

RoHS Compliant & Pb-Free Product
Package Style: Standard Batwing

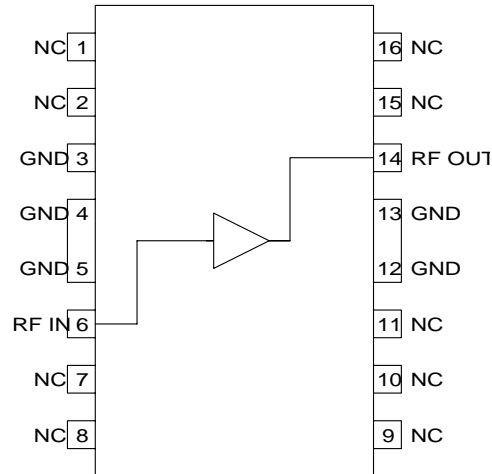


Features

- 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

Applications

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



Functional Block Diagram

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.

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

Optimum Technology Matching® Applied

- | | | | |
|---|--------------------------------------|-------------------------------------|-----------------------------------|
| <input type="checkbox"/> GaAs HBT | <input type="checkbox"/> SiGe BiCMOS | <input type="checkbox"/> GaAs pHEMT | <input type="checkbox"/> GaN HEMT |
| <input checked="" 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
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.

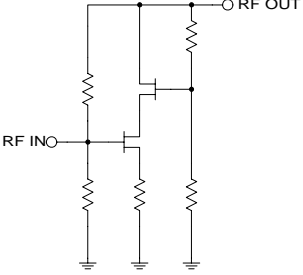
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EU Directive 2002/95/EC (at time of this document revision).

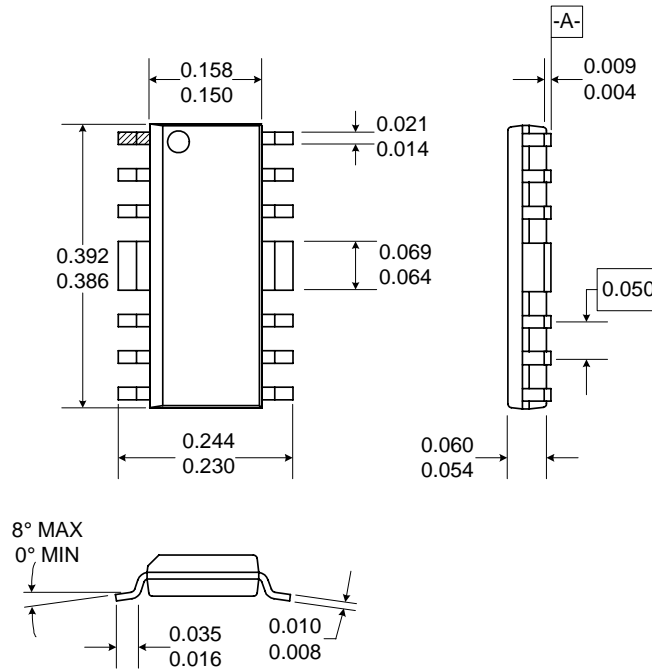
The information in this publication is believed to be accurate and reliable. However, no responsibility is assumed by RF Micro Devices, Inc. ("RFMD") for its use, nor for any infringement of patents, or other rights of third parties, resulting from its use. No license is granted by implication or otherwise 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 (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	

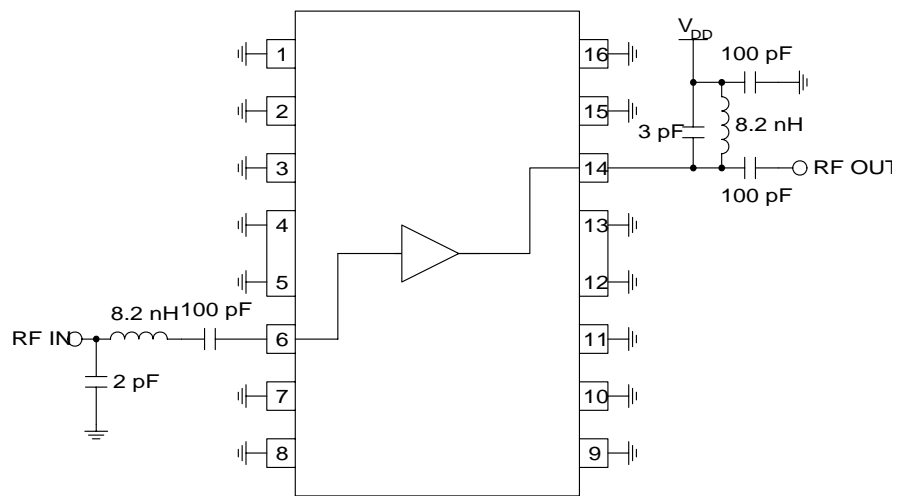
Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall (75Ω)					T=25°C, V _{DD} =7V, 75Ω System, P _{IN} =-8dBm
Frequency Range	5		1500	MHz	3dB Bandwidth
Input VSWR		1.6:1			Appropriate values for the output DC blocking capacitor and bias inductor are required to maintain this VSWR over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

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.	

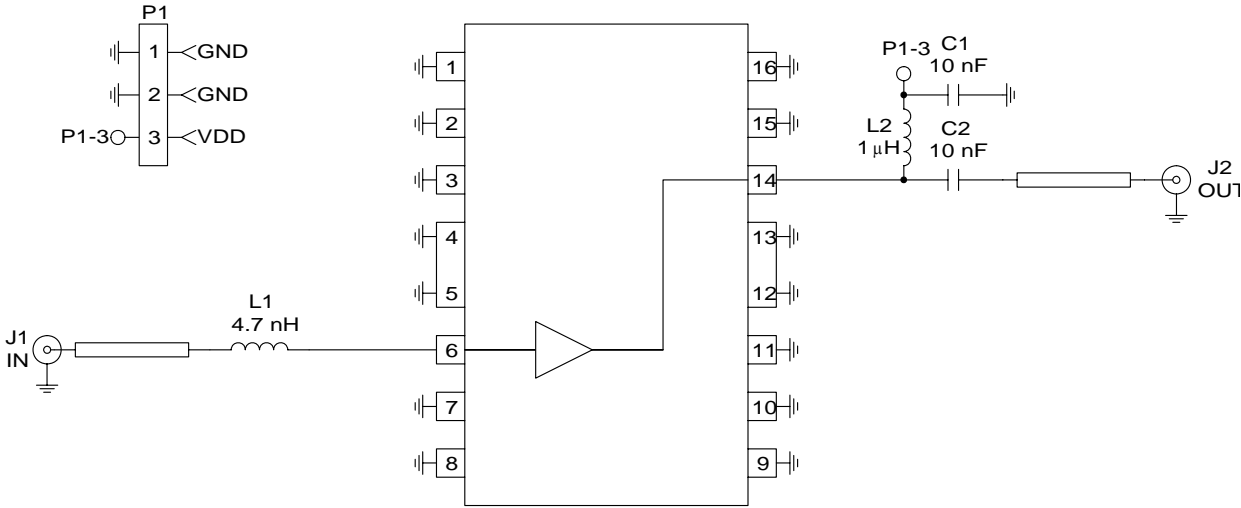
Package Drawing



Application Schematic
869-894 MHz Narrowband Operation

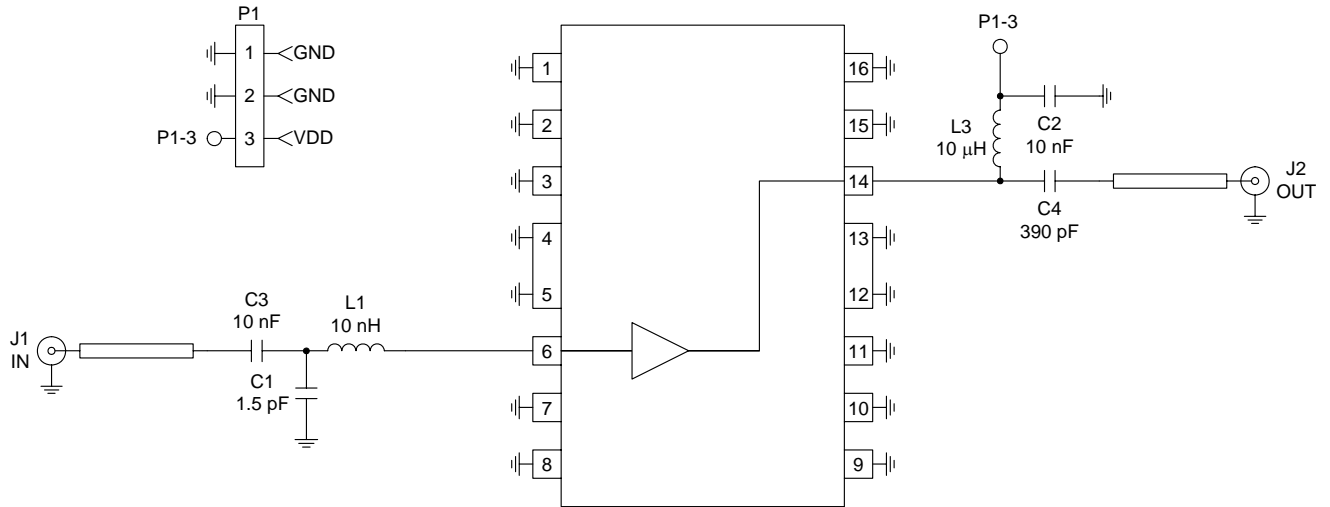


Evaluation Board Schematic - 50Ω



2360400 Rev 1

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

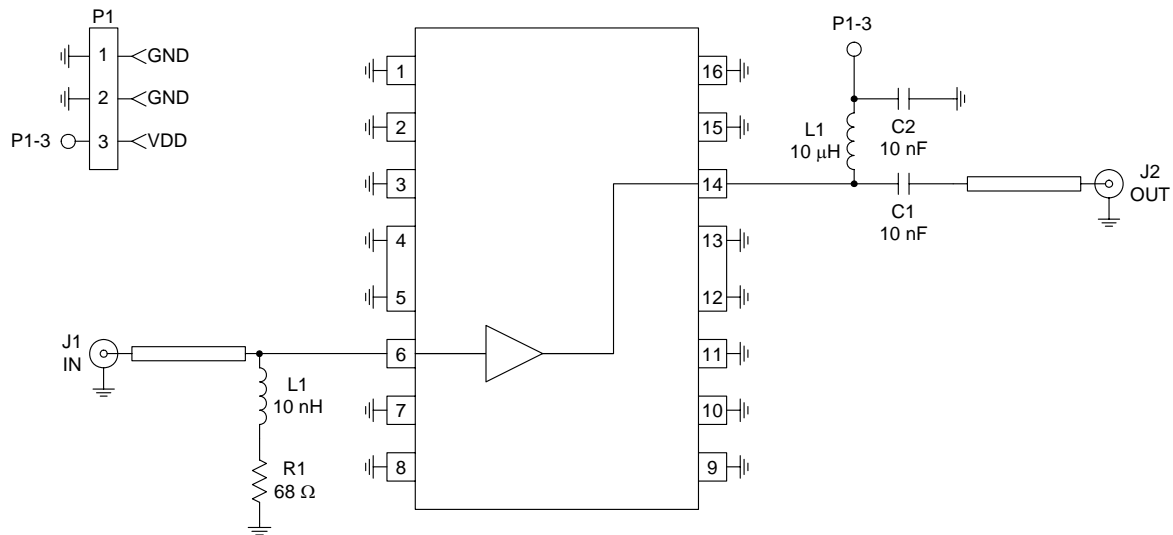


2360401-

NOTES:

J1 and J2 are 75 Ω F connectors.

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

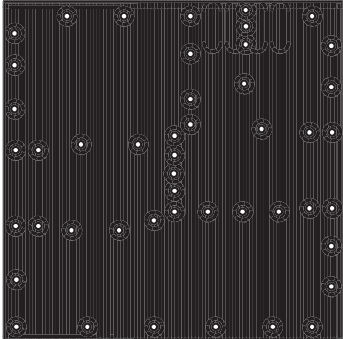
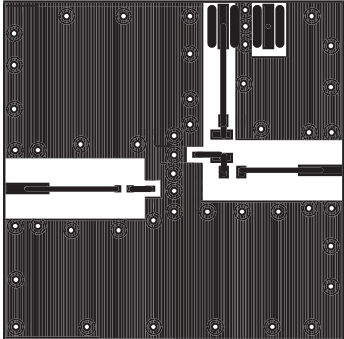
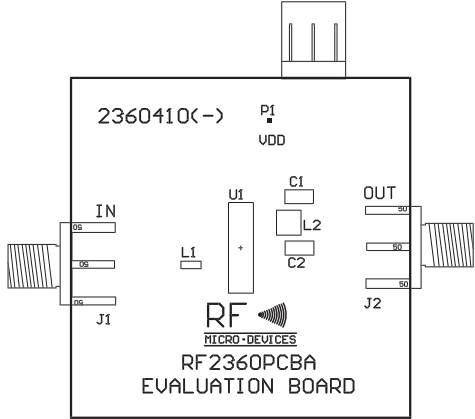


2360402-

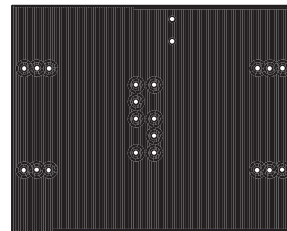
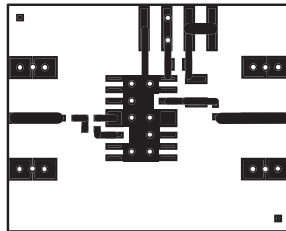
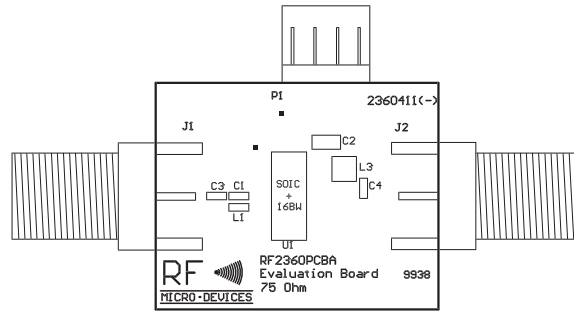
NOTES:

J1 and J2 are 75 Ω F connectors.

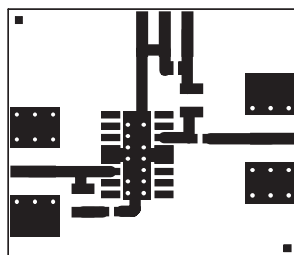
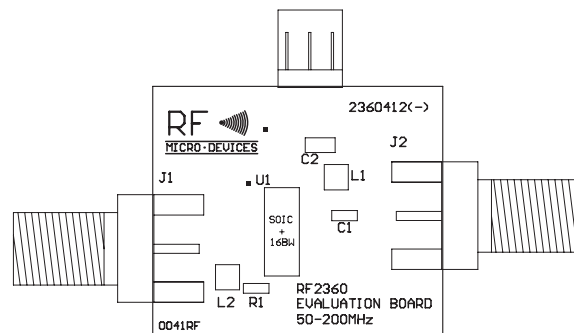
Evaluation Board Layout - 50Ω
Board Size 1.5" x 1.5"
Board Thickness 0.031", Board Material FR-4

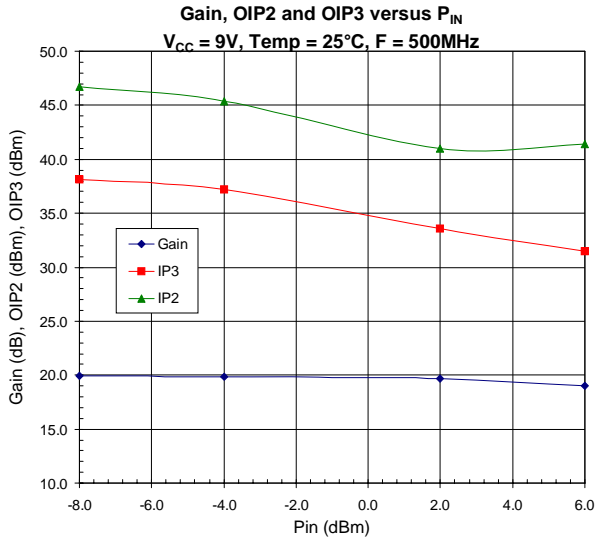
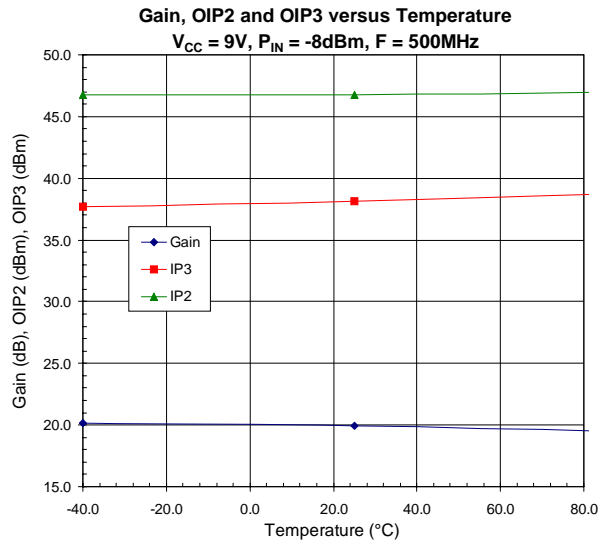
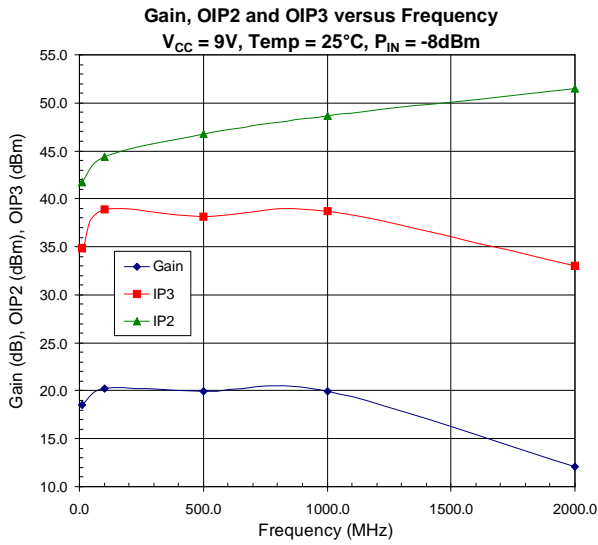


**Evaluation Board Layout - 75Ω High Frequency
(50MHz to 2000MHz)
Board Size 1.25" x 1.0"
Board Thickness 0.062", Board Material FR-4**

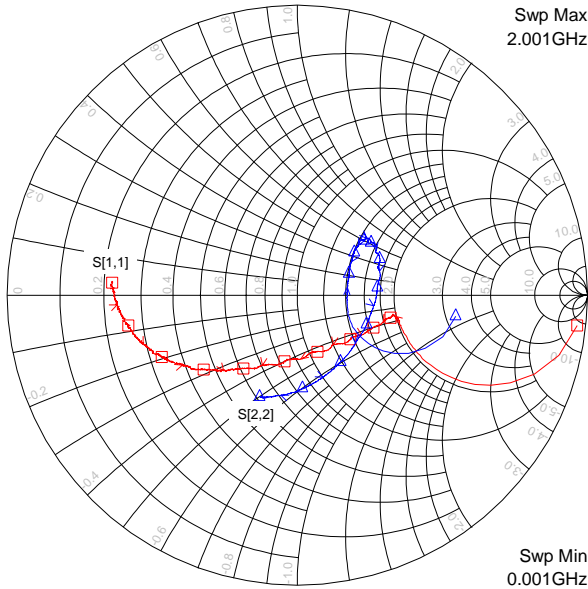


**Evaluation Board Layout - 75Ω Low Frequency
(5MHz to 200MHz)**





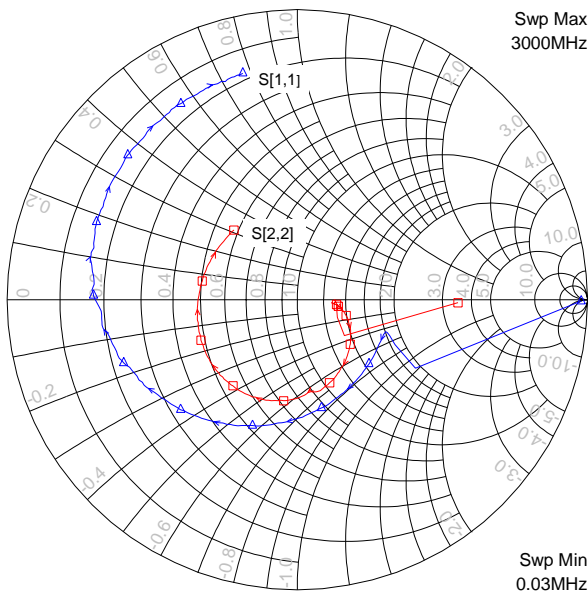
75 Ohm, 8V, 25°C



Swp Max
2.001GHz

Swp Min
0.001GHz

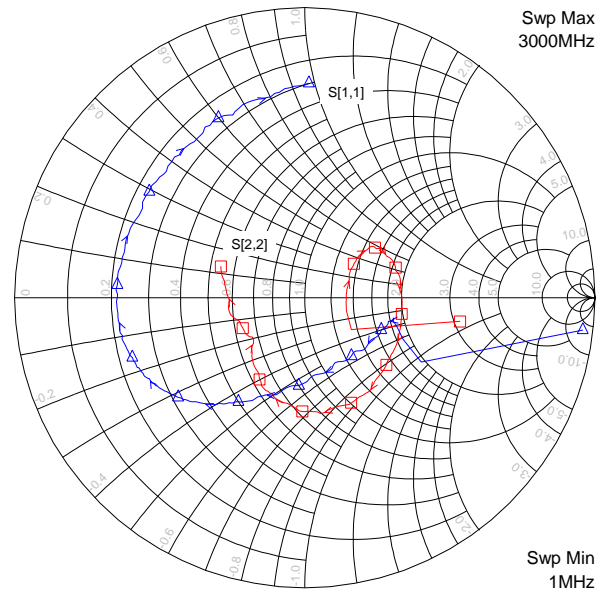
50 Ohm, 8V – Return Loss



Swp Max
3000MHz

Swp Min
0.03MHz

75 Ohm, 8V – Return Loss



Swp Max
3000MHz

Swp Min
1MHz

RoHS* Banned Material Content

RoHS Compliant: yes
 Package total weight in gram 0.139
 Compliance Date Code: 0435
 Bill of Materials Revision: -
 Pb Free Category: e3

Bill of Materials	Parts Per Million (PPM)					
	Pb	Cd	Hg	Cr VI	PBB	PBDE
Die	0	0	0	0	0	0
Molding Compound	0	0	0	0	0	0
Lead Frame	0	0	0	0	0	0
Die Attach Epoxy	0	0	0	0	0	0
Wire	0	0	0	0	0	0
Solder Plating	0	0	0	0	0	0

This RoHS banned material content declaration was prepared solely on information, including analytical data, provided to RFMD by its suppliers, and applies to the Bill of Materials (BOM) revision noted

* DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment