



RFSW6223

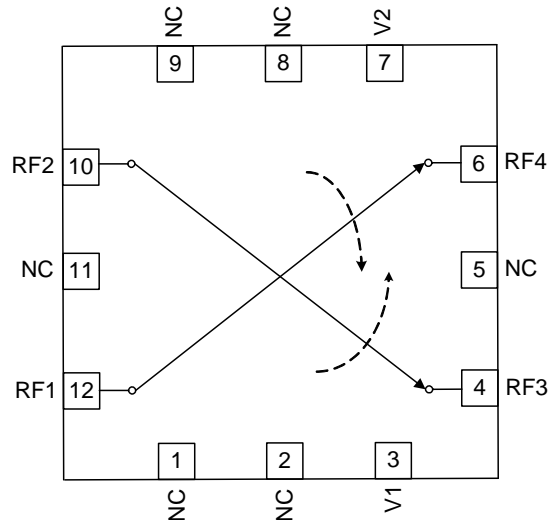


Features

- 10 MHz to 6000 MHz Operation
- Symmetric DPDT
- Low Loss: 0.65 dB (2 GHz)
- Isolation: 33 dB (2 GHz)
- High IP3: 56 dBm
- High P1dB: 34 dBm at 3 V
- Positive Logic Control
- 3 V and 5 V Logic Compatible

Applications

- Cellular, 3G, LTE Infrastructure
- WiBro, WiMAX, LTE, TD-SCDMA
- Wireless Backhaul
- High Performance Communications Systems
- GMSK, QPSK, DQPSK, QAM Modulation



Functional Block Diagram

Product Description

The RFSW6223 is a GaAs pHEMT Double-Pole Double-Throw (DPDT) switch designed for use in Cellular, 3G, LTE, and other high performance communications systems. It is ideally suited for applications requiring diversity. The RFSW6223 is 3V and 5V positive logic compatible.

Ordering Information

RFSW6223SQ	Sample bag with 25 pieces
RFSW6223SR	7" Sample reel with 100 pieces
RFSW6223TR7	7" Reel with 2500 pieces
RFSW6223PCK-410	0.4GHz to 6GHz PCBA with 5-piece sample bag

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"/> BiFET HBT |
| <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
Control Voltage (V1, V2)	7.0	V
Maximum RF Input Power, 3V, 10:1 VSWR	33	dBm
Maximum RF Input Power, 5V, 10:1 VSWR	34	dBm
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +150	°C
Maximum Junction Temperature	+150	°C
ESD Rating - Human Body Model (HBM)	Class 1A	
Moisture Sensitivity Level	MSL 1	



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.

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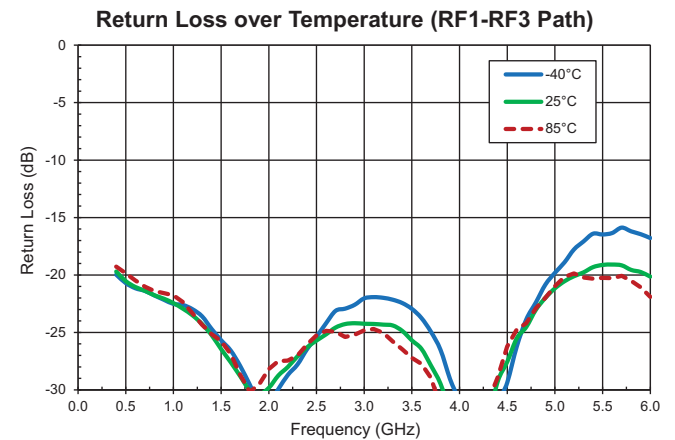
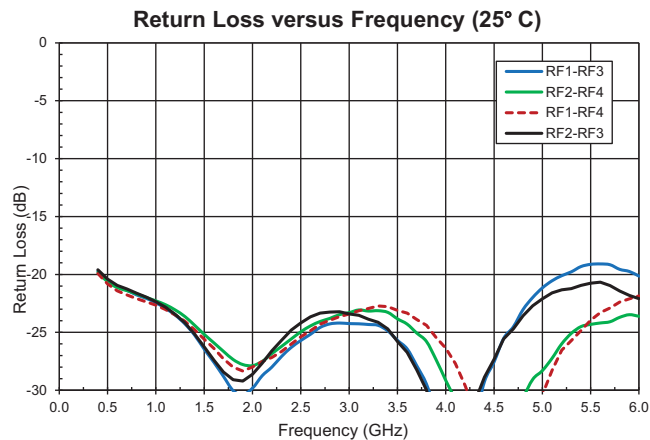
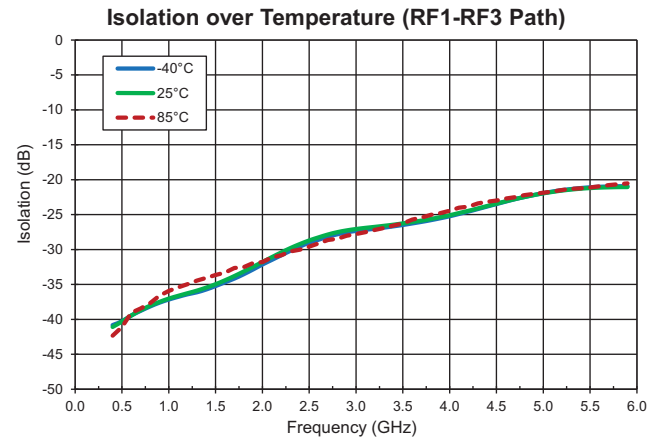
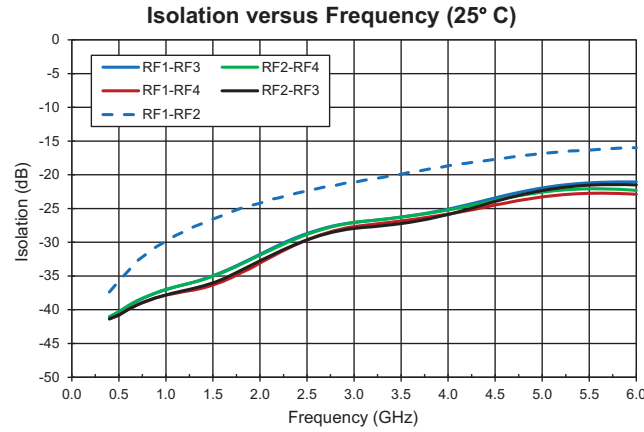
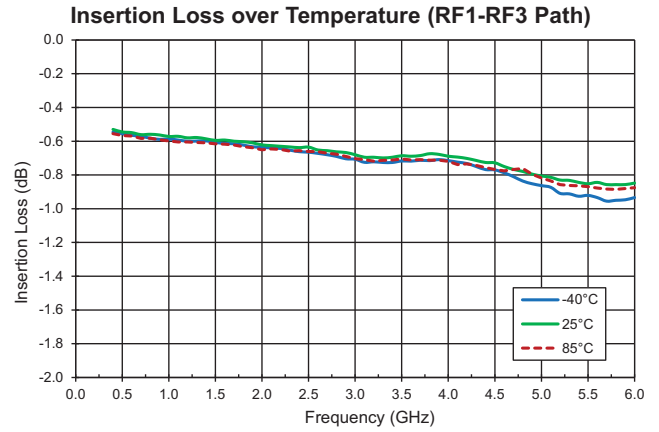
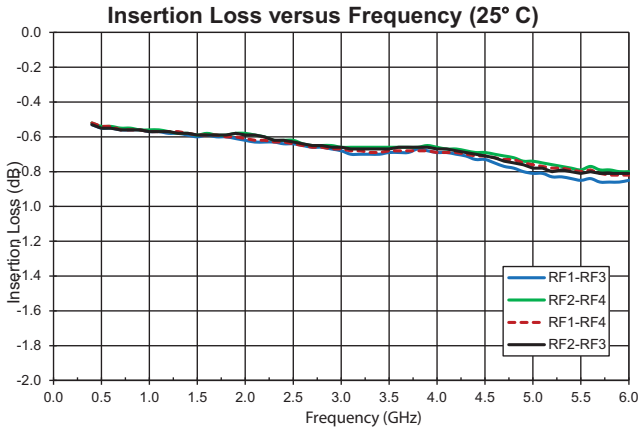
RFMD Green: RoHS compliant per EU Directive 2002/95/EC, halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
General Performance					3.0V control voltage unless otherwise noted. T=25 °C, 100pF DC blocks.
Insertion Loss		0.60		dB	1GHz
		0.65	0.85	dB	2GHz
		0.70		dB	4GHz
		0.80		dB	6GHz
Isolation (RF1/RF2 to RF3/RF4)		37		dB	1GHz
	28	33		dB	2GHz
		27		dB	4GHz
		22		dB	6GHz
Isolation (RF1 to RF2, RF3 to RF4)		30		dB	1GHz
		24.5		dB	2GHz
		18.5		dB	4GHz
		16		dB	6GHz
Return Loss		>20		dB	1GHz
		>20		dB	2GHz
		>20		dB	4GHz
		>20		dB	6GHz
IPO.1dB		30.5		dBm	3.0V, 900MHz
		35		dBm	5.0V, 900MHz
IP1dB		34		dBm	3.0V, 900MHz
IIP3		56		dBm	15dBm input power/tone, 5MHz tone spacing
IIP2		100		dBm	15dBm input power/tone, 5MHz tone spacing
2nd Harmonic		75		dBc	0.88GHz, +20dBm input power
		90		dBc	2.44GHz, +20dBm input power
3rd Harmonic		83		dBc	0.88GHz, +20dBm input power
		83		dBc	2.44GHz, +20dBm input power
T _{ON} , T _{OFF}		35		ns	50% V _{CC} to 10/90% RF, +10dBm input power
T _{RISE} , T _{FALL}		20		ns	10/90% RF, +10dBm input power
Power Supply					
Control Voltage (V1, V2)	1.8	3.0	5.0	V	Recommended for continuous operation.
Control Current		5		µA	3.0V

