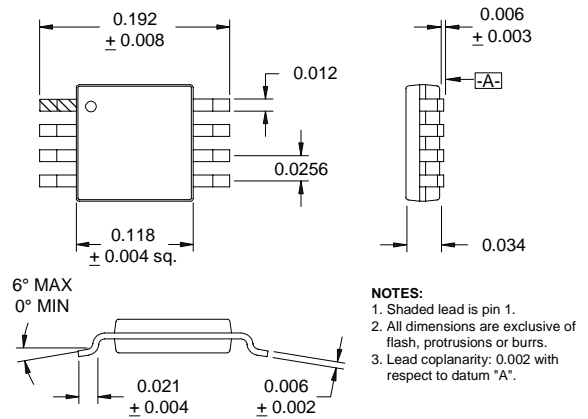


Typical Applications

- W-CDMA Systems
- PCS/Cellular CDMA Systems
- PHS 1500/WLAN 2400 Systems
- General Purpose Upconverter
- BPSK Modulation
- Micro-Cell PCS Base Stations

Product Description

The RF2638 is a complete upconverter designed for cellular, PCS and W-CDMA 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 and W-CDMA Chip Sets.

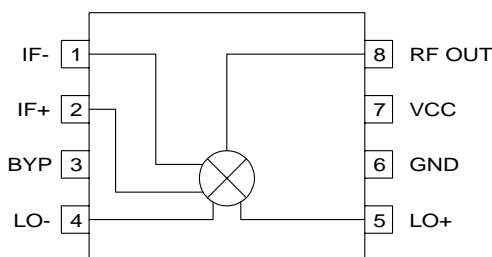


**6**  
MIXERS

Optimum Technology Matching® Applied

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

Package Style: MSOP-8



Functional Block Diagram

Features

- Supports Dual Mode Operation
- +10dBm Output IP3 (1950MHz)
- +13dBm Output IP3 (830MHz)
- Single 3.0V Power Supply
- Miniature 8-Pin Package
- Double-Balanced Mixer

Ordering Information

RF2638	W-CDMA and CDMA Upconverter/ BPSK Modulator
RF2638 PCBA-PCS/CEL	Fully Assembled Evaluation Board
RF2638 PCBA-DO	Fully Assembled Evaluation Board
RF2638 PCBA-W	Fully Assembled Evaluation Board

RF Micro Devices, Inc.  
7625 Thorndike Road  
Greensboro, NC 27409, USA

Tel (336) 664 1233  
Fax (336) 664 0454  
<http://www.rfmd.com>

# RF2638

## Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	-0.5 to +5.0	V <sub>DC</sub>
Input RF Power	+3	dBm
Operating Ambient Temperature	-30 to +80	°C
Storage Temperature	-30 to +150	°C



**Caution!** ESD sensitive device.

RF Micro Devices believes the furnished information is correct and accurate at the time of this printing. However, RF Micro Devices reserves the right to make changes to its products without notice. RF Micro Devices does not assume responsibility for the use of the described product(s).

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Overall</b> RF Output Frequency Range Spurious Product Rejection		500 to 2500 30		MHz dBc	T=25°C, V <sub>CC</sub> =3.0V Referenced to RF output
<b>Cellular</b> Conversion Gain Noise Figure Output IP3	-1 -2.2	-0.5 -1 14 +13		dB dB dB dBm	T=25°C, V <sub>CC</sub> =3.0V, LO=960MHz @ -3dBm, IF=130MHz @ -13dBm RF <sub>OUT</sub> =830MHz RF <sub>OUT</sub> =836MHz (Dual-Output board) RF <sub>OUT</sub> =830MHz P <sub>IN</sub> =-13dBm per Tone, RF out=830MHz
<b>PCS</b> Conversion Gain Noise Figure Output IP3	-3.0 -3.5	-1.5 -2.5 15 +11		dB dB dB dBm	T=25°C, V <sub>CC</sub> =3.0V, LO=1750MHz @ -3dBm, IF=130MHz @ -13dBm RF <sub>OUT</sub> =1880MHz RF <sub>OUT</sub> =1880MHz (Dual-Output board) RF <sub>OUT</sub> =1880MHz P <sub>IN</sub> =-13dBm per Tone, RF out=1880MHz
<b>W-CDMA</b> ACPR Conversion Gain Noise Figure Output IP3 Max OIP3	-58 -2.0 13 +8	-57 -1.0 14 +10	-56 0 15 11	dBc dB dB dBm dBm	T=25°C, V <sub>CC</sub> =3.0V, LO=2330MHz @ -3dBm, IF=380MHz @ -13dBm RF <sub>OUT</sub> =1950MHz RF <sub>OUT</sub> =1950MHz P <sub>IN</sub> =-13dBm per Tone, RF <sub>OUT</sub> =1950MHz
<b>IF Input</b> IF Frequency Differential Input Impedance IF to RF Output Isolation IF to LO Isolation	DC 220	130/380 260 30 30	500 300	MHz Ω dB dB	IF=130MHz
<b>LO Input</b> LO Frequency Range LO Level LO to RF Output Leakage RF to LO Isolation LO Input VSWR		300 to 2700 -6 to 0 -18 -15 -14		MHz dBm dBm dBm dB	At Cellular band, high side injection (Dual-Output board) At PCS band, low side injection (Dual-Output board) 50Ω
<b>Power Supply</b> Voltage Current Consumption	2.7	3.0 25	3.3	V mA	

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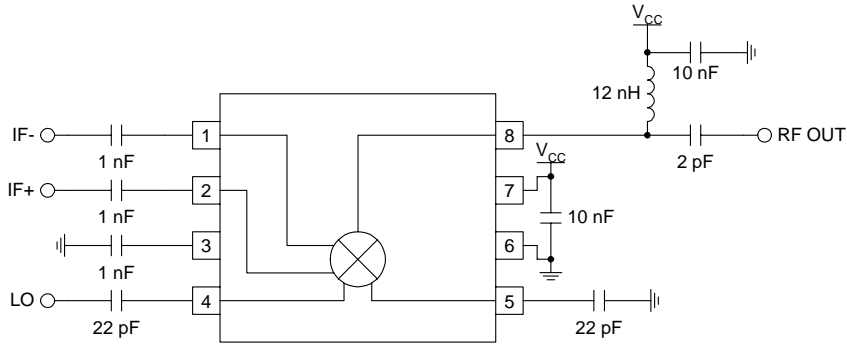
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# RF2638

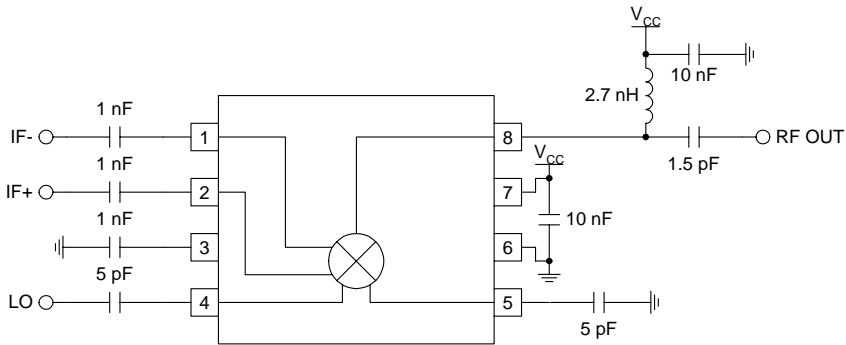
Pin	Function	Description	Interface Schematic
1	IF-	Balanced IF input pin. This pin is internally DC-biased and should be DC-blocked if connected to a device with a DC level present. For single-ended input operation, one pin is used as an input and the other IF input is AC-coupled to ground. The balanced, 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 1 nF 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.	
5	LO+	Same as pin 4, except complementary input.	See pin 4.
6	GND	Ground connection. For best performance, keep traces physically short and connect immediately to ground plane.	
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.	

