RF2445

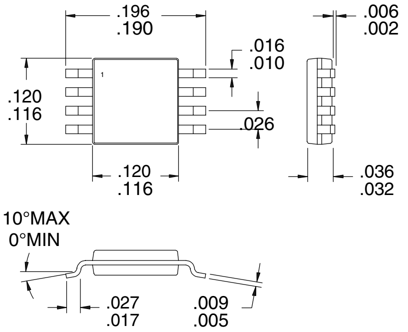
3V DCS LOW NOISE AMPLIFIER

Typical Applications

- LNA for DCS 1800/1900 Handsets
- IF or RF Buffer Amplifiers
- Driver Stage for Power Amplifiers
- Oscillator Loop Amplifiers

Product Description

The RF2445 is a general purpose, low-cost, high-performance, low-noise amplifier designed for operation from a 2.7V to 3.6V supply with low current consumption. The device features a power-down mode with controlled attenuation, which can be used to save current while providing a controlled gain step. The device linearity (Input IP3) and current drain are set with an external resistor, allowing the designer to select the optimum performance for a given application. “Proportional to Absolute Temperature (PTAT)” biasing is used to provide consistent performance across a wide temperature range. The RF2445 is available in a small industry-standard MSOP-8 lead surface mount package, enabling compact designs which conserve board space.



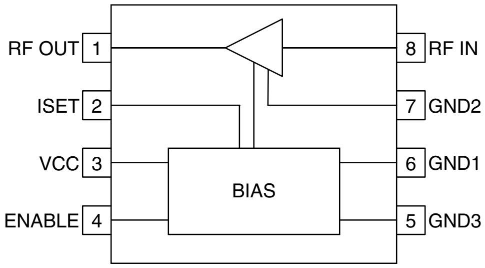
Package Style: MSOP-8

Optimum Technology Matching® Applied

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

Features

- 700MHz to 2000MHz Operation
- 2.7V to 3.6V Single Supply
- -5dBm Input IP_3 at 5.3mA
- 19dB Gain at 1950MHz
- 2.2dB Noise Figure
- 27dB Gain Step



Functional Block Diagram

Ordering Information

RF2445	3V DCS Low Noise Amplifier
RF2445 PCBA	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

Absolute Maximum Ratings

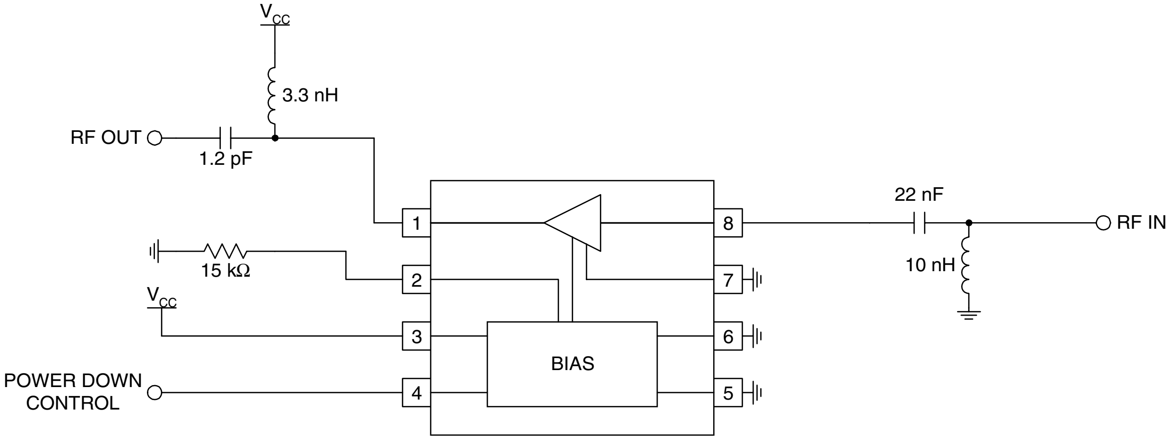
Parameter	Rating	Unit
Supply Voltage	4.0	V
Supply Current	20	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

