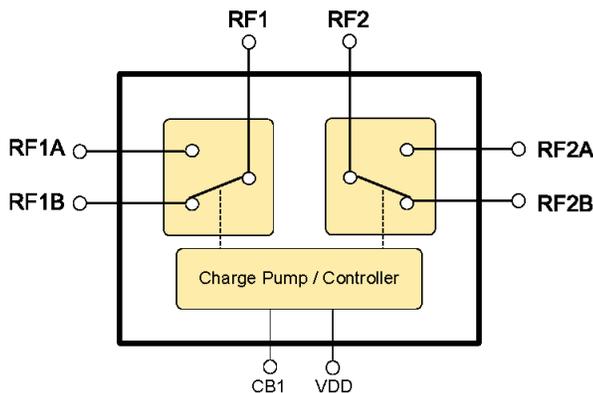


# RFSW6222

Differential SPDT or Dual SPDT Switch  
50MHz to 3700MHz

The RFSW6222 is a dual single-pole double-throw (SPDT) switch designed for general purpose switching applications. The low insertion loss along with excellent linearity performance makes the RFSW6222 ideal for filter or amplifier bypass switching to 3700MHz. The RF ports can be directly connected in 50Ω systems. And control logic is compatible with 1.3V and 2.7V systems. The supply voltage is intended for connection to 2.8V systems but the device is operable from 1.3V to 2.7V. The standard 12-pin QFN package and compact 2.0mm x 2.0mm size a compact, easy-to-use, switch component for quick integration into multi-mode, multi-band systems.



Functional Block Diagram

## Ordering Information

RFSW6222SQ	Sample bag with 25 pieces
RFSW6222SR	7" Reel with 100 pieces
RFSW6222TR7	7" Reel with 2500 pieces
RFSW6222PCK-410	50MHz to 3700MHz PCBA with 5-piece sample bag



Package: QFN, 12-pin,  
2.0mm x 2.0mm

## Features

- Low insertion loss: 0.29dB Typical at 2700MHz
- High Port-to-Port Isolation: 29dB Typical at 2700MHz
- Power Handling >35dBm
- Very Low Current Consumption
- 1.3V to 2.7V GPIO Compatible

## Applications

- Filter Switching
- LNA Bypass Switching
- Antenna Switching
- Differential or Dual Path Switching

## Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage in Operating Mode	3.9	V
Control Voltage (Digital Inputs)	3.0	dBm
Maximum Input Power		
Momentary Infrequent Occurrence	+38 (50Ω) +36 (6:1 VSWR)	dBm
Continuous Operation	+36 (50Ω) +35 (6:1 VSWR)	dBm
Storage Temperature	-65 to +150	°C
ESD Rating - Human Body Model (HBM)	Class 2	V
Moisture Sensitivity Level	MSL1	



Caution! ESD sensitive device.



RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), 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.

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.

## Recommended Operating Condition

Parameter	Specification			Unit
	Min	Typ	Max	
Operating Temperature Range	-30	25	+90	°C
Operating Junction Temperature				°C
Switch Supply Voltage	2.4	2.8	3.5	V

