

Package: QFN, 24 pin, 0.8mm x 4mm x 4mm

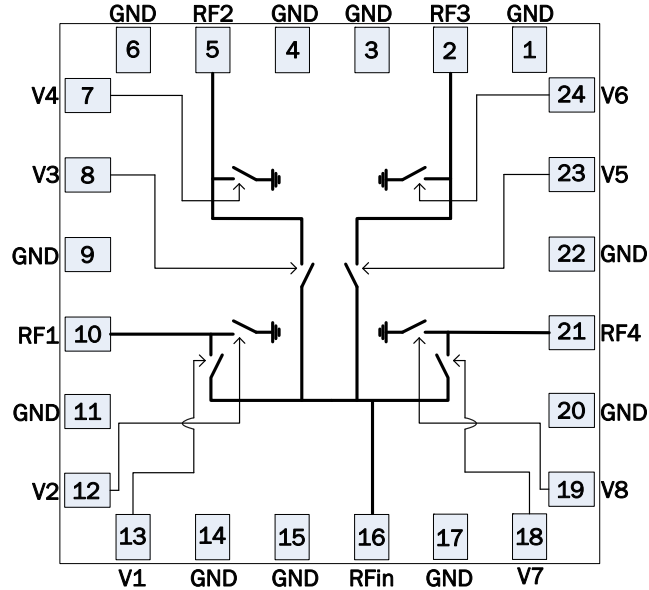


Features

- Low Insertion Loss: 2.4dB at 16GHz
- High Isolation: 38dB at 16GHz
- 21ns Switching Speed
- GaAs pHEMT Technology
- Compact 4mm x 4mm QFN package

Applications

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



Functional Block Diagram

Product Description

RFMD's RFSW2045 is a broadband reflective SP4T GaAs microwave monolithic integrated circuit (MMIC) switch designed to operate from DC to 16GHz using the RFMD FD05 0.5 μ m switch process. It features low insertion loss of 2.4dB at 16GHz and high isolation of 38dB at 16GHz 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

RFSW2045S2	2-piece sample bag
RFSW2045SB	5-piece bag
RFSW2045SQ	25-piece bag
RFSW2045SR	100 pieces on 7" reel
RFSW2045TR7	750 pieces on 7" reel
RFSW2045PCK-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 | |

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Absolute Maximum Ratings

Parameter	Rating	Unit
Drain Bias Voltage (V_{CTRL})	-10	V_{DC}
RF Input Power	+21	dBm
Storage Temperature	-55 to +150	$^{\circ}C$
Operating Temperature	-55 to +85	$^{\circ}C$
ESD JESD22-A114 Human Body Model (HBM)	Class 0 (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.

