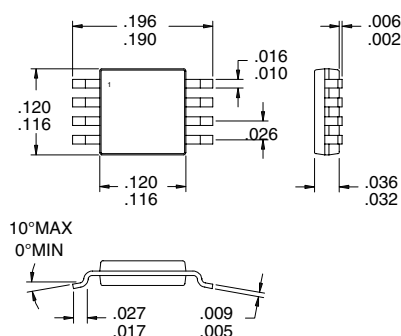


## Typical Applications

- TDMA/CDMA/FM PCS Tx Amplifier
- Low Noise Transmit Driver Amplifier
- 2.4GHz WLAN Systems
- ISM Band LNA/Driver
- General Purpose Amplification
- Commercial and Consumer Systems

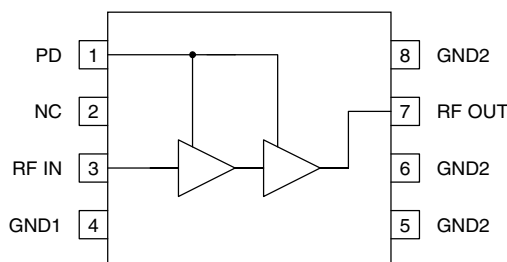
## Product Description

The RF2324 is a low noise CDMA/TDMA PA driver amplifier with a very high dynamic range designed for transmit digital PCS applications at 1880MHz. The device functions as an outstanding PA driver amplifier in the transmit chain of digital subscriber units where low transmit noise power is a concern. The IC includes a power down feature that can be used to completely turn off the device. The IC is featured in a standard miniature 8-lead plastic MSOP package.



## Optimum Technology Matching® Applied

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



**Functional Block Diagram**

## Package Style: MSOP-8

## Features

- Low Noise and High Intercept Point
- Power Down Control
- Single 2.5V to 6.0V Power Supply
- 150MHz to 2500MHz Operation
- Extremely Small MSOP-8 Package

## Ordering Information

RF2324	PCS CDMA/TDMA 3V PA Driver Amplifier
RF2324 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 <sub>DC</sub>
Input RF Level	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C



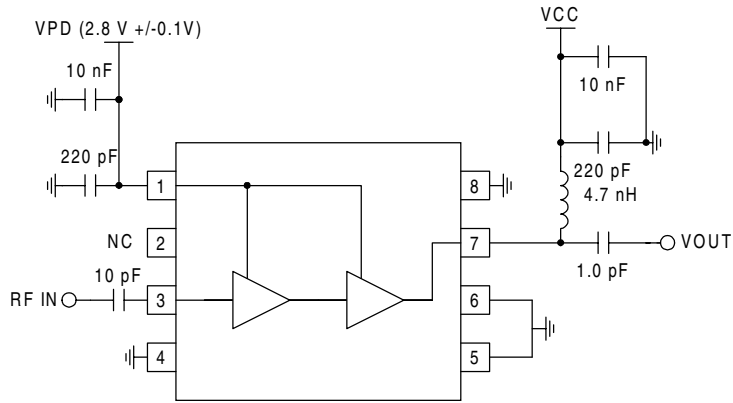
**Caution!** ESD sensitive device.

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>					
RF Frequency Range		150 to 2500		MHz	
<b>1880 MHz Performance</b>					Schematic per Evaluation Board, T = 25 °C, RF = 1880 MHz, V <sub>PD</sub> = 2.8 V
Gain	21	22	23	dB	V <sub>CC</sub> = 3.5 V
	21	22	23	dB	V <sub>CC</sub> = 3.0 V
	21	22	23	dB	V <sub>CC</sub> = 2.5 V
Output IP3	+26	+28	+35	dBm	V <sub>CC</sub> = 3.5 V
		+26		dBm	V <sub>CC</sub> = 3.0 V
		+25		dBm	V <sub>CC</sub> = 2.5 V
Noise Figure		1.8	2.5	dB	V <sub>CC</sub> = 3.5 V
		1.8		dB	V <sub>CC</sub> = 3.0 V
		1.8		dB	V <sub>CC</sub> = 2.5 V
Reverse Isolation		36		dB	V <sub>CC</sub> = 3.5 V
		36		dB	V <sub>CC</sub> = 3.0 V
		35		dB	V <sub>CC</sub> = 2.5 V
Input VSWR		1.3:1	2.0:1		
Output VSWR		1.25:1	2.0:1		Using External LC network used on Evaluation Board
P <sub>1dB</sub>	14	16		dBm	V <sub>CC</sub> = 3.5 V
	12.5	14.5		dBm	V <sub>CC</sub> = 3.0 V
	11	13		dBm	V <sub>CC</sub> = 2.5 V
<b>Power Supply</b>					T = 25 °C
Voltage (V <sub>CC</sub> )		2.5 to 6.0		V	
Voltage (V <sub>PD</sub> )	2.7	2.8	2.9	V	
Current Consumption	24	33	43	mA	V <sub>CC</sub> = 3.5 V; V <sub>PD</sub> = 2.8 V; V <sub>PD</sub> + V <sub>CC</sub> - Current Consumption from V <sub>PD</sub> is 8.5 mA Typ. @ V <sub>PD</sub> = 2.8 V and 12 mA Max @ V <sub>PD</sub> = 2.9 V
	24	31	38	mA	V <sub>CC</sub> = 3.0 V; V <sub>PD</sub> = 2.7 V; V <sub>PD</sub> + V <sub>CC</sub>
	29	36	43	mA	V <sub>CC</sub> = 2.5 V; V <sub>PD</sub> = 2.9 V; V <sub>PD</sub> + V <sub>CC</sub>
	- Power Down		10	μA	V <sub>CC</sub> = 3.5 V; V <sub>PD</sub> ≤ 0.9 V