## Nominal Operating Parameters

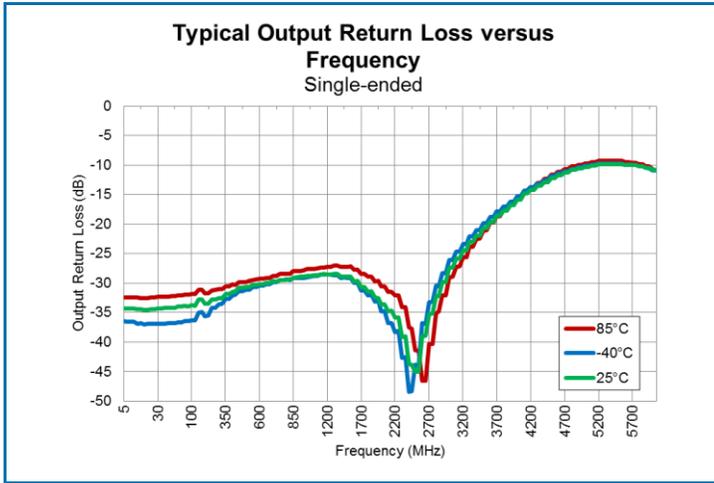
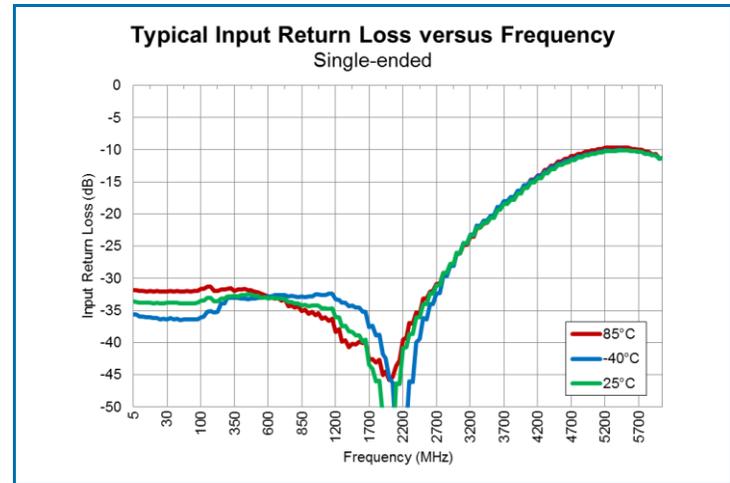
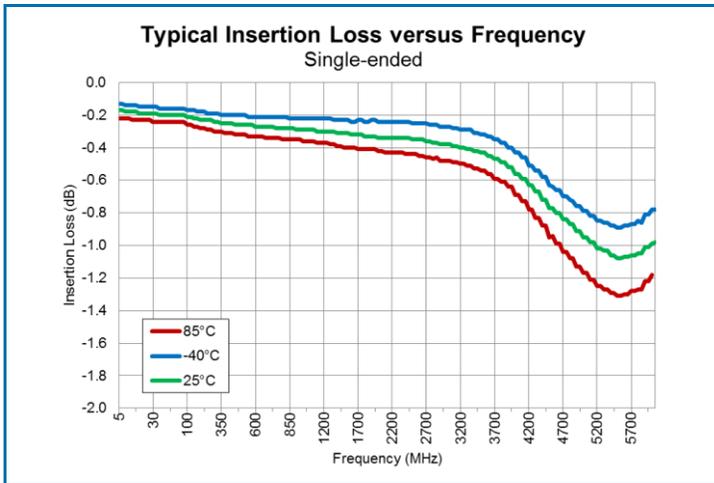
Parameter	Specification			Unit	Condition
	Min	Typ	Max		
					<b>Nominal Test Conditions Unless Otherwise State. <math>V_{DD} = 2.8V</math>, <math>V_{HIGH} / V_{LOW} = 1.8V / 0V</math>, Temp = 25°C, 50Ω, Single-ended Data</b>
Frequency Range	50		2700	MHz	
Insertion Loss (RF <sub>X</sub> to RF <sub>X</sub> A/B)		0.26	0.40	dB	700MHz to 960MHz
		0.26	0.45	dB	961MHz to 1710MHz
		0.27	0.45	dB	1711MHz to 2170MHz
		0.29	0.50	dB	2171MHz to 2700MHz
Isolation (RF1 to RF1A/B)	31	40		dB	700MHz to 960MHz
	25	36		dB	961MHz to 1710MHz
	25	30		dB	1711MHz to 2170MHz
	25	30		dB	2171MHz to 2700MHz
Isolation (RF2 to RF2A/B)	31	40		dB	700MHz to 960MHz
	25	35		dB	961MHz to 1710MHz
	25	32		dB	1711MHz to 2170MHz
	25	29		dB	2171MHz to 2700MHz

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
<b>Continued</b>					<b>Nominal Test Conditions Unless Otherwise State. <math>V_{DD} = 2.8V</math>, <math>V_{HIGH} / V_{LOW} = 1.8V / 0V</math>, Temp = 25°C, 50Ω, Single-ended Data</b>
IP3		70		dBm	700MHz to 2700MHz, 35dBm
Harmonics					
	2fo	-79		dBc	$P_{IN} = 26dBm$ , fo = 787MHz, 50Ω
	3fo	-84		dBc	$P_{IN} = 26dBm$ , fo = 710MHz, 50Ω
	2fo	-84	-107	dBc	$P_{IN} = 26dBm$ , fo = 915MHz, 50Ω
	3fo	-84	-106	dBc	
	2fo	-76	-103	dBc	$P_{IN} = 35dBm$ , fo = 915MHz, 50Ω
	3fo	-76	-90	dBc	
	2fo	-86	-105	dBc	$P_{IN} = 26dBm$ , fo = 1980MHz, 50Ω
	3fo	-86	-105	dBc	
	2fo	-76	-99	dBc	$P_{IN} = 32dBm$ , fo = 1980MHz, 50Ω
	3fo	-76	-94	dBc	
	2fo	-86	-108	dBc	$P_{IN} = 26dBm$ , fo = 2570MHz, 50Ω
	3fo	-86	-109	dBc	
	2fo	-86	-109	dBc	$P_{IN} = 26dBm$ , fo = 2690MHz, 50Ω
	3fo	-86	-105	dBc	
VSWR		1.1	1.3		700MHz to 960MHz
					961MHz to 1710MHz
					1711MHz to 2170MHz
					2171MHz to 2700MHz
Phase Balance	-5		+5	Deg	
<b>Operating Environment, Supply and Control</b>					<b>Nominal Test Conditions Unless Otherwise State. <math>V_{DD} = 2.8V</math>, <math>V_{HIGH} / V_{LOW} = 1.8V / 0V</math>, Temp = 25°C, 50Ω</b>
$V_{DD}$ Supply Current		90	110	μA	
LVC1-3, HVC1-3 – Control Voltage High	1.3	1.8	2.7	V	
LVC1-3, HVC1-3 – Control Voltage Low	0		0.45	V	
Control Current			1	μA	
Switching Speed			5	μs	10% to 90% RF

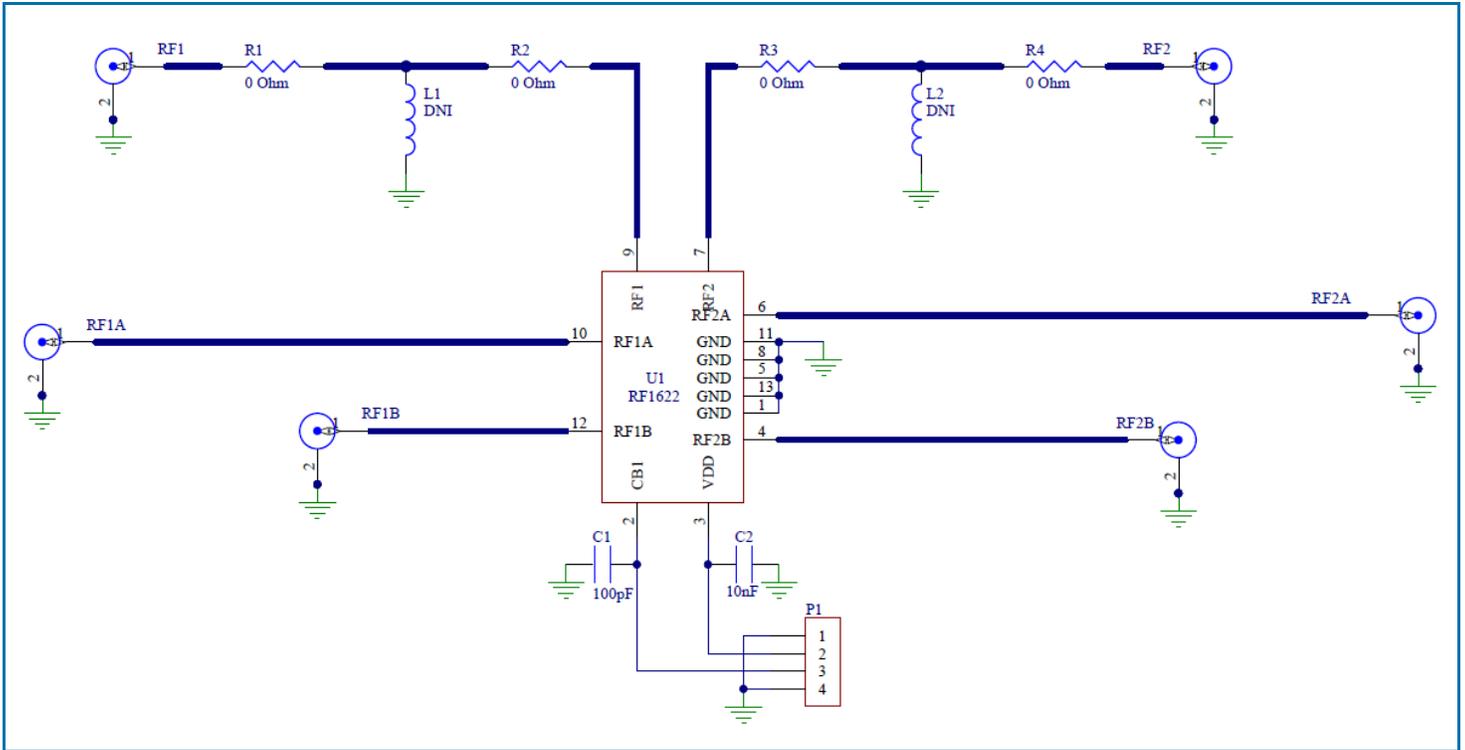
## Control Logic

Mode Bit (CB1)	RF1 Mode	RF2 Mode
0	RF1 to RF1A	RF2 to RF2A
1	RF1 to RF1B	RF2 to RF2B

Typical Performance: T = 