

# RFRX1702

GaAs MMIC IQ Downconverter  
17.7GHz to 19.7GHz

RFMD's RFRX1702 is a 17.7GHz to 19.7GHz GaAs pHEMT Downconverter, incorporating a low-noise amplifier, an integrated X2 LO frequency multiplier and buffer amplifier, and an image rejection mixer. The combination of high performance part and low cost packaging makes the RFRX1702 a cost effective solution, ideally suited to both current and next generation Point-to-Point Microwave Radio and Satellite Applications. RFRX1702 is packaged in a 5mm x 5mm QFN to simplify both system level board design and volume assembly.



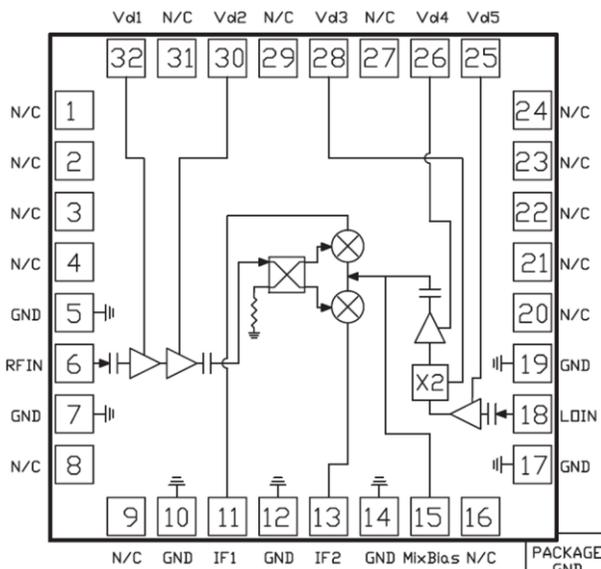
Package: QFN, 32-pin,  
5mm x 5mm x 0.95mm

## Features

- RF Frequency: 17.7GHz to 19.7GHz
- LO Frequency: 6.85GHz to 11.85GHz
- IF Frequency: DC to 4GHz
- Conversion Gain: 12dB
- Noise Figure: 2dB
- IIP3: 6dBm
- Image Rejection: 15dBc
- Low Cost 5mm x 5mm QFN Package

## Applications

- Point-to-Point Radio
- Point-Multipoint Radio
- Satellite Communications
- Radar
- Electronic Warfare



Functional Block Diagram

## Ordering Information

RFRX1702S2	Sample bag with 2 pieces
RFRX1702SB	Bag with 5 pieces
RFRX1702SQ	Bag with 25 pieces
RFRX1702SR	100 Pieces
RFRX1702TR7	7" Reel with 750 pieces
RFRX1702PCBA-410	Evaluation board

## Absolute Maximum Ratings

Parameter	Rating	Unit
LNA Drain Voltage	6	V
LOA Drain Voltage	6	V
RF Input Power	10	dBm
LO Input Power	15	dBm
T <sub>OPER</sub>	-40 to +85	°C
T <sub>STOR</sub>	-65 to +150	°C
ESD Human Body Model	Class 1A	



**Caution!** ESD sensitive device.



RFMD Green: RoHS compliant per EU Directive 2011/65/EU, 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 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.

## Nominal Operating Parameters

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
<b>General Performance</b>					
RF Frequency	17.7		19.7	GHz	
LO Frequency	6.85		11.85	GHz	
IF Frequency	DC		4.0	GHz	
LO Input Drive		+5		dBm	
Conversion Gain		13		dB	
NF (17.7GHz to 19.7GHz)		2		dB	
IIP3		6		dBm	
Image Rejection		15		dB	
LO-RF Isolation		40		dB	
LO-IF Isolation		15		dB	
LO Return Loss		12		dB	
RF Return Loss		12		dB	
V <sub>D</sub>		2.8 to 4.5		V	
I <sub>b</sub>		350		mA	

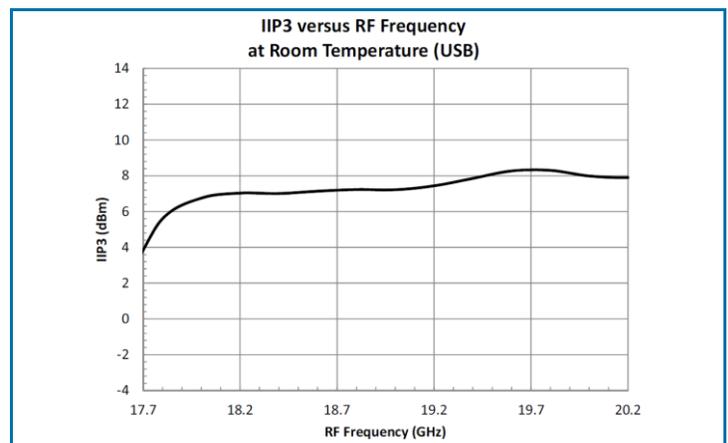
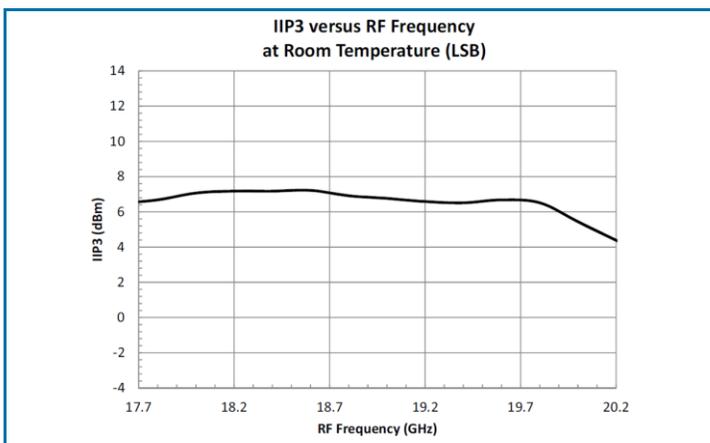
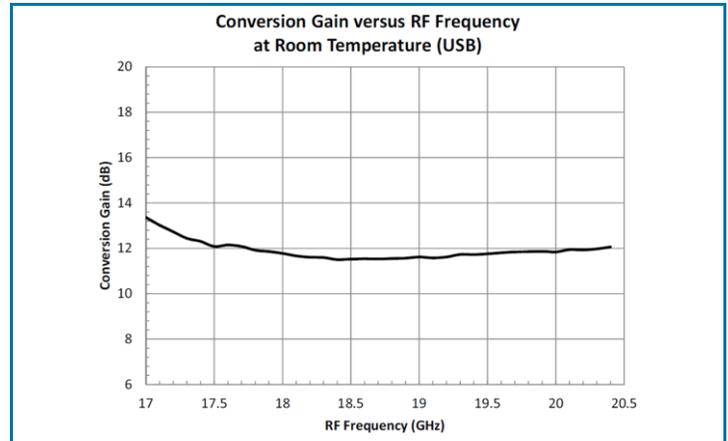
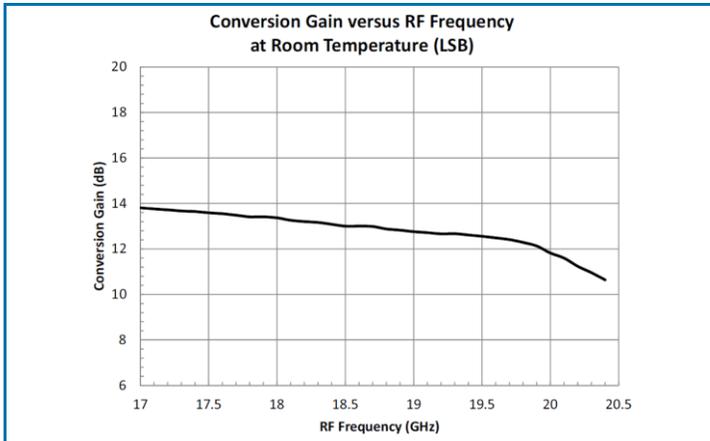
NOTES: Measurements performed on part soldered on evaluation board with SMA connectors and IF ports connected to an external 90° Hybrid Combiner and LO Power of +5dBm and at 25°C, unless otherwise stated.

IF = 2.5GHz, RF Power = -20dBm, IIP3 is measured with a 2-tone input of -23dBm power for each tone and  $\Delta f = 10\text{MHz}$ , Vd1 = 2.8V, Vd2 = 4V, Vd3 through Vd5 = 4.5V, MixerBias = 0V

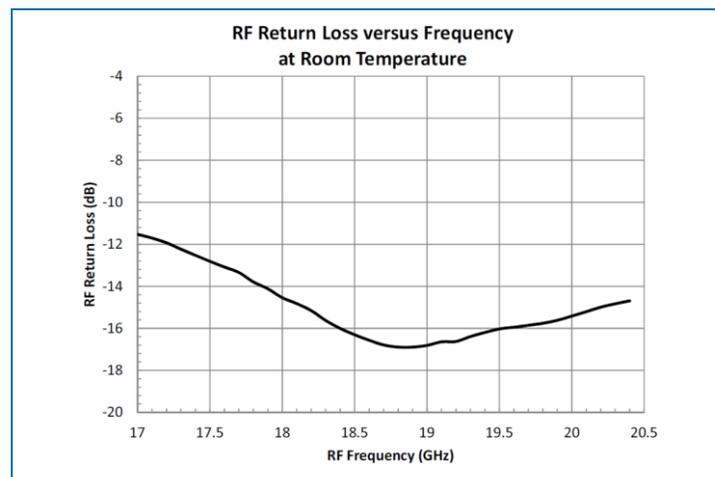
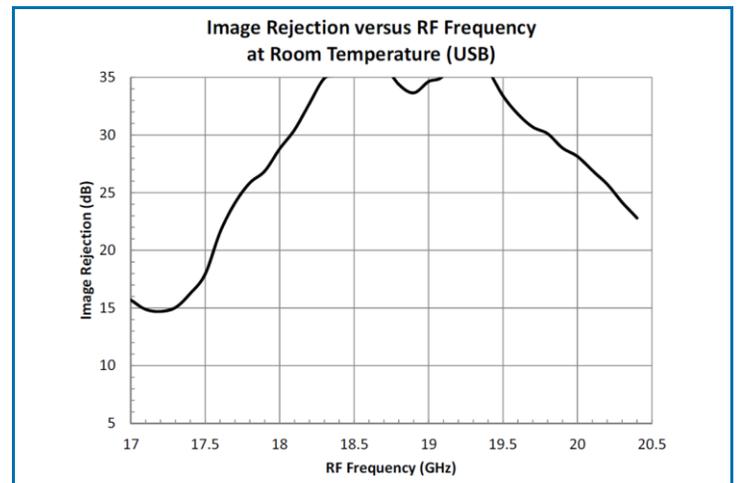
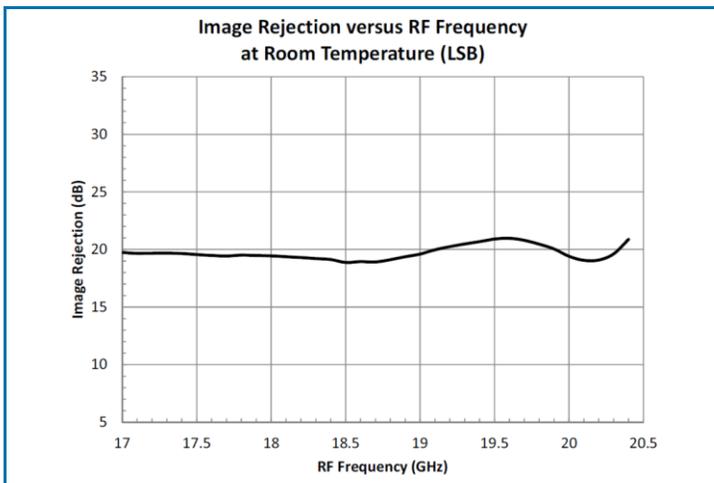
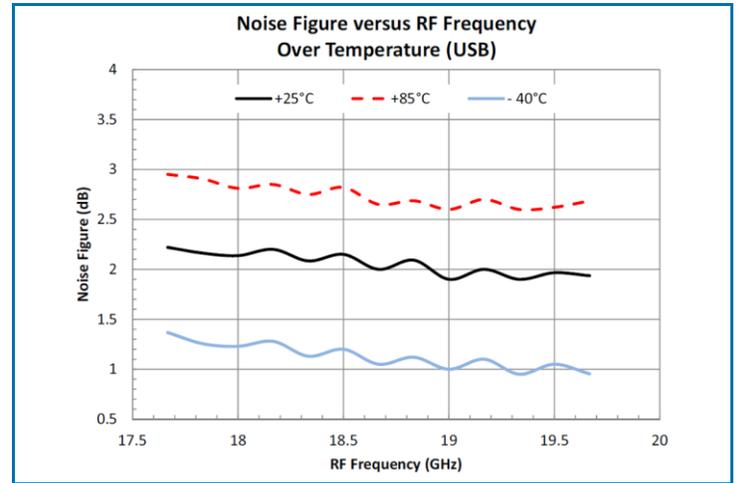
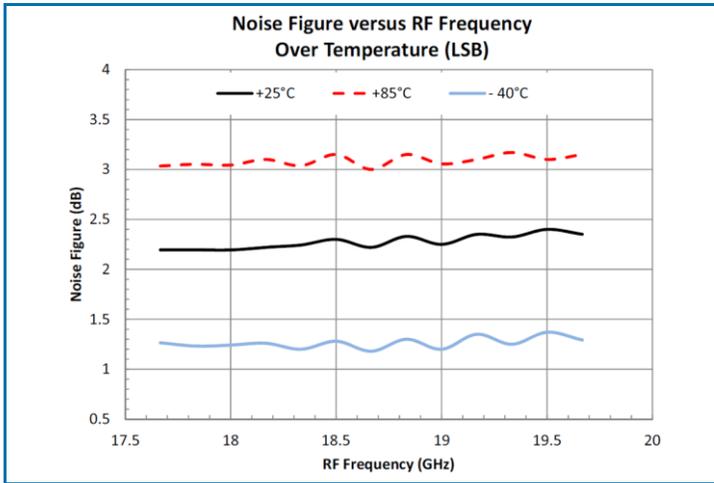
## Typical Electrical Performance

Measurements performed on part soldered on evaluation board with SMA connectors and IF ports connected to an external 90° Hybrid Combiner and LO Power of +5dBm and at 25°C, unless otherwise stated.

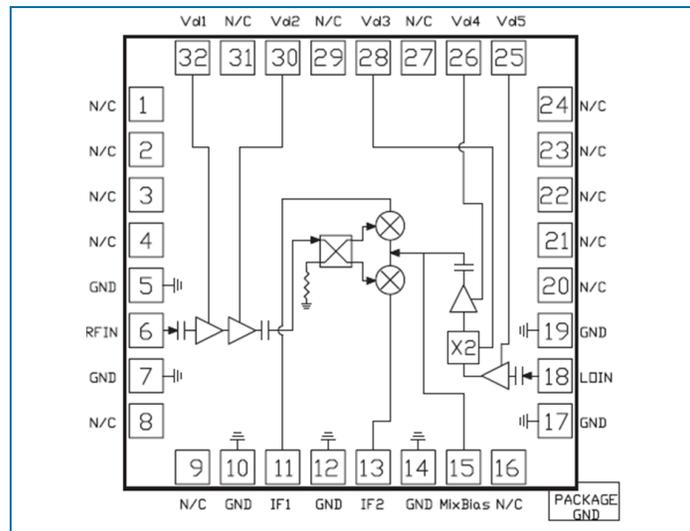
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Typical Electrical Performance (continued)



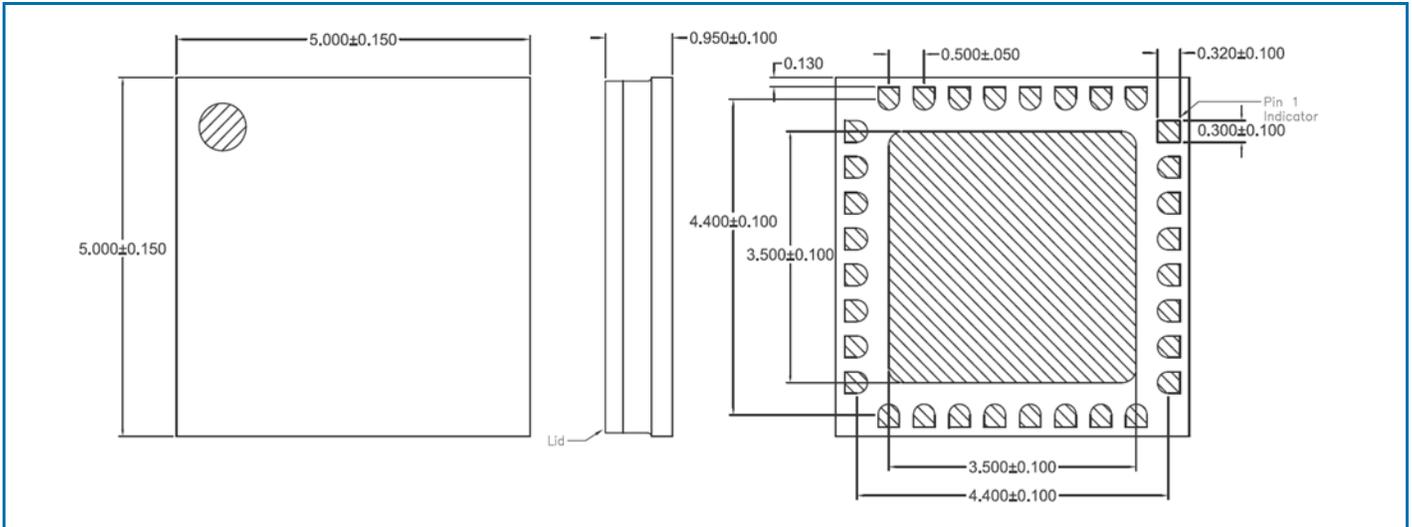
## Pin Out



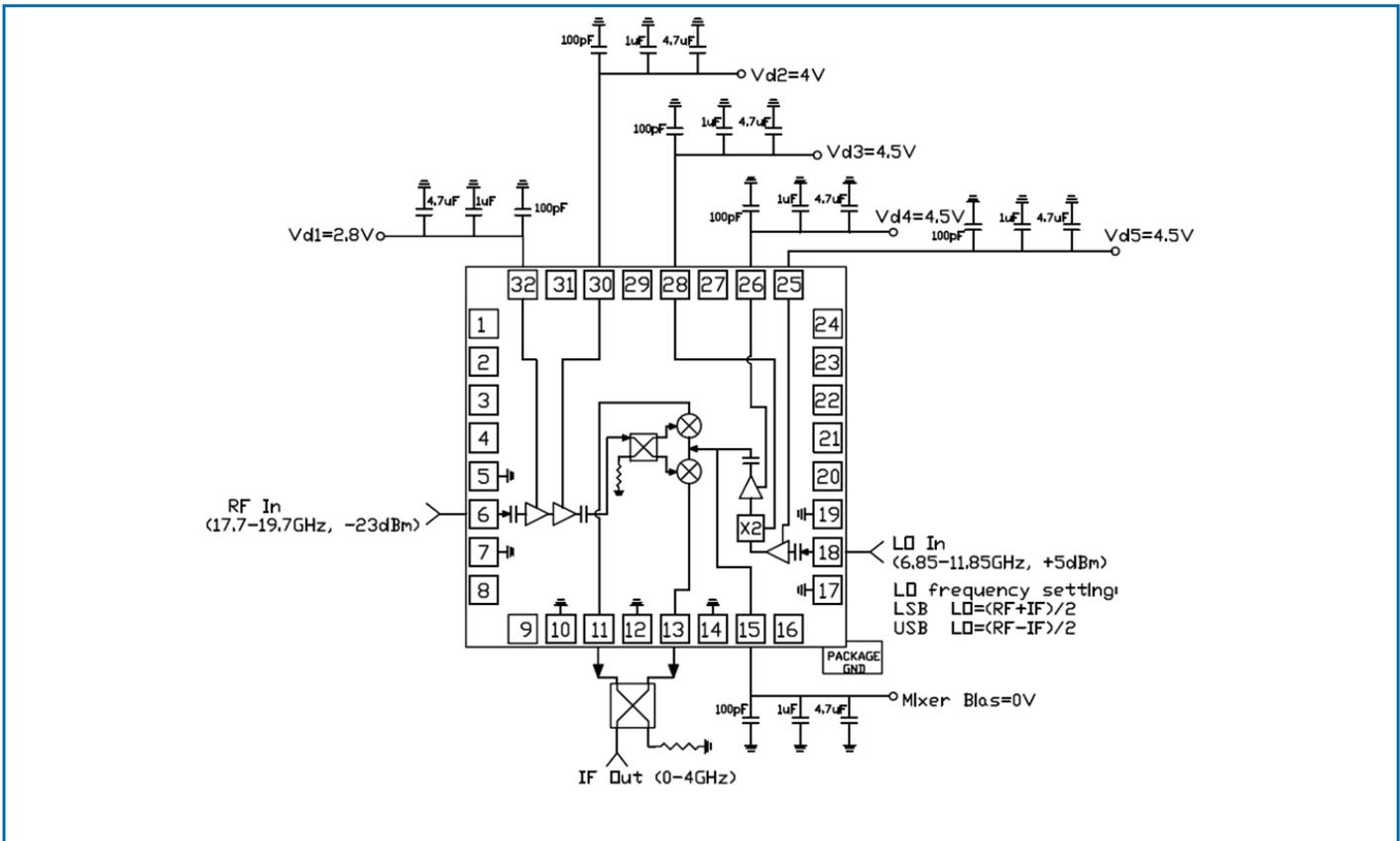
## Pin Names and Descriptions

Pin	Name	Description
1-4	N/C	Not Connected
5	GND	Ground
6	RF	RF Input, AC coupled and matched to 50Ω
7	GND	Ground
8-9	N/C	Not Connected
10	GND	Ground
11	IF1	IF1 Output
12	GND	Ground
13	IF2	IF2 Output
14	GND	Ground
15	Mixer Bias	Mixer Bias = 0V
16	N/C	Not Connected
17	GND	Ground
18	LO	LO Input, AC coupled and matched to 50Ω
19	GND	Ground
20-24	N/C	Not Connected
25	Vd5	Vd5 (LOA bias) = 4.5V
26	Vd4	Vd4 (LOA bias) = 4.5V
27	N/C	Not Connected
28	Vd3	Vd3 (LOA bias) = 4.5V
29	N/C	Not Connected
30	Vd2	LNA drain bias2 = 4V
31	N/C	Not Connected
32	Vd1	LNA drain bias1 = 2.8V

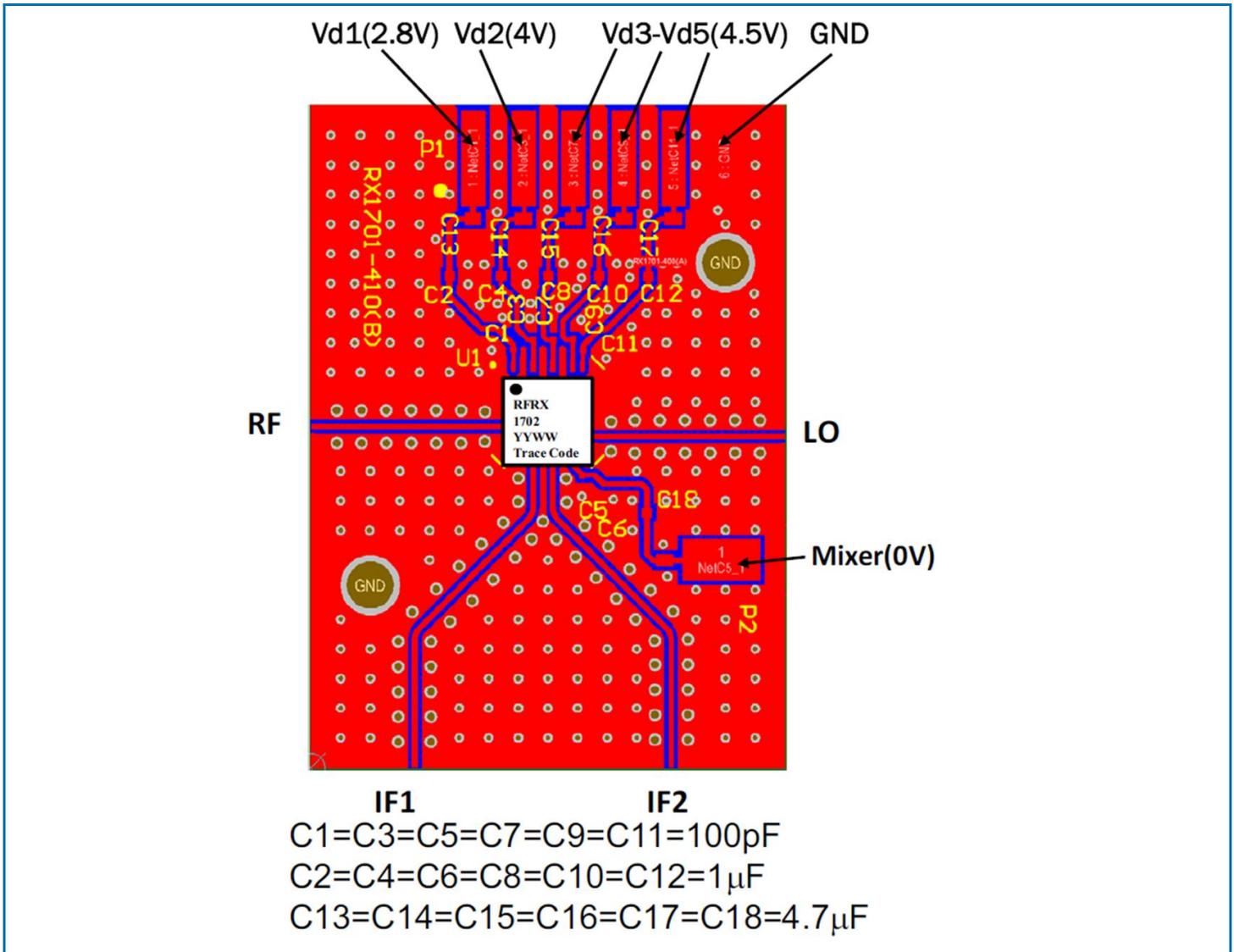
Package Outline Drawing (Dimensions in millimeters)



Application Circuit Block Diagram



## Evaluation Board Layout



## Test Conditions

LO Power	+5dBm
RF Power	-20dBm
Vd1	2.8V
Vd2	4.0V
Vd3, Vd4, Vd5	4.5V
Mixer Bias	0V