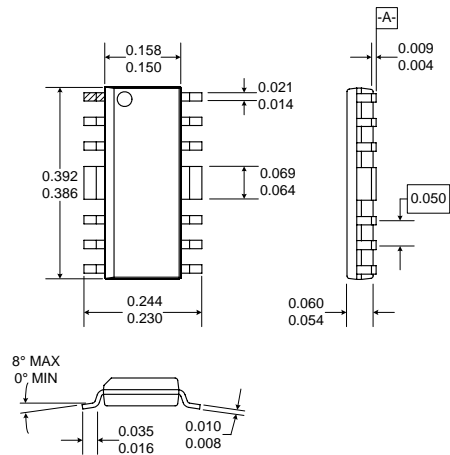


RoHS Compliant & Pb-Free Product

- Typical Applications
- CATV Distribution Amplifiers
 - Cable Modems
 - Broadband Gain Blocks
 - Laser Diode Driver
 - Return Channel Amplifier
 - Base Stations

Product Description

The RF2360 is a general purpose, low-cost, high-linearity RF amplifier IC. The device is manufactured on a Gallium Arsenide process and is featured in an SOP-16 batwing package. It has been designed for use as an easily cascadable 75Ω gain block with a Noise Figure of less than 2dB. Gain flatness better than 0.5dB from 5MHz to 1000MHz, and high linearity make this part ideal for cable TV applications. Other applications include IF and RF amplification in wireless voice and data communication products operating in frequency bands up to 1000MHz. The device is self-contained with 75Ω input and output impedances providing less than 2:1 VSWR matching. For higher input and output return losses, see the evaluation schematic.

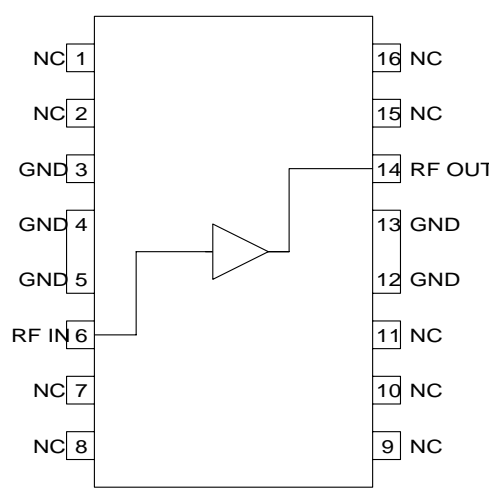


Optimum Technology Matching® Applied

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

Package Style: Standard Batwing

- Features
- 5MHz to 1500MHz Operation
 - Internally Matched Input and Output
 - 20dB Small Signal Gain
 - 1.2dB Noise Figure
 - +24dBm Output Power
 - Single 6V to 9V Positive Power Supply



Functional Block Diagram

Ordering Information

RF2360	Linear General Purpose Amplifier
RF2360 PCBA	Fully Assembled Evaluation Board 50Ω
RF2360 411	Fully Assembled Evaluation Board 75H
RF2360 412	Fully Assembled Evaluation Board 75L

RF Micro Devices, Inc. Tel (336) 664 1233
 7628 Thorndike Road Fax (336) 664 0454
 Greensboro, NC 27409, USA <http://www.rfmd.com>

RF2360

Absolute Maximum Ratings

Parameter	Rating	Unit
Device Current	175	mA
Device Voltage	9	V
Input RF Power	+13	dBm
Output Load VSWR	20:1	
Ambient Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C



Caution! ESD sensitive device.

