
Ne	1.95BCS		
Nd	1.95BCS		
E	3.90	4.00	4.10
E2	2.10	2.20	2.30
L	0.45	0.55	0.65
h	0.30	0.35	0.40

Figure 10

Revision History

Table 7

Revision Number	Revision Date	Description	Modifications
0	2020/11/9	Draft	—
0.1	2020/12/13	Initial release	
0.2	2021/1/8	Preliminary	Modify the format
0.3	2021/2/25	Preliminary	Add applications information
1.0	2021/9/15	Preliminary	
1.1	2022/3/25	Released	
1.2	2025/7/16	Released	Update Data

Document Categories

Advance Information

The product is in a formative or design stage. The datasheet contains design target specifications for product development. Specifications and features may change in any manner without notice.

Preliminary Specification

The datasheet contains preliminary data. Additional data may be added at a later date. RFone Technology reserves the right to change specifications at any time without notice in order to supply the best possible product.

Product Specification

The datasheet contains final data. In the event RFone Technology decides to change the specifications, RFone Technology will notify customers of the intended changes by issuing a CNF (Customer Notification Form).

Sales Contact

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