# **RF2370**

### **3V LOW NOISE AMPLIFIER**

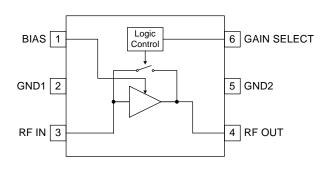
RoHS Compliant & Pb-Free Product
Package Style: SOT 6-Lead

#### **Features**

- Low Noise and High Intercept Point
- Adjustable Bias Current
- Power Down Control
- Low Insertion Loss Bypass Feature
- 1.8 V to 5 V Operation (See Note: Page 2)
- 1.5 GHz to 3.8 GHz Operation

# **Applications**

- WLAN LNA with Bypass Feature
- CDMA PCS LNA with Bypass Feature
- MMDS LNA with Bypass Feature
- General Purpose Amplification
- Commercial and Consumer Systems



**Functional Block Diagram** 

### **Product Description**

The RF2370 is a switchable low noise amplifier with a very high dynamic range designed for digital cellular and WLAN applications. The device functions as an outstanding front end low noise amplifier. The bias current may be set externally. The IC is featured in a standard SOT 6-lead plastic package.

#### **Ordering Information**

RF2370 3V Low Noise Amplifier

RF2370PCBA-410 Fully Assembled Evaluation Board (WLAN) usable from

1.9 GHz to 4 GHz with standard tune

## **Optimum Technology Matching® Applied**

☐ SiGe BiCMOS	☐ GaAs pHEMT	☐ GaN HEMT
☐ Si BiCMOS	☐ Si CMOS	
☐ SiGe HBT	☐ Si BJT	
	☐ Si BiCMOS	☐ Si BiCMOS ☐ Si CMOS

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# **RF2370**



### **Absolute Maximum Ratings**

Parameter	Rating	Unit
Supply Voltage	-0.5 to +6.0	V <sub>DC</sub>
Input RF Level	+5 (see note)	dBm
Current Drain, I <sub>CC</sub>	32	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

NOTE: Exceeding any one or a combination of the above maximum rating limits may cause permanent damage. Input RF transients to +15dBm will not harm the device. For sustained operation at inputs  $\geq +5\,\text{dBm}$ , a small dropping resistor is recommended in series with the  $V_{CC}$  in order to limit the current due to self-biasing to  $<32\,\text{mA}$ .



#### Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EU Directive 2002/95/EC (at time of this document revision).

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Parameter	Min.	Тур.	Max.	Unit	Condition	
Operating Range					T <sub>AMB</sub> =+25°C, V <sub>CC</sub> =3.0V	
Frequency Range	900		4000	MHz		
WLAN Low Noise Amplifier						
Frequency		2450		MHz		
HIGH GAIN MODE					Gain Select < 0.8 V, V <sub>BIAS</sub> = 3 V, T = +25 ° C	
Gain	12.0	14.0		dB		
Noise Figure		1.3	1.5	dB		
Input IP3		+7.0		dBm	IIP3 will improve if ICC is raised above 7 mA.	
Output VSWR		1.7:1	2:1			
Current Drain		7		mA		
BYPASS MODE					Gain Select > 1.8 V, V <sub>BIAS</sub> = 0 V	
Gain	-4.0	-3.0	-2.0	dB	Note: Bypass mode insertion loss will degrade gradually as V <sub>CC</sub> goes below 2.7 V.	
Input IP3	+16.0	+20.0		dBm		
Output VSWR		1.6:1				
Current Drain		2.0	3.0	mA		
Power Supply						
Voltage (V <sub>CC</sub> )		3		V		
V <sub>SELECT</sub> Low			0.8	V	High Gain mode. Select<0.8V, V <sub>BIAS</sub> =3V	
V <sub>SELECT</sub> High	1.8			V	Low Gain mode. Select>1.8V, V <sub>BIAS</sub> =0V	
Power Down	0		10	μΑ	Gain Select < 0.8 V, V <sub>BIAS</sub> = 0 V, V <sub>CC</sub> = 3.0 V	

Bias note: Due to the presence of ESD protection circuitry on the RF2370, the maximum allowable collector bias voltage (pin 4) is 4.0V. Higher supply voltages such as 5V are permissible if a series resistor is used to drop  $V_{CC}$  to  $\leq$ 4.0V for a given  $I_{CC}$ .

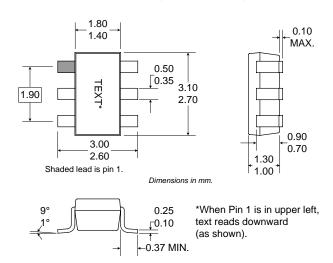


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Pin	Function	Description	Interface Schematic
1	BIAS	For low noise amplifier applications, this pin is used to control the bias current. An external resistor can be used to set the bias current for any $V_{\text{BIAS}}$ voltage.	VBIAS
2	GND1	Ground connection. For best performance, keep traces physically short and connect immediately to ground plane.	
3	RF IN	RF input pin. This part is designed such that $50\Omega$ is the optimal source impedance for best noise figure. Best noise figure is achieved with only a series capacitor on the input.	To Bias Circuit RF IN RF OUT
4	RF OUT	Amplifier output pin. This pin is an open-collector output. It must be biased to $V_{CC}$ through a choke or matching inductor. This pin is matched to $50\Omega$ with a shunt L, series L topology enhances to stability of the device by reducing the high frequency gain above 6GHz.	
5	GND2	See GND1.	
6	GAIN SELECT	This pin selects high gain and bypass modes. Gain Select $\leq$ 0.8V, high gain. Gain Select $\geq$ 1.8V, low gain. A series resistor of $100\Omega$ is required on this pin to enhance stability.	

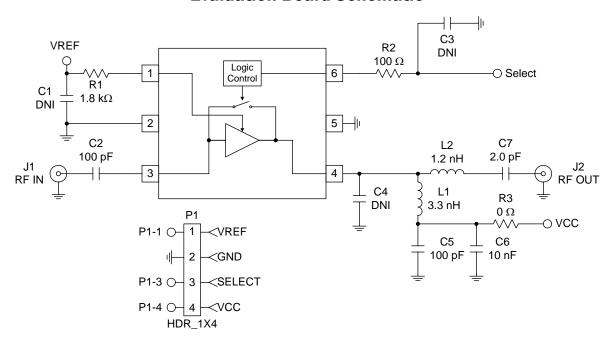


# **Package Drawing**





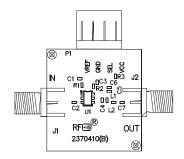
# **Evaluation Board Schematic**



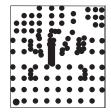


# Evaluation Board Layout Board Size 0.835" x 0.900"

Board Thickness 0.032", Board Material FR-4









### **RoHS\* Banned Material Content**

RoHS Compliant: Yes
Package total weight in grams (g): 0.013
Compliance Date Code: N/A
Bill of Materials Revision: Pb Free Category: e3

Bill of Materials	Parts Per Million (PPM)					
	Pb	Cd	Hg	Cr VI	PBB	PBDE
Die	0	0	0	0	0	0
Molding Compound	0	0	0	0	0	0
Lead Frame	0	0	0	0	0	0
Die Attach Epoxy	0	0	0	0	0	0
Wire	0	0	0	0	0	0
Solder Plating	0	0	0	0	0	0

This RoHS banned material content declaration was prepared solely on information, including analytical data, provided to RFMD by its suppliers, and applies to the Bill of Materials (BOM) revision noted

<sup>\*</sup> DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment