

Product Overview

The MCSPT0033P47 is a symmetrical reflective Single Pole Four Throws (SP4T) switch designed for broadband, high power switching applications. Its broadband behavior from 30MHz to 3.3GHz frequencies makes the MCSPT0033P47 an excellent switch for all the applications requiring low insertion loss, high isolation and high linearity within a small package size. Part can also be used below 30MHz with reduced power handling.

The MCSPT0033P47 is packaged into a compact Quad Flat No lead (QFN) 4x4mm 32 leads plastic package.

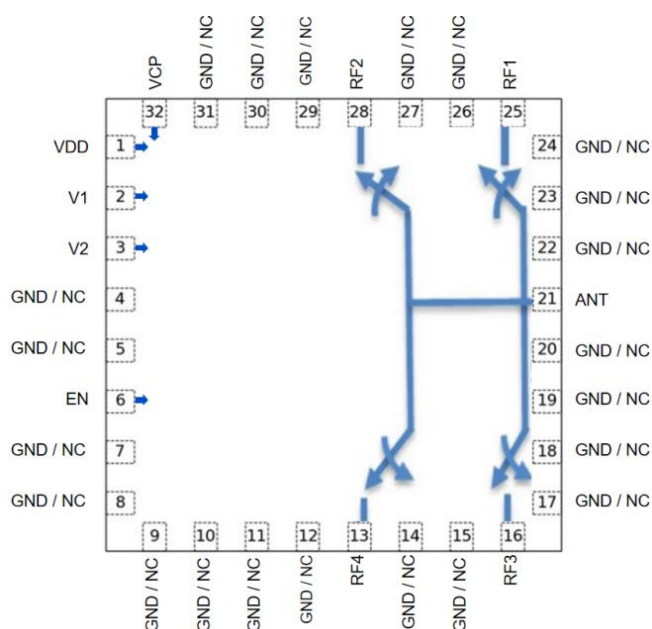
Applications

- Private mobile radio handsets
- Public safety handsets
- Cellular infrastructure
- Small cells

Key Features

- Operating frequency: 30MHz to 3.3GHz
- Low insertion loss: 0.3dB @ 1GHz
- High isolation: 40dB @ 1GHz
- 50W CW, 125W Peak Power
- High linear power handling capability
- No external DC blocking capacitors on RF lines
- Versatile 4.5-5.5V power supply

Functional Diagram



Top View

Ordering Information

Part No.	Description
MCSPT0033P47	30MHz to 3.3GHz, 50W CW GaN Broadband RF Switch SP4T

Signal Descriptions

Pin	Name	Description
1	VDD	DC power supply
2	V1	Switch control input 1
3	V2	Switch control input 2
4,5,7,8,9,10,11,12,14,15,17,18, 19,20,22,23,24,26,27,29,30,31	GND/NC	No internal connection, Grounding can better achieve heat dissipation.
6	EN	Charge pump enable. When EN=0, internal charge pump is disabled and external -18V supply will be supplied to VCP pin. When EN=1 or Floating, internal charge pump is enabled and VCP pin should be floated.
13	RF 4	RF port 4
16	RF 3	RF port 3
21	ANT	Antenna port
25	RF 1	RF port 1
28	RF 2	RF port 2
32	VCP	When EN=1 or Floating, the VCP is internal charge pump voltage output. When EN=0, the VCP is Negative Voltage supply pin.
33	Ground	Ground thermal pad

Absolute Maximum Ratings@Ta = +25°C

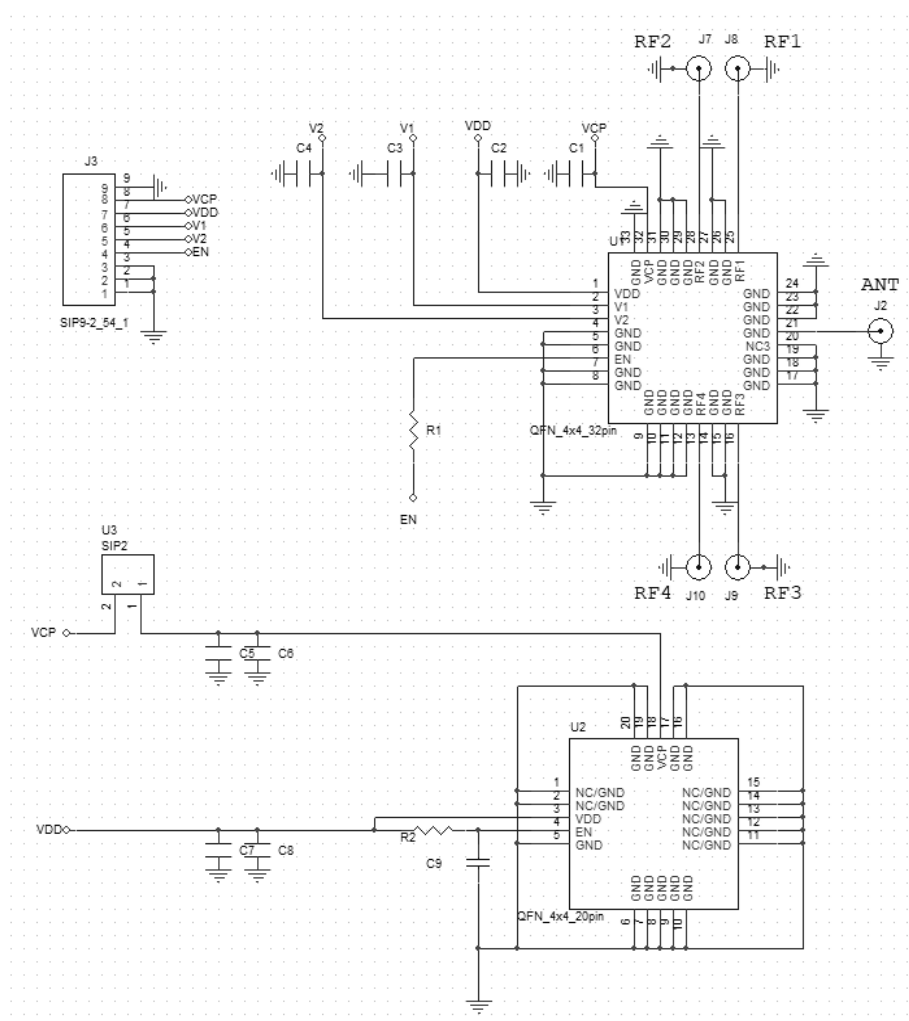
Parameter	Symbol	Absolute Maximum
Power Supply Voltage	VDD	4.5V to 5.5 V
Charge Pump Voltage	VCP	-20V to -17V
RF Input Power peak	Ppeak	53 dBm @ 1.3GHz
RF Input Power CW	PCW	49 dBm @ 1.3GHz
Hot Switching Power CW	PHS	47 dBm @ 1.3GHz
Junction Temperature	Tj	+140 °C
Operating Temperature	Top	-40 °C to +100 °C
Storage Temperature	Tst	-55 °C to +150 °C

Electrical Specifications@Ta = +25°C

Parameter	Test condition	Min	Typ	Max	Unit
Operating Frequency		30		3300	MHz
Insertion Loss, ANT-RFx	Freq=1GHz		0.3		dB
	Freq=2GHz		0.45		dB
	Freq=3GHz (match)		0.55		dB
Isolation, ANT-RFx	Freq=1GHz		40		dB
	Freq=2GHz		31		dB
	Freq=3GHz		27		dB
Return Loss ANT-RFx	Freq=1GHz		30		dB
	Freq=2GHz		20		dB
	Freq=3GHz		15		dB
P0.1 dB	1300MHz, CW	47			dBm

