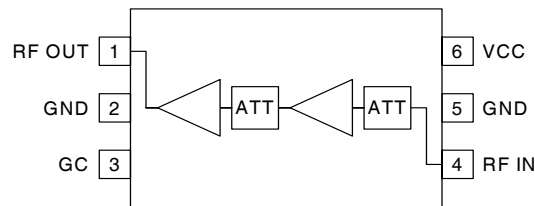


Features

- 50dB Linear Gain Control Range
- 24 dB Maximum Gain
- Single 2.7V to 3.3V Supply
- 45 mA Supply Current
- High Linearity

Applications

- CDMA PCS/Cellular Handsets
- TDMA PCS/Cellular Handsets
- W-CDMA Handsets



Functional Block Diagram

Product Description

The RF2377 is a linear variable gain amplifier suitable for use in TDMA and CDMA systems in the cellular or PCS band and for W-CDMA systems. The features of this device include linear gain control, high gain, and high linearity. The IC is manufactured on an advanced Gallium Arsenide Heterojunction Bipolar Transistor (GaAs HBT) process and is featured in an industry-standard miniature 6-lead plastic SOT package.

Ordering Information

- RF2377-410 PCBA Fully Assembled Evaluation Board, PCS
- RF2377-411 PCBA Fully Assembled Evaluation Board, W-CDMA

Optimum Technology Matching® Applied

- | | | | |
|--|--------------------------------------|-------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input type="checkbox"/> GaAs MESFET | <input type="checkbox"/> Si BiCMOS | <input type="checkbox"/> Si CMOS | |
| <input type="checkbox"/> InGaP HBT | <input type="checkbox"/> SiGe HBT | <input type="checkbox"/> Si BJT | |

RF MICRO DEVICES®, RFMD®, Optimum Technology Matching®, Enabling Wireless Connectivity™, PowerStar®, POLARIS™ TOTAL RADIO™ and UltimateBlue™ are trademarks of RFMD, LLC. BLUETOOTH is a trademark owned by Bluetooth SIG, Inc., U.S.A. and licensed for use by RFMD. All other trade names, trademarks and registered trademarks are the property of their respective owners. ©2006, RF Micro Devices, Inc.

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	0 to +5.0	V _{DC}
DC Current	100	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-55 to +150	°C



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).

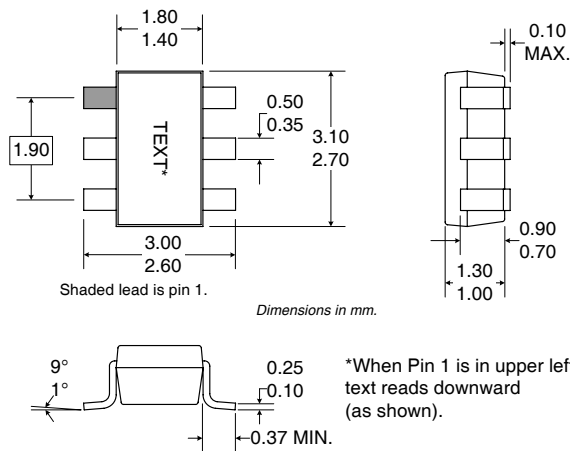
The information in this publication is believed to be accurate and reliable. However, no responsibility is assumed by RF Micro Devices, Inc. ("RFMD") for its use, nor for any infringement of patents, or other rights of third parties, resulting from its use. No license is granted by implication or otherwise under any patent or patent rights of RFMD. RFMD reserves the right to change component circuitry, recommended application circuitry and specifications at any time without prior notice.