# RF2638

## Application Schematic 836MHz



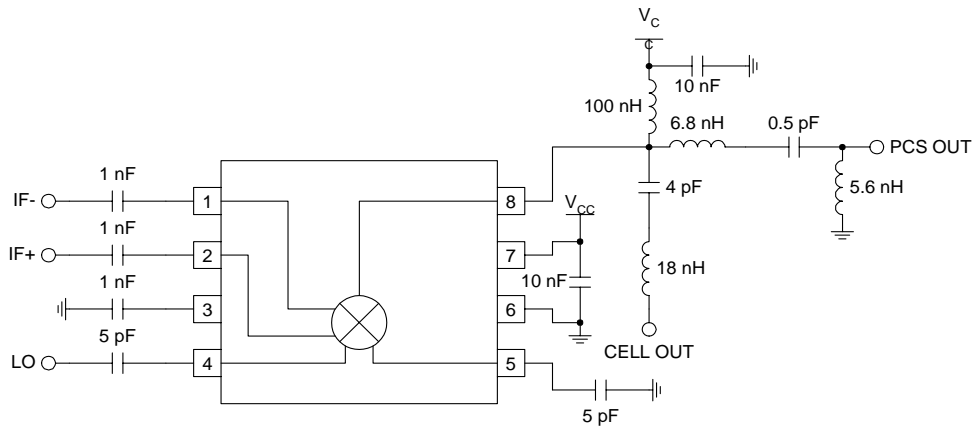
## Application Schematic 1880MHz



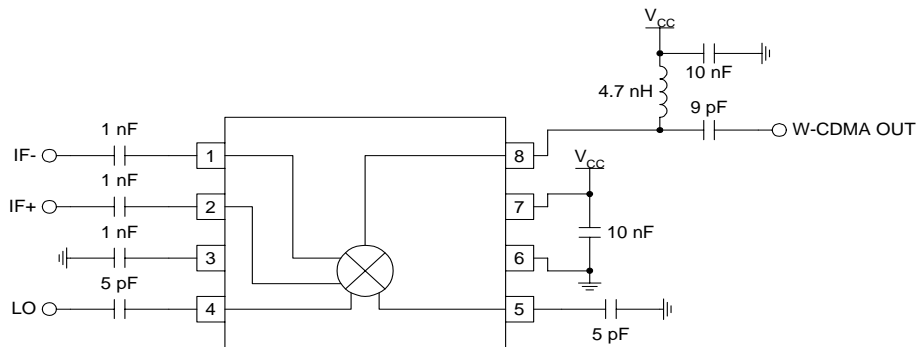
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**Application Schematic  
Dual-Band Output (836MHz/1880MHz)**



