rfmd.com

RF3863

WIDE BANDWIDTH, HIGH LINEARITY LOW NOISE AMPLIFIER

Package Style: QFN, 16-Pin, 3mmx3mm

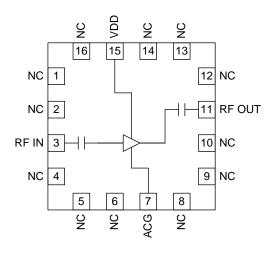


Features

- Low Noise and High Intercept Point
- Adjustable Bias Current
- Single 2.5V to 6.0V Power Supply
- 700 MHz to 3800 MHz Operation
- Extremely Small QFN16 3mmx3mm Package

Applications

- First Stage CDMA, PCS, ECS, UMTS LNA/Linear Driver
- First Stage WLAN LNA/Linear Driver
- First Stage WiMAX LNA/Linear Driver
- General Purpose Amplification



Functional Block Diagram

Product Description

The RF3863 is a low noise amplifier with a high output IP3. The amplifier is self-biased from a single voltage supply with 50Ω input and output ports. The useful frequency range is from 700MHz to 3800MHz. A 0.8dB noise figure and 36dBm OIP3 performance is achieved with a 5V $V_{DD},\,90\,\text{mA}.$ Current can be increased to raise OIP3 while having minimal effect on noise figure. The IC is featured in a standard QFN, 16-pin, $3\,\text{mmx}3\,\text{mm}$ package.

Ordering Information

RF3863 Wide Bandwidth, High Linearity Low Noise Amplifier RF3863PCK-410 Fully Assembled Evaluation Board with 5 Sample Parts

 $1.5\,\mbox{GHz}$ to $2.7\,\mbox{GHz}$

RF3863PCK-411 3.3 GHz to 3.8 GHz RF3863PCK-412 700 MHz to 1100 MHz

Optimum Technology Matching® Applied

☐ GaAs HBT	☐ SiGe BiCMOS	▼ GaAs pHEMT	☐ GaN HEMT
☐ GaAs MESFET	☐ Si BiCMOS	☐ Si CMOS	
☐ InGaP HBT	☐ SiGe HBT	☐ Si BJT	

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Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	0 to +7	V_{DC}
Input RF Level	+10	dBm
Current Drain, I _{DD}	150	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

Note 1: Max continuous RF IN is $\pm 10\,\mathrm{dBm}$. The max transient RF IN is $\pm 20\,\mathrm{dBm}$.



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 EUDirective 2002/95/EC (at time of this document revision).

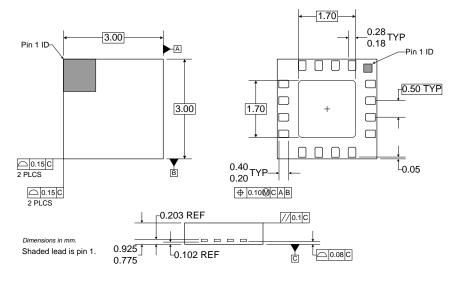
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Parameter		Specification		11:4	O andition
	Min.	Тур.	Max.	Unit	Condition
High Band		_		_	
Frequency	3.3		3.8	GHz	V _{DD} =5V
Current		90	110	mA	
Gain		10		dB	
Noise Figure		0.9		dB	
OIP3		37.0		dBm	+25°C, V _{DD} =5V, I _{DD} =90 mA, 3500 MHz unless specified
OP1dB		22.0		dBm	
S11		-11		dB	
S22		-18		dB	f ₁ =3500MHz, f ₂ =3501MHz
Mid Band					
Frequency	1.5		2.7	GHz	
Current		90	110	mA	V _{DD} =5V
Gain	14	15	16.5	dB	+25°C, V _{DD} =5V, I _{DD} =90 mA, 2000 MHz unless specified
Noise Figure		0.8	1.0	dB	
OIP3	33.0	35.5		dBm	f ₁ =2000MHz, f ₂ =2001MHz
OP1dB	21.0	22.5	25.0	dBm	
S11		-10		dB	
S22		-17		dB	
Low Band					
Frequency	700		1100	MHz	
Current		90	110	mA	V _{DD} =5V
Gain		18		dB	+25°C, V _{DD} =5V, I _{DD} =90 mA, 850 MHz unless specified
Noise Figure		0.9		dB	
OIP3		35		dBm	f ₁ =850MHz, f ₂ =851MHz
OP1dB		22		dBm	
S11		-10		dB	
S22		-17		dB	



