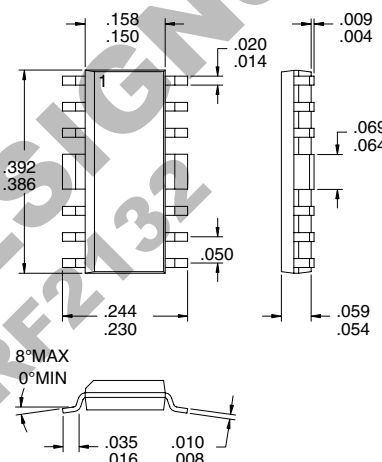


### Typical Applications

- 4.8V AMPS Cellular Handsets
- 4.8V CDMA/AMPS Cellular Handsets
- Driver Amplifier in Cellular Base Stations
- Portable Battery Powered Equipment

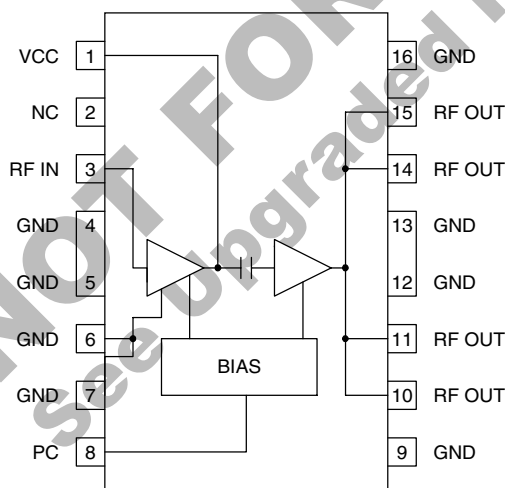
### Product Description

The RF2108 is a high power, high efficiency linear amplifier IC. The device is manufactured on an advanced Gallium Arsenide Heterojunction Bipolar Transistor (HBT) process, and has been designed for use as the final RF amplifier in dual-mode 4-cell CDMA/AMPS hand-held digital cellular equipment, spread spectrum systems, and other applications in the 800MHz to 950MHz band. The device is self-contained with 50Ω input and the output can be easily matched to obtain optimum power, efficiency, and linearity characteristics.



### 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: SOP-16 Batwing

### Features

- Single 4.2V to 6.0V Supply
- 28dBm Linear Output Power
- 29dB Gain With Analog Gain Control
- 45% Linear Efficiency
- On-board Power Down Mode
- 800MHz to 950MHz Operation

### Ordering Information

RF2108	Linear Power Amplifier
RF2108 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

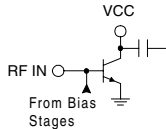
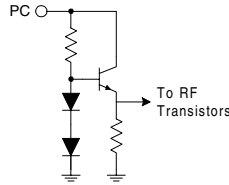
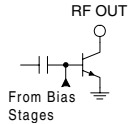
Parameter	Rating	Unit
Supply Voltage (No RF)	-0.5 to +8.0	V <sub>DC</sub>
Supply Voltage (P <sub>OUT</sub> <31 dBm)	-0.5 to +6.0	V <sub>DC</sub>
Power Control Voltage (V <sub>PC</sub> )	-0.5 to +6.0 or V <sub>CC</sub>	V
DC Supply Current	800	mA
Input RF Power	+12	dBm
Output Load VSWR	10:1	
Storage Temperature	-40 to +150	°C
Junction Temperature	200	°C



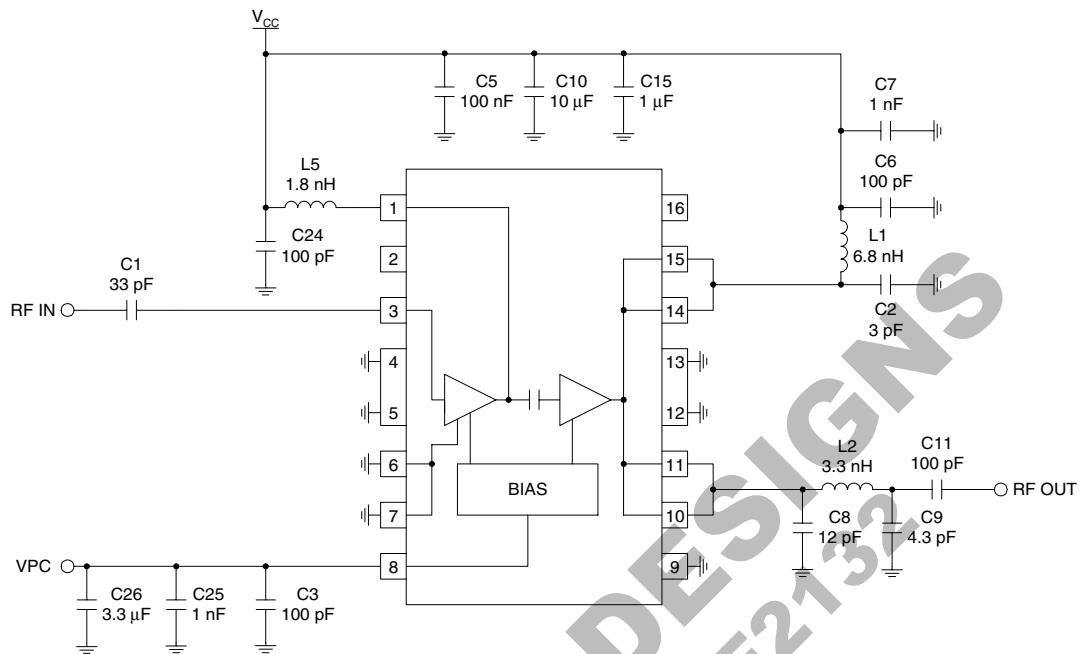
**Caution!** ESD sensitive device.

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>					T=25 °C, V <sub>CC</sub> =4.8V, V <sub>PC</sub> =3.3V, Freq=824MHz to 849MHz
Usable Frequency Range	800	824 to 849	950	MHz	
Linear Gain	27	29	31	dB	
Total Linear Efficiency	40	45		%	
Efficiency at Max Output	50	55		%	
OFF Isolation	23	27		dB	V <sub>PC</sub> =0V, P <sub>IN</sub> =+6dBm
Second Harmonic		-30		dBc	Including Second Harmonic Trap
Maximum Linear Output Power		28.5	29	dBc	IS-95A CDMA Modulation
Adjacent Channel Power Rejection @ 885 kHz		-46	-44	dBc	P <sub>out</sub> = 28 dBm
Adjacent Channel Power Rejection @ 1.98 MHz		-58	-56	dBc	ACPR can be improved by trading off efficiency.
Maximum CW Output Power	31.5	32		dBm	P <sub>out</sub> = 28 dBm
Operating Case Temperature	-30		110	°C	P <sub>out</sub> = 31 dBm, Efficiency = 55%
Ambient Operating Temperature	-30		100	°C	
Junction to Case Thermal Resistance		85		°C/W	
Input VSWR		<2:1			
Output Load VSWR			10:1		No oscillations
<b>Power Down</b>					
Turn On/Off Time			100	ns	
Total Current			10	μA	"OFF" State
V <sub>PC</sub> "OFF" Voltage	0.2		0.5	V	
V <sub>PC</sub> "ON" Voltage	3.0	3.3	V <sub>CC</sub>	V	
<b>Power Supply</b>					
Power Supply Voltage	4.2	4.8	6.0	V	Operating voltage
Idle Current		40	160	mA	V <sub>PC</sub> =3.3V
Current into VPC pin		15	20	mA	"ON" State

