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RF1128

BROADBAND MEDIUM POWER (HIGH ISOLATION) SPDT SWITCH

Package Style: QFN, 6-pin, 2mmx1.3mm

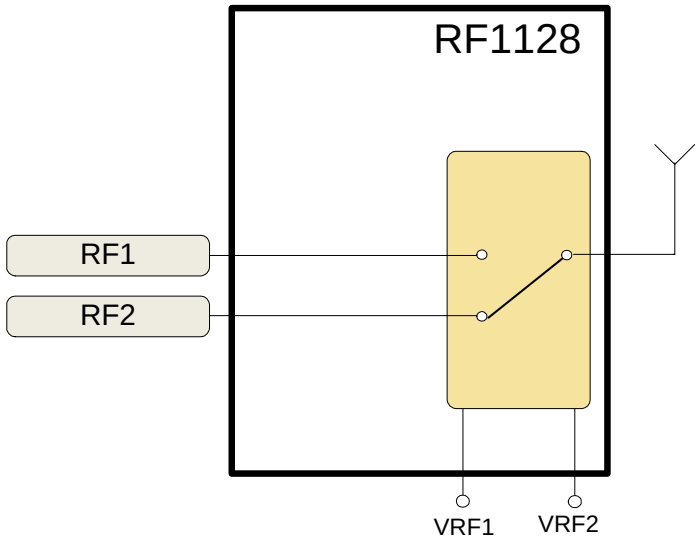
RFMD RF1128

Features

- Broadband Performance: Low Frequency to 3.5GHz
- Very Low Insertion Loss:
  - 0.35dB at 1GHz
  - 0.40dB at 2GHz
- Excellent Linearity:
  - IIP2 > 108dBm (Typ.)
  - IIP3 > 67dBm (Typ.)
- P0.1dB: 32dBm (Typ.)
- Compact Footprint (2.0mmx1.3mmx0.35mm, 6-pin QFN)

Applications

- Cellular Handset Applications
- Antenna Tuning Applications
- Multi-mode GSM, W-CDMA Applications
- WLAN Applications



Functional Block Diagram

Product Description

The RF1128 is a single-pole double-throw (SPDT) switch designed for general purpose switching applications which require very low insertion loss and high power handling capability. The RF1128 is ideally suited for battery operated applications requiring high performance switching with very low DC power consumption. The RF1128 features very low insertion loss, broadband isolation and excellent linearity performance, and is operable from 1.8V to 3.3V control voltage. It is fabricated with 0.5µm GaAs pHEMT process, and is packaged in a very compact 2mmx1.3mm, 6-pin, leadless QFN package.

Ordering Information

RF1128	Broadband Medium Power (High Isolation) SPDT Switch
RF1128PCBA-410	Fully Assembled Evaluation Board

Optimum Technology Matching® Applied

☐ GaAs HBT	☐ SiGe BiCMOS	☑ GaAs pHEMT	☐ GaN HEMT
☐ GaAs MESFET	☐ Si BiCMOS	☐ Si CMOS	☐ RF MEMS
☐ InGaP HBT	☐ SiGe HBT	☐ Si BJT	☐ LDMOS

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Absolute Maximum Ratings

Parameter	Rating	Unit
Voltage	6.0	V
Maximum Input Power (0.6GHz to 3.5GHz), RF1, RF2, 50Ω	+34	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).

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
					VRF1, VRF2=High=3V, VRF1=VRF2=Low=0V, Temp=25°C
Operating Frequency	600		3500	MHz	
Insertion Loss					
RFC - RF1, RFC - RF2		0.25	0.35	dB	RF ON, 50MHz to 600MHz
		0.35	0.50	dB	RF ON, 824MHz to 960MHz
		0.40	0.55	dB	RF ON, 1850MHz to 1990MHz
		0.45	0.60	dB	RF ON, 2170MHz to 2500MHz
		0.55	0.70	dB	RF ON, 3500MHz
RF Isolation					
RF1 - RF2 and RF2 - RF1	27	29		dB	RF ON, 600MHz
	25	27		dB	RF ON, 824MHz to 960MHz
	29	31		dB	RF ON, 1850MHz to 1990MHz
	32	34		dB	RF ON, 2170MHz to 2500MHz
RFC - RF1, RFC - RF2	27	29		dB	RF ON, 600MHz
	25	27		dB	RF ON, 824MHz to 960MHz
	28	30		dB	RF ON, 1850MHz to 1990MHz
	31	33		dB	RF ON, 2170MHz to 2500MHz
RF Port Return Loss					
VSWR			1.5:1		
880MHz Harmonics					
Second Harmonic	70	91		dBc	P_{IN}=26dBm; F_O=880MHz
Third Harmonic	70	91		dBc	P_{IN}=26dBm; F_O=880MHz
1880MHz Harmonics					
Second Harmonic	70	85		dBc	P_{IN}=26dBm; F_O=1880MHz
Third Harmonic	70	88		dBc	P_{IN}=26dBm; F_O=1880MHz
2500MHz Harmonics					
Second Harmonic	70	82		dBc	P_{IN}=26dBm; F_O=2500MHz
Third Harmonic	70	86		dBc	P_{IN}=26dBm; F_O=2500MHz

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
IIP2					
RF1, RF2 - ANT Cell	104	111		dBm	Tone 1: 836.5MHz @ 16dBm, Tone 2: 1718MHz @ -20dBm, Receive Freq: 881.5MHz
RF1, RF2 - ANT AWS	105	111		dBm	Tone 1: 1732.5MHz @ 16dBm, Tone 2: 3865MHz @ -20dBm, Receive Freq: 2132.5MHz
RF1, RF2 - ANT PCS	104	108		dBm	Tone 1: 1880MHz @ 16dBm, Tone 2: 3840MHz @ -20dBm, Receive Freq: 1960MHz
IIP3					
RF1, RF2 - ANT Cell	65	68		dBm	Tone 1: 836.5MHz @ 16dBm, Tone 2: 791.5MHz @ -20dBm, Receive Freq: 881.5MHz
RF1, RF2 - ANT IMT	65	67		dBm	Tone 1: 1950MHz @ 16dBm, Tone 2: 1760MHz @ -20dBm, Receive Freq: 2140MHz
Input Power at 0.1dB Compression Point					
		32		dBm	
Switching Speed					
			600	ns	50% to 90% RF ON, 50% to 10% RF OFF
DC Supply					
VRF1 and VRF2 (H)	2.85	3.0	3.30	V	
VRF1 and VRF2 (L)	0.00		0.40	V	
Control Current			6.00	uA	

Control Logic

	Control Signals		Signal Paths	
	VRF1	VRF2	RF1-RFC	RF2-RFC
Valid States	1	0	ON	OFF
	0	1	OFF	ON
Invalid States	0	0	Indeterminate State*	
	1	1	Indeterminate State*	

