



RF2365

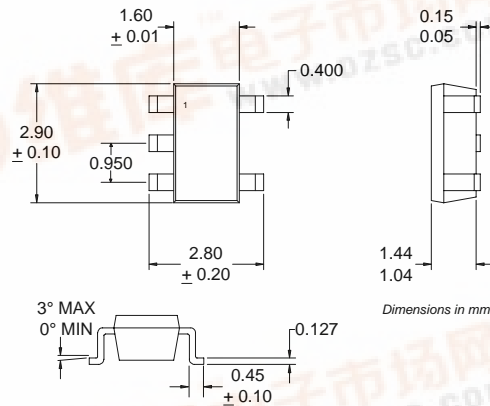
3V LOW NOISE AMPLIFIER

Typical Applications

- DCS GSM
- PCS CDMA
- PCS TDMA
- 2.4GHz Systems
- General Purpose Amplification
- Commercial and Consumer Systems

Product Description

The RF2365 is a low noise amplifier with a high dynamic range designed for the receive front end of digital cellular applications at PCS/DCS frequencies. It is designed to amplify low level signals with minimum noise contribution while operating in the harsh, interference-rich environments of newly deployed digital subscriber units. The part provides excellent performance as a LNA for 2.4GHz radio applications. The IC is featured in a standard SOT5-lead plastic package.



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GENERAL PURPOSE AMPLIFIERS

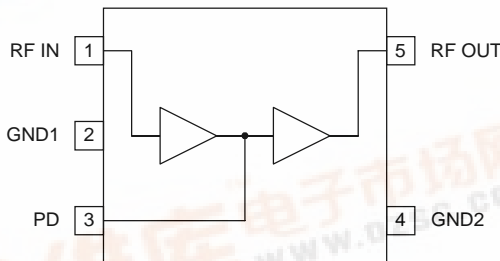
Optimum Technology Matching® Applied

- Si BJT GaAs HBT GaAs MESFET
 Si Bi-CMOS SiGe HBT Si CMOS

Package Style: SOT 5-Lead

Features

- 1.6dB Noise Figure @ 1850MHz
- 1.75dB Noise Figure @ 2450MHz
- 18.0dB Gain at PCS/DCS
- 15.5dB Gain at 2.45GHz
- External Bias Control
- Extremely Small SOT23-5 Package



Functional Block Diagram

Ordering Information

- RF2365 3V Low Noise Amplifier
 RF2365 PCBA Fully Assembled Evaluation Board

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Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	-0.5 to +8.0	V _{DC}
Input RF Level	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C



Caution! ESD sensitive device.

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Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					
RF Frequency Range	1500		2500	MHz	
PCS Performance					Schematic per 1.9GHz LNA Application Schematic, V _{PD} = 3.0 V _{CC} = 3.0V, T=25°C
Gain	16	18	20	dB	V _{CC} =3.0V, I _{CC} =8.0mA
Noise Figure		1.6		dB	
Off Mode Gain		-15		dB	V _{CC} =3.0V, V _{PD} =0
S ₁₂		25		dB	
Input IP3		-3.5		dBm	V _{CC} =3.0V, I _{CC} =5.0mA, R ₁ =150Ω (see application schematic)
		+2.0		dBm	V _{CC} =3.0V, I _{CC} =6.5mA, R ₁ =75Ω (see application schematic)
		+4.0		dBm	V _{CC} =3.0V, I _{CC} =8.0mA, R ₁ =0Ω (see application schematic)
Output IP3	20.0	22.0	28.0	dBm	V _{CC} =3.0V, I _{CC} =8.0mA, R ₁ =0Ω (see application schematic)
Input VSWR		1.7			
Output VSWR		1.4			
2.4GHz Performance					Schematic per 2.4GHz LNA Application Schematic T=25°C
Gain		15.5		dB	V _{CC} =3.0V, I _{CC} =8.0mA
Noise Figure		1.75		dB	
Input IP3		+2.0		dBm	V _{CC} =3.0V, I _{CC} =8.0mA
Input VSWR		1.3			
Output VSWR		1.75			
Power Supply					T = 25 °C
Voltage (V _{CC})		3		V	
Current Consumption	5.0	8.0	11.0	mA	V _{CC} =3.0V, IIP3=+4.0dBm
		6.5		mA	V _{CC} =3.0V, IIP3=+2.0dBm
		5.0		mA	V _{CC} =3.0V, IIP3=-3.5dBm
Power Down	0		1	μA	V _{CC} =3.0V; V _{PD} ≤0.9V

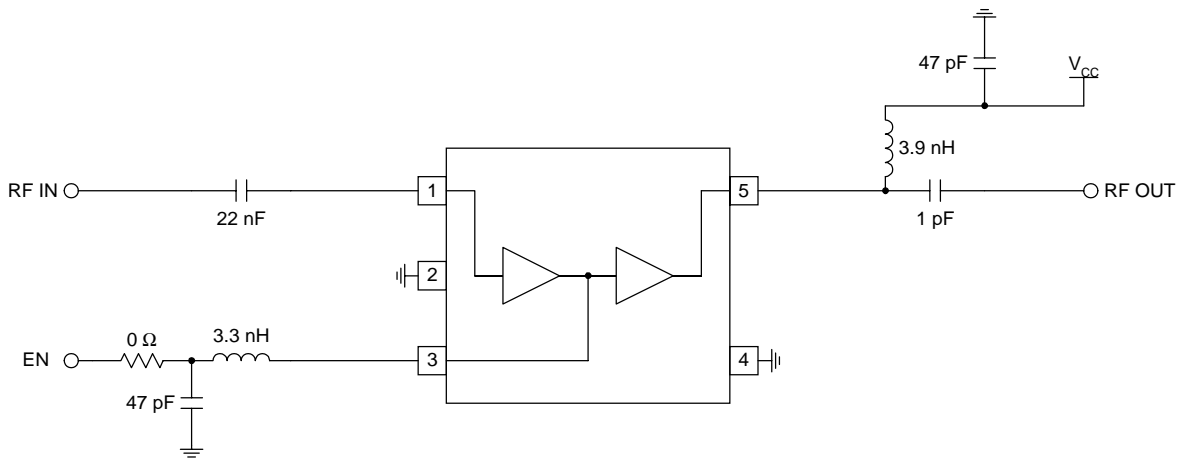
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Pin	Function	Description	Interface Schematic
1	RF IN	RF input pin. This pin is DC coupled.	
2	GND1	Ground connection. See evaluation board schematic notes.	
3	PD	Power down pin. This pin serves as the interstage for the 2-stage LNA. An inductor is required to pull pin 3 to V_{CC} (see application schematic). If desired, this voltage can be lowered to trade off IP3 versus $I_{CC,TOTAL}$. (See table below.)	
4	GND2	Ground connection. See evaluation board schematic notes.	
5	RF OUT	Amplifier Output pin. This pin is an open-collector output. It must be biased to either V_{CC} or pin 4 through a choke or matching inductor. This pin is typically matched to 50Ω with a shunt bias/matching inductor and series blocking/matching capacitor. Refer to application schematics.	

R1	IIP3	I_{CC}
0Ω	+4.0dBm	8.0mA
75Ω	+2.0dBm	6.5mA
150Ω	-3.5dBm	5.0mA

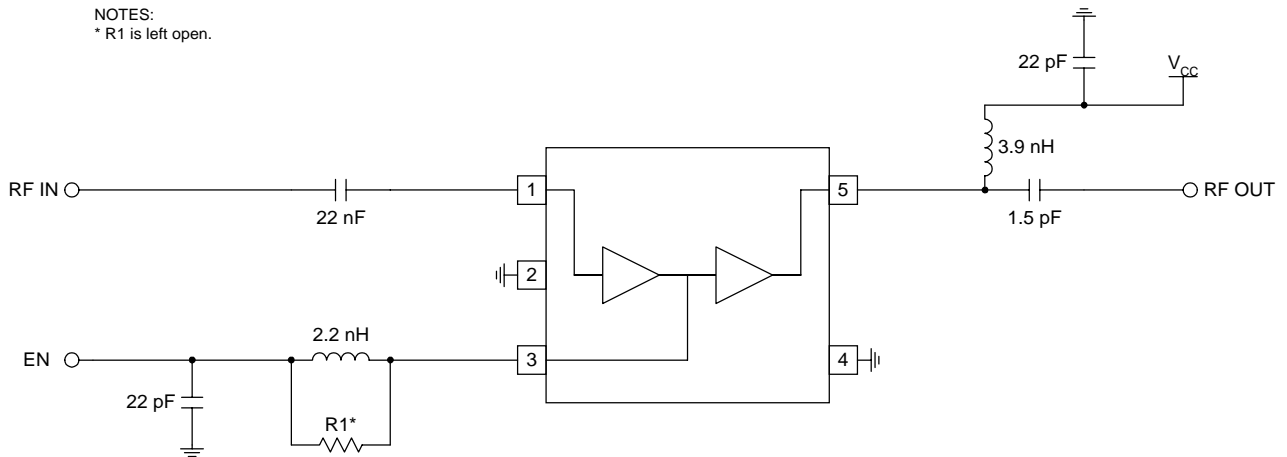
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Application Schematic - 1.9GHz



