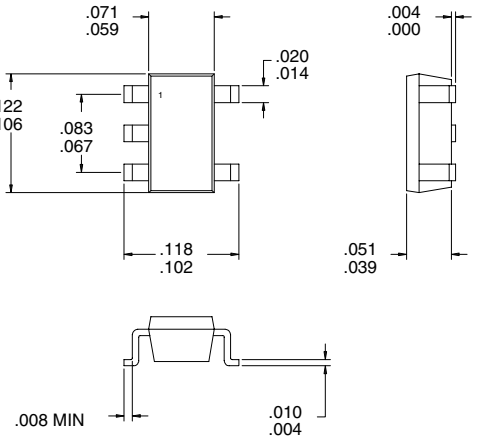
Typical Applications

- DCS GSM
- PCS CDMA
- PCS TDMA
- 2.4GHz Systems
- General Purpose Amplification
- Commercial and Consumer Systems

Product Description

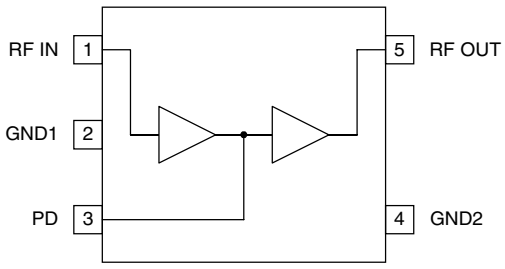
The RF2365 is a low noise amplifier with a high dynamic range designed for the receive front end of digital cellular applications at PCS/DCS frequencies. It is designed to amplify low level signals with minimum noise contribution while operating in the harsh, interference-rich environments of newly deployed digital subscriber units. The part provides excellent performance as a LNA for 2.4GHz radio applications. The IC is featured in a standard SOT23-5 plastic package.



Package Style: SOT23-5

Optimum Technology Matching® Applied

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



Functional Block Diagram

Features

- 1.6dB Noise Figure @ 1850MHz
- 1.75dB Noise Figure @ 2450MHz
- 18.0dB Gain at PCS/DCS
- 15.5dB Gain at 2.45GHz
- External Bias Control
- Extremely Small SOT23-5 Package

Ordering Information

RF2365	3V Low Noise Amplifier
RF2365 PCBA	Fully Assembled Evaluation Board

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

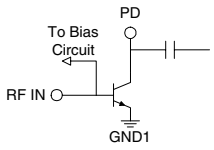
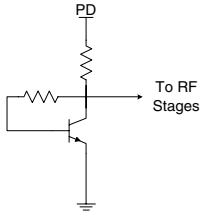
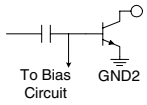
Tel (336) 664 1233
Fax (336) 664 0454
http://www.rfmd.com

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	-0.5 to +8.0	V_{DC}
Input RF Level	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

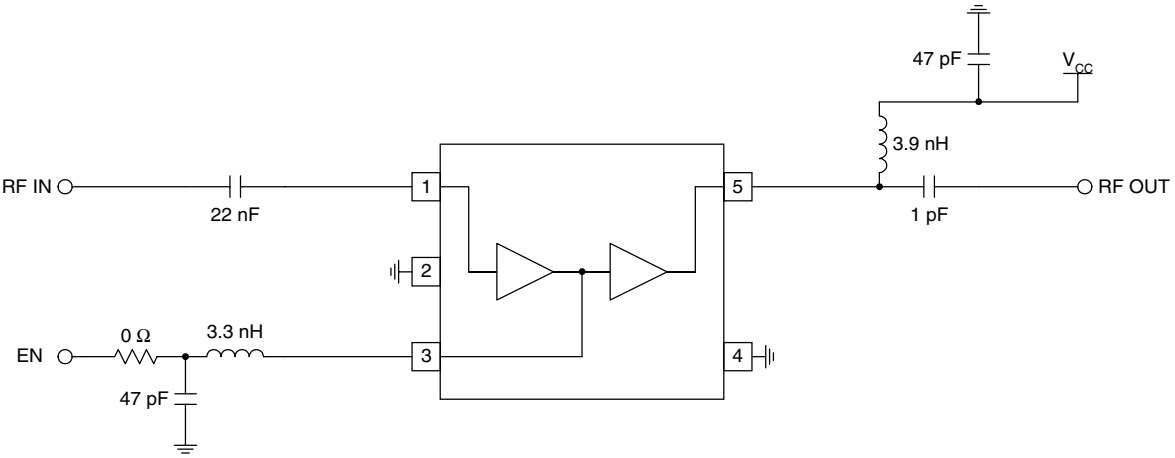
Caution! ESD sensitive device.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					
RF Frequency Range	1500		2500	MHz	
PCS Performance					Schematic per 1.9GHz LNA Application Schematic, V_{PD} = 3.0 V_{CC} = 3.0V, T=25°C
Gain		18		dB	V_{CC}=3.0V, I_{CC}=8.0mA
Noise Figure		1.6		dB	
Off Mode Gain		-15		dB	V_{CC}=3.0V, V_{PD}=0
$\|S_{12}\|$		25		dB	
Input IP3		-3.5		dBm	V_{CC}=3.0V, I_{CC}=5.0mA, R_1=150Ω (see application schematic)
		+2.0		dBm	V_{CC}=3.0V, I_{CC}=6.5mA, R_1=75Ω (see application schematic)
		+4.0		dBm	V_{CC}=3.0V, I_{CC}=8.0mA, R_1=0Ω (see application schematic)
Input VSWR		1.7			
Output VSWR		1.4			
2.4GHz Performance					Schematic per 2.4GHz LNA Application Schematic T=25°C
Gain		15.5		dB	V_{CC}=3.0V, I_{CC}=8.0mA
Noise Figure		1.75		dB	
Input IP3		+2.0		dBm	V_{CC}=3.0V, I_{CC}=8.0mA
Input VSWR		1.3			
Output VSWR		1.75			
Power Supply					T=25 °C
Voltage (V_{CC})		3.0		V	
Current Consumption		8.0		mA	V_{CC}=3.0V, IIP3=+4.0dBm
		6.5		mA	V_{CC}=3.0V, IIP3=+2.0dBm
		5.0		mA	V_{CC}=3.0V, IIP3=-3.5dBm
Into VPD Current		TBD		mA	
Power Down			10	µA	V_{CC}=3.5V; V_{PD}≤0.9V