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					V _{CC} =2.8V, V _{GC} =2.0V, T=25 °C
Usable Frequency Range		800 to 2200		MHz	
Linear Gain Control Range	50			dB	
Gain Control Slope		70		dB/V	
TDMA					V _{CC} =2.8V, V _{GC} =2.0V, T=25 °C
Operating Frequency		1880		MHz	
Maximum Small Signal Gain	22	24	27	dB	
Input VSWR		1.5:1	2.5:1		Over entire gain control range
Output IP3	+23	+26		dBm	
Noise Figure		7		dB	Maximum gain
Maximum Average Output Power		+8		dBm	TDMA modulation
Adjacent Channel Power Rejection		-33	-32	dBc	TDMA modulation; P _{OUT} =+8dBm
Alternate Channel Power Rejection		-61	-57	dBc	TDMA modulation; P _{OUT} =+8dBm
CDMA					V _{CC} =2.8V, V _{GC} =2.0V, T=25 °C
Operating Frequency		1880		MHz	
Maximum Small Signal Gain	22	24	27	dB	
Input VSWR		1.5:1	2.5:1		Over entire gain control range
Output IP3	+23	+26		dBm	
Noise Figure		7		dB	Maximum gain
Maximum Average Output Power		+11		dBm	CDMA modulation; V _{CC} =3.0V, maximum gain setting, ACPR _≤ -52dBc.
Adjacent Channel Power Rejection		-53		dBc	CDMA modulation; V _{CC} =3.0V. For P _{IN} >-16dBm, adjustment of P _{IN} is required to maintain ACPR performance over gain control range. For P _{IN} ≤-16dBm, ACPR performance is maintained over entire gain control range.
W-CDMA					V _{CC} =2.8V, T=25 °C
Operating Frequency		1920 to 1980		MHz	
Small Signal Gain	20	22	24	dB	V _{GC} =2.0V
	-33	-32	-31	dB	V _{GC} =0.3V
Input VSWR		1.5:1	2.5:1		Over entire gain control range
Output IP3	+22	+24		dBm	
Noise Figure	4	5	6	dB	Maximum gain
	32	32.5	34	dB	Minimum gain

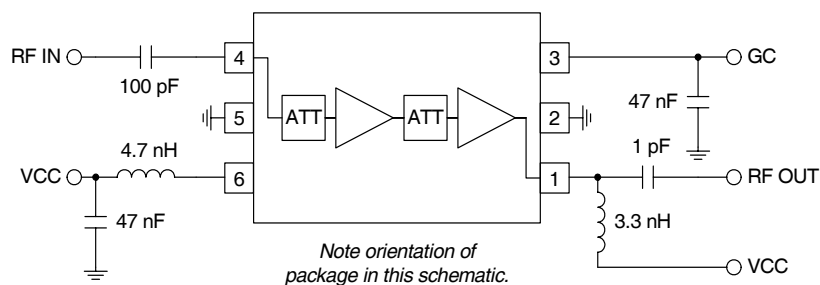
Maximum Linear Output Power	+8	+9		dBm	W-CDMA ACPR < -46 dBc, $V_{GC}=2.0V$
Adjacent Channel Power Rejection		-48	-46	dBc	W-CDMA modulation; $V_{GC}=2.0V$, $P_{IN} < -12$ dBm
			-43	dBc	W-CDMA modulation; Over entire gain control range, $P_{IN} < -17$ dBm
			-43	dBc	W-CDMA modulation; $V_{GC}=1.0V$, $P_{IN} < -14$ dBm
Power Supply					T = 25 ° C
Supply Voltage		2.8		V	Specifications
		2.7 to 3.3		V	Operating range
Gain Control Voltage		0 to 2.0		V	
Supply Current	32	45	65	mA	$V_{CC}=2.8V$, $V_{GC}=2.0V$
		56		mA	$V_{CC}=3.0V$, $V_{GC}=2.0V$
			20	mA	$V_{CC}=2.8V$, $V_{GC}=0.4V$
V_{GC} Current			1.5	mA	

Pin	Function	Description	Interface Schematic
1	RF OUT	RF output pin. This pin is DC coupled and requires V_{CC} through a bias inductor sized accordingly to provide a high pass transformation with a series capacitor.	
2	GND	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance.	
3	GC	Analog gain control pin. This pin controls the gain of the IC. Minimum gain occurs at $V_{GC} < 0.4V$ and maximum gain is achieved with $V_{GC} = 2.0V$. 50dB of linear gain control with little variation of input P_{1dB} is available.	
4	RF IN	RF input pin. This pin is DC coupled.	
5	GND	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance.	
6	VCC	Power supply. This pin should be connected to a regulated supply and requires a bypass capacitor. Voltage is supplied through this pin to the first stage collector; this voltage also controls the bias. Gain may be tuned by adjusting the value of the feed inductor.	

