

Typical Applications

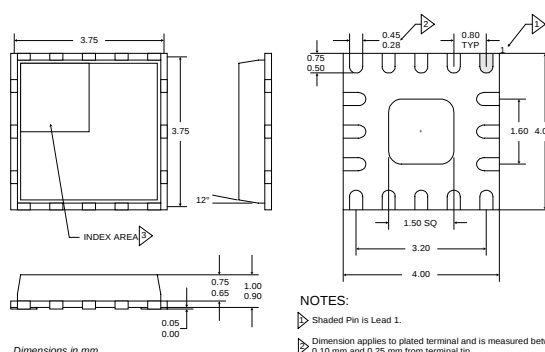
- 2.5GHz ISM Band Applications
- PCS Communication Systems
- Wireless LAN Systems
- Commercial and Consumer Systems
- Portable Battery Powered Equipment
- Broadband Spread-Spectrum Systems

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POWER AMPLIFIERS

Product Description

The RF2163 is a linear, medium power, high efficiency amplifier IC designed specifically for low voltage operation. 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 2.5GHz spread-spectrum transmitters. The device is provided in a 16-pin leadless chip carrier with a backside ground and is self-contained with the exception of the output matching network and power supply feed line.

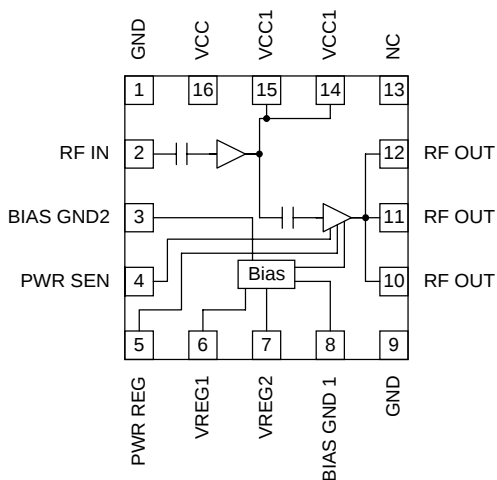


NOTES:

- Shaded Pin is Lead 1.
- Dimension applies to plated terminal and is measured between 0.10 mm and 0.25 mm from terminal tip.
- The terminal #1 identifier and terminal numbering convention shall conform to JEDEC 95-1 SPP-012. Details of terminal #1 identifier are optional, but must be located within the zone indicated. The identifier may be either a mold or marked feature.
- Pins 1 and 9 are fused.
- Package Warpage: 0.05 max.

Optimum Technology Matching® Applied

- | | | |
|-------------------------------------|--|--------------------------------------|
| ☐ Si BJT | ☒ GaAs HBT | ☐ GaAs MESFET |
| ☐ Si Bi-CMOS | ☐ SiGe HBT | ☐ Si CMOS |



Functional Block Diagram

Package Style: LCC, 16-Pin

Features

- Single 3.3V Power Supply
- +30dBm Saturated Output Power
- 19dB Small Signal Gain
- High Power Added Efficiency
- Patent Pending Power Sense Technology
- 1800MHz to 2500MHz Frequency Range

Ordering Information

RF2163	3V, 2.5GHz Linear Power Amplifier
RF2163 PCBA	Fully Assembled Evaluation Board

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Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	-0.5 to +6.0	V _{DC}
Power Control Voltage (V _{PC})	-0.5 to 3.3	V
DC Supply Current	1000	mA
Input RF Power	+15	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C
Moisture sensitivity	JEDEC Level 3	

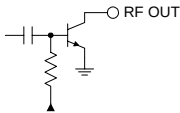
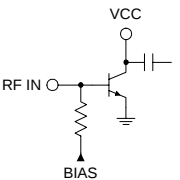
Refer to "Handling of PSOP and PSSOP Products" on page 16-15 for special handling information.



