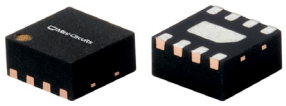
MMIC SURFACE MOUNT

Low Noise Amplifier PMA2-252LNA+

50Ω 1500 to 2500 MHz Ultra Low Noise

THE BIG DEAL

- Noise Figure, Typ 0.8 dB
- Adjustable Gain at V_S=+4 V, Typ. 14.5 to 17.6 dB
- OIP3, Typ. +30 dBm
- P1dB, Typ. +17.8 dBm
- 2x2mm 8-Lead SMT Package
- May be used as a replacement for MGA-632P8[a,b]

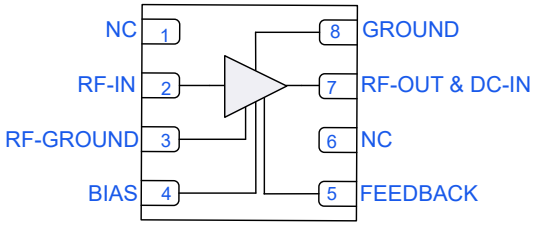


Generic photo used for illustration purposes only

APPLICATIONS

- Base Station Infrastructure
- Satellite Communication (Inmarsat)
- GPS
- Tactical Air Navigation

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

The PMA2-252LNA+ is an E-PHEMT amplifier that operates from 1500 to 2500 MHz. The amplifier has a low noise figure of 0.8 dB typical while providing 17.6 dB of gain, +30 dBm OIP3, and +17.8 dBm P1dB with 18 dB typical return loss from a +4 V supply drawing 57 mA. Gain is adjustable across the operating bandwidth by changing the external feedback resistor R1. The amplifier is housed in an industry standard 2x2mm SMT package, with RF ports internally matched to 50Ω, facilitating easy integration into microwave system PC boards.

KEY FEATURES

Feature	Advantages
Ultra Low Noise Figure • Typ. 0.8 dB	Excellent noise figure performance.
High OIP3 • OIP3, Typ. +25 dBm	Suitable as a driver amplifier in receiver/transmitter chains.
Adjustable Gain, 14.5 to 17.6 dB	By changing the feedback resistor R1, the device gain may be adjusted to optimize the signal chain.
Max Input Power, +25 dBm	Ruggedized design operates up to high input power often seen at receiver inputs eliminating the need for an external limiter.
2x2mm 8-Lead SMT package	Small footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

a. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, and compatibility with other components and environmental conditions and stresses.
b. The Avago MGA-632P8 part number is used for identification and comparison purposes only.

REV. D
ECO-026088
PMA2-252LNA+
MCL NY
250717

Low Noise Amplifier PMA2-252LNA+

50Ω 1500 to 2500 MHz Ultra Low Noise

ELECTRICAL SPECIFICATIONS[1] AT 25°C, Zo=50Ω, UNLESS NOTED OTHERWISE

Parameter	Condition (MHz)	V_S = +4 V[1] Min.	V_S = +4 V[1] Typ.	V_S = +4 V[1] Max.	V_S = +3 V[1] Typ.	Units
Frequency Range		1500		2500		MHz
Gain	1500	15.7	19.5	19.5	18.8	dB
	1800		18.6		17.8	
	2000		17.6		16.8	
	2200		16.5		15.7	
	2500		15.7		14.8	
Input Return Loss	1500		21.3		17.5	dB
	1800		19.9		15.4	
	2000		18.0		14.4	
	2200		16.3		13.4	
	2500		14.9		13.0	
Output Return Loss	1500		10.0		10.8	dB
	1800		23.3		28.5	
	2000		18.2		16.9	
	2200		12.9		11.9	
	2500		8.3		7.9	
Isolation	1500-2500		37.4		35.8	dB
Output Power at 1 dB Compression (P1dB)	1500		+18.5		+16.2	dBm
	1800		+17.9		+15.9	
	2000		+17.8		+15.6	
	2200		+17.4		+15.3	
	2500		+16.2		+13.9	
Output Third-Order Intercept Point (Pout = +2 dBm/Tone)	1500		+31.1		+27.1	dBm
	1800		+30.1		+25.5	
	2000		+30.0		+25.3	
	2200		+29.3		+24.8	
	2500		+27.6		+23.2	
Noise Figure	1500		0.7		0.7	dBm
	1800		0.8		0.8	
	2000		0.8		0.9	
	2200		0.8		1.1	
	2500		1.2		1.1	
Device Operating Voltage (V_S)		+3.5	+4.0	+4.5	+3.0	V
Device Operating Current (I_S) [2]			57		41	mA
Device Current Variation Vs. Temperature[3]			-19.0		-3.4	uA/°C
Device Current Variation Vs. Voltage[4]			0.018		0.017	mA/mV

1. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-PMA2252LNAC+ with R1 = 825 Ω. See Figure 2. De-embedded to the device reference plane.
2. Current at P_{IN} = -25 dBm. Increases to 95 mA at P1dB.
3. ((Current at Tmax°C - Current at -Tmin°C))/(Tmax °C -Tmin °C)
4. (Current at Nominal V +ΔV in mA)- (Current at Nominal V -ΔV mA)/(2ΔV mV)

Low Noise Amplifier PMA2-252LNA+

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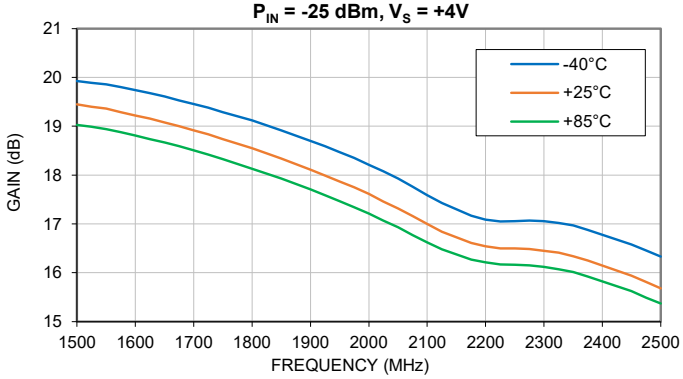
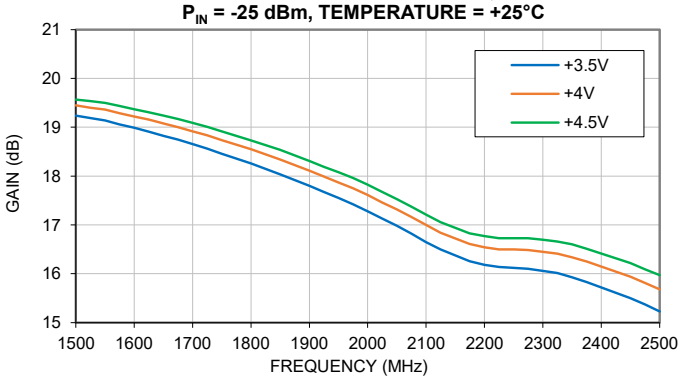
TYPICAL PERFORMANCE GRAPHS

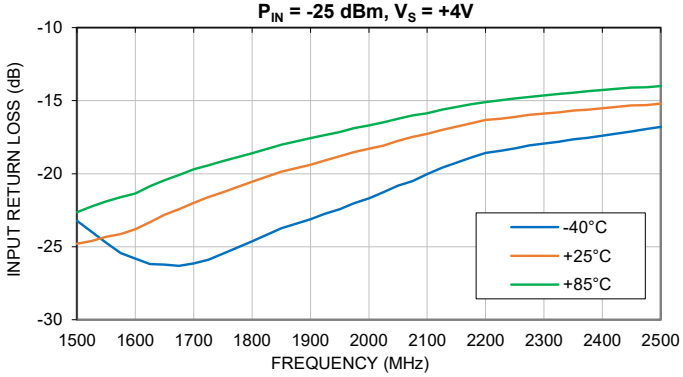
GAIN vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



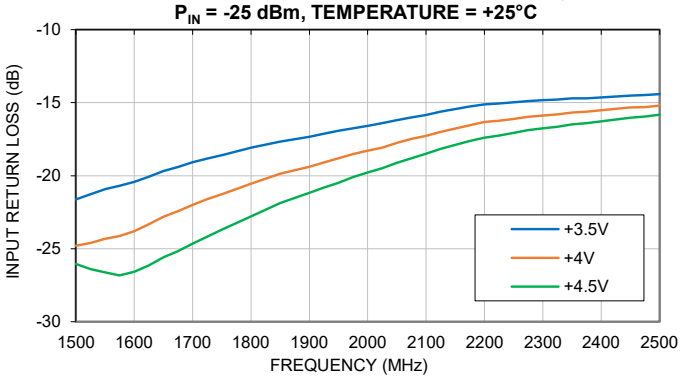
GAIN vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



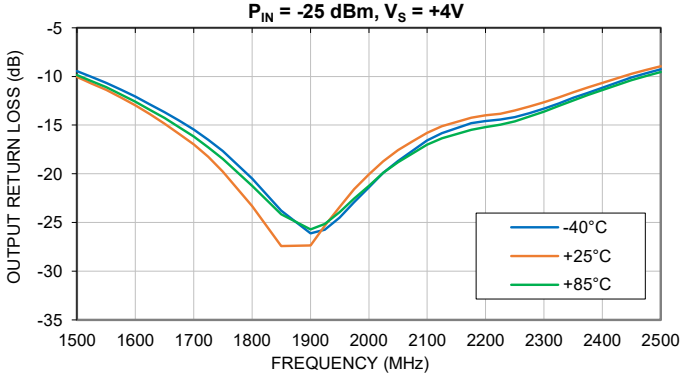
INPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



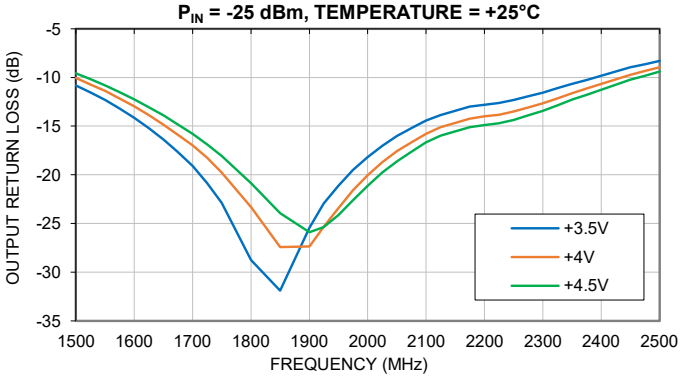
INPUT RETURN LOSS vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



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



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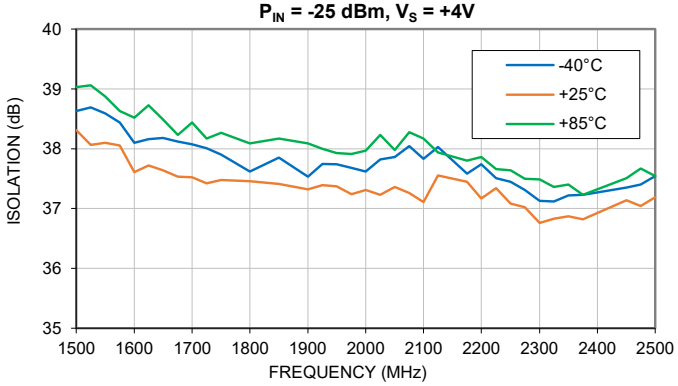
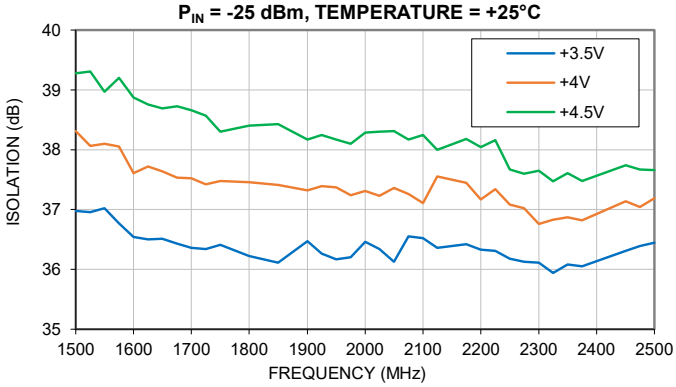
TYPICAL PERFORMANCE GRAPHS

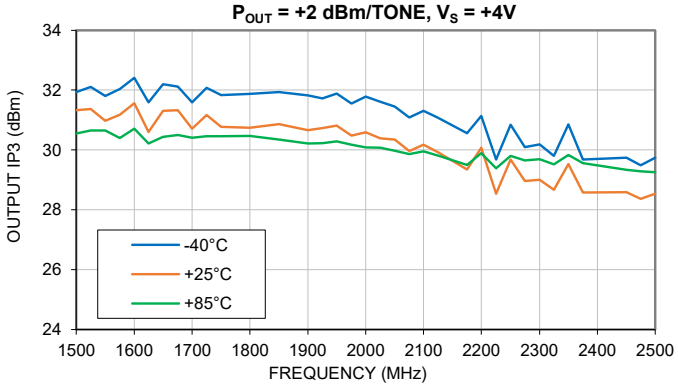
ISOLATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



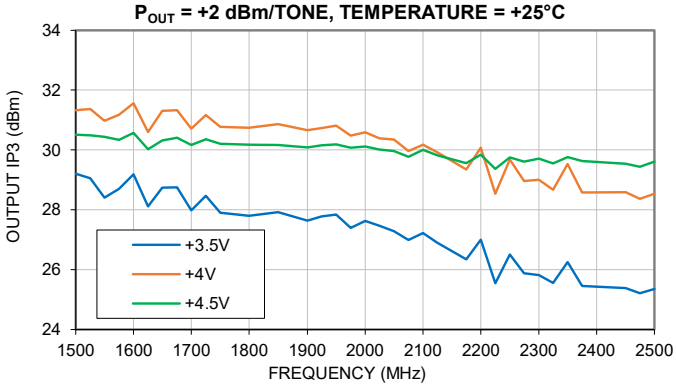
ISOLATION vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



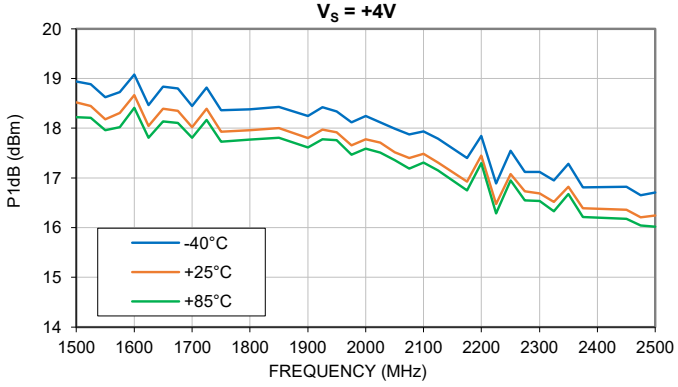
OUTPUT IP3 vs. TEMPERATURE,
P_{OUT} = +2 dBm/TONE, V_S = +4V



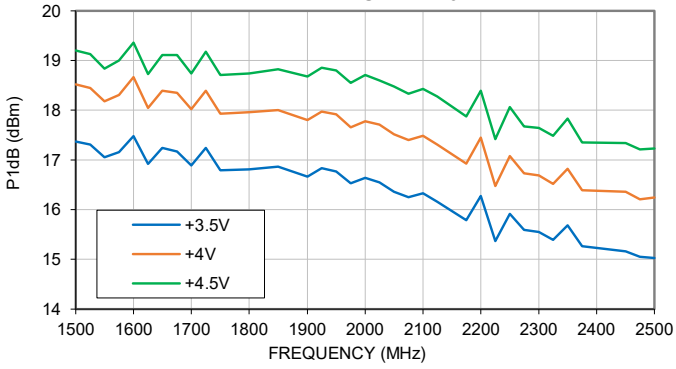
OUTPUT IP3 vs. DEVICE VOLTAGE,
P_{OUT} = +2 dBm/TONE, TEMPERATURE = +25°C



P1dB vs. TEMPERATURE,
V_S = +4V



P1dB vs. DEVICE VOLTAGE,
TEMPERATURE = +25°C



Low Noise Amplifier PMA2-252LNA+

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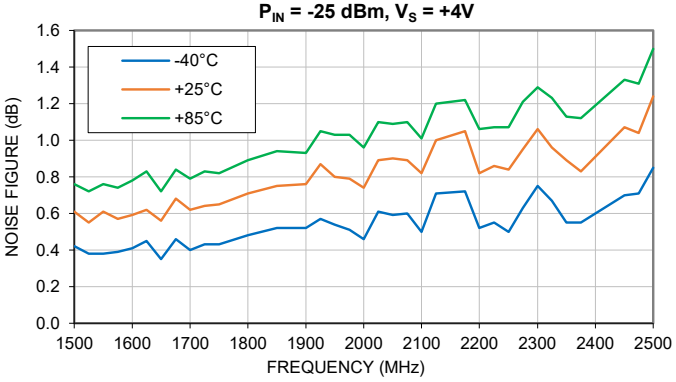
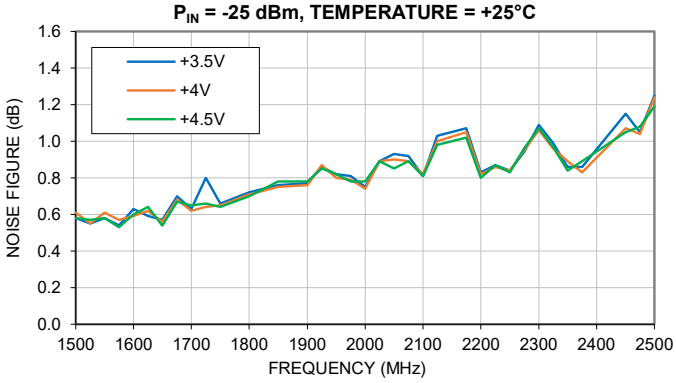
TYPICAL PERFORMANCE GRAPHS

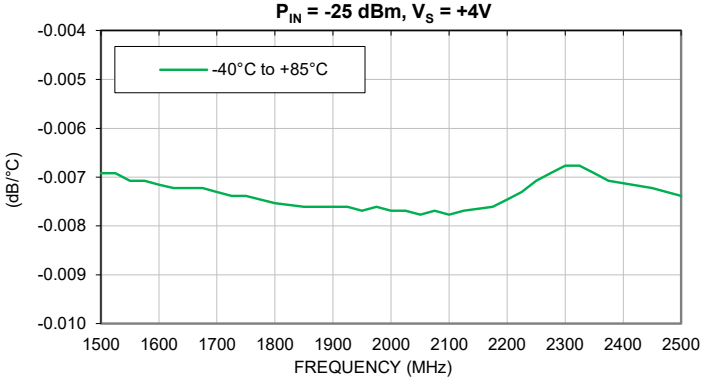
NOISE FIGURE vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



NOISE FIGURE vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



GAIN VARIATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



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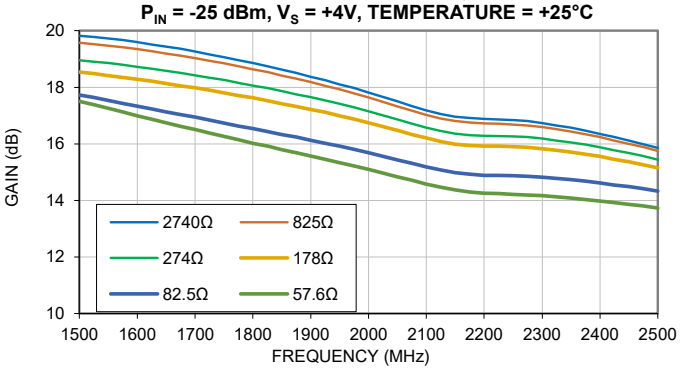
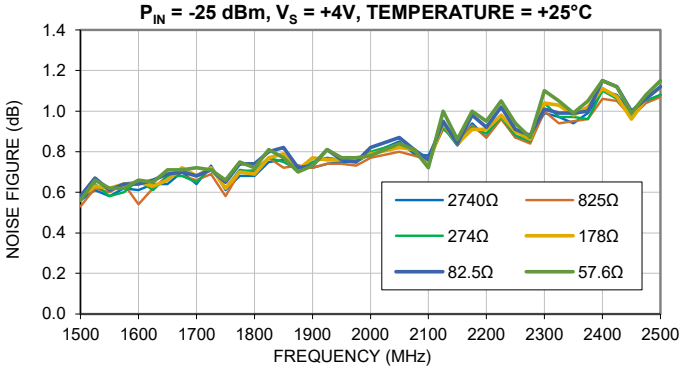
TYPICAL PERFORMANCE GRAPHS

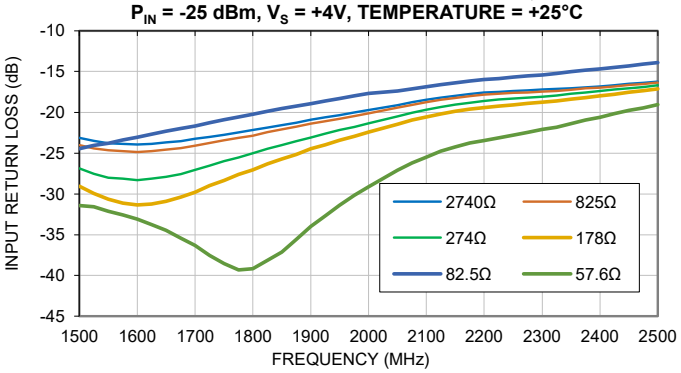
GAIN vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



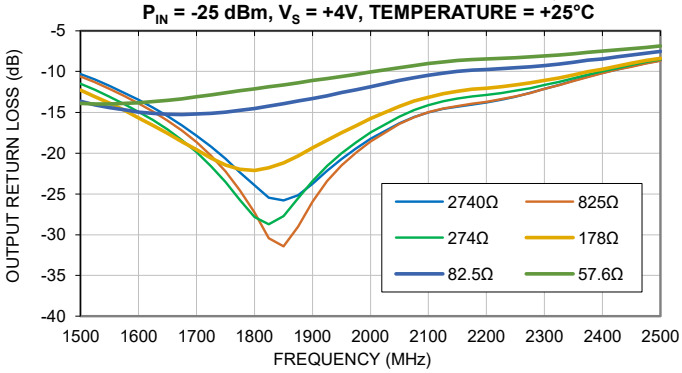
NOISE FIGURE vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



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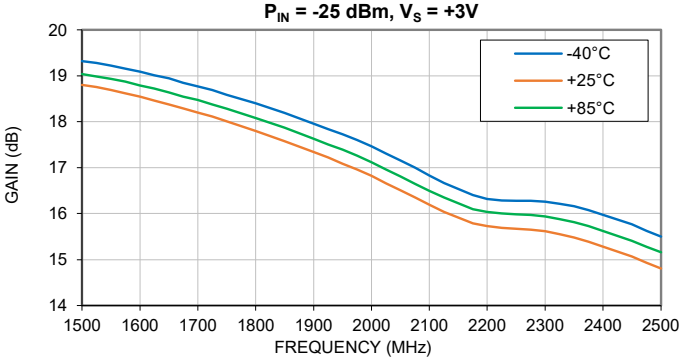
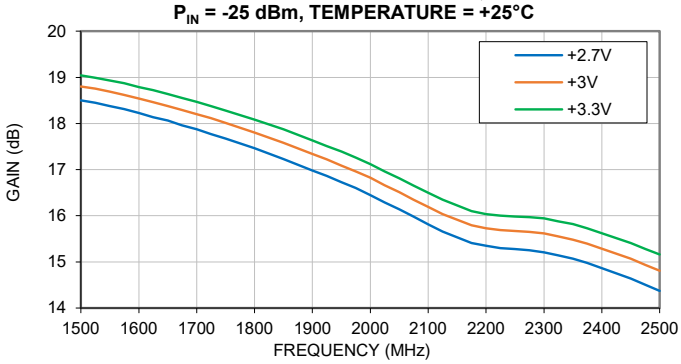
TYPICAL PERFORMANCE GRAPHS

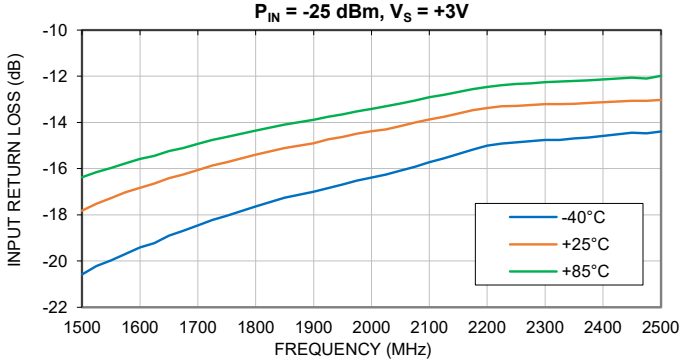
GAIN vs.TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



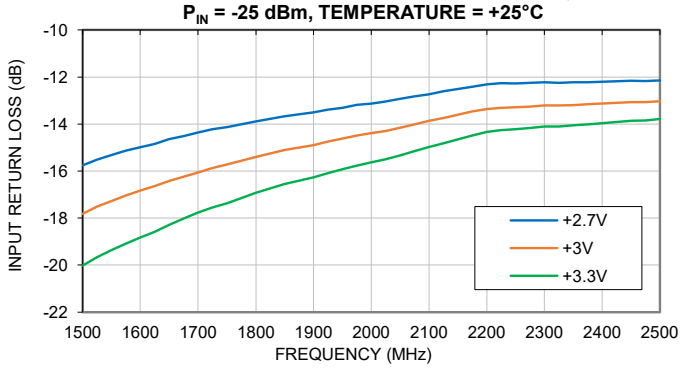
GAIN vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



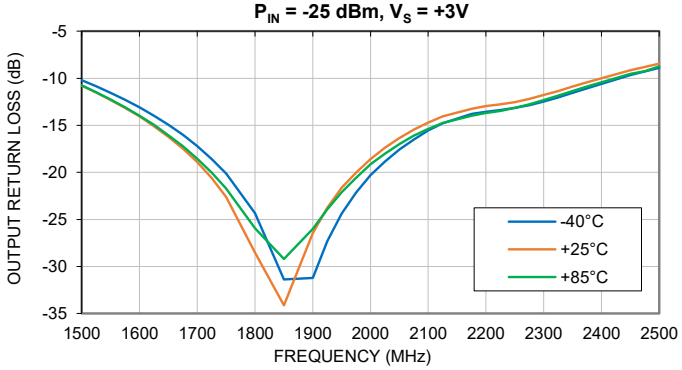
INPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



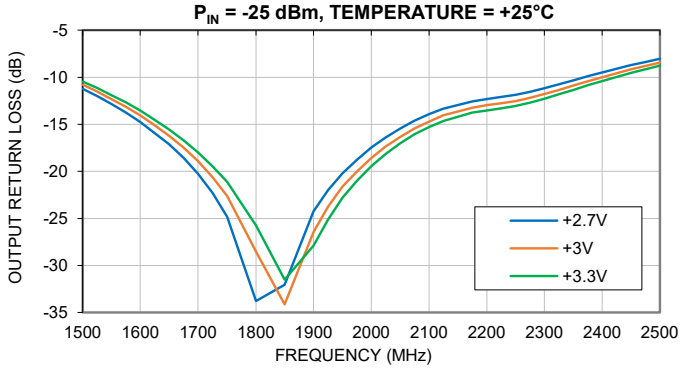
INPUT RETURN LOSS vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



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



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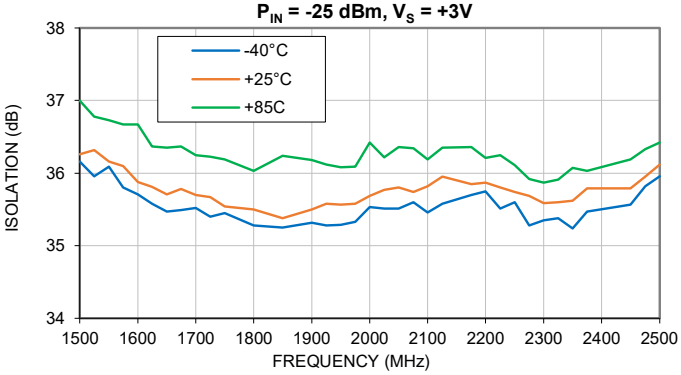
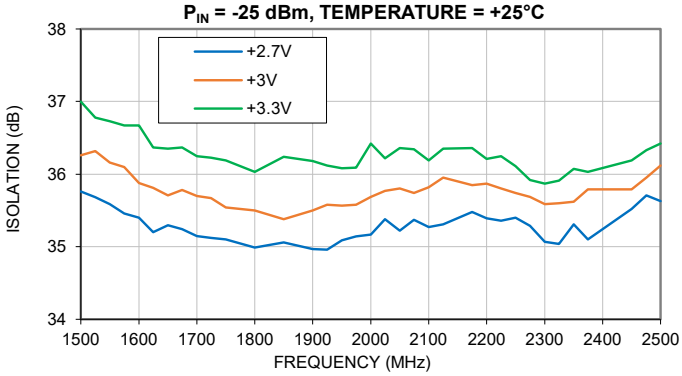
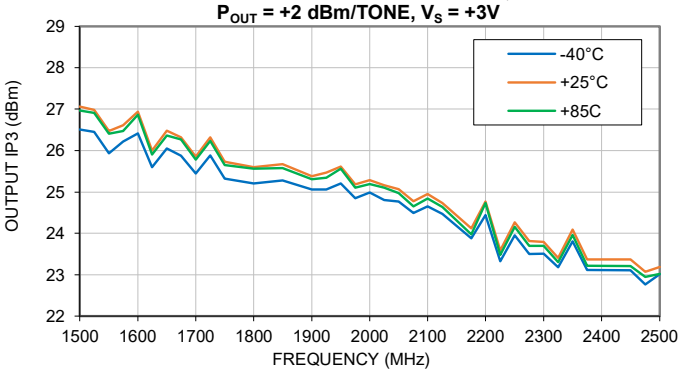
ISOLATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



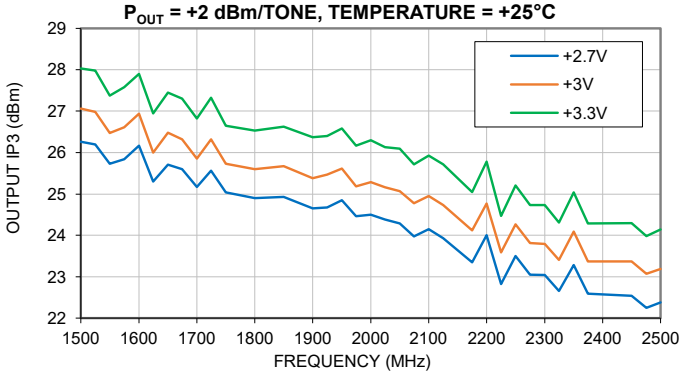
ISOLATION vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



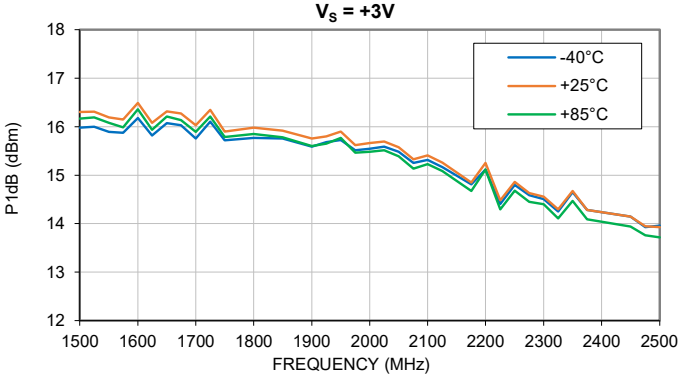
OUTPUT IP3 vs. TEMPERATURE,
P_{OUT} = +2 dBm/TONE, V_S = +3V



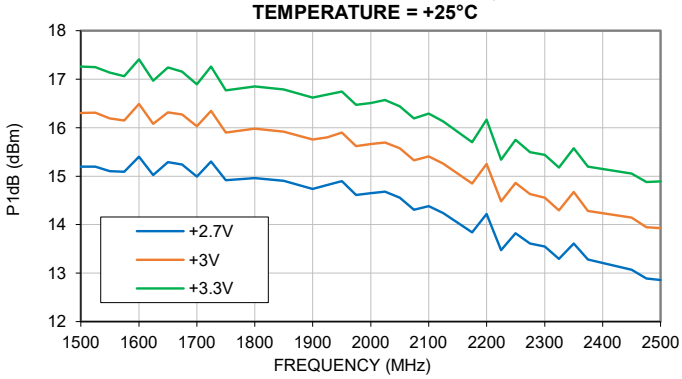
OUTPUT IP3 vs. DEVICE VOLTAGE,
P_{OUT} = +2 dBm/TONE, TEMPERATURE = +25°C



P1dB vs. TEMPERATURE,
V_S = +3V



P1dB vs. DEVICE VOLTAGE,
TEMPERATURE = +25°C



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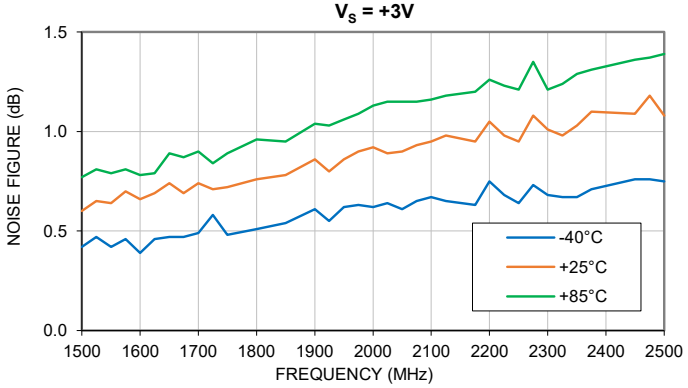
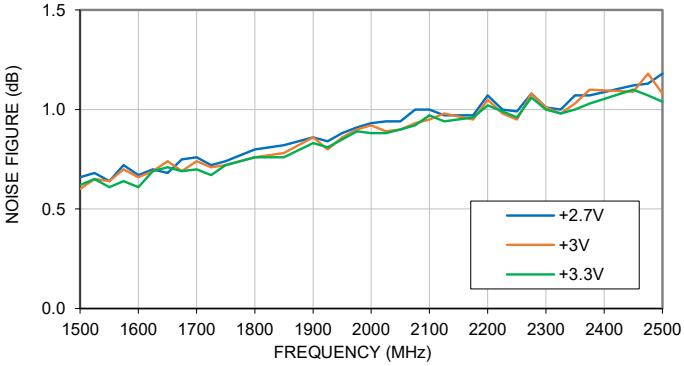
TYPICAL PERFORMANCE GRAPHS