**Application Schematic  
W-CDMA (1950MHz)**

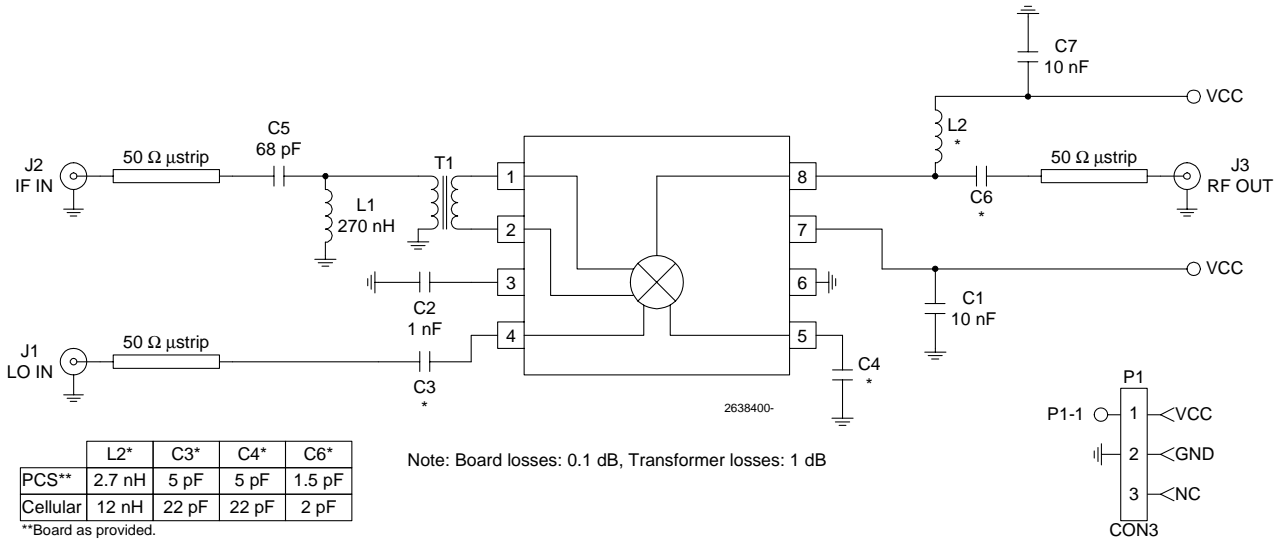


# RF2638

## Evaluation Board Schematic - PCS/Cellular

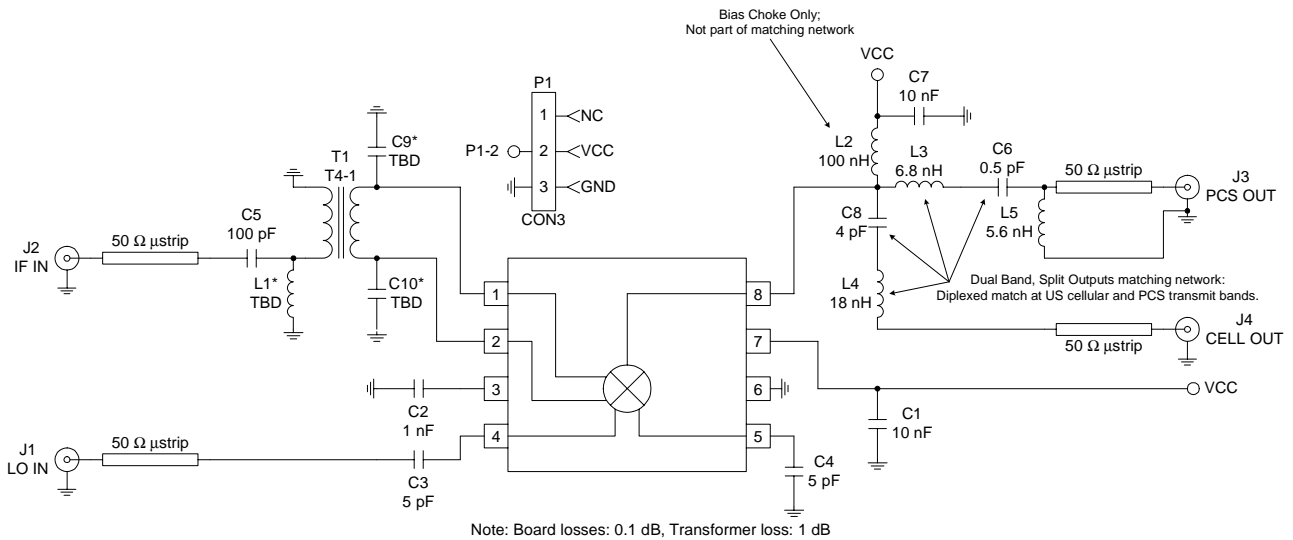
RF = 1880MHz, IF = 130MHz

(Download [Bill of Materials](http://www.rfmd.com) from www.rfmd.com.)



## Evaluation Board Schematic - Dual Output

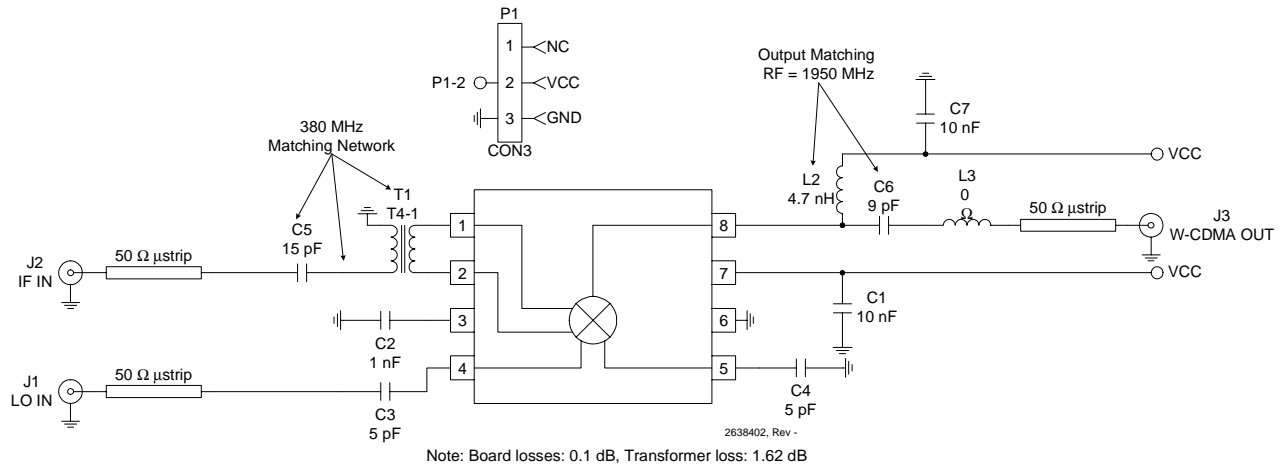
Cellular Out = 836MHz, PCS Out = 1880MHz, IF = 130MHz



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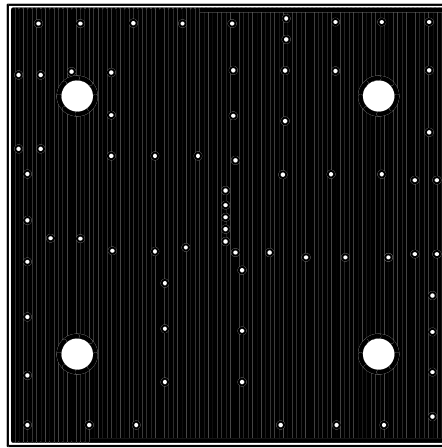
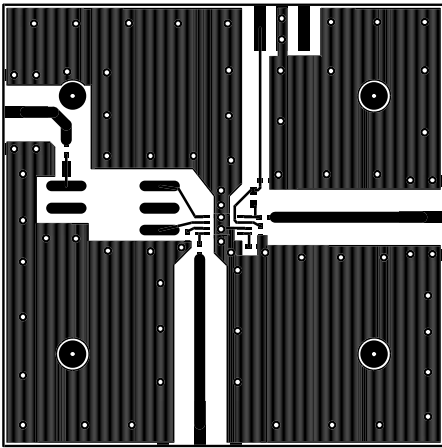
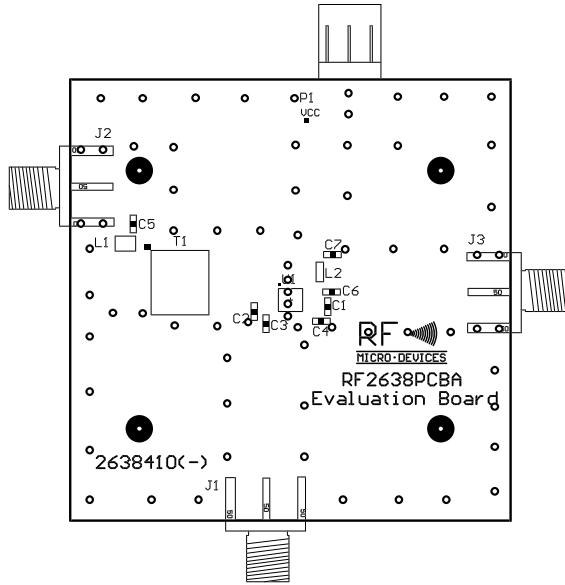
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## Evaluation Board Schematic - W-CDMA RF = 1950MHz, IF = 380MHz



# RF2638

Evaluation Board Layout  
PCS/Cellular  
Board Size 2.0" x 2.0"  
Board Thickness 0.031", Board Material FR-4



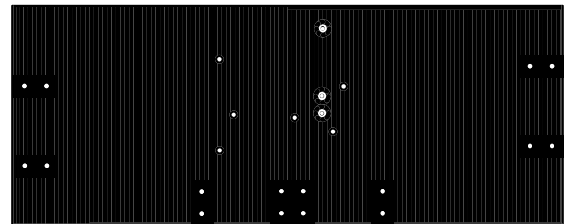
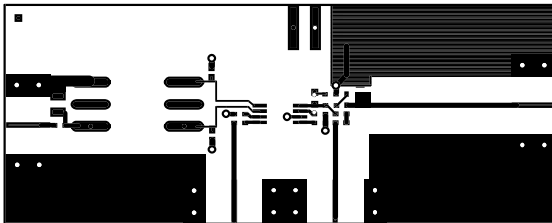
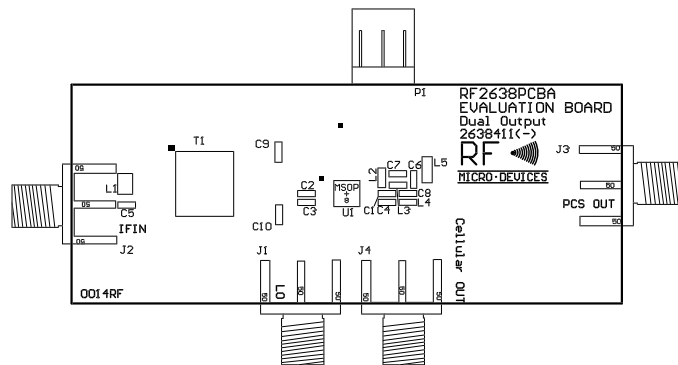
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Evaluation Board Layout  
 Dual Output  
 Board Size 2.5" x 1.0"

Board Thickness 0.060", Board Material FR-4, Multi-Layer  
 (Intermediate layers (Ground Plane and Power Plane [V<sub>CC1</sub>]) are not shown.)

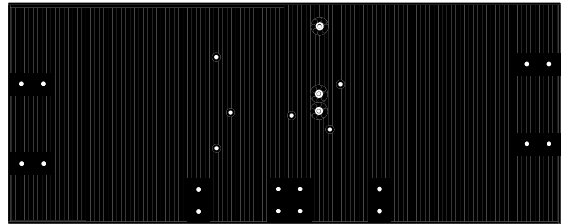
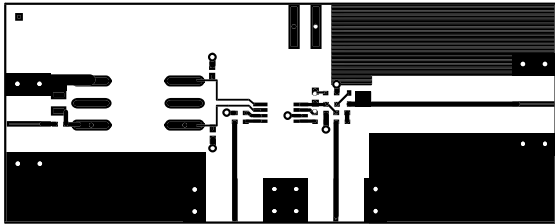
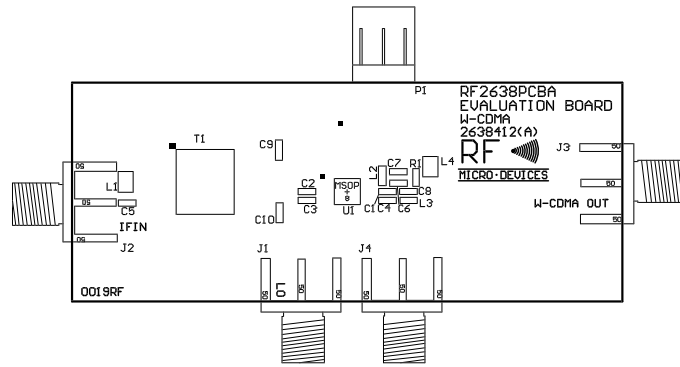


# RF2638

## Evaluation Board Layout W-CDMA

Board Size 2.5" x 1.0"

Board Thickness 0.060", Board Material FR-4, Multi-Layer  
(Intermediate layers (Ground Plane and Power Plane [V<sub>CC1</sub>]) are not shown.)



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