

Product Overview

The MCSPT0035P45 is a symmetrical reflective Single Pole Four Throws (SP4T) switch designed for broadband, high power switching applications. Its broadband behavior from 30MHz to 5.0GHz frequencies makes the MCSPT0035P45 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 MCSPT0035P45 is packaged into a compact Quad Flat No lead (QFN) 4x4mm 32 leads plastic package.

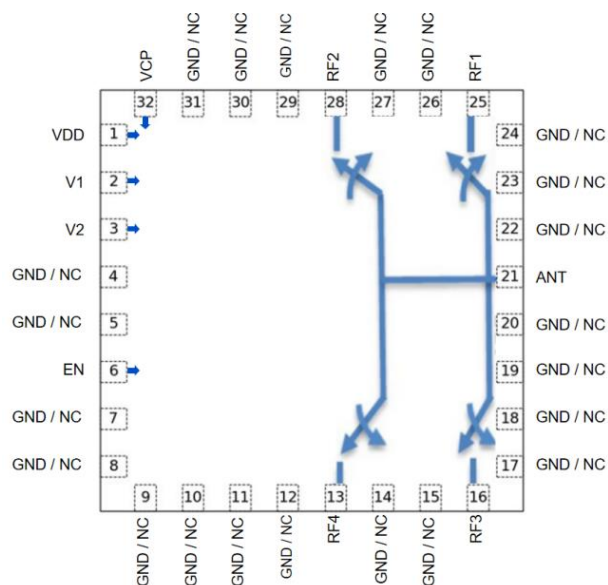
Applications

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

Key Features

- Operating frequency: 30MHz to 5GHz
- Low insertion loss: 0.25dB @ 1GHz
- High isolation: 40dB @ 1GHz
- 30W CW, 60W 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
MCSPT0035P45	30MHz to 5GHz, 30W 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

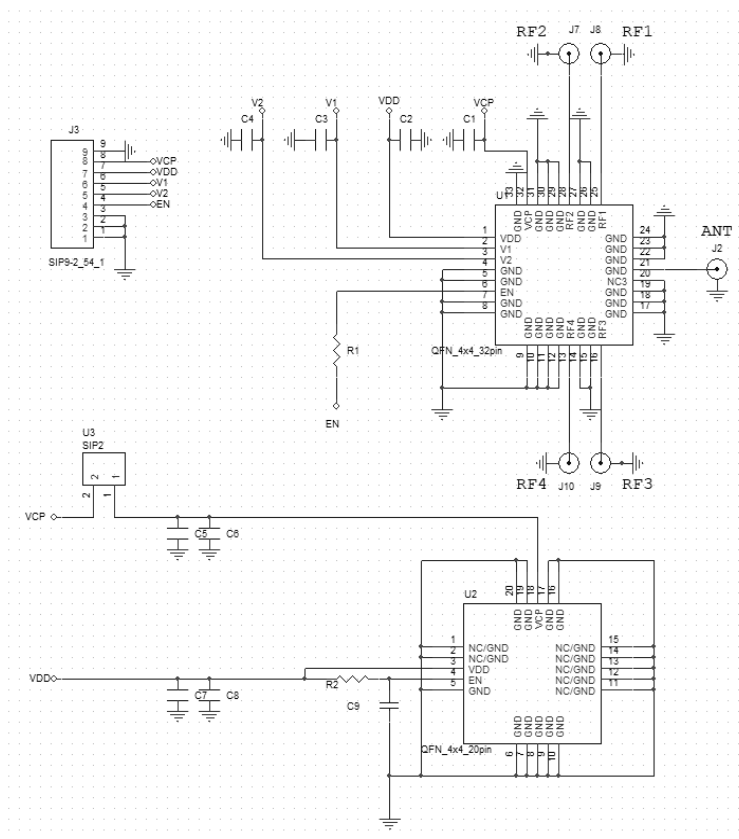
Parameter	Symbol	Absolute Maximum
Power Supply Voltage	VDD	4.5V to 5.5 V
Charge Pump Voltage	VCP	-20V to -17V
RF Input Power peak	Ppeak	50 dBm @ 1.3GHz
RF Input Power CW	PCW	46.5 dBm @ 1.3GHz
Hot Switching Power CW	PHS	45 dBm @ 1.3GHz
Junction Temperature	Tj	+140 °C
Operating Temperature	Top	-40 °C to +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		5000	MHz
Insertion Loss, ANT-RFx	Freq=1GHz		0.25		dB
	Freq=2GHz		0.4		dB
	Freq=3GHz		0.5		dB
	Freq=4GHz (match)		0.6		dB
	Freq=5GHz (match)		0.8		dB
Isolation, ANT-RFx	Freq=1GHz		40		dB
	Freq=2GHz		32		dB
	Freq=3GHz		28		dB
	Freq=4GHz		24		dB
	Freq=5GHz		22		dB

