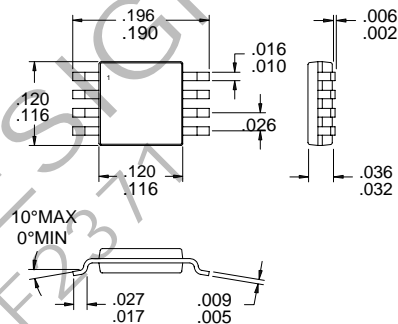


Typical Applications

- GSM Handsets
- CDMA Handsets
- TDMA Handsets
- IF or RF Buffer Amplifiers
- Driver Stage for Power Amplifiers
- Oscillator Loop Amplifiers

Product Description

The RF2451 is a general purpose, low-cost, high performance low noise amplifier designed for operation from a 2.7V to 4V supply with low current consumption. The attenuation of the device is controlled when in power down mode, providing a known gain step. The RF2451 is available in a small industry-standard MSOP-8 surface mount package, enabling compact designs which conserve board space. The design features accurate PTAT (Proportional To Absolute Temperature) biasing scheme using band gap cells.



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GENERAL PURPOSE  
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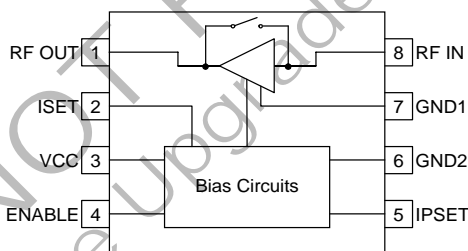
Optimum Technology Matching® Applied

- |  |                                   |                                      |
|--|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> Si BJT                | <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> GaAs MESFET |
| <input checked="" type="checkbox"/> Si Bi-CMOS | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si CMOS     |

Package Style: MSOP-8

Features

- 700MHz to 2000MHz Operation
- 2.7V to 3.6V Single Supply
- +5dBm Input IP<sub>3</sub> at 3.0mA
- 12dB Gain at 1950MHz
- 1.8dB Noise Figure at 1950MHz
- 17dB Gain Step



Functional Block Diagram

Ordering Information

- |             |                                  |
|-------------|----------------------------------|
| RF2451      | 3V Low Noise Amplifier           |
| RF2451 PCBA | Fully Assembled Evaluation Board |

RF Micro Devices, Inc.  
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Greensboro, NC 27409, USA

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<http://www.rfmd.com>

# RF2451

## Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	4.0	V
Supply Current	20	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 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=27°C, V <sub>CC</sub> =2.7V, V <sub>IPSET</sub> =0V, V <sub>ENABLE</sub> =2.7V
Frequency Range		700 to 2000		MHz	
<b>LNA Performance</b>					Freq=1.95GHz
Gain	10.5	12.5		dB	
Noise Figure		1.6		dB	
Input IP3	+4.5	+8		dBm	At 2.9mA
Input VSWR		5:1		dB	(Noise match)
Output VSWR			1.5:1	dB	
Off Mode Gain		-5.0		dB	V <sub>ENABLE</sub> =0V
Gain		17		dB	Freq=836MHz
Noise Figure		1.6		dB	
Input IP3		0		dBm	
Off Mode Gain		-8		dB	V <sub>ENABLE</sub> =0V
<b>Current Control</b>					
Internal current setting "ON"		CMOS Low		V	Voltage on IPSET
External current setting "ON"		CMOS High		V	Voltage on IPSET
Current into ISELECT			1	μA	V <sub>ISELECT</sub> =2.7V
<b>Power Control</b>					
Power "ON" Voltage		CMOS High		V	Voltage on ENABLE
Power "OFF" Voltage		CMOS Low		V	Voltage on ENABLE
Current into ENABLE			1	μA	V <sub>ENABLE</sub> =2.7V
<b>Power Supply</b>					
Operating Voltage		2.7 to 3.6		V	
Operating Current		2.9	5	mA	V <sub>CC</sub> =2.7V, Internal current setting
Leakage Current			1	μA	V <sub>ENABLE</sub> =0V

