



Package: QFN, 16-pin, 0.8mm x 4mm x 4mm

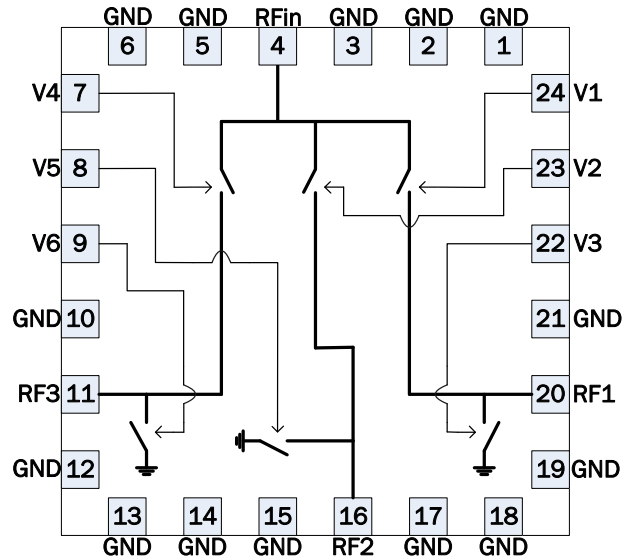


**Features**

- Low Insertion Loss: 2.1dB at 15GHz
- High Isolation: 37dB at 15GHz
- Excellent Return Loss
- 21nS Switching Speed
- GaAs pHEMT Technology
- Compact 4x4mm QFN package

**Applications**

- Broadband Communications
- Test Instrumentation
- Fiber Optics
- Military
- Aerospace



Functional Block Diagram

**Product Description**

RFMD's RFSW2042 is a broadband reflective SP3T GaAs microwave monolithic integrated circuit (MMIC) switch designed to operate from DC to 15GHz using the RFMD FD05 0.5µm switch process. It features low insertion loss of 2.1dB at 15GHz and high isolation of 37dB at 15GHz while being packaged in a compact, low cost, 4mm x 4mm QFN package for easy end use assembly. The switch uses complementary control logic of -5/0V and does not require a separate bias supply.

**Ordering Information**

RFSW2042S2	2-piece sample bag
RFSW2042SB	5-piece bag
RFSW2042SQ	25-piece bag
RFSW2042SR	100 piece on 7" reel
RFSW2042TR7	750 piece on 7" reel
RFSW2042PCK-410	Evaluation Board with a 2-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"/> LD MOS    |

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## Absolute Maximum Ratings

Parameter	Rating	Unit
Drain Bias Voltage ( $V_{CTRL}$ )	-10	$V_{DC}$
RF Input Power	+30	dBm
Storage Temperature	-55 to +150	$^{\circ}C$
Operating Temperature	-55 to +85	$^{\circ}C$
ESD JESD22-A114 Human Body Model (HBM)	Class 1A (All pads)	



**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.

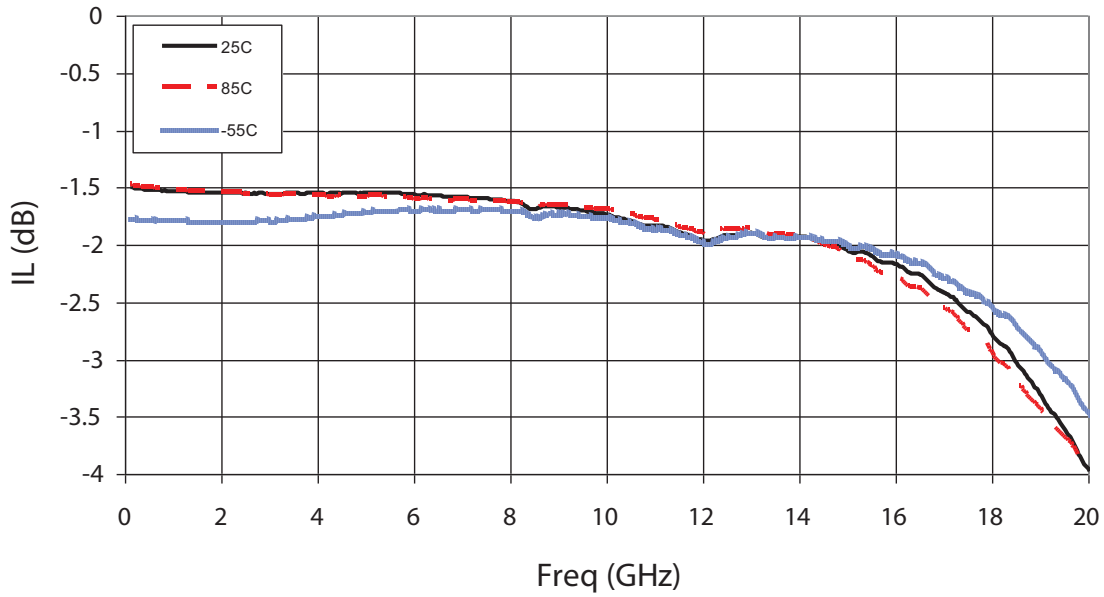
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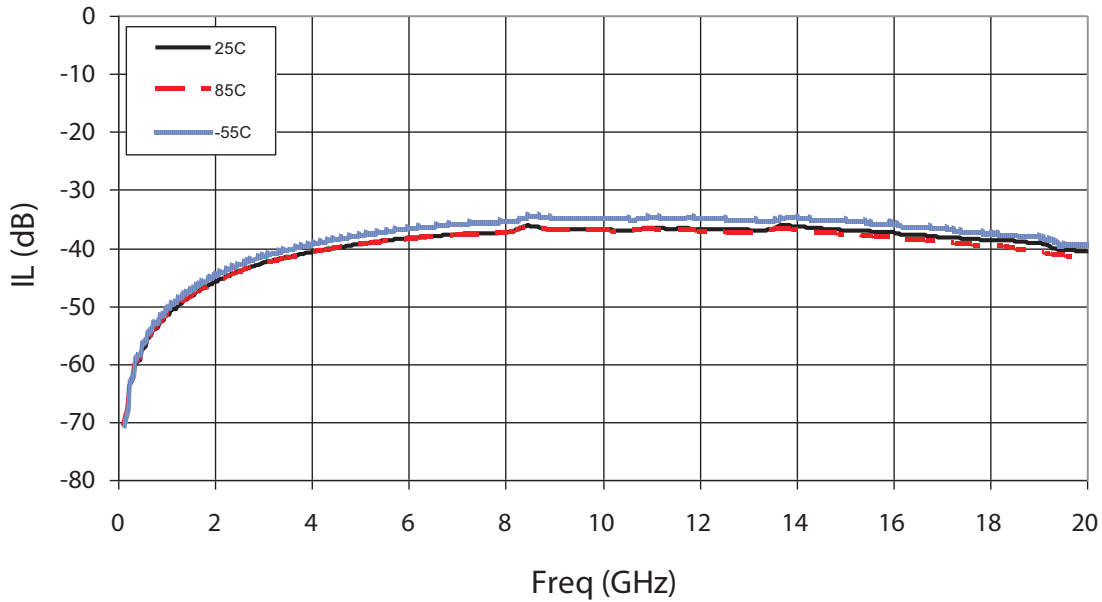
RFMD Green: RoHS compliant per EU Directive 2002/95/EC, halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Operating Frequency	DC		15	GHz	
Insertion Loss (0 GHz to 5 GHz)		1.6	2	dB	ON State, All Temps
Insertion Loss (5 GHz to 10 GHz)		1.7	2.6	dB	
Insertion Loss (10 GHz to 15 GHz)		2.1	2.7	dB	
Isolation (DC to 15 GHz)	32	37		dB	
Input Return Loss (DC to 15 GHz)	10	15		dB	
Output Return Loss (DC to 15 GHz)	9	15		dB	
OIP3 (.5 GHz to 15 GHz)	32	36		dBm	100MHz spacing, 2dBm input, 25 $^{\circ}C$
OIP2 (.5 GHz to 15 GHz)	53	63		dBm	
Switching Speed		21	25	ns	50% control to 90% RF, All Temps
Control Current		50	105	$\mu A$	Sum of all control lines, 25 $^{\circ}C$
Control Voltage		0/-5		V	

