RF2641

CDMA UPCONVERTER/BPSK MODULATOR

Typical Applications

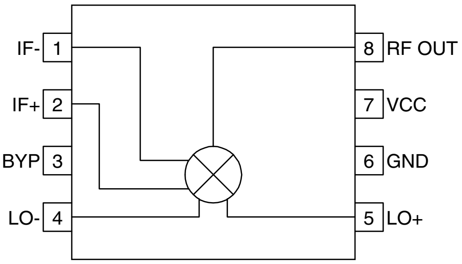
- PCS/Cellular CDMA Systems
- PHS 1500/ WLAN 2400 Systems
- General Purpose Upconverter
- BPSK Modulation
- Micro-Cell PCS Base Stations
- Portable Battery Powered Equipment

Product Description

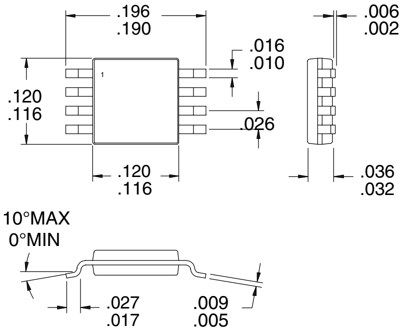
The RF2641 is a complete upconverter designed for cellular and PCS applications. This device may also be used to directly BPSK modulate a carrier. The unit operates at 3.0V and is designed as part of the RFMD PCS/Cellular CDMA Chip Set, consisting of a Transmit IF AGC Amp, this Transmit Upconverter, a Receive LNA/Mixer, and a Receive IF AGC Amp.

Optimum Technology Matching® Applied

☐ Si BJT
☑ Si Bi-CMOS
☐ GaAs HBT
☐ SiGe HBT
☐ GaAs MESFET
☐ Si CMOS



Functional Block Diagram



Package Style: MSOP-8

Features

- Supports Dual Mode Operation
- +5.5dBm Output Intercept Point
- 7dB Conversion Gain (836MHz)
- Single 3.0V Power Supply
- Miniature 8 Pin Package
- Double-Balanced Mixer

Ordering Information

RF2641	CDMA Upconverter/BPSK Modulator
RF2641 PCBA	Fully Assembled Evaluation Board

RF Micro Devices, Inc.
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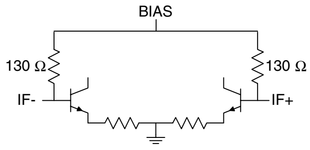
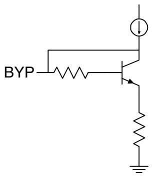
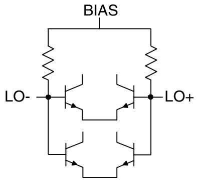
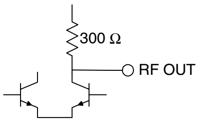
Fax (336) 664 0454
http://www.rfmd.com

Absolute Maximum Ratings

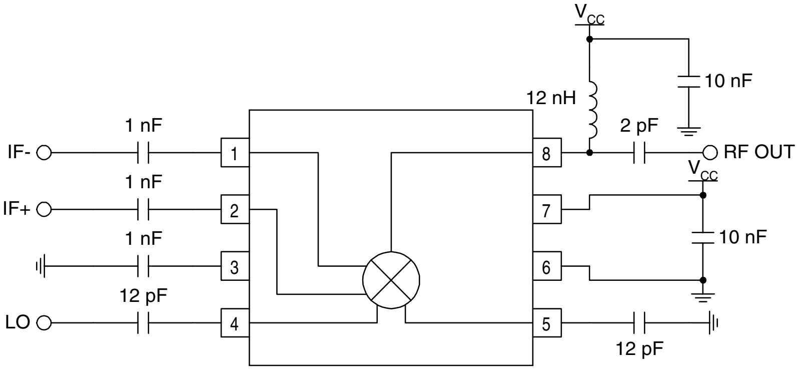
Parameter	Rating	Unit
Supply Voltage	-0.5 to +5.0	V_{DC}
Input RF Power	+3	dBm
Operating Ambient Temperature	-30 to +80	°C
Storage Temperature	-30 to +150	°C

Caution! ESD sensitive device.