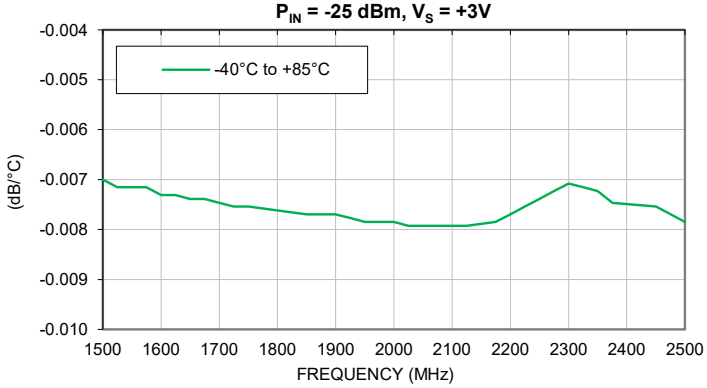
NOISE FIGURE vs. TEMPERATURE,
V_S = +3V



NOISE FIGURE vs. DEVICE VOLTAGE,
TEMPERATURE = +25°C



GAIN VARIATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



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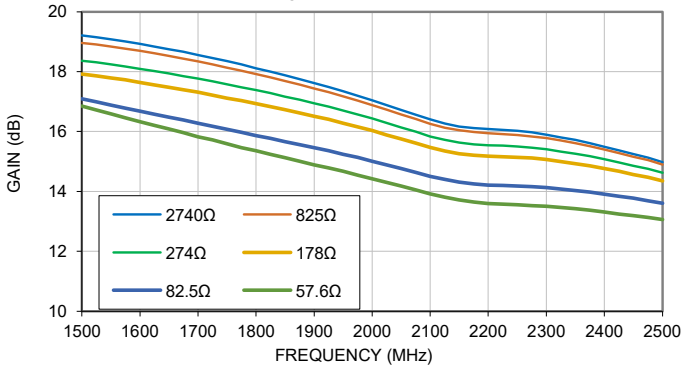
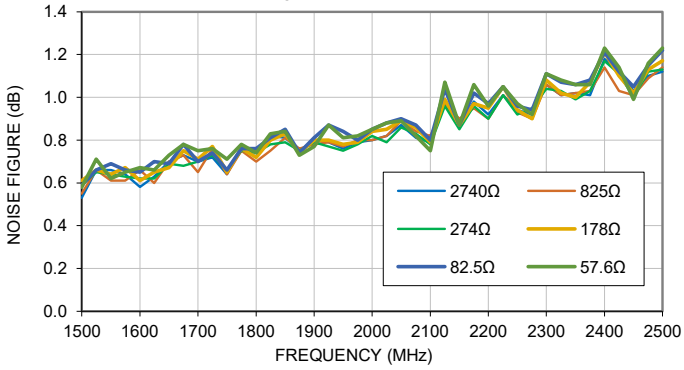
TYPICAL PERFORMANCE GRAPHS

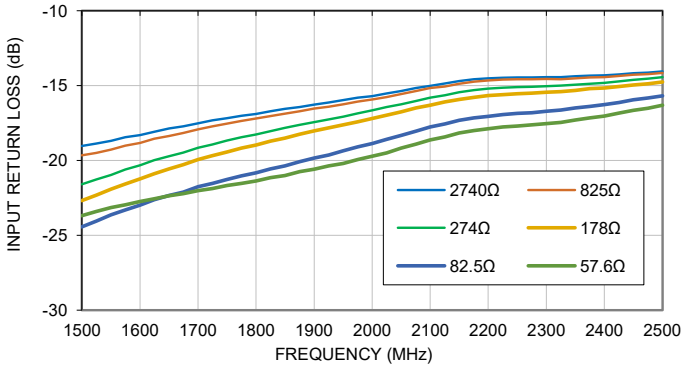
GAIN vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



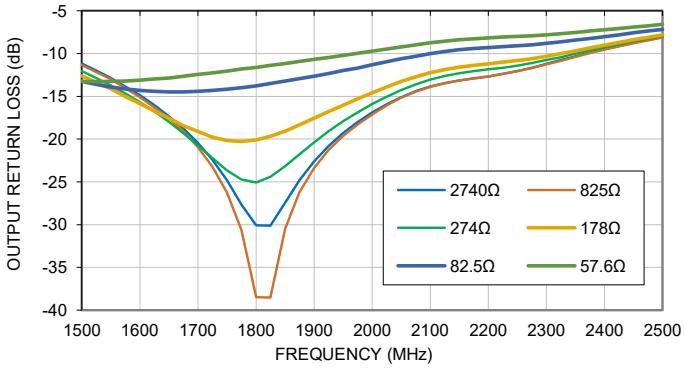
NOISE FIGURE vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Total Power Dissipation	0.55W
Junction Temperature[6]	+150°C
Input Power (CW), V_S = +4V, or V_S = +3V	+25 dBm (5-minutes max) +20 dBm (Continuous)
DC Voltage on V_S	+5.5V
Current I_S	130mA

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]	53°C/W

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

ESD RATING

	Class	Voltage Range	Reference Standard
Human Body Model (HBM)	1A	250V to <500V	ANSI/ESDA/JEDEC JS-001-2017
Machine Model (MM)	M1	25V	JESD22-C101F

ESD HANDLING PRECAUTION: This device is designed to be Class 1A for HBM and Class M1 for MM. 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-020E/JEDEC J-STD-033C

Low Noise Amplifier PMA2-252LNA+

50Ω 1500 to 2500 MHz Ultra Low Noise

FUNCTIONAL DIAGRAM

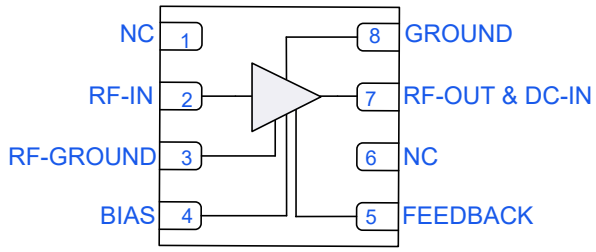


Figure 1. PMA2-252LNA+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description (See Figure 1)
RF-IN	2	RF-IN Pad connects to RF-Input port.
RF-OUT & DC-IN	7	RF-OUT Pad connects to RF-Output and the voltage input port, DC-IN.
BIAS	4	BIAS Pad that is used to adjust the bias voltage supplied to the DUT through the use of an external resistor.
FEEDBACK	5	FEEDBACK Pad used to reflect any feedback into the DUT.
RF-GROUND	3	RF-GND Pad used for grounding.
GROUND	8 & Paddle	Connects to ground.
NC	1 & 6	Not used internally. Connected to ground on test board.

CHARACTERIZATION TEST BOARD

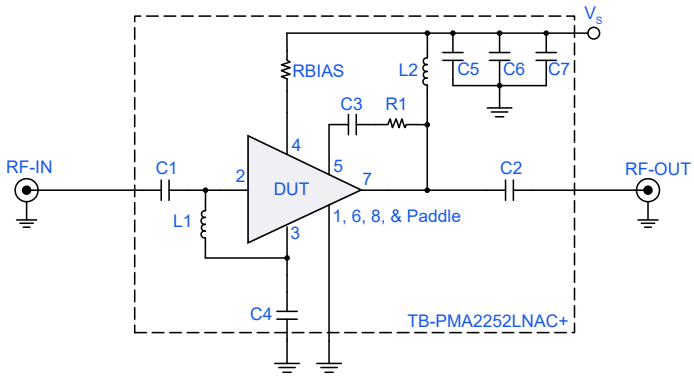
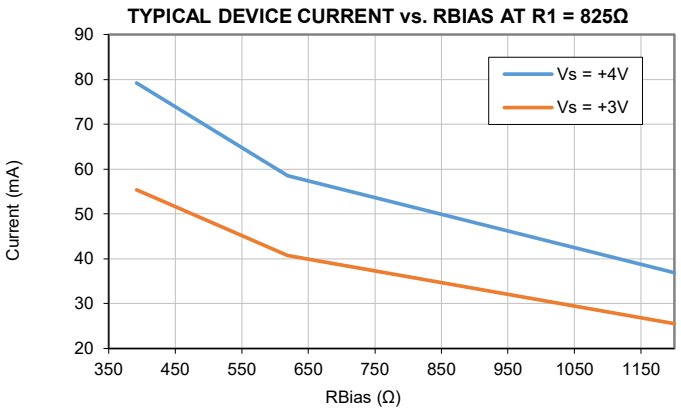


Figure 2. DUT soldered on Mini-Circuits Characterization Test Board: TB-PMA2252LNAC+



Gain, Return Loss, Output Power at 1dB Compression (P1dB), Output IP3 (OIP3) and Noise Figure measured using N5242A PNA-X Microwave Network Analyzer:

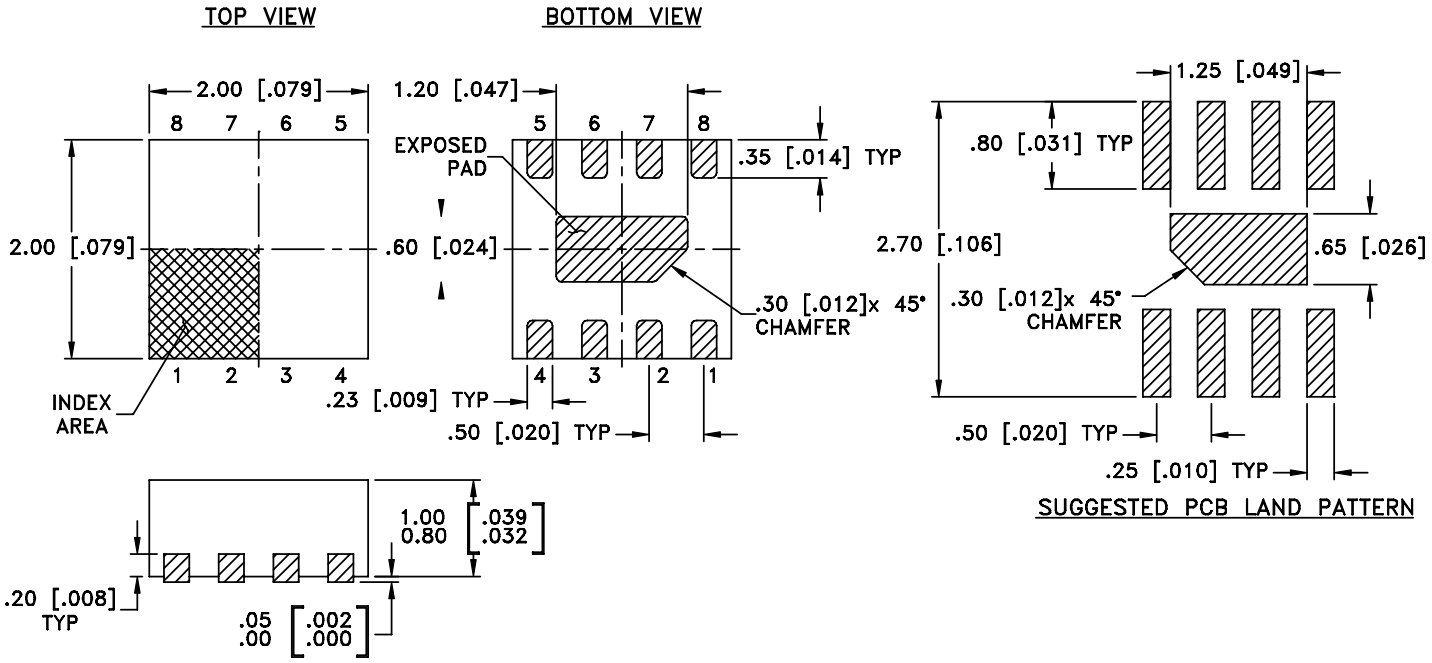
Conditions:
1. Gain and Return Loss: P_{IN}= -25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +2 dBm/tone at output.
3. V_S = +4V, or V_S = +3V

Component	Vendor	Vendor P/N	Value	Size
C1	Murata	GRM1555C1H270JA01D	27pF	0402
C2	Murata	GRM1555C1H2R7BZ01D	2.7pF	0402
C3	Murata	GRM1555C1H1R2WA01D	1.2pF	0402
C4	Murata	GRM1555C1H221GA01D	220pF	0402
C5	Murata	GRM1555C1H7R0WA01D	7pF	0402
C6, C7	Murata	GRM155R71C104KA88D	0.1µF	0402
L1	Coilcraft	0402CS-6N8XJRW	6.8nH	0402
L2	Coilcraft	0402CS-2N2XJRW	2.2nH	0402
RBIAS	KOA Speer Electronics	RK73H1ETTP6190F	619Ω	0402
R1	KOA Speer Electronics	RK73H1ELTP8250F	825Ω	0402

Low Noise Amplifier PMA2-252LNA+

50Ω 1500 to 2500 MHz Ultra Low Noise

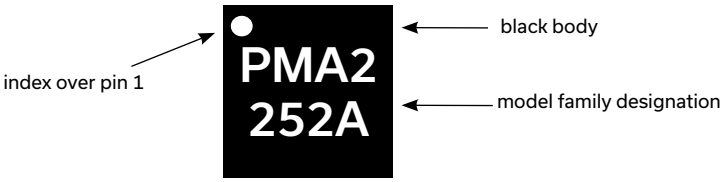
CASE STYLE DRAWING



Weight: 0.006 grams
Dimensions are in inches [mm].

Figure 3. MC1631-1 Case Style Drawing

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

Figure 4. PMA2-252LNA+ Product Marking

Low Noise Amplifier PMA2-252LNA+

50Ω 1500 to 2500 MHz Ultra Low Noise

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD CLICK HERE

Performance Data	Data Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MC1631-1. Plastic Package, Exposed Paddle, Lead Finish: Matte Tin
RoHs Status	Compliant
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50 , 100, 200, 500, or 1000 devices
Suggested Layout for PCB Design	PL-738
Evaluation Board	TB-PMA2252LNAC+ Gerber File
Environmental Ratings	ENV08T1

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

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: V_S = +4V, I_S = 59.59 mA @ 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)
1500	19.45	38.31	-24.80	-10.04	4.01	0.89	31.32	18.52	0.61
1525	19.40	38.06	-24.60	-10.70	3.98	0.90	31.36	18.45	0.55
1550	19.36	38.10	-24.33	-11.38	4.07	0.91	30.97	18.18	0.61
1575	19.29	38.05	-24.14	-12.14	4.13	0.93	31.18	18.31	0.57
1600	19.22	37.61	-23.81	-12.97	4.00	0.94	31.56	18.67	0.59
1625	19.16	37.72	-23.32	-13.88	4.12	0.95	30.60	18.05	0.62
1650	19.08	37.64	-22.82	-14.83	4.14	0.96	31.30	18.39	0.56
1675	19.00	37.53	-22.44	-15.86	4.16	0.96	31.32	18.35	0.68
1700	18.92	37.52	-21.99	-16.98	4.21	0.97	30.71	18.02	0.62
1725	18.84	37.42	-21.62	-18.26	4.22	0.98	31.17	18.39	0.64
1750	18.74	37.48	-21.26	-19.75	4.31	0.98	30.77	17.93	0.65
1800	18.55	37.46	-20.54	-23.31	4.41	0.99	30.74	17.96	0.71
1850	18.34	37.41	-19.86	-27.42	4.49	1.00	30.86	18.00	0.75
1900	18.11	37.32	-19.37	-27.36	4.55	1.00	30.66	17.80	0.76
1925	17.99	37.39	-19.09	-25.34	4.64	1.00	30.73	17.97	0.87
1950	17.87	37.37	-18.81	-23.39	4.68	1.00	30.81	17.92	0.80
1975	17.75	37.24	-18.52	-21.57	4.66	1.00	30.48	17.66	0.79
2000	17.61	37.31	-18.30	-20.06	4.75	1.00	30.59	17.78	0.74
2025	17.46	37.23	-18.07	-18.70	4.76	0.99	30.38	17.71	0.89
2050	17.32	37.36	-17.75	-17.55	4.89	0.99	30.34	17.52	0.90
2075	17.16	37.26	-17.49	-16.65	4.89	0.99	29.96	17.40	0.89
2100	17.00	37.11	-17.27	-15.76	4.87	0.99	30.18	17.49	0.82
2125	16.84	37.55	-17.00	-15.11	5.17	0.98	29.92	17.31	1.00
2175	16.61	37.45	-16.54	-14.23	5.20	0.98	29.34	16.93	1.05
2200	16.54	37.17	-16.33	-13.99	5.06	0.98	30.07	17.45	0.82
2225	16.50	37.34	-16.25	-13.81	5.17	0.98	28.54	16.48	0.86
2250	16.50	37.08	-16.12	-13.49	5.00	0.97	29.68	17.08	0.84
2275	16.49	37.02	-15.97	-13.08	4.95	0.97	28.96	16.73	0.95
2300	16.45	36.76	-15.88	-12.64	4.79	0.97	29.00	16.69	1.06
2325	16.41	36.83	-15.80	-12.14	4.81	0.96	28.67	16.52	0.96
2350	16.34	36.87	-15.67	-11.62	4.82	0.95	29.53	16.82	0.89
2375	16.25	36.82	-15.62	-11.14	4.80	0.95	28.58	16.39	0.83
2450	15.94	37.14	-15.32	-9.71	4.96	0.92	28.59	16.36	1.07
2475	15.81	37.04	-15.29	-9.33	4.93	0.91	28.36	16.21	1.04
2500	15.68	37.19	-15.19	-8.94	5.01	0.90	28.54	16.24	1.24

Typical Performance Data

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

TEST CONDITIONS: V_S = +3.5V, I_S =50.69 mA @ 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)
1500	19.24	36.98	-21.62	-10.79	3.59	0.90	29.20	17.37	0.58
1525	19.19	36.96	-21.27	-11.53	3.65	0.91	29.05	17.31	0.55
1550	19.14	37.02	-20.92	-12.31	3.74	0.93	28.40	17.06	0.58
1575	19.06	36.77	-20.68	-13.17	3.70	0.94	28.70	17.16	0.54
1600	18.99	36.54	-20.43	-14.14	3.67	0.95	29.19	17.48	0.63
1625	18.91	36.50	-20.07	-15.19	3.72	0.96	28.11	16.92	0.59
1650	18.83	36.51	-19.68	-16.37	3.78	0.97	28.73	17.24	0.57
1675	18.75	36.43	-19.40	-17.64	3.80	0.97	28.74	17.17	0.70
1700	18.66	36.36	-19.08	-19.09	3.82	0.98	27.98	16.89	0.63
1725	18.56	36.34	-18.83	-20.83	3.86	0.99	28.47	17.24	0.80
1750	18.46	36.41	-18.59	-22.85	3.94	0.99	27.90	16.79	0.66
1800	18.26	36.22	-18.10	-28.75	3.95	1.00	27.79	16.81	0.72
1850	18.04	36.11	-17.66	-31.88	3.99	1.00	27.92	16.87	0.76
1900	17.80	36.47	-17.32	-25.42	4.25	1.00	27.64	16.67	0.77
1925	17.68	36.26	-17.12	-22.95	4.19	1.00	27.77	16.83	0.86
1950	17.55	36.17	-16.93	-21.10	4.19	1.00	27.84	16.77	0.82
1975	17.42	36.20	-16.74	-19.48	4.25	1.00	27.39	16.53	0.81
2000	17.28	36.46	-16.59	-18.18	4.42	1.00	27.63	16.64	0.75
2025	17.13	36.34	-16.41	-17.03	4.41	0.99	27.46	16.55	0.89
2050	16.98	36.13	-16.20	-16.00	4.35	0.99	27.28	16.36	0.93
2075	16.82	36.55	-16.01	-15.20	4.61	0.99	26.99	16.25	0.92
2100	16.65	36.52	-15.85	-14.42	4.65	0.98	27.22	16.33	0.81
2125	16.50	36.36	-15.61	-13.83	4.61	0.98	26.90	16.16	1.03
2175	16.26	36.42	-15.25	-13.01	4.71	0.98	26.34	15.79	1.07
2200	16.18	36.33	-15.11	-12.78	4.68	0.97	27.00	16.28	0.83
2225	16.14	36.31	-15.05	-12.60	4.68	0.97	25.55	15.37	0.87
2250	16.12	36.18	-14.98	-12.31	4.60	0.97	26.51	15.92	0.84
2275	16.10	36.13	-14.89	-11.93	4.55	0.96	25.88	15.59	0.94
2300	16.06	36.11	-14.84	-11.55	4.53	0.96	25.81	15.55	1.09
2325	16.01	35.94	-14.80	-11.11	4.43	0.95	25.56	15.39	0.99
2350	15.93	36.08	-14.70	-10.65	4.49	0.94	26.25	15.69	0.86
2375	15.83	36.05	-14.70	-10.24	4.48	0.94	25.45	15.26	0.86
2450	15.50	36.31	-14.52	-8.97	4.60	0.91	25.38	15.16	1.15
2475	15.37	36.39	-14.48	-8.62	4.66	0.90	25.21	15.05	1.05
2500	15.23	36.45	-14.41	-8.28	4.69	0.89	25.35	15.03	1.25

Typical Performance Data

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

TEST CONDITIONS: V_S = +4.5V, I_S = 68.6 mA @ 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)
1500	19.57	39.28	-26.04	-9.55	4.35	0.88	30.51	19.20	0.58
1525	19.54	39.31	-26.39	-10.16	4.46	0.89	30.49	19.13	0.57
1550	19.50	38.97	-26.62	-10.80	4.37	0.90	30.44	18.84	0.58
1575	19.44	39.20	-26.83	-11.48	4.57	0.92	30.33	19.00	0.53
1600	19.37	38.87	-26.57	-12.24	4.49	0.93	30.57	19.36	0.60
1625	19.31	38.76	-26.15	-13.05	4.51	0.94	30.02	18.73	0.64
1650	19.24	38.69	-25.59	-13.90	4.55	0.95	30.31	19.11	0.54
1675	19.17	38.73	-25.17	-14.80	4.64	0.96	30.40	19.11	0.67
1700	19.09	38.66	-24.65	-15.78	4.68	0.96	30.17	18.74	0.65
1725	19.01	38.57	-24.19	-16.87	4.70	0.97	30.35	19.18	0.66
1750	18.92	38.30	-23.71	-18.07	4.63	0.98	30.21	18.71	0.64
1800	18.73	38.40	-22.77	-20.83	4.80	0.99	30.18	18.74	0.70
1850	18.54	38.43	-21.88	-23.96	4.94	0.99	30.17	18.83	0.78
1900	18.31	38.17	-21.17	-25.89	4.92	1.00	30.08	18.68	0.78
1925	18.19	38.25	-20.83	-25.36	5.02	1.00	30.16	18.86	0.85
1950	18.08	38.17	-20.49	-24.12	5.03	1.00	30.19	18.80	0.82
1975	17.96	38.10	-20.11	-22.60	5.05	1.00	30.07	18.55	0.78
2000	17.82	38.29	-19.78	-21.14	5.22	1.00	30.12	18.71	0.78
2025	17.68	38.30	-19.50	-19.75	5.29	0.99	30.01	18.60	0.89
2050	17.53	38.31	-19.12	-18.60	5.36	0.99	29.96	18.48	0.85
2075	17.37	38.17	-18.81	-17.60	5.35	0.99	29.77	18.33	0.89
2100	17.21	38.25	-18.49	-16.66	5.46	0.99	30.00	18.43	0.81
2125	17.06	38.00	-18.17	-15.99	5.37	0.98	29.82	18.28	0.98
2175	16.83	38.18	-17.62	-15.10	5.58	0.98	29.56	17.88	1.02
2200	16.77	38.04	-17.39	-14.88	5.52	0.98	29.84	18.39	0.80
2225	16.73	38.16	-17.25	-14.70	5.61	0.98	29.36	17.42	0.87
2250	16.73	37.67	-17.06	-14.36	5.28	0.98	29.74	18.07	0.83
2275	16.73	37.60	-16.88	-13.90	5.21	0.98	29.61	17.68	0.96
2300	16.70	37.65	-16.75	-13.42	5.22	0.97	29.71	17.65	1.07
2325	16.66	37.47	-16.64	-12.87	5.11	0.97	29.55	17.49	0.97
2350	16.60	37.61	-16.49	-12.27	5.18	0.96	29.76	17.83	0.84
2375	16.51	37.48	-16.40	-11.76	5.11	0.95	29.63	17.35	0.89
2450	16.22	37.74	-16.03	-10.22	5.25	0.93	29.54	17.34	1.05
2475	16.09	37.67	-15.95	-9.80	5.23	0.92	29.44	17.21	1.08
2500	15.97	37.66	-15.82	-9.38	5.23	0.91	29.61	17.23	1.19

Typical Performance Data

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

TEST CONDITIONS: V_S =+ 4V, I_S=61.67 mA @ Temperature = -40°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)
1500	19.93	38.63	-23.21	-9.44	3.87	0.87	31.93	18.94	0.42
1525	19.89	38.69	-23.96	-10.04	3.98	0.89	32.11	18.89	0.38
1550	19.86	38.59	-24.72	-10.66	4.01	0.90	31.80	18.62	0.38
1575	19.80	38.44	-25.43	-11.34	4.02	0.91	32.03	18.73	0.39
1600	19.74	38.10	-25.81	-12.06	3.95	0.92	32.41	19.08	0.41
1625	19.68	38.16	-26.19	-12.84	4.04	0.93	31.59	18.47	0.45
1650	19.61	38.18	-26.24	-13.65	4.12	0.94	32.20	18.84	0.35
1675	19.53	38.12	-26.31	-14.52	4.16	0.95	32.12	18.80	0.46
1700	19.46	38.07	-26.15	-15.45	4.19	0.96	31.59	18.45	0.40
1725	19.38	38.01	-25.90	-16.51	4.23	0.96	32.08	18.82	0.43
1750	19.29	37.90	-25.50	-17.65	4.24	0.97	31.83	18.36	0.43
1800	19.12	37.62	-24.62	-20.48	4.22	0.98	31.87	18.38	0.48
1850	18.92	37.85	-23.75	-23.76	4.44	0.99	31.93	18.43	0.52
1900	18.70	37.53	-23.12	-26.10	4.39	0.99	31.82	18.25	0.52
1925	18.59	37.75	-22.74	-25.72	4.56	0.99	31.73	18.42	0.57
1950	18.47	37.74	-22.44	-24.50	4.61	0.99	31.88	18.34	0.54
1975	18.35	37.68	-22.02	-22.88	4.62	0.99	31.55	18.12	0.51
2000	18.21	37.62	-21.69	-21.37	4.65	0.99	31.78	18.25	0.46
2025	18.08	37.82	-21.26	-19.90	4.81	0.99	31.61	18.12	0.61
2050	17.93	37.86	-20.83	-18.67	4.89	0.99	31.45	17.99	0.59
2075	17.76	38.04	-20.50	-17.60	5.06	0.98	31.09	17.88	0.60
2100	17.59	37.83	-20.02	-16.57	5.01	0.98	31.30	17.94	0.50
2125	17.43	38.03	-19.60	-15.80	5.19	0.98	31.08	17.79	0.71
2175	17.17	37.58	-18.89	-14.78	5.03	0.97	30.56	17.40	0.72
2200	17.09	37.74	-18.58	-14.56	5.16	0.97	31.14	17.85	0.52
2225	17.05	37.51	-18.44	-14.43	5.03	0.97	29.68	16.89	0.55
2250	17.06	37.45	-18.27	-14.16	4.98	0.97	30.84	17.55	0.50
2275	17.07	37.31	-18.05	-13.76	4.87	0.97	30.09	17.12	0.63
2300	17.06	37.13	-17.93	-13.31	4.75	0.96	30.19	17.12	0.75
2325	17.02	37.12	-17.81	-12.76	4.73	0.96	29.80	16.95	0.67
2350	16.97	37.22	-17.65	-12.19	4.77	0.95	30.85	17.29	0.55
2375	16.88	37.23	-17.55	-11.66	4.78	0.95	29.68	16.81	0.55
2450	16.58	37.35	-17.10	-10.10	4.83	0.92	29.73	16.82	0.70
2475	16.46	37.40	-16.95	-9.66	4.87	0.91	29.49	16.65	0.71
2500	16.33	37.54	-16.80	-9.26	4.95	0.90	29.73	16.71	0.85

Typical Performance Data

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

TEST CONDITIONS: V_S = +3.5V, I_S =51.58 mA @ Temperature = -40°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)
1500	19.65	37.75	-24.03	-9.97	3.68	0.88	30.14	17.56	0.43
1525	19.60	37.70	-24.16	-10.63	3.74	0.90	30.05	17.52	0.35
1550	19.56	37.56	-24.20	-11.31	3.74	0.91	29.27	17.28	0.40
1575	19.49	37.34	-24.23	-12.07	3.72	0.92	29.89	17.40	0.32
1600	19.42	37.19	-24.14	-12.87	3.73	0.93	30.25	17.71	0.41
1625	19.35	37.08	-23.75	-13.75	3.75	0.94	29.10	17.18	0.41
1650	19.28	37.09	-23.27	-14.66	3.81	0.95	29.91	17.51	0.37
1675	19.20	37.08	-22.93	-15.67	3.87	0.96	29.81	17.46	0.46
1700	19.12	36.86	-22.44	-16.76	3.82	0.97	28.95	17.15	0.41
1725	19.04	36.98	-22.03	-18.04	3.93	0.97	29.61	17.49	0.49
1750	18.94	36.96	-21.67	-19.46	3.98	0.98	28.92	17.08	0.42
1800	18.75	36.91	-20.93	-23.13	4.06	0.99	28.76	17.09	0.47
1850	18.55	36.67	-20.31	-27.48	4.04	0.99	29.04	17.16	0.51
1900	18.32	36.74	-19.83	-27.45	4.17	0.99	28.72	16.99	0.54
1925	18.20	36.73	-19.62	-25.37	4.22	1.00	28.85	17.16	0.61
1950	18.08	36.66	-19.35	-23.34	4.23	0.99	28.90	17.07	0.57
1975	17.96	36.79	-19.10	-21.52	4.33	0.99	28.49	16.86	0.53
2000	17.82	36.86	-18.86	-19.99	4.42	0.99	28.81	16.99	0.50
2025	17.68	36.80	-18.58	-18.57	4.44	0.99	28.46	16.87	0.60
2050	17.52	36.82	-18.28	-17.41	4.50	0.99	28.36	16.74	0.61
2075	17.36	37.13	-18.00	-16.45	4.72	0.99	28.06	16.61	0.61
2100	17.18	36.88	-17.73	-15.48	4.64	0.98	28.27	16.66	0.52
2125	17.02	36.91	-17.40	-14.77	4.71	0.98	27.91	16.52	0.72
2175	16.75	36.95	-16.88	-13.80	4.83	0.97	27.32	16.16	0.75
2200	16.67	36.89	-16.64	-13.56	4.82	0.97	27.91	16.58	0.52
2225	16.63	36.76	-16.52	-13.40	4.76	0.97	26.39	15.71	0.54
2250	16.63	36.55	-16.40	-13.16	4.63	0.97	27.39	16.27	0.52
2275	16.63	36.61	-16.28	-12.80	4.64	0.97	26.65	15.92	0.65
2300	16.61	36.41	-16.21	-12.40	4.51	0.96	26.59	15.91	0.78
2325	16.56	36.42	-16.14	-11.90	4.50	0.96	26.34	15.75	0.67
2350	16.50	36.44	-16.06	-11.39	4.50	0.95	27.15	16.05	0.54
2375	16.41	36.38	-16.02	-10.92	4.47	0.94	26.19	15.64	0.52
2450	16.10	36.61	-15.71	-9.50	4.58	0.91	26.18	15.57	0.73
2475	15.97	36.59	-15.63	-9.09	4.57	0.90	25.95	15.43	0.71
2500	15.84	37.03	-15.54	-8.73	4.81	0.89	26.21	15.46	0.87

Typical Performance Data

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

TEST CONDITIONS: V_S = +4.5V, I_S = 72.08 mA @ Temperature = -40°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)
1500	20.00	39.98	-21.73	-8.92	4.38	0.86	32.29	19.67	0.42
1525	19.97	39.81	-22.44	-9.48	4.39	0.88	32.31	19.63	0.38
1550	19.94	39.67	-23.22	-10.05	4.41	0.89	32.03	19.33	0.41
1575	19.89	39.43	-23.98	-10.67	4.38	0.90	32.30	19.47	0.40
1600	19.83	39.18	-24.45	-11.31	4.35	0.92	32.71	19.82	0.44
1625	19.77	39.36	-25.12	-12.02	4.52	0.93	31.70	19.20	0.43
1650	19.71	38.98	-25.63	-12.73	4.41	0.94	32.33	19.55	0.36
1675	19.64	39.08	-26.14	-13.49	4.53	0.94	32.19	19.53	0.46
1700	19.58	39.06	-26.35	-14.31	4.59	0.95	31.75	19.17	0.44
1725	19.50	38.87	-26.53	-15.21	4.56	0.96	32.14	19.56	0.44
1750	19.41	38.91	-26.43	-16.17	4.65	0.97	31.93	19.09	0.42
1800	19.24	38.90	-25.91	-18.43	4.78	0.98	31.97	19.10	0.48
1850	19.06	38.90	-25.24	-21.03	4.91	0.98	32.03	19.19	0.54
1900	18.85	38.69	-24.55	-23.54	4.92	0.99	31.84	18.99	0.52
1925	18.74	38.63	-24.18	-24.21	4.95	0.99	31.76	19.16	0.60
1950	18.63	38.61	-23.85	-24.15	5.00	0.99	31.95	19.08	0.58
1975	18.51	38.37	-23.41	-23.47	4.92	0.99	31.68	18.82	0.54
2000	18.37	38.90	-23.05	-22.37	5.30	0.99	31.84	18.96	0.51
2025	18.24	38.61	-22.55	-21.06	5.19	0.99	31.71	18.86	0.63
2050	18.09	38.77	-22.05	-19.84	5.35	0.99	31.55	18.72	0.58
2075	17.93	38.94	-21.67	-18.80	5.54	0.99	31.32	18.58	0.61
2100	17.76	38.64	-21.18	-17.70	5.43	0.98	31.42	18.67	0.54
2125	17.60	38.84	-20.69	-16.90	5.63	0.98	31.29	18.50	0.69
2175	17.34	38.70	-19.87	-15.87	5.67	0.98	30.97	18.11	0.73
2200	17.27	38.59	-19.59	-15.65	5.63	0.98	31.41	18.60	0.54
2225	17.24	38.18	-19.38	-15.54	5.38	0.98	30.34	17.63	0.60
2250	17.25	38.21	-19.16	-15.27	5.38	0.98	31.08	18.26	0.55
2275	17.27	37.86	-18.89	-14.81	5.14	0.97	30.76	17.88	0.66
2300	17.26	37.81	-18.74	-14.31	5.09	0.97	30.82	17.86	0.76
2325	17.23	37.88	-18.54	-13.68	5.11	0.97	30.61	17.65	0.68
2350	17.18	37.76	-18.34	-13.03	5.02	0.96	31.15	18.04	0.60
2375	17.10	37.90	-18.21	-12.45	5.11	0.95	30.50	17.55	0.55
2450	16.82	38.00	-17.67	-10.71	5.16	0.93	30.51	17.54	0.85
2475	16.70	37.71	-17.48	-10.23	5.00	0.92	30.30	17.38	0.71
2500	16.58	37.99	-17.34	-9.79	5.17	0.91	30.41	17.42	0.88

Typical Performance Data

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

TEST CONDITIONS: V_S = +4V, I_S = 58.6 mA @ 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)
1500	19.03	39.03	-22.64	-9.82	4.53	0.89	30.55	18.22	0.76
1525	18.99	39.06	-22.25	-10.45	4.63	0.90	30.65	18.21	0.72
1550	18.94	38.87	-21.89	-11.10	4.61	0.91	30.65	17.96	0.76
1575	18.88	38.63	-21.62	-11.81	4.58	0.93	30.39	18.02	0.74
1600	18.81	38.52	-21.34	-12.59	4.60	0.94	30.71	18.41	0.78
1625	18.74	38.73	-20.87	-13.42	4.79	0.95	30.22	17.81	0.83
1650	18.67	38.49	-20.45	-14.28	4.74	0.96	30.44	18.14	0.72
1675	18.59	38.23	-20.11	-15.19	4.67	0.97	30.50	18.11	0.84
1700	18.51	38.44	-19.71	-16.17	4.85	0.97	30.40	17.81	0.79
1725	18.42	38.17	-19.42	-17.29	4.77	0.98	30.46	18.17	0.83
1750	18.33	38.27	-19.14	-18.46	4.90	0.99	30.46	17.73	0.82
1800	18.13	38.09	-18.59	-21.23	4.92	1.00	30.47	17.77	0.89
1850	17.93	38.17	-18.01	-24.15	5.09	1.00	30.34	17.81	0.94
1900	17.71	38.09	-17.57	-25.70	5.17	1.01	30.22	17.61	0.93
1925	17.59	38.00	-17.35	-25.15	5.17	1.01	30.23	17.78	1.05
1950	17.47	37.93	-17.14	-23.96	5.19	1.01	30.28	17.76	1.03
1975	17.34	37.91	-16.89	-22.54	5.24	1.01	30.18	17.47	1.03
2000	17.21	37.97	-16.69	-21.22	5.34	1.01	30.08	17.59	0.96
2025	17.07	38.23	-16.49	-19.90	5.56	1.01	30.07	17.51	1.10
2050	16.93	37.98	-16.24	-18.79	5.46	1.01	29.97	17.36	1.09
2075	16.77	38.28	-16.01	-17.88	5.73	1.00	29.86	17.19	1.10
2100	16.62	38.17	-15.86	-17.02	5.72	1.00	29.95	17.31	1.01
2125	16.48	37.94	-15.61	-16.35	5.64	1.00	29.81	17.15	1.20
2175	16.27	37.80	-15.24	-15.46	5.64	1.00	29.50	16.75	1.22
2200	16.21	37.86	-15.09	-15.21	5.70	1.00	29.89	17.30	1.06
2225	16.17	37.66	-14.98	-14.97	5.58	1.00	29.38	16.29	1.07
2250	16.16	37.64	-14.86	-14.59	5.55	0.99	29.80	16.95	1.07
2275	16.15	37.50	-14.73	-14.11	5.44	0.99	29.65	16.55	1.21
2300	16.12	37.49	-14.64	-13.60	5.42	0.99	29.69	16.54	1.29
2325	16.07	37.36	-14.54	-13.03	5.32	0.98	29.52	16.33	1.23
2350	16.01	37.40	-14.45	-12.45	5.34	0.98	29.83	16.68	1.13
2375	15.92	37.23	-14.36	-11.91	5.24	0.97	29.56	16.21	1.12
2450	15.63	37.51	-14.12	-10.38	5.41	0.95	29.33	16.18	1.33
2475	15.49	37.67	-14.10	-9.95	5.53	0.94	29.28	16.04	1.31
2500	15.37	37.54	-13.99	-9.54	5.46	0.93	29.25	16.02	1.50

Typical Performance Data

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

TEST CONDITIONS: V_S = +3.5V, I_S = 50.16 mA @ 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)
1500	18.81	37.88	-19.69	-10.26	4.11	0.90	29.17	17.20	0.77
1525	18.76	37.87	-19.34	-10.93	4.18	0.91	29.13	17.16	0.71
1550	18.71	37.62	-19.05	-11.63	4.13	0.92	28.51	16.96	0.77
1575	18.64	37.56	-18.80	-12.41	4.18	0.94	28.74	16.99	0.73
1600	18.57	37.35	-18.60	-13.24	4.16	0.95	29.25	17.35	0.76
1625	18.49	37.34	-18.26	-14.15	4.22	0.96	28.13	16.77	0.83
1650	18.42	37.33	-17.95	-15.14	4.28	0.97	28.82	17.07	0.73
1675	18.33	37.46	-17.71	-16.14	4.41	0.98	28.84	17.00	0.84
1700	18.25	37.15	-17.43	-17.29	4.31	0.98	28.08	16.74	0.80
1725	18.16	37.29	-17.20	-18.58	4.44	0.99	28.60	17.08	0.82
1750	18.06	37.09	-17.01	-19.97	4.40	1.00	28.07	16.64	0.84
1800	17.86	37.07	-16.58	-23.43	4.50	1.00	27.97	16.72	0.91
1850	17.65	37.03	-16.16	-26.96	4.58	1.01	28.11	16.73	0.94
1900	17.42	37.12	-15.85	-26.88	4.74	1.01	27.78	16.52	0.96
1925	17.30	37.07	-15.69	-25.22	4.77	1.02	27.95	16.67	1.05
1950	17.17	37.04	-15.51	-23.39	4.80	1.02	27.99	16.62	1.00
1975	17.05	37.03	-15.33	-21.70	4.85	1.02	27.61	16.36	1.01
2000	16.91	37.07	-15.19	-20.31	4.93	1.01	27.78	16.47	0.99
2025	16.77	37.21	-15.04	-19.00	5.06	1.01	27.59	16.39	1.09
2050	16.62	37.16	-14.84	-17.89	5.08	1.01	27.42	16.21	1.07
2075	16.47	37.36	-14.67	-17.02	5.27	1.01	27.14	16.07	1.11
2100	16.32	37.18	-14.54	-16.18	5.22	1.01	27.36	16.16	1.03
2125	16.17	37.20	-14.38	-15.53	5.29	1.00	27.06	15.98	1.25
2175	15.96	37.11	-14.06	-14.66	5.31	1.00	26.51	15.63	1.26
2200	15.89	37.10	-13.94	-14.42	5.33	1.00	27.22	16.13	1.03
2225	15.85	37.14	-13.86	-14.18	5.36	1.00	25.77	15.17	1.11
2250	15.84	36.93	-13.79	-13.84	5.22	1.00	26.74	15.73	1.07
2275	15.82	36.79	-13.68	-13.38	5.11	0.99	26.11	15.41	1.20
2300	15.79	36.77	-13.63	-12.90	5.09	0.99	26.02	15.37	1.32
2325	15.73	36.67	-13.58	-12.39	5.02	0.98	25.74	15.19	1.24
2350	15.66	36.60	-13.50	-11.86	4.97	0.98	26.45	15.48	1.15
2375	15.57	36.65	-13.45	-11.38	5.01	0.97	25.63	15.05	1.09
2450	15.26	36.91	-13.28	-9.92	5.15	0.94	25.56	14.96	1.35
2475	15.13	37.07	-13.28	-9.54	5.27	0.93	25.44	14.84	1.32
2500	15.01	37.08	-13.20	-9.14	5.28	0.93	25.51	14.80	1.50

Typical Performance Data

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

TEST CONDITIONS: V_S = +4.5V, I_S = 67.05 mA @ 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)
1500	19.16	40.21	-25.31	-9.45	5.05	0.88	29.62	18.81	0.76
1525	19.12	40.09	-24.98	-10.05	5.08	0.88	29.67	18.77	0.73
1550	19.08	39.79	-24.66	-10.66	5.01	0.88	29.56	18.51	0.75
1575	19.02	39.82	-24.38	-11.33	5.12	0.89	29.50	18.59	0.71
1600	18.95	39.49	-23.98	-12.04	5.03	0.89	29.69	18.98	0.80
1625	18.89	39.35	-23.42	-12.81	5.03	0.89	29.27	18.36	0.78
1650	18.81	39.47	-22.84	-13.60	5.19	0.89	29.53	18.72	0.73
1675	18.74	39.16	-22.44	-14.43	5.09	0.90	29.61	18.72	0.87
1700	18.67	39.26	-21.94	-15.33	5.22	0.90	29.31	18.42	0.79
1725	18.58	39.09	-21.55	-16.30	5.19	0.90	29.50	18.82	0.83
1750	18.49	39.02	-21.15	-17.31	5.23	0.91	29.37	18.33	0.86
1800	18.30	39.00	-20.41	-19.65	5.36	0.91	29.23	18.42	0.89
1850	18.10	39.03	-19.68	-22.10	5.51	0.92	29.22	18.52	0.96
1900	17.88	38.85	-19.09	-23.98	5.54	0.92	29.25	18.32	0.96
1925	17.77	39.01	-18.82	-24.14	5.71	0.92	29.31	18.56	1.05
1950	17.65	38.92	-18.53	-23.71	5.72	0.93	29.26	18.53	1.02
1975	17.53	38.93	-18.22	-22.73	5.79	0.93	29.17	18.24	1.02
2000	17.40	39.08	-17.98	-21.69	5.96	0.93	29.21	18.41	0.98
2025	17.26	38.77	-17.75	-20.50	5.83	0.93	29.13	18.31	1.08
2050	17.12	38.91	-17.44	-19.45	5.99	0.93	29.11	18.18	1.06
2075	16.96	38.97	-17.17	-18.58	6.11	0.94	29.00	18.05	1.09
2100	16.82	38.94	-16.97	-17.69	6.17	0.94	29.11	18.16	1.03
2125	16.68	38.82	-16.69	-17.03	6.16	0.94	28.96	17.99	1.19
2175	16.47	38.54	-16.23	-16.16	6.07	0.95	28.71	17.61	1.26
2200	16.41	38.61	-16.04	-15.89	6.14	0.95	28.98	18.17	1.04
2225	16.37	38.36	-15.93	-15.66	5.98	0.95	28.56	17.13	1.11
2250	16.37	38.07	-15.76	-15.26	5.76	0.95	28.89	17.82	1.08
2275	16.36	37.93	-15.59	-14.73	5.64	0.95	28.69	17.40	1.21
2300	16.34	37.98	-15.47	-14.18	5.66	0.95	28.76	17.39	1.29
2325	16.29	37.93	-15.37	-13.57	5.62	0.96	28.63	17.20	1.20
2350	16.23	37.83	-15.23	-12.94	5.54	0.96	28.82	17.60	1.16
2375	16.15	38.05	-15.14	-12.38	5.69	0.96	28.63	17.09	1.15
2450	15.86	37.89	-14.80	-10.73	5.59	0.96	28.57	17.10	1.33
2475	15.73	37.85	-14.75	-10.30	5.58	0.97	28.55	16.96	1.33
2500	15.61	37.87	-14.64	-9.85	5.60	0.97	28.75	16.96	1.50

Typical Performance Data

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

TEST CONDITIONS: V_S = +3V, I_S = 40.82 mA @ 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)
1500	18.80	36.26	-17.82	-10.78	3.47	0.90	27.06	16.30	0.60
1525	18.75	36.32	-17.52	-11.51	3.54	0.92	26.98	16.31	0.65
1550	18.69	36.16	-17.28	-12.31	3.51	0.93	26.47	16.19	0.64
1575	18.62	36.10	-17.03	-13.15	3.57	0.95	26.61	16.15	0.70
1600	18.54	35.88	-16.83	-14.06	3.55	0.96	26.94	16.49	0.66
1625	18.46	35.81	-16.65	-15.11	3.58	0.97	26.00	16.08	0.69
1650	18.38	35.71	-16.42	-16.23	3.61	0.97	26.48	16.32	0.74
1675	18.29	35.78	-16.25	-17.47	3.70	0.98	26.32	16.27	0.69
1700	18.20	35.70	-16.06	-18.92	3.70	0.99	25.85	16.03	0.74
1725	18.11	35.67	-15.87	-20.58	3.65	1.00	26.32	16.35	0.71
1750	18.01	35.54	-15.72	-22.62	3.72	1.00	25.73	15.90	0.72
1800	17.80	35.50	-15.39	-28.53	3.86	1.01	25.60	15.98	0.76
1850	17.58	35.38	-15.11	-34.15	3.94	1.02	25.67	15.92	0.78
1900	17.34	35.50	-14.90	-26.47	3.94	1.02	25.38	15.76	0.86
1925	17.22	35.58	-14.74	-23.77	4.07	1.02	25.47	15.80	0.80
1950	17.09	35.57	-14.62	-21.63	4.07	1.02	25.61	15.90	0.86
1975	16.96	35.58	-14.49	-20.03	4.19	1.02	25.18	15.62	0.90
2000	16.82	35.69	-14.38	-18.57	4.16	1.01	25.29	15.66	0.92
2025	16.66	35.77	-14.30	-17.37	4.27	1.01	25.16	15.69	0.89
2050	16.51	35.80	-14.16	-16.33	4.32	1.01	25.07	15.58	0.90
2075	16.35	35.74	-14.01	-15.43	4.39	1.00	24.78	15.33	0.93
2100	16.19	35.82	-13.87	-14.69	4.55	1.00	24.95	15.41	0.95
2125	16.04	35.95	-13.75	-14.04	4.48	1.00	24.73	15.26	0.98
2175	15.79	35.85	-13.47	-13.23	4.59	0.99	24.12	14.85	0.95
2200	15.73	35.87	-13.37	-12.97	4.57	0.99	24.77	15.25	1.05
2225	15.69	35.80	-13.30	-12.78	4.58	0.99	23.59	14.48	0.98
2250	15.67	35.74	-13.28	-12.52	4.48	0.99	24.27	14.86	0.95
2275	15.65	35.69	-13.25	-12.18	4.46	0.98	23.82	14.63	1.08
2300	15.62	35.59	-13.21	-11.77	4.43	0.98	23.80	14.56	1.01
2325	15.55	35.60	-13.21	-11.34	4.40	0.97	23.41	14.30	0.98
2350	15.48	35.62	-13.20	-10.88	4.43	0.96	24.09	14.67	1.03
2375	15.39	35.79	-13.16	-10.42	4.38	0.96	23.37	14.28	1.10
2450	15.07	35.79	-13.07	-9.14	4.56	0.93	23.37	14.15	1.09
2475	14.93	35.95	-13.07	-8.80	4.66	0.92	23.07	13.95	1.18
2500	14.81	36.12	-13.03	-8.44	4.68	0.91	23.19	13.93	1.08

Typical Performance Data

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

TEST CONDITIONS: V_S = +2.7V, I_S =35.73 mA @ 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)
1500	18.50	35.76	-15.76	-11.21	3.38	0.92	26.26	15.20	0.66
1525	18.45	35.68	-15.51	-11.99	3.41	0.93	26.20	15.20	0.68
1550	18.38	35.59	-15.32	-12.85	3.44	0.95	25.73	15.10	0.64
1575	18.31	35.46	-15.13	-13.76	3.44	0.96	25.84	15.09	0.72
1600	18.23	35.40	-14.99	-14.75	3.47	0.97	26.17	15.40	0.67
1625	18.14	35.20	-14.84	-15.93	3.45	0.98	25.30	15.02	0.70
1650	18.06	35.30	-14.65	-17.13	3.54	0.99	25.71	15.29	0.68
1675	17.96	35.24	-14.51	-18.56	3.56	1.00	25.60	15.24	0.75
1700	17.87	35.15	-14.36	-20.24	3.57	1.00	25.17	14.99	0.76
1725	17.77	35.12	-14.22	-22.27	3.60	1.01	25.56	15.30	0.72
1750	17.67	35.10	-14.12	-24.83	3.64	1.02	25.04	14.92	0.74
1800	17.46	34.99	-13.89	-33.78	3.68	1.02	24.90	14.96	0.80
1850	17.23	35.06	-13.66	-32.04	3.78	1.03	24.93	14.91	0.82
1900	16.98	34.97	-13.50	-24.25	3.83	1.03	24.65	14.74	0.86
1925	16.86	34.96	-13.39	-22.01	3.86	1.03	24.67	14.82	0.84
1950	16.73	35.09	-13.30	-20.21	3.95	1.03	24.85	14.90	0.88
1975	16.60	35.14	-13.18	-18.77	4.01	1.03	24.46	14.61	0.91
2000	16.45	35.17	-13.13	-17.46	4.07	1.02	24.50	14.65	0.93
2025	16.29	35.38	-13.05	-16.40	4.21	1.02	24.38	14.68	0.94
2050	16.14	35.22	-12.93	-15.44	4.17	1.02	24.29	14.56	0.94
2075	15.98	35.37	-12.82	-14.61	4.28	1.01	23.97	14.31	1.00
2100	15.81	35.27	-12.73	-13.93	4.28	1.01	24.15	14.38	1.00
2125	15.66	35.31	-12.61	-13.34	4.34	1.00	23.93	14.24	0.97
2175	15.41	35.48	-12.41	-12.56	4.49	1.00	23.35	13.84	0.97
2200	15.35	35.39	-12.31	-12.31	4.45	1.00	24.00	14.22	1.07
2225	15.30	35.36	-12.26	-12.10	4.44	0.99	22.82	13.47	1.00
2250	15.28	35.40	-12.27	-11.86	4.46	0.99	23.50	13.82	0.99
2275	15.25	35.29	-12.25	-11.54	4.39	0.99	23.05	13.61	1.08
2300	15.21	35.07	-12.22	-11.15	4.26	0.98	23.04	13.55	1.01
2325	15.14	35.04	-12.25	-10.74	4.24	0.97	22.66	13.30	1.00
2350	15.07	35.31	-12.23	-10.32	4.37	0.97	23.28	13.61	1.07
2375	14.98	35.10	-12.23	-9.89	4.26	0.96	22.59	13.28	1.07
2450	14.64	35.52	-12.16	-8.70	4.45	0.93	22.54	13.07	1.12
2475	14.50	35.71	-12.18	-8.37	4.57	0.91	22.25	12.89	1.13
2500	14.37	35.63	-12.15	-8.03	4.52	0.90	22.38	12.86	1.18

Typical Performance Data

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

TEST CONDITIONS: V_S = +3.3V, I_S = 46.05 mA @ 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)
1500	19.04	37.00	-20.02	-10.44	3.65	0.90	28.03	17.26	0.62
1525	18.99	36.78	-19.66	-11.14	3.63	0.91	27.98	17.25	0.65
1550	18.93	36.73	-19.36	-11.89	3.68	0.92	27.38	17.14	0.61
1575	18.87	36.67	-19.08	-12.69	3.71	0.94	27.58	17.06	0.64
1600	18.79	36.67	-18.83	-13.53	3.78	0.95	27.90	17.41	0.61
1625	18.72	36.37	-18.58	-14.52	3.71	0.96	26.95	16.97	0.69
1650	18.64	36.35	-18.28	-15.55	3.76	0.97	27.45	17.24	0.71
1675	18.55	36.37	-18.02	-16.68	3.82	0.97	27.30	17.16	0.69
1700	18.47	36.25	-17.76	-17.98	3.82	0.98	26.82	16.89	0.70
1725	18.38	36.23	-17.55	-19.44	3.87	0.99	27.32	17.26	0.67
1750	18.28	36.19	-17.36	-21.13	3.90	0.99	26.65	16.77	0.72
1800	18.08	36.03	-16.92	-25.76	3.92	1.00	26.53	16.85	0.76
1850	17.87	36.24	-16.55	-31.51	4.11	1.01	26.63	16.79	0.76
1900	17.63	36.18	-16.27	-27.88	4.18	1.01	26.37	16.62	0.83
1925	17.51	36.12	-16.09	-25.15	4.19	1.01	26.40	16.68	0.81
1950	17.39	36.08	-15.93	-22.79	4.22	1.01	26.58	16.75	0.85
1975	17.26	36.09	-15.76	-21.04	4.26	1.01	26.17	16.47	0.89
2000	17.12	36.42	-15.63	-19.46	4.47	1.01	26.30	16.51	0.88
2025	16.96	36.22	-15.50	-18.17	4.43	1.00	26.13	16.57	0.88
2050	16.81	36.36	-15.33	-17.03	4.55	1.00	26.09	16.44	0.90
2075	16.65	36.34	-15.15	-16.06	4.59	1.00	25.72	16.19	0.92
2100	16.50	36.19	-14.97	-15.28	4.56	1.00	25.93	16.29	0.97
2125	16.35	36.35	-14.82	-14.62	4.69	0.99	25.72	16.13	0.94
2175	16.10	36.36	-14.49	-13.76	4.77	0.99	25.05	15.70	0.96
2200	16.04	36.21	-14.34	-13.51	4.71	0.99	25.78	16.17	1.02
2225	16.00	36.25	-14.26	-13.31	4.73	0.99	24.47	15.34	0.99
2250	15.98	36.11	-14.22	-13.05	4.65	0.98	25.20	15.75	0.96
2275	15.97	35.92	-14.18	-12.70	4.54	0.98	24.73	15.49	1.06
2300	15.94	35.87	-14.10	-12.27	4.49	0.98	24.73	15.44	1.00
2325	15.88	35.91	-14.10	-11.80	4.51	0.97	24.31	15.18	0.98
2350	15.82	36.07	-14.05	-11.33	4.58	0.96	25.04	15.58	1.00
2375	15.73	36.03	-14.01	-10.85	4.56	0.96	24.29	15.20	1.03
2450	15.41	36.19	-13.86	-9.51	4.64	0.93	24.30	15.05	1.10
2475	15.28	36.33	-13.85	-9.14	4.73	0.92	23.98	14.88	1.07
2500	15.16	36.42	-13.79	-8.75	4.77	0.91	24.14	14.89	1.04

Typical Performance Data

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

TEST CONDITIONS: V_S = +3V, I_S =41.95 mA @ Temperature = -40°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)
1500	19.32	36.16	-20.58	-10.20	3.21	0.88	26.51	15.98	0.42
1525	19.28	35.96	-20.23	-10.84	3.20	0.90	26.45	16.00	0.47
1550	19.22	36.09	-19.97	-11.53	3.30	0.91	25.94	15.89	0.42
1575	19.15	35.80	-19.69	-12.29	3.26	0.92	26.22	15.87	0.46
1600	19.09	35.71	-19.42	-13.08	3.28	0.93	26.42	16.18	0.39
1625	19.01	35.58	-19.23	-13.99	3.29	0.94	25.60	15.82	0.46
1650	18.94	35.47	-18.90	-14.95	3.30	0.95	26.05	16.07	0.47
1675	18.85	35.49	-18.69	-16.01	3.35	0.96	25.87	16.03	0.47
1700	18.77	35.52	-18.46	-17.21	3.41	0.97	25.45	15.76	0.49
1725	18.69	35.40	-18.23	-18.57	3.41	0.98	25.88	16.11	0.58
1750	18.59	35.45	-18.04	-20.14	3.48	0.98	25.32	15.72	0.48
1800	18.40	35.28	-17.64	-24.36	3.50	0.99	25.20	15.77	0.51
1850	18.19	35.25	-17.27	-31.39	3.57	1.00	25.28	15.76	0.54
1900	17.96	35.32	-17.00	-31.22	3.68	1.00	25.06	15.59	0.61
1925	17.84	35.28	-16.84	-27.32	3.70	1.00	25.06	15.68	0.55
1950	17.73	35.29	-16.69	-24.37	3.74	1.00	25.20	15.73	0.62
1975	17.60	35.33	-16.52	-22.16	3.79	1.00	24.85	15.52	0.63
2000	17.46	35.53	-16.38	-20.30	3.92	1.00	24.99	15.55	0.62
2025	17.31	35.51	-16.26	-18.82	3.96	1.00	24.81	15.59	0.64
2050	17.16	35.51	-16.09	-17.56	4.00	1.00	24.77	15.48	0.61
2075	17.00	35.60	-15.92	-16.49	4.09	0.99	24.49	15.25	0.65
2100	16.83	35.46	-15.73	-15.54	4.07	0.99	24.65	15.32	0.67
2125	16.67	35.58	-15.55	-14.80	4.18	0.99	24.47	15.17	0.65
2175	16.40	35.70	-15.18	-13.81	4.31	0.98	23.88	14.81	0.63
2200	16.32	35.75	-15.00	-13.55	4.35	0.98	24.44	15.12	0.75
2225	16.29	35.51	-14.92	-13.36	4.24	0.98	23.33	14.41	0.68
2250	16.28	35.60	-14.86	-13.16	4.28	0.98	23.95	14.80	0.64
2275	16.28	35.28	-14.82	-12.87	4.11	0.97	23.50	14.59	0.73
2300	16.26	35.35	-14.77	-12.46	4.12	0.97	23.51	14.51	0.68
2325	16.21	35.38	-14.76	-12.03	4.13	0.97	23.18	14.25	0.67
2350	16.16	35.24	-14.69	-11.52	4.05	0.96	23.81	14.65	0.67
2375	16.08	35.47	-14.65	-11.05	4.15	0.95	23.12	14.28	0.71
2450	15.77	35.57	-14.45	-9.66	4.19	0.93	23.11	14.15	0.76
2475	15.63	35.82	-14.47	-9.28	4.33	0.92	22.77	13.93	0.76
2500	15.50	35.96	-14.39	-8.88	4.40	0.91	23.01	13.96	0.75

Typical Performance Data

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

TEST CONDITIONS: V_S = +2.7V, I_S =36.04 mA @ Temperature = -40°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)
1500	18.80	35.85	-16.79	-10.40	3.27	0.90	25.31	14.61	0.39
1525	18.75	35.62	-16.51	-11.06	3.25	0.91	25.28	14.64	0.43
1550	18.69	35.50	-16.29	-11.79	3.26	0.93	24.88	14.59	0.42
1575	18.62	35.53	-16.07	-12.57	3.33	0.94	25.15	14.56	0.43
1600	18.55	35.40	-15.88	-13.39	3.33	0.95	25.31	14.82	0.38
1625	18.47	35.30	-15.75	-14.35	3.35	0.96	24.61	14.54	0.44
1650	18.39	35.09	-15.52	-15.37	3.32	0.97	25.01	14.76	0.49
1675	18.31	35.14	-15.39	-16.50	3.39	0.98	24.87	14.71	0.44
1700	18.22	35.00	-15.21	-17.81	3.38	0.99	24.52	14.47	0.49
1725	18.13	35.05	-15.06	-19.26	3.44	0.99	24.88	14.79	0.42
1750	18.03	35.15	-14.93	-20.97	3.52	1.00	24.45	14.45	0.48
1800	17.83	35.00	-14.64	-25.77	3.55	1.01	24.31	14.48	0.48
1850	17.62	35.07	-14.41	-33.54	3.66	1.02	24.38	14.45	0.51
1900	17.38	34.93	-14.24	-28.88	3.68	1.02	24.18	14.34	0.57
1925	17.27	34.91	-14.12	-25.49	3.71	1.02	24.16	14.34	0.56
1950	17.15	35.03	-14.04	-22.96	3.79	1.02	24.31	14.40	0.56
1975	17.02	34.94	-13.91	-21.06	3.79	1.02	24.00	14.15	0.62
2000	16.88	35.12	-13.83	-19.35	3.91	1.02	24.09	14.17	0.63
2025	16.72	35.17	-13.76	-18.01	3.98	1.02	23.94	14.23	0.61
2050	16.57	35.11	-13.65	-16.86	3.99	1.01	23.85	14.08	0.61
2075	16.41	35.18	-13.53	-15.85	4.07	1.01	23.59	13.85	0.64
2100	16.24	35.32	-13.40	-14.98	4.18	1.01	23.75	13.94	0.69
2125	16.08	35.30	-13.27	-14.28	4.21	1.00	23.54	13.75	0.67
2175	15.80	35.41	-13.00	-13.33	4.34	1.00	23.03	13.39	0.64
2200	15.73	35.35	-12.90	-13.07	4.33	1.00	23.54	13.75	0.72
2225	15.69	35.43	-12.81	-12.88	4.37	1.00	22.51	13.06	0.69
2250	15.68	35.18	-12.77	-12.68	4.24	0.99	23.11	13.37	0.66
2275	15.67	35.15	-12.76	-12.38	4.21	0.99	22.71	13.19	0.72
2300	15.66	35.07	-12.73	-11.99	4.15	0.99	22.73	13.10	0.68
2325	15.60	35.14	-12.72	-11.55	4.17	0.98	22.37	12.85	0.66
2350	15.54	35.22	-12.68	-11.08	4.20	0.97	22.99	13.15	0.72
2375	15.46	35.16	-12.68	-10.61	4.16	0.96	22.31	12.83	0.68
2450	15.14	35.41	-12.58	-9.27	4.27	0.94	22.31	12.59	0.76
2475	15.00	35.69	-12.60	-8.91	4.43	0.93	21.97	12.44	0.69
2500	14.88	35.82	-12.53	-8.50	4.48	0.91	22.19	12.35	0.75

Typical Performance Data

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

TEST CONDITIONS: V_S = +3.3V, I_S = 46.43 mA @ Temperature = -40°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)
1500	19.53	36.77	-22.78	-10.03	3.35	0.88	27.81	16.97	0.42
1525	19.48	36.68	-22.54	-10.65	3.38	0.89	27.75	16.99	0.45
1550	19.43	36.65	-22.29	-11.34	3.43	0.91	27.17	16.85	0.43
1575	19.37	36.57	-22.04	-12.07	3.46	0.92	27.48	16.83	0.46
1600	19.30	36.46	-21.74	-12.84	3.48	0.93	27.68	17.14	0.38
1625	19.23	36.34	-21.52	-13.72	3.50	0.94	26.81	16.75	0.48
1650	19.16	36.09	-21.11	-14.68	3.45	0.95	27.27	17.04	0.49
1675	19.08	36.06	-20.87	-15.69	3.49	0.96	27.12	16.99	0.46
1700	19.00	36.10	-20.55	-16.86	3.56	0.97	26.62	16.69	0.49
1725	18.92	35.94	-20.27	-18.15	3.54	0.97	27.11	17.04	0.44
1750	18.82	36.00	-20.01	-19.59	3.61	0.98	26.51	16.61	0.45
1800	18.63	35.87	-19.47	-23.45	3.66	0.99	26.35	16.64	0.49
1850	18.42	35.92	-19.03	-29.21	3.77	0.99	26.44	16.65	0.51
1900	18.19	35.91	-18.62	-30.46	3.85	1.00	26.22	16.51	0.59
1925	18.08	35.91	-18.41	-27.39	3.89	1.00	26.26	16.57	0.53
1950	17.96	35.88	-18.20	-24.58	3.92	1.00	26.42	16.64	0.58
1975	17.84	36.06	-18.00	-22.43	4.04	1.00	26.03	16.39	0.61
2000	17.70	36.02	-17.80	-20.54	4.06	1.00	26.19	16.45	0.59
2025	17.55	35.96	-17.62	-19.08	4.09	0.99	26.01	16.47	0.63
2050	17.40	36.05	-17.39	-17.76	4.17	0.99	25.95	16.37	0.64
2075	17.23	36.12	-17.19	-16.69	4.26	0.99	25.65	16.14	0.65
2100	17.07	36.12	-16.95	-15.75	4.31	0.99	25.82	16.21	0.65
2125	16.91	36.22	-16.73	-15.00	4.41	0.98	25.63	16.06	0.62
2175	16.63	36.13	-16.25	-14.00	4.45	0.98	24.98	15.67	0.63
2200	16.56	36.23	-16.09	-13.73	4.52	0.98	25.62	16.03	0.73
2225	16.53	36.14	-15.95	-13.55	4.48	0.98	24.35	15.29	0.66
2250	16.52	35.79	-15.88	-13.35	4.30	0.97	25.03	15.69	0.61
2275	16.52	35.81	-15.83	-13.06	4.29	0.97	24.56	15.46	0.72
2300	16.50	35.91	-15.73	-12.65	4.32	0.97	24.54	15.40	0.63
2325	16.45	35.88	-15.70	-12.19	4.30	0.96	24.17	15.17	0.64
2350	16.40	35.77	-15.59	-11.69	4.23	0.96	24.88	15.55	0.68
2375	16.32	35.95	-15.54	-11.19	4.31	0.95	24.12	15.19	0.73
2450	16.01	36.06	-15.27	-9.77	4.36	0.92	24.13	15.07	0.84
2475	15.87	36.17	-15.28	-9.39	4.44	0.91	23.79	14.83	0.72
2500	15.75	36.51	-15.14	-8.99	4.61	0.90	24.01	14.90	0.69

Typical Performance Data

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

TEST CONDITIONS: V_S = +3V, I_S = 40.58 mA @ 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)
1500	18.41	36.75	-16.38	-10.74	3.79	0.91	26.97	16.17	0.77
1525	18.35	36.69	-16.15	-11.46	3.83	0.93	26.91	16.19	0.81
1550	18.29	36.67	-15.96	-12.26	3.89	0.94	26.41	16.08	0.79
1575	18.22	36.43	-15.78	-13.09	3.85	0.95	26.47	15.99	0.81
1600	18.14	36.38	-15.59	-13.98	3.90	0.97	26.87	16.36	0.78
1625	18.06	36.28	-15.45	-14.96	3.91	0.98	25.90	15.94	0.79
1650	17.98	36.26	-15.24	-16.05	3.96	0.98	26.36	16.21	0.89
1675	17.89	36.31	-15.10	-17.20	4.04	0.99	26.27	16.14	0.87
1700	17.80	36.19	-14.93	-18.56	4.04	1.00	25.78	15.89	0.90
1725	17.71	36.22	-14.76	-20.03	4.10	1.01	26.23	16.21	0.84
1750	17.61	36.15	-14.63	-21.72	4.12	1.01	25.65	15.79	0.89
1800	17.40	36.07	-14.36	-25.93	4.18	1.02	25.56	15.85	0.96
1850	17.18	36.23	-14.09	-29.20	4.36	1.03	25.58	15.78	0.95
1900	16.94	36.15	-13.88	-25.99	4.41	1.03	25.31	15.60	1.04
1925	16.82	36.26	-13.75	-23.93	4.51	1.03	25.34	15.65	1.03
1950	16.70	36.35	-13.65	-22.12	4.60	1.03	25.56	15.77	1.06
1975	16.57	36.24	-13.52	-20.56	4.59	1.03	25.10	15.46	1.09
2000	16.43	36.21	-13.41	-19.13	4.63	1.03	25.19	15.48	1.13
2025	16.28	36.17	-13.30	-18.02	4.66	1.03	25.10	15.52	1.15
2050	16.13	36.28	-13.18	-16.98	4.77	1.02	24.97	15.39	1.15
2075	15.98	36.45	-13.06	-16.10	4.91	1.02	24.65	15.14	1.15
2100	15.83	36.50	-12.91	-15.38	4.99	1.02	24.84	15.23	1.16
2125	15.69	36.38	-12.81	-14.77	4.97	1.02	24.64	15.08	1.18
2175	15.46	36.36	-12.55	-13.98	5.04	1.01	23.97	14.67	1.20
2200	15.40	36.32	-12.46	-13.69	5.02	1.01	24.73	15.12	1.26
2225	15.36	36.40	-12.39	-13.45	5.07	1.01	23.48	14.30	1.23
2250	15.34	36.28	-12.34	-13.14	4.99	1.01	24.16	14.68	1.21
2275	15.31	36.07	-12.31	-12.77	4.86	1.00	23.70	14.45	1.35
2300	15.28	36.09	-12.26	-12.31	4.86	1.00	23.70	14.40	1.21
2325	15.21	36.02	-12.24	-11.83	4.81	0.99	23.30	14.11	1.24
2350	15.14	35.98	-12.20	-11.35	4.78	0.98	23.96	14.47	1.29
2375	15.05	36.03	-12.17	-10.87	4.81	0.98	23.22	14.09	1.31
2450	14.73	36.20	-12.06	-9.53	4.90	0.95	23.21	13.94	1.36
2475	14.58	36.59	-12.10	-9.23	5.17	0.94	22.95	13.76	1.37
2500	14.48	36.34	-11.98	-8.73	4.98	0.93	23.02	13.72	1.39

Typical Performance Data

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

TEST CONDITIONS: V_S = +2.7V, I_S = 35.35 mA @ 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)
1500	18.10	35.99	-14.54	-11.30	3.61	0.93	26.12	15.02	0.79
1525	18.04	35.86	-14.35	-12.07	3.62	0.95	26.07	15.04	0.82
1550	17.97	35.98	-14.20	-12.96	3.73	0.96	25.60	14.95	0.82
1575	17.90	35.92	-14.07	-13.87	3.76	0.97	25.66	14.88	0.87
1600	17.82	35.81	-13.92	-14.90	3.78	0.98	26.06	15.24	0.82
1625	17.73	35.60	-13.81	-16.01	3.74	0.99	25.11	14.86	0.91
1650	17.64	35.64	-13.64	-17.25	3.81	1.00	25.57	15.09	0.89
1675	17.55	35.59	-13.53	-18.62	3.84	1.01	25.44	15.03	0.91
1700	17.45	35.78	-13.41	-20.24	3.97	1.02	25.02	14.81	0.93
1725	17.36	35.44	-13.29	-22.15	3.87	1.02	25.44	15.13	0.89
1750	17.25	35.57	-13.18	-24.39	3.98	1.03	24.86	14.72	0.95
1800	17.04	35.54	-12.96	-30.11	4.05	1.04	24.77	14.79	0.96
1850	16.81	35.52	-12.77	-29.39	4.13	1.04	24.81	14.71	0.98
1900	16.56	35.47	-12.60	-23.96	4.19	1.04	24.48	14.55	1.09
1925	16.44	35.47	-12.51	-21.98	4.23	1.04	24.51	14.59	1.06
1950	16.31	35.58	-12.42	-20.35	4.33	1.04	24.69	14.69	1.10
1975	16.18	35.34	-12.31	-18.99	4.25	1.04	24.26	14.41	1.14
2000	16.03	35.66	-12.24	-17.74	4.45	1.04	24.31	14.44	1.17
2025	15.88	35.55	-12.17	-16.73	4.45	1.03	24.20	14.47	1.15
2050	15.73	35.73	-12.06	-15.79	4.58	1.03	24.09	14.34	1.15
2075	15.57	35.83	-11.97	-15.02	4.68	1.03	23.78	14.10	1.17
2100	15.42	35.79	-11.85	-14.36	4.70	1.03	23.94	14.17	1.22
2125	15.28	35.82	-11.76	-13.81	4.76	1.02	23.74	14.02	1.22
2175	15.05	35.90	-11.55	-13.04	4.87	1.02	23.11	13.61	1.21
2200	14.98	35.83	-11.48	-12.78	4.85	1.02	23.81	14.03	1.35
2225	14.94	35.86	-11.43	-12.54	4.86	1.01	22.65	13.25	1.27
2250	14.91	35.64	-11.39	-12.23	4.74	1.01	23.32	13.62	1.23
2275	14.88	35.56	-11.38	-11.88	4.68	1.01	22.87	13.37	1.38
2300	14.83	35.67	-11.34	-11.48	4.72	1.00	22.84	13.34	1.31
2325	14.76	35.46	-11.34	-11.04	4.61	0.99	22.45	13.03	1.26
2350	14.69	35.74	-11.32	-10.61	4.75	0.99	23.04	13.36	1.32
2375	14.60	35.57	-11.29	-10.15	4.65	0.98	22.35	13.01	1.34
2450	14.25	35.80	-11.23	-8.92	4.77	0.95	22.29	12.79	1.42
2475	14.09	36.17	-11.28	-8.65	5.02	0.94	22.05	12.63	1.44
2500	13.99	36.08	-11.18	-8.19	4.92	0.92	22.10	12.60	1.45

Typical Performance Data

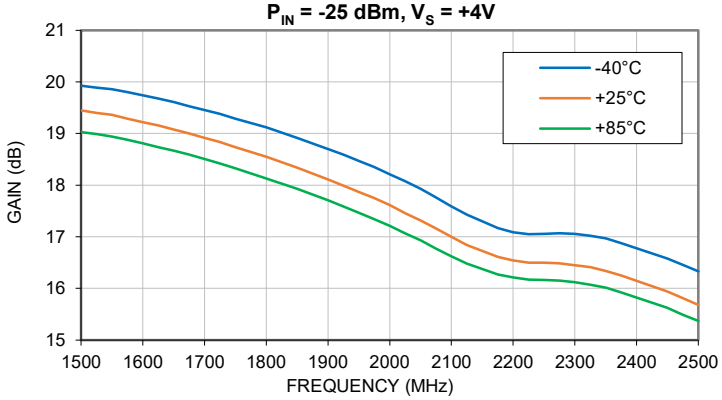
Definitions:
Input Return Loss = S11 (dB)
Gain(Power Gain) = S21 (dB)
Isolation = -S12 (dB)
Output Return Loss = S22 (dB)

TEST CONDITIONS: V_S = +3.3V, I_S = 45.53 mA @ Temperature = +85°C

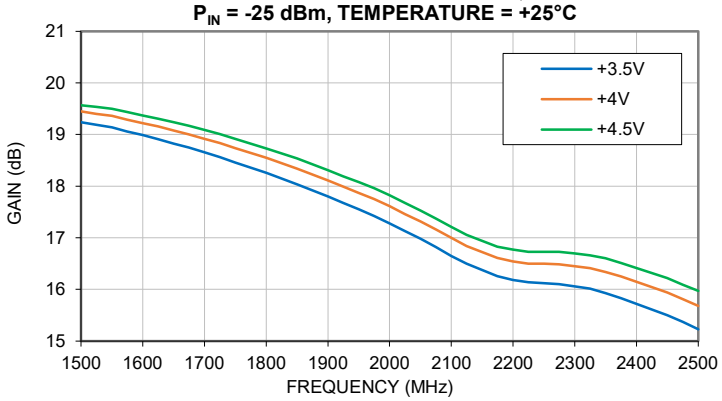
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
1500	18.63	37.39	-18.16	-10.39	3.97	0.90	27.98	17.11	0.75
1525	18.59	37.56	-17.86	-11.07	4.11	0.92	27.92	17.11	0.82
1550	18.52	37.30	-17.65	-11.82	4.07	0.93	27.38	17.01	0.80
1575	18.46	37.27	-17.43	-12.59	4.13	0.94	27.51	16.88	0.82
1600	18.39	37.18	-17.19	-13.42	4.15	0.95	27.93	17.30	0.76
1625	18.31	36.94	-17.01	-14.33	4.11	0.96	26.87	16.85	0.84
1650	18.23	36.96	-16.74	-15.30	4.18	0.97	27.42	17.10	0.87
1675	18.15	36.87	-16.56	-16.35	4.20	0.98	27.27	17.03	0.89
1700	18.06	36.71	-16.34	-17.54	4.18	0.99	26.77	16.78	0.89
1725	17.97	36.78	-16.17	-18.84	4.26	1.00	27.27	17.09	0.96
1750	17.87	36.74	-15.99	-20.28	4.30	1.00	26.66	16.64	0.88
1800	17.67	36.84	-15.62	-23.74	4.46	1.01	26.55	16.71	0.92
1850	17.46	36.76	-15.31	-27.21	4.52	1.02	26.62	16.65	0.94
1900	17.22	36.77	-15.05	-26.59	4.63	1.02	26.35	16.45	1.01
1925	17.11	36.62	-14.89	-24.90	4.60	1.02	26.41	16.49	1.02
1950	16.98	36.65	-14.75	-23.09	4.67	1.02	26.61	16.63	1.05
1975	16.86	36.78	-14.59	-21.58	4.78	1.02	26.14	16.31	1.09
2000	16.72	36.71	-14.45	-20.06	4.80	1.02	26.22	16.34	1.14
2025	16.57	36.72	-14.33	-18.89	4.87	1.02	26.11	16.40	1.11
2050	16.42	36.92	-14.19	-17.77	5.04	1.02	26.04	16.29	1.13
2075	16.27	36.91	-14.03	-16.86	5.08	1.01	25.71	16.01	1.15
2100	16.12	36.80	-13.87	-16.08	5.07	1.01	25.90	16.14	1.16
2125	15.98	36.97	-13.72	-15.46	5.23	1.01	25.69	15.98	1.18
2175	15.77	36.87	-13.43	-14.64	5.25	1.01	24.96	15.54	1.13
2200	15.71	36.67	-13.32	-14.34	5.14	1.01	25.81	16.03	1.28
2225	15.67	36.85	-13.22	-14.10	5.25	1.01	24.43	15.17	1.21
2250	15.65	36.71	-13.16	-13.77	5.15	1.00	25.20	15.60	1.17
2275	15.63	36.61	-13.11	-13.38	5.09	1.00	24.69	15.34	1.31
2300	15.60	36.53	-13.03	-12.89	5.02	1.00	24.69	15.27	1.24
2325	15.53	36.51	-13.00	-12.39	5.01	0.99	24.27	15.00	1.25
2350	15.47	36.58	-12.94	-11.87	5.03	0.98	24.99	15.42	1.27
2375	15.39	36.67	-12.90	-11.34	5.08	0.98	24.23	14.98	1.28
2450	15.07	36.79	-12.75	-9.94	5.16	0.95	24.23	14.87	1.36
2475	14.92	36.89	-12.81	-9.60	5.27	0.94	23.93	14.71	1.38
2500	14.83	36.83	-12.64	-9.10	5.19	0.93	24.02	14.66	1.38

Typical Performance Curves

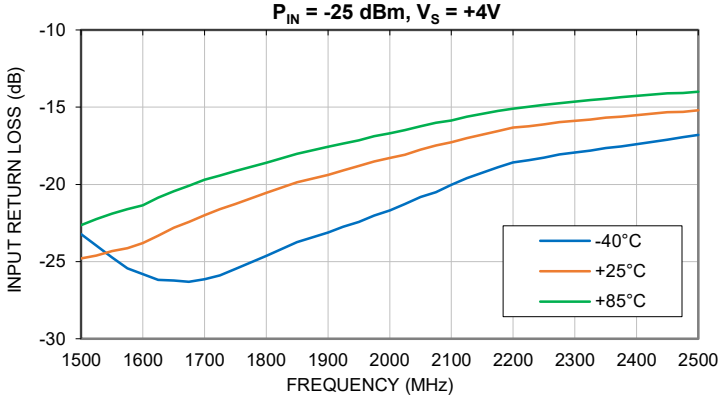
GAIN vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +4V



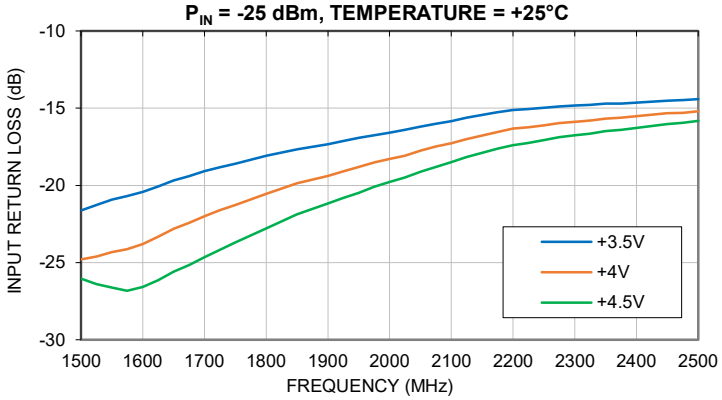
GAIN vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C



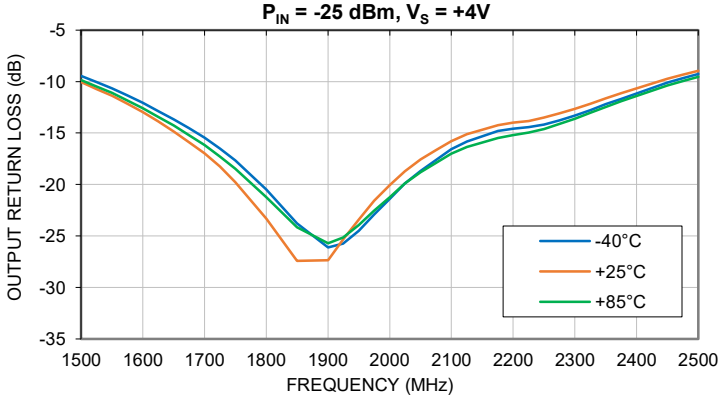
INPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +4V



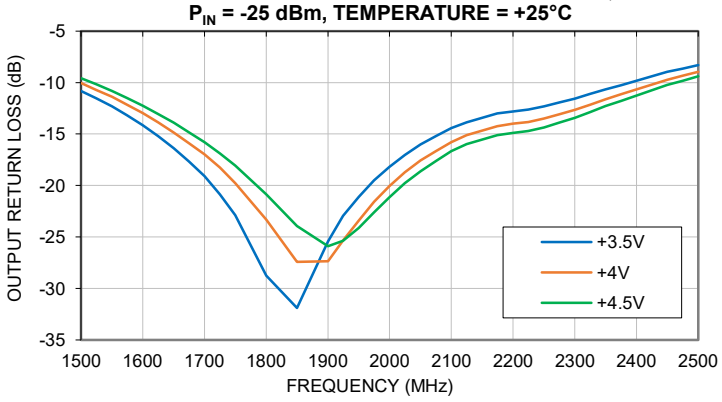
INPUT RETURN LOSS vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +4V

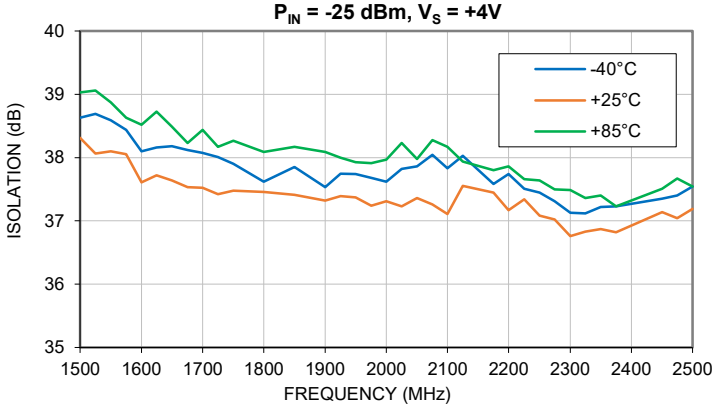


OUTPUT RETURN LOSS vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C

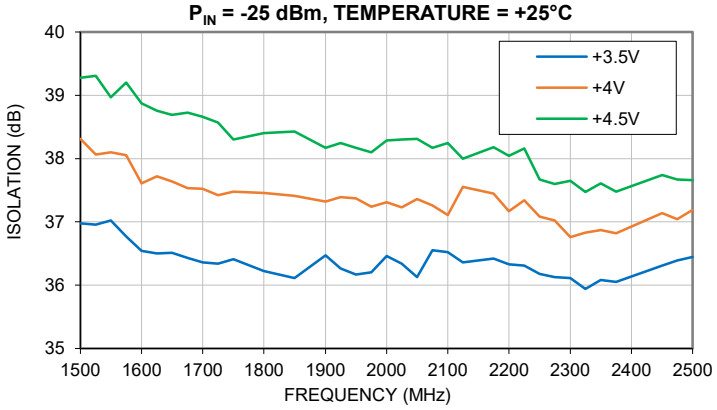


Typical Performance Curves

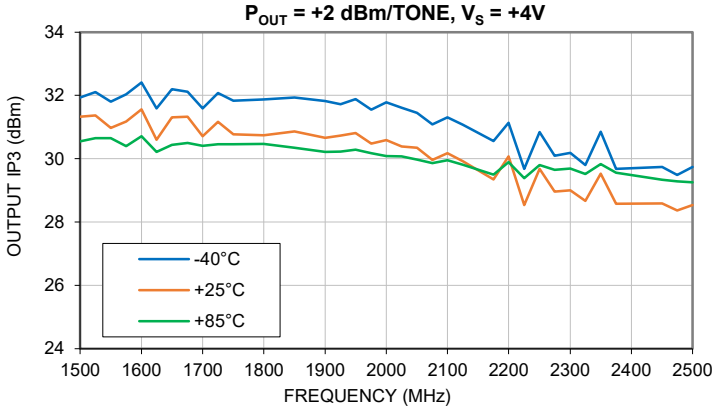
ISOLATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



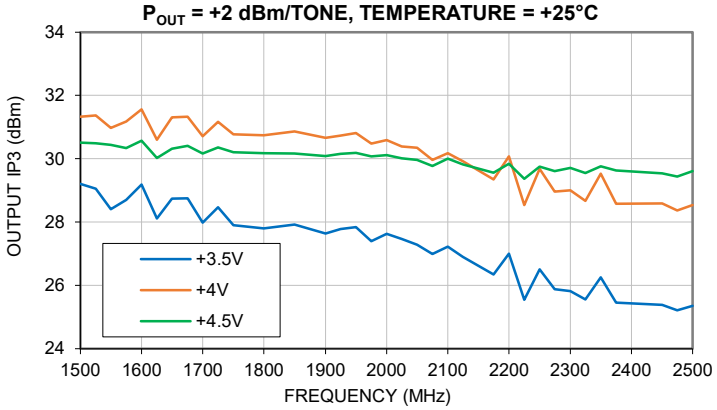
ISOLATION vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



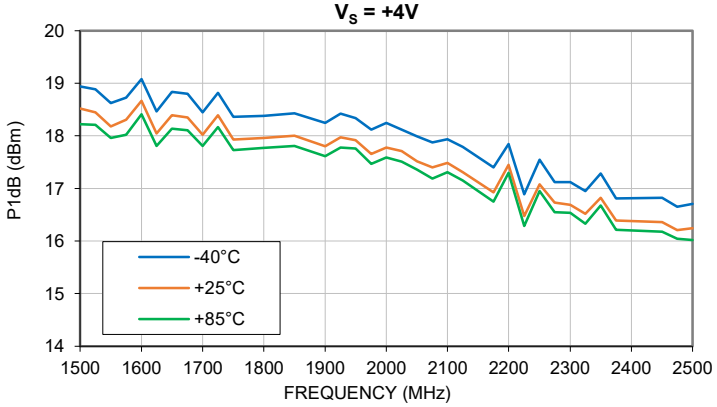
OUTPUT IP3 vs. TEMPERATURE,
P_{OUT} = +2 dBm/TONE, V_S = +4V



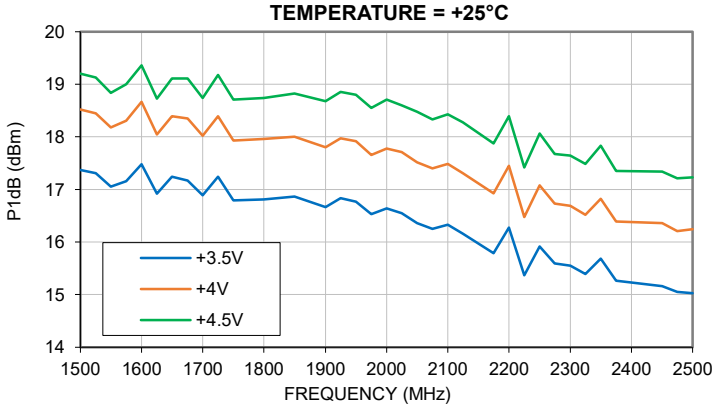
OUTPUT IP3 vs. DEVICE VOLTAGE,
P_{OUT} = +2 dBm/TONE, TEMPERATURE = +25°C



P1dB vs. TEMPERATURE,
V_S = +4V

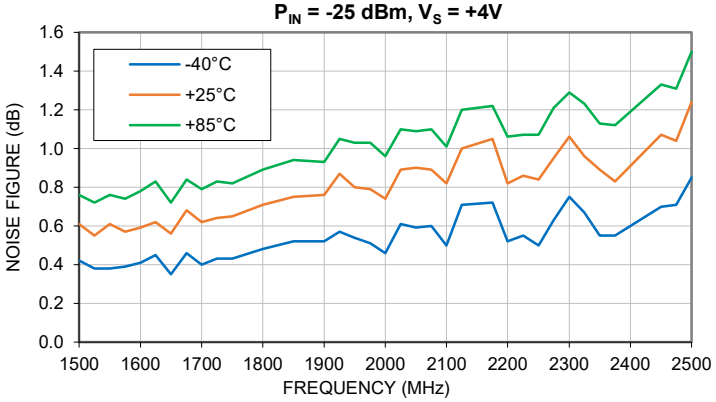


P1dB vs. DEVICE VOLTAGE,
TEMPERATURE = +25°C

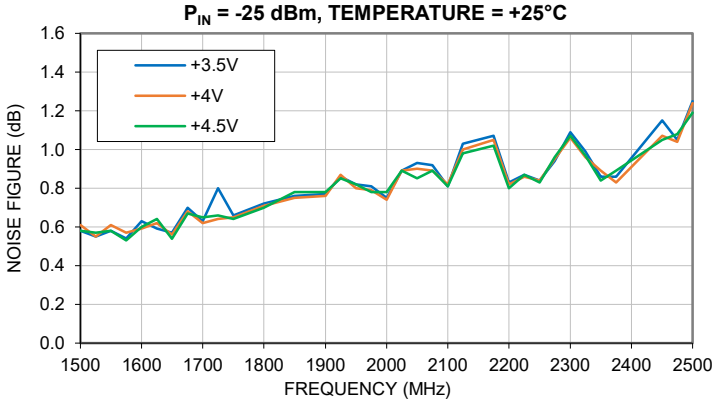


Typical Performance Curves

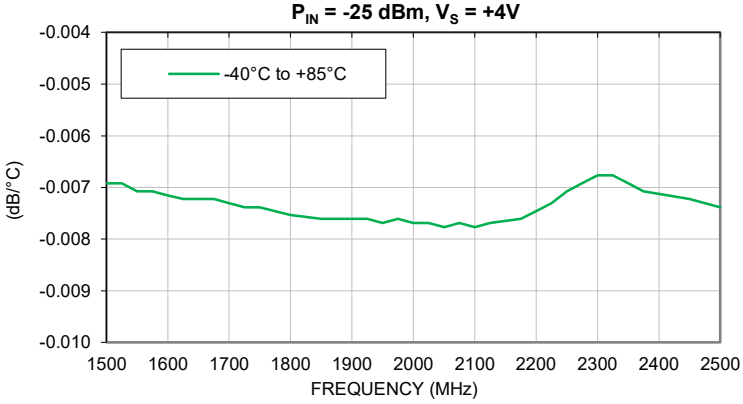
NOISE FIGURE vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V



NOISE FIGURE vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C

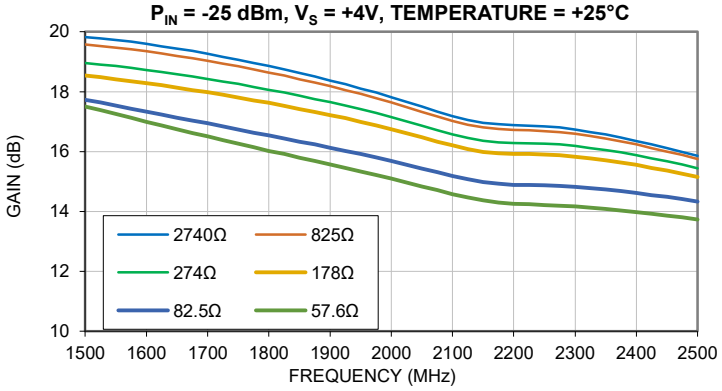


GAIN VARIATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +4V

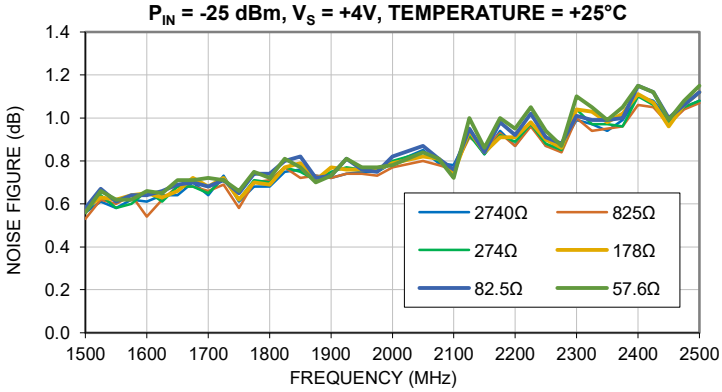


Typical Performance Curves

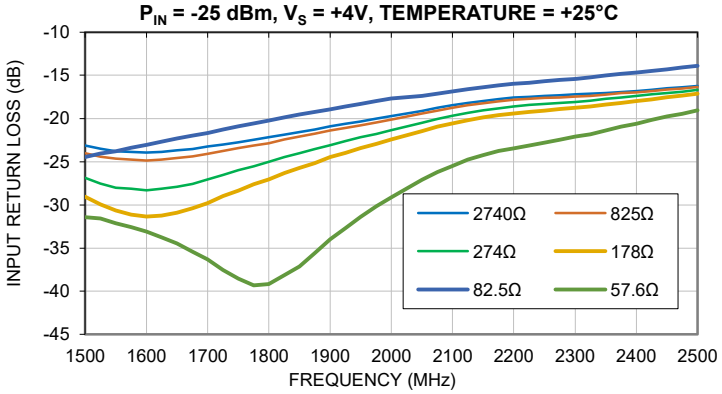
GAIN vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



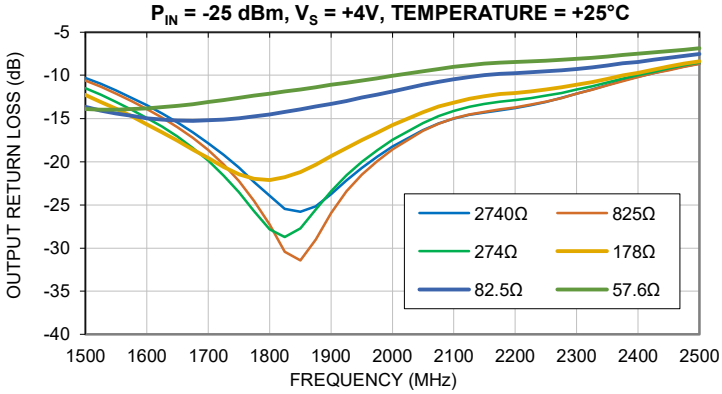
NOISE FIGURE vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C

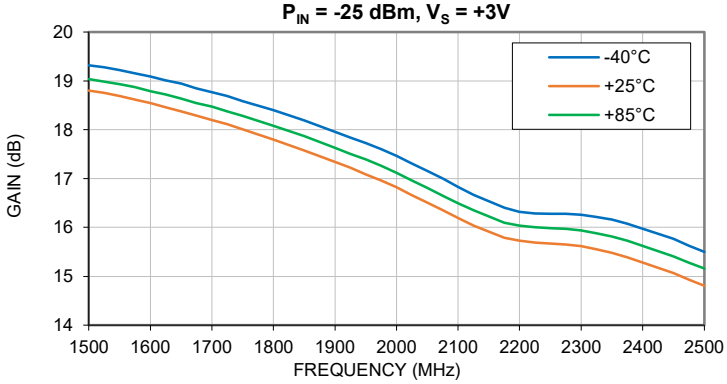


OUTPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +4V, TEMPERATURE = +25°C

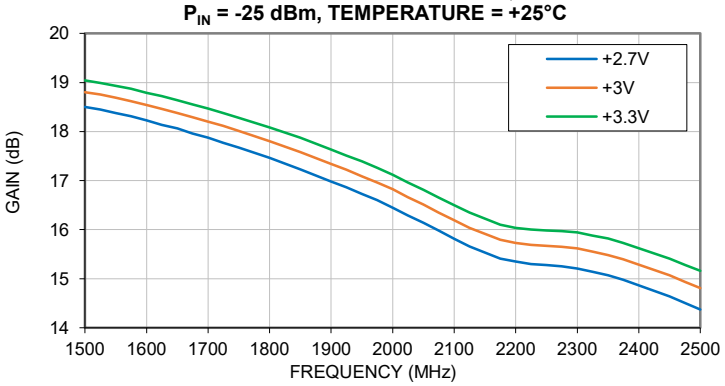


Typical Performance Curves

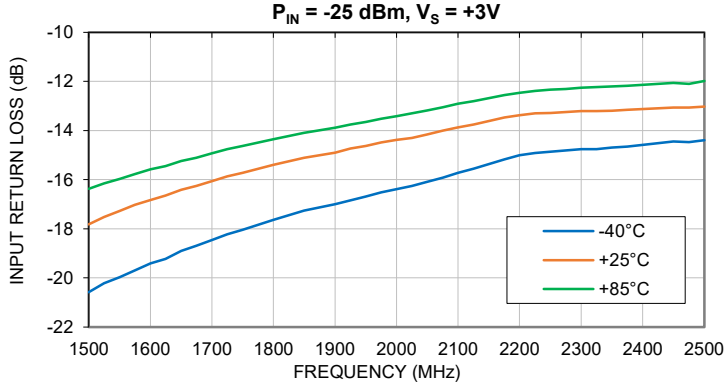
GAIN vs.TEMPERATURE, P_{IN} = -25 dBm, V_S = +3V



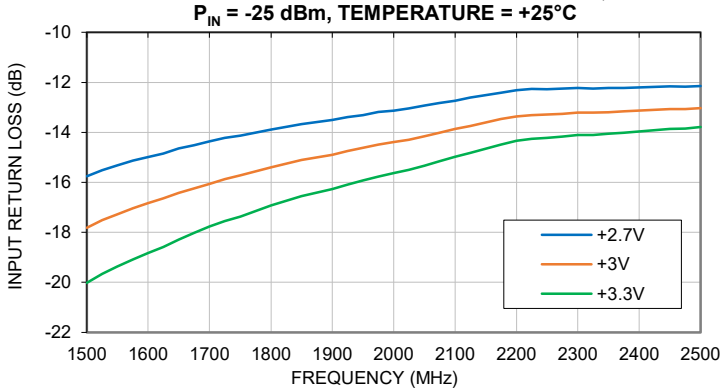
GAIN vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C



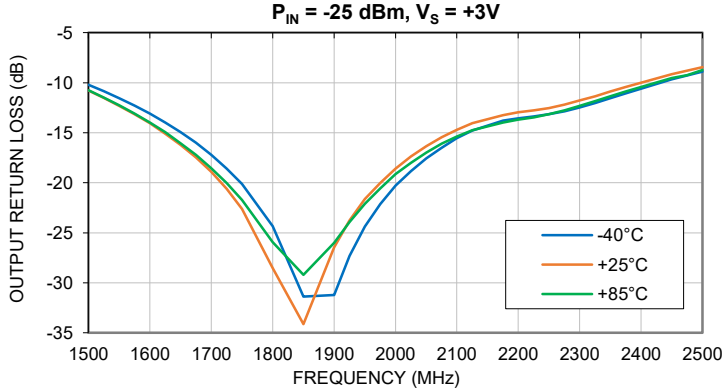
INPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +3V



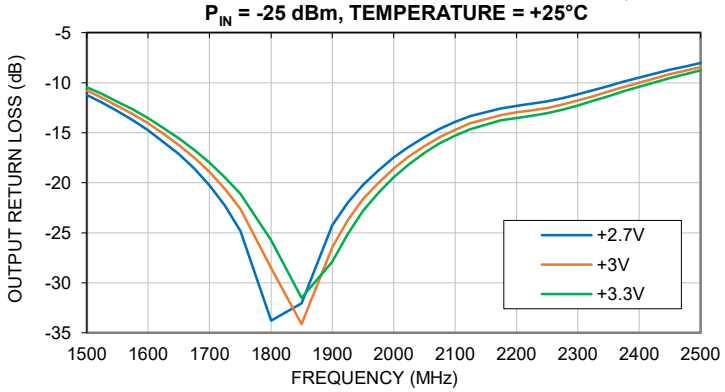
INPUT RETURN LOSS vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +3V

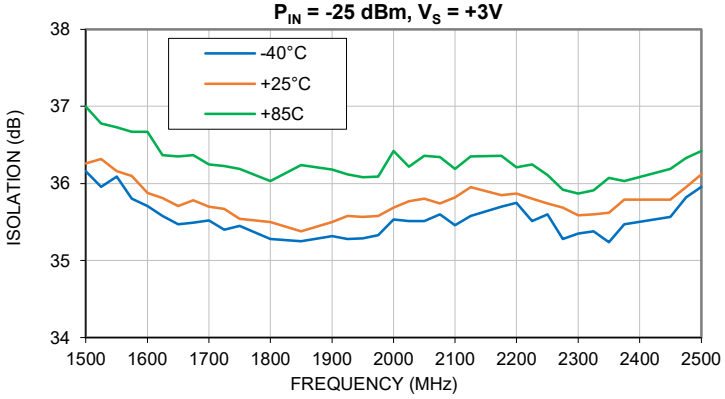


OUTPUT RETURN LOSS vs. DEVICE VOLTAGE, P_{IN} = -25 dBm, TEMPERATURE = +25°C

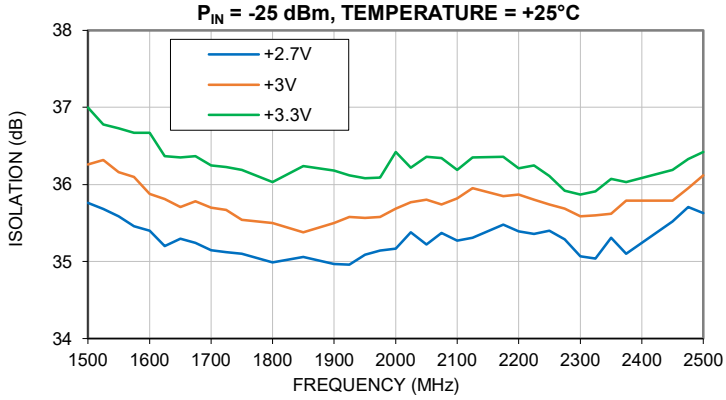


Typical Performance Curves

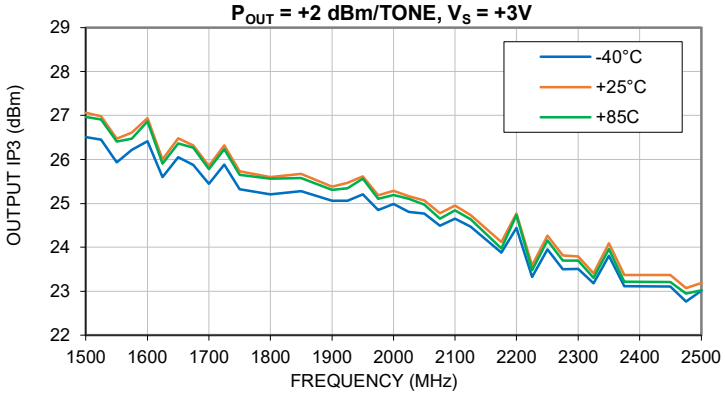
ISOLATION vs. TEMPERATURE,
P_{IN} = -25 dBm, V_S = +3V



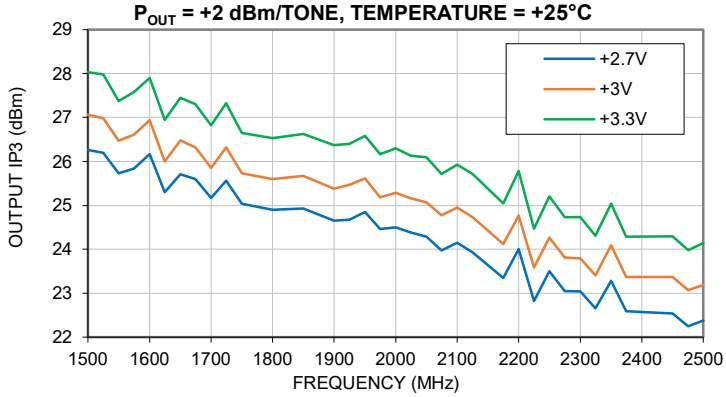
ISOLATION vs. DEVICE VOLTAGE,
P_{IN} = -25 dBm, TEMPERATURE = +25°C



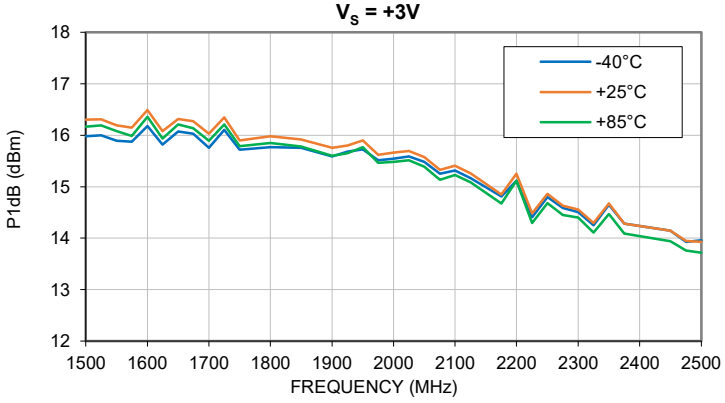
OUTPUT IP3 vs. TEMPERATURE,
P_{OUT} = +2 dBm/TONE, V_S = +3V



