RFUV5945A

10GHz to 16GHz GaAs MMIC IQ UPCONVERTER

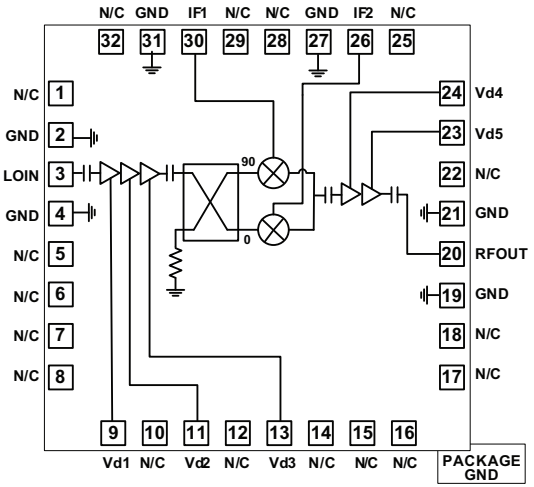
Package: QFN, 32-Pin, 5mm x 5mm x 0.95mm

Features

- Integrated LPA
- Image Rejection Mixer
- LO Buffer Amplifier
- Conversion Gain +13 dB
- Image Frequency Rejection 22 dB
- LO input Drive 0dBm
- Output IP3 >21 dBm
- IF Frequency DC to 4GHz
- No Mixer bias required
- Compact Low Cost 5x5 QFN Package.
- 100% RF and DC Testing

Applications

- Point to point
- VSAT



Functional Block Diagram

Product Description

RFMD's RFUV5945A is a 10GHz to 16GHz GaAs pHEMT upconverter, incorporating an integrated LPA, image rejection mixer, LO buffer amplifier, and DC decoupling capacitors. The combination of high performance and low-cost packaging makes the RFUV5945A a cost effective solution, ideally suited to both current and next generation Point-to-Point and VSAT applications. RFUV5945A is packaged in a 5mm x 5mm QFN to simplify both system level board design and volume assembly.

Ordering Information

RFUV5945A	Sample
RFUV5945A.AEA	Evaluation Board
RFUV5945A-DK	Design Kits (1 x Evaluation board + 3 x loose samples)

Optimum Technology Matching® Applied

☐ GaAs HBT	☐ SiGe BiCMOS	☑ GaAs pHEMT	☐ GaN HEMT
☐ GaAs MESFET	☐ Si BiCMOS	☐ Si CMOS	☐ BiFET HBT
☐ InGaP HBT	☐ SiGe HBT	☐ Si BJT	☐ LDMOS

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Absolute Maximum Ratings

Parameter	Rating	Unit
LPA Drain Voltage Vd	6	V
LOA Drain Voltage	6	V
RF Input Power	+10	dBm
LO Input Power	+15	dBm
T_{OPER}	-40 to +85	°C
T_{STOR}	-55 to +150	°C
ESD Human Body Model	250	
ESD Machine Model	50	
MSL	2	

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.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
10.70GHz to 11.70GHz					Electrical Characterization T=25°C
Output RF Frequency	10.7		11.7	GHz	
Input LO Frequency	6.7		15.7	GHz	
Input IF Frequency	DC		4	GHz	
LO input Drive		0		dBm	
Conversion Gain	10	13		dB	
Output IP3	20	24		dBm	
LO to IF Isolation		30		dBc	
RF to IF Isolation		50		dB	
Image Rejection	15	24		dBc	
RF Input Return Loss		15		dB	
LO Input Return Loss		15		dB	
LPA Bias Voltage		4		V	
LPA Supply Current		110	120	mA	
LOA Bias Voltage		4		V	
LOA Supply Current		140	150	mA	
12.75GHz to 13.25GHz					Electrical Characterization T=25°C
Output RF Frequency	12.75		13.25	GHz	
Input LO Frequency	8.75		17.25	GHz	
Input IF Frequency	DC		4	GHz	
LO input Drive		0		dBm	
Conversion Gain	11	13		dB	
Output IP3	20	22		dBm	
LO to IF Isolation		35		dBc	
RF to IF Isolation		50		dB	
Image Rejection	15	22		dBc	
RF Input Return Loss		14		dB	
LO Input Return Loss		13		dB	
LPA Bias Voltage		4		V	
LPA Supply Current		110	120	mA	
LOA Bias Voltage		4		V	
LOA Supply Current		140	150	mA	