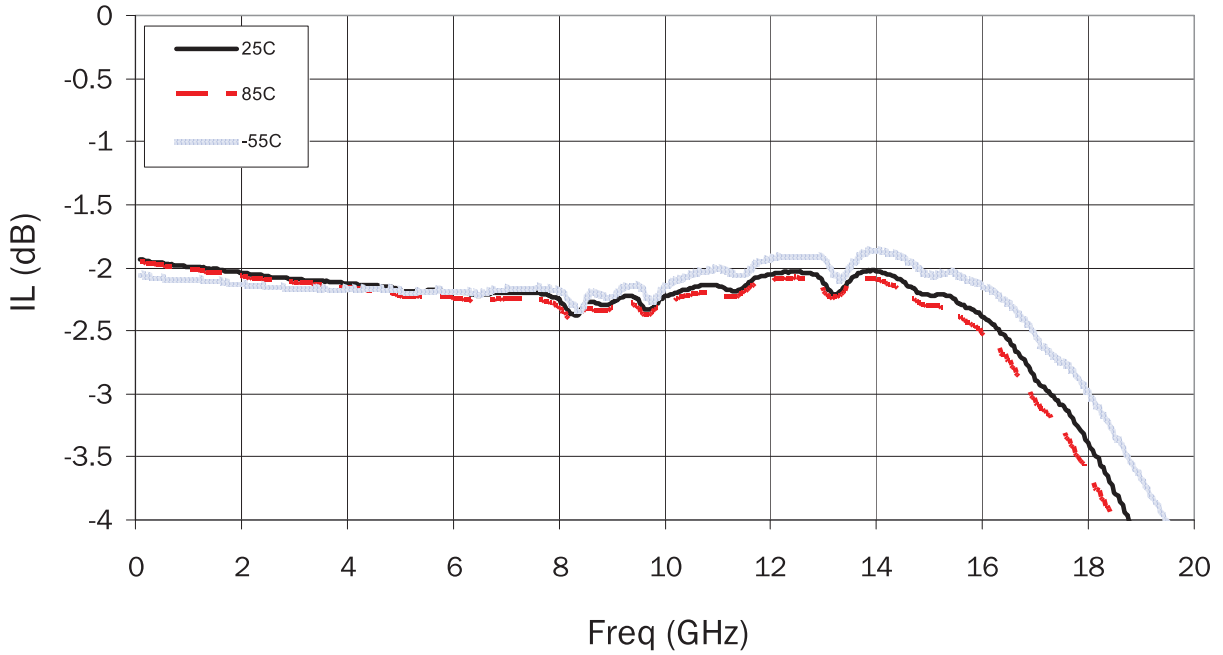
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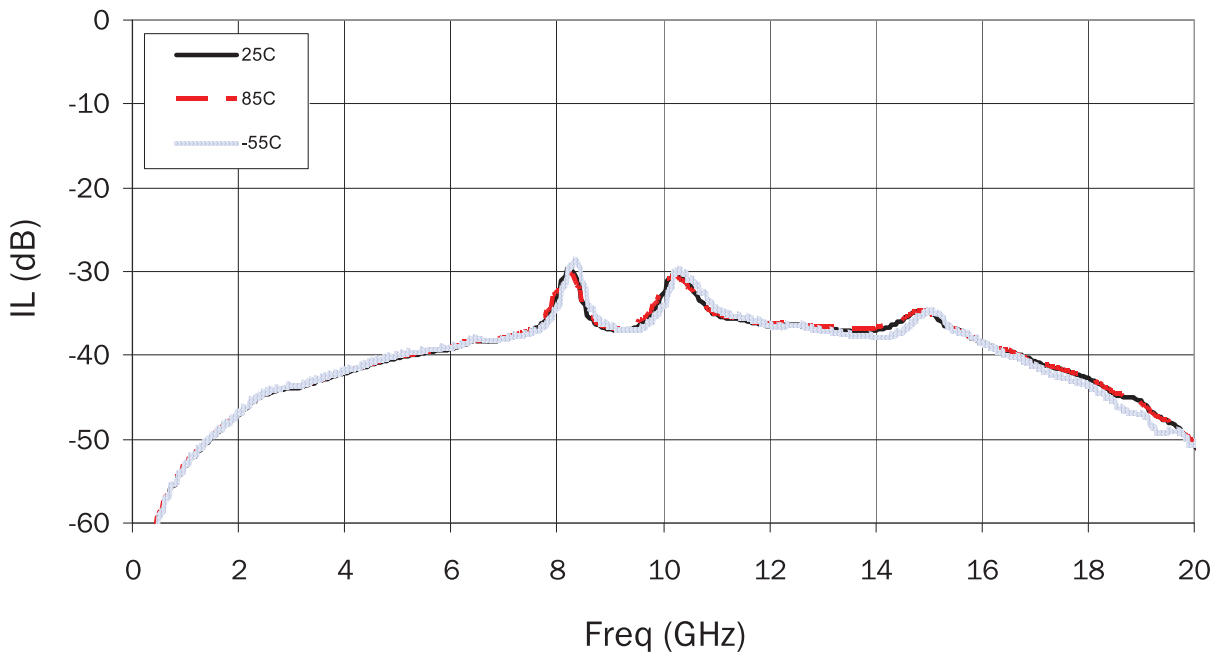
RFMD Green: RoHS compliant per EU Directive 2002/95/EC, halogen free per IEC 61249-2-21, < 1000ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Operating Frequency	DC		16	GHz	
Insertion Loss (0GHz to 5GHz)		2.2	2.9	dB	ON State, All Temps
Insertion Loss (5GHz to 10GHz)		2.4	3.2	dB	ON State, All Temps
Insertion Loss (10GHz to 16GHz)		2.4	3.6	dB	ON State, All Temps
Isolation (DC to 16GHz)	25	38		dB	OFF State, All Temps
Input Return Loss (DC to 16GHz)	9	14		dB	ON State, All Temps
Output Return Loss (DC to 16GHz)	9	12		dB	ON State, All Temps
OIP3 (2GHz to 16GHz)	26	38		dBm	100MHz spacing, 2dBm input, 25 $^{\circ}C$
OIP2 (3GHz to 16GHz)	54	60		dBm	100MHz spacing, 2dBm input, 25 $^{\circ}C$
Switching Speed		21	26	ns	50% control to 90% RF, All Temps
Control Current		50	115	μA	Sum of all control lines, 25 $^{\circ}C$
Control Voltage		0/-5		V	