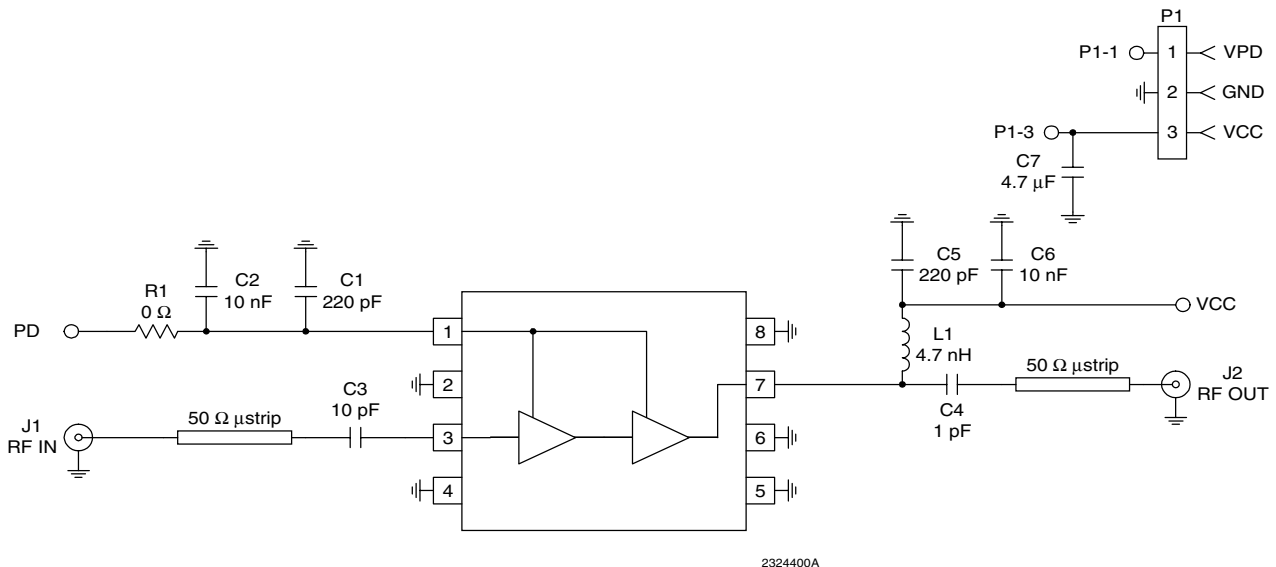
Pin	Function	Description	Interface Schematic
1	PD	Power Down for the IC. $V_{PD} = 2.8V \pm 0.1V$ turns on the Part. $V_{PD} < 0.9V$ turns off the Part. External RF bypassing is required. The trace length between the pin and the bypass capacitors should be minimized. The ground side of the bypass capacitors should connect immediately to ground plane. Nominal current required for $V_{PD} = 2.8V$ is 8.5 mA typical and 12 mA Max (@ $V_{PD} = 2.9V$ ).	
2	NC	No connection. This pin is typically left unconnected or grounded.	
3	RF IN	RF input pin. This pin is DC coupled and matched to $50\Omega$ at 1880MHz.	
4	GND1	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance.	
5	GND2	See pin 6.	
6	GND2	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance.	
7	RF OUT	Amplifier Output pin. This pin is an open-collector output. It must be biased to either $V_{CC}$ or pin 7 through a choke or matching inductor. This pin is typically matched to $50\Omega$ with a shunt bias/matching inductor and series blocking/matching capacitor. Refer to application schematics.	
8	GND2	See pin 6.	

## Application Schematic: ~1880 MHz Operation, Internal Collector Bias



## Evaluation Board Schematic

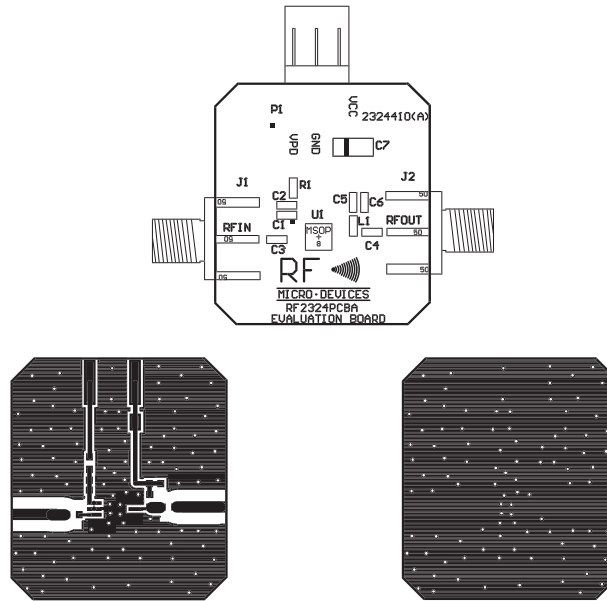
(Download [Bill of Materials](http://www.rfmd.com) from [www.rfmd.com](http://www.rfmd.com).)