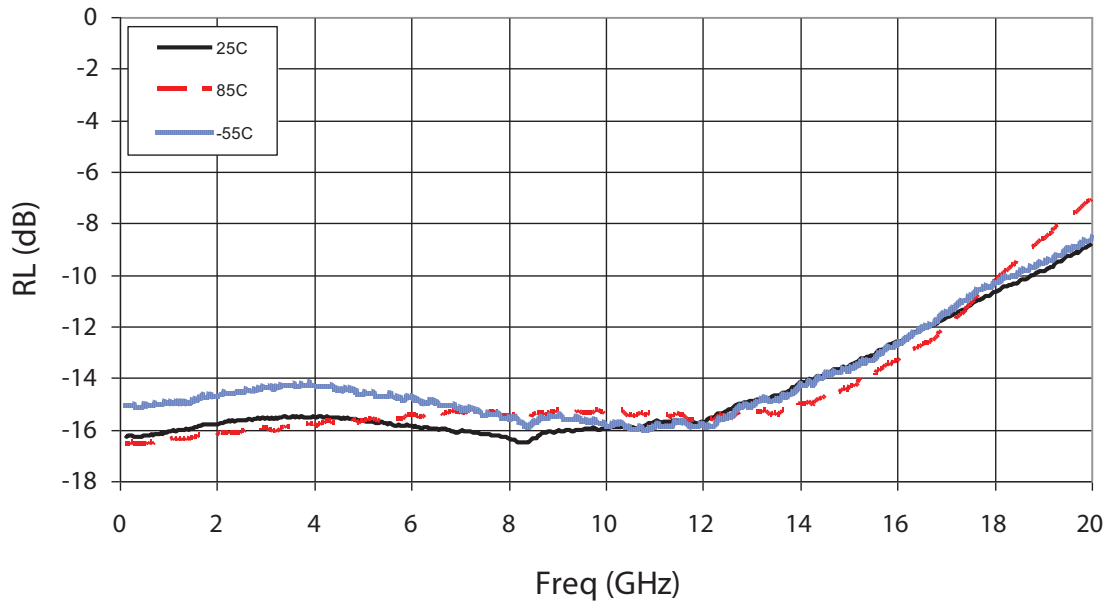
Insertion Loss vs Temp (Vcontrol = -5v)



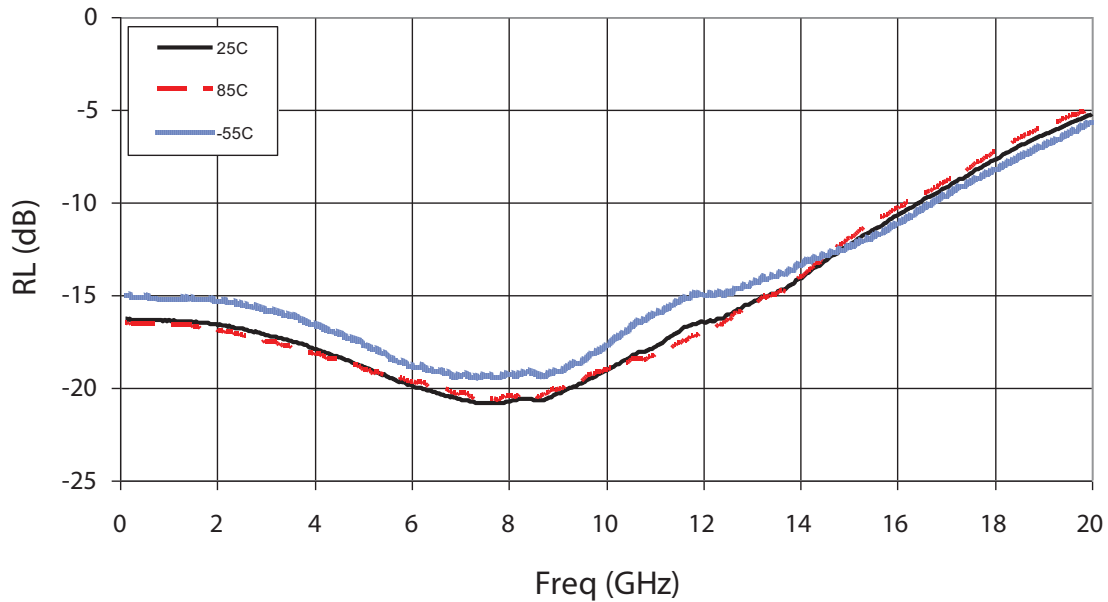
Isolation vs Temp (Vcontrol = -5v)



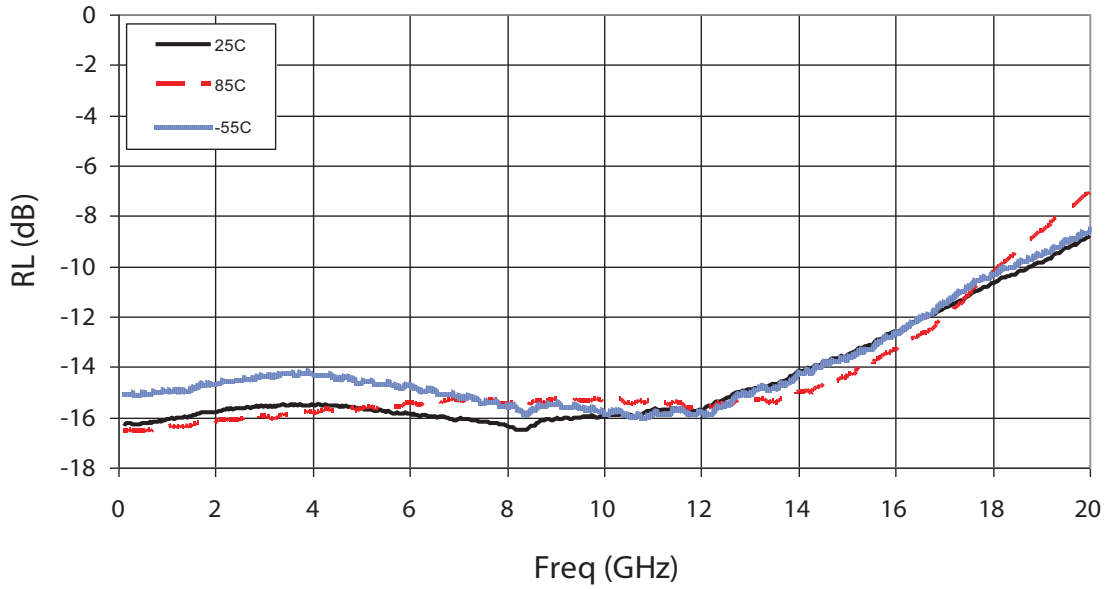
### Input Return Loss vs Temp (Vcontrol = -5v)



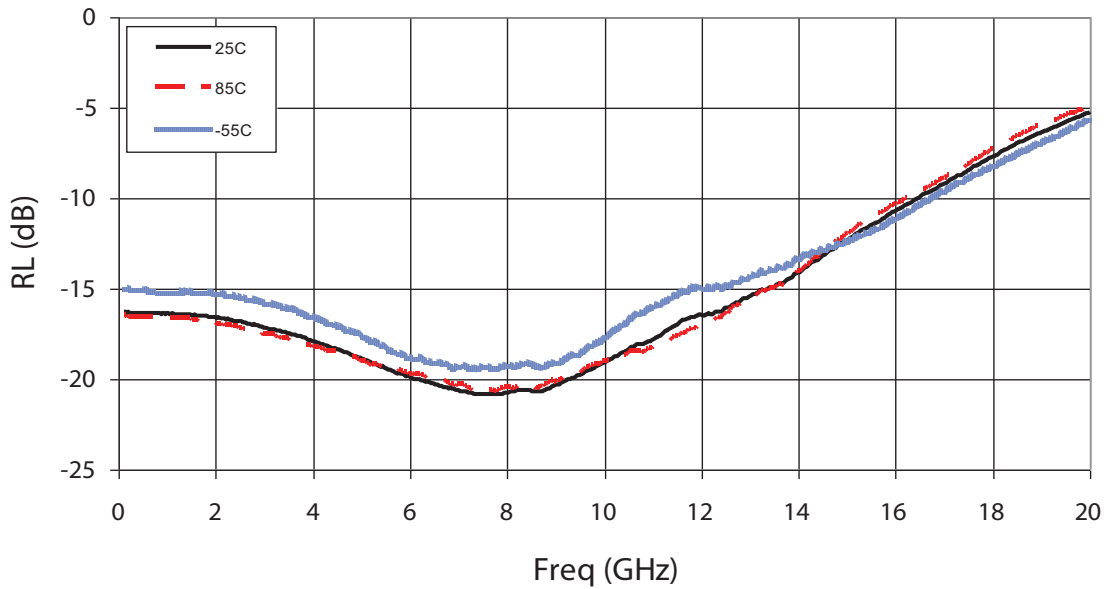
### Output Return Loss vs Temp (Vcontrol = -5v)

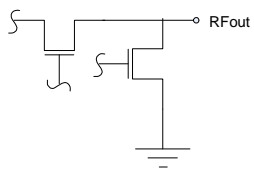
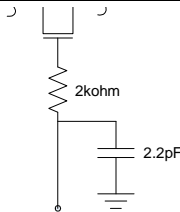
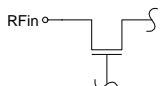


Input Return Loss vs Temp (Vcontrol = -5v)



Output Return Loss vs Temp (Vcontrol = -5v)



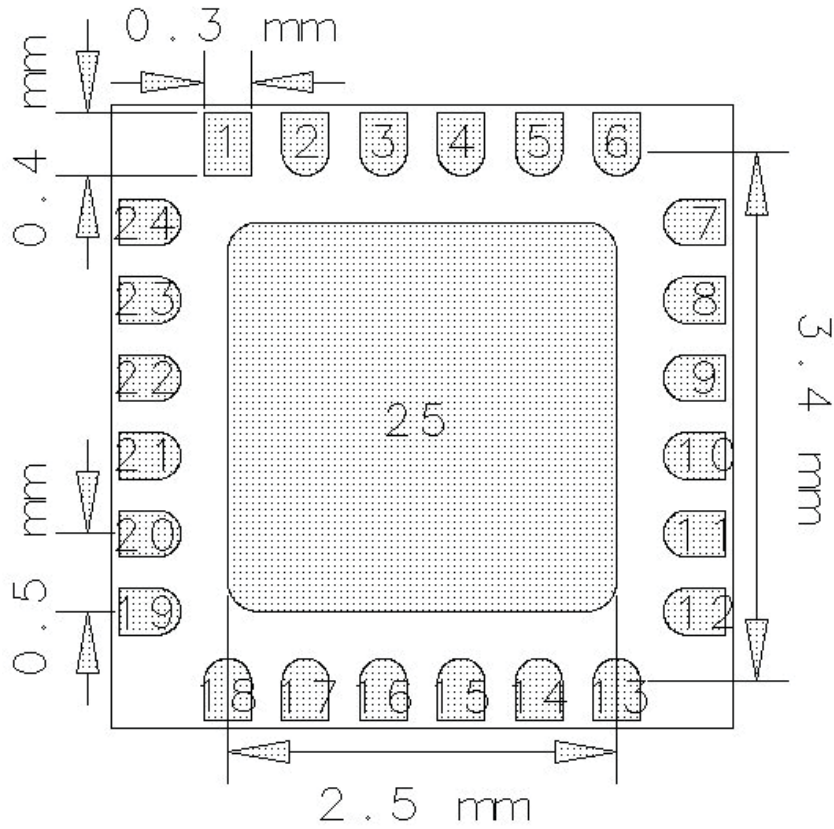
Pin	Function	Description	Interface Schematic
7, 8, 9, 22, 23, 24	V4, V5, V6, V3, V2, V1	DC control for switch operation. Nominal operating voltage is -5V.	
1, 2, 3, 5, 6, 10, 12, 13, 14, 15, 17, 18, 19, 21	GND	Ground. Grounding via should be located as close as possible to this pin.	
11, 16, 20	RF3, RF2, RF1	RF output. These pins are DC coupled and matched to 50Ω from DC to 15GHz.	
4		RF input. This pin is DC coupled and matched to 50Ω from DC to 15GHz.	