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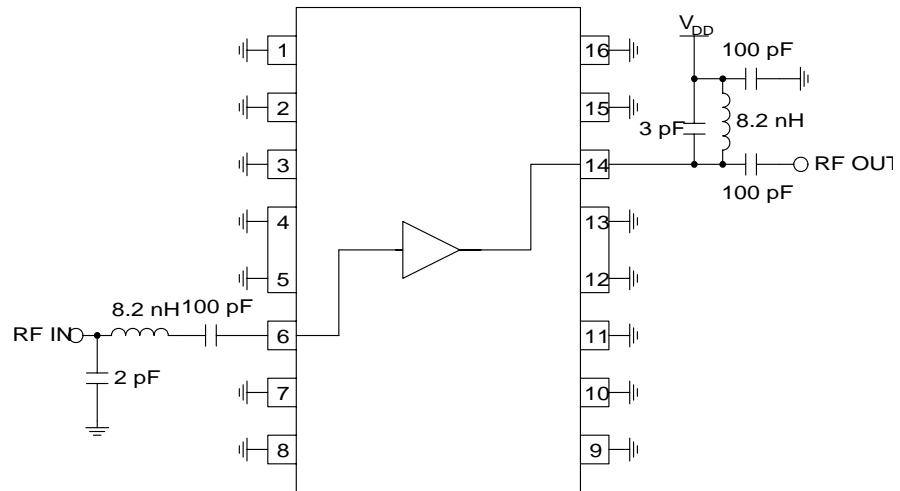
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall (50Ω)					T=25 °C, V _{DD} =7V, 50Ω System, P _{IN} =-8dBm
Frequency Range	5		1500	MHz	3dB Bandwidth
Input VSWR		1.6:1			Appropriate values for the output DC blocking capacitor and bias inductor are required to maintain this VSWR over the intended operating frequency range.
Output VSWR		1.2:1			See note for Input VSWR.
Gain		20		dB	At 500MHz
Gain Flatness		+/-0.9		dB	5MHz to 1000MHz
Noise Figure		1.2		dB	At 500MHz
Noise Figure		1.5		dB	From 5MHz to 1000MHz
Output IP ₃		33.7		dBm	At 10MHz, Delta F1 and F2 = 1MHz
Output IP ₃		37.2		dBm	At 500MHz
Output IP ₃		36.4		dBm	At 1000MHz
Output IP ₂		46.3		dBm	At 100MHz, Delta F1 and F2 = 156MHz
Output IP ₂		44.4		dBm	At 1000MHz
Output P _{1dB}		21		dBm	At 10MHz
Output P _{1dB}		24		dBm	At 500MHz
Output P _{1dB}		23.7		dBm	At 1000MHz
Reverse Isolation		24		dB	At 500MHz
					T=25 °C, V _{DD} =9V, P _{IN} =-8dBm
Gain		20		dB	At 500MHz
Gain Flatness		+/-0.9		dB	5MHz to 1000MHz
Noise Figure		1.1		dB	At 500MHz
Noise Figure		1.5		dB	From 5MHz to 1000MHz,
Output IP ₃		34.8		dBm	At 10MHz, Delta F1 and F2 = 1MHz
Output IP ₃		38.1		dBm	At 500MHz
Output IP ₃		38.7		dBm	At 1000MHz
Output IP ₂		44.1		dBm	At 100MHz, Delta F1 and F2 = 156MHz
Output IP ₂		48.6		dBm	At 1000MHz
Output P _{1dB}		22.5		dBm	At 10MHz
Output P _{1dB}		25.1		dBm	At 500MHz
Output P _{1dB}		25.3		dBm	At 1000MHz
Power Supply					
Supply Voltage (V _{DD})	6	7	9	V	