25°C, V<sub>DD</sub> = 3.3V, singled-ended data unless otherwise noted



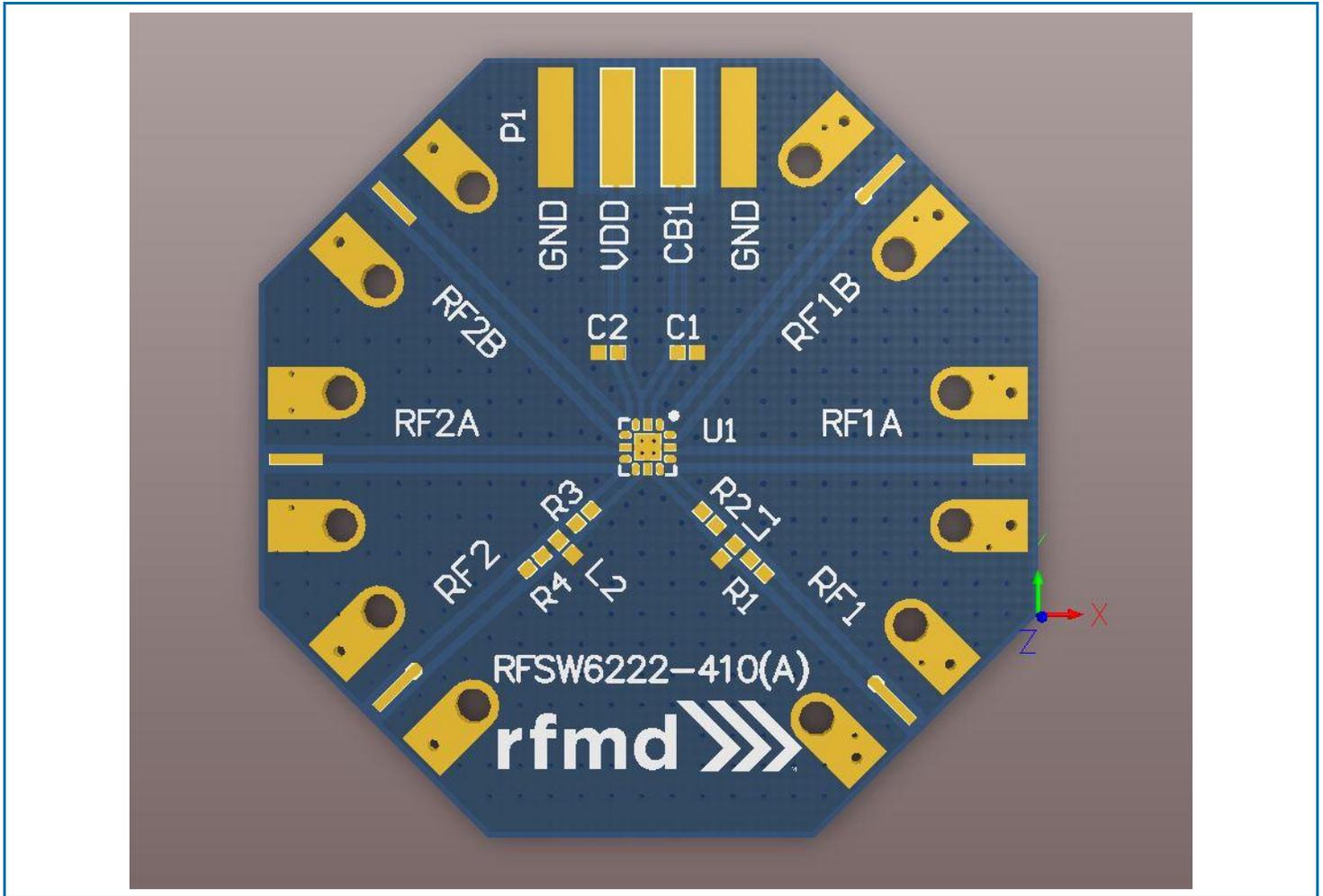
Evaluation Board Schematic 50MHz to 2700MHz Application Circuit