Return Loss ANT-RFx	Freq=1GHz		30		dB
	Freq=2GHz		30		dB
	Freq=3GHz		25		dB
	Freq=4GHz		15		dB
	Freq=5GHz		12		dB
P0.1 dB	1300MHz, CW	45			dBm
Peak P0.1 dB	1300MHz, 1% duty cycle, 1 mS period.		48		dBm
IIP3	Pin=34dBm/tone		70		dBm
Switching time	50% ctrl to 10/90% of the RF value is settled. C1=1nF		370		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		0		uA
	All control pins high, Iih		10		uA
Current Consumption, IDD	Active mode		1	3.6	mA

Bill of Materials



Note:

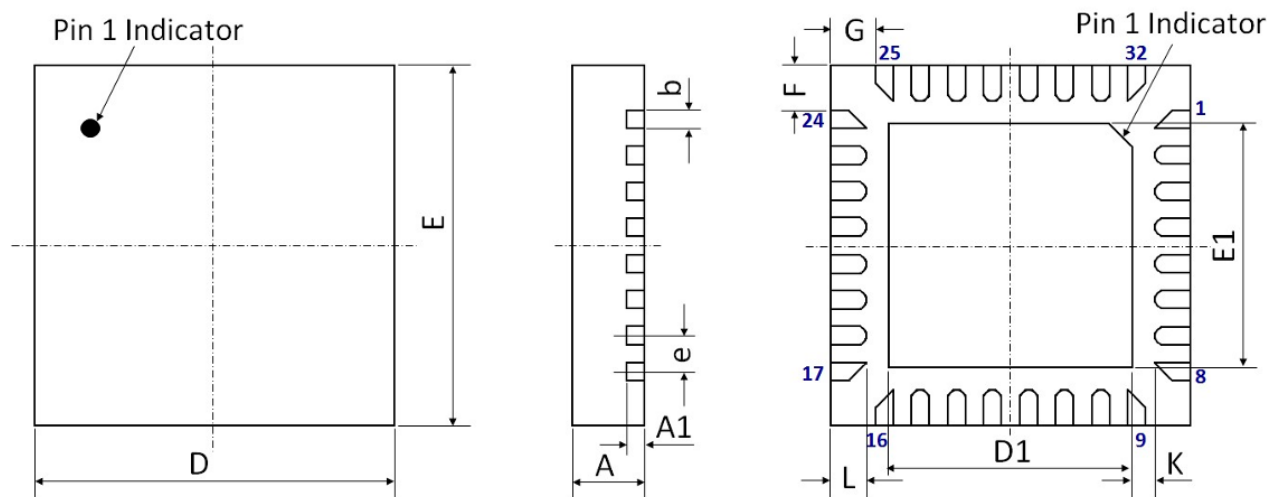
When EN=0, internal charge pump is disabled and external -18V supply will be supplied to VCP pin.
 When EN=1 or Floating, internal charge pump is enabled and VCP pin should be floated.

Component	Description
U1	MCSPT0035P45
U2	MCNS6218
C1、C6、C8	1nF, 25 V, $\pm 10\%$, 0402
C2、C5、C7、C9	1 μ F, 25 V, $\pm 10\%$, 0402
C3、C4	100pF 25 V, $\pm 10\%$, 0402
R1	0 Ω , 0402
R2	500K Ω , $\pm 10\%$, 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