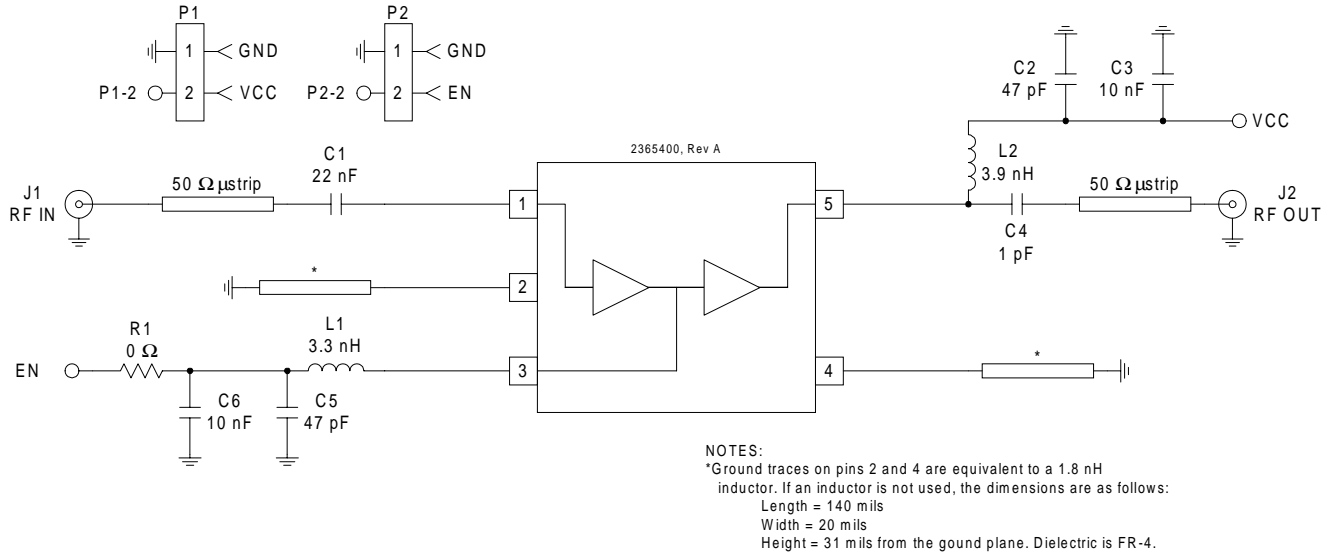
Application Schematic - 2.4GHz

NOTES:
* R1 is left open.

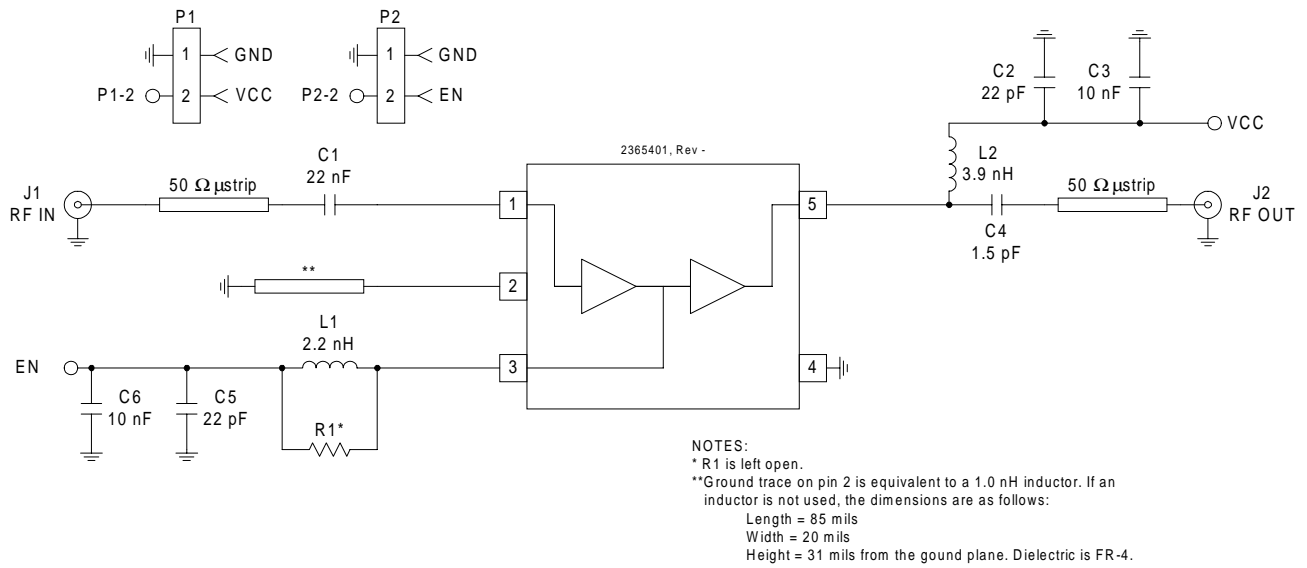


Evaluation Board Schematic - 1.9GHz

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



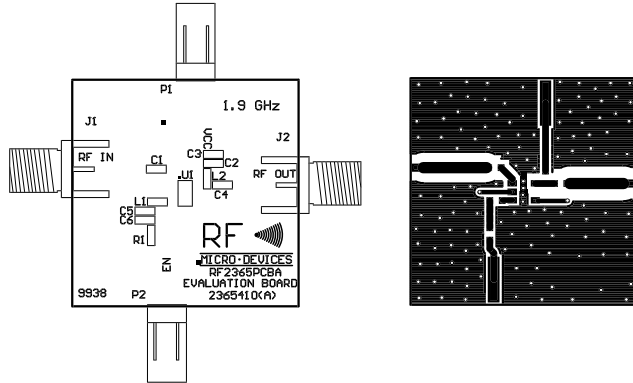
Evaluation Board Schematic - 2.4GHz



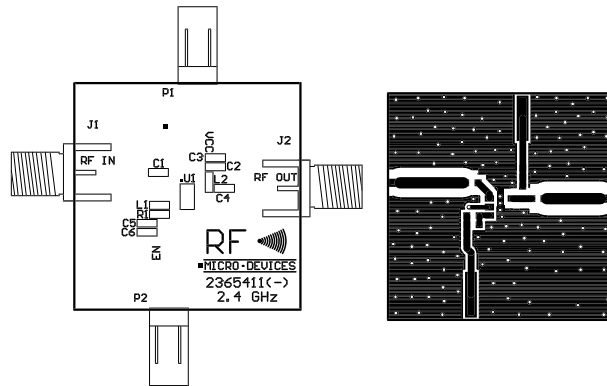
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Evaluation Board Layout Board Size 1" x 1" 1.9GHz

Board Thickness 0.031"; Board Material FR-4

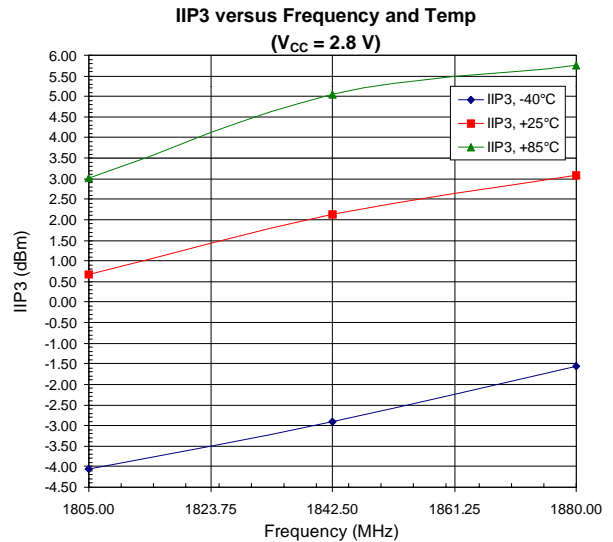
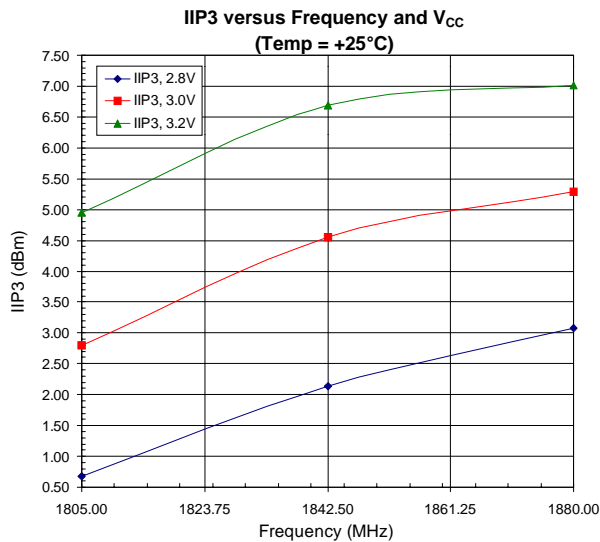
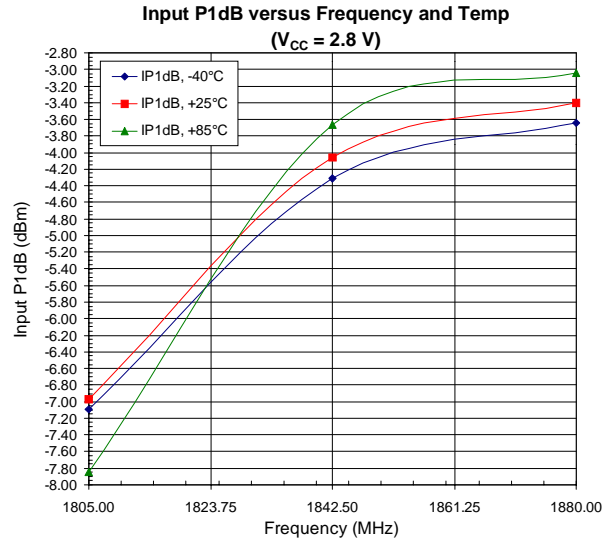
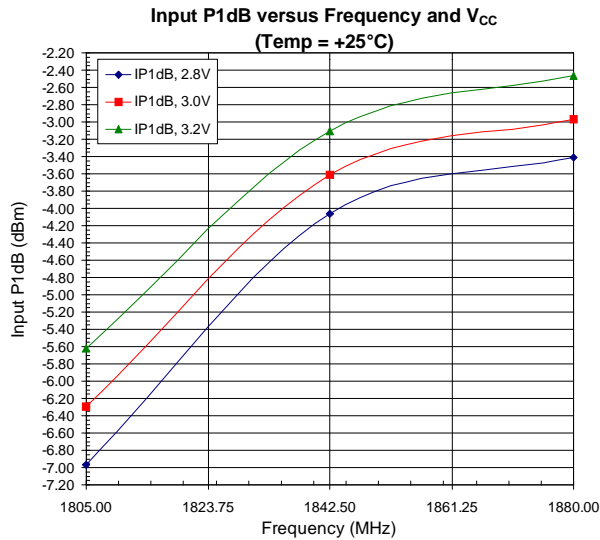
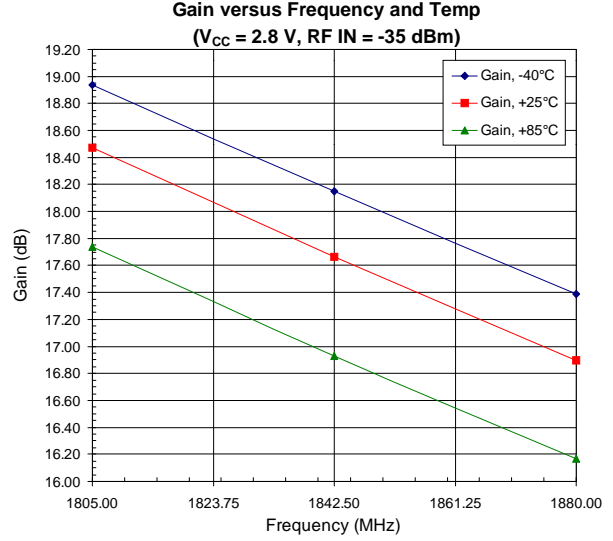
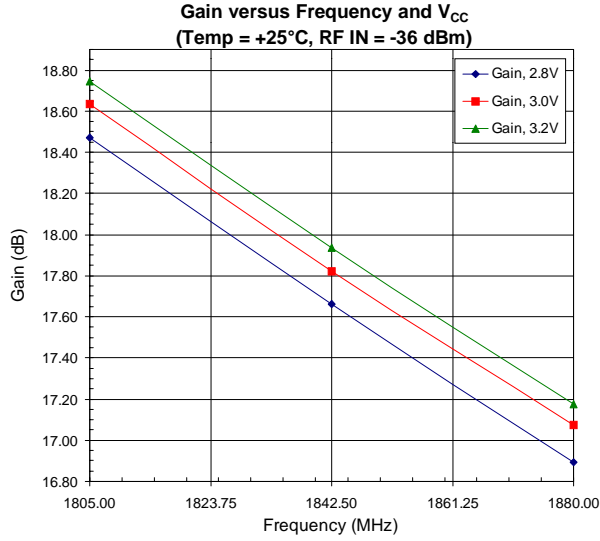