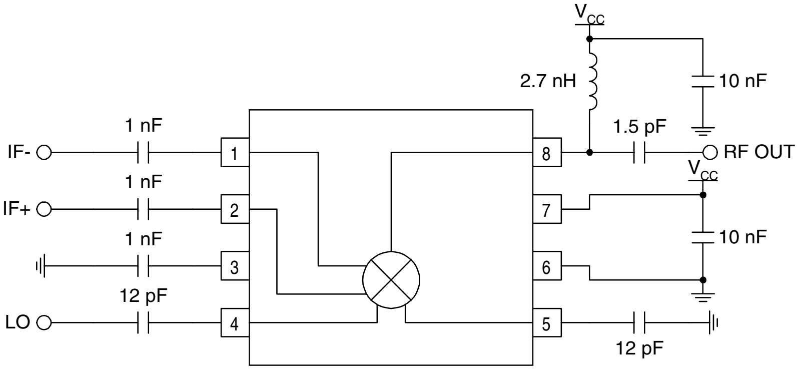
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					T=25°C, V_{CC}=3.0V, IF=130MHz
RF Output Frequency Range		500 to 2500		MHz	
Conversion Gain	5	7		dB	RF out=836MHz, LO=-3dBm @ 960MHz
		4		dB	RF out=1830MHz, LO=-3dBm @ 2010MHz
Noise Figure		10		dB	RF out=836MHz
		13		dB	RF out=1830MHz
Output IP3	+4	+5.5		dBm	P_{IN}=-18dBm per Tone, RF out=836MHz
		+4			P_{IN}=-18dBm per Tone, RF out=1830MHz
Spurious Product Rejection		30		dBc	Referenced to RF output
IF Input					
IF Frequency		DC to 300		MHz	
Differential Input Impedance		260		Ω	
IF to RF Output Isolation		30		dB	
IF to LO Isolation		30		dB	
LO Input					
LO Frequency Range		300 to 2700		MHz	
LO Level		-6 to 0		dBm	
LO to RF Output Leakage	-15	-20		dBm	
RF to LO Isolation		30		dB	
LO Input VSWR		2:1			50Ω
Power Supply					
Voltage		2.7 to 3.3		V	
Current Consumption		13	16	mA	

Pin	Function	Description	Interface Schematic
1	**IF-**	Balanced IF Input Pin. This pin is internally DC biased and should be DC blocked if connected to a device with a DC level present. For single-ended input operation, one pin is used as an input and the other IF input is AC coupled to ground. The balanced, as well as single-ended, input impedance is 260Ω.	
2	**IF+**	Same as pin 1, except complementary input.	See Pin 1.
3	**BYP**	Bypass pin for internal bias circuitry. Bypass with a 1nF capacitor.	
4	**LO-**	Balanced LO Input Pin. This pin is internally DC biased and should be DC blocked if connected to a device with a DC level present. For single-ended input operation, one pin is used as an input and the other LO input is AC coupled to ground. The balanced, as well as single-ended, input impedance is 50Ω.	
5	**LO+**	Same as pin 4, except complementary input.	See Pin 4.
6	**GND**	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance.	
7	**VCC**	Supply Voltage pin. External bypassing is required. External RF, LO, and IF bypassing is required. The trace length between the pin and the bypass capacitors should be minimized. The ground side of the bypass capacitors should connect immediately to ground plane.	
8	**RF OUT**	RF Output Pin.	

Application Schematic
836MHz

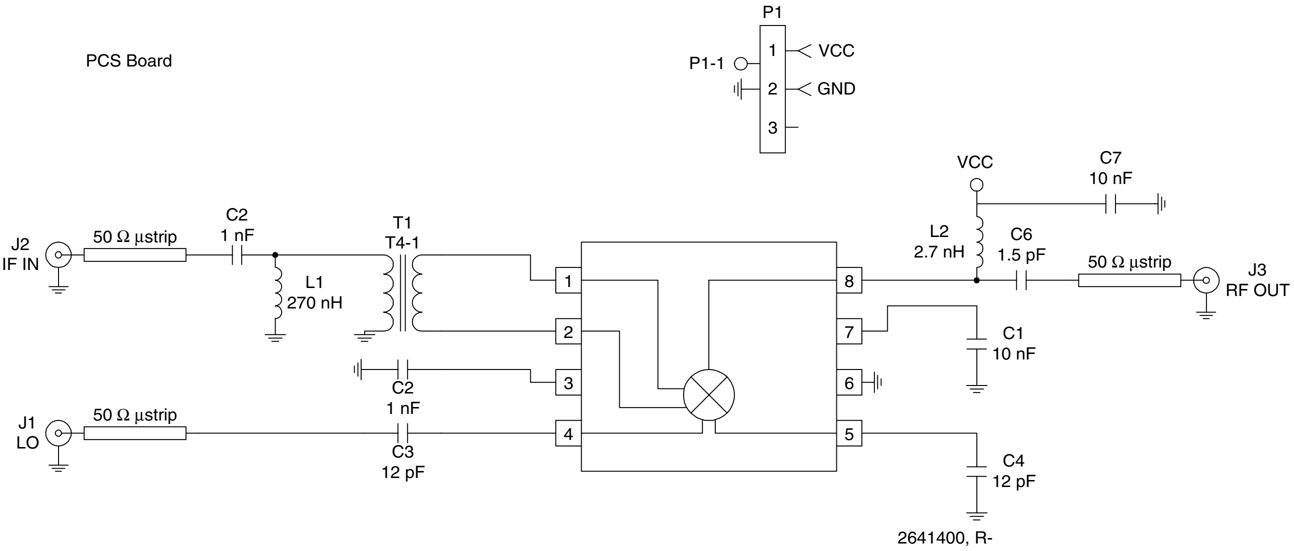


Application Schematic
1880MHz



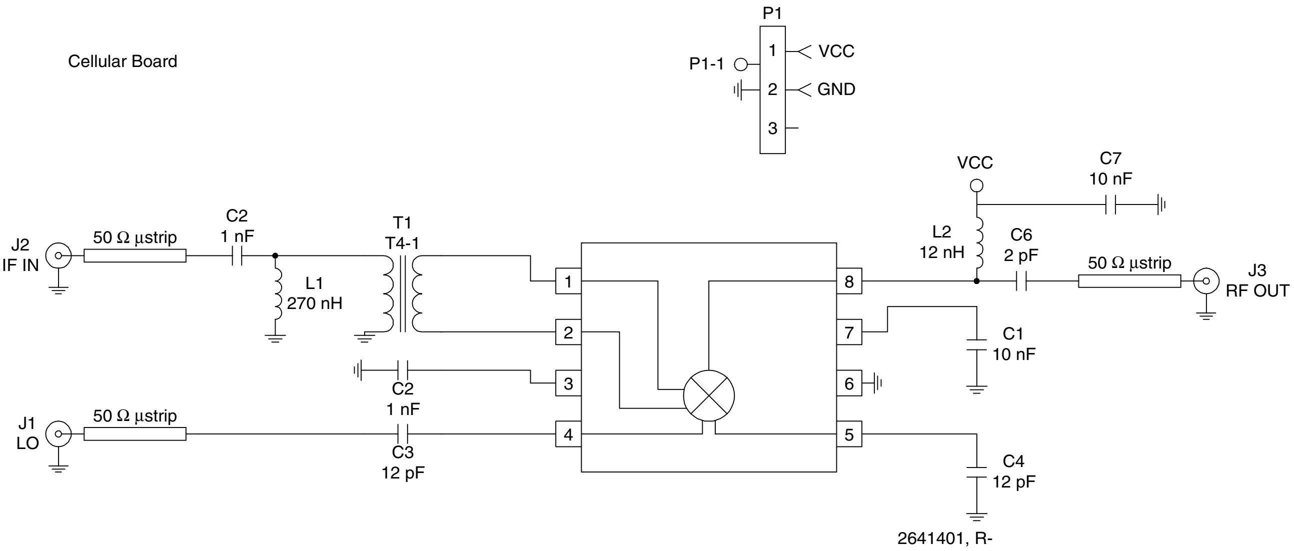
Evaluation Board Schematic
PCS Board

(Download Bill of Materials from www.rfmd.com.)



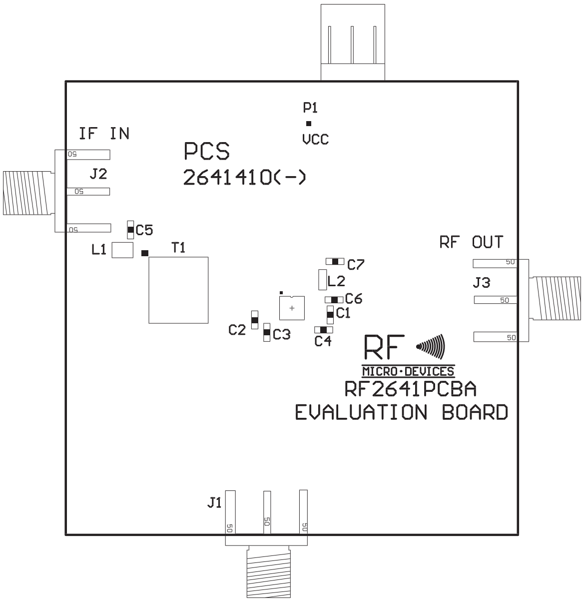
Evaluation Board Schematic
Cellular Board

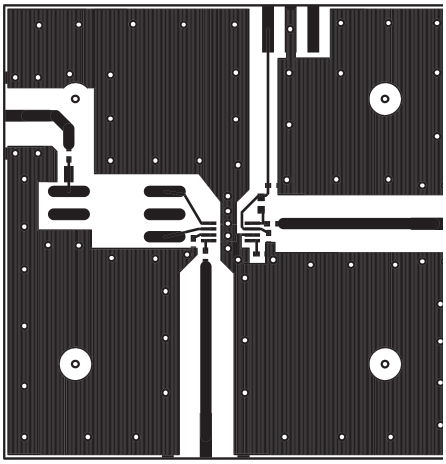
(Download Bill of Materials from www.rfmd.com.)

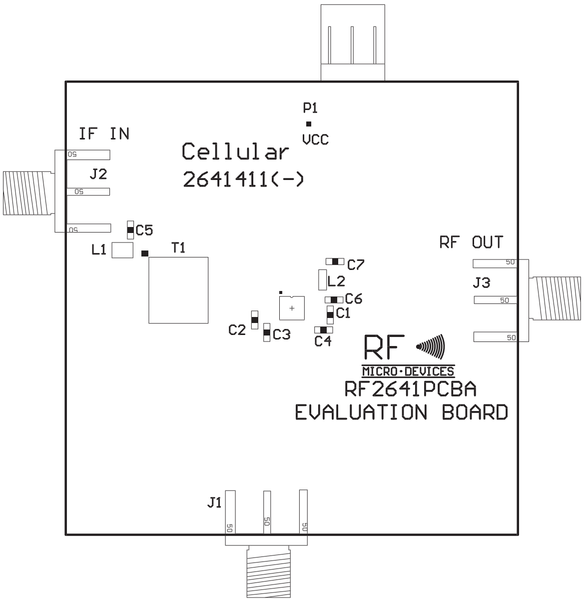


Evaluation Board Layout

Board Thickness 0.014”; Board Material FR-4






P1
VCC
IF IN
Cellular
2641411(-)
J2
50
50
50
C5
L1
T1
RF OUT
C7
L2
J3
50
50
50
C6
C1
C2
C3
C4
RF
MICRO·DEVICES
RF2641PCBA
EVALUATION BOARD
J1
50
50
50