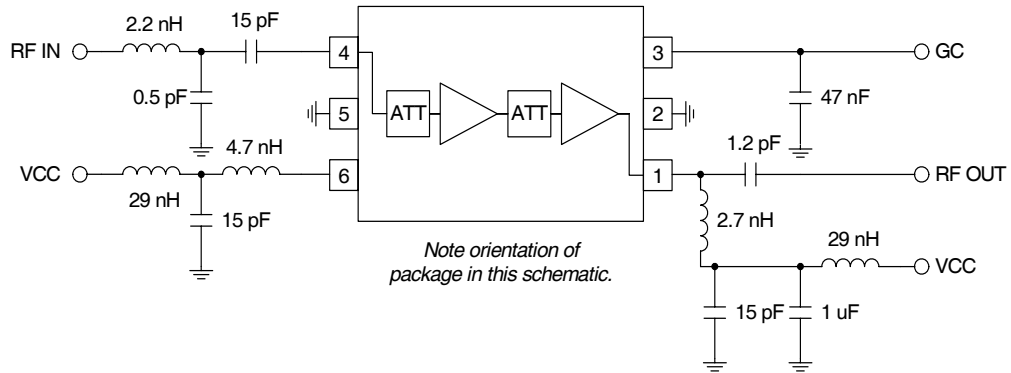
Package Drawing SOT23-6



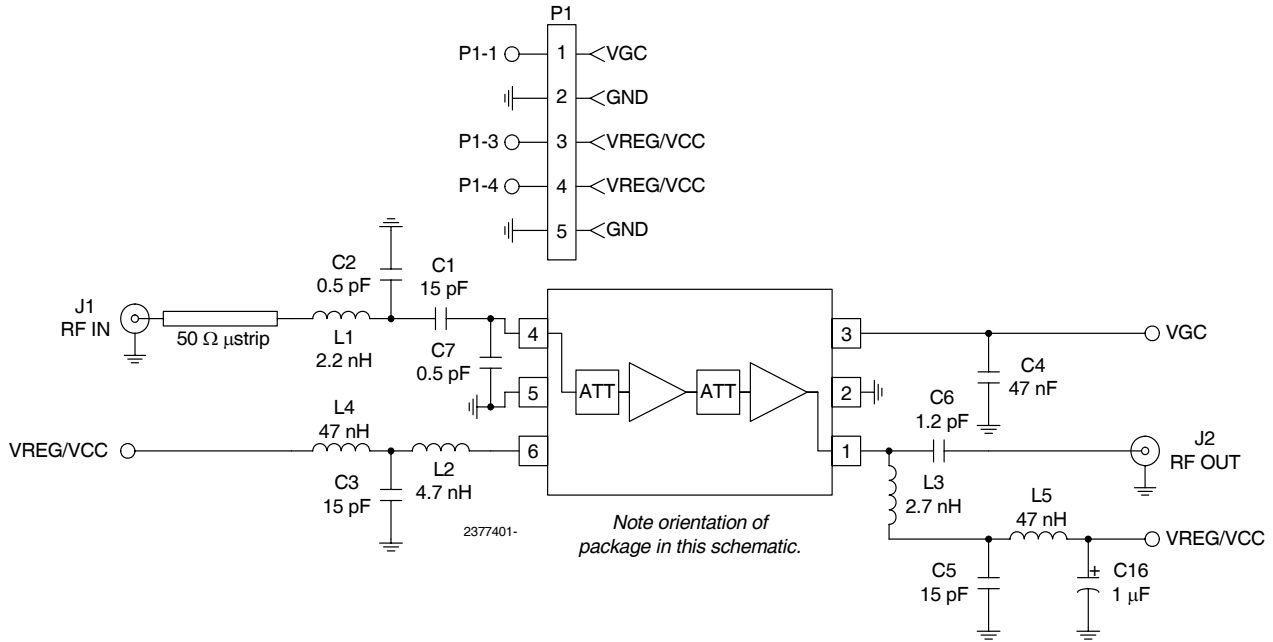
Application Schematic



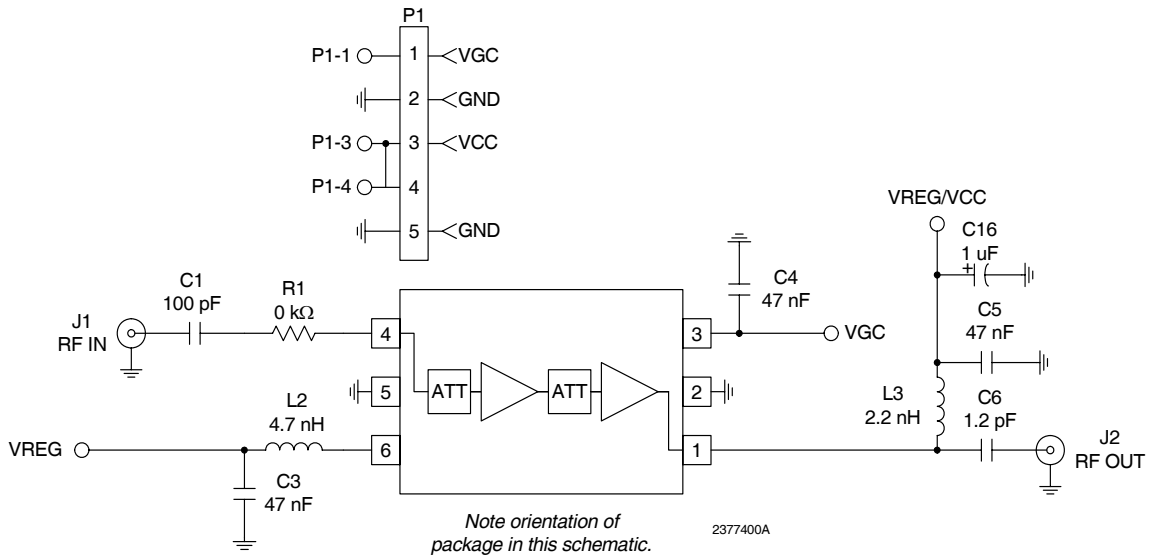
W-CDMA Application Schematic



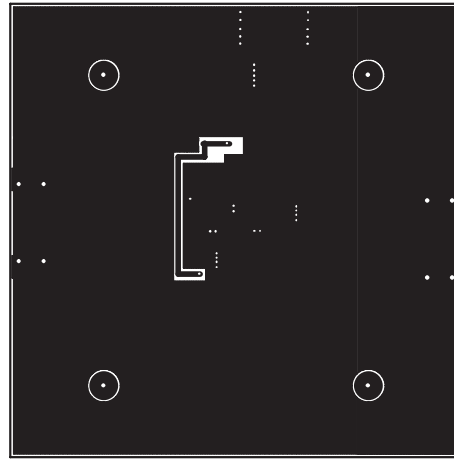
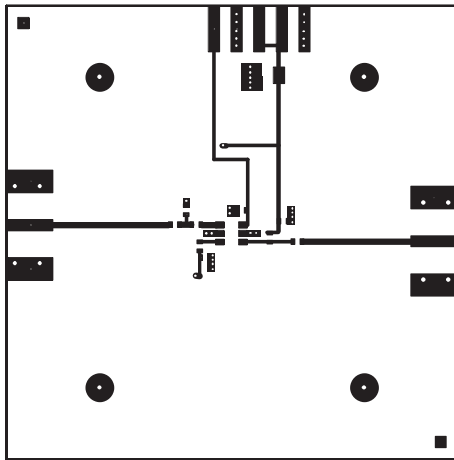
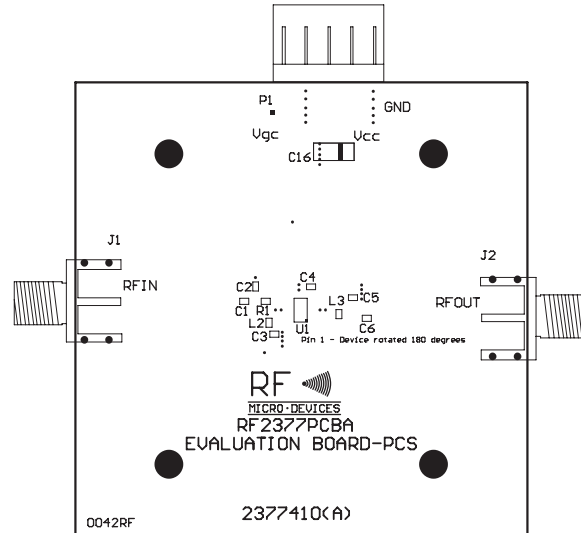
Evaluation Board Schematic (W-CDMA)



Evaluation Board Schematic (PCS)



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



Evaluation Board Layout (W-CDMA) Board Size 2.0" x 2.0" Board Thickness 0.028", Board Material FR-4