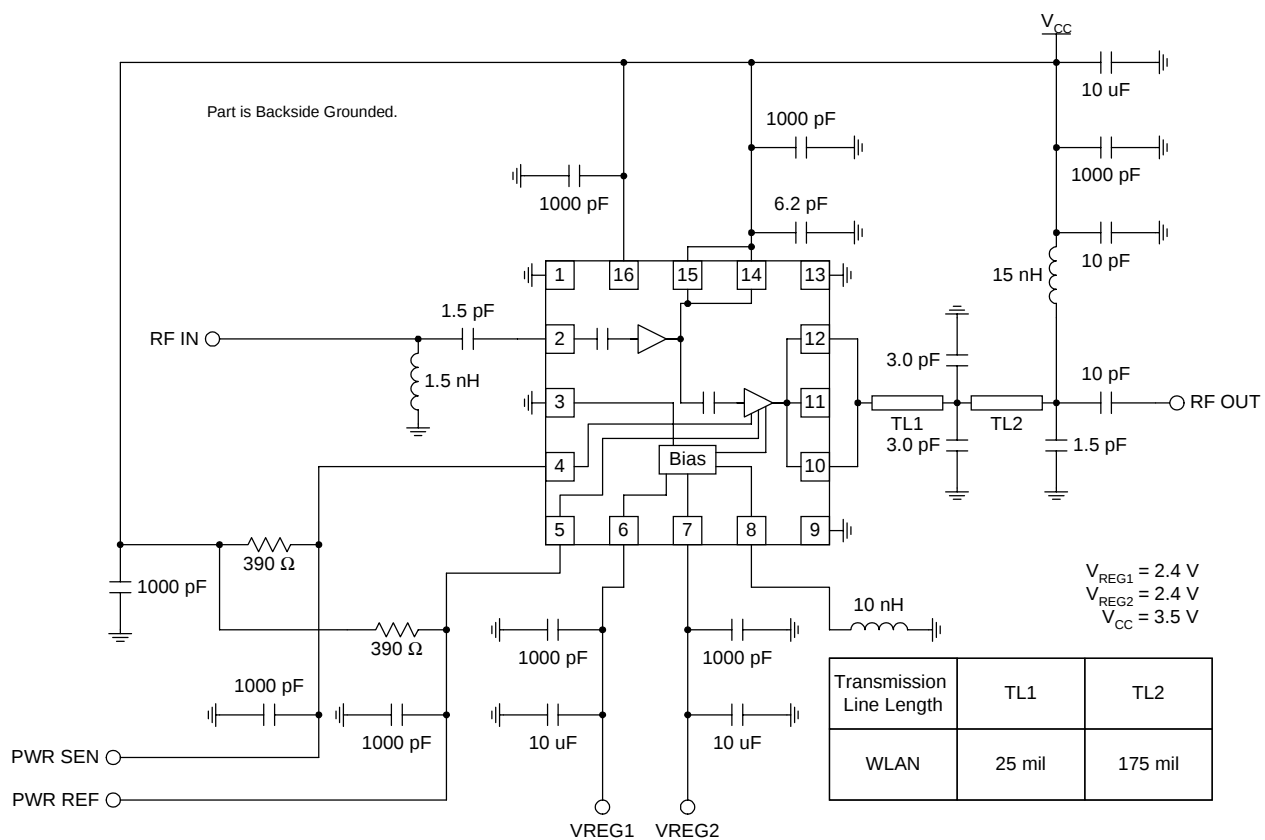
Caution! ESD sensitive device.

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					T=25 °C, V _{CC} =3.5V, V _{PC} =2.4V, Freq=2450MHz
Frequency Range		1800 to 2500		MHz	
Maximum Saturated Output Power	+29	+30	+32	dBm	P _{IN} =+13dBm
Efficiency at Max Output Power		37		%	
Maximum Linear Output Power		25		dBm	With 802.11 modulation (11Mbit/s) and meeting 802.11 spectral mask.
Linear Efficiency		25		%	
Small Signal Gain	17	19		dB	
Reverse Isolation		30		dB	In "ON" state
		30		dB	In "OFF" state
Second Harmonic		-35		dBc	Including second harmonic trap, see application circuit
Adjacent Channel Power		-35		dBc	P _{OUT} =25dBm
		-52			P _{OUT} =25dBm
Isolation		TBD		dBm	In "OFF" state, P _{IN} =TBD
Input Impedance		50		Ω	
Input VSWR		2:1			
Power Down					
V _{REG} "ON"		2.4		V	Voltage supplied to control input; device is "ON"
V _{REG} "OFF"		0	0.5	V	Voltage supplied to control input; device is "OFF"
Power Supply					
Operating Voltage		3.0 to 5.0		V	
Current Consumption		650		mA	Power Down "ON", at max output power
		350		mA	Power Down "ON", P _{OUT} =25dBm
		150		mA	Idle current

Pin	Function	Description	Interface Schematic
1	GND	Ground connection. For best performance, keep traces physically short and connect immediately to ground plane.	
2	RF IN	RF input. This input is AC coupled, so an external blocking capacitor is not required if this pin is connected to a DC path.	See pin 14.
3	BIAS GND2	Ground for second stage bias circuit. For best performance, keep traces physically short and connect immediately to ground plane.	
4	PWR SEN	The PWR SEN and PWR REF pins can be used in conjunction with an external feedback path to provide an RF power control function for the RF2163. The power control function is based on sampling the RF drive to the final stage of the RF2163.	
5	PWR REF	Same as pin 4.	
6	VREG1	This pin requires a regulated supply to maintain the correct bias current.	
7	VREG2	Same as pin 6.	
8	BIAS GND1	Ground for first stage bias circuit. For best performance connect to ground with a 10nH inductor.	
9	GND	Same as pin 1.	
10	RF OUT	RF output and bias for the output stage. The power supply for the output transistor needs to be supplied to this pin. This can be done through a quarter-wave length microstrip line that is RF grounded at the other end, or through an RF inductor that supports the required DC currents.	
11	RF OUT	Same as pin 10.	See pin 10.
12	RF OUT	Same as pin 10.	See pin 10.
13	NC	Not connected.	
14	VCC1	Power supply pin for the bias circuits. External low frequency bypass capacitors should be connected if no other low frequency decoupling is nearby.	
15	VCC1	Same as pin 14.	See pin 14.
16	VCC	Same as pin 14.	See pin 14.
Pkg Base	GND	Ground connection. The backside of the package should be connected to the ground plane through a short path, i.e., vias under the device may be required.	See pin 1 and 2.

