

Product Overview

The MCSDT0056P53 is a SPDT high power, broadband, high linearity, PIN diode T/R switch for 0.05 - 6.0 GHz applications, including WiMAX & WiFi. The device is provided in an industry standard lead free 4 mm QFN plastic package. This device incorporates PIN diode die fabricated with a low loss, high isolation switching diode.

Applications

- Suitable for High Power LTE, TD-SCDMA, WiMAX, and Military Radio Applications

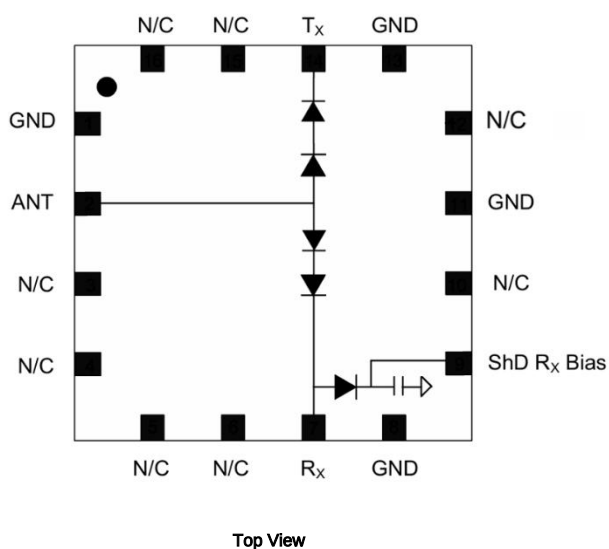
Key Features

- DC - 6000MHz Broadband Performance
- Low Insertion Loss: TX = 0.14 dB @ 1.8 GHz
- High Isolation: RX = 49 dB @ 1.8 GHz
- High TX RF Input Power = 200 W CW@ 1.3 GHz, +25°C
- High TX RF Input Peak Power: 1000 W
- Positive DC Bias Only Required
- Surface Mount 4 mm PQFN Package
- RoHS* Compliant and 260°C Reflow Compatible

Ordering Information

Part No.	Description
MCSDT0056P53	

Functional Diagram



Signal Descriptions

Pin	Name	Description
1、8、11、13	GND	Ground
2	ANT	Antenna
3、6、15	N/C	Connect to Ground
4、5、10、12、16	N/C	No Connection
7	Rx	Receive
9	ShD Rx Bias	ShD Rx Bias
14	Tx	Transmit

Absolute Maximum Ratings @TA= +25°C

Parameter	Absolute Maximum
Forward Current	200 mA
DC Reverse Voltage	150 V
Tx Incident CW Power	53.5 dBm @ 1.3GHz
Tx Incident Peak Power (10 μ s Pulse Width)	60 dBm
Rx Incident CW Power	48 dBm @ 1.3GHz
Junction Temperature	+175 °C
Operating Temperature	-40 °C to +100 °C
Storage Temperature	-55 °C to +150 °C

Minimum Reverse Bias Voltage¹

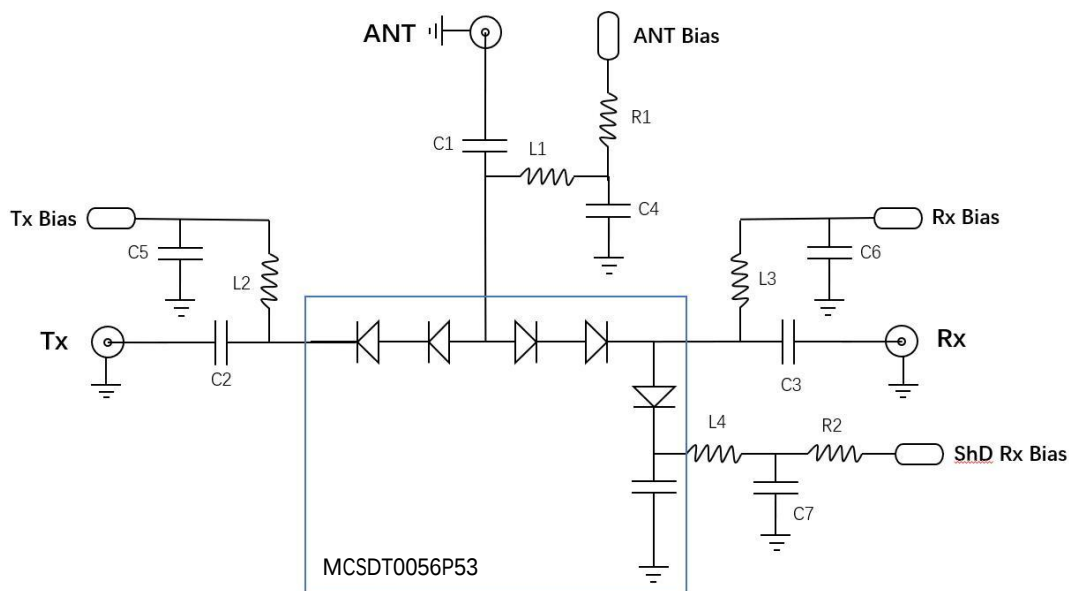
Frequency (MHz)	DC Voltage (V)
50	130
500	90
1000	60
2000	30
4000	15
6000	10