Evaluation Board Bill of Materials (BOM) 50MHz to 2700MHz Application Circuit

Description	Reference Designator	Manufacturer	Manufacturer's P/N
RFSW6222 Evaluation Board	PCB Itself	Viasystems Technologies Corp.	RSW6222-410(A)
General Purpose DPDT Switch	U1	RFMD	RFSW6222
CAP, 10000pF, 10%, X7R, 0402	C2	Murata Electronics	GRM155R71E103KA01D
CAP, 100pF, 5%, 50V, C0G, 0402	C1	Taiyo Yuden (USA), Inc.	RM UMK105CG101JV-F
CONN, SMA, END LNCH, MINI, FLT, 0.068"	RF1, RF2, RF1A, RF1B, RF2A, RF2B	Aliner Industries, Inc.	20-001CF-T
CONN, HDR, ST, PLRZD, 4-PIN, 0.100"	P1	ITW Pancon	MPSS100-4-C
RES, 0Ω, 0402	R1-R4	Kamaya, Inc.	RMC1/16SJPTH
DNP	L1-L2	N/A	N/A

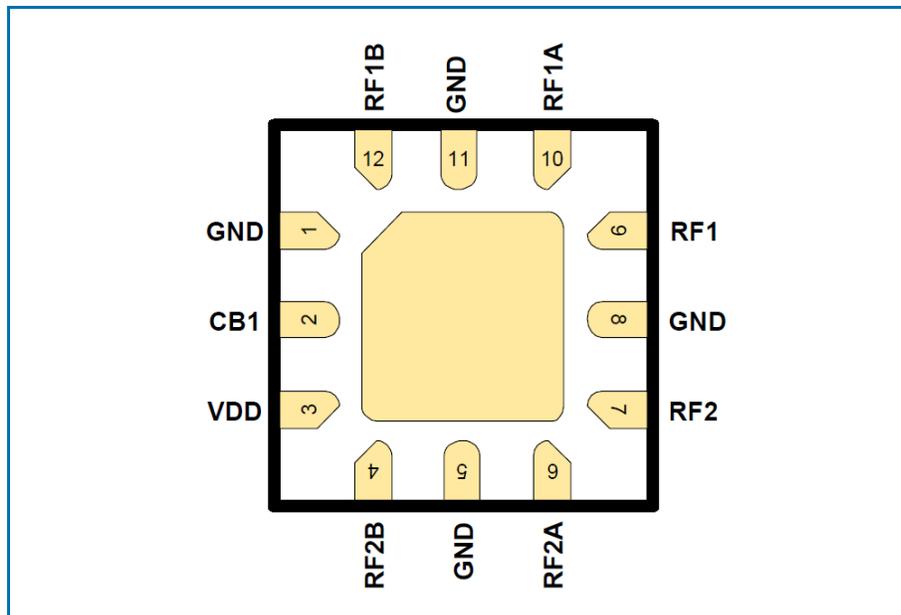
Evaluation Board Assembly Drawing



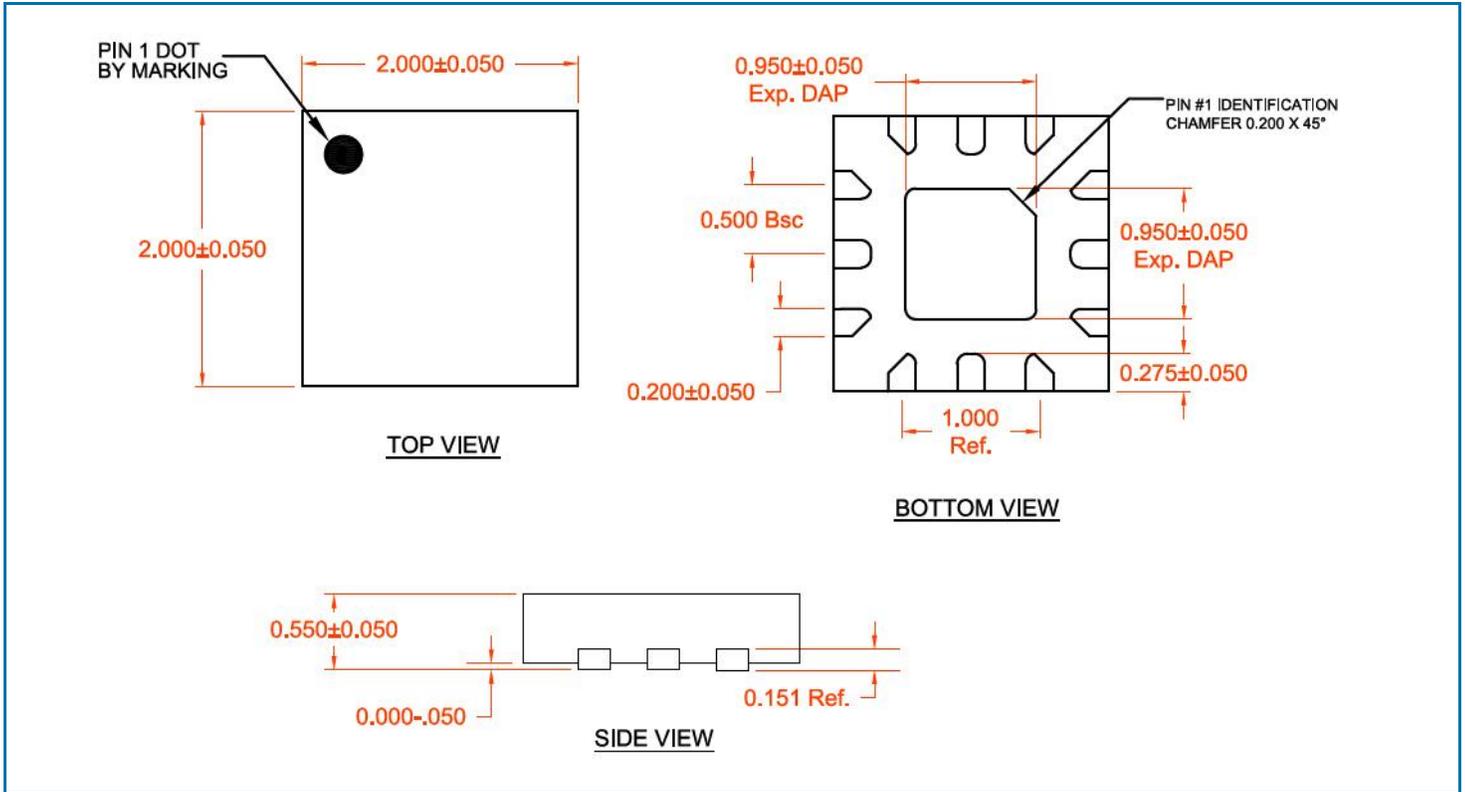
## Pin Names and Descriptions

Pin	Name	Description
1	GND	Ground
2	CB1	Control Voltage
3	VDD	Supply Voltage
4	RF2B	RF2 Output
5	GND	Ground
6	RF2A	RF2 Output
7	RF2	RF2 Common Input
8	GND	Ground
9	RF1	RF1 Common Input
10	RF1A	RF1 Output
11	GND	Ground
12	RF1B	RF1 Output

## Pin Out Top View



**Package Outline (Dimensions in millimeters)**



**Branding Diagram**