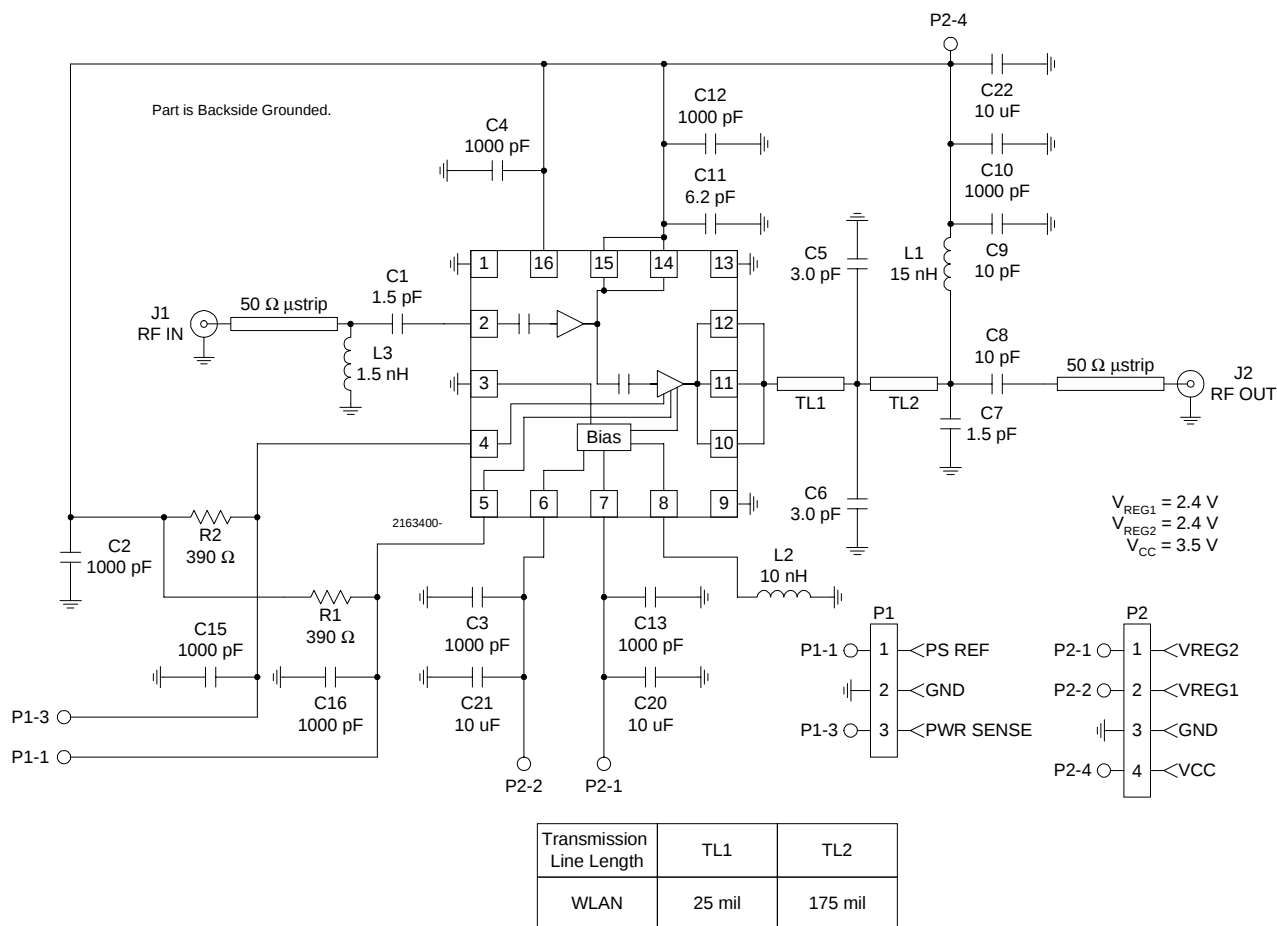
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Evaluation Board Schematic

2400 MHz to 2483 MHz

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



Evaluation Board Layout
 Board Size 2.0" x 2.0"
 Board Thickness 0.028", Board Material FR-4

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