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
14.40GHz - 15.35GHz					Electrical Characterization T=25°C
Output RF Frequency	14.4		15.35	GHz	
Input LO Frequency	10.4		19.35	GHz	
Input IF Frequency	DC		4	GHz	
LO input Drive		0		dBm	
Conversion Gain	10	13		dB	
Output IP3	20	22		dBm	
LO to IF Isolation		30		dBc	
RF to IF Isolation		50		dB	
Image Rejection	15	20		dBc	
RF Input Return Loss		18		dB	
LO Input Return Loss		12		dB	
LPA Bias Voltage		4		V	
LPA Supply Current		110	120	mA	
LOA Bias Voltage		4		V	
LOA Supply Current		140	150	mA	

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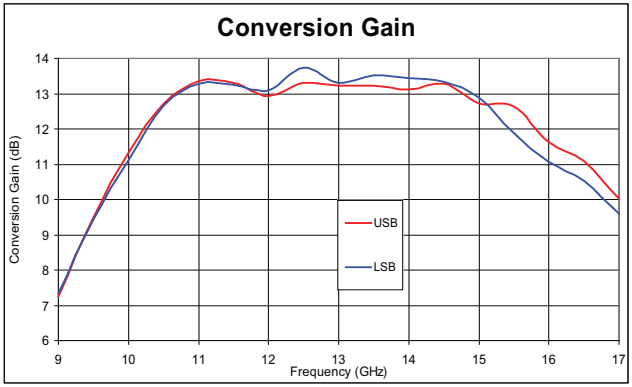
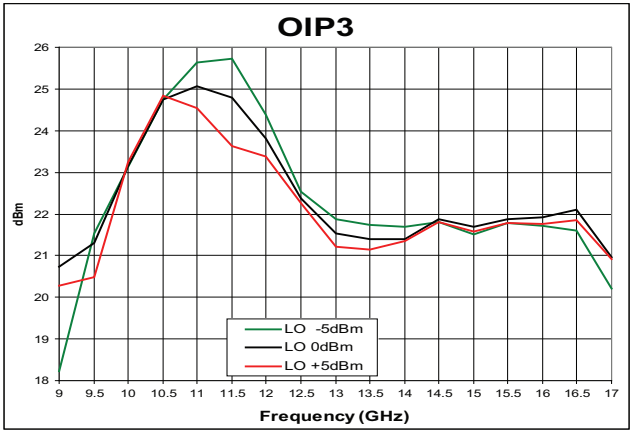
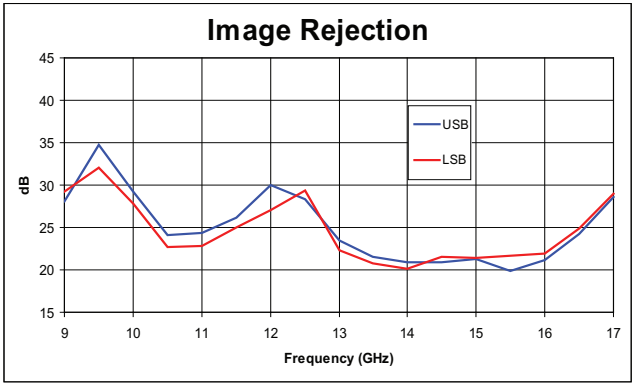
Typical Electrical Performance

Measurements performed with I and Q ports connected to an external 90° Hybrid Combiner and Bias Voltage of +4V, and LO Power of 0dBm (unless stated otherwise):

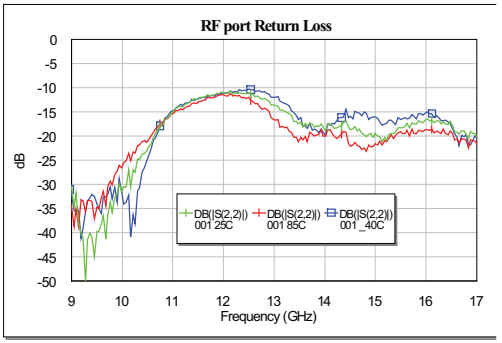


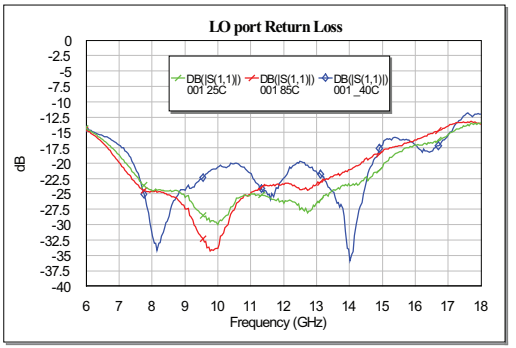


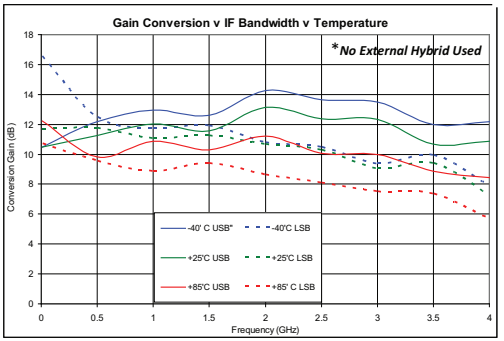


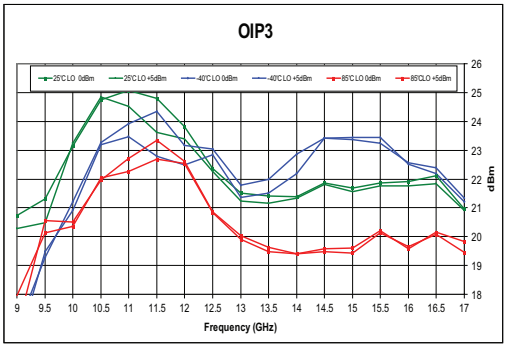
Typical Electrical Performance

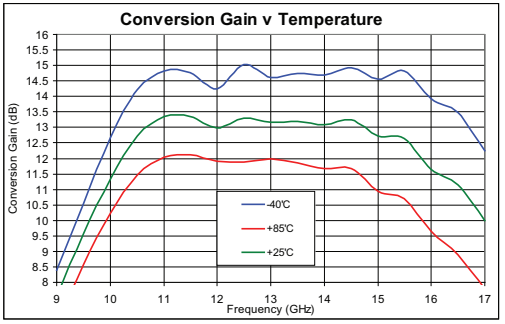
Measurements over Temperature Range -40°C, +25°C and +85°C, with Bias Voltage of +4V, and LO Power of 0dBm (unless stated otherwise):

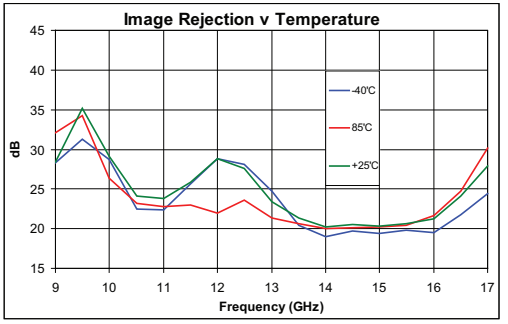












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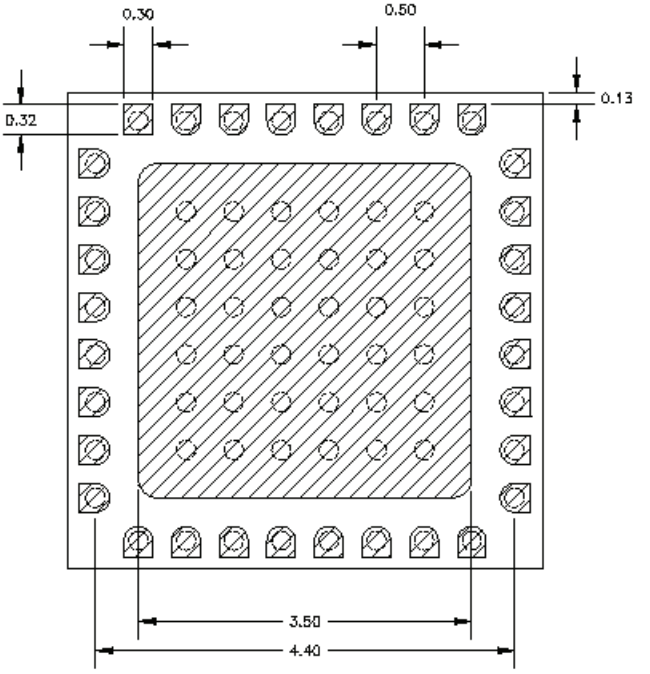
Package Drawing



Note: All dimensions in millimeters.