Notes: User should optimize DC-blocking capacitors for the desired frequency of operation. For positive logic control, DC-blocking capacitors are required on all RF ports.

Typical Performance: 0.4GHz to 6.0GHz Evaluation Board, 3V, 25 °C

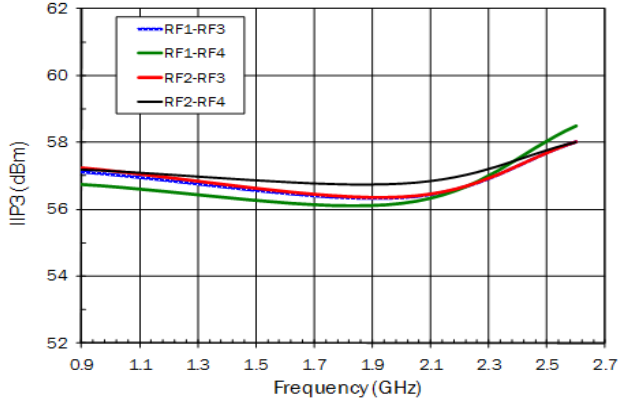
Thru losses are deembedded



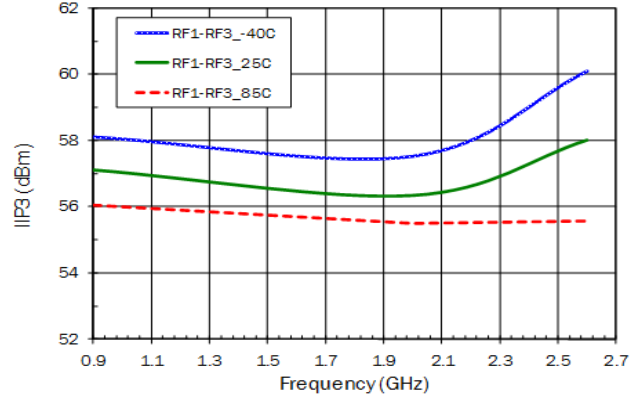
Typical Performance: 0.4GHz to 6.0GHz Evaluation Board, 25 °C

Thru losses are deembedded.

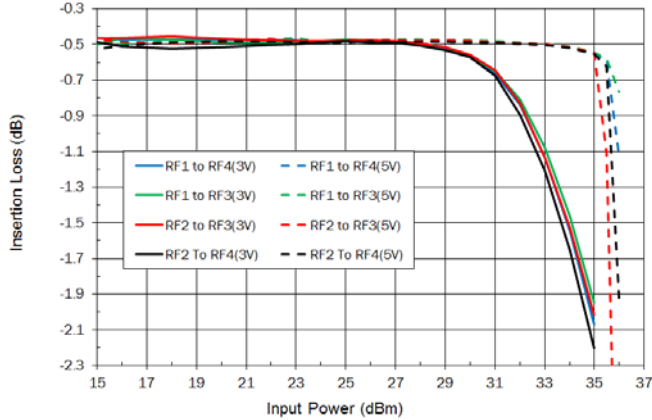
IIP3 versus Frequency (3V, 17dBm/tone, 25C)



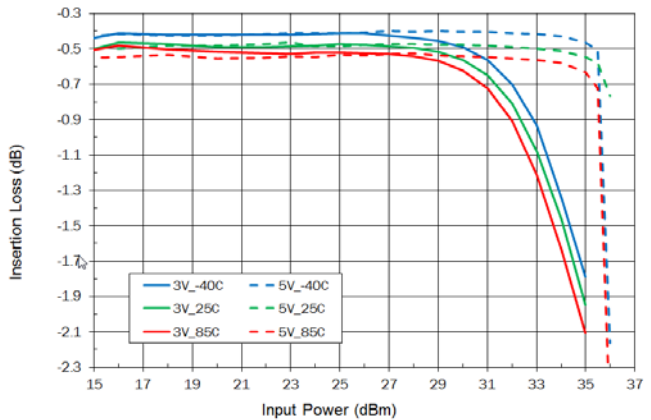
RF1 to RF3 IIP3 over Temp (3V, 17dBm/tone)



