WS7802DE

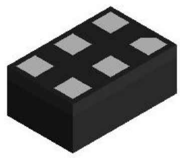
0.1GHz – 3GHz SPDT Antenna Switch

http//:www.sh-willsemi.com

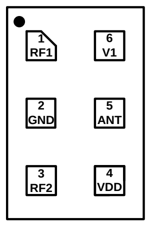
Descriptions

The WS7802DE is a single-pole, double-throw (SPDT) switch. The device is optimized for 3G/4G routing and diversity applications. The high linearity performance and low insertion loss make the device an ideal choice for WCDMA/LTE handset and data card applications. No external DC blocking capacitors are required on the RF paths if no DC voltage is applied to those paths.

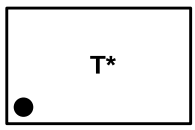
The WS7802DE is provided in a compact Dual Flat No-lead Package (DFN) 1.1 x 0.7 mm^2 package.



DFN 1.1X0.7-6L (Bottom view)



Pin configuration (Top view)



T = Device code

* = Month code（A~Z）

Marking (Top view)

Features

- Small, low profile package 1.1mm x 0.7mm x 0.55mm
- Working frequency up to 3GHz
- Very low insertion loss
- Excellent isolation performance
- Low power consumption
- Exceptional linearity performance for WCDMA/LTE application
- Low harmonic generation
- Very good ESD performance

Applications

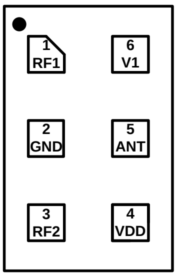
- Cell phones
- Tablets
- Other RF front-end modules

Order information

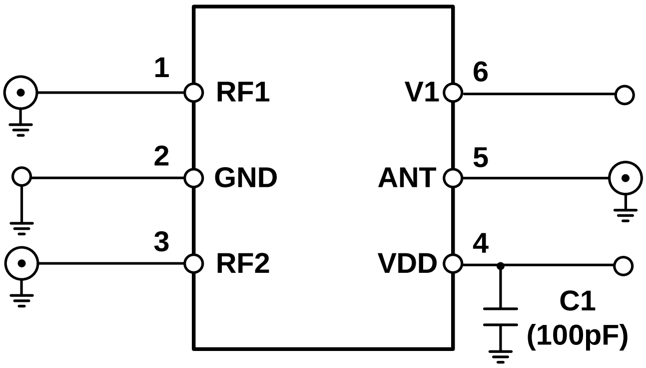
Device	Package	Shipping
WS7802DE-6/TR	DFN 1.1X0.7-6L	3000/Reel&Tape

Pinning information

Pin	Function	Description	Transparent top view
1	RF1	RF port 1	
2	GND	Ground	
3	RF2	RF port 2	
4	VDD	DC power supply	
5	ANT	RF common (antenna) port	
6	V1	DC control voltage1	



Application information



Note1: filter capacitor is needed on VDD

Recommended operating conditions

Parameters	Conditions	Specifications			Unit
		Min.	Typ.	Max.	
ESD Rating					
ESD All Pins	HBM	-1000		+1000	V
	CDM	-500		+500	V
Power Supply					
Power Supply Voltage	Operating Voltage	2.5	2.8	5.0	V
Power Supply Current	VDD≤3.0V		35	45	μA
Control Voltage					
Logic Control "Low"		0	0	0.4	V
Logic Control "High"		1.2	1.8	4.5	V
RF Impedance					
RF Port Input and Output Impedance			50		Ω

Absolute maximum ratings

Maximum ratings are absolute ratings, exceeding only one of these values may cause irreversible damage to the integrated circuit.

Items	Value	Unit
VDD Voltage	-0.3 to +5.5	V
Control Voltage	-0.3 to +5.0	V
Momentary, infrequent occurrence, 50 ohms	+34	dBm
Continuous Operation, 50 ohms	+33	dBm
Operation Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C

Characteristics (RF spec)

Normal test condition unless otherwise stated. All unused ports are 50Ω terminated.
VDD=2.8V, Temp=+25°C.P_{IN}=0dBm.

Parameters	Conditions	Specifications			Unit
		Min.	**Typ.**	**Max.**	
Insertion Loss (RF1/RF2)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		0.25 0.28 0.30		dB
Isolation (ANT to RF1/RF2)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		38 30 27		dB
Input Return Loss (ANT to RF1/RF2)	0.1GHz to 1.0GHz 1.0GHz to 2.0GHz 2.0GHz to 2.7GHz		37 30 27		dB
Second Harmonics (RF1/RF2)	0.7GHz to 1.0GHz, PIN=+25dBm 1.0GHz to 2.0GHz, PIN=+25dBm 2.0GHz to 2.7GHz, PIN=+25dBm		102		dBc
Third Harmonics (RF1/RF2)	0.7GHz to 1.0GHz, PIN=+25dBm 1.0GHz to 2.0GHz, PIN=+25dBm 2.0GHz to 2.7GHz, PIN=+25dBm		93		dBc
0.1dB Compression Point (RF1/RF2)	0.7GHz to 2.7GHz		33		dBm
Turn-On Switching Time	50% of final control voltage to 90% of final RF power, switching between RF ports		1		μs

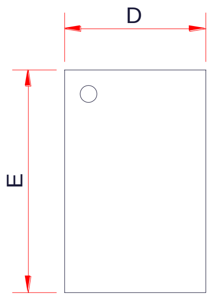
Truth Table for Operation

Mode	V1
RF1	1
RF2	0

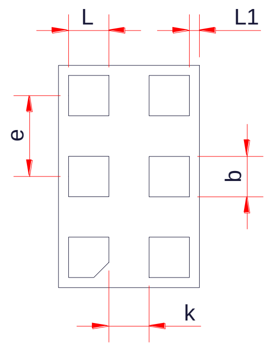
Note2: Any state other than that described in this table places the switch into an undefined state. An undefined state will not damage the device, but not recommended for customers.

Package outline dimensions

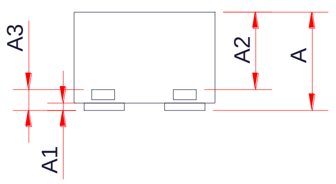
DFN1107-6L



TOP VIEW



BOTTOM VIEW

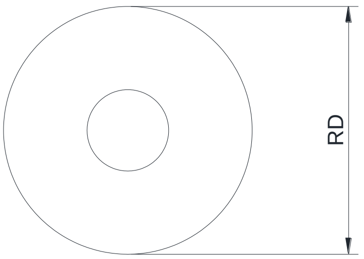


SIDE VIEW

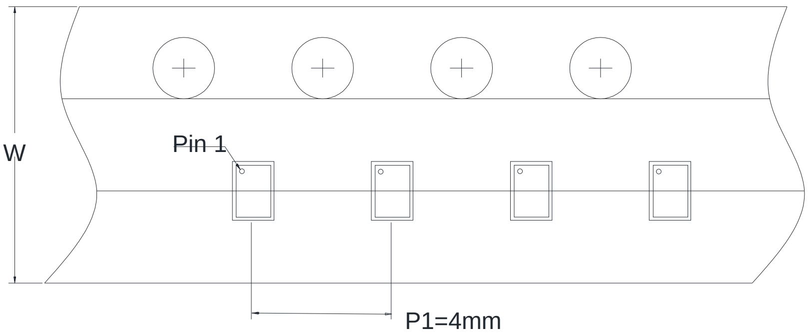
Symbol	Dimensions in Millimeters		
	Min.	**Typ.**	**Max.**
A	0.50	0.55	0.60
A1	- 0.004	0.02	0.05
A2	0.44Ref.		
A3	0.11Ref.		
b	0.15	0.20	0.25
D	0.70 BSC.		
E	1.10 BSC.		
e	0.40BSC.		
L1	0.05 Ref.		
L	0.15	0.20	0.25

Tape and reel information

Reel Dimensions

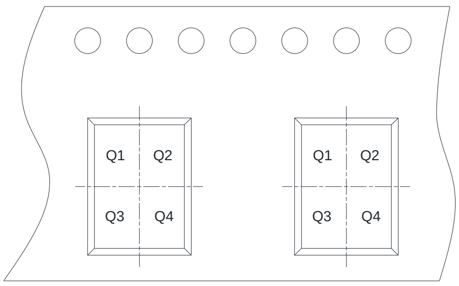


Tape Dimensions



Note：Tape material is plastic. Pitch between successive cavity centers is 4mm.

Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch	☐ 13inch		
W	Overall width of the carrier tape	☑ 8mm	☐ 12mm	☐ 16mm	
P1	Pitch between successive chip centers	☐ 2mm	☑ 4mm	☐ 8mm	
Pin1	Pin1 Quadrant	☑ Q1	☐ Q2	☐ Q3	☐ Q4