Peak P0.1 dB	1300MHz, 1% duty cycle, 1 mS period.		50		dBm
IIP3	Pin=30dBm/tone		70		dBm
Switching time	50% ctrl to 10/90% of the RF value is settled. C1=1nF		650		ns
Control Voltage	Power supply VDD	4.5	5	5.5	V
	Negative Voltage supply, VCP	-20	-18	-17	V
	All control pins high, Vih	4.5	5	5.5	V
	All control pins low, Vil	-0.3	0	0.5	V
Control Current	All control pins low, Iil				uA
	All control pins high, Iih				uA
Current Consumption, IDD	Active mode		1	3.6	mA

Bill of Materials



Note:

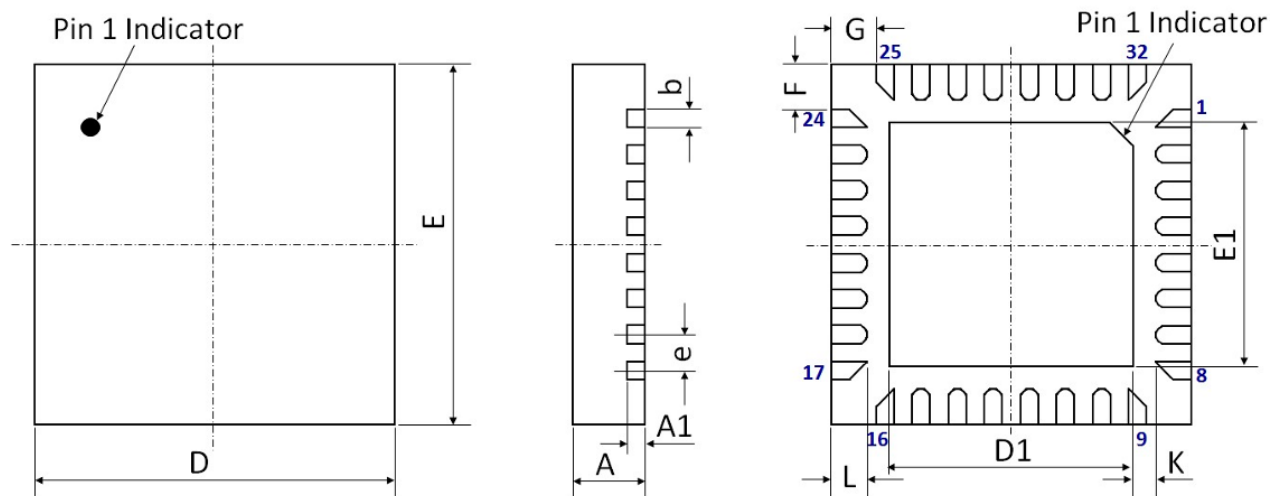
When EN=0, internal charge pump is disabled and external -18V supply will be supplied to VCP pin.
 When EN=1 or Floating, internal charge pump is enabled and VCP pin should be floated.

Component	Description
U1	MCSPT0033P47
U2	MCNS6218
C1、C6、C8	1nF, 25 V, ±10%, 0402
C2、C5、C7、C9	1uF, 25 V, ±10%, 0402
C3、C4	100pF 25 V, ±10%, 0402
R1	0Ω, 0402
R2	500KΩ, ±10%, 0402

Bias Table

V1	V2	Active RF Path
0	0	ANT-RF1
1	0	ANT-RF2
0	1	ANT-RF3
1	1	ANT-RF4

Device Package Information



Device Package Dimensions

Dimension (mm)	Value (mm)	Tolerance (mm)	Dimension (mm)	Value (mm)	Tolerance (mm)
A	0.80	±0.05	E	4.00 BSC	±0.05
A1	0.203	±0.02	E1	2.70	±0.05
b	0.20	+0.05/-0.07	F	0.50	±0.05
D	4.00 BSC	±0.05	G	0.50	±0.05
D1	2.70	±0.05	L	0.40	±0.05
e	0.40 BSC	±0.05	K	0.25	±0.05