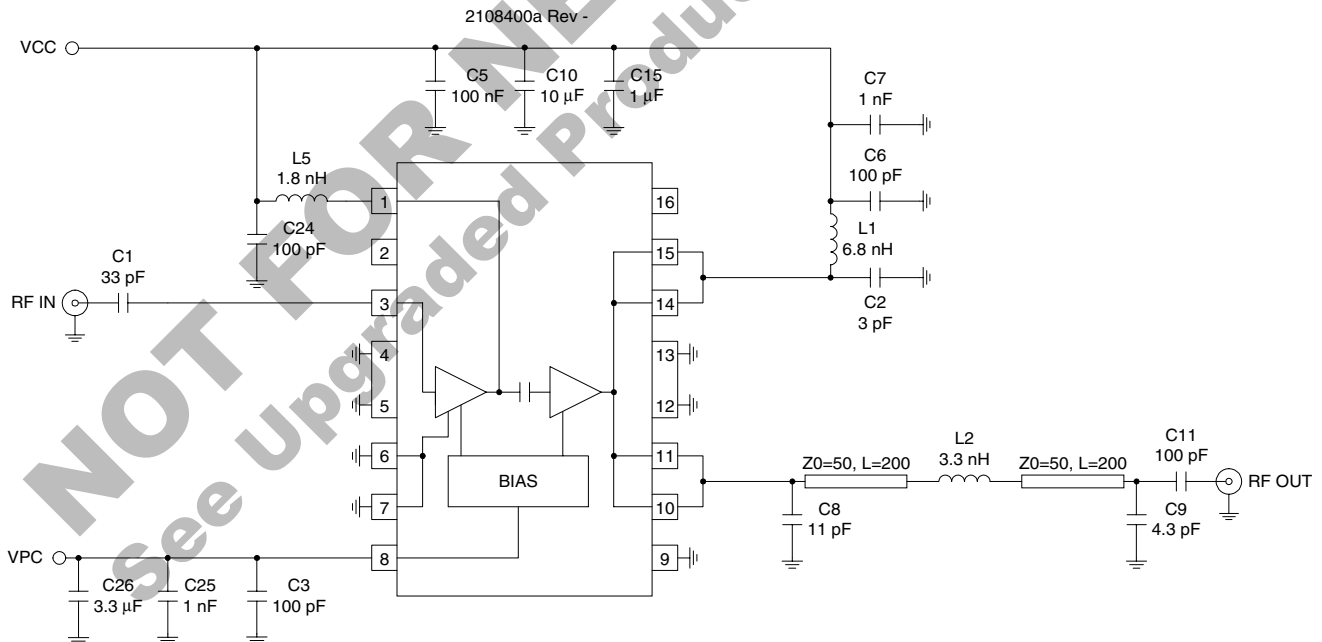
Pin	Function	Description	Interface Schematic
1	VCC	Power supply for the driver stage, and interstage matching. Shunt inductance is required on this pin, which can be achieved by an inductor to $V_{CC}$ , with a decoupling capacitor on the $V_{CC}$ side. The value of the inductor is frequency dependent, 3.3nH is required for 830MHz, and 1.2nH for 950MHz. Instead of an inductor, a high impedance microstrip line can be used.	
2	NC	Not connected.	
3	RF IN	RF input. This is a 50Ω input, but the actual input impedance depends on the interstage matching network connected to pin 1. An external DC blocking capacitor is required if this port is connected to a DC path to ground or a DC voltage.	See pin 1.
4	GND	Ground connection. Keep traces physically short and connect immediately to the ground plane for best performance.	
5	GND	Same as pin 4.	
6	GND	Same as pin 4.	
7	GND	Same as pin 4.	
8	PC	Power Control. When this pin is "low", all circuits are shut off. A "low" is typically 0.5V or less at room temperature. During normal operation this pin is the power control. Control range varies from about 2V for 0dBm to $V_{CC}$ for +31 dBm RF output power. The maximum power that can be achieved depends on the actual output matching. PC should never exceed 6.0V or $V_{CC}$ , whichever is the lowest.	
9	GND	Same as pin 4.	
10	RF OUT	RF output and power supply for the output stage. The four output pins are combined, and bias voltage for the final stage is provided through these pins. The external path must be kept symmetric until combined to ensure stability. An external matching network is required to provide the optimum load impedance; see the application schematics for details.	
11	RF OUT	Same as pin 10.	See pin 10.
12	GND	Same as pin 4.	
13	GND	Same as pin 4.	
14	RF OUT	Same as pin 10.	See pin 10.
15	RF OUT	Same as pin 10.	See pin 10.
16	GND	Same as pin 4.	

## Application Schematic

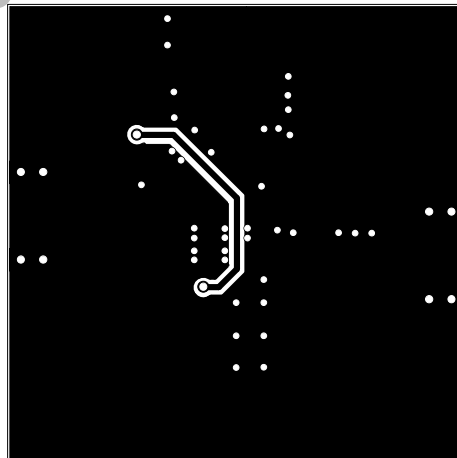
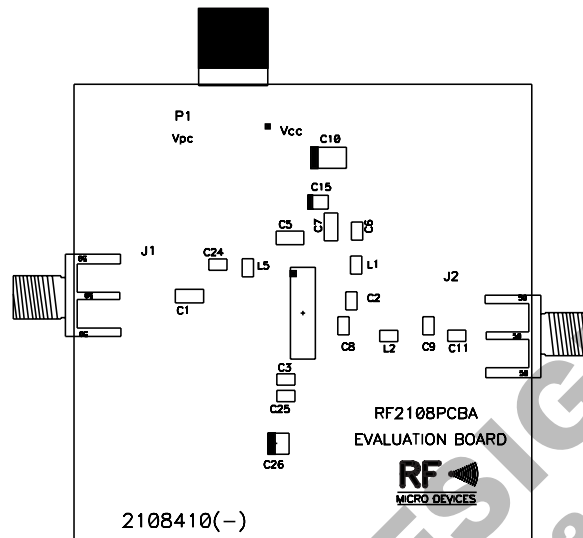


## Evaluation Board Schematic

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



# Evaluation Board Layout



**NOT FOR NEW DESIGNS**  
See Upgraded Product RF2132