Caution! ESD sensitive device.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					V_{CC}=2.7V, T=27°C
Frequency Range		700 to 2000		MHz	
High Gain Mode					V_{ENABLE}=2.7V, R_{ISET}=15kΩ
Gain		20.5		dB	At 1700MHz
Noise Figure		1.8		dB	
Input IP3		-6.0		dBm	
Gain		18.5		dB	At 1880MHz
Noise Figure		2.2		dB	
Input IP3		-4.0		dBm	
Input VSWR		2:1			
Output VSWR		1.5:1			
Gain		18		dB	At 2000MHz
Noise Figure		2.5		dB	
Input IP3		-3.0		dBm	
Power-Down Mode					V_{ENABLE}=0V
Gain		-6.0		dB	At 1700MHz
Gain		-8.0		dB	At 1880MHz
Gain		-7.0		dB	At 2000MHz
Power Supply					
Power Supply Range (VCC)	2.7	3.0	3.6	V	
Current Drain (ICC)		5.3	7.0	mA	V_{ENABLE}=2.7V, R_{ISET}=15kΩ (High Gain Mode)
Current into ENABLE			1	µa	V_{ENABLE}=2.7V
Current Drain (ICC)			1	µa	V_{ENABLE}=0V (Power-Down Mode)

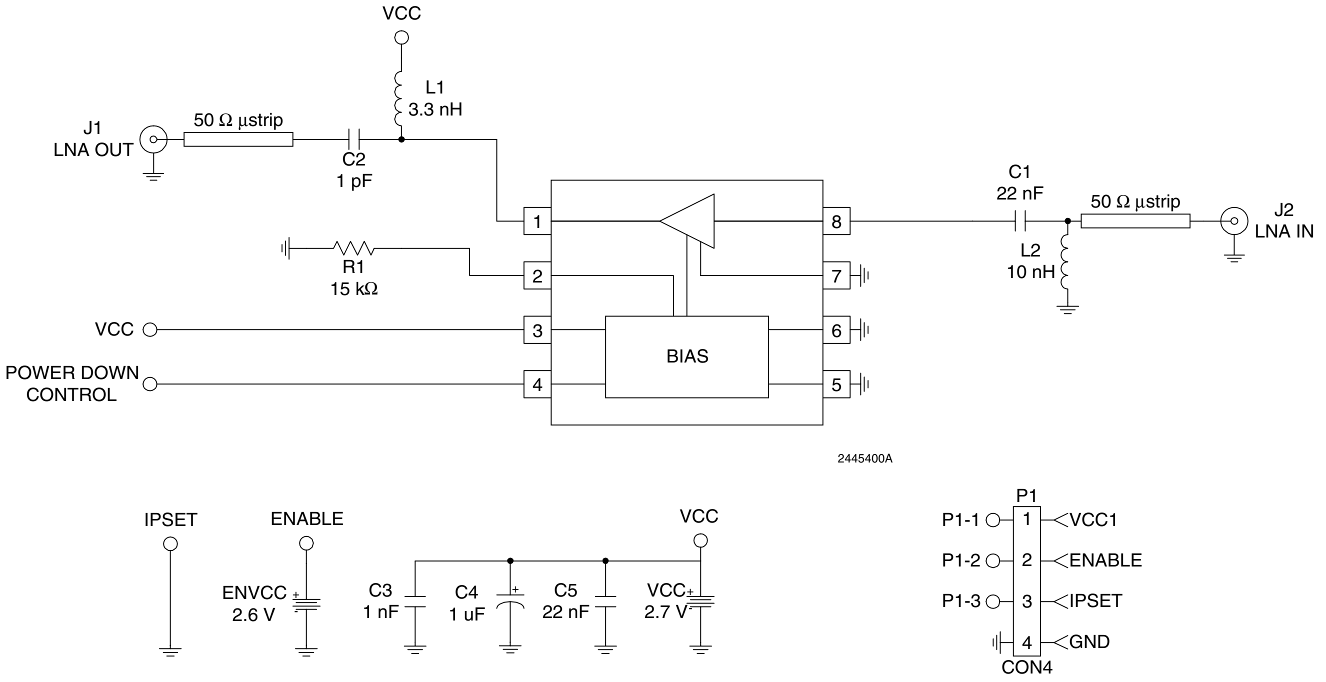
Pin	Function	Description	Interface Schematic
1	**RF OUT**	RF output pin. The output impedance of this pin is internally matched to 50Ω using feedback. Bias for the LNA is provided through this pin, hence it should be connected to VCC through an inductor.	
2	**ISET**	This pin sets the current for the device. A resistor to ground of 15kΩ provides a current of 5.3mA.	
3	**VCC**	Power supply for the bias circuits.	
4	**POWER DOWN CONTROL**	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	**GND3**	Ground connection for the LNA. Keep traces physically short and connect immediately to ground plane for best performance.	
6	**GND1**	Same as pin 5.	
7	**GND2**	Ground connection for the bias circuits.	
8	**RF IN**	RF input pin. This pin is not internally DC blocked and requires an external blocking capacitor. The input impedance of this pin is internally matched to 50Ω using feedback.	

Application Schematic



Evaluation Board Schematic

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



Evaluation Board Layout
Board Size 1.0" x 1.0"

Board Thickness 0.031”; Board Material FR-4