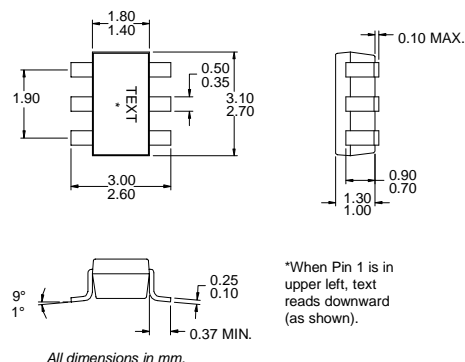


### Typical Applications

- CDMA/Cellular Bypass LNA
- CDMA/Cellular Bypass Driver Amplifier
- General Purpose Amplification
- Commercial and Consumer Systems

### Product Description

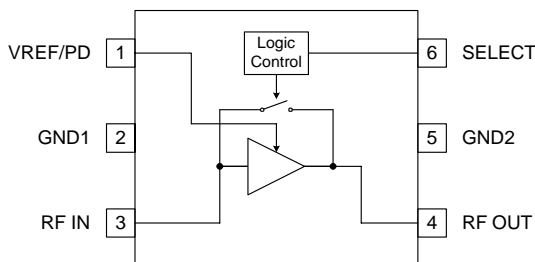
The RF2369 is a switchable low noise amplifier with a very high dynamic range designed for digital cellular applications. The device functions as an outstanding front end low noise amplifier. When used as an LNA, the bias current can be set externally. When used as a PA driver, the IC can operate directly from a single cell Li-ion battery and includes a power down feature that can be used to completely turn off the device. The IC is featured in a standard SOT 6-lead plastic package.



### 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     |

### Package Style: SOT 6-Lead



Functional Block Diagram

### Features

- Low Noise and High Intercept Point
- Adjustable Bias Current
- LNA Bypass Loss is +2dB
- 150MHz to 2500MHz Operation
- Meets IMD Tests with Two Gain States/  
Single Logic Control Line

### Ordering Information

- |             |  |
|-------------|--|
| RF2369      | 3V Low Noise Amplifier/ 3V PA Driver Amplifier |
| RF2369 PCBA | Fully Assembled Evaluation Board (LNA)         |

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	-0.5 to +8.0	V <sub>DC</sub>
Input RF Level	+10	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°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).

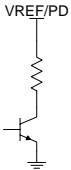
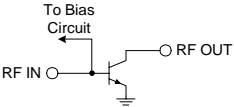

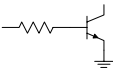
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GENERAL PURPOSE  
AMPLIFIERS

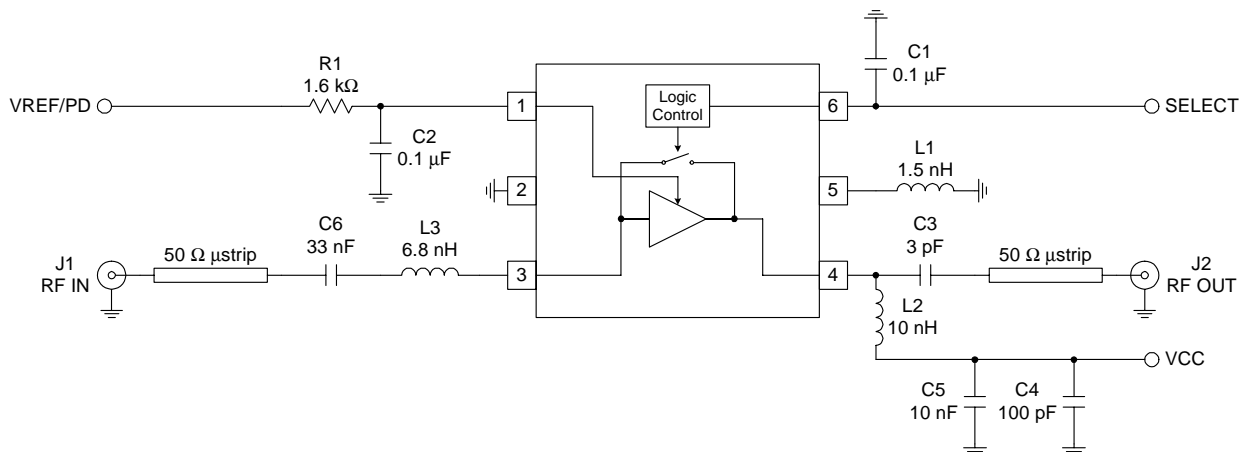
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
<b>Overall</b>					T <sub>AMB</sub> =25°C, V <sub>CC</sub> =3.0V
Frequency Range	150	824 to 894	2500	MHz	
<b>Cellular Low Noise Amplifier</b>					
Frequency	869		894	MHz	Gain Select<0.8V, V <sub>PD</sub> /V <sub>REF</sub> =3V
<i>HIGH GAIN MODE</i>					
Gain	14.0	15.5	17.0	dB	
Noise Figure		1.6	2.0	dB	
Input IP3	9.0	11.5		dBm	
Input VSWR			2:1		Gain Select>1.8V, V <sub>PD</sub> /V <sub>REF</sub> =0V
Output VSWR			2:1		
Current Drain		7.5	10.0	mA	
<i>BYPASS MODE</i>					
Gain	-3	-2	-1	dB	
Input IP3	+10	+24		dBm	
Input VSWR			2:1		
Output VSWR			2:1		Gain Select<0.8V, V <sub>PD</sub> /V <sub>REF</sub> =3V
Current Drain		2.0	4.0	mA	
<b>Cellular CDMA Driver</b>					
Frequency	824		849	MHz	
<i>HIGH GAIN MODE</i>					
Gain	14.0	15.5	17.0	dB	
Noise Figure		2.0	2.5	dB	
Output Power	4			dBm	
ACPR1		-65		dBc/30kHz	
ACPR2		-70		dBc/30kHz	
Input VSWR			2:1		Gain Select>1.8V, V <sub>PD</sub> /V <sub>REF</sub> =0V
Output VSWR			2:1		
Current Drain		8.5		mA	
<i>BYPASS MODE</i>					
Gain	-3.0	-2.0	-1.0	dB	
Input IP3	+10	+24		dBm	
Input VSWR			2:1		
Output VSWR			2:1		
Current Drain		2.0	4.0	mA	
<b>Power Supply</b>					
Voltage (V <sub>CC</sub> )		3		V	High Gain mode. Select<0.8V, V <sub>PD</sub> /V <sub>REF</sub> =3V Low Gain mode. Select>1.8V, V <sub>PD</sub> /V <sub>REF</sub> =0V Gain Select<0.8V, V <sub>PD</sub> /V <sub>REF</sub> =0V, V <sub>CC</sub> =0V
V <sub>SELECT</sub> Low			0.8	V	
V <sub>SELECT</sub> High	1.8			V	
Power Down	0		10	μA	

**Bypass Possibility**

Gain Select	$V_{PD}/V_{REF}$	$V_{CC}$	Current	Comments
>1.8V	0V	3V	2.3mA	Recommended Bypass Mode
>1.8V	3V	3V	3.4mA	Alternative Bypass Mode

Pin	Function	Description	Interface Schematic
1	VREF/PD	For low noise amplifier applications, this pin is used to control the bias current. An external resistor can be used to set the bias current for any $V_{PD}$ voltage.	
2	GND1	Ground connection. For best performance, keep traces physically short and connect immediately to ground plane.	
3	RF IN	RF input pin.	
4	RF OUT	Amplifier output pin. This pin is an open-collector output. It must be biased to $V_{CC}$ through a choke or matching inductor. This pin is typically matched to $50\Omega$ with a shunt bias/matching inductor and series blocking/matching capacitor. Refer to application schematics.	
5	GND2	LNA emittance inductance. Total inductance is comprised of package+bondwire+stripline (L1) on PCB.	
6	SELECT	This pin selects high gain and bypass. Select $\leq 0.8V$ , high gain. Select $\geq 1.8V$ , low gain.	

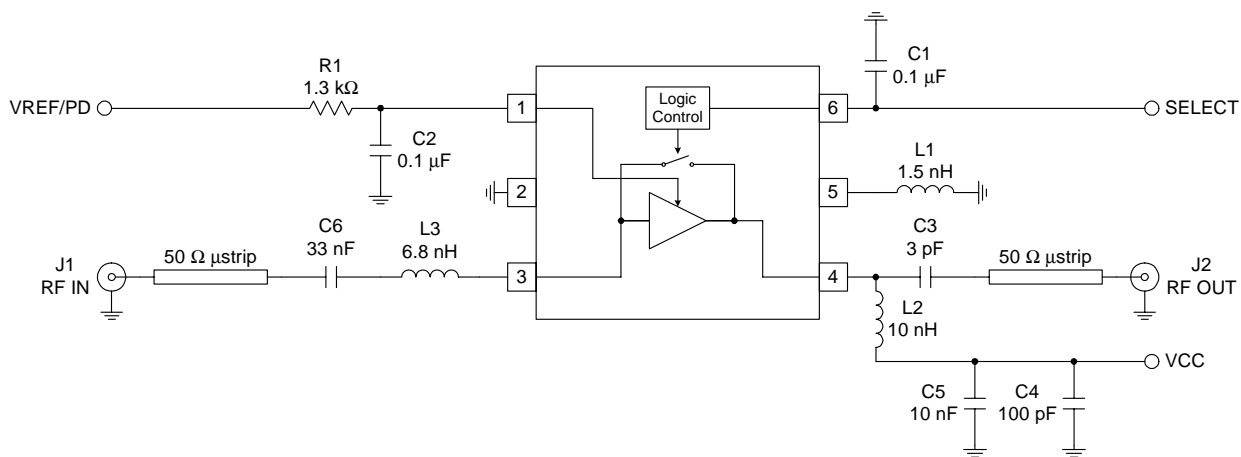
## Application Schematic Cellular Low Noise Amplifier ~881MHz



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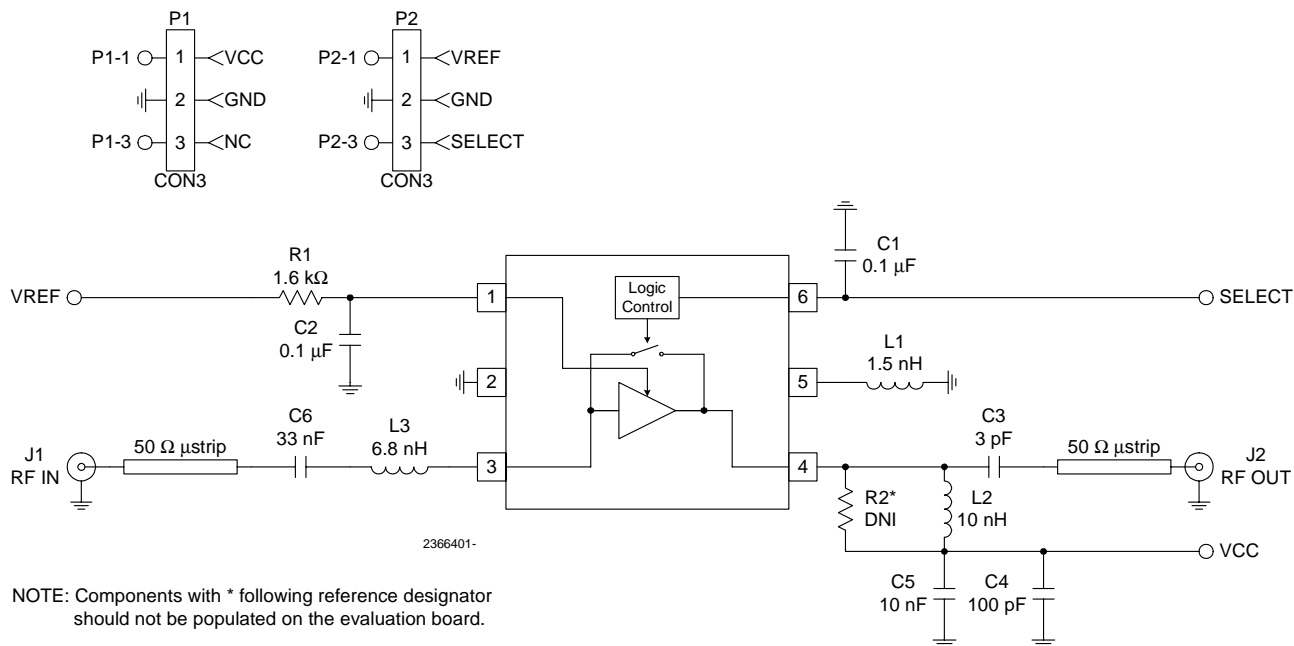
GENERAL PURPOSE  
AMPLIFIERS