1. Minimum DC bias voltage to maintain low loss under 200 W of Tx power with 1.5:1 VSWR@TA= +25°C

Electrical Specifications: TA=25°C, Bias = 100mA/28V

Parameter	Symbol	Test condition	Min	Typ	Max	Unit
Operating Frequency	Freq		50		6000	MHz
Insertion Loss	I _L _Tx	Pin=0dBm; Freq=1 GHz		0.08		dB
		Pin=0dBm; Freq=3 GHz		0.16		dB
		Pin=0dBm; Freq=6 GHz		0.31		dB
	I _L _Rx	Pin=0dBm; Freq=1 GHz		0.18		dB
		Pin=0dBm; Freq=3 GHz		0.41		dB
		Pin=0dBm; Freq=6 GHz		0.95		dB
Isolation	Iso_Tx Rx on	Pin=0dBm; Freq=1 GHz		44		dB
		Pin=0dBm; Freq=1.8 GHz		49		dB
		Pin=0dBm; Freq=3 GHz		39		dB
		Pin=0dBm; Freq=6 GHz		25		dB
	Iso_Rx Tx on	Pin=0dBm; Freq=1 GHz		25		dB
		Pin=0dBm; Freq=3 GHz		17		dB
		Pin=0dBm; Freq=6 GHz		12		dB
Input Return Loss	R _L _Tx	Pin=0dBm		23		dB
	R _L _Rx	Pin=0dBm		25		dB
Tx Input P0.1 dB		TX on	53			dBm
TX IIP3		Pin=30dBm/tone	85			dBm
TX CW Input max Power			53			dBm
RX CW Input max Power			47			dBm
TX RF Switching Speed		(10 - 90% RF Voltage) 1 MHz Rep Rate in Modulating Mode		200		ns

Bias Schematic



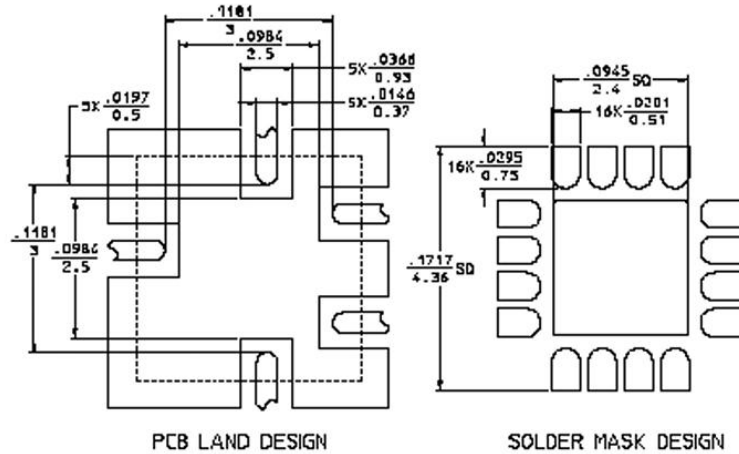
Suggested Component Value

component	Value	package
C1、C2、C3	10 pF	0603、>200V
C4、C5、C6、C7	10 nF	0603、>100V
L1、L2、L3、L4	22nH	0603、>200mA
R1	39Ω	0805
R2	480Ω	0805

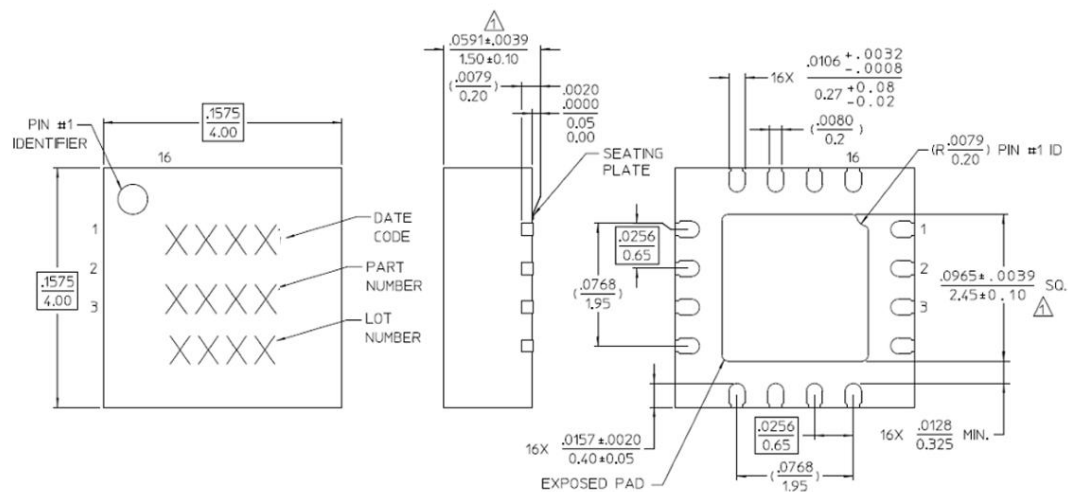
Bias Table

Switch State	ANT Bias	Tx Bias	Rx Bias	ShD Rx Bias
Tx - ANT On	5V	0V, (-100mA)	28V, (50mA)	0V, (-50mA)
ANT - Rx On	5V	28V, (0mA)	0V, (-100mA)	28V, (0mA)

PCB Footprint



Lead Free 4 mm 16-Lead PQFN



NOTES:

1. ALL DIMENSION PER JEDEC MO-220, VAR. VGGC-3 EXCEPT INDICATED DIMENSIONS. REFERENCE JEDEC SPEC. FOR ADDITIONAL DIMENSION AND TOLERANCE INFORMATION.
2. ALL DIMENSIONS SHOWN AS IN/MM.