

D7004

0.1 - 3.0GHz SP4T Antenna Switch

PRELIMINARY DATA SHEET

Version 1.0

Features

- QFN (14-Pin, 2mm×2mm) Package
- Multi-Band Applications (0.1 – 3.0GHz)
- Low insertion loss and high isolation
- GPIO compatible
- High power handling

Typical Applications

- 2G/3G/4G antenna switch
- LTE TDD/FDD receive diversity
- Portable Battery-Powered Equipment

Product Description

The D7004 is a Single Pole, Four-Throw (SP4T) antenna switch; with high linearity performance and low insertion loss. It is suitable for LTE-based handsets, data cards, and other devices, both for receive diversity and higher power antenna switch, such as in multi-mode GSM/EDGE/WCDMA, TD-SCDMA/TDD-LTE, WCDMA/FDD, and LTE transmit or receive applications.

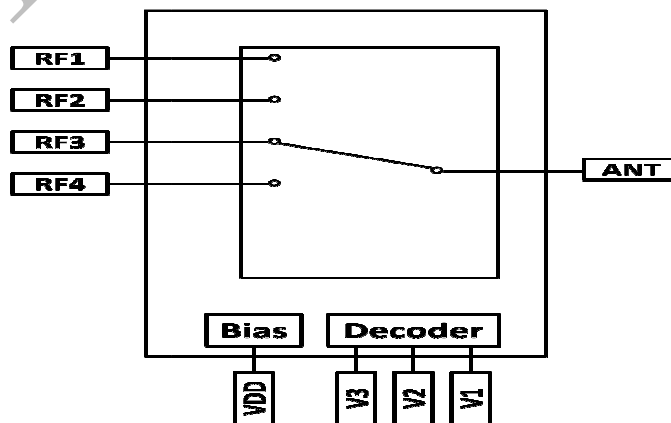
This part is packaged in a compact 2mm x 2mm, 14- Pin, QFN package, with GPIO compatible logic control.

Optimum Process Technology Applied

√GaAs pHEMT

√Si CMOS

Fig.1 Functional Block Diagram



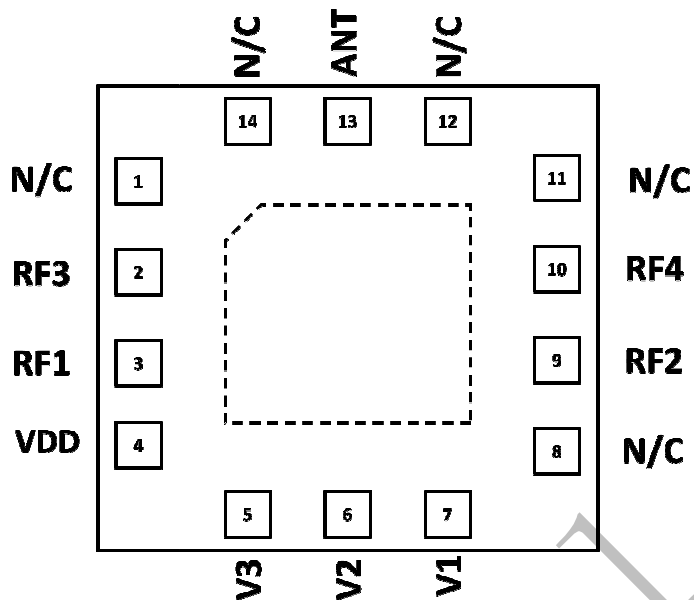


Fig. 2 D7004 Pin Layout (Top View)

Table 1: Pin Description

Pin No	Definition	Description
2, 3, 9, 10	RF1 ~RF4	Four separately controlled RF paths
13	ANT	Antenna port
5~7	V1~V3	Logic Control "H" : 1.6 ~ 3.0V, Logic Control "L": 0 ~ 0.5V
4	VDD	DC power supply
1, 8, 11, 12,14	NC	Not connected
	Package Base	Ground

Table2: Control Logic Tables

Switched Path	Control Logic		
	V1	V2	V3
RF1 --- ANT	0	0	0
RF2 --- ANT	0	0	1
RF3 ---ANT	0	1	0
RF4 --- ANT	0	1	1
ALL OFF	1	0	0
ALL OFF	1	0	1
Power Down (Standby)	1	1	1

Table 3: Absolute Maximum Ratings

PARAMETER	MIN	MAX	UNIT
Supply Voltage VDD	2.5	+5.0	V _{DC}
Control Voltage (V1, V2, V3)	-0.3	+3.0	V
RF Input Power	-	+36	dBm
Operating Case Temperature	-40	+90	°C
Storage Temperature	-55	+150	°C

Cautions ! ESD sensitive device.

Table 4: Electrical Specification

PARAMETER	SPECIFICATION			UNIT	CONDITION
	MIN	TYP	MAX		
					Temp=+25°C, VDD=2.6V, Pin=0dBm, V1/V2/V3 = 0V/1.8V
Supply Voltage VDD	2.5	3.0	5.0	V	
Supply Current IDD		30	60	μA	
Control Voltage V1, V2, V3	Low: 0 ~ 0.5V, High: 1.6 ~ 3.0V				
Control Current		1	5	μA	V1/V2/V3 = 1.8V
Shutdown Current		3		μA	V1=V2=V3=1.8V, VDD=3V
Insertion Loss IL ANT to (RF1~RF4) Ports		0.5 0.6 0.8		dB	0.1 to 1.0 GHz 1.0 to 2.0 GHz 2.0 to 2.7 GHz
Isolation ANT/ All RF Ports		35 30 25		dB	0.1 to 1.0 GHz 1.0 to 2.0 GHz 2.0 to 2.7 GHz
Second Harmonic		-80		dBc	Pin = 26dBm, up to 2.7GHz
Third Harmonic		-80		dBc	Pin = 26dBm, up to 2.7GHz
VSWR		1.1	1.5		Up to 3000 MHz
Impedance		50		Ω	Load impedance presented at RFin pad
Turn-on time			2	μs	Switching between RF ports or turning on

Application Schematic

Device is intended for use in a 50 Ohm system, with a DC-blocking capacitor (any value from 5pF to 15pF) in each RF path.

Power-Up/Down Sequence

In order to avoid damaging the device, if VDD is not supplied at any time, the control voltages must all be set to 0V (or ground).

ON Sequence: First turn ON VDD, then to apply logic control signals, and last RF input.

OFF Sequence: First remove RF input; turn OFF the logic control signals, then turn OFF VDD.

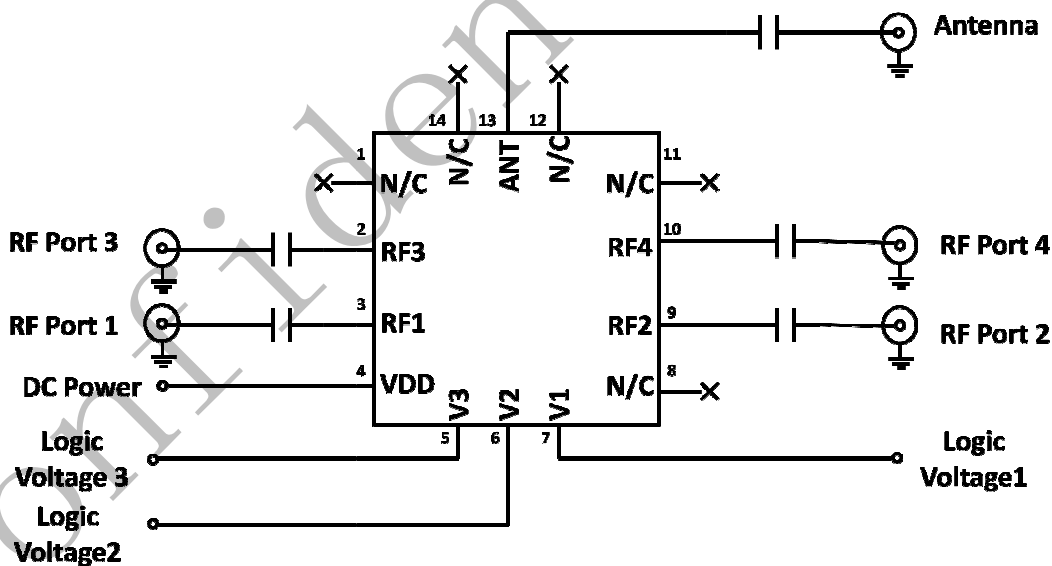


Fig. 3 D7004 Applications Schematic

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
<u>D7004</u>	-40°C to +90°C	2mm×2mm×0.7mm QFN-14L	Tape and Reel, <u>3000</u> per reel

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