2.4GHz



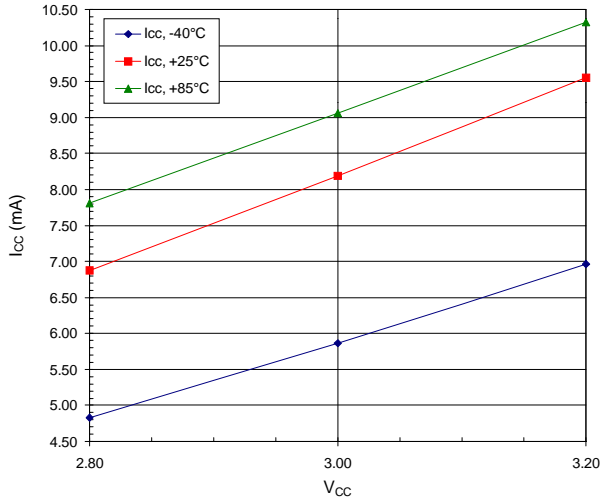
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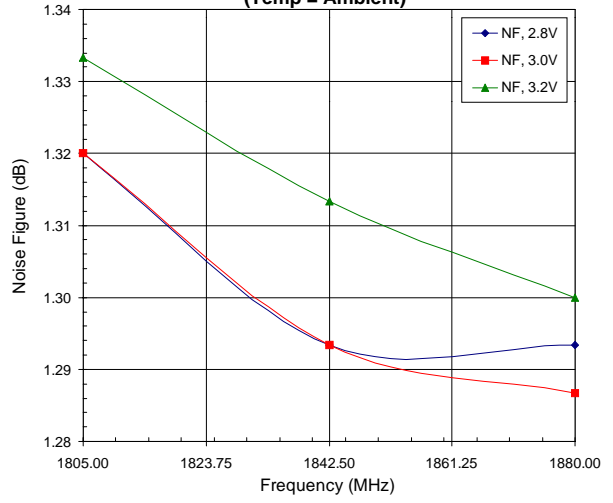


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I_{CC} versus V_{CC} and Temp



**Noise Figure versus Frequency and V_{CC}
(Temp = Ambient)**



Input/Output Impedance @ 2.8 V