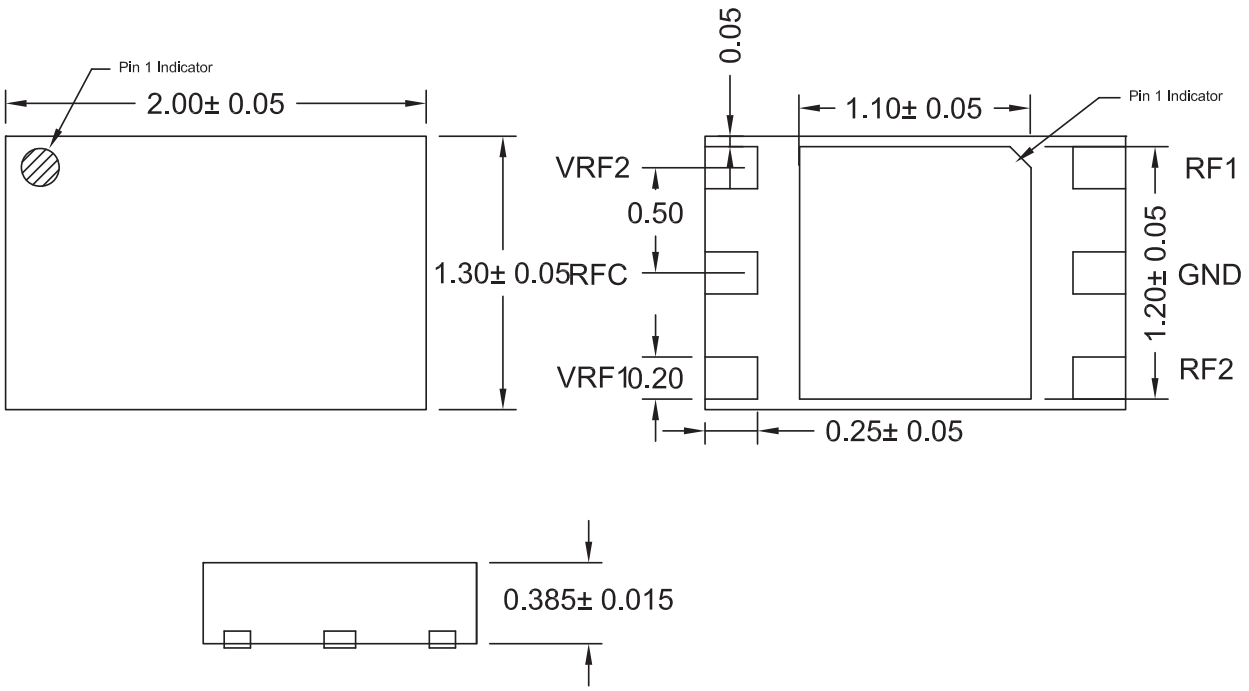
0: Logic level low, 0V~0.4V

1: Logic level high, 2.85V~3.3V

Note: In indeterminate states, both signal paths are ON with degraded performance.
For low power applications, RF1128 is operable at 1.8V control voltage with no significant change to the Insertion Loss, Return Loss, and Isolation performance.

Pin	Function	Description
1	RF1	RF Port 1.
2	GND	Ground.
3	RF2	RF Port 2.
4	VRF1	Control 1.
5	RFC	Antenna.
6	VRF2	Control 2.
Pkg Base	GND	Ground.

Package Drawing



1) PIN 1 INDICATOR SHADED AREA

Notes:

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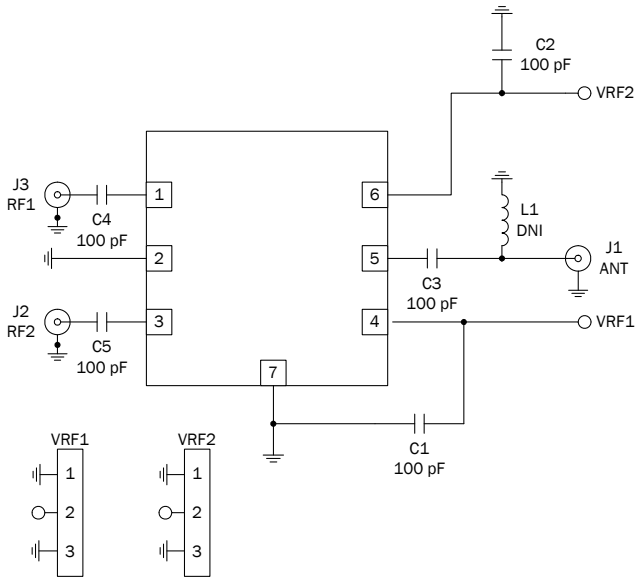
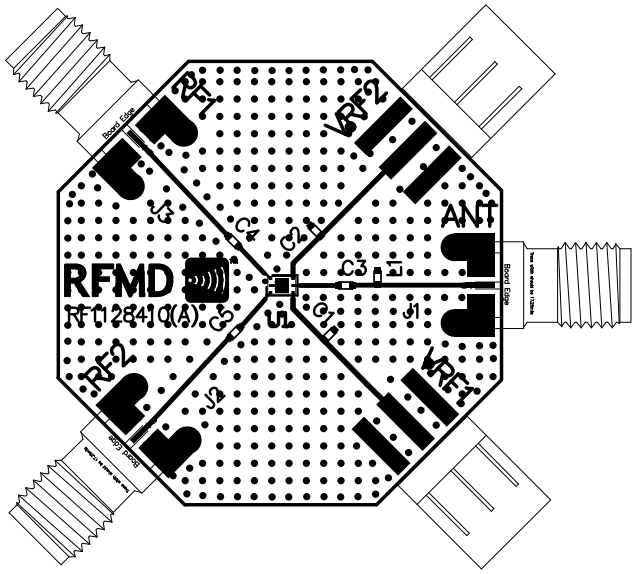
Evaluation Board Schematic



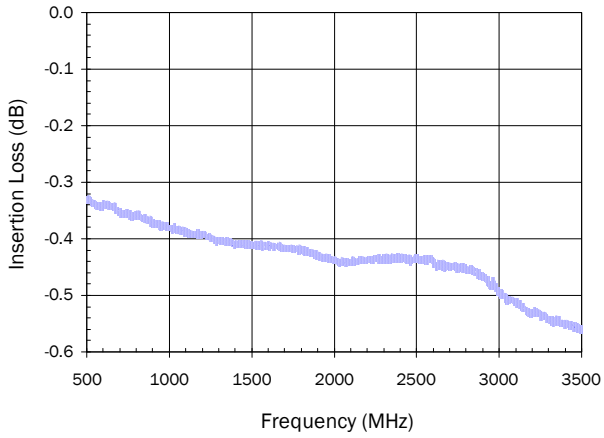
Evaluation Board Layout



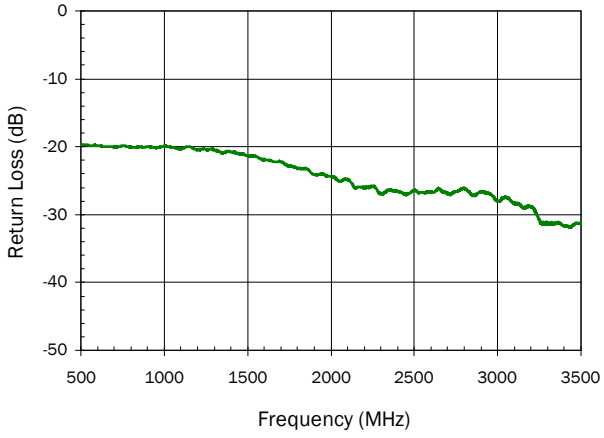
Typical Performance Data on Evaluation Board

Note: Fixture losses have been de-embedded (Temp=25°C, VRF1=VRF2=High=3V, VRF1=VRF2=Low=0V)

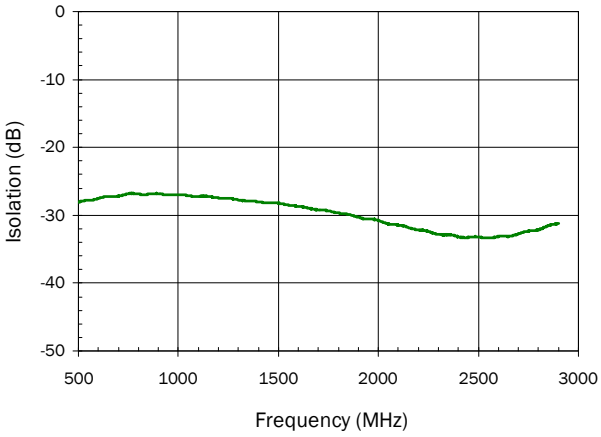
Insertion Loss
(Temperature=25°C, VRF(H)=3V)



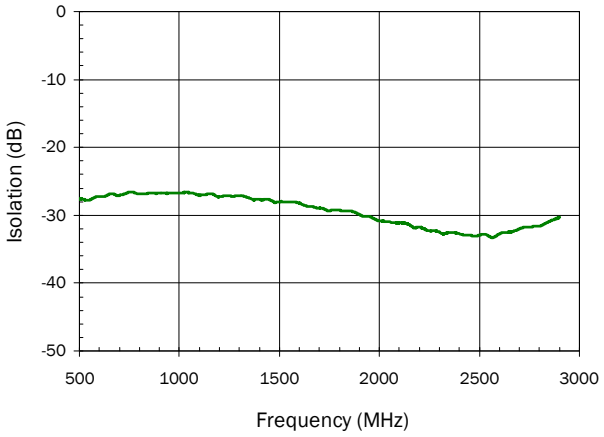
Ant Port Return Loss
(Temperature=25°C, VRF(H)=3V)



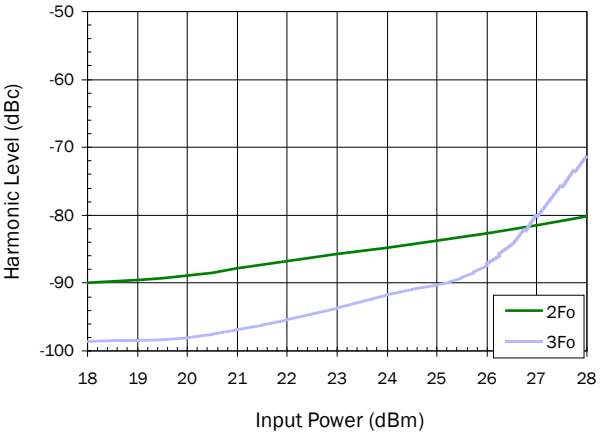
Port-to-Port Isolation
(Temperature=25°C, VRF(H)=3V)



Antenna-to-Port Isolation
(Temperature=25°C, VRF(H)=3V)



Harmonics
(Temperature=25°C, VRF(H)=3V)



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