

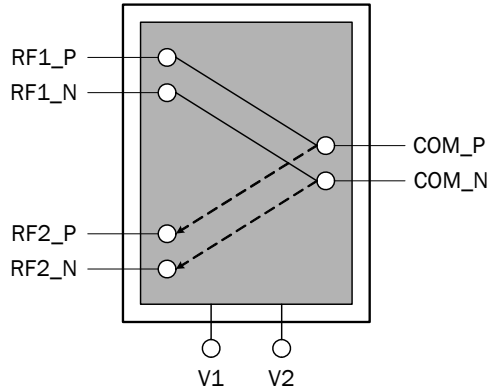


Features

- Broadband Performance
Low Frequency to 4GHz
- Very Low Insertion Loss
0.25 dB Typ at 0.90GHz
0.4dB Typ at 1.90GHz
- Excellent Linearity Performance
IIP2 > 109dBm at
P_{OUT} = 16dBm at 0.90GHz
IIP2 > 105dBm at
P_{OUT} = 16dBm at 1.90GHz
- 1.6V Capable for Low Power Applications
- Compact Footprint
(2.0mmx2.0mmx0.55mm,
12-pin QFN)
- Lead Free and RoHS Compliant

Applications

- Cellular Handset Applications
- IEEE 802.11b/g WLAN Applications
- Multi-mode GSM, WCDMA Applications
- WLAN Applications
- SAW Filter Switching



Functional Block Diagram

Product Description

The RF1226 is a single-pole double-throw (SPDT) differential switch designed for general purpose switching applications which require very low insertion loss and low power signal routing applications. Excellent performance matching between the two SPDT devices makes the RF1226 particularly suited to differential SAW filter switching. The RF1226 features low insertion loss, high linearity, and very good harmonic characteristics. The switch is operable from 1.6V to 3.6V control voltage. It is fabricated with 0.5um GaAs pHEMT process and is packaged in a very compact 2mmx2mm 12-pin leadless QFN package.

Ordering Information

RF1226	Broadband Medium Power Differential SPDT Switch
RF1226PCBA-410	Fully Assembled Evaluation Board

Optimum Technology Matching® Applied

- | | | | |
|--------------------------------------|--------------------------------------|------------------------------------------------|-----------------------------------|
| <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input checked="" type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS | <input type="checkbox"/> Si CMOS | <input type="checkbox"/> RF MEMS |
| <input type="checkbox"/> InGaP HBT | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si BJT | <input type="checkbox"/> LDMOS |

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Absolute Maximum Ratings

Parameter	Rating	Unit
Voltage	6.0	V
Maximum Input Power (0.6GHz to 2.5GHz), RF1, RF2	+28	dBm
Operating Temperature	-30 to +85	°C
Storage Temperature	-65 to +100	°C



Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
					$V_{RF1}, V_{RF2} = \text{High} = 2.6\text{V}, V_{RF1} = V_{RF2} = \text{Low} = 0\text{V}, \text{Temp} = 25^\circ\text{C}$
Operating Frequency	0.6		2.5	GHz	
DC Supply					
VRF1 and VRF2 (H)	1.6	2.6	3.6	V	
VRF1 and VRF2 (L)	0		0.4	V	
Control Current		0.4	1.0	μA	$P_{IN} = 15\text{dBm}$
Insertion Loss					
RF1_P, RF2_P - COM_P RF1_N, RF2_N - COM_N		0.22	0.45	dB	824 MHz to 960 MHz
		0.4	0.65	dB	1850 MHz to 1990 MHz
		0.45		dB	2170 MHz to 2500 MHz
		0.45		dB	2500 MHz to 3500 MHz
Isolation					
RF1_P, RF2_P - COM_P RF1_N, RF2_N - COM_N	24	27		dB	824 MHz to 960 MHz
	18	21		dB	1850 MHz to 1990 MHz
	16	19		dB	2170 MHz to 2500 MHz
	14	17		dB	2500 MHz to 3500 MHz
RF1_N - RF2_N RF1PN - RF2_P	24	27.0		dB	824 MHz to 960 MHz
	18	21.0		dB	1850 MHz to 1990 MHz
	16	19		dB	2170 MHz to 2500 MHz
	14	17.5		dB	2500 MHz to 3500 MHz
Return Loss					
		1.5:1		dB	500 MHz to 3000 MHz
Harmonics					
Second Harmonics	62	96		dBc	$P_{IN} = +16\text{dBm}, 880\text{MHz}$
	62	93		dBc	$P_{IN} = +16\text{dBm}, 1880\text{MHz}$
	62	90		dBc	$P_{IN} = +16\text{dBm}, 2500\text{MHz}$
Third Harmonics	62	98		dBc	$P_{IN} = +16\text{dBm}, 880\text{MHz}$
	62	98		dBc	$P_{IN} = +16\text{dBm}, 1880\text{MHz}$
	62	95		dBc	$P_{IN} = +16\text{dBm}, 2500\text{MHz}$

