![RFMD logo](rfmd.com)

RF2360
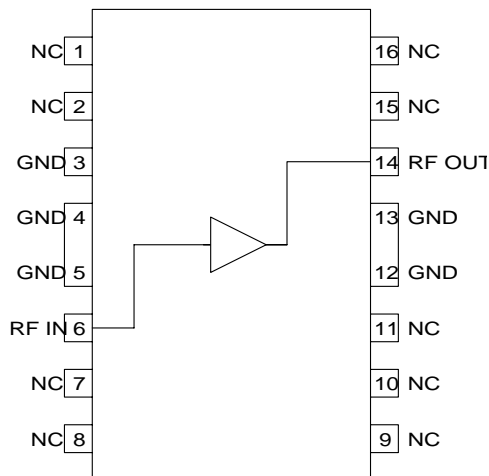## LINEAR GENERAL PURPOSE AMPLIFIER

Features

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

Applications

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

NC	1	16	NC
NC	2	15	NC
GND	3	14	RF OUT
GND	4	13	GND
GND	5	12	GND
RF IN	6	11	NC
NC	7	10	NC
NC	8	9	NC

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

☐ 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

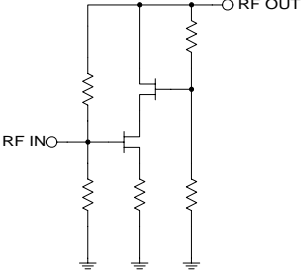| Parameter	Rating	Unit
Device Current	175	mA
Device Voltage	9	V
Input RF Power	+13	dBm
Output Load VSWR	20:1	
Ambient Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

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.

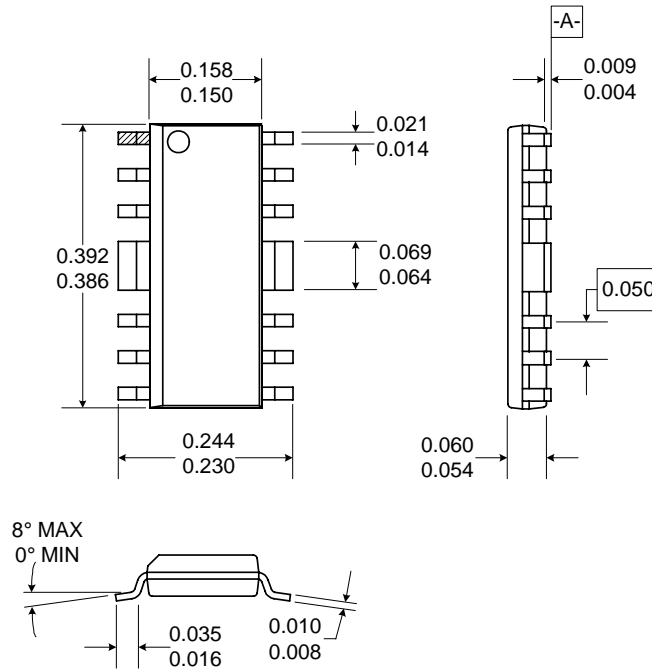RoHS status based on EU Directive 2002/95/EC (at time of this document revision).

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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 500 MHz
Gain Flatness		+/-0.9		dB	5 MHz to 1000 MHz
Noise Figure		1.2		dB	At 500 MHz
Noise Figure		1.5		dB	From 5 MHz to 1000 MHz
Output IP_3		33.7		dBm	At 10 MHz, Delta F1 and F2 = 1 MHz
Output IP_3		37.2		dBm	At 500 MHz
Output IP_3		36.4		dBm	At 1000 MHz
Output IP_2		46.3		dBm	At 100 MHz, Delta F1 and F2 = 156 MHz
Output IP_2		44.4		dBm	At 1000 MHz
Output P_{1dB}		21		dBm	At 10 MHz
Output P_{1dB}		24		dBm	At 500 MHz
Output P_{1dB}		23.7		dBm	At 1000 MHz
Reverse Isolation		24		dB	At 500 MHz
					T=25 °C, V_{DD}=9V, P_{IN}=-8dBm
Gain		20		dB	At 500 MHz
Gain Flatness		+/-0.9		dB	5 MHz to 1000 MHz
Noise Figure		1.1		dB	At 500 MHz
Noise Figure		1.5		dB	From 5 MHz to 1000 MHz,
Output IP_3		34.8		dBm	At 10 MHz, Delta F1 and F2 = 1 MHz
Output IP_3		38.1		dBm	At 500 MHz
Output IP_3		38.7		dBm	At 1000 MHz
Output IP_2		44.1		dBm	At 100 MHz, Delta F1 and F2 = 156 MHz
Output IP_2		48.6		dBm	At 1000 MHz
Output P_{1dB}		22.5		dBm	At 10 MHz
Output P_{1dB}		25.1		dBm	At 500 MHz
Output P_{1dB}		25.3		dBm	At 1000 MHz
Power Supply					
Supply Voltage (V_{DD})	6	7	9	V	

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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	5MHz 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 = 55.25MHz
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	

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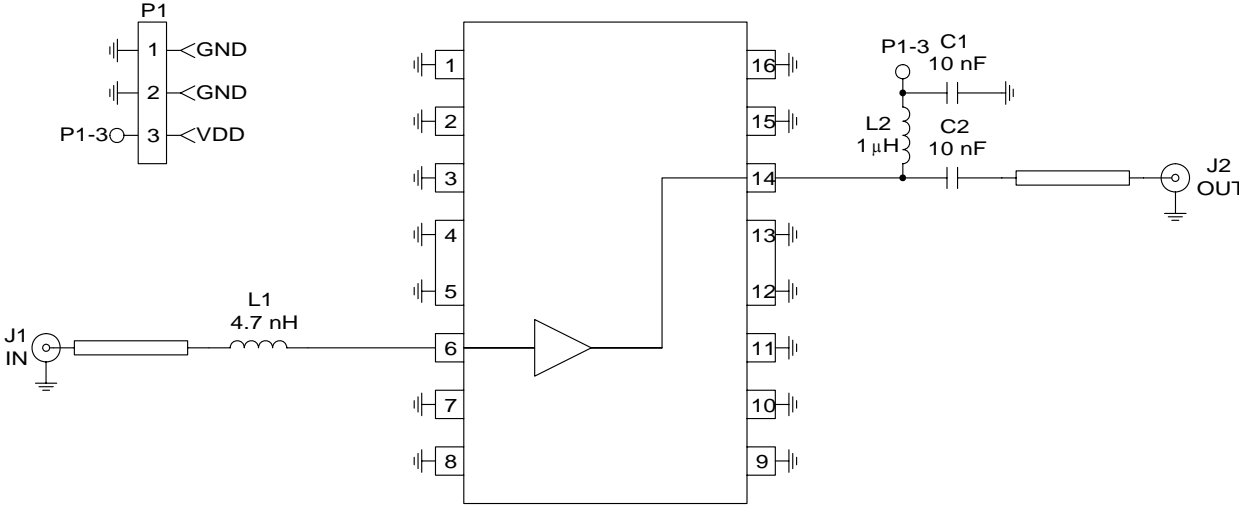| Pin	Function	Description	Interface Schematic
1	NC	No connection. This pin should be connected to the ground plane.	
2	NC	Same as pin 1.	
3	GND	Ground connection. Keep traces physically short and connect immediately to ground plane for best performance. Each ground pin should have a via to the ground 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
869-894MHz Narrowband Operation

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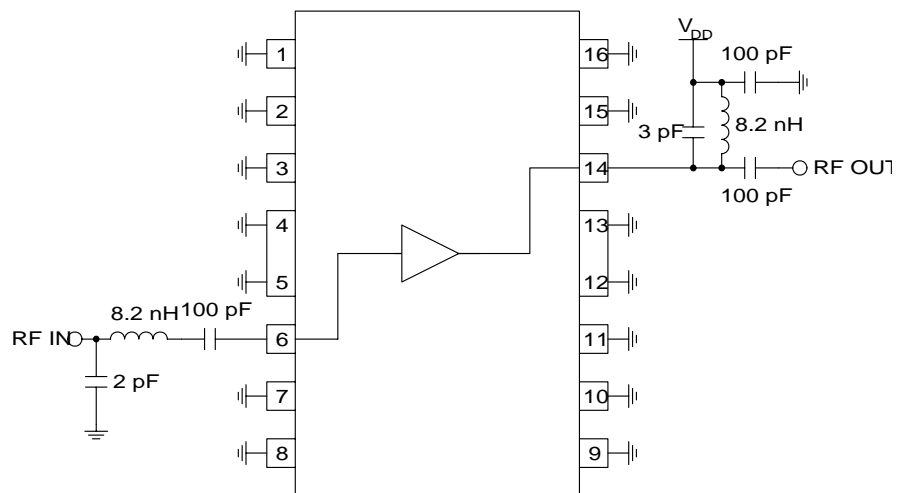
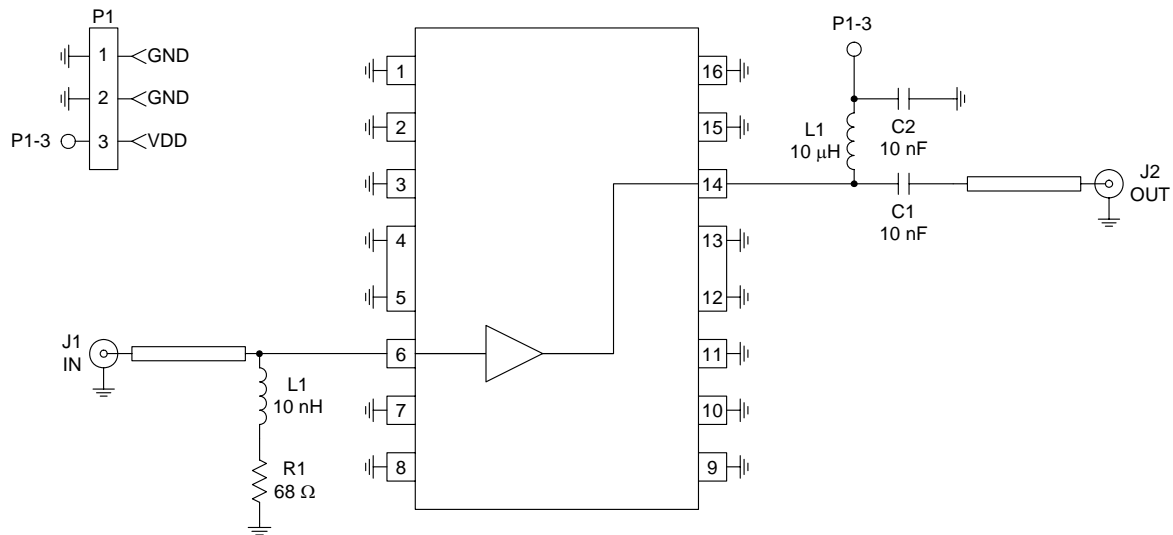## Evaluation Board Schematic - 50Ω

2360400 Rev 1

Rev A12 DS070731

Evaluation Board Schematic - 75Ω High Frequency
(50 MHz to 2000 MHz)
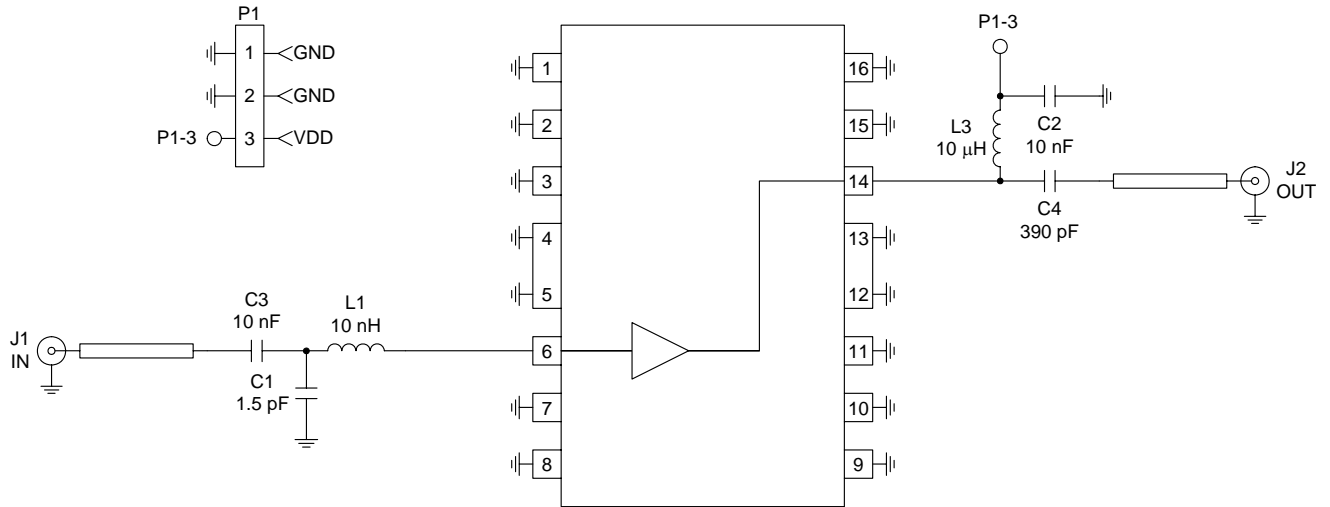
2360401-

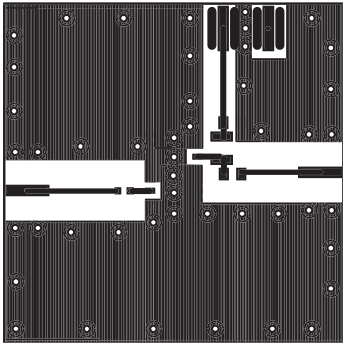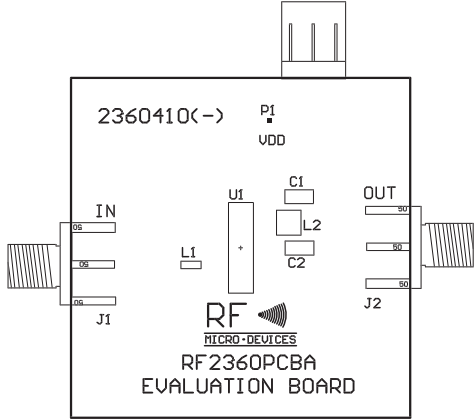**NOTES:**
J1 and J2 are 75 Ω F connectors.

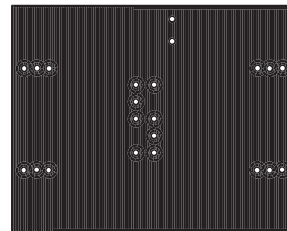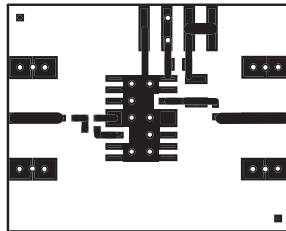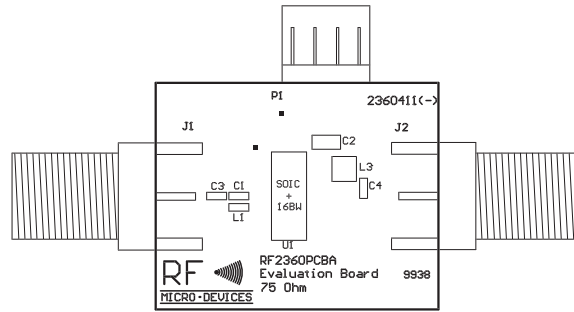## Evaluation Board Schematic - 75Ω Low Frequency
(5 MHz to 200 MHz)

2360402-

NOTES:
J1 and J2 are 75 Ω F connectors.

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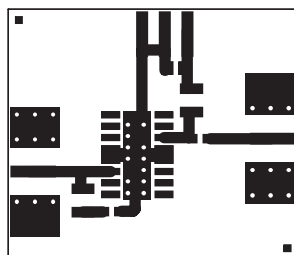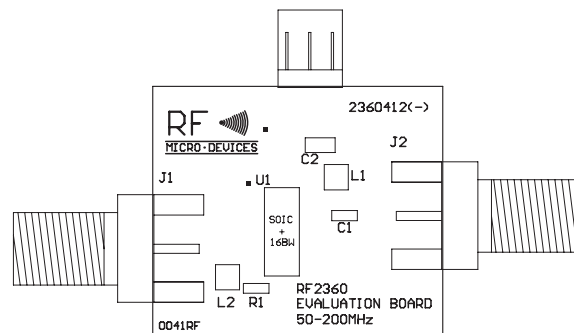
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Evaluation Board Layout - 50Ω
Board Size 1.5" x 1.5"
Board Thickness 0.031", Board Material FR-4

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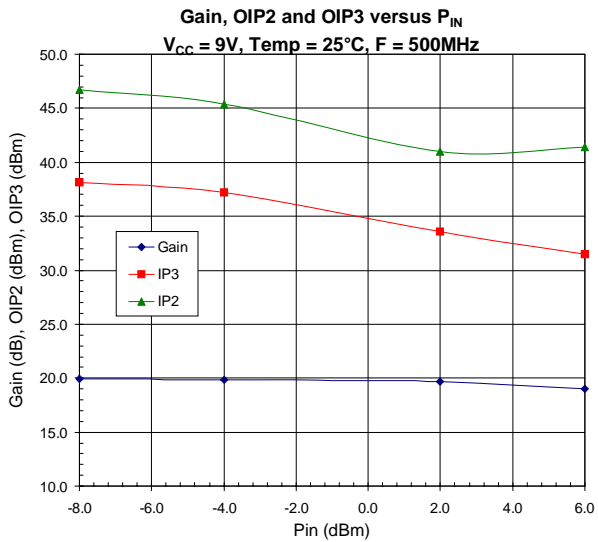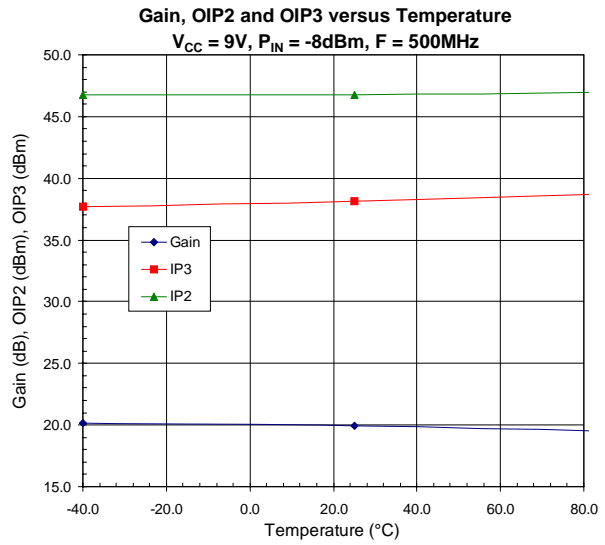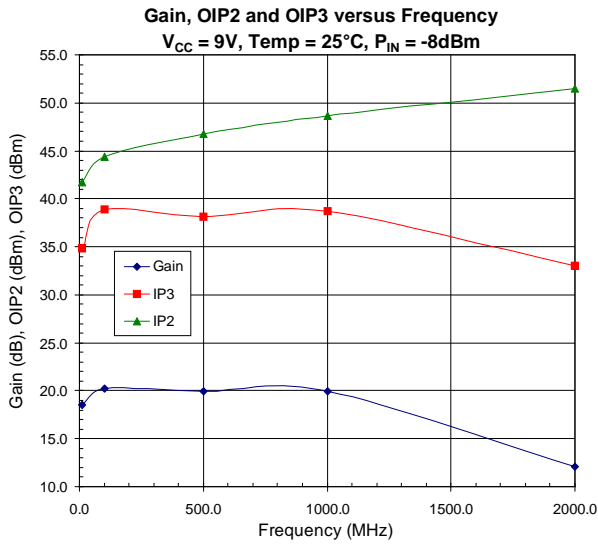
Rev A12 DS070731
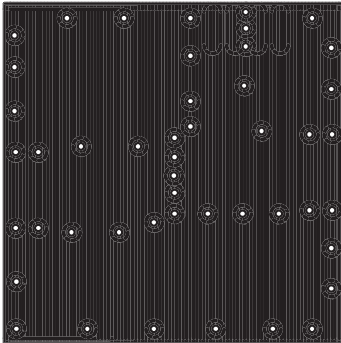
Evaluation Board Layout - 75Ω High Frequency (50MHz to 2000MHz)
Board Size 1.25" x 1.0"
Board Thickness 0.062", Board Material FR-4

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

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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

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75 Ohm, 8V, 25°C

Swp Max
2.001GHz

S[1,1]

S[2,2]
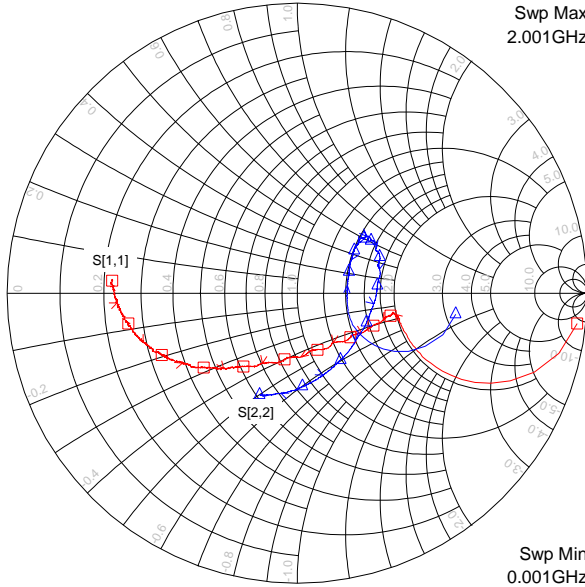
Swp Min
0.001GHz

50 Ohm, 8V – Return Loss

Swp Max
3000MHz

S[1,1]

S[2,2]
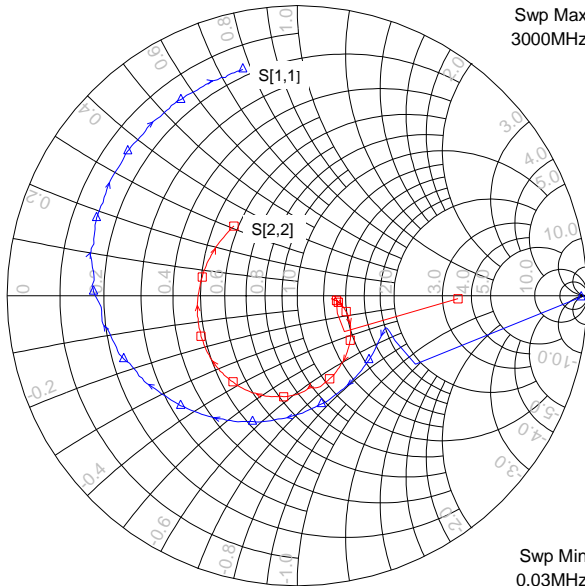
Swp Min
0.03MHz

75 Ohm, 8V – Return Loss

Swp Max
3000MHz

S[1,1]

S[2,2]

Swp Min
1MHz

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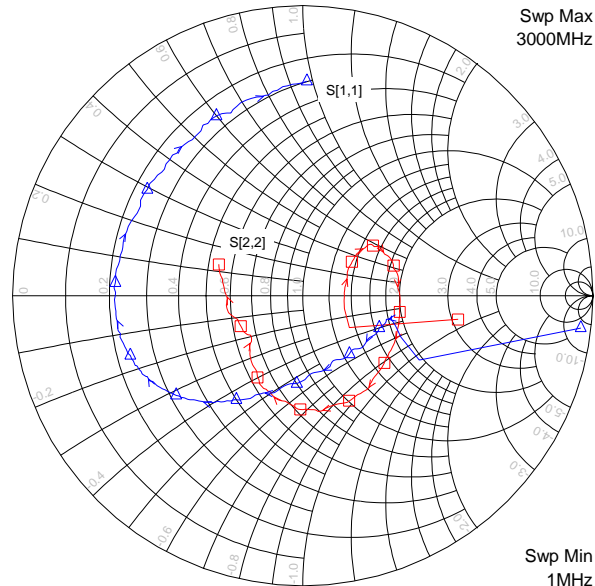
RoHS* Banned Material Content

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

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* 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

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