### Truth Table

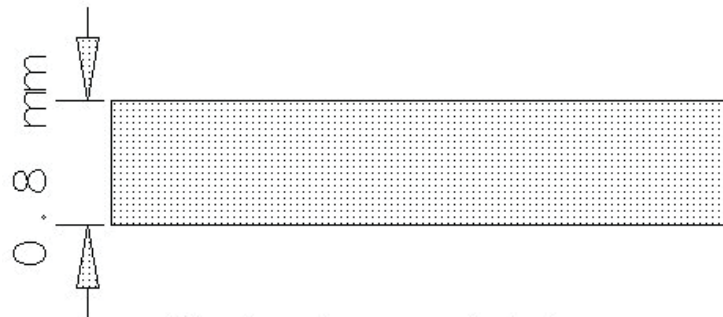
High = -5V ±0.2V, Low = 0V, ±0.2V

Control Line						RF Path
V1	V2	V3	V4	V5	V6	
Low	High	High	High	Low	Low	RFin to RF1
High	Low	Low	High	High	Low	RFin to RF2
High	High	Low	Low	Low	High	RFin to RF3
High	High	Low	High	Low	Low	RFOFF (high isolation)

**Package Drawing**



Bottom View



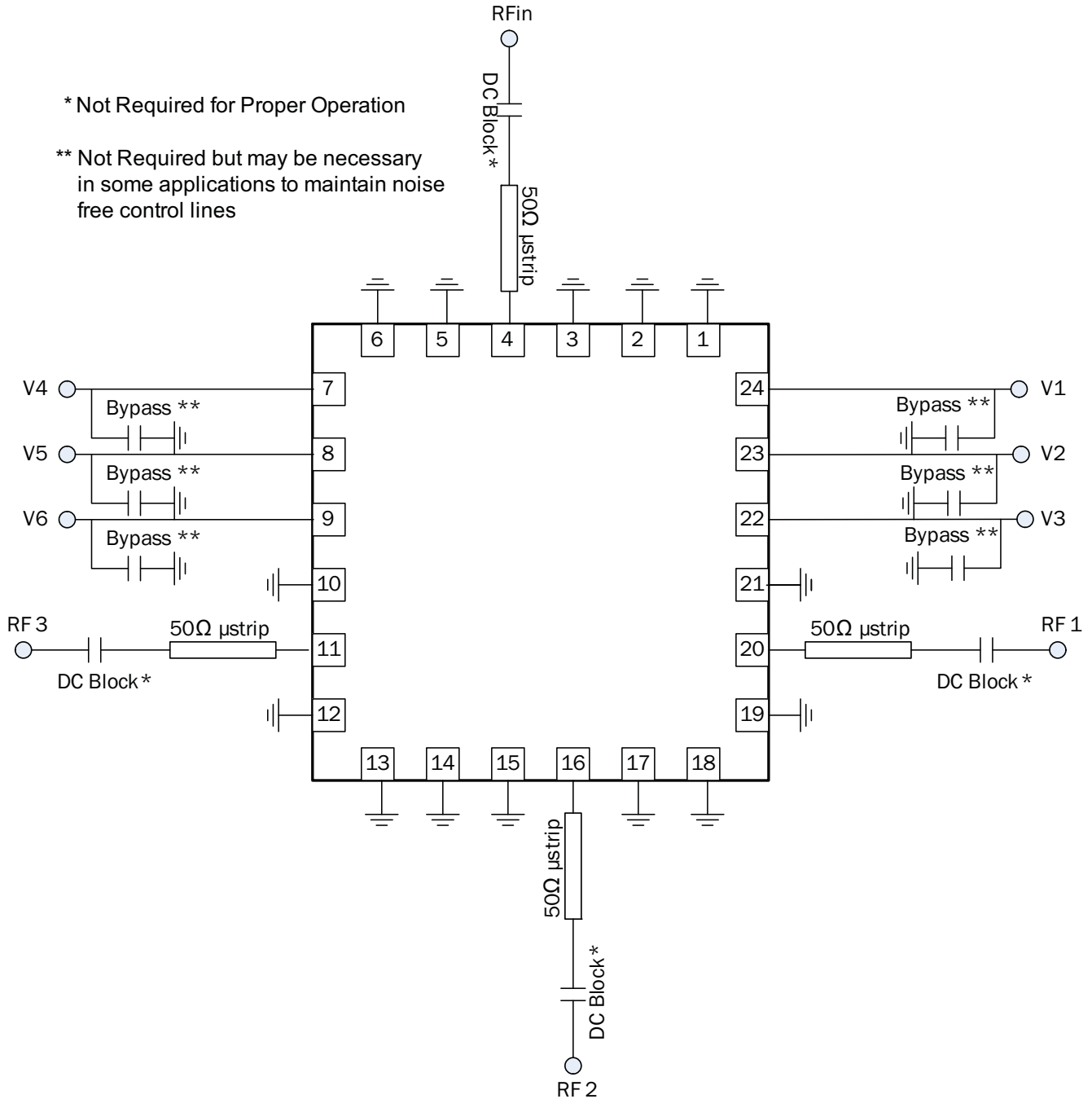
Side View

Maximum Height = 1.0mm  
Dimensional Tolerance = +0.05mm

## Application Schematic

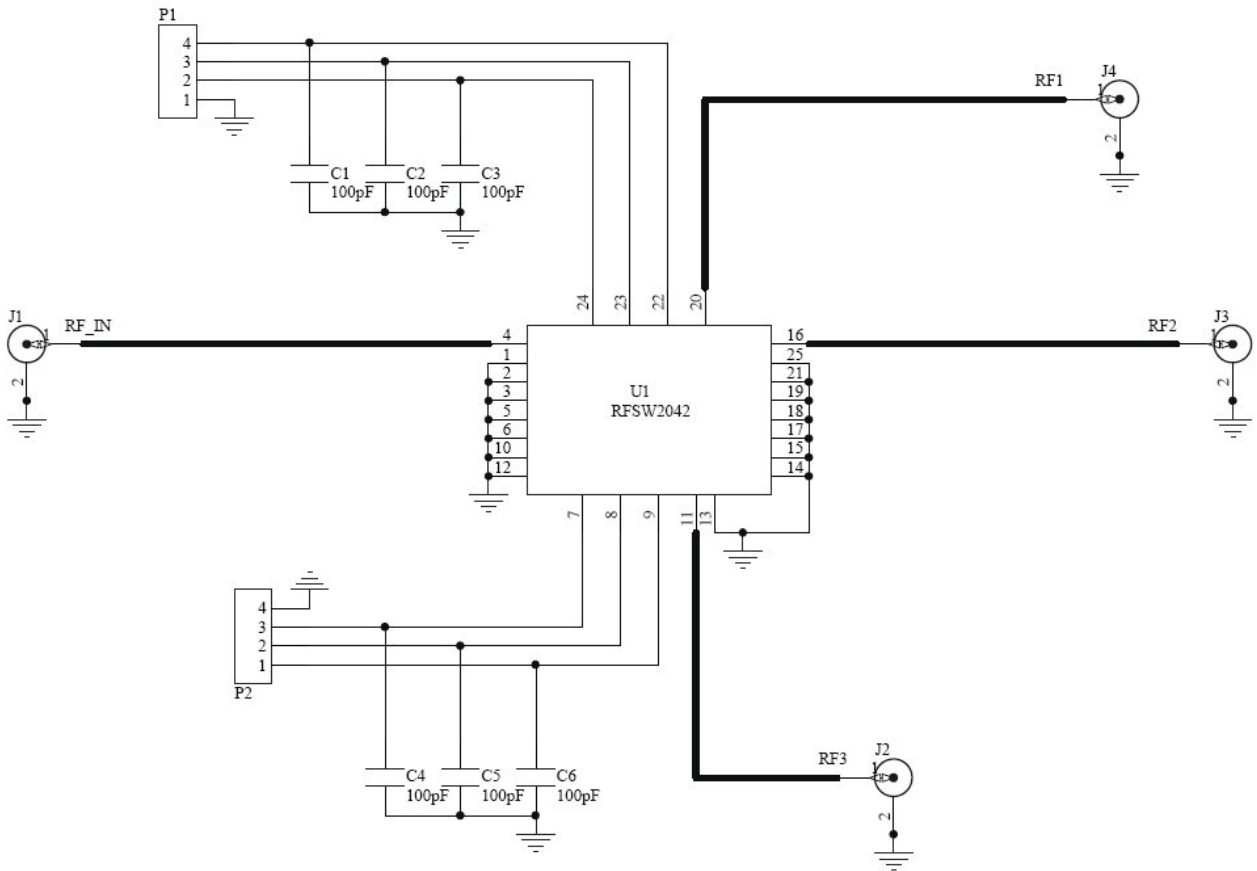
\* Not Required for Proper Operation

\*\* Not Required but may be necessary in some applications to maintain noise free control lines





Evaluation Board Schematic



## Evaluation Board Layout