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall (75Ω)					
Frequency Range	5		1500	MHz	T=25°C, V _{DD} =7V, 75Ω System, P _{IN} =-8dBm 3dB Bandwidth Appropriate values for the output DC blocking capacitor and bias inductor are required to maintain this VSWR over the intended operating frequency range. See note for input VSWR. At 500MHz 5MHz to 1000MHz At 50MHz, Delta F1 and F2 = 1MHz At 500MHz At 500MHz, Delta F1 and F2 = 55.25MHz At 10MHz At 500MHz At 1000MHz
Input VSWR		1.6:1			
Output VSWR		1.3:1			
Gain		20		dB	
Gain Flatness		±0.5		dB	
Output IP ₃		36.8		dBm	
		36.0		dBm	
Output IP ₂		50.1		dBm	
Output IP _{1dB}		21		dBm	
		23		dBm	
Operating Current Range	100	104	109	mA	
110 Channels					10dBmV per channel, flat, at the input of the amplifier; V _{CC} =7V, I _{CC} =120mA At 55.25MHz At 331.25MHz At 547.25MHz At 55.25MHz At 331.25MHz At 547.25MHz At 55.25MHz At 331.25MHz At 547.25MHz At 55.25MHz At 331.25MHz At 547.25MHz
CTB		-75		dBc	
		-77		dBc	
CSO+1.25MHz		-75		dBc	
		-91		dBc	
		-60		dBc	
CSO-1.25MHz		-57		dBc	
		-55		dBc	
		-54		dBc	
		-56		dBc	
CNR		+66		dB	
		+65		dB	
		+65		dB	
Power Supply					
Supply Voltage (V _{DD})	6	7	9	V	
Operating Current Range	115	120	130	mA	

RF2360

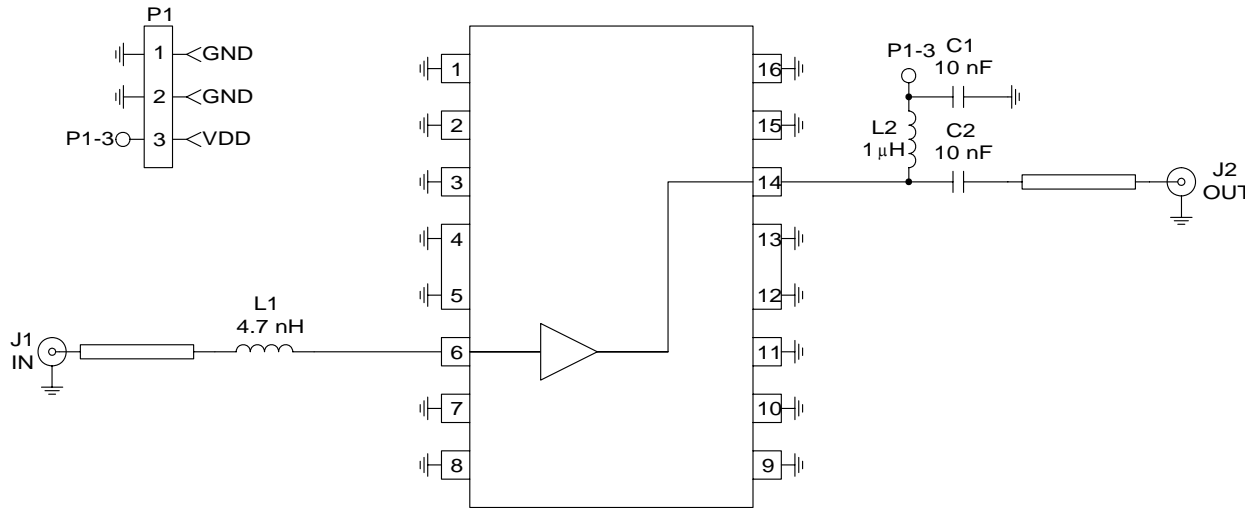
Pin	Function	Description	Interface Schematic
1	NC	No connection. This pin should be connected to the ground plane.	
2	NC	Same as pin 1.	
3	GND	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance. Each ground pin should have a via to the ground plane.	
4	GND	Same as pin 3.	
5	GND	Same as pin 3.	
6	RF IN	RF input pin. This pin is internally DC blocked. An external DC blocking capacitor is not required.	
7	NC	Same as pin 1.	
8	NC	Same as pin 1.	
9	NC	Same as pin 1.	
10	NC	Same as pin 1.	
11	NC	Same as pin 1.	
12	GND	Same as pin 3.	
13	GND	Same as pin 3.	
14	RF OUT	RF output and bias pin. Because DC is present on this pin, a DC blocking capacitor, suitable for the frequency of operation, should be used in most applications. For biasing, only an RF choke is needed.	
15	NC	Same as pin 1.	
16	NC	Same as pin 1.	

Application Schematic 869-894 MHz Narrowband Operation



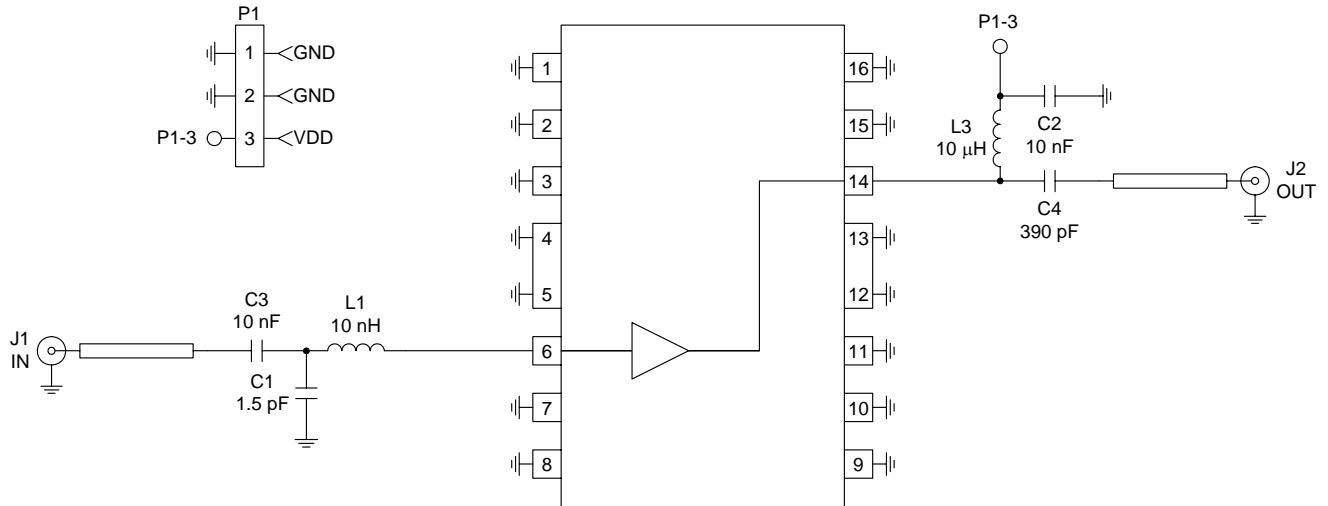
RF2360

Evaluation Board Schematic - 50Ω



2360400 Rev 1

Evaluation Board Schematic - 75Ω High Frequency (50MHz to 2000MHz)

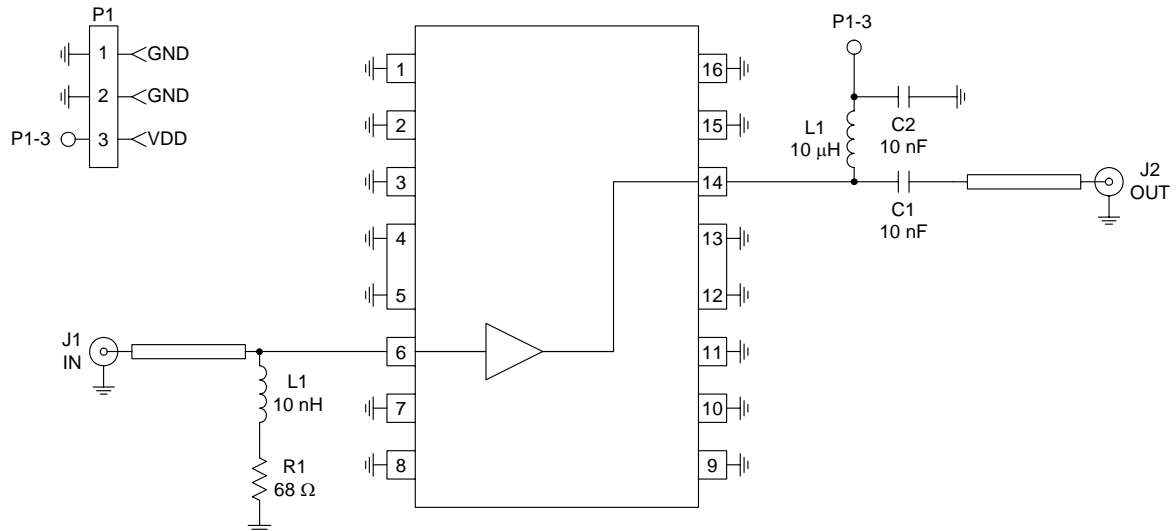


2360401-

NOTES:

J1 and J2 are 75 Ω F connectors.