Pin	Function	Description
1	N/C	
2	LO GND	LO Ground
3	LO IN	LO Input
4	LO GND	LO Ground
5	N/C	
6	N/C	
7	N/C	
8	N/C	
9	VD1	LOA First Stage drain bias 4V. Pins 9, 11, and 13 can be connected together.
10	N/C	
11	VD2	LOA Second Stage drain bias 4V. Pins 9, 11, and 13 can be connected together.
12	N/C	
13	VD3	LOA Third Stage drain bias 4V. Pins 9, 11, and 13 can be connected together.
14	N/C	
15	N/C	
16	N/C	
17	N/C	
18	N/C	
19	RF GND	RF Ground
20	RF OUT	RF Input
21	RF GND	RF Ground
22	N/C	
23	VD2	LPA First Stage drain bias 4V. Pins 23 and 24 can be connected together.
24	VD1	LPA Second Stage drain bias 4V. Pins 23 and 24 can be connected together.
25	N/C	
26	IF2	
27	IF GND	
28	N/C	
29	N/C	
30	IF1	
31	IF GND	
32	N/C	

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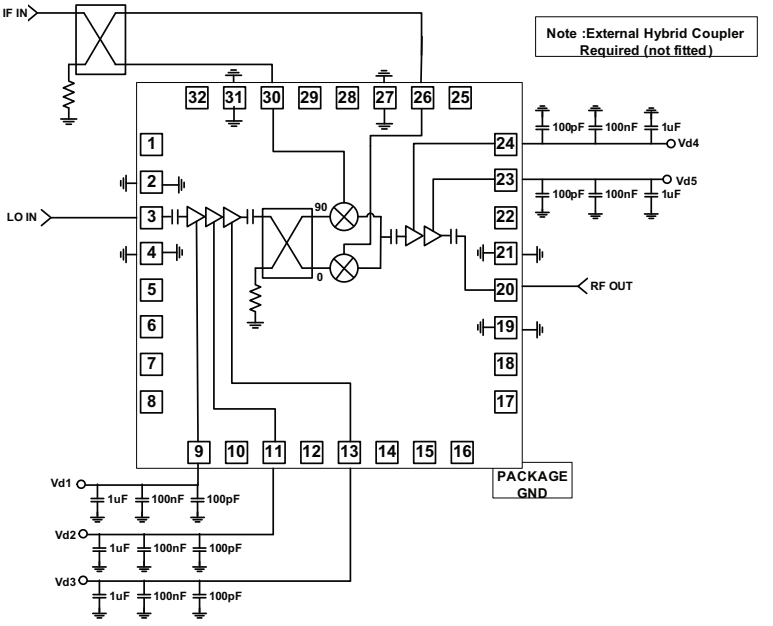
Application Circuit Block Diagram



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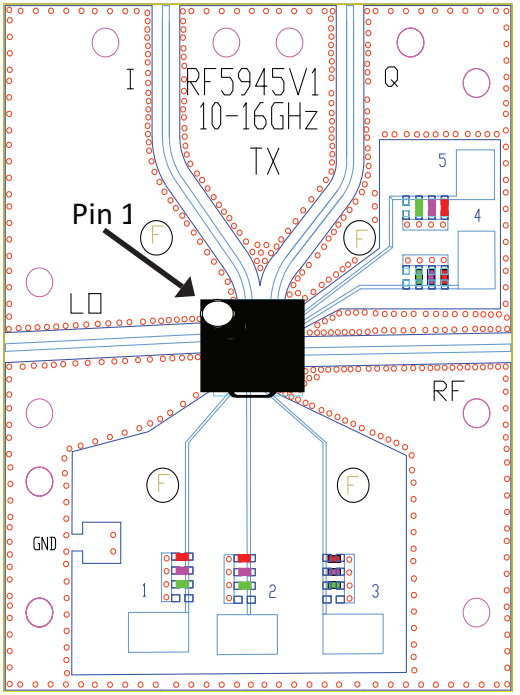
Evaluation Board Layout



Key	0402 Capacitors
	1µF Capacitor
	100nF Capacitor
	10000pF Capacitor

PCB PAD NUMBERS 1, 2 and 3 can be tied together at +4V (LOA RF Amplifiers, Stage 1,2 and 3)

PCB PAD NUMBERS GND is the Ground Return

PCB PAD NUMBERS 1 and 2 are tied together at +4.0V (LNA RF Amplifier, Stages 1 and 2)

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