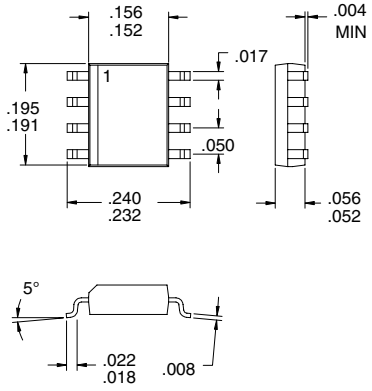
Typical Applications

- General Purpose High Bandwidth Gain Blocks
- IF or RF Buffer Amplifiers
- Broadband Test Equipment
- Final PA for Medium Power Applications
- Driver Stage for Power Amplifiers

Product Description

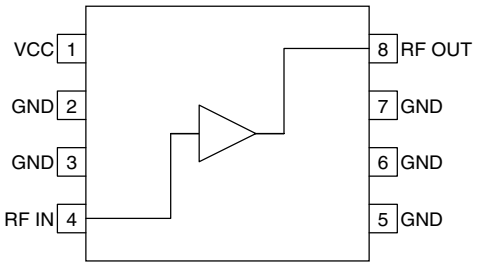
The RF2310 is a general purpose, low-cost, high linearity RF amplifier IC. The device is manufactured on an advanced Gallium Arsenide Heterojunction Bipolar Transistor (HBT) process, and has been designed for use as an easily cascadable 50Ω gain block. Applications include IF and RF amplification in wireless voice and data communication products operating in frequency bands up to 2500MHz. The gain flatness over a very wide bandwidth makes the device suitable for many applications. The device is self-contained with 50Ω input and output impedances and requires only two external DC biasing elements to operate as specified.



Package Style: SOP-8

Optimum Technology Matching® Applied

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



Functional Block Diagram

Features

- DC to well over 2500MHz Operation
- Internally Matched Input and Output
- 15dB Small Signal Gain
- 5dB Noise Figure
- +19dBm Output Power
- Single 3.5V to 6V Positive Power Supply

Ordering Information

RF2310	Wideband General Purpose Amplifier
RF2310 PCBA	Fully Assembled Evaluation Board

RF Micro Devices, Inc.
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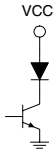
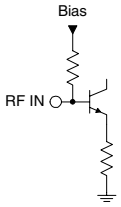
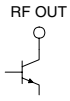
Absolute Maximum Ratings

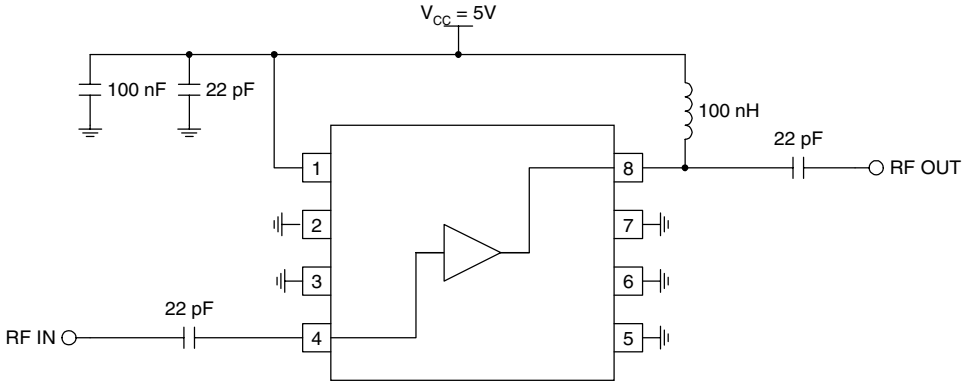
Parameter	Rating	Unit
Supply Voltage	-0.5 to +6.0	V_{DC}
Input RF Power	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C
Junction Temperature	175	°C
Thermal Resistance, Junction to Case	179	°C/W
Notes; case reference: pins 5-7, conditions: no signal in and both RF ports terminated in 50Ω; average junction temperature measured at 85 °C ambient: 143 °C		

Caution! ESD sensitive device.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					T=25 °C, V_{CC}=5V, Freq=900MHz
Frequency Range		DC to 2500		MHz	0.5dB Bandwidth
Gain	14.0	15.5		dB	
		14.5		dB	V_{CC}=3.6V
Noise Figure		6		dB	V_{CC}=5.0V
		5		dB	V_{CC}=3.6V
Input VSWR		<1.5:1			
Output VSWR		<1.5:1			300MHz to 1200MHz
		<2.5:1			1200MHz to 2500MHz
Output IP_3	+28	+31		dBm	900MHz, V_{CC}=5V
		+19		dBm	900MHz, V_{CC}=3.6V
Output IP_3		+26		dBm	2500MHz, V_{CC}=5V
		+16		dBm	2500MHz, V_{CC}=3.6V
Saturated Output Power	+18	+19		dBm	900MHz, V_{CC}=5V
		+12		dBm	900MHz, V_{CC}=3.6V
Saturated Output Power		+17		dBm	2500MHz, V_{CC}=5V
		+10		dBm	2500MHz, V_{CC}=3.6V
Reverse Isolation		20		dB	
Power Supply					
Operating Voltage		3.5 to 6		V	
Operating Current Range	40	50	65	mA	V_{CC}=5V
		20	25	mA	V_{CC}=3.6V

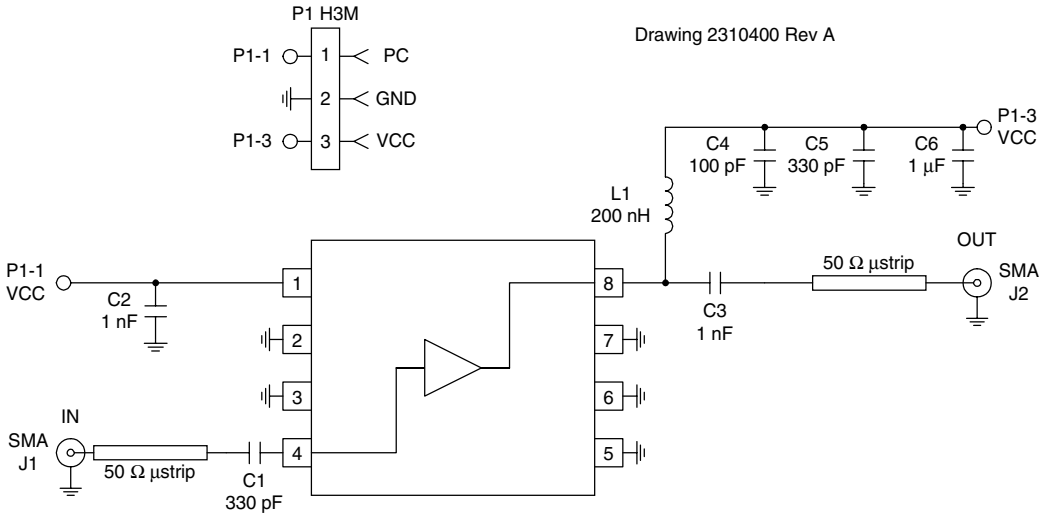
Pin	Function	Description	Interface Schematic
1	VCC	Power supply pin. An external bypass capacitor is recommended. The total supply current is shared between this pin and pin 8 (through the inductor).	
2	GND	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance. To achieve the performance as specified, and to minimize instability, it is recommended to have a local ground plane under the device, as shown in the evaluation board layout.	
3	GND	Same as pin 2.	
4	RF IN	RF input pin. This pin is NOT internally DC blocked. A DC blocking capacitor, suitable for the frequency of operation, should be used in most applications. DC coupling of the input is not allowed, because this will override the internal feedback loop and cause temperature instability.	
5	GND	Same as pin 2.	
6	GND	Same as pin 2.	
7	GND	Same as pin 2.	
8	RF OUT	RF output and bias pin. Biasing is accomplished with an external choke inductor to V_{CC} that provides high impedance at the operating frequency. Because DC is present on this pin, a DC blocking capacitor, suitable for the frequency of operation, should be used in most applications. The supply side of the bias network should also be well bypassed.	

Application Schematic



Evaluation Board Schematic

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



Evaluation Board Layout
2” x 2”