## Application Schematic Cellular Driver Amplifier ~836MHz



## Evaluation Board Schematic - Cellular LNA

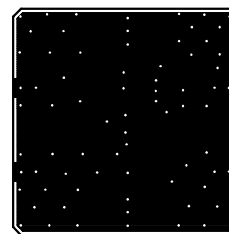
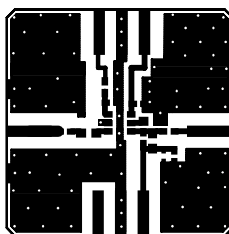
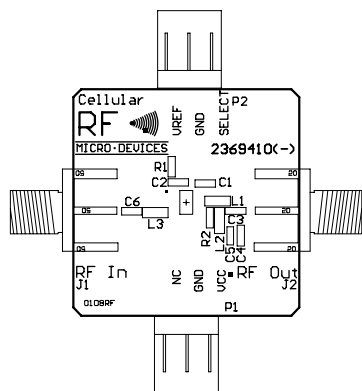
(Download [Bill of Materials](http://www.rfmd.com) from [www.rfmd.com](http://www.rfmd.com).)

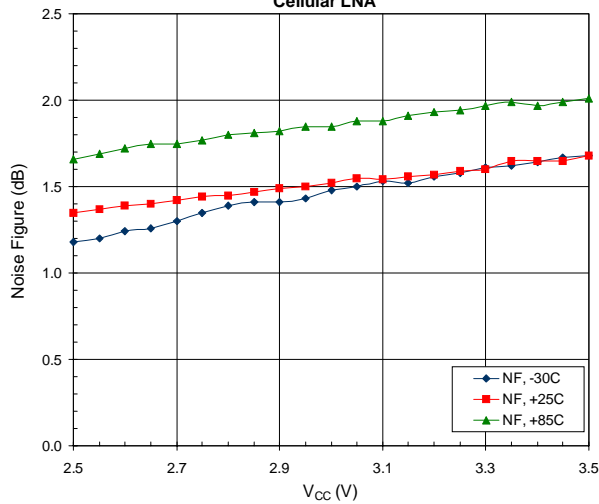
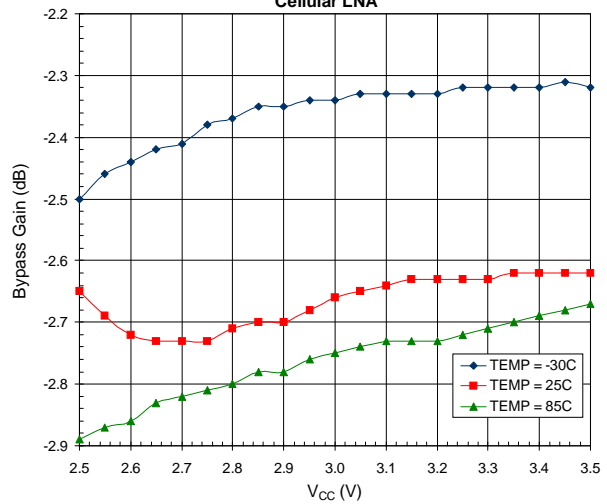
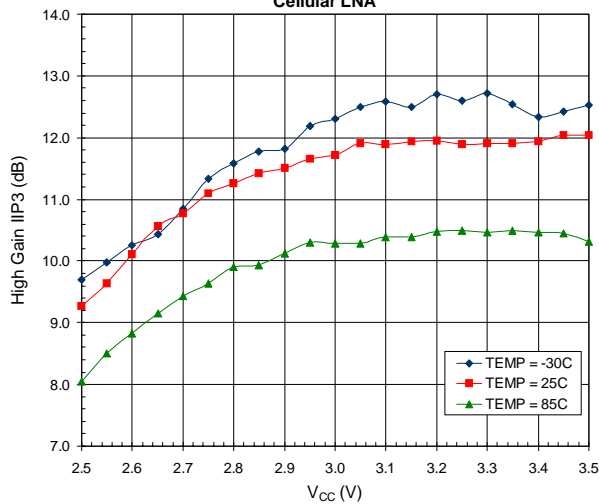
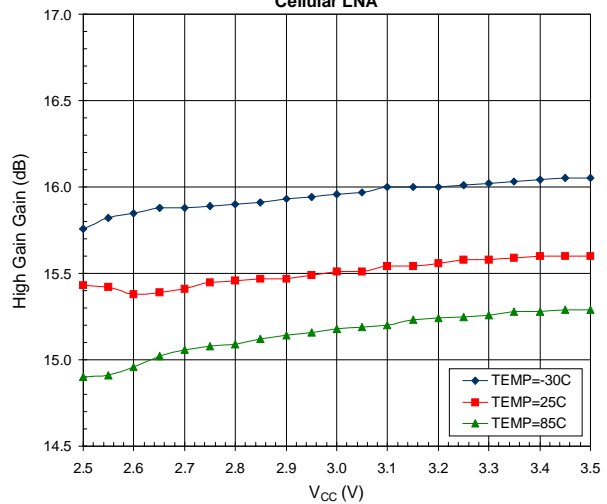
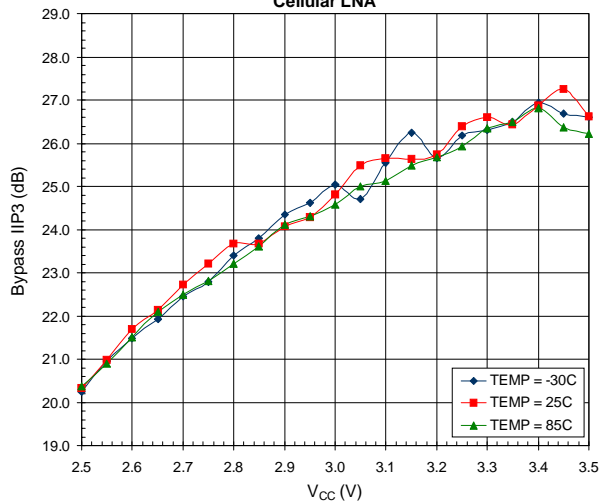
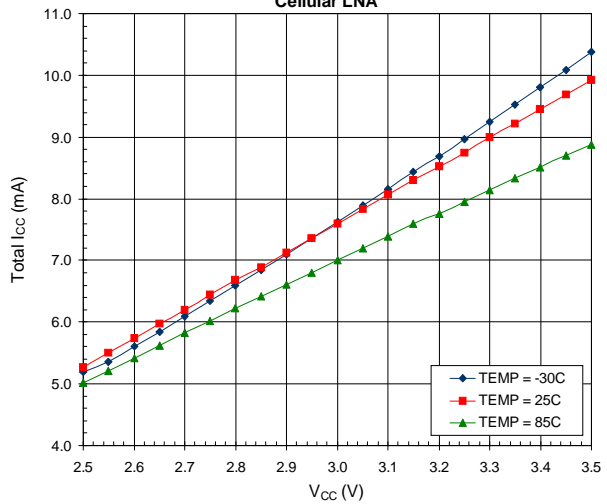


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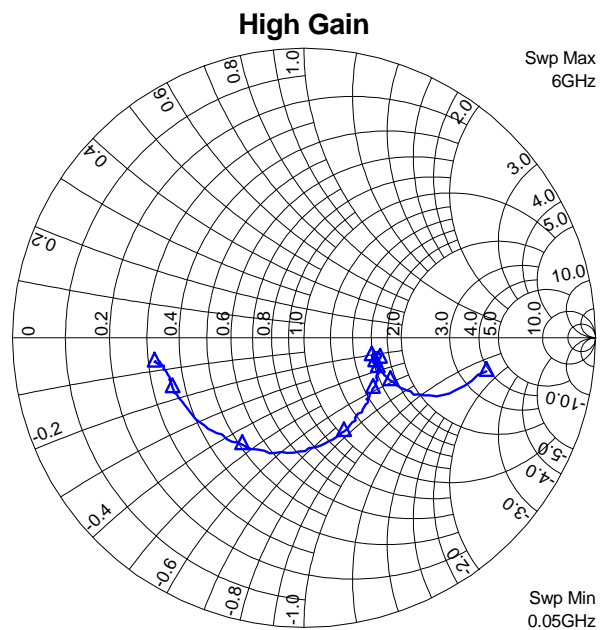
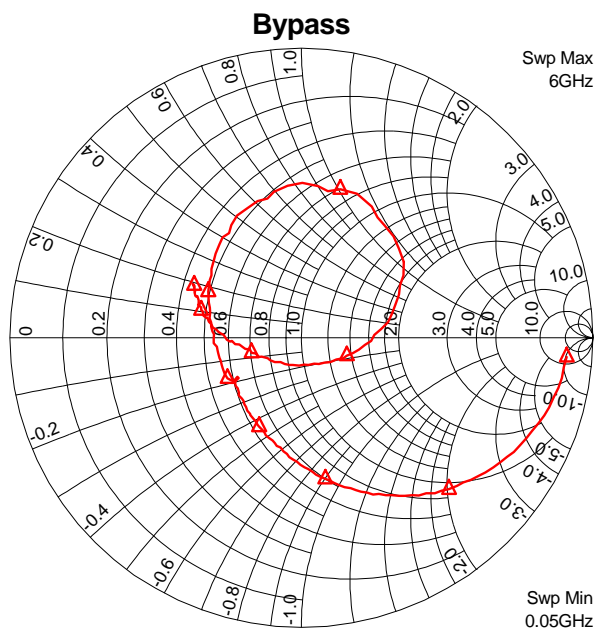
GENERAL PURPOSE  
AMPLIFIERS

Evaluation Board Layout  
Board Size 1.0" x 1.0"  
Board Thickness 0.032", Board Material FR-4

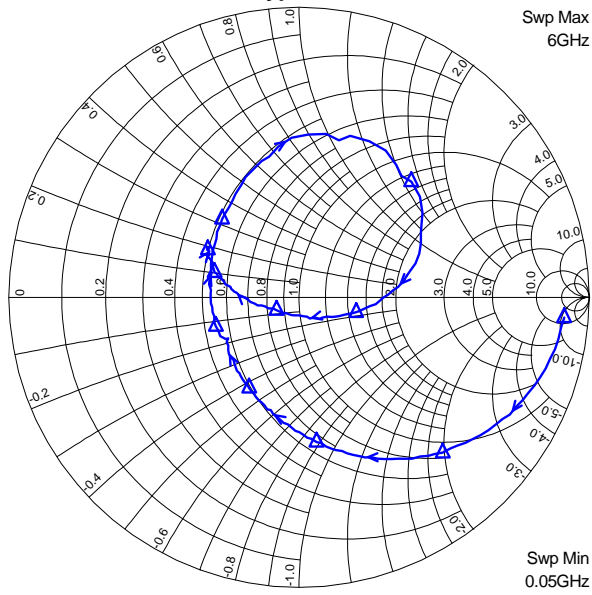


High Gain Mode Noise Figure versus  $V_{CC}$   
Cellular LNAGain (Bypass Mode) versus  $V_{CC}$   
Cellular LNAIIP3 (High Gain Mode) versus  $V_{CC}$   
Cellular LNAGain (High Gain Mode) versus  $V_{CC}$   
Cellular LNAIIP3 (Bypass Mode) versus  $V_{CC}$   
Cellular LNATotal  $I_{CC}$  (High Gain Mode) versus  $V_{CC}$   
Cellular LNA

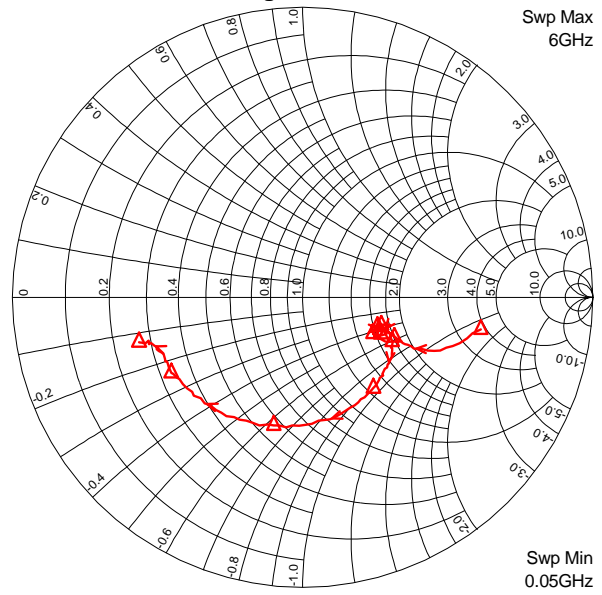




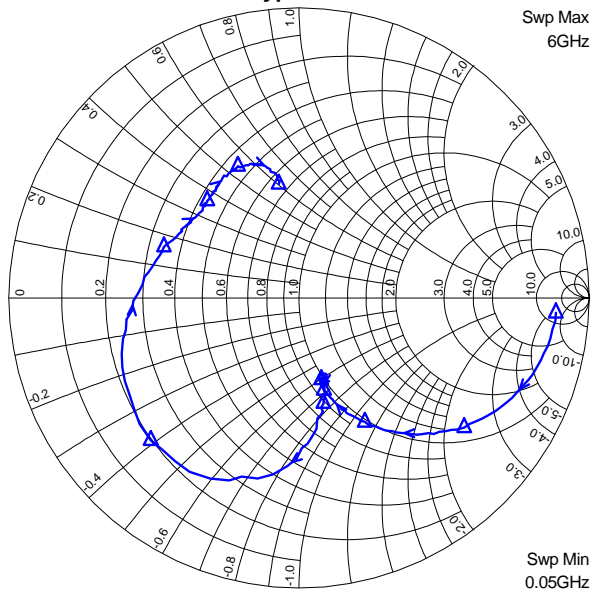
### S11 Bypass Mode



### S11 High Gain Mode



### S22 Bypass Mode



### S22 High Gain Mode