Evaluation Board Schematic - 75Ω Low Frequency (5MHz to 200MHz)



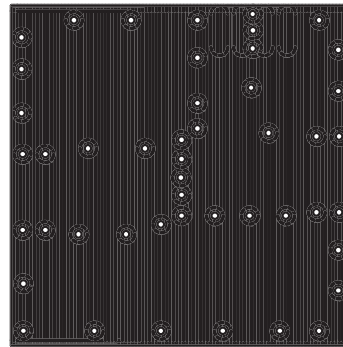
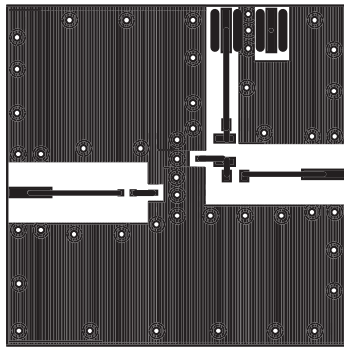
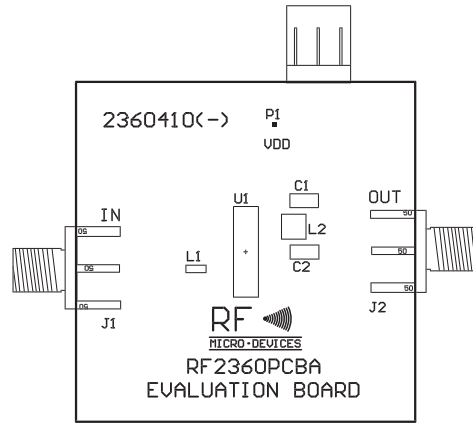
2360402-

NOTES:

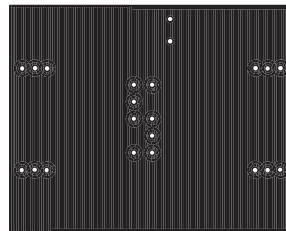
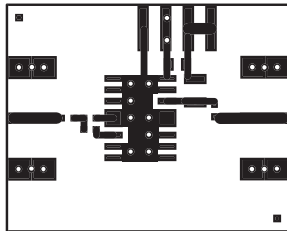
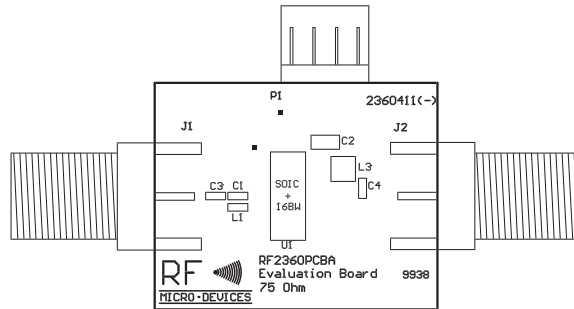
J1 and J2 are 75 Ω F connectors.

RF2360

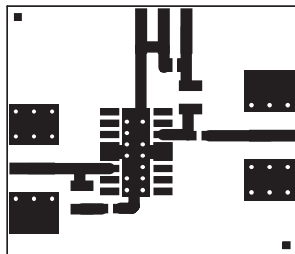
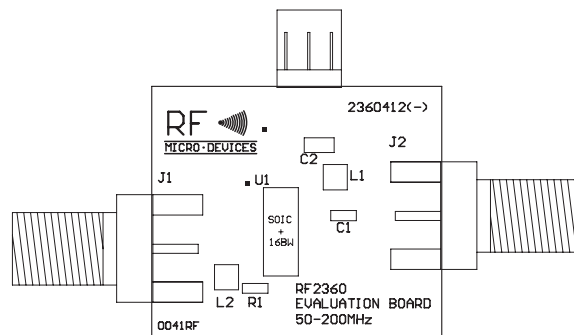
Evaluation Board Layout - 50Ω
Board Size 1.5" x 1.5"
Board Thickness 0.031", Board Material FR-4