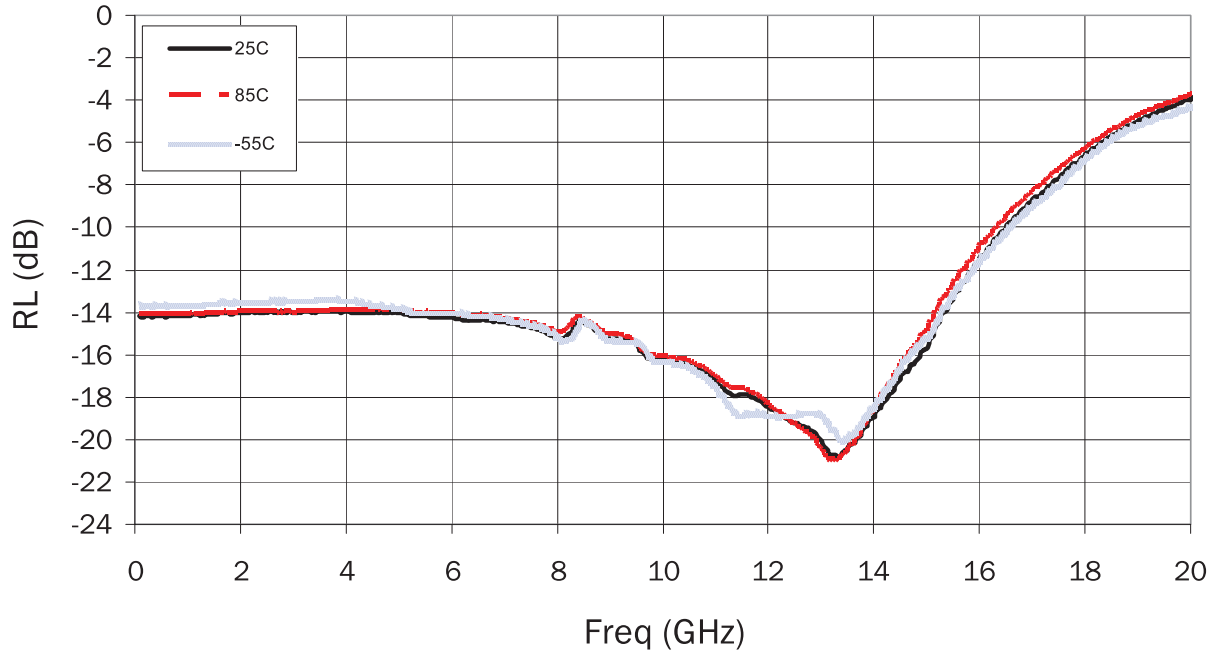
Insertion Loss vs Temp (Vcontrol = -5v)



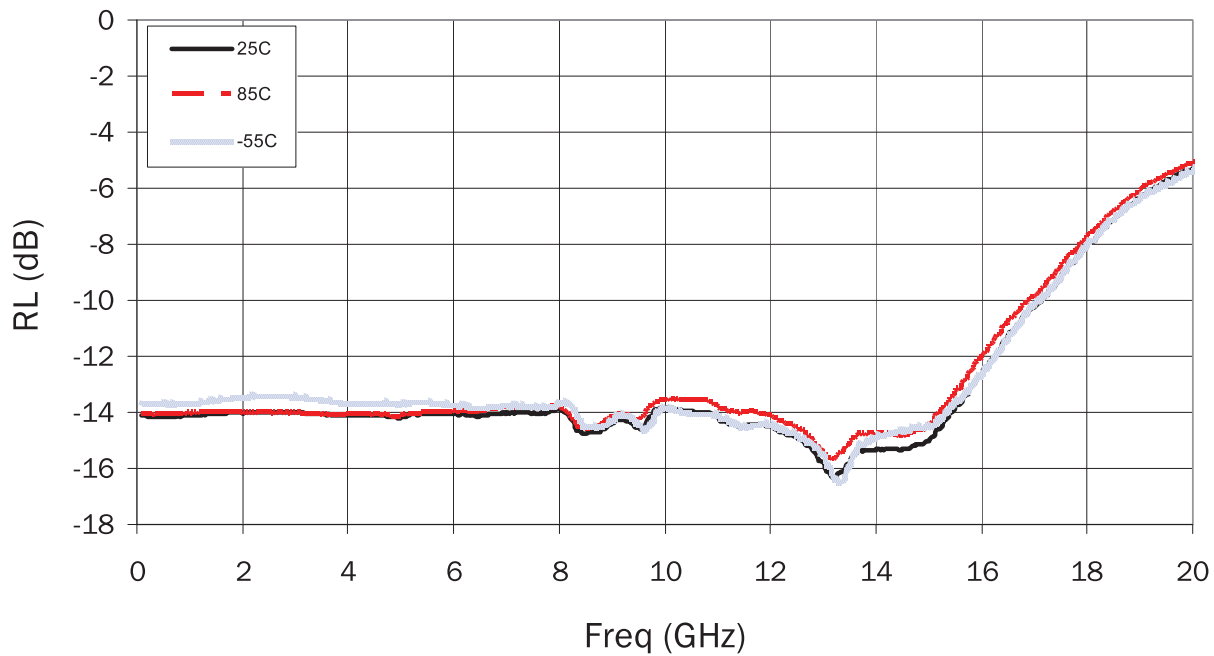
Isolation vs Temp (Vcontrol = -5V)



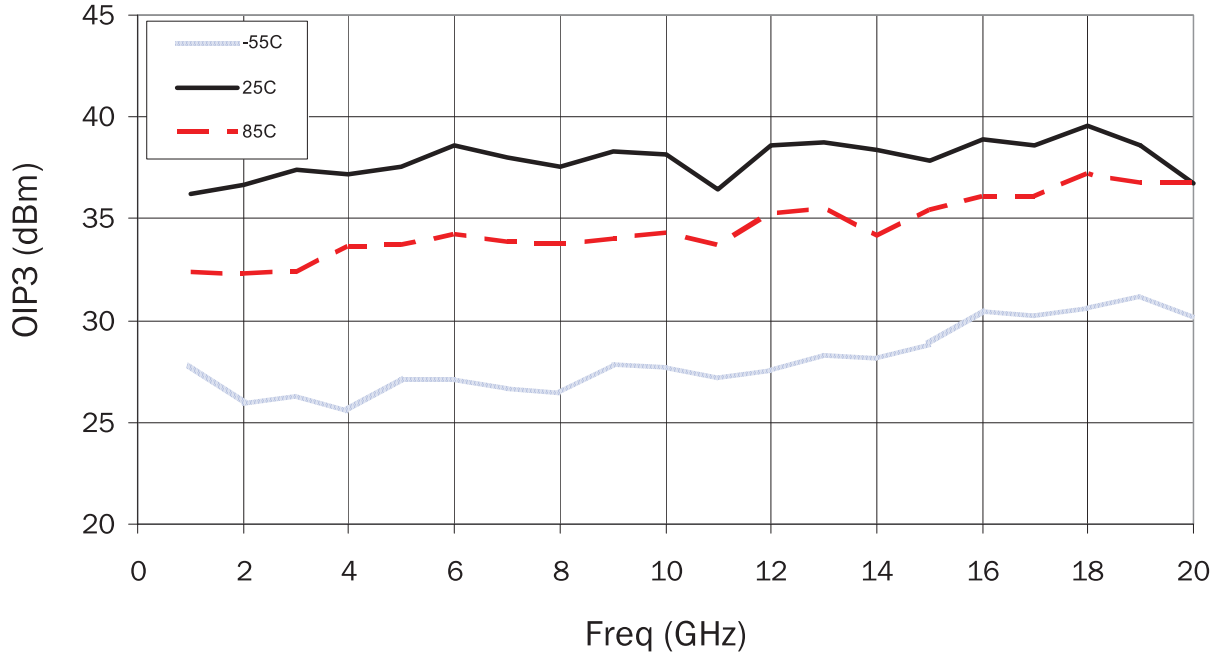
Input RL vs Temp (Vcontrol = -5V)