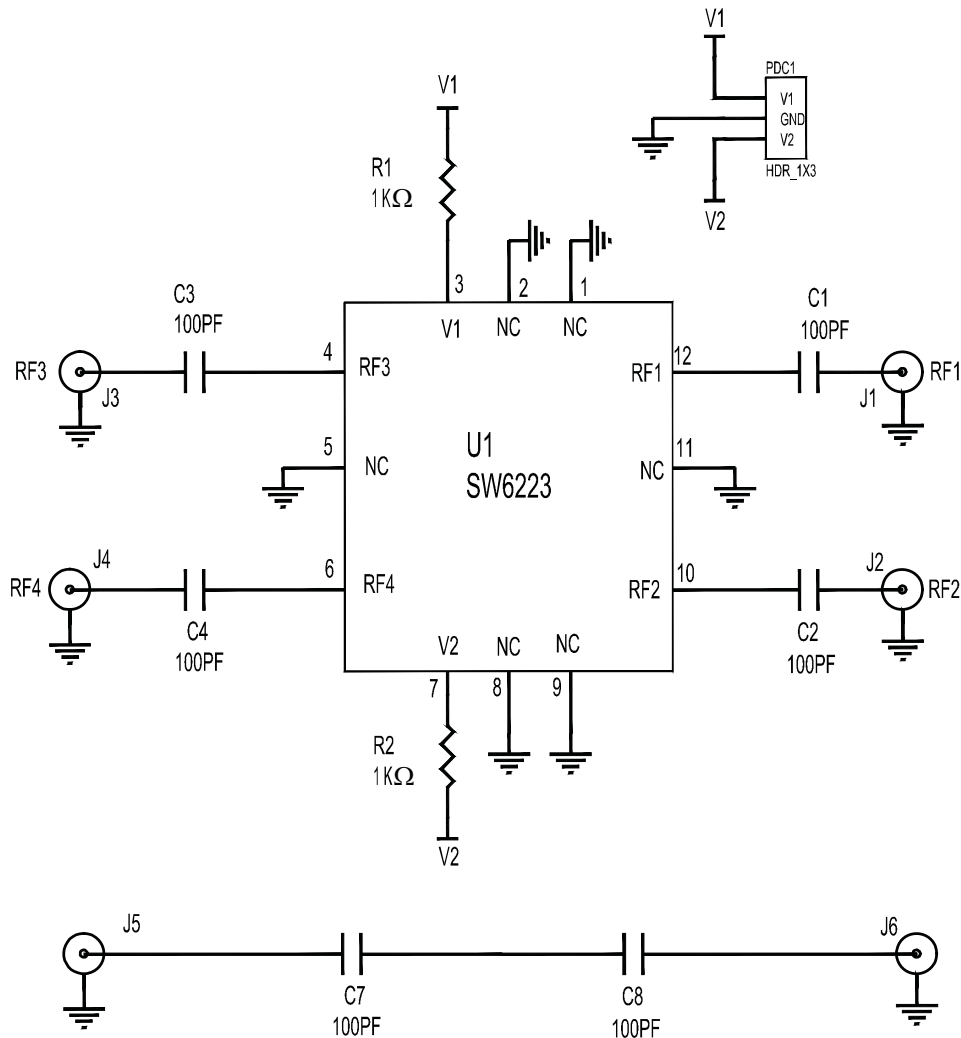
Insertion Loss versus Input Power (900MHz, 25C)



Insertion Loss (RF1-RF3) versus Input Power (900MHz)