Pin	Function	Description	Interface Schematic
1	**RF IN**	RF input pin. This pin is DC coupled.	
2	**GND1**	Ground connection. See evaluation board schematic notes.	
3	**PD**	Power down pin. This pin serves as the interstage for the 2-stage LNA. An inductor is required to pull pin 3 to V_{CC} (see application schematic). If desired, this voltage can be lowered to trade off IP3 versus $I_{CC,TOTAL}$. (See table below.)	
4	**GND2**	Ground connection. See evaluation board schematic notes.	
5	**RF OUT**	Amplifier Output pin. This pin is an open-collector output. It must be biased to either V_{CC} or pin 4 through a choke or matching inductor. This pin is typically matched to 50Ω with a shunt bias/matching inductor and series blocking/matching capacitor. Refer to application schematics.	

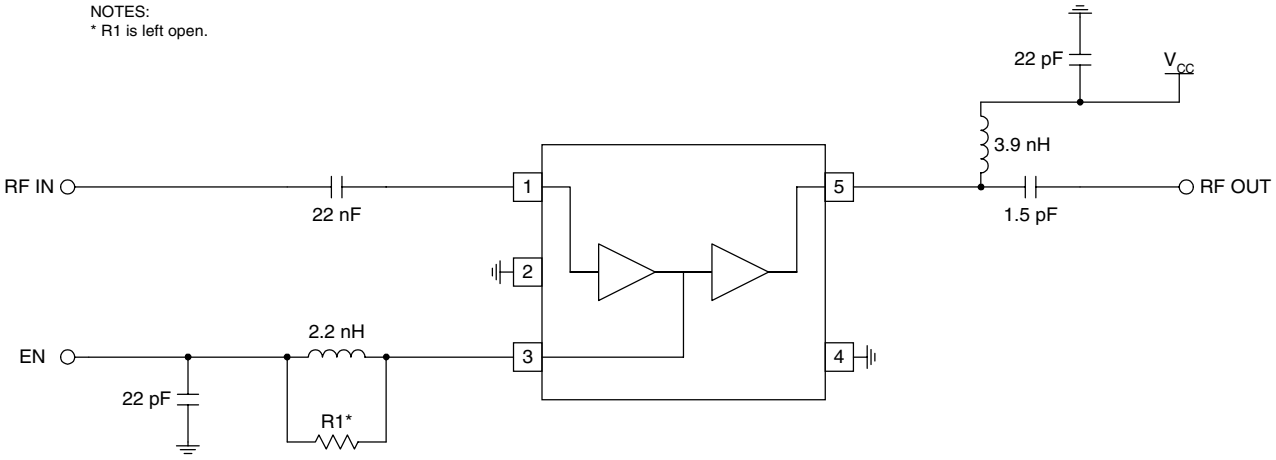
R1	IIP3	I_{CC}
0Ω	+4.0dBm	8.0mA
75Ω	+2.0dBm	6.5mA
150Ω	-3.5dBm	5.0mA