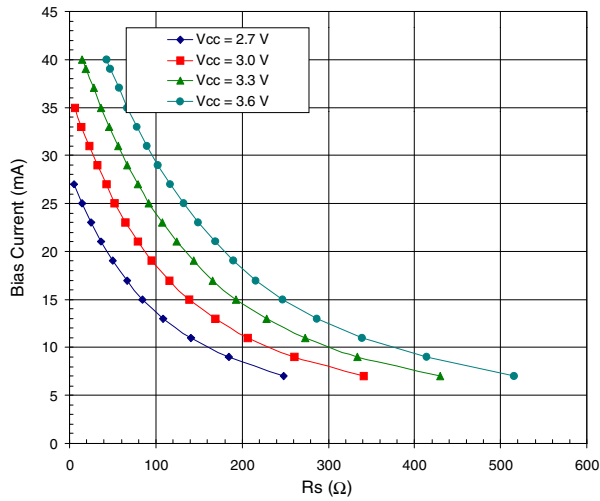
## Evaluation Board Layout

### Board Size 1" x 1"

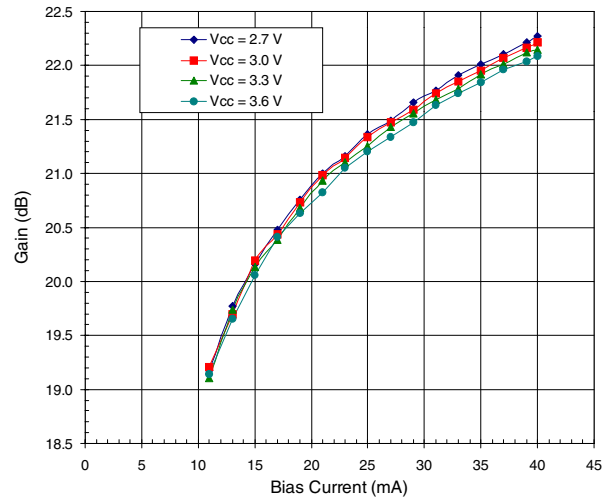
Board Thickness 0.031"; Board Material FR-4; Multi-Layer



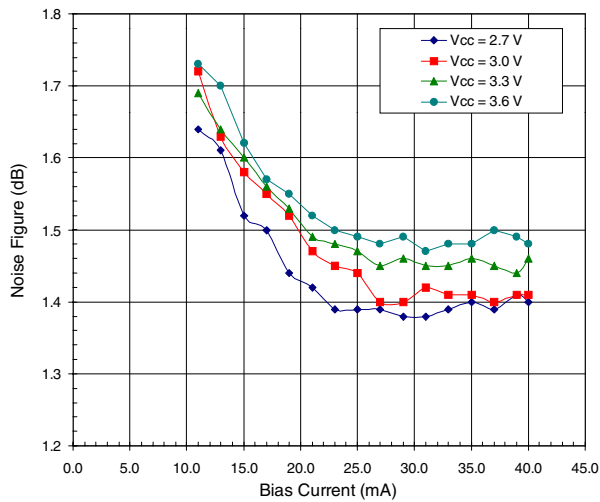
RF2324 Bias Current versus  $R_s$



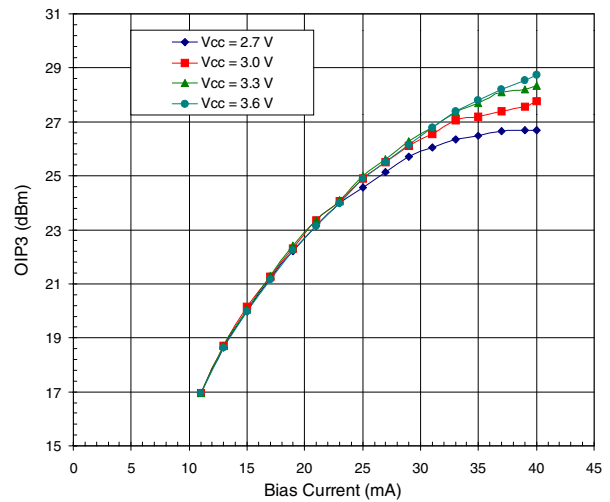
RF2324 Gain versus Bias Current



RF2324 Noise Figure versus Bias Current



RF2324 OIP3 versus Bias Current



RF2324 IIP3 versus Bias Current