Evaluation Board Layout - 75Ω High Frequency (50MHz to 2000MHz) Board Size 1.25" x 1.0" Board Thickness 0.062", Board Material FR-4

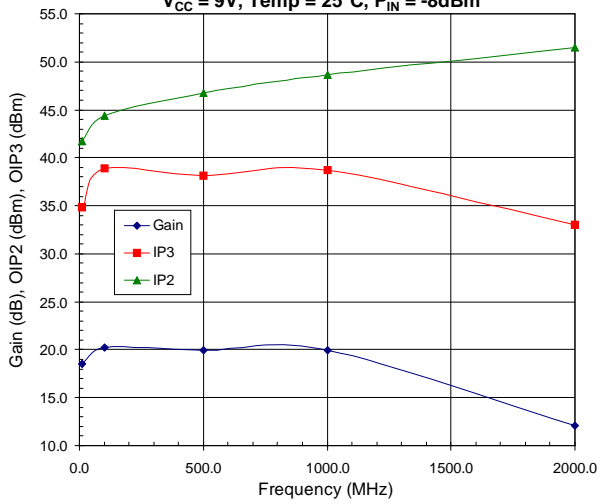


Evaluation Board Layout - 75Ω Low Frequency (5MHz to 200MHz)

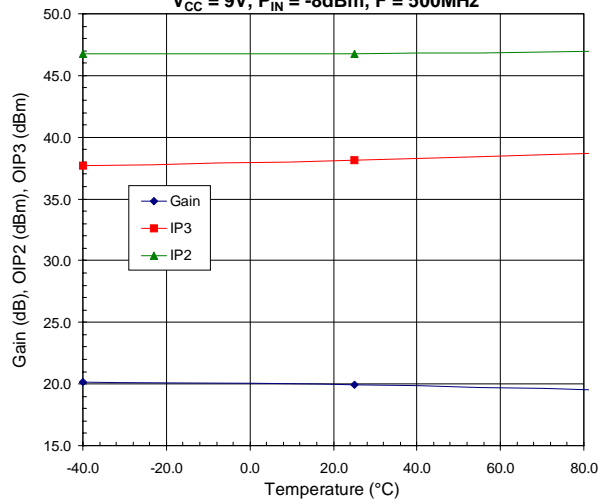


RF2360

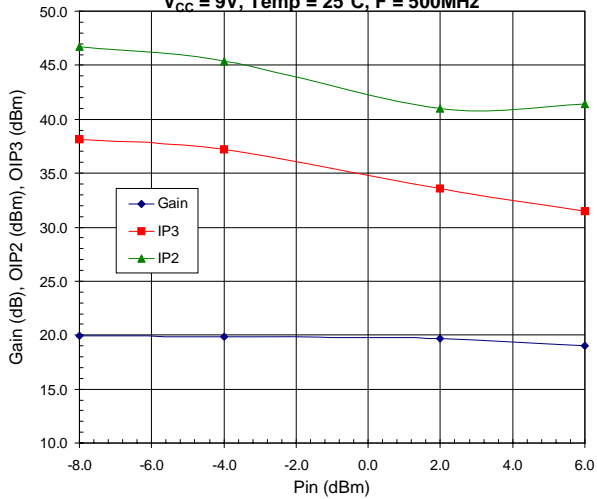
Gain, OIP2 and OIP3 versus Frequency
 $V_{CC} = 9V$, Temp = 25°C, $P_{IN} = -8dBm$



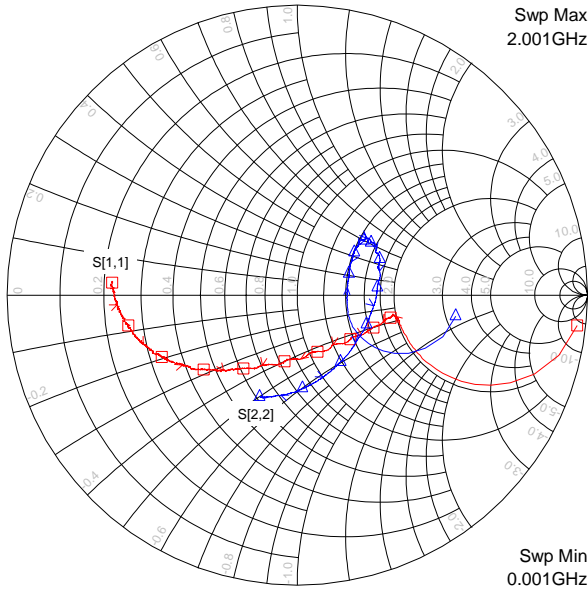
Gain, OIP2 and OIP3 versus Temperature
 $V_{CC} = 9V$, $P_{IN} = -8dBm$, F = 500MHz



Gain, OIP2 and OIP3 versus P_{IN}
 $V_{CC} = 9V$, Temp = 25°C, F = 500MHz



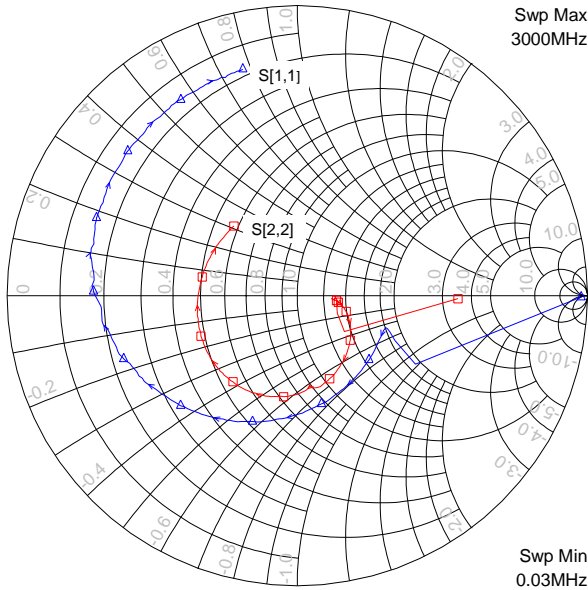
75 Ohm, 8V, 25°C



Swp Max
2.001GHz

Swp Min
0.001GHz

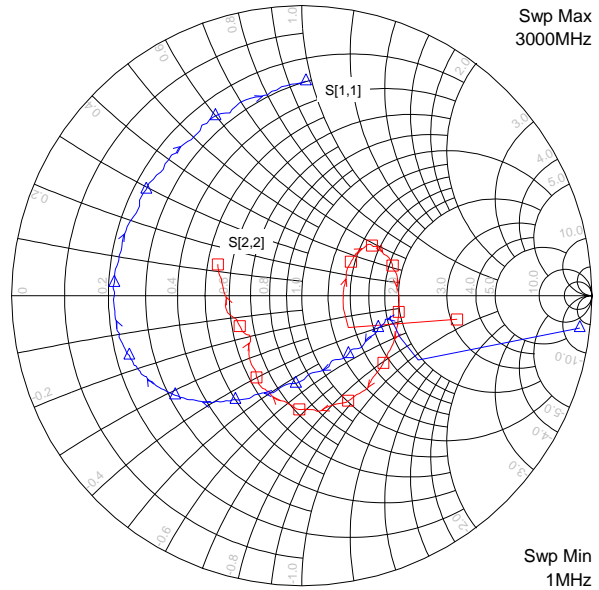
50 Ohm, 8V – Return Loss



Swp Max
3000MHz

Swp Min
0.03MHz

75 Ohm, 8V – Return Loss



Swp Max
3000MHz

Swp Min
1MHz

RF2360