MMIC SURFACE MOUNT

Low Noise Amplifier

PSA2-6+

50Ω DC to 7000 MHz Low Current

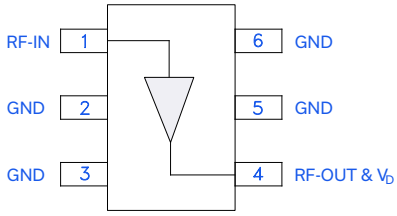
THE BIG DEAL

- Wide Bandwidth, DC to 7000 MHz
- Low Noise Figure, Typ. 2.4 dB
- High Gain, Typ. 15.2 dB
- Internally Matched to 50 Ohms
- Single +5 V Supply Voltage
- Low Current, Typ. 15 mA



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- 5G MIMO Radio Systems
- Test and Measurement Equipment
- Radar Systems

PRODUCT OVERVIEW

The PSA2-6+ is a wideband amplifier fabricated using GaAs HBT technology. This device offers +5.6 dBm P1dB, 15.2 dB gain, +17 dBm OIP3 and 2.4 dB NF making it ideal for use in communications applications, radar systems and broadband test and measurement equipment. It has repeatable performance from lot-to-lot and is packaged in a compact 1.85 x 2 mm 6-Lead, SOT-363.

KEY FEATURES

Features	Advantages
Broadband	A single amplifier covers DC to 7000 MHz, making this ideal for wideband Test and Measurement, Wireless Infrastructure, and Radar Systems.
Low Noise Figure, Typ. 2.4 dB	Low noise figure and low current (15 mA) makes this an ideal low noise amplifier in power sensitive applications.
High Gain, Typ. 15.2 dB	High gain helps limit the noise figure contribution of subsequent components.
SOT-363 Package	Tiny footprint saves space in dense layouts, while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

REV. B
ECO-026332
PSA2-6+
MCL NY
250812

Low Noise Amplifier

PSA2-6+

50Ω DC to 7000 MHz Low Current

ELECTRICAL SPECIFICATIONS[1] AT +25°C, V_S = +5 V, UNLESS NOTED OTHERWISE

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		DC		7000	MHz
Gain	100		22.2		dB
	1000		21.2		
	2000		19.2		
	4000		15.2		
	6000		11.6		
	7000		9.7		
Output Power at 1 dB Compression (P1dB)[2]	100		+4.5		dBm
	1000		+4.3		
	2000		+3.0		
	4000		+5.6		
	6000		+2.9		
	7000		+1.5		
Output Third-Order Intercept (P_{OUT} = -8 dBm/Tone)	100		+18		dBm
	1000		+19		
	2000		+17		
	4000		+17		
	6000		+14		
	7000		+12		
Input Return Loss	100		28		dB
	1000		25		
	2000		18		
	4000		13		
	6000		8		
	7000		6		
Output Return Loss	100		24		dB
	1000		16		
	2000		14		
	4000		11		
	6000		9		
	7000		8		
Isolation	100		24		dB
	1000		24		
	2000		23		
	4000		21		
	6000		20		
	7000		20		
Noise Figure	100		2.1		dB
	1000		2.1		
	2000		2.1		
	4000		2.4		
	6000		2.8		
	7000		3.2		
Device Supply Voltage (V_S)		+4.75	+5	+5.25	V
Device Operating Voltage (V_D)			+3.6		V
Device Operating Current (I_S)			15		mA
Device Current Variation vs. Temperature[3]			31		µA/°C
Device Current Variation vs. Voltage @ 25°C[4]			0.01		mA/mV

1. Tested on Mini-Circuits Characterization Test Board TB-MB-149C+. See Figure 3. De-embedded to the device reference plane.
2. Defined as Output Power at which Gain is compressed by 1 dB.
3. (Current at +85°C – Current at -45°C) / (130°C)
4. (Current at +5.25 V - Current at -4.75 V) / (+5.25 V - 4.75 V)

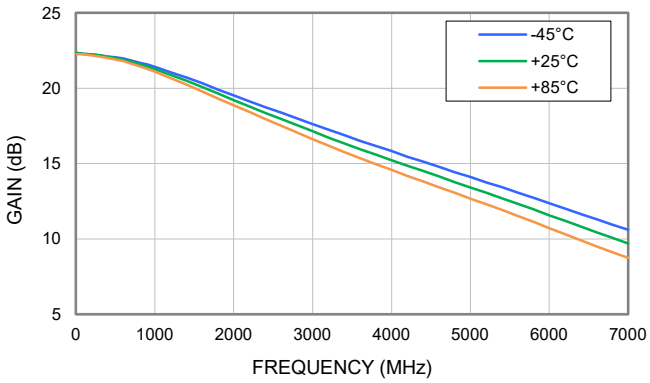
Low Noise Amplifier

PSA2-6+

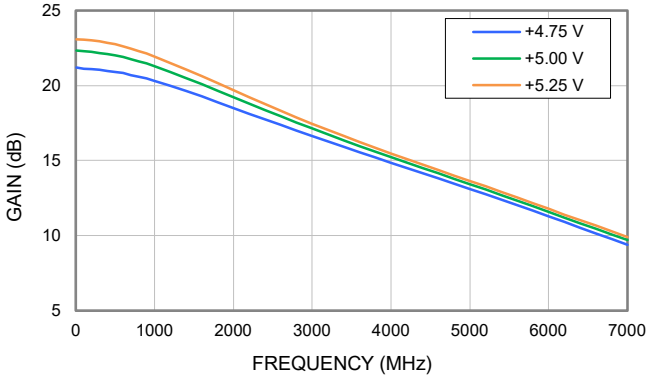
50Ω DC to 7000 MHz Low Current

TYPICAL PERFORMANCE GRAPHS

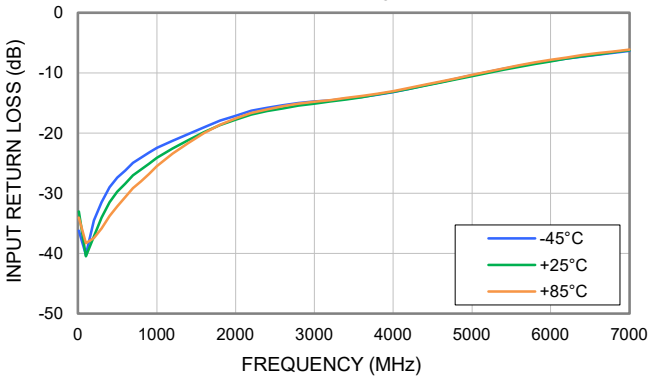
GAIN vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +5 V



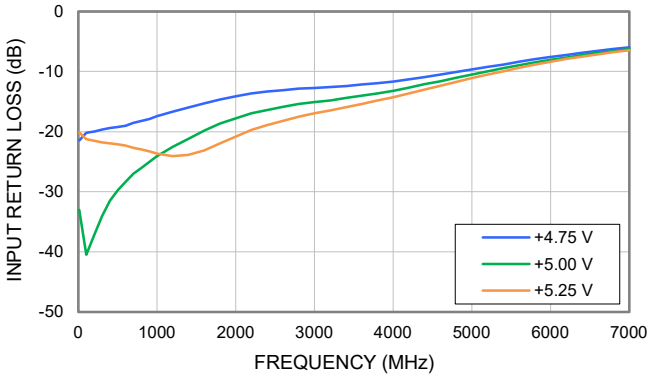
GAIN vs. V_S,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



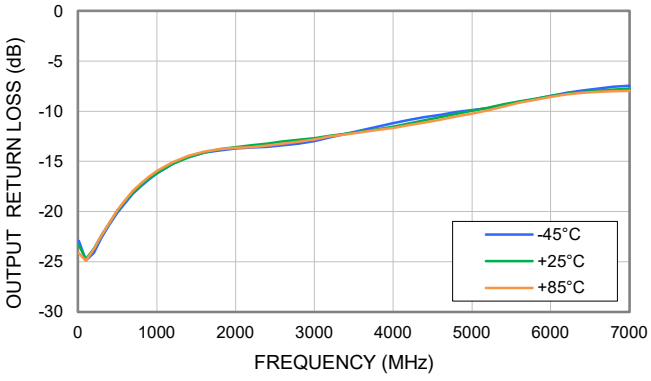
INPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +5 V



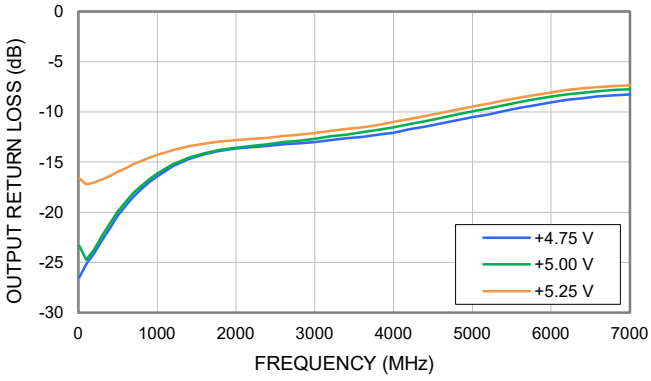
INPUT RETURN LOSS vs. V_S,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +5 V



OUTPUT RETURN LOSS vs. V_S,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



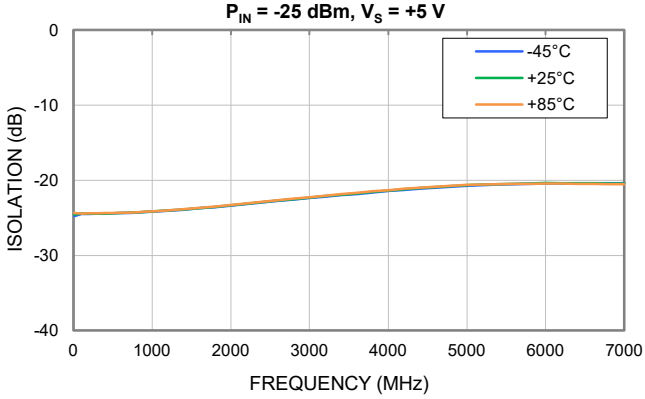
Low Noise Amplifier

PSA2-6+

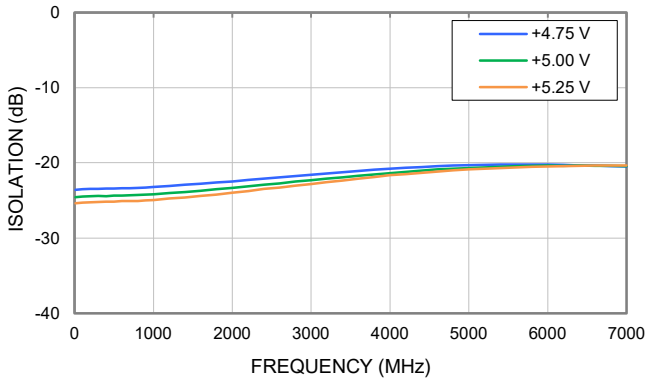
50Ω DC to 7000 MHz Low Current

TYPICAL PERFORMANCE GRAPHS

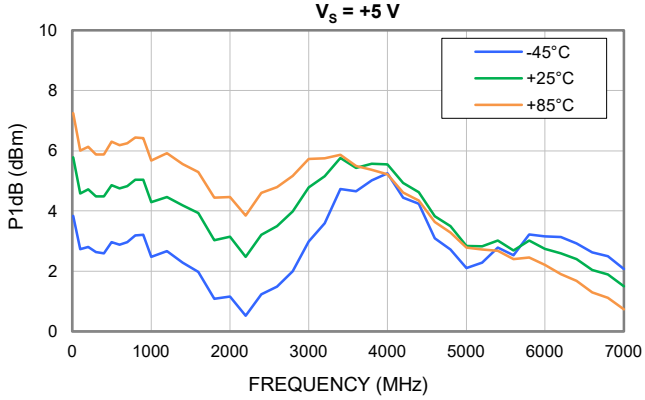
ISOLATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +5 V



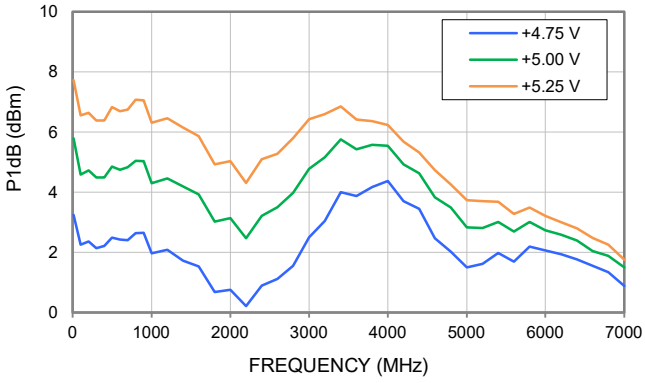
ISOLATION vs. V_S,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



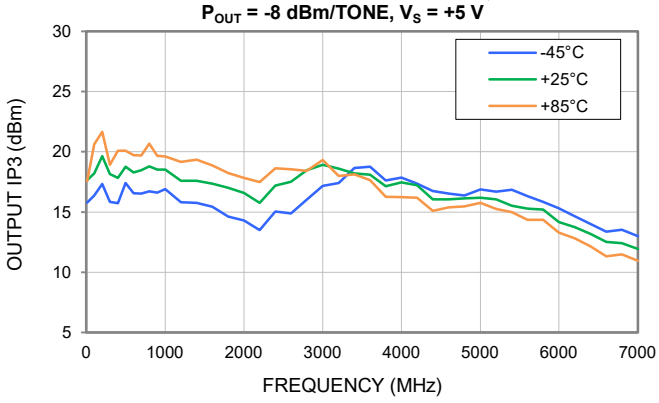
P1dB vs. TEMPERATURE,
V_S = +5 V



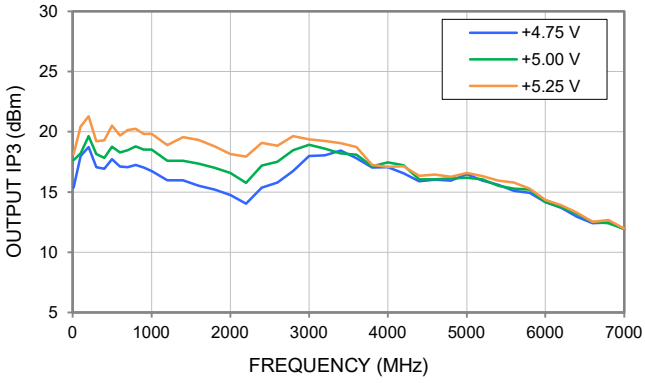
P1dB vs. V_S,
TEMPERATURE = +25°C



OUTPUT IP3 vs. TEMPERATURE,
P_{OUT} = -8 dBm/TONE, V_S = +5 V



OUTPUT IP3 vs. V_S,
P_{OUT} = -8 dBm/TONE, TEMPERATURE = +25°C



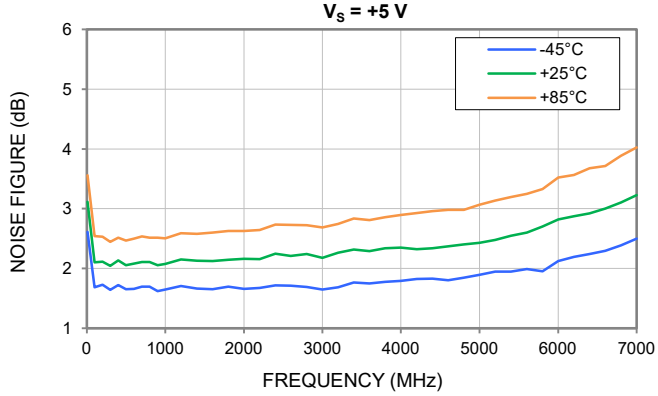
Low Noise Amplifier

PSA2-6+

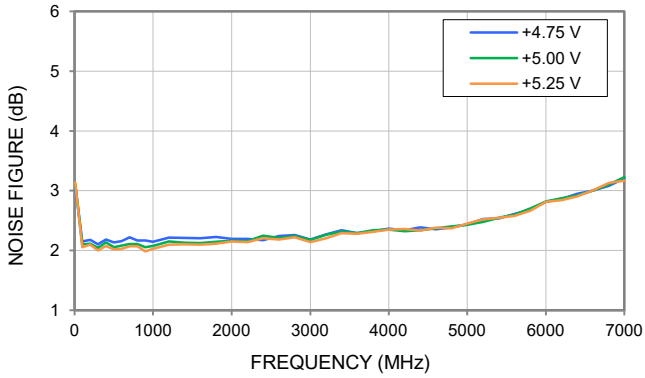
50Ω DC to 7000 MHz Low Current

TYPICAL PERFORMANCE GRAPHS

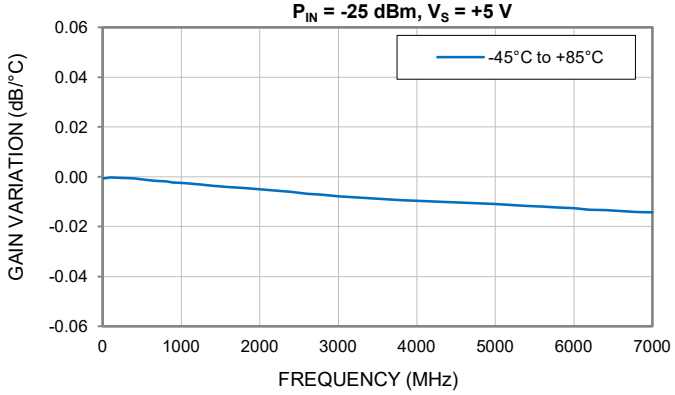
NOISE FIGURE vs. TEMPERATURE,
V_S = +5 V



NOISE FIGURE vs. V_S,
TEMPERATURE = +25°C



GAIN VARIATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +5 V



ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature (ground lead)	-45°C to +85°C
Storage Temperature	-65°C to +150°C
Junction Temperature[6]	+150°C
Total Power Dissipation	0.2 W
Input Power (CW), V_S = +5V	+25 dBm
DC Current on V_S (I_S)	50 mA

5. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.
6. Peak temperature on top of Die.

THERMAL RESISTANCE

Parameter	Ratings
Thermal Resistance (Θ_{JC})[7]	95°C/W

7. Θ_{JC}= (Hot Spot Temperature on Die - Temperature at Ground Lead)/Dissipated Power

ESD RATING

	Class	Voltage Range	Reference Standard
HBM	1C	1000 to < 2000 V	ANSI/ESDA/JEDEC JS-001-2017

ESD HANDLING PRECAUTION: This device is designed to be Class 1C for HBM. Static charges may easily produce potentials higher than this with improper handling and can discharge into DUT and damage it. As a preventive measure Industry standard ESD handling precautions should be used at all times to protect the device from ESD damage.

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

Low Noise Amplifier

PSA2-6+

50Ω DC to 7000 MHz Low Current

FUNCTIONAL DIAGRAM

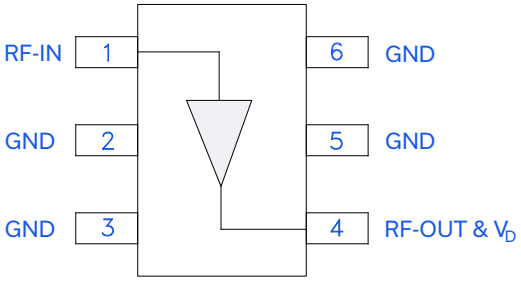


Figure 1. PSA2-6+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Application Description (Refer to Fig 2)
RF-IN	1	RF-IN Pad connects to RF input port.
RF-OUT & V_D	4	RF-OUT Pad connects to RF output and V_D port.
GND	2, 3, 5, 6	Connects to ground.

EVALUATION BOARD

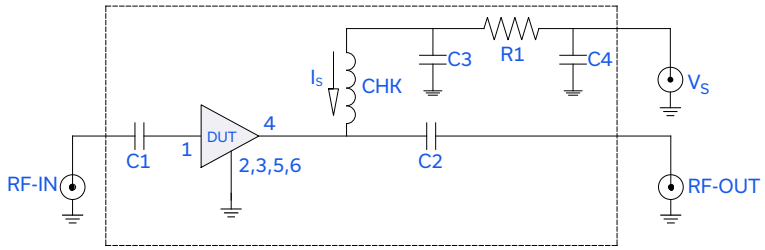


Figure 2. DUT soldered on Mini-Circuits Evaluation Board: TB-PSA2-6C+

Electrical Parameters and Conditions
Gain, Return Loss, Output Power at 1dB Compression (P1dB), Output IP3 (OIP3), and Noise Figure measured using N5247B PNA-X microwave network analyzer.

Conditions:
1. Gain and Return Loss: P_{IN} = -25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -8 dBm/tone at output.
3. V_S = +5 V

Component	Value	Size	Part Number	Manufacturer
C1, C2	2400 pF	0402	GRM155R71H242JA01D	Murata
C3	0.01 uF	0603	GRM1885C1H103JA01D	Murata
C4	0.1 uF	0603	GCJ188R71H104KA12D	Murata
R1	93.1 Ω	0805	ERJ-6ENF93R1V	Panasonic
CHK	-	0.15" x 0.15"	TCCH-80+	Mini-Circuits

CHARACTERIZATION BOARD

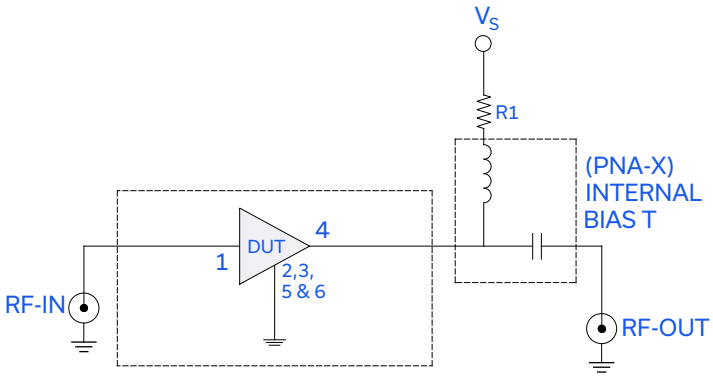


Figure 3. DUT soldered on Mini-Circuits Characterization Board TB-149C+

Electrical Parameters and Conditions
Gain, Return Loss, Output Power at 1dB Compression (P1dB), Output IP3 (OIP3), and Noise Figure measured using N5247B PNA-X microwave network analyzer.

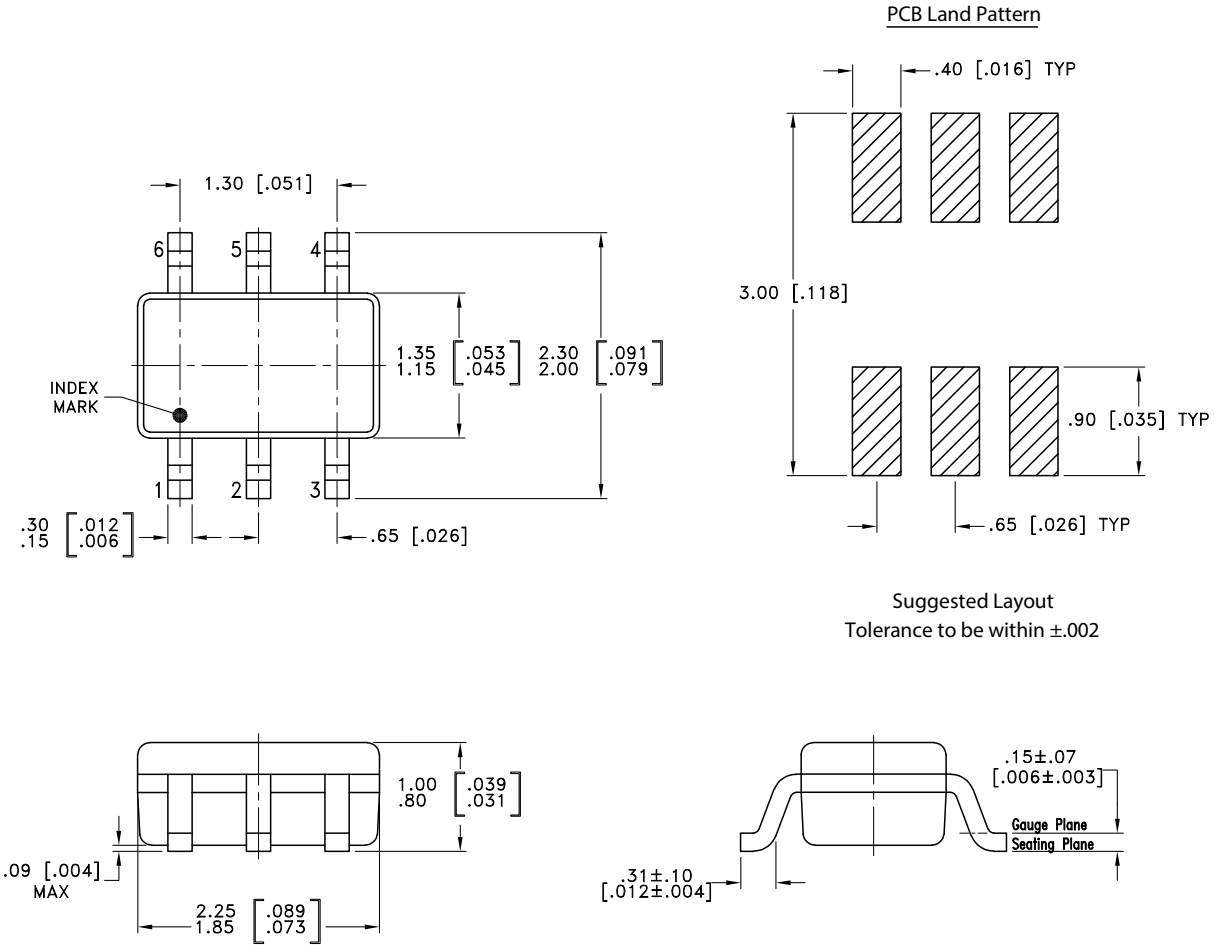
Conditions:
1. PNA Internal Bias T is required
2. Connect R1 = 93 Ω Series Resistor Between Power Supply and Bias T
3. Gain and Return Loss: P_{IN} = - 25 dBm
4. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -8 dBm/tone at output.
5. Vs = +5 V.

Low Noise Amplifier

PSA2-6+

50Ω DC to 7000 MHz Low Current

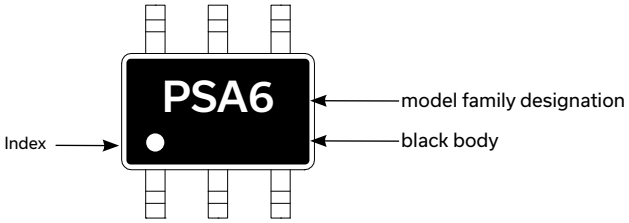
CASE STYLE DRAWING



Suggested Layout
Tolerance to be within ±.002

Weight: .010 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±0.25[0.01]; 3Pl.± 0.127 [0.005] mm [Inches]

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Low Noise Amplifier

PSA2-6+

50Ω DC to 7000 MHz Low Current

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	CA1389. Plastic molded SOT-363 package, Lead Finish: Matte Tin
RoHS Status	Compliant
Tape & Reel **Standard quantities available on reel**	F101 7" reels with 20, 50, 100, 200, 500, 1000, or 2000 devices
Suggested Layout for PCB Design	PL-770
Evaluation Board	TB-PSA2-6C+ Gerber File
Environmental Ratings	ENV08T02

NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +4.75 V, I_S = 12mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	21.2	23.6	21.5	26.5	1.04	0.42	15.4	3.3	3.1
100	21.1	23.5	20.2	25.2	1.03	0.42	18.0	2.2	2.2
200	21.1	23.5	20.0	24.1	1.03	0.42	18.7	2.4	2.2
300	21.0	23.5	19.7	22.8	1.03	0.43	17.1	2.1	2.1
400	21.0	23.5	19.4	21.6	1.03	0.44	16.9	2.2	2.2
500	20.9	23.4	19.2	20.3	1.03	0.44	17.7	2.5	2.1
600	20.8	23.4	19.0	19.4	1.02	0.45	17.1	2.4	2.2
700	20.7	23.3	18.5	18.5	1.02	0.46	17.1	2.4	2.2
800	20.6	23.3	18.2	17.7	1.02	0.47	17.2	2.6	2.2
900	20.5	23.3	17.9	17.0	1.02	0.48	17.0	2.6	2.2
1000	20.3	23.2	17.4	16.4	1.02	0.50	16.7	2.0	2.1
1200	20.0	23.1	16.7	15.4	1.01	0.53	16.0	2.1	2.2
1400	19.6	22.9	16.0	14.7	1.01	0.55	16.0	1.7	2.2
1600	19.3	22.8	15.3	14.2	1.00	0.58	15.5	1.5	2.2
1800	18.9	22.6	14.6	13.8	1.00	0.62	15.2	0.7	2.2
2000	18.5	22.5	14.1	13.6	1.00	0.64	14.8	0.8	2.2
2200	18.1	22.3	13.6	13.5	1.01	0.67	14.0	0.2	2.2
2400	17.7	22.1	13.3	13.4	1.01	0.69	15.4	0.9	2.2
2600	17.4	21.9	13.1	13.2	1.01	0.71	15.8	1.1	2.2
2800	17.0	21.7	12.9	13.1	1.02	0.72	16.7	1.6	2.3
3000	16.6	21.6	12.7	13.0	1.03	0.74	18.0	2.5	2.2
3200	16.3	21.4	12.6	12.8	1.03	0.75	18.0	3.0	2.3
3400	15.9	21.2	12.4	12.7	1.04	0.76	18.4	4.0	2.3
3600	15.6	21.1	12.2	12.5	1.05	0.78	17.8	3.9	2.3
3800	15.2	20.9	11.9	12.3	1.06	0.79	17.0	4.2	2.3
4000	14.9	20.8	11.7	12.1	1.07	0.80	17.0	4.4	2.4
4200	14.5	20.7	11.3	11.7	1.07	0.81	16.5	3.7	2.3
4400	14.2	20.5	10.9	11.5	1.08	0.82	15.9	3.5	2.4
4600	13.8	20.4	10.5	11.2	1.09	0.83	16.0	2.5	2.4
4800	13.5	20.4	10.1	10.8	1.09	0.84	15.9	2.0	2.4
5000	13.1	20.3	9.7	10.5	1.10	0.86	16.5	1.5	2.4
5200	12.8	20.2	9.2	10.2	1.11	0.87	15.9	1.6	2.5
5400	12.4	20.2	8.8	9.9	1.12	0.88	15.6	2.0	2.5
5600	12.0	20.2	8.4	9.6	1.13	0.90	15.1	1.7	2.6
5800	11.7	20.2	8.0	9.3	1.14	0.91	14.9	2.2	2.7
6000	11.3	20.2	7.6	9.1	1.16	0.93	14.2	2.1	2.8
6200	10.9	20.3	7.2	8.8	1.17	0.94	13.7	1.9	2.9
6400	10.5	20.3	6.9	8.6	1.18	0.96	12.9	1.8	2.9
6600	10.1	20.4	6.6	8.5	1.20	0.98	12.4	1.6	3.0
6800	9.8	20.4	6.2	8.3	1.21	1.00	12.5	1.3	3.1
7000	9.4	20.5	6.0	8.2	1.23	1.02	11.9	0.9	3.2

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5 V, I_S = 15mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	22.3	24.6	33.0	23.3	1.03	0.39	17.6	5.8	3.1
100	22.3	24.5	40.5	24.7	1.03	0.39	18.2	4.6	2.1
200	22.2	24.4	37.2	23.7	1.03	0.39	19.6	4.7	2.1
300	22.2	24.4	34.1	22.4	1.03	0.40	18.1	4.5	2.0
400	22.1	24.4	31.5	21.1	1.03	0.41	17.8	4.5	2.1
500	22.0	24.4	29.8	19.9	1.03	0.41	18.8	4.9	2.1
600	21.9	24.3	28.4	19.0	1.03	0.42	18.3	4.8	2.1
700	21.8	24.3	27.0	18.1	1.03	0.44	18.5	4.8	2.1
800	21.6	24.3	26.1	17.4	1.03	0.45	18.8	5.0	2.1
900	21.5	24.2	25.1	16.7	1.03	0.46	18.5	5.0	2.1
1000	21.3	24.2	24.1	16.2	1.03	0.48	18.5	4.3	2.1
1200	20.9	24.0	22.5	15.2	1.03	0.51	17.6	4.5	2.1
1400	20.5	23.9	21.2	14.6	1.03	0.53	17.6	4.2	2.1
1600	20.1	23.7	19.9	14.1	1.03	0.56	17.3	3.9	2.1
1800	19.6	23.5	18.7	13.8	1.04	0.59	17.0	3.0	2.1
2000	19.2	23.3	17.8	13.6	1.04	0.62	16.6	3.1	2.2
2200	18.8	23.1	16.9	13.4	1.05	0.64	15.7	2.5	2.2
2400	18.4	22.9	16.4	13.2	1.05	0.66	17.2	3.2	2.2
2600	18.0	22.7	15.9	13.0	1.06	0.68	17.5	3.5	2.2
2800	17.5	22.5	15.4	12.9	1.07	0.69	18.5	4.0	2.2
3000	17.1	22.3	15.1	12.7	1.07	0.71	18.9	4.8	2.2
3200	16.7	22.1	14.8	12.4	1.08	0.72	18.6	5.2	2.3
3400	16.3	21.9	14.4	12.2	1.09	0.73	18.2	5.8	2.3
3600	16.0	21.7	14.0	12.0	1.10	0.74	18.1	5.4	2.3
3800	15.6	21.5	13.6	11.8	1.11	0.75	17.1	5.6	2.3
4000	15.2	21.4	13.2	11.5	1.11	0.76	17.4	5.5	2.3
4200	14.9	21.2	12.7	11.2	1.12	0.77	17.2	4.9	2.3
4400	14.5	21.0	12.1	10.9	1.12	0.78	16.1	4.6	2.3
4600	14.2	20.9	11.6	10.6	1.13	0.79	16.1	3.8	2.4
4800	13.8	20.8	11.1	10.3	1.14	0.79	16.1	3.5	2.4
5000	13.4	20.7	10.5	9.9	1.14	0.80	16.2	2.8	2.4
5200	13.1	20.6	10.0	9.7	1.15	0.81	16.1	2.8	2.5
5400	12.7	20.5	9.5	9.3	1.16	0.82	15.5	3.0	2.5
5600	12.3	20.5	9.0	9.0	1.16	0.84	15.3	2.7	2.6
5800	12.0	20.4	8.5	8.7	1.17	0.85	15.2	3.0	2.7
6000	11.6	20.4	8.1	8.5	1.18	0.86	14.2	2.7	2.8
6200	11.2	20.4	7.7	8.3	1.19	0.88	13.7	2.6	2.9
6400	10.8	20.4	7.3	8.1	1.20	0.89	13.2	2.4	2.9
6600	10.4	20.4	6.9	7.9	1.21	0.91	12.5	2.0	3.0
6800	10.1	20.4	6.6	7.8	1.22	0.93	12.4	1.9	3.1
7000	9.7	20.4	6.3	7.8	1.23	0.95	11.9	1.5	3.2

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5.25 V, I_S = 18mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	23.1	25.4	20.1	16.6	1.03	0.37	18.1	7.7	3.1
100	23.1	25.3	21.3	17.2	1.03	0.37	20.4	6.6	2.1
200	23.0	25.2	21.5	17.0	1.03	0.37	21.3	6.6	2.1
300	22.9	25.2	21.7	16.7	1.03	0.38	19.2	6.4	2.0
400	22.9	25.2	22.0	16.4	1.03	0.38	19.3	6.4	2.1
500	22.7	25.2	22.1	16.0	1.03	0.39	20.5	6.8	2.0
600	22.6	25.1	22.3	15.6	1.03	0.40	19.7	6.7	2.0
700	22.5	25.1	22.7	15.2	1.03	0.42	20.1	6.7	2.1
800	22.3	25.0	23.0	14.9	1.03	0.43	20.2	7.1	2.1
900	22.1	25.0	23.3	14.6	1.03	0.44	19.8	7.1	2.0
1000	21.9	24.9	23.7	14.3	1.04	0.46	19.8	6.3	2.0
1200	21.5	24.8	24.1	13.8	1.04	0.49	18.9	6.5	2.1
1400	21.1	24.6	23.9	13.4	1.04	0.52	19.6	6.2	2.1
1600	20.6	24.4	23.1	13.2	1.05	0.54	19.3	5.9	2.1
1800	20.1	24.2	22.0	13.0	1.06	0.57	18.8	4.9	2.1
2000	19.7	24.0	20.9	12.8	1.06	0.60	18.1	5.0	2.1
2200	19.2	23.7	19.7	12.7	1.07	0.62	17.9	4.3	2.1
2400	18.8	23.5	18.9	12.6	1.08	0.64	19.1	5.1	2.2
2600	18.3	23.3	18.2	12.4	1.08	0.66	18.8	5.3	2.2
2800	17.9	23.0	17.5	12.3	1.09	0.67	19.6	5.8	2.2
3000	17.5	22.8	17.0	12.1	1.10	0.69	19.4	6.4	2.1
3200	17.0	22.6	16.5	11.9	1.11	0.70	19.2	6.6	2.2
3400	16.6	22.4	15.9	11.7	1.12	0.71	19.1	6.8	2.3
3600	16.2	22.1	15.4	11.5	1.13	0.72	18.7	6.4	2.3
3800	15.8	21.9	14.9	11.3	1.13	0.72	17.2	6.4	2.3
4000	15.5	21.7	14.3	11.0	1.13	0.73	17.1	6.2	2.3
4200	15.1	21.5	13.6	10.7	1.14	0.74	17.2	5.7	2.4
4400	14.7	21.3	13.0	10.4	1.15	0.74	16.4	5.3	2.3
4600	14.4	21.2	12.4	10.1	1.15	0.75	16.4	4.7	2.4
4800	14.0	21.0	11.7	9.8	1.16	0.76	16.3	4.3	2.4
5000	13.6	20.9	11.1	9.5	1.16	0.77	16.6	3.7	2.5
5200	13.3	20.8	10.5	9.2	1.17	0.77	16.3	3.7	2.5
5400	12.9	20.7	9.9	8.9	1.17	0.78	15.9	3.7	2.5
5600	12.5	20.6	9.4	8.6	1.18	0.79	15.8	3.3	2.6
5800	12.2	20.5	8.8	8.3	1.18	0.80	15.3	3.5	2.7
6000	11.8	20.5	8.4	8.1	1.19	0.81	14.4	3.2	2.8
6200	11.4	20.4	7.9	7.8	1.19	0.83	13.9	3.0	2.8
6400	11.0	20.4	7.5	7.7	1.20	0.84	13.3	2.8	2.9
6600	10.7	20.4	7.1	7.5	1.21	0.86	12.5	2.5	3.0
6800	10.3	20.4	6.8	7.4	1.22	0.88	12.7	2.3	3.1
7000	9.9	20.4	6.5	7.4	1.23	0.90	12.0	1.8	3.2

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +4.75 V, I_S = 10mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	20.7	23.3	17.6	22.1	1.04	0.45	15.0	0.7	2.6
100	20.6	23.2	16.5	20.8	1.04	0.45	15.9	-0.2	1.8
200	20.6	23.2	16.3	20.2	1.04	0.45	16.9	-0.2	1.8
300	20.5	23.2	16.2	19.9	1.04	0.46	15.3	-0.3	1.8
400	20.5	23.2	16.1	19.4	1.03	0.46	15.0	-0.3	1.8
500	20.5	23.1	16.1	18.7	1.03	0.46	15.4	-0.1	1.8
600	20.4	23.1	16.1	18.1	1.02	0.47	15.2	-0.1	1.8
700	20.3	23.1	15.8	17.5	1.02	0.48	14.7	-0.1	1.9
800	20.2	23.0	15.7	17.0	1.02	0.49	15.3	0.1	1.9
900	20.2	23.0	15.6	16.4	1.01	0.49	15.0	0.1	1.8
1000	20.0	22.9	15.2	15.9	1.01	0.51	15.0	-0.5	1.8
1200	19.7	22.8	14.7	15.0	1.00	0.54	13.3	-0.4	1.8
1400	19.4	22.6	14.3	14.4	0.99	0.55	13.4	-0.8	1.8
1600	19.1	22.5	13.7	13.9	0.98	0.58	12.4	-1.1	1.8
1800	18.7	22.3	13.1	13.6	0.98	0.62	12.1	-1.9	1.8
2000	18.4	22.2	12.7	13.5	0.98	0.64	11.6	-1.9	1.7
2200	18.1	22.0	12.2	13.4	0.97	0.67	11.0	-2.3	1.8
2400	17.8	21.8	12.0	13.4	0.97	0.69	12.6	-1.9	1.8
2600	17.5	21.7	11.8	13.3	0.98	0.70	12.7	-1.6	1.8
2800	17.2	21.5	11.7	13.4	0.98	0.72	13.9	-1.3	1.8
3000	16.9	21.3	11.7	13.2	0.98	0.72	15.1	-0.3	1.7
3200	16.6	21.2	11.7	13.0	0.99	0.74	15.6	0.4	1.8
3400	16.3	21.0	11.6	12.7	1.00	0.74	17.6	1.8	1.8
3600	15.9	20.9	11.5	12.5	1.00	0.76	17.6	1.9	1.8
3800	15.6	20.8	11.4	12.1	1.01	0.77	17.8	2.5	1.8
4000	15.3	20.6	11.2	11.8	1.01	0.77	18.5	2.9	1.8
4200	15.0	20.5	10.8	11.5	1.02	0.79	17.6	2.0	1.9
4400	14.6	20.4	10.5	11.3	1.02	0.80	16.5	1.8	1.8
4600	14.3	20.4	10.1	11.1	1.03	0.82	16.8	0.7	1.8
4800	14.0	20.3	9.7	10.8	1.04	0.83	17.0	0.4	1.9
5000	13.6	20.2	9.2	10.6	1.05	0.85	17.6	-0.1	1.9
5200	13.3	20.2	8.8	10.5	1.05	0.86	17.6	0.2	1.9
5400	13.0	20.2	8.4	10.2	1.06	0.88	17.0	0.9	2.0
5600	12.6	20.2	8.0	9.9	1.07	0.89	16.5	0.7	2.0
5800	12.3	20.2	7.7	9.6	1.08	0.91	15.9	1.8	2.1
6000	12.0	20.2	7.3	9.3	1.09	0.92	14.8	1.9	2.2
6200	11.6	20.3	7.0	9.0	1.10	0.93	14.5	2.0	2.2
6400	11.2	20.3	6.7	8.7	1.11	0.95	14.0	2.0	2.3
6600	10.9	20.4	6.5	8.5	1.13	0.96	13.4	1.8	2.3
6800	10.5	20.5	6.2	8.3	1.14	0.98	13.7	1.7	2.4
7000	10.2	20.5	5.9	8.2	1.15	1.00	13.1	1.1	2.5

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5 V, I_S = 13mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	22.4	24.8	36.2	22.9	1.04	0.42	15.8	3.8	2.6
100	22.3	24.5	40.2	24.9	1.03	0.40	16.4	2.7	1.7
200	22.2	24.5	34.5	24.1	1.03	0.40	17.3	2.8	1.7
300	22.2	24.5	31.5	22.6	1.03	0.41	15.8	2.6	1.6
400	22.1	24.4	29.0	21.3	1.03	0.41	15.7	2.6	1.7
500	22.0	24.4	27.4	20.1	1.03	0.41	17.4	3.0	1.7
600	22.0	24.4	26.2	19.2	1.02	0.42	16.5	2.9	1.7
700	21.8	24.3	25.0	18.2	1.02	0.43	16.5	3.0	1.7
800	21.7	24.3	24.1	17.5	1.02	0.44	16.7	3.2	1.7
900	21.6	24.2	23.3	16.8	1.02	0.45	16.6	3.2	1.6
1000	21.4	24.2	22.4	16.2	1.02	0.47	16.9	2.5	1.6
1200	21.1	24.1	21.3	15.2	1.02	0.49	15.8	2.7	1.7
1400	20.7	23.9	20.2	14.6	1.02	0.52	15.8	2.3	1.7
1600	20.3	23.7	19.0	14.1	1.02	0.54	15.4	2.0	1.7
1800	19.9	23.6	17.9	13.9	1.02	0.57	14.6	1.1	1.7
2000	19.5	23.4	17.1	13.7	1.03	0.60	14.3	1.2	1.7
2200	19.1	23.2	16.3	13.6	1.03	0.62	13.5	0.5	1.7
2400	18.8	23.0	15.8	13.5	1.03	0.64	15.0	1.2	1.7
2600	18.4	22.8	15.4	13.4	1.04	0.65	14.9	1.5	1.7
2800	18.0	22.6	15.0	13.2	1.05	0.67	16.0	2.0	1.7
3000	17.6	22.4	14.8	13.0	1.05	0.68	17.2	3.0	1.6
3200	17.3	22.2	14.5	12.6	1.06	0.69	17.4	3.6	1.7
3400	16.9	22.0	14.3	12.2	1.07	0.69	18.6	4.7	1.8
3600	16.5	21.8	14.0	11.9	1.07	0.70	18.8	4.6	1.7
3800	16.2	21.6	13.6	11.5	1.08	0.71	17.6	5.0	1.8
4000	15.8	21.4	13.2	11.2	1.08	0.72	17.8	5.3	1.8
4200	15.5	21.3	12.7	10.9	1.09	0.72	17.3	4.4	1.8
4400	15.1	21.1	12.1	10.6	1.09	0.73	16.7	4.2	1.8
4600	14.8	21.0	11.6	10.3	1.09	0.74	16.5	3.1	1.8
4800	14.4	20.9	11.0	10.1	1.10	0.76	16.4	2.7	1.8
5000	14.1	20.8	10.4	9.9	1.10	0.77	16.9	2.1	1.9
5200	13.8	20.7	9.9	9.7	1.11	0.78	16.7	2.3	1.9
5400	13.4	20.6	9.3	9.4	1.11	0.79	16.8	2.8	1.9
5600	13.1	20.5	8.8	9.1	1.12	0.80	16.3	2.5	2.0
5800	12.7	20.5	8.4	8.8	1.12	0.81	15.8	3.2	2.0
6000	12.4	20.4	8.0	8.5	1.13	0.82	15.3	3.2	2.1
6200	12.0	20.4	7.6	8.2	1.14	0.83	14.6	3.1	2.2
6400	11.7	20.4	7.3	7.9	1.14	0.84	14.0	2.9	2.2
6600	11.3	20.4	7.0	7.7	1.15	0.86	13.4	2.6	2.3
6800	11.0	20.4	6.7	7.6	1.15	0.87	13.5	2.5	2.4
7000	10.6	20.4	6.4	7.5	1.16	0.89	13.0	2.1	2.5

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5.25 V, I_S = 15mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	23.3	25.6	18.9	15.5	1.03	0.36	18.5	6.2	2.6
100	23.3	25.5	20.4	16.2	1.03	0.36	18.5	5.0	1.6
200	23.2	25.5	20.7	16.2	1.03	0.36	19.3	5.2	1.7
300	23.2	25.4	20.6	15.8	1.03	0.37	18.0	4.9	1.6
400	23.1	25.4	20.5	15.5	1.03	0.38	18.3	4.9	1.6
500	23.0	25.4	20.4	15.2	1.03	0.38	18.4	5.3	1.6
600	22.9	25.3	20.4	14.9	1.03	0.39	18.6	5.3	1.6
700	22.7	25.3	20.4	14.5	1.03	0.40	18.5	5.4	1.6
800	22.6	25.2	20.5	14.2	1.03	0.41	19.2	5.6	1.6
900	22.4	25.2	20.5	14.0	1.03	0.42	18.4	5.6	1.6
1000	22.2	25.1	20.7	13.7	1.03	0.44	19.0	4.9	1.6
1200	21.8	25.0	21.0	13.3	1.03	0.46	17.8	5.0	1.6
1400	21.4	24.8	21.1	13.0	1.04	0.49	17.5	4.6	1.6
1600	21.0	24.6	20.9	12.8	1.04	0.52	17.7	4.3	1.6
1800	20.6	24.4	20.4	12.7	1.05	0.54	17.0	3.4	1.7
2000	20.1	24.2	19.8	12.7	1.05	0.57	16.4	3.5	1.6
2200	19.7	23.9	19.0	12.7	1.06	0.59	15.9	2.8	1.6
2400	19.3	23.7	18.4	12.7	1.06	0.60	17.6	3.7	1.7
2600	18.9	23.4	17.8	12.6	1.07	0.62	17.2	3.9	1.7
2800	18.5	23.2	17.2	12.4	1.08	0.63	18.6	4.4	1.7
3000	18.0	23.0	16.8	12.1	1.08	0.64	19.7	5.3	1.6
3200	17.6	22.7	16.4	11.8	1.09	0.65	18.7	5.8	1.7
3400	17.3	22.5	15.9	11.5	1.10	0.66	19.6	6.6	1.8
3600	16.9	22.3	15.5	11.2	1.10	0.67	18.8	6.4	1.7
3800	16.5	22.1	15.0	10.9	1.11	0.67	17.8	6.5	1.8
4000	16.1	21.9	14.4	10.6	1.11	0.68	18.4	6.5	1.8
4200	15.8	21.7	13.7	10.3	1.11	0.68	18.5	5.9	1.8
4400	15.4	21.5	13.0	10.0	1.11	0.69	16.8	5.6	1.8
4600	15.1	21.3	12.4	9.8	1.12	0.70	16.9	4.7	1.8
4800	14.7	21.1	11.7	9.5	1.12	0.71	17.0	4.3	1.8
5000	14.4	21.0	11.0	9.3	1.12	0.71	17.2	3.6	1.9
5200	14.0	20.9	10.4	9.1	1.13	0.72	17.4	3.7	1.9
5400	13.7	20.7	9.8	8.8	1.13	0.73	16.9	4.0	1.9
5600	13.3	20.6	9.3	8.5	1.13	0.74	16.8	3.7	2.0
5800	13.0	20.6	8.8	8.2	1.14	0.75	16.2	4.1	2.1
6000	12.6	20.5	8.4	7.9	1.14	0.76	15.3	3.9	2.2
6200	12.3	20.4	8.0	7.6	1.14	0.76	14.7	3.7	2.2
6400	11.9	20.4	7.6	7.4	1.14	0.78	14.3	3.5	2.3
6600	11.6	20.3	7.2	7.2	1.15	0.79	13.4	3.2	2.3
6800	11.2	20.3	6.9	7.1	1.15	0.80	13.5	3.1	2.4
7000	10.9	20.3	6.6	6.9	1.15	0.82	13.1	2.5	2.5

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +4.75 V, I_S = 14mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	21.4	23.6	24.0	28.8	1.03	0.40	17.3	5.0	3.6
100	21.3	23.7	22.8	28.4	1.03	0.41	18.8	4.0	2.6
200	21.3	23.6	22.6	26.3	1.03	0.42	20.3	4.1	2.6
300	21.2	23.6	22.2	24.3	1.03	0.42	17.9	3.9	2.5
400	21.1	23.6	21.7	22.4	1.03	0.43	17.8	3.9	2.6
500	21.1	23.6	21.3	20.9	1.03	0.44	18.5	4.3	2.5
600	21.0	23.5	21.0	19.7	1.03	0.45	18.7	4.2	2.6
700	20.8	23.5	20.4	18.7	1.03	0.46	18.6	4.2	2.6
800	20.7	23.5	19.9	17.7	1.03	0.48	19.1	4.4	2.6
900	20.5	23.4	19.4	17.0	1.02	0.49	18.6	4.4	2.5
1000	20.4	23.4	18.8	16.3	1.02	0.51	18.7	3.7	2.5
1200	20.0	23.2	17.8	15.3	1.02	0.54	17.5	3.8	2.6
1400	19.6	23.1	16.9	14.6	1.02	0.57	18.1	3.6	2.6
1600	19.2	22.9	16.0	14.1	1.02	0.60	17.4	3.3	2.6
1800	18.8	22.8	15.2	13.8	1.02	0.63	16.9	2.5	2.7
2000	18.3	22.6	14.5	13.7	1.02	0.66	16.8	2.6	2.6
2200	17.9	22.4	14.0	13.7	1.03	0.69	16.2	2.0	2.7
2400	17.5	22.2	13.6	13.6	1.03	0.71	17.5	2.7	2.8
2600	17.1	22.0	13.3	13.5	1.04	0.73	17.2	3.0	2.7
2800	16.7	21.8	13.1	13.4	1.05	0.75	18.2	3.4	2.7
3000	16.3	21.6	12.9	13.2	1.06	0.76	18.2	4.1	2.7
3200	15.8	21.5	12.8	12.9	1.07	0.78	17.4	4.5	2.8
3400	15.4	21.3	12.6	12.7	1.08	0.79	17.4	4.9	2.8
3600	15.1	21.1	12.4	12.5	1.09	0.80	17.1	4.6	2.9
3800	14.7	21.0	12.1	12.3	1.10	0.81	16.2	4.6	2.9
4000	14.3	20.8	11.8	12.1	1.11	0.83	16.0	4.6	2.9
4200	13.9	20.7	11.5	11.8	1.12	0.84	16.2	3.9	2.9
4400	13.5	20.6	11.0	11.6	1.13	0.85	15.1	3.6	2.9
4600	13.2	20.5	10.6	11.3	1.15	0.86	15.1	2.8	3.0
4800	12.8	20.4	10.2	11.0	1.16	0.87	15.2	2.5	3.0
5000	12.4	20.3	9.7	10.7	1.17	0.89	15.5	2.0	3.1
5200	12.1	20.3	9.2	10.4	1.18	0.90	15.2	1.9	3.1
5400	11.7	20.3	8.7	10.0	1.19	0.91	14.7	2.1	3.2
5600	11.3	20.2	8.3	9.7	1.20	0.93	14.4	1.7	3.2
5800	10.9	20.3	7.9	9.4	1.21	0.94	14.0	1.9	3.4
6000	10.5	20.3	7.5	9.0	1.23	0.96	13.2	1.7	3.5
6200	10.1	20.3	7.1	8.8	1.24	0.97	12.5	1.5	3.6
6400	9.7	20.4	6.7	8.6	1.26	0.99	12.0	1.3	3.6
6600	9.3	20.4	6.4	8.5	1.27	1.01	11.4	0.9	3.7
6800	8.9	20.5	6.1	8.4	1.29	1.03	11.4	0.7	3.9
7000	8.5	20.5	5.9	8.3	1.31	1.05	10.9	0.3	4.0

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5 V, I_S = 17mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	22.3	24.4	34.1	24.1	1.03	0.38	17.6	7.2	3.6
100	22.2	24.4	38.3	24.9	1.03	0.39	20.6	6.0	2.5
200	22.2	24.4	37.4	23.7	1.03	0.39	21.7	6.1	2.5
300	22.1	24.4	35.8	22.4	1.03	0.40	18.9	5.9	2.4
400	22.0	24.4	33.8	21.1	1.03	0.41	20.1	5.9	2.5
500	21.9	24.3	32.2	19.9	1.03	0.42	20.1	6.3	2.5
600	21.8	24.3	30.6	18.8	1.03	0.43	19.7	6.2	2.5
700	21.6	24.3	29.2	17.9	1.03	0.45	19.7	6.2	2.5
800	21.5	24.2	28.0	17.2	1.03	0.46	20.7	6.4	2.5
900	21.3	24.2	26.8	16.5	1.03	0.48	19.7	6.4	2.5
1000	21.1	24.1	25.5	16.0	1.03	0.49	19.6	5.7	2.5
1200	20.7	24.0	23.4	15.1	1.04	0.52	19.2	5.9	2.6
1400	20.3	23.9	21.7	14.5	1.04	0.55	19.3	5.6	2.6
1600	19.8	23.7	20.0	14.0	1.04	0.59	18.9	5.3	2.6
1800	19.3	23.5	18.6	13.8	1.05	0.62	18.2	4.4	2.6
2000	18.9	23.3	17.6	13.7	1.05	0.64	17.8	4.5	2.6
2200	18.4	23.1	16.7	13.6	1.06	0.67	17.5	3.8	2.6
2400	18.0	22.9	16.0	13.4	1.07	0.69	18.6	4.6	2.7
2600	17.5	22.6	15.5	13.2	1.08	0.71	18.5	4.8	2.7
2800	17.1	22.4	15.1	13.0	1.09	0.73	18.4	5.2	2.7
3000	16.6	22.2	14.8	12.8	1.10	0.74	19.3	5.7	2.7
3200	16.2	22.0	14.5	12.5	1.11	0.76	18.0	5.7	2.7
3400	15.8	21.8	14.2	12.3	1.12	0.77	18.1	5.9	2.8
3600	15.4	21.7	13.8	12.1	1.13	0.78	17.6	5.5	2.8
3800	15.0	21.5	13.5	11.9	1.14	0.79	16.3	5.4	2.9
4000	14.6	21.3	13.0	11.7	1.16	0.80	16.2	5.2	2.9
4200	14.2	21.1	12.5	11.4	1.16	0.81	16.2	4.6	2.9
4400	13.8	21.0	12.0	11.1	1.17	0.82	15.1	4.3	3.0
4600	13.4	20.9	11.5	10.9	1.18	0.83	15.4	3.6	3.0
4800	13.1	20.7	10.9	10.5	1.19	0.84	15.5	3.3	3.0
5000	12.7	20.6	10.4	10.2	1.20	0.85	15.7	2.8	3.1
5200	12.3	20.6	9.8	9.9	1.21	0.86	15.2	2.7	3.1
5400	11.9	20.5	9.3	9.5	1.22	0.87	15.0	2.7	3.2
5600	11.5	20.5	8.8	9.2	1.23	0.88	14.3	2.4	3.2
5800	11.1	20.4	8.3	8.9	1.24	0.89	14.3	2.5	3.3
6000	10.7	20.4	7.8	8.6	1.25	0.91	13.3	2.2	3.5
6200	10.3	20.4	7.4	8.3	1.26	0.92	12.8	1.9	3.6
6400	9.9	20.4	7.1	8.2	1.27	0.94	12.2	1.7	3.7
6600	9.5	20.5	6.7	8.1	1.29	0.96	11.3	1.3	3.7
6800	9.1	20.5	6.4	8.0	1.30	0.98	11.5	1.1	3.9
7000	8.7	20.5	6.1	8.0	1.32	1.00	10.9	0.7	4.0

Typical Performance Data

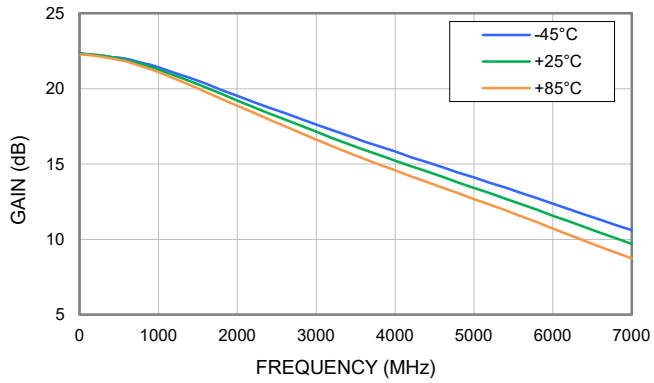
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: V_S= +5.25 V, I_S = 19mA @ Temperature = +85°C

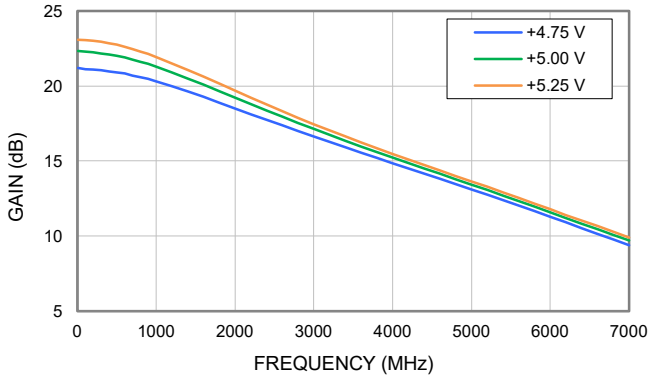
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	22.9	25.1	21.0	17.6	1.03	0.37	18.7	8.9	3.6
100	22.9	25.1	22.2	18.1	1.03	0.37	21.3	7.7	2.5
200	22.8	25.1	22.4	17.8	1.03	0.38	21.9	7.8	2.5
300	22.8	25.1	22.9	17.5	1.03	0.39	21.2	7.5	2.4
400	22.7	25.0	23.4	17.1	1.03	0.39	20.6	7.5	2.5
500	22.5	25.0	23.8	16.6	1.03	0.41	21.5	8.0	2.4
600	22.4	25.0	24.2	16.1	1.03	0.42	20.6	7.8	2.5
700	22.2	24.9	25.0	15.6	1.03	0.43	20.9	7.9	2.5
800	22.0	24.9	25.7	15.3	1.04	0.45	21.8	8.1	2.5
900	21.8	24.8	26.4	14.9	1.04	0.46	21.2	8.0	2.4
1000	21.6	24.8	27.2	14.6	1.04	0.48	20.3	7.4	2.5
1200	21.2	24.6	27.6	14.0	1.05	0.51	20.4	7.5	2.5
1400	20.7	24.5	26.4	13.6	1.05	0.54	20.6	7.2	2.6
1600	20.2	24.3	24.3	13.3	1.06	0.57	19.9	6.9	2.6
1800	19.7	24.0	22.2	13.2	1.07	0.60	19.2	6.0	2.6
2000	19.3	23.8	20.6	13.1	1.07	0.63	18.3	6.0	2.6
2200	18.8	23.6	19.2	13.0	1.08	0.66	18.8	5.4	2.6
2400	18.3	23.3	18.3	12.9	1.09	0.68	19.8	6.0	2.7
2600	17.8	23.1	17.5	12.7	1.10	0.69	19.2	6.2	2.7
2800	17.3	22.9	16.8	12.5	1.11	0.71	19.2	6.5	2.7
3000	16.9	22.6	16.4	12.3	1.12	0.72	18.7	6.8	2.7
3200	16.4	22.4	15.9	12.0	1.14	0.74	18.2	6.7	2.7
3400	16.0	22.2	15.5	11.8	1.15	0.75	17.9	6.6	2.8
3600	15.6	22.0	15.0	11.7	1.16	0.76	17.7	6.1	2.8
3800	15.2	21.8	14.5	11.4	1.17	0.77	16.5	5.9	2.9
4000	14.8	21.6	14.0	11.2	1.18	0.78	16.6	5.7	2.9
4200	14.4	21.4	13.4	11.0	1.19	0.78	16.5	5.1	2.9
4400	14.0	21.2	12.7	10.7	1.19	0.79	15.1	4.8	3.0
4600	13.6	21.1	12.1	10.4	1.20	0.80	15.5	4.2	3.0
4800	13.3	20.9	11.5	10.1	1.21	0.81	15.4	3.8	3.0
5000	12.9	20.8	10.9	9.8	1.22	0.82	16.2	3.5	3.1
5200	12.5	20.7	10.2	9.5	1.22	0.83	15.4	3.2	3.1
5400	12.1	20.6	9.7	9.1	1.23	0.83	15.3	3.2	3.2
5600	11.7	20.6	9.1	8.8	1.24	0.84	14.9	2.8	3.3
5800	11.3	20.5	8.6	8.5	1.25	0.86	14.3	2.9	3.3
6000	10.9	20.5	8.1	8.2	1.25	0.87	13.6	2.6	3.5
6200	10.5	20.5	7.7	8.0	1.26	0.88	12.9	2.3	3.6
6400	10.1	20.5	7.3	7.8	1.27	0.90	12.4	2.0	3.6
6600	9.7	20.5	6.9	7.8	1.29	0.92	11.5	1.6	3.8
6800	9.3	20.5	6.6	7.7	1.30	0.94	11.6	1.5	3.9
7000	8.9	20.5	6.3	7.7	1.32	0.96	11.0	1.1	4.0

Typical Performance Curves

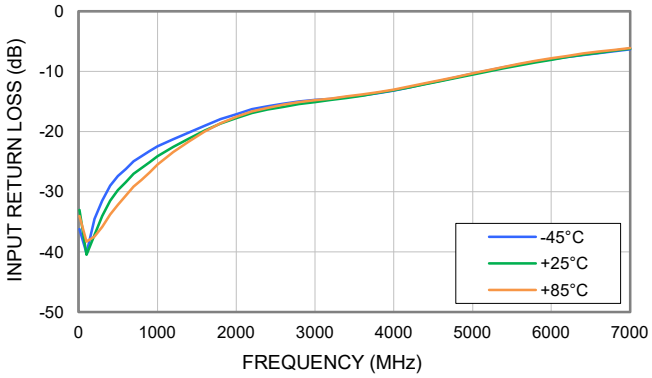
GAIN vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +5 V



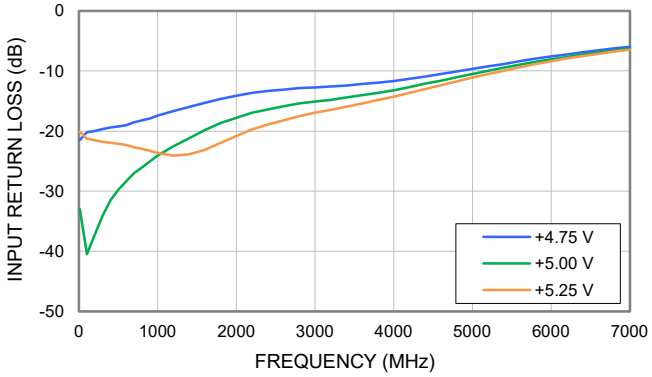
GAIN vs. V_S, P_{IN} = -25 dBm, TEMPERATURE = +25°C



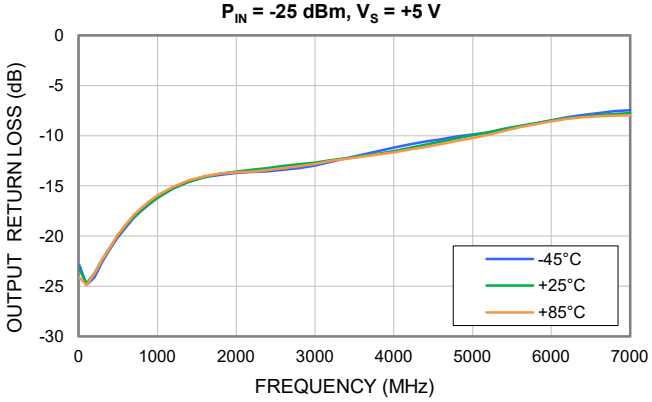
INPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +5 V



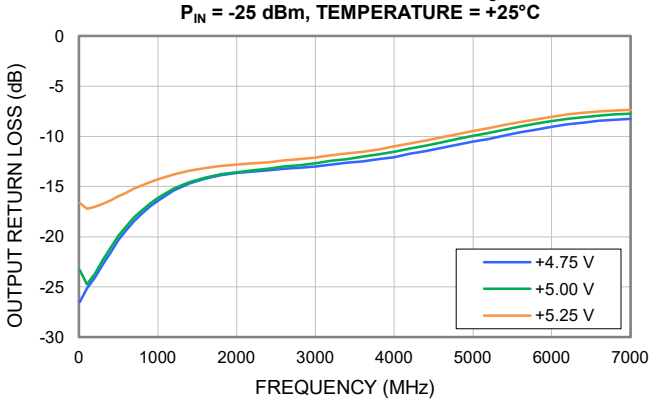
INPUT RETURN LOSS vs. V_S, P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +5 V

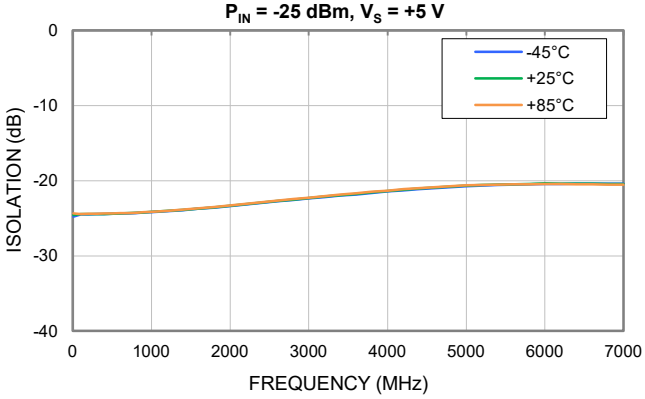


OUTPUT RETURN LOSS vs. V_S, P_{IN} = -25 dBm, TEMPERATURE = +25°C

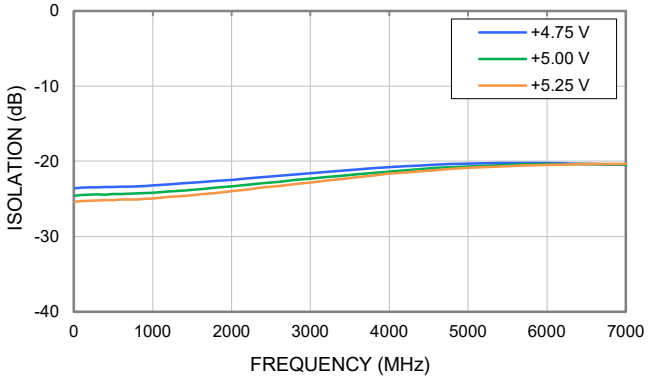


Typical Performance Curves

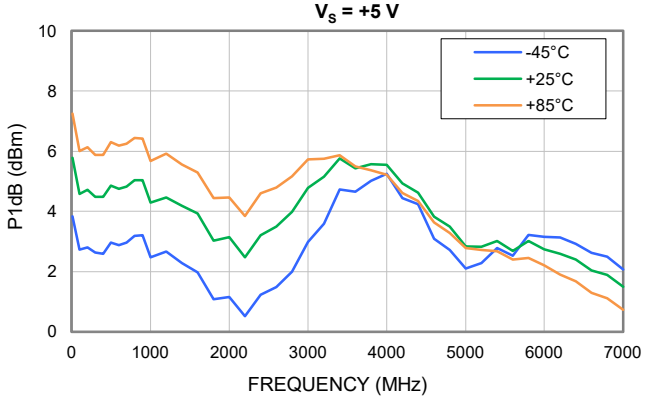
ISOLATION vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +5 V



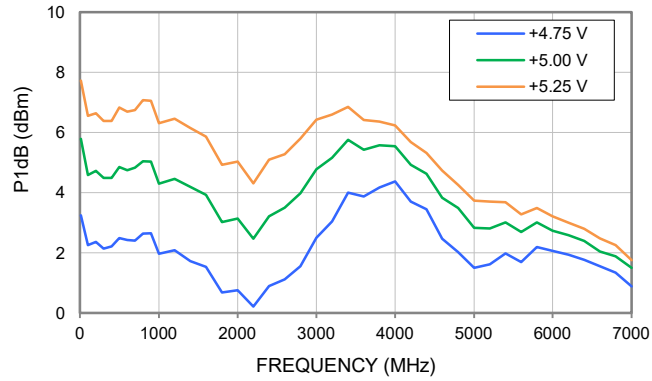
ISOLATION vs. V_S, P_{IN} = -25 dBm, TEMPERATURE = +25°C



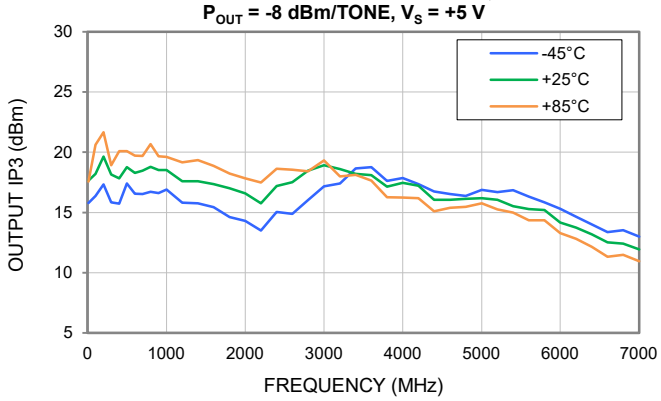
P1dB vs. TEMPERATURE, V_S = +5 V



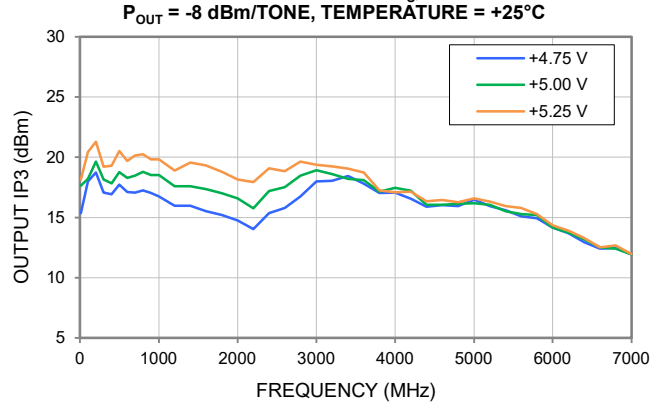
P1dB vs. V_S, TEMPERATURE = +25°C



OUTPUT IP3 vs. TEMPERATURE, P_{OUT} = -8 dBm/TONE, V_S = +5 V

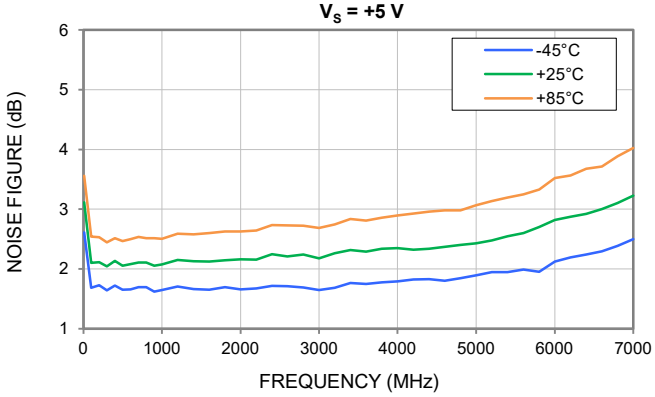


OUTPUT IP3 vs. V_S, P_{OUT} = -8 dBm/TONE, TEMPERATURE = +25°C

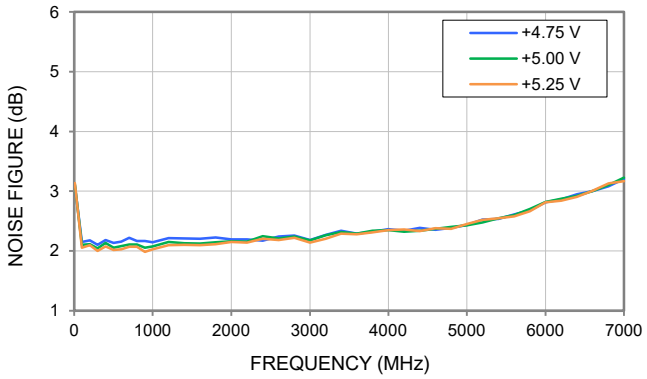


Typical Performance Curves

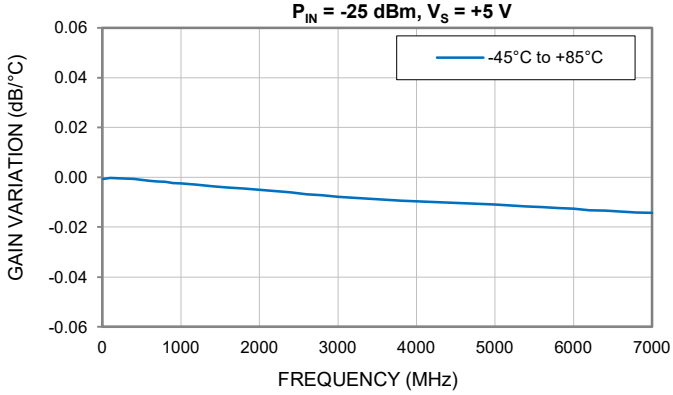
NOISE FIGURE vs. TEMPERATURE, V_S = +5 V



NOISE FIGURE vs. V_S, TEMPERATURE = +25°C



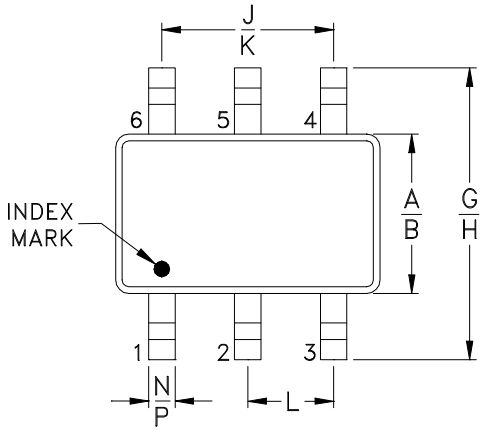
GAIN VARIATION vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +5 V



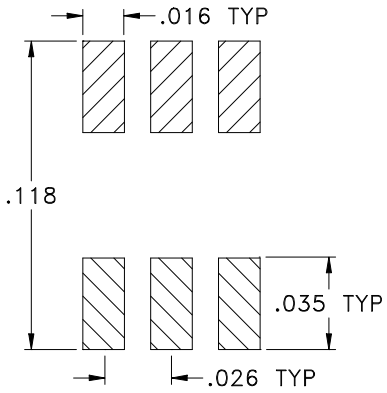
Case Style CA

CA1389

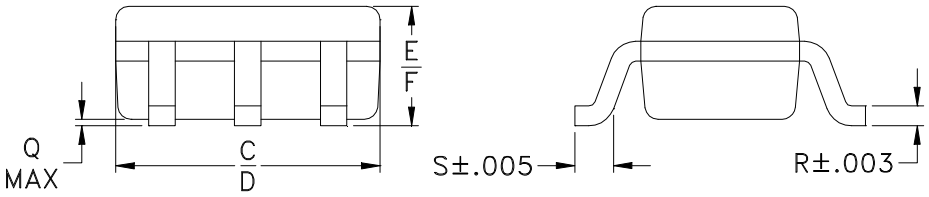
Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002



CASE #	A	B	C	D	E	F	G	H	J	K
CA1389	.045 (1.15)	.053 (1.35)	.073 (1.85)	.089 (2.25)	.031 (0.80)	.039 (1.00)	.079 (2.00)	.091 (2.30)	.051 (1.30)	.051 (1.30)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CA1389	.026 (0.65)	- -	.006 (0.15)	.012 (0.30)	.004 (0.09)	.007 (0.165)	.012 (0.31)	- -	.010

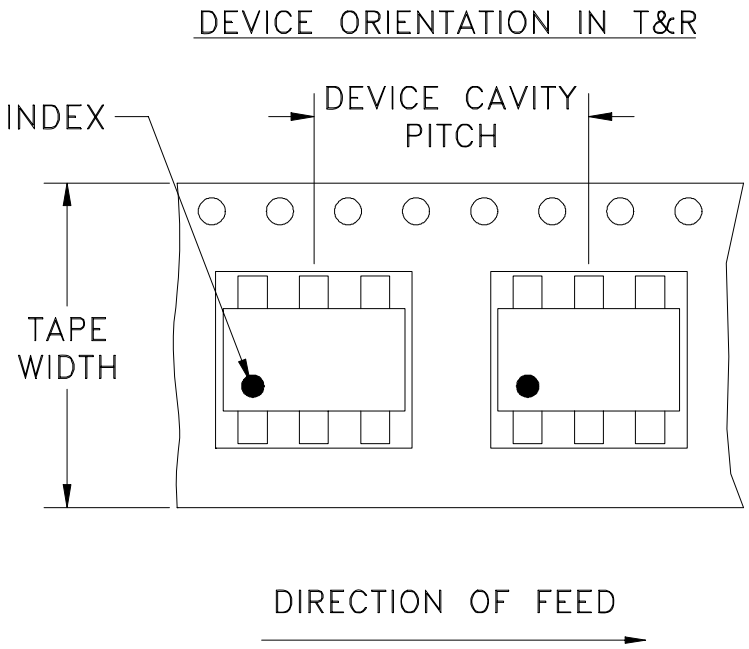
Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3Pl. ± .005

Notes:
1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Matte Tin plate.
3. Primary dimensions are in millimeters.

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Tape & Reel Packaging TR-F101



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
8	4	7	Small quantity standards (see note)	20
				50
				100
				200
				500
				1000
		7	Standard	2000

Note: Please Consult individual model data sheet to determine device per reel availability.

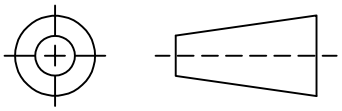
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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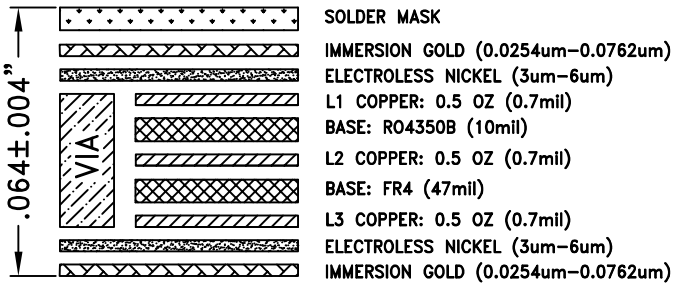
THIRD ANGLE PROJECTION



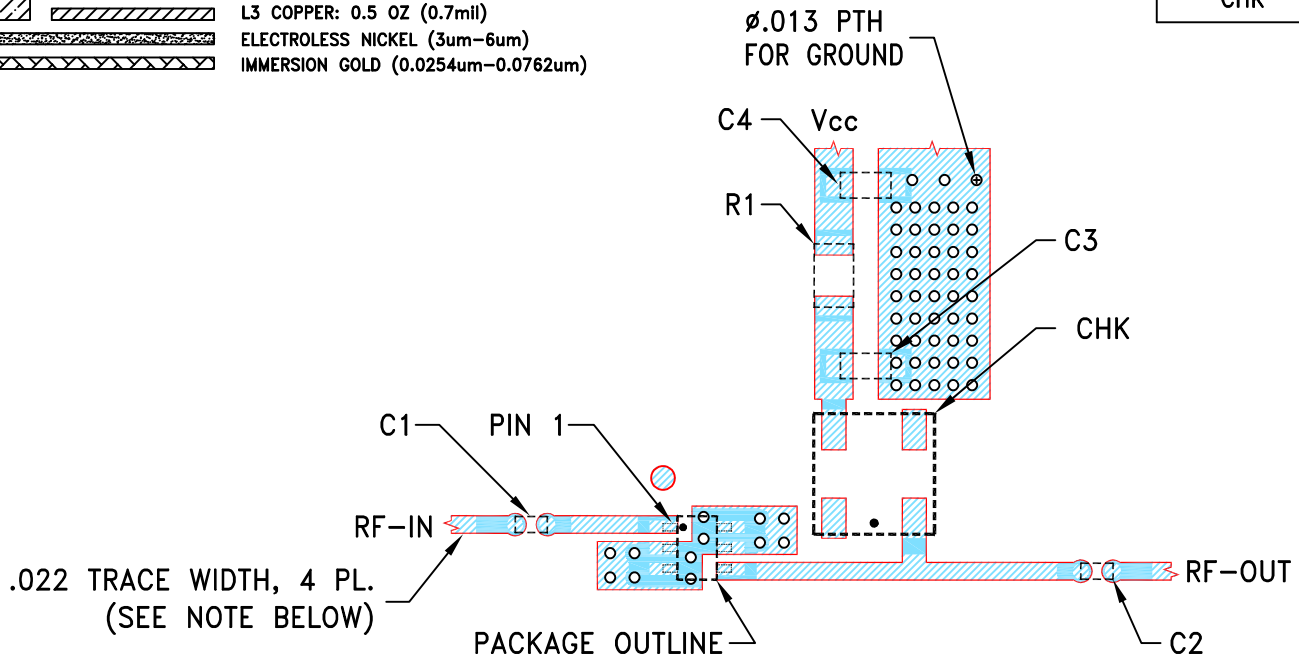
REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-019913	NEW RELEASE	11/14/23	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR CA1389 CASE STYLE

3 LAYER STACK-UP DETAIL



COMPONENT	SIZE
C1,C2	0402
C3,C4	0603
R1	0805
CHK	.150X.150



NOTES:

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010".
   COPPER: 1/2 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
3. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUES REFER TO TB-PSA2-6C+.
4. LAYERS 2 & 3 OF PCB ARE CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	11/14/23
TOLERANCES ON:	CHECKED	GF	11/14/23
2 PL DECIMALS ±	APPROVED	IL	11/14/23
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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ASHEETA1.DWG REV:A DATE:01/12/95

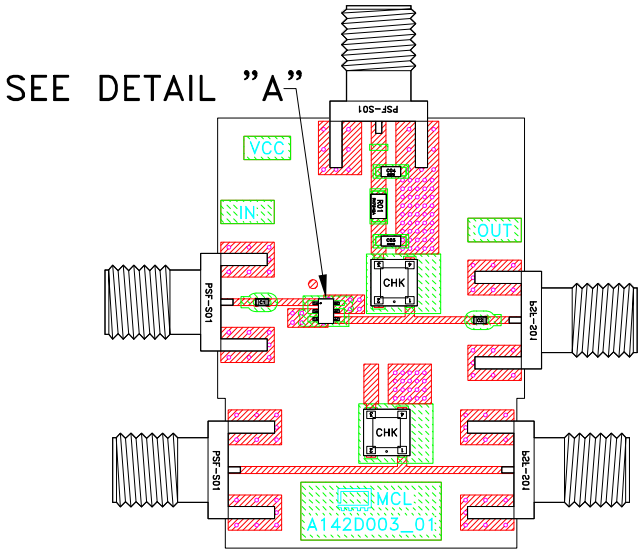
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

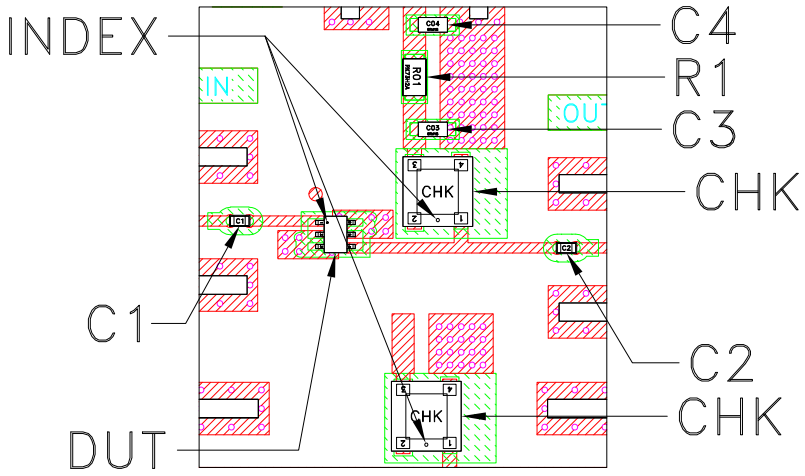
PL, CA1389, TB-PSA2-6C+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-770	OR

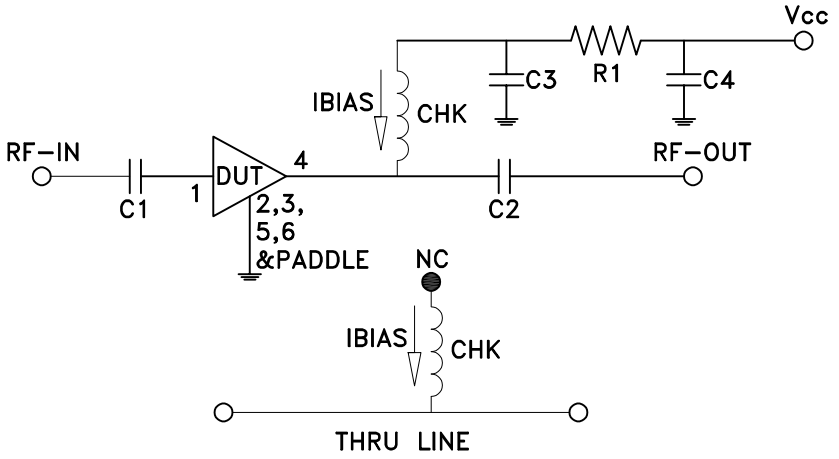
FILE:	SCALE:	SHEET:
98PL770	4:1	1 OF 1

Evaluation Board and Circuit





DETAIL "A"
LOCATION OF COMPONENTS
ON THE PCB
(SCALE 1.5:1)



SCHEMATIC DIAGRAM

Component	Size	Description
C1,C2	0402	2400pF
C3	0603	0.01uF
C4	0603	0.1uF
R1	0805	93.1ohm
CHK		TCCH-80+

Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger RO4350B or equivalent,
   Dielectric constant=3.5, Thickness=0.010 inch

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Environmental Specifications **ENV08T2**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-45° to 85°C or -40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +	MIL-STD-202, Method 215

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
	monoethanolamine at 63°C to 70°C	

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