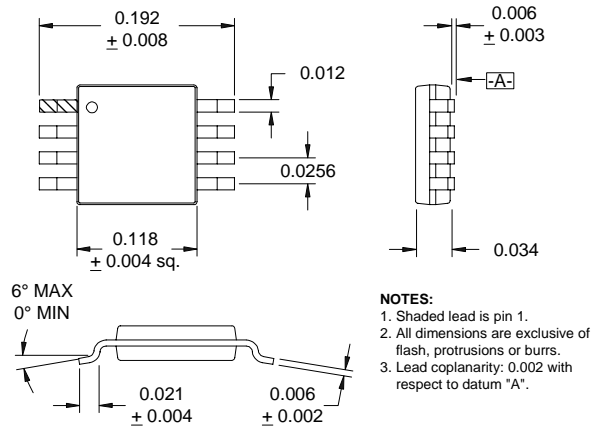


Typical Applications

- 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.



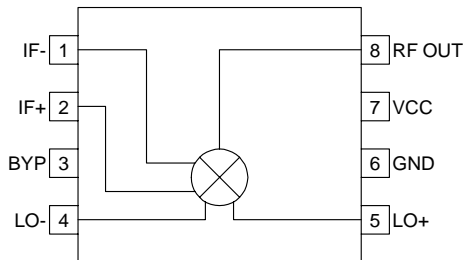
**6**  
MIXERS

Optimum Technology Matching® Applied

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

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



Functional Block Diagram

**Ordering Information**

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

RF Micro Devices, Inc.      Tel (336) 664 1233  
7628 Thorndike Road      Fax (336) 664 0454  
Greensboro, NC 27409, USA      <http://www.rfmd.com>

# RF2641

## 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>               |               |             |      |      | T=25°C, V <sub>CC</sub> =3.0V, IF=130MHz         |
| RF Output Frequency Range    |               | 500 to 2500 |      | MHz  |  |
| Conversion Gain              | 5             | 7           |      | dB   | RF out=836MHz, LO=-3dBm @ 960MHz                 |
| Noise Figure                 |               | 4           |      | dB   | RF out=1880MHz, LO=-3dBm @ 2010MHz               |
|                              |               | 10          |      | dB   | RF out=836MHz                                    |
| Output IP3                   | +3            | 11          |      | dB   | RF out=1880MHz                                   |
|                              |               | +5.5        |      | dBm  | P <sub>IN</sub> =-18dBm per Tone, RF out=836MHz  |
| Spurious Product Rejection   |               | +4          |      |      | P <sub>IN</sub> =-18dBm per Tone, RF out=1880MHz |
|                              |               | 30          |      | dBc  | Referenced to RF output                          |
| <b>IF Input</b>              |               |             |      |      |  |
| IF Frequency                 |               | DC to 300   |      | MHz  |  |
| Differential Input Impedance |               | 260         |      | Ω    |  |
| IF to RF Output Isolation    |               | 30          |      | dB   |  |
| IF to LO Isolation           |               | 30          |      | dB   |  |
| <b>LO Input</b>              |               |             |      |      |  |
| 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  |
| <b>Power Supply</b>          |               |             |      |      |  |
| Voltage                      |               | 2.7 to 3.3  |      | V    |  |
| Current Consumption          |               | 13          | 16   | mA   |  |

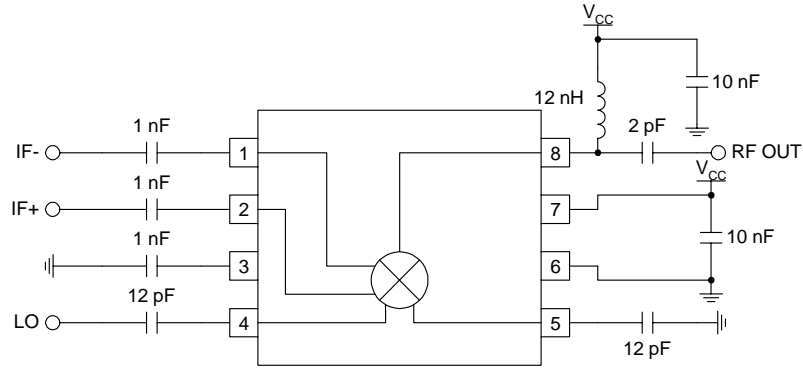
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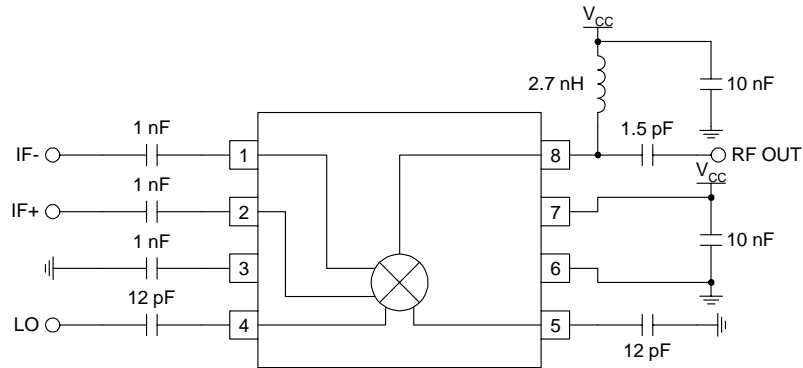
| Pin | Function | Description  | Interface Schematic |
|-----|----------|--|---------------------|
| 1   | IF-      | Balanced IF input pin. This pin is internally DC-biased and should be DC-blocked if connected to a device with a DC level present. For single-ended input operation, one pin is used as 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. 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.   |                     |

# RF2641

## Application Schematic 836MHz



## Application Schematic 1880MHz

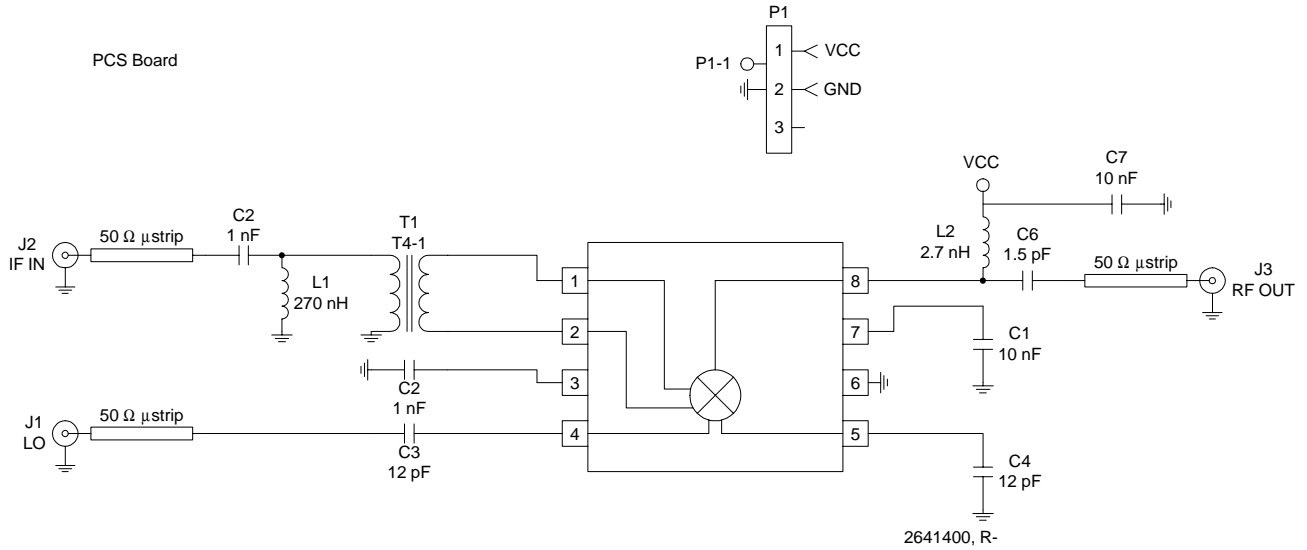


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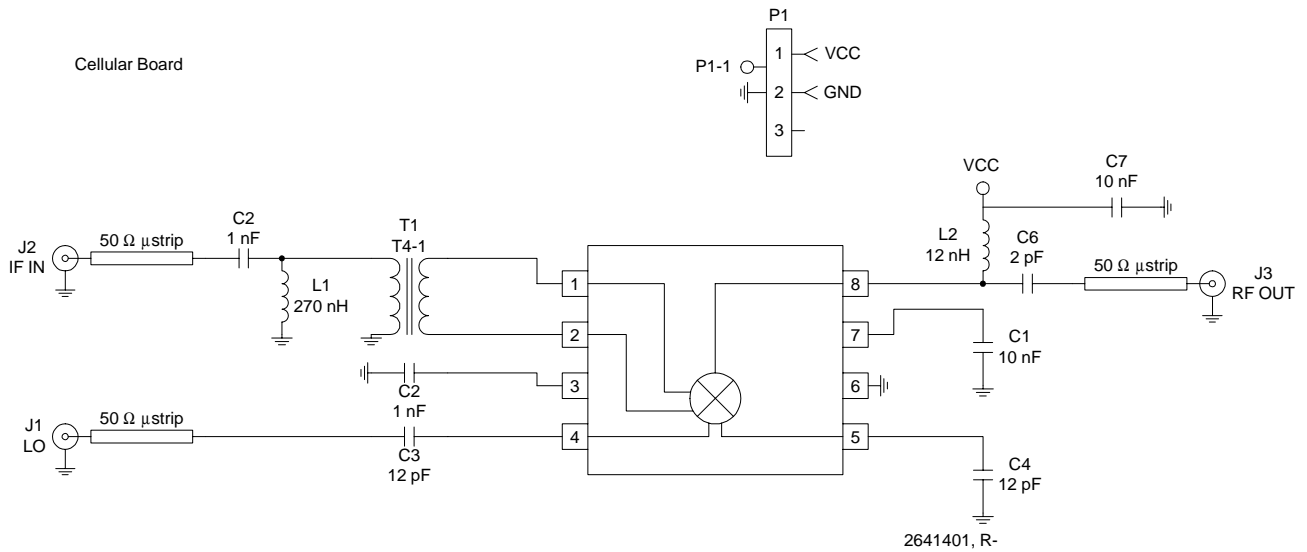
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## Evaluation Board Schematic PCS Board

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



## Evaluation Board Schematic Cellular Board



## Evaluation Board Layout

Board Thickness 0.014"; Board Material FR-4