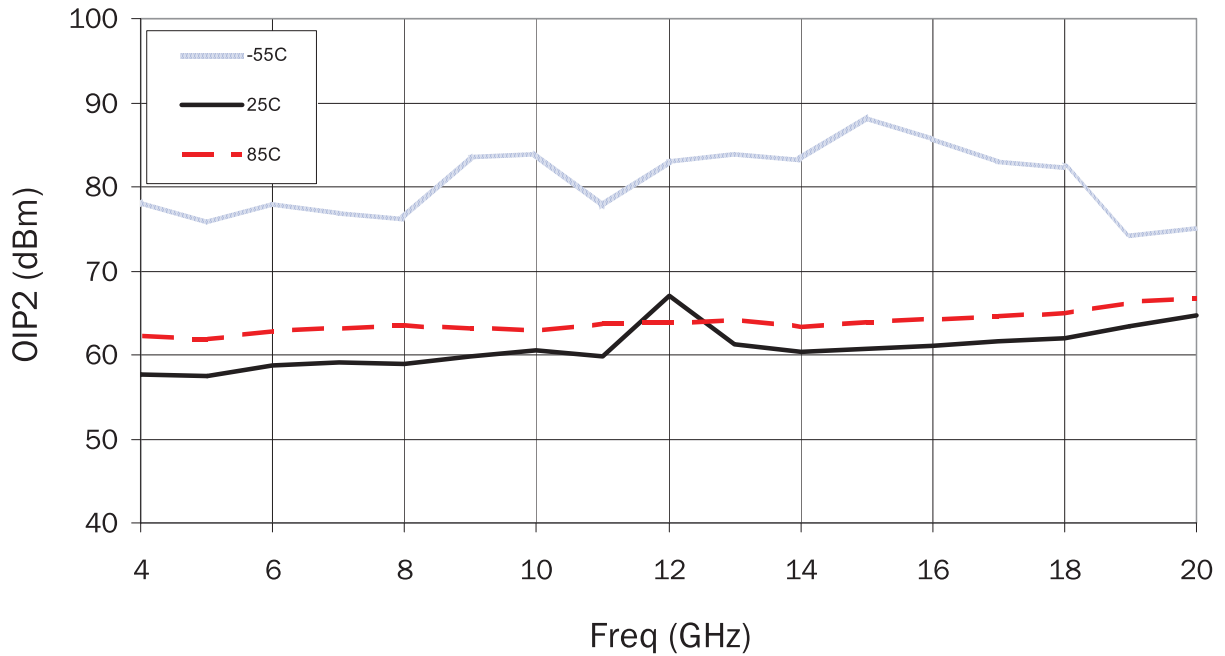
Output RL vs Temp (Vcontrol = -5V)



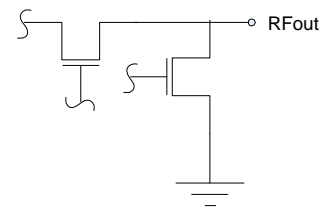
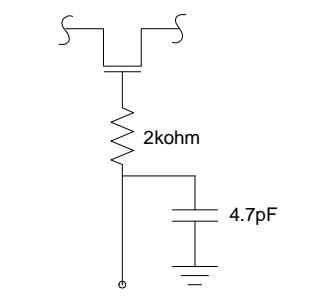
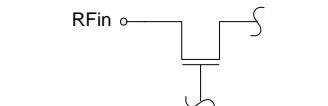
OIP3 vs Temp (Vcontrol = -5V)



OIP2 vs Temp (Vcontrol = -5V)