Application Schematic - 1.9GHz



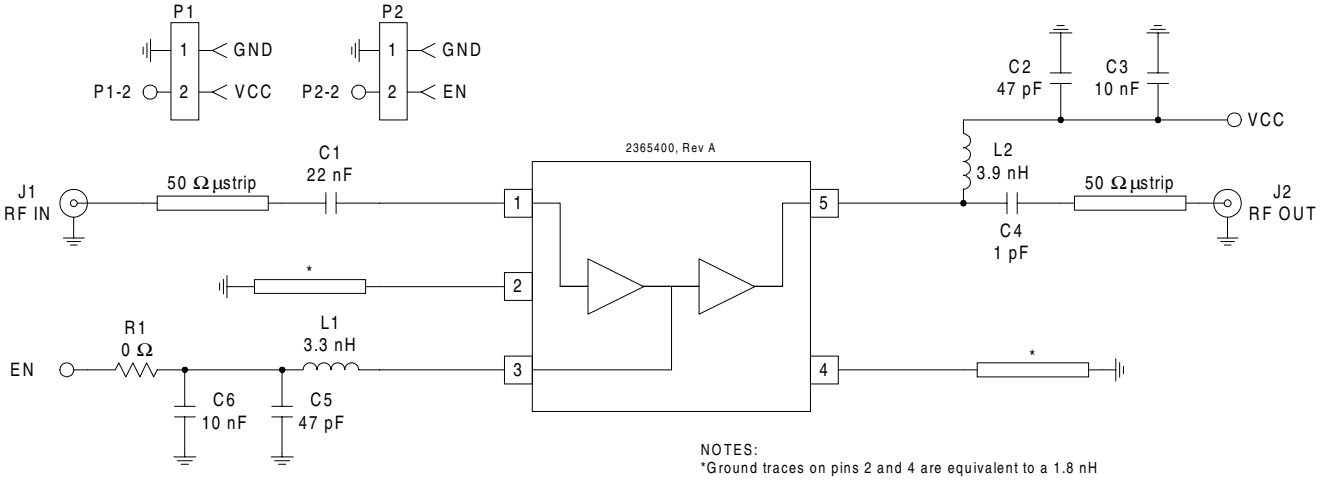
Application Schematic - 2.4GHz

NOTES:
* R1 is left open.



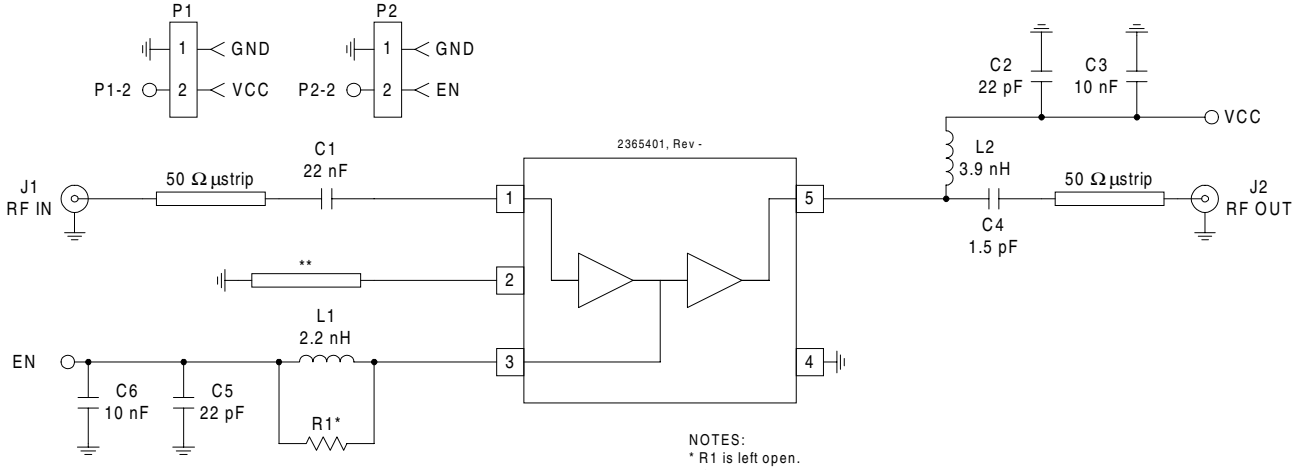
Evaluation Board Schematic - 1.9GHz

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



NOTES:
*Ground traces on pins 2 and 4 are equivalent to a 1.8 nH inductor. If an inductor is not used, the dimensions are as follows:
Length = 140 mils
Width = 20 mils
Height = 31 mils from the gound plane. Dielectric is FR-4.

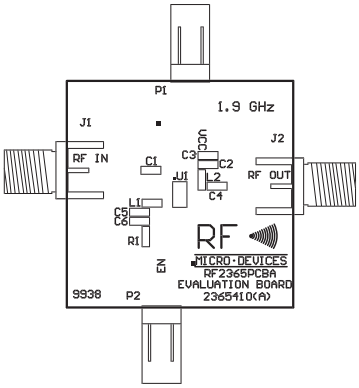
Evaluation Board Schematic - 2.4GHz

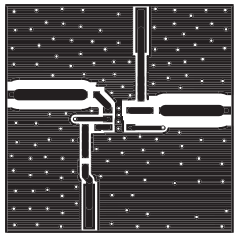


NOTES:
* R1 is left open.
**Ground trace on pin 2 is equivalent to a 1.0 nH inductor. If an inductor is not used, the dimensions are as follows:
Length = 85 mils
Width = 20 mils
Height = 31 mils from the gound plane. Dielectric is FR-4.

Evaluation Board Layout
Board Size 1” x 1”
1.9GHz

Board Thickness 0.031”; Board Material FR-4





2.4GHz