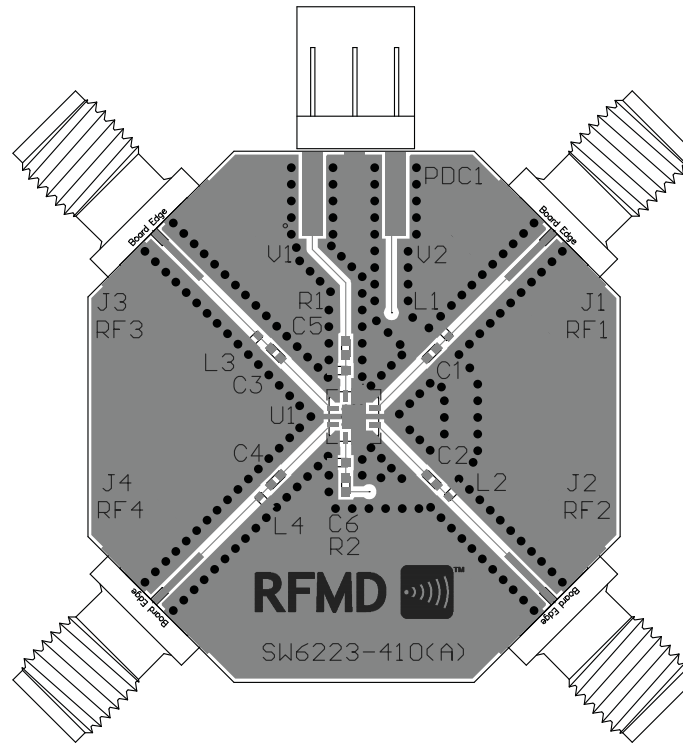


Evaluation Board Schematic
0.4GHz to 6GHz Application Circuit

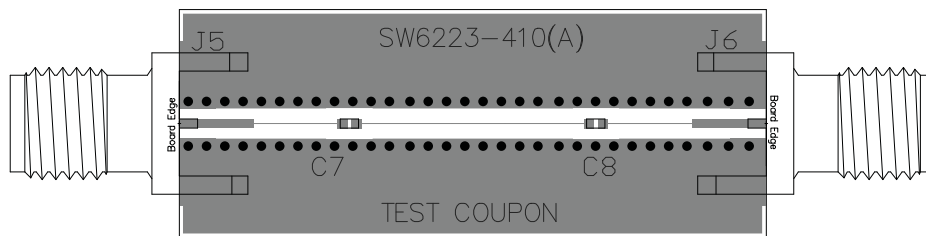


Note: Adjust value of DC-blocking capacitors based on frequency of operation.

Evaluation Board Assembly Drawing



Thru Assembly Drawing



Evaluation Board Bill of Materials (BOM)

0.4GHz to 6GHz Application Circuit

Description	Reference Designator	Manufacturer	Manufacturer's P/N
Evaluation Board			SW6223-410(A)
DPDT Switch	U1	RFMD	RFSW6223
CAP, 100pF, 5%, 50V, COG, 0402	C1-C4, C7-C8	Taiyo Yuden (USA), Inc.	RM UMK105CG101JV-F
RES, 1K, 5%, 1/16W, 0402	R1-R2	Kamaya Inc.	RMC1/16S-102JTH
CONN, SMA, END LAUNCH, 26.5GHz, 0.068"	J1-J6	Gigalane	PSF-S01-008
CONN, HDR, ST, PLRZD, 3-PIN, 0.100"	PDC1	ITW Pancon	MPSS100-3-C
DO NOT PLACE	C5-C6, L1-L4		

Pin Names and Description

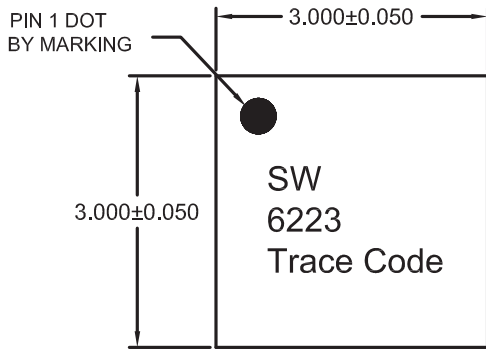
Pin	Function	Description
1	NC	No internal connection
2	NC	No internal connection
3	V1	Control 1
4	RF3	RF Port 3 - external DC block required
5	NC	No internal connection
6	RF4	RF Port 4 - external DC block required
7	V2	Control 2
8	NC	No internal connection
9	NC	No internal connection
10	RF2	RF Port 2 - external DC block required
11	NC	No internal connection.
12	RF1	RF Port 1 - external DC block required
EPAD	GND	RF and DC Ground. Must be soldered to EVB ground plane over a bed of vias for RF and thermal performance.

Note: RFMD recommends that the NC pins be grounded on the EVB to maximize channel-to-channel isolation.

Truth Table

Control Logic		RF Path Configuration			
V1	V2	RF1-RF3	RF1-RF4	RF2-RF4	RF2-RF3
1	0	Off	On	Off	On
0	1	On	Off	On	Off
1 = 1.8V to 5.0V 0 = 0V to 0.2V					

Package Drawing (Dimensions in millimeters)



Trace Code assigned by assembly SubCon