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
IIP2					
RF1, RF2 - COM (Cell)	105.5	109.0		dBm	Tone 1: 836.5MHz @ 16dBm, Tone 2: 791.5MHz @ -20dBm RX Freq: 881.5MHz
RF1, RF2 - COM (IMT)	102	106		dBm	Tone 1: 1950MHz @ 16dBm, Tone 2: 1760MHz @ -20dBm RX Freq: 2140MHz
RF1, RF2 - COM (AWS)	101	106		dBm	Tone 1: 1710MHz @ 16dBm, Tone 2: 3820MHz @ -20dBm RX Freq: 2110MHz
RF1, RF2 - COM (PCS)	102	107		dBm	Tone 1: 1910MHz @ 16dBm, Tone 2: 3900MHz @ -20dBm RX Freq: 1990MHz
Triple Beat Ratio (TBR)					
Cell/AWS/PCS		100		dBc	VSWR=2:1, TX1=TX2= 11.5dBm
0.1dB Compression (P0.1dB)					
		26		dBm	500MHz to 3000MHz
Switching Speed					
		400		ns	50% control to 10% RF OFF
		260		ns	50% control to 90% RF ON

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
					$V_1, V_2 = \text{High} = 1.8\text{V}, V_1 = V_2 = \text{Low} = 0\text{V}, \text{Temp} = 25^\circ\text{C}$
Operating Frequency	0.6		4.0	GHz	
Insertion Loss					
RF1_P, RF2_P - COM_P RF1_N, RF2_N - COM_N		0.23	0.45	dB	824 MHz to 960 MHz
		0.4	0.65	dB	1850 MHz to 1990 MHz
		0.45		dB	2170 MHz to 2500 MHz
		0.45		dB	2500 MHz to 3500 MHz
Isolation					
RF1_P, RF2_P - COM_P RF1_N, RF2_N - COM_N	24	26.5		dB	824 MHz to 960 MHz
	18	20.5		dB	1850 MHz to 1990 MHz
	16	18.5		dB	2170 MHz to 2500 MHz
	14	17		dB	2500 MHz to 3500 MHz
RF1_N - RF2_N RF1PN - RF2_P	24	27		dB	824 MHz to 960 MHz
	18	20.5		dB	1850 MHz to 1990 MHz
	16	19.0		dB	2170 MHz to 2500 MHz
	14	17.0		dB	2500 MHz to 3500 MHz
Return Loss					
		1.5:1		dB	500 MHz to 3000 MHz
0.1dB Compression (P0.1dB)					
		20		dBm	500 MHz to 3000 MHz
Switching Speed					
		1.25		μs	50% control to 10% RF OFF
		0.66		μs	50% control to 90% RF ON

Control Logic

	Control Signals		Signal Paths	
	V1	V2	RF1_P - COM_P, RF1_N - COM_N	RF2_P - COM_P, RF2_N - COM_N
Valid States	1	0	ON	OFF
	0	1	OFF	ON
Invalid States	0	0	Indeterminate State*	
	1	1	Indeterminate State*	

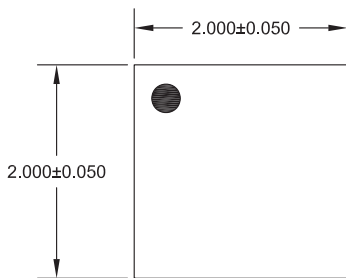
0: Logic level low, 0V~0.4V

1: Logic level high, 1.6V~3.6V

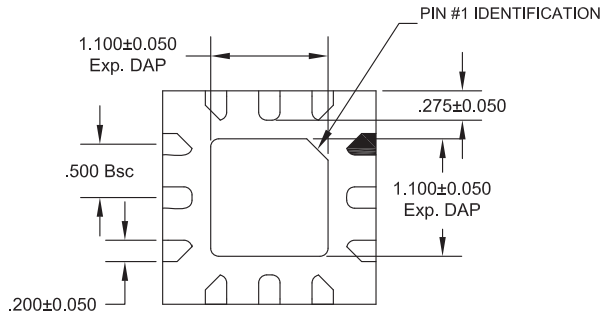
Note: In indeterminate states, both signal paths are ON with degraded performance.

Pin	Function	Description
1	RF1_P	Positive RF Port 1.
2	RF1_N	Negative RF Port 1.
3	V1	Voltage Control 1.
4	NC	Not connected.
5	NC	Not connected.
6	NC	Not connected.
7	V2	Voltage Control 2.
8	RF2_N	Negative RF Port 2.
9	RF2_P	Positive RF Port 2.
10	COM_P	Positive Common Port.
11	GND	Ground.
12	COM_N	Negative Common Port.

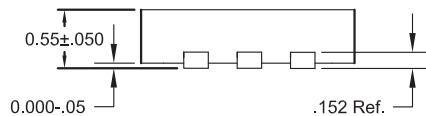
Package Drawing



TOP VIEW



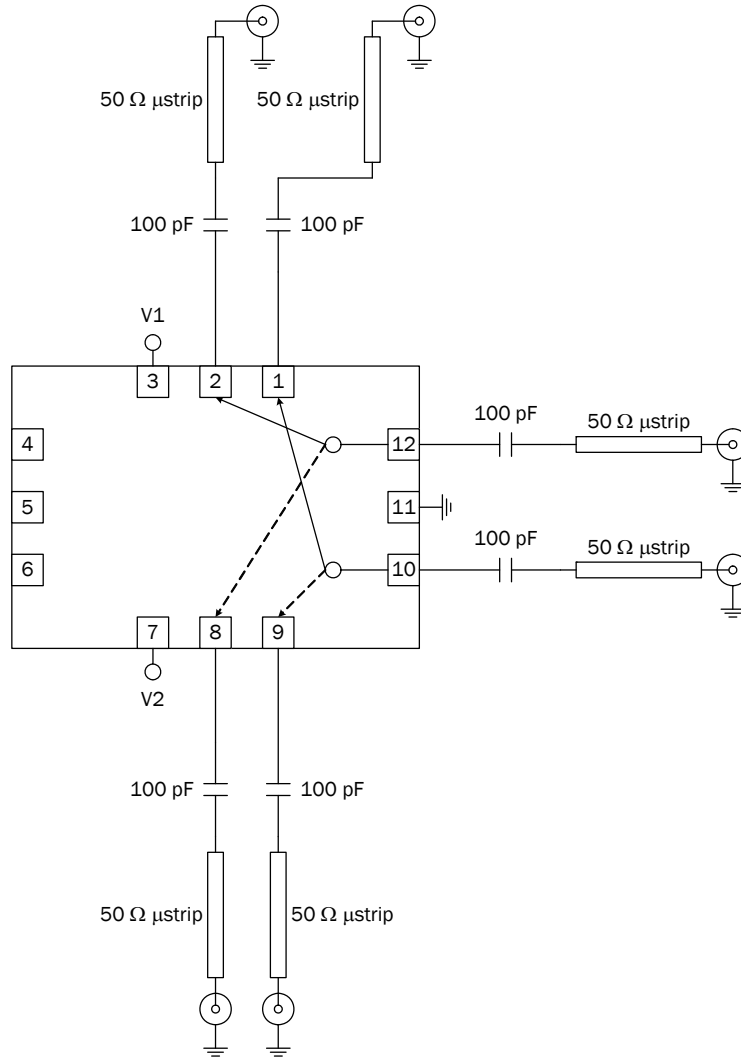
BOTTOM VIEW



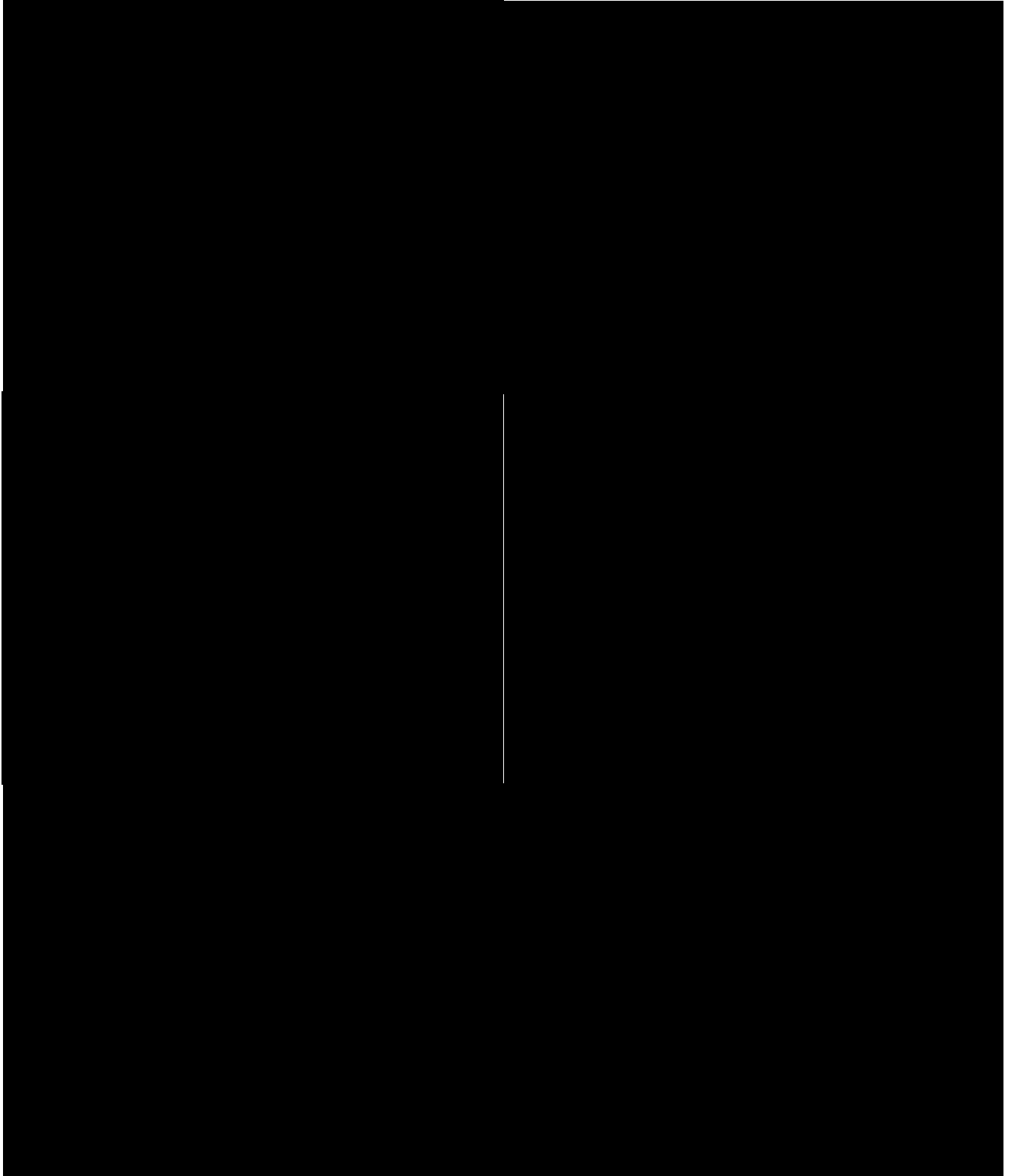
SIDE VIEW

Notes:
1) Pin 1 Shaded Area

Evaluation Board Schematic



Typical Performance



Typical Performance