Pin Names and Descriptions

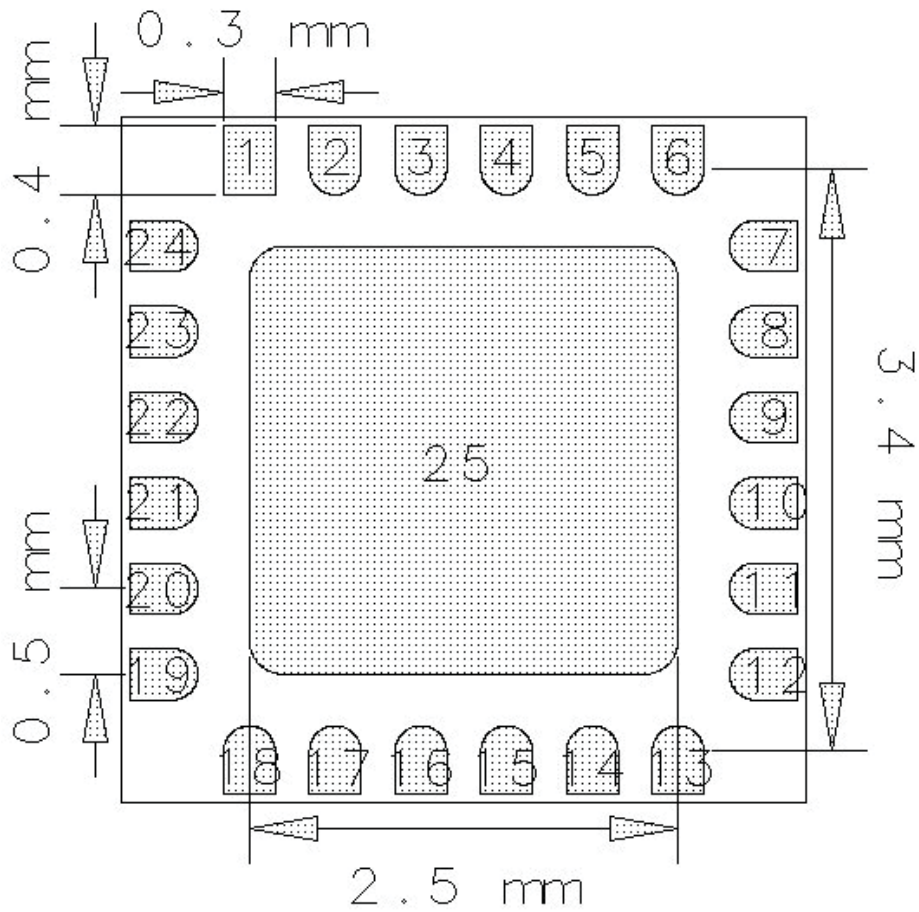
Pin	Name	Description	Interface Schematic
2, 5, 10, 21	RF3, RF2, RF1, RF4	RF output. These pins are DC coupled and matched to 50Ω from DC to 16GHz.	
1, 3, 4, 6, 9, 11, 14, 15, 17, 20, 22	GND	Ground. Grounding via should be located as close as possible to this pin.	
7, 8, 12, 13, 18, 19, 23, 24	V4, V3, V2, V1, V7, V8, V5, V6	DC control for switch operation. Nominal operating voltage is -5V.	
16	RFIN	RF input. This pin is DC coupled and matched to 50Ω from DC to 16GHz.	

Truth Table

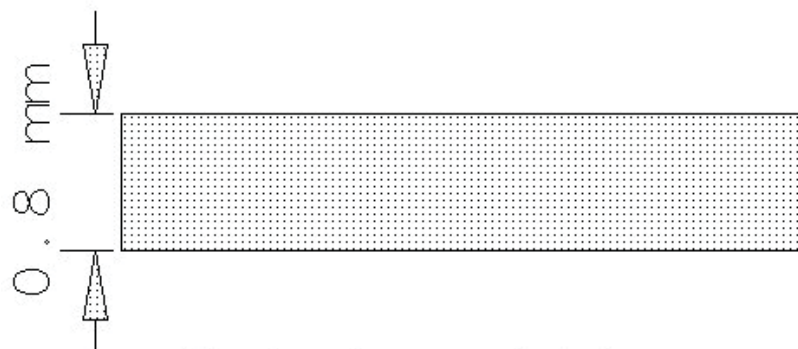
High = -5V ± 0.2V, Low = 0V, ± 0.2V

Control Line								RF Path
V1	V2	V3	V4	V5	V6	V7	V8	
Low	High	High	Low	High	Low	High	Low	RFin to RF1
High	Low	Low	High	High	Low	High	Low	RFin to RF2
High	Low	High	Low	Low	High	High	Low	RFin to RF3
High	Low	High	Low	High	Low	Low	High	RFin to RF4
High	Low	High	Low	High	Low	High	Low	RFOFF (high isolation)

Package Drawing



Bottom View



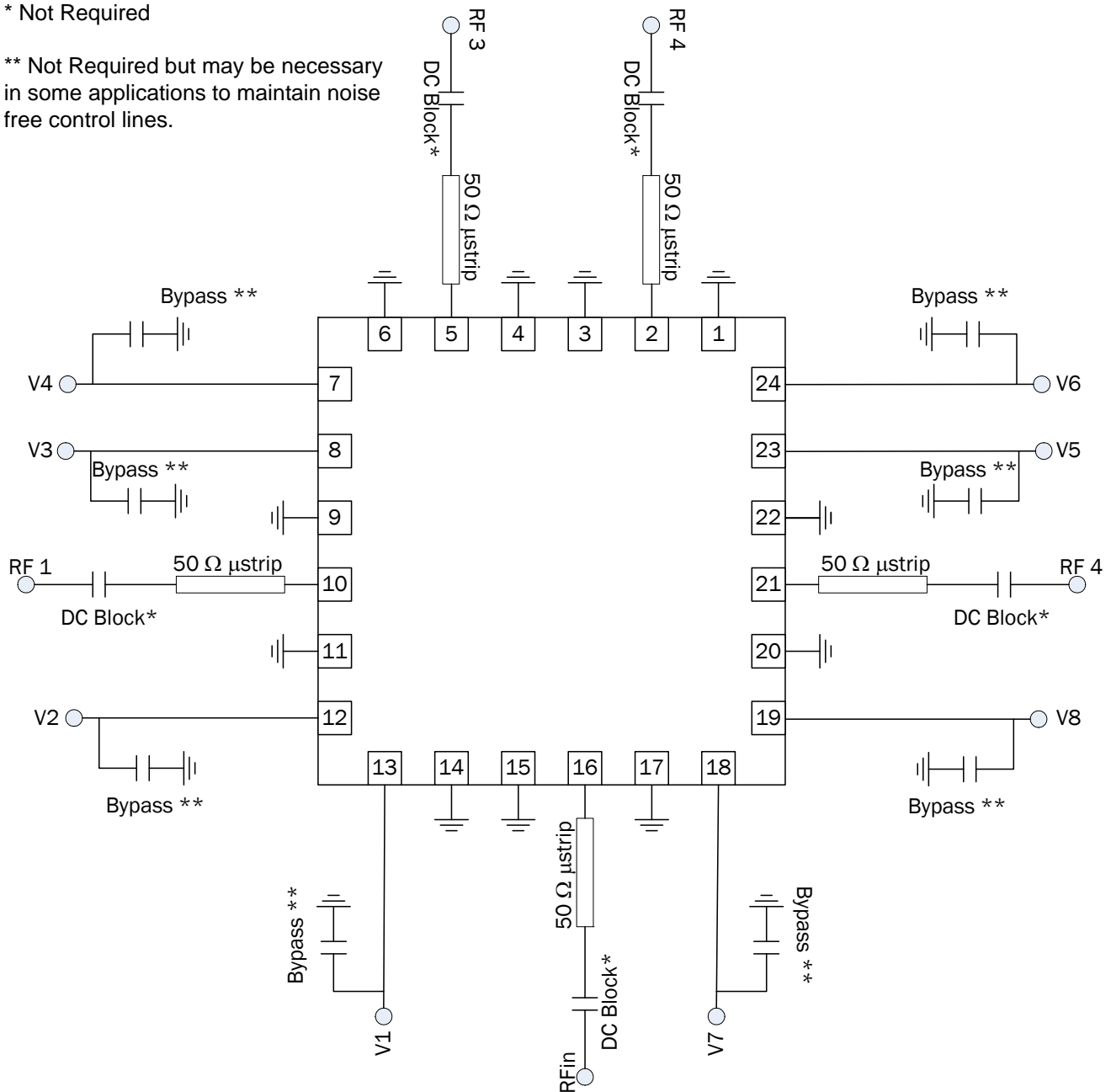
Side View

Maximum Height = 1.0mm
Dimensional Tolerance = +0.05mm

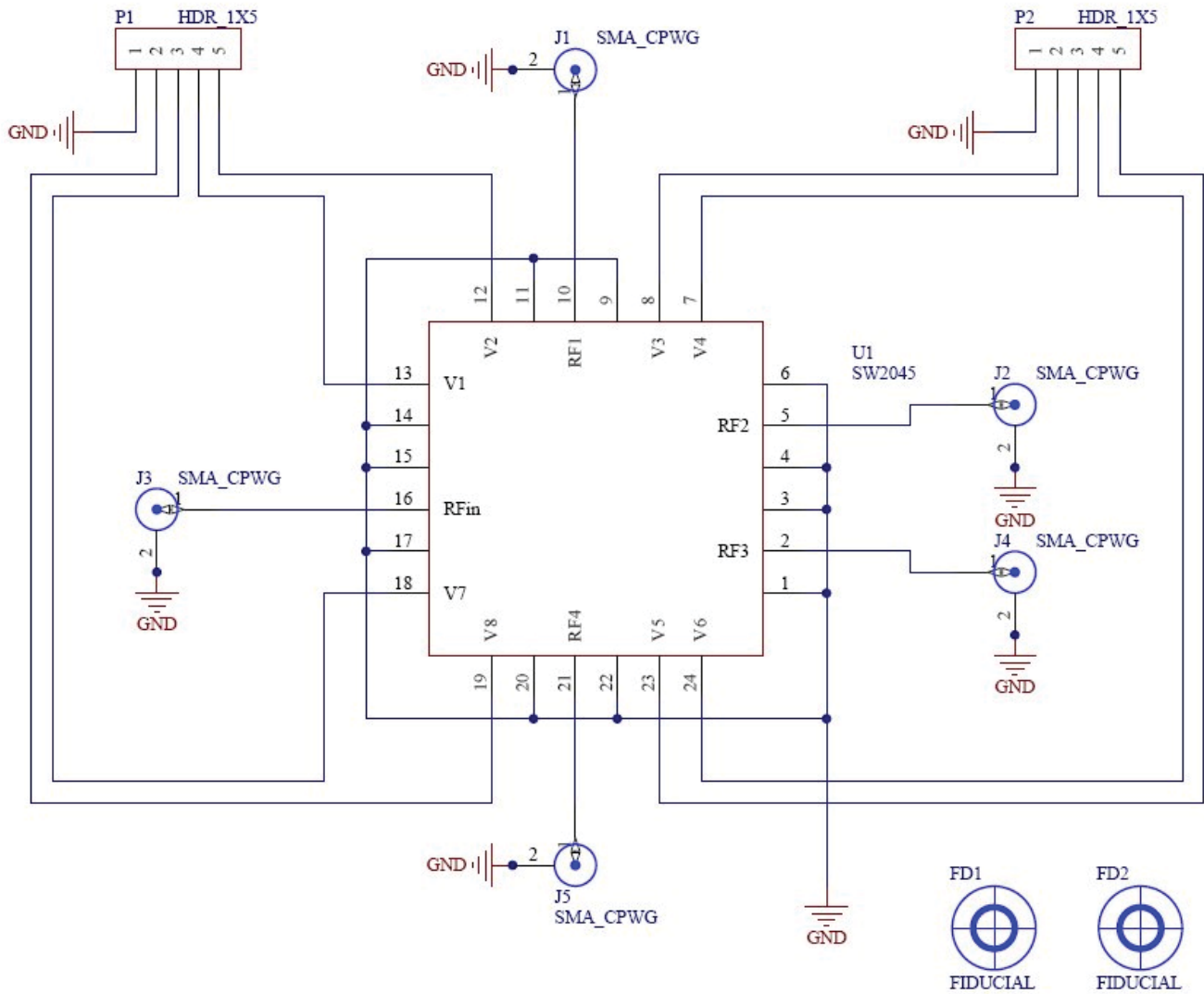
Application Schematic

* Not Required

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



Evaluation Board Schematic



Evaluation Board Layout