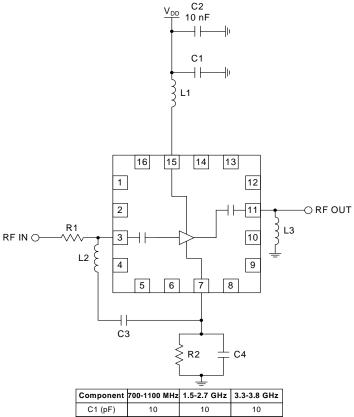
Pin	Function	Description	Interface Schematic
1	NC	Not connected.	
2	NC	Not connected.	
3	RF IN	RF input pin. 50Ω matched. This pin is DC-blocked.	
4	NC	Not connected.	
5	NC	Not connected.	
6	NC	Not connected.	
7	ACG	AC ground. Shunt cap may be added for tuning. Shunt resistor may be added to increase $I_{\rm DD}$.	
8	NC	Not connected.	
9	NC	Not connected.	
10	NC	Not connected.	
11	RF OUT	RF output pin. 50Ω matched. This pin is DC-blocked.	
12	NC	Not connected.	
13	NC	Not connected.	
14	NC	Not connected.	
15	VD	Bias voltage. 2.5V to 6.0V applied through bias inductor.	
16	NC	Not connected.	
Pkg	GND	Ground connection.	
Base			

Package Drawing





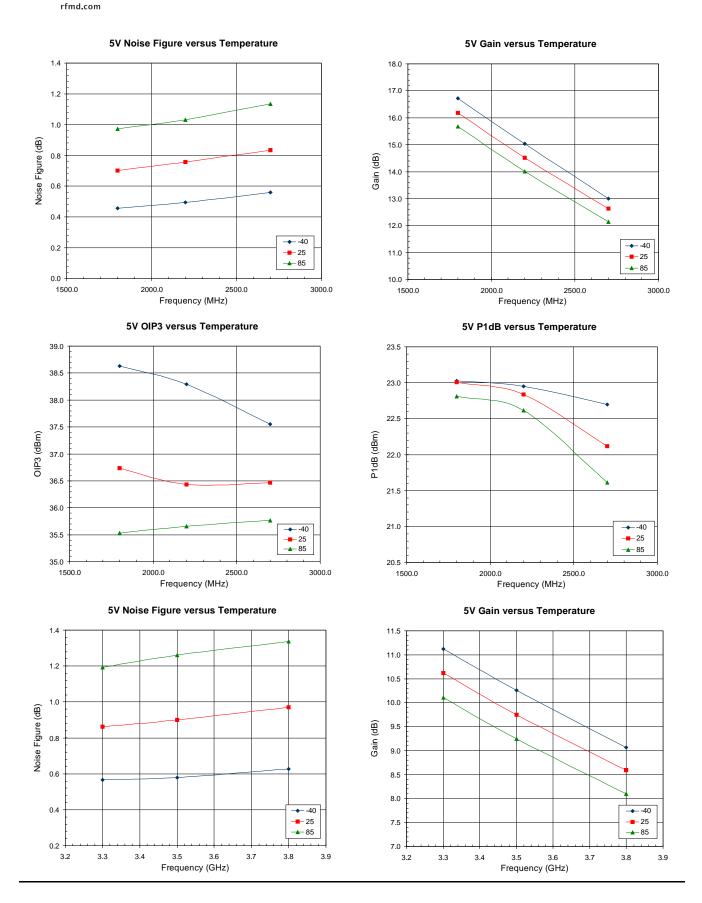
Evaluation Board Schematic 700 MHz to 3800 MHz



Component	700-1100 MHz	1.5-2.7 GHz	3.3-3.8 GHz
C1 (pF)	10	10	10
C3 (pF)	100	100	100
C4 (pF)	10	DNP	DNP
L1 (nH)	56	5.6	2.2
L2 (nH)	18	4.7	4.7
R1 (ohm)	5.6 nH	0	0
R2 (ohm)	DNP	DNP	DNP
L3 (nH)	15	DNP	DNP

R2 is DNP for standard 90 mA current draw. If R2 is added, the I_{DD} will increase. A 20 Ω R2 will raise the current to achieve higher linearity.





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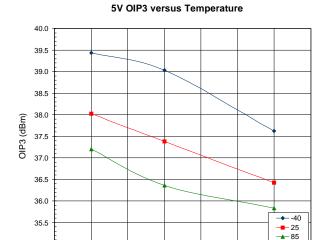
35.0

3.2

3.3

3.4





3.5

Frequency (GHz)

3.6

3.7

3.8

3.9

