

0.1GHz – 7.125GHz SP2T Switch by 1 bit control

1. Description

The SR1358D6RL is a CMOS SOI SP2T switch IC with low insertion loss and high isolation over wide frequency range from 0.1GHz to 7.125 GHz.

The SR1358D6RL is packaged in a miniaturized 1.0mm×1.0mm×0.45mm, 6-lead DFN with exposed ground pad.

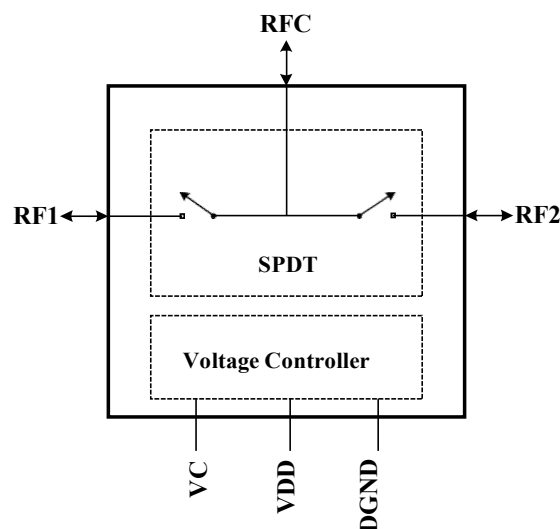
2. Features

- ❑ Wide control voltage range: 1.6V to 3.6V.
- ❑ Broad frequency range: 0.1GHz to 7.125 GHz
- ❑ Low insertion loss: 0.40 dB typical @2.5GHz, 0.50 dB typical @6.0GHz
- ❑ High isolation: 37dB @2.5GHz, 29dB @6.0GHz
- ❑ 1KV ESD Capability (HBM)
- ❑ Miniaturized package: DFN-6L, 1.0mm×1.0mm×0.60mm.
- ❑ RoHS compliant, Pb-free, Halogen-free

3. Applications

- ❑ IEEE802.11a/b/g/n/ac/ax (Wi-Fi 5, Wi-Fi 6, Wi-Fi 6e)
- ❑ ISM band radios

4. Functional Block Diagram



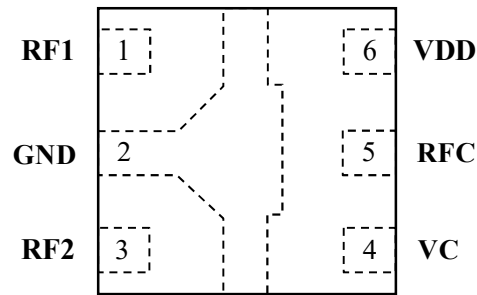


Figure 1: SR1358D6RL Pinout
(Top View)

Table 1. Pin Descriptions

Pin	Name	Description
1	RF1	RF port 1, must be DC blocked.
2	GND	Ground
3	RF2	RF port 2, must be DC blocked.
4	VC	DC control voltage
5	RFC	RF antenna port, must be DC blocked.
6	V _{DD}	DC Power Supply

Table 2. Truth Table (High: 1.2V ~ 3.6V, Low: 0V ~ 0.3V)

VC (Pin 4)	RFC-RF1	RFC-RF2
High	Insertion loss	Isolation
Low	Isolation	Insertion loss

5. Absolute Maximum Ratings

Parameters	Symbol	Minimum	Maximum	Unit
Supply Voltage	V _{DD}	-	5V	V
Control Voltage	V _c	-	5V	V
RF Input Power	P _{IN}	-	+35	dBm
Operating Temperature	T _A	-40	+85	°C
Storage Temperature	T _{STG}	-40	+125	°C

6. Recommended Operating Condition

Parameters	Symbol	Min.	Max.	Unit
Operating Frequency	f	0.1	7.125	GHz
Supply Voltage	V _{DD}	1.6	3.6	V
Control Voltage High	V _{C_H}	0.7x V _{DD}	V _{DD}	V
Control Voltage Low	V _{C_L}	0	0.3	V
Operating Temperature	T _{OP}	-40	+85	°C

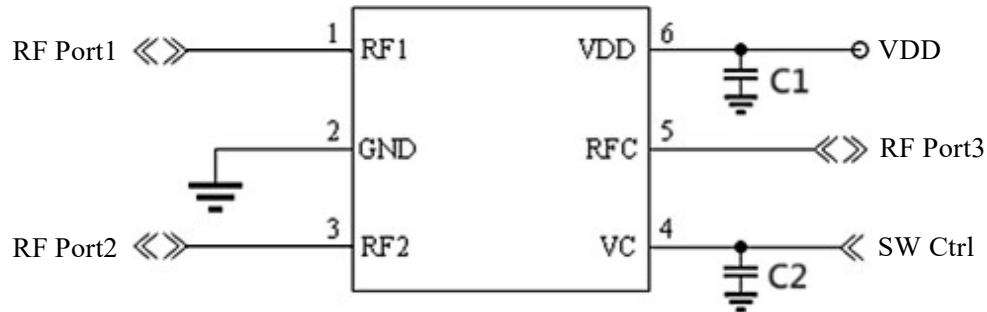
7. Electrical Characteristics

T_a = 25 °C; V_{DD}=3.3V , V_{C_H}=1.8V, Pin=0dBm, unless otherwise specified.

Parameters	Symbol	Conditions	Min.	Typ.	Max.	Unit
Insertion Loss	IL	2.4 - 2.5GHz	-	0.30	0.45	dB
		4.9 – 6.0 GHz	-	0.40	0.55	
		6.0 - 7.125 GHz	-	0.45	0.65	
Isolation (RF1 to RFC, RF2 to RFC)	ISOL	2.4 - 2.5GHz	32	37	-	dB
		4.9 – 6.0 GHz	27	29	-	
		6.0 - 7.125 GHz	20	25	-	
Input/Output Return Loss	RL	2.4 - 2.5GHz	-	20	-	dB
		4.9 – 6.0 GHz	-	15	-	
		6.0 - 7.125 GHz	--	15	-	
Input Power for 0.1dB Compression	IP1dB	2.4GHz	-	32	-	dB
		5.8GHz	-	32	-	
Harmonics	2 nd Harmonic	2.4GHz, Pin=+25dBm	-	89	-	dBc
	3 rd harmonic	2.4GHz, Pin=+25dBm	-	87	-	
Switching rise/fall time	tr	10/90% to 90/10% RF	-	140	-	ns
Switching on/offtime	tc	50% of V _c to 90/10% RF	-	240	-	ns
Control Current	I _{CTL_H}	Input power 0dBm	-	1	-	uA
Supply current	I _{DD}		-	32	-	uA

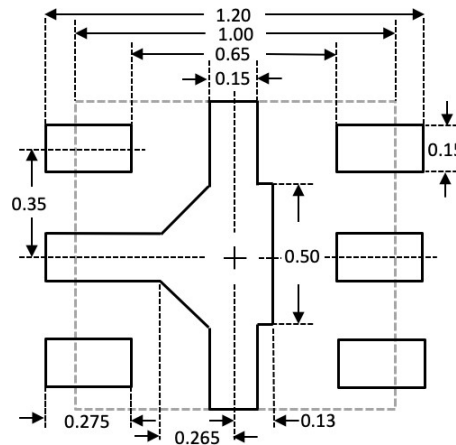
8. Application Circuit and PCB Layout

Application circuit:

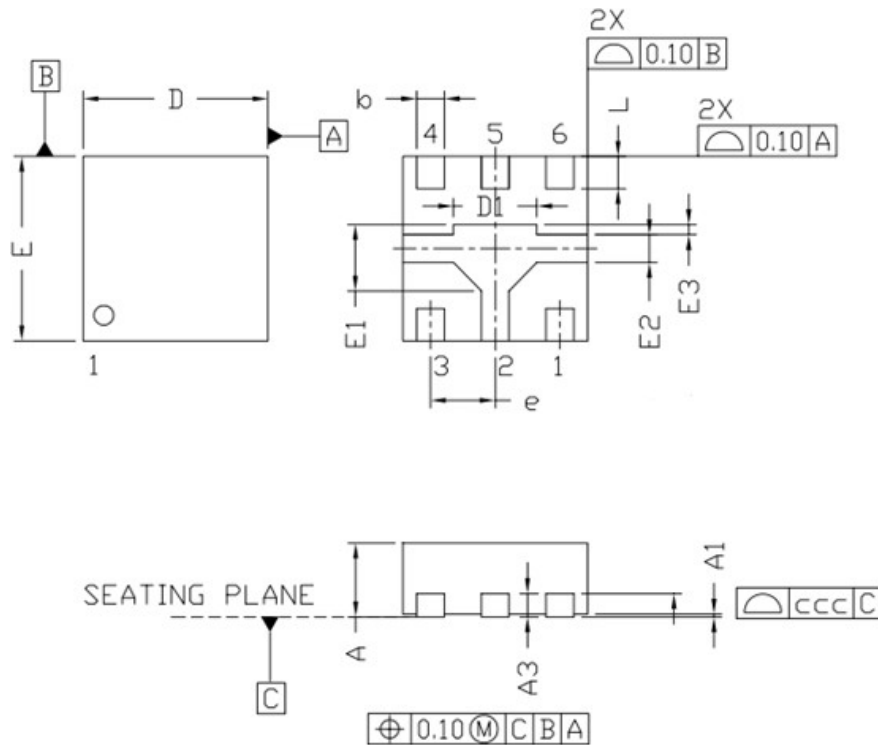


1. C1=1000pF, C2=100pF are bypass capacitors.
2. Exposed pas in the bottom must be connected to ground by via holes.
3. Internal DC voltage at each RF port is 0V. DC blocking capacitor is required if external DC voltage is not at 0V.

PCB Layout Footprint:

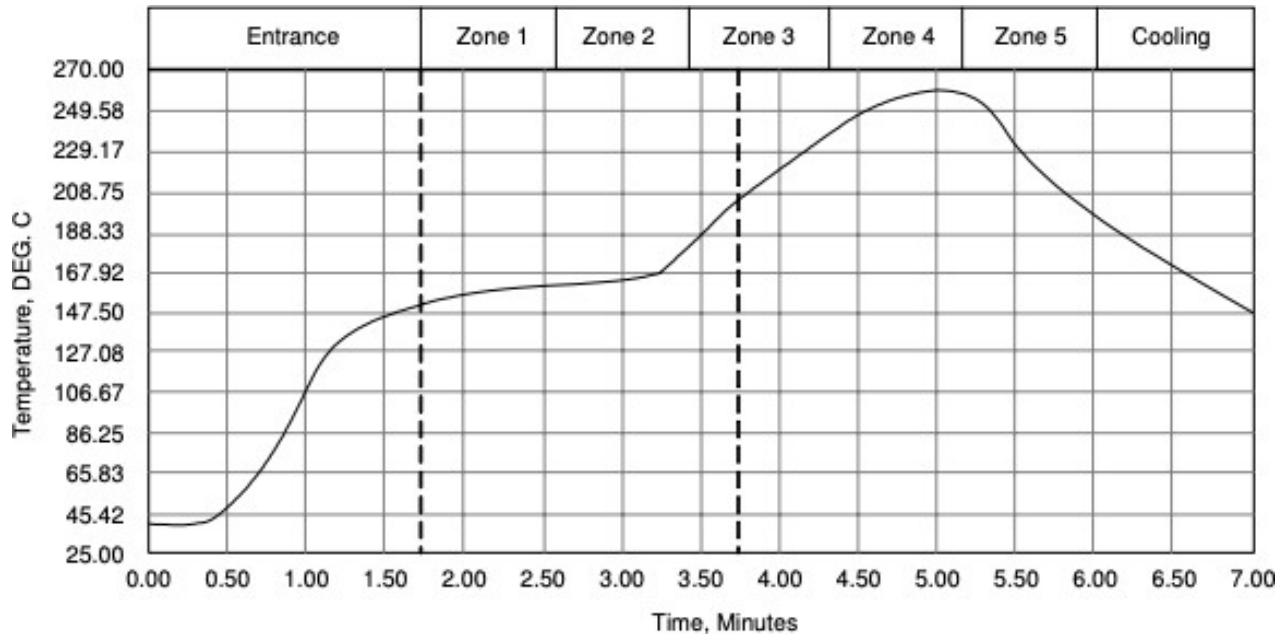


9. Package Drawing



Symbol	Unit: mm		
	MIN	NOM	MAX
A	0.41	0.45	0.6
A1	0.00	0.02	0.05
A3	---	0.127 Ref.	---
b	0.10	0.15	0.20
L	0.100	0.175	0.250
D	1.00 BSC		
E	1.00 BSC		
e	0.35 BSC		
ccc	0.05		
E1	0.33	0.34	0.37
E2	0.10	0.15	0.20
E3	0.03	0.13	0.23
D1	0.44	0.57	0.67

10. SMT Reflow



Handling Precaution

SAFETY INFORMATION ON THIS PRODUCT

Cautions on using this product	The product contains Gallium-Arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested. ● Do not destroy or burn the product. ● Do not cut or cleave off any part of the product. ● Do not crush or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.
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