NOT FOR AEMV DESIGN

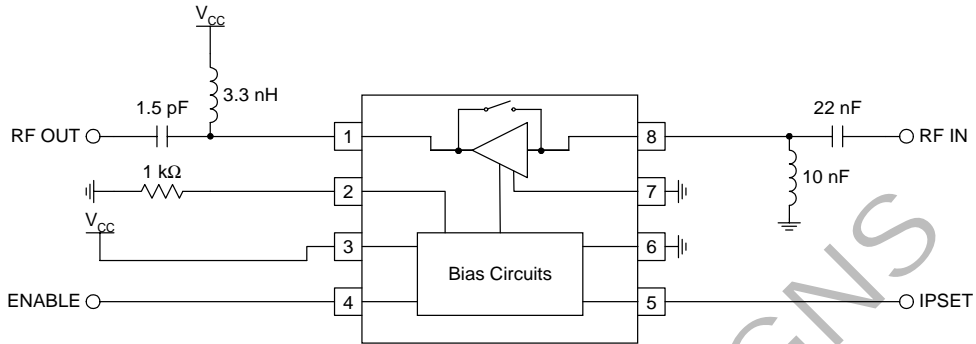
See Upgraded product RF237A

# RF2451

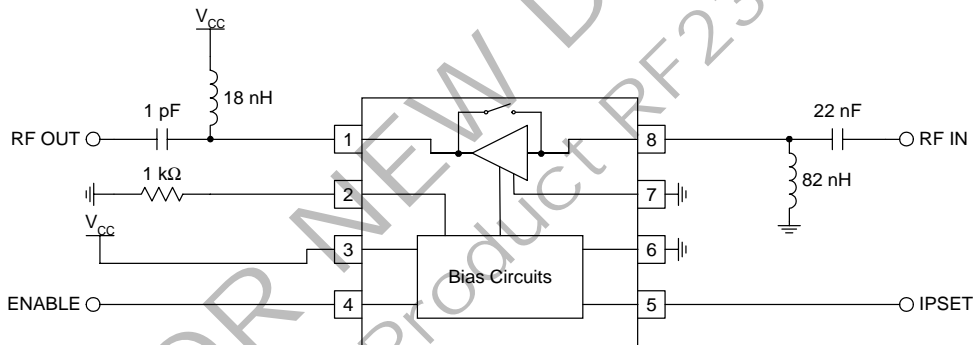
Pin	Function	Description	Interface Schematic
1	RF OUT	RF output pin. Bias for the LNA is provided through this pin, hence it should be connected to VCC through an inductor.	
2	ISET	This pin sets the current for the device. A resistor to ground of 1 k $\Omega$ provides a current of 17.5mA. The condition for optimal IP3 is to use the internal current setting option and leave this pin open (no connect).	
3	VCC	Power supply for the bias circuits.	
4	ENABLE	Power down control. This is a CMOS input. When this pin is CMOS "high" the device is enabled. When the level is CMOS "low" the device is shut off and a controlled attenuator is turned on.	
5	IPSET	This pin selects the internal current setting when CMOS level "low", and the external current setting when this pin is CMOS level "high". The current is set to 2.8mA using the internal current setting, and can be up to 20mA using the external current setting.	
6	GND2	Ground connection for the bias circuits.	
7	GND1	Ground connection for the LNA. Keep traces physically short and connect immediately to ground plane for best performance.	
8	RF IN	RF input pin. This pin is not internally DC blocked and requires an external blocking capacitor.	

# RF2451

## Application Schematic 1.95GHz



## Application Schematic 836MHz

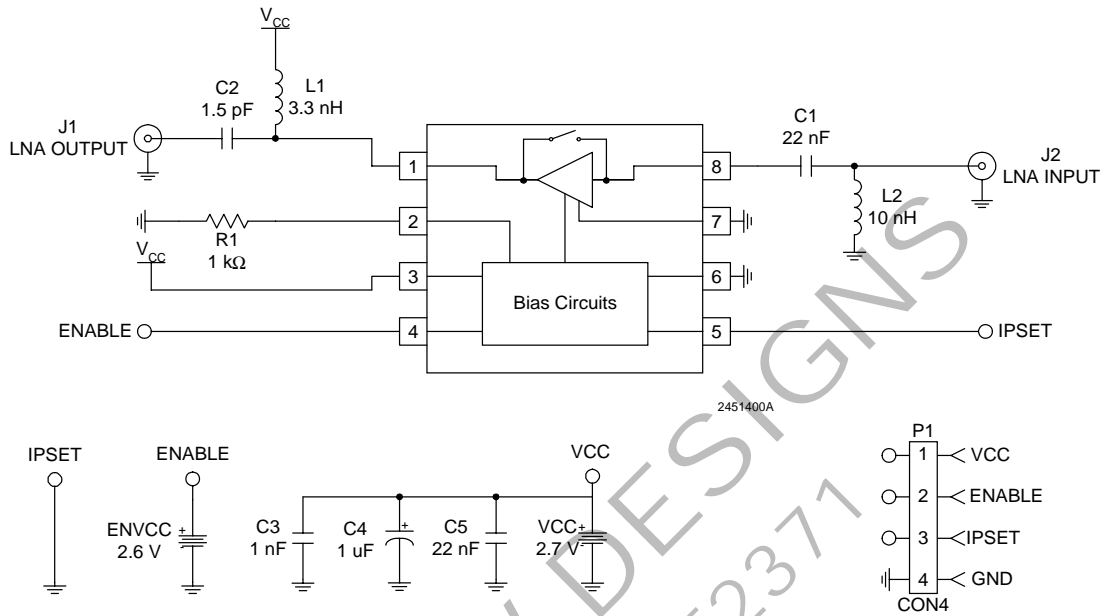


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GENERAL PURPOSE  
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NOT FOR NEW DESIGNS  
See Upgraded Product RF2371

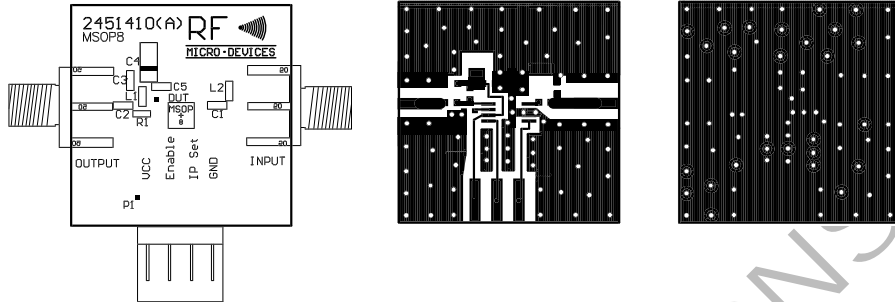
## Evaluation Board Schematic (Download [Bill of Materials](http://www.rfmd.com) from www.rfmd.com.)



# RF2451

## Evaluation Board Layout Board Size 1" x 1"

Board Thickness 0.031", Board Material FR-4



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GENERAL PURPOSE  
AMPLIFIERS

NOT FOR NEW DESIGN  
See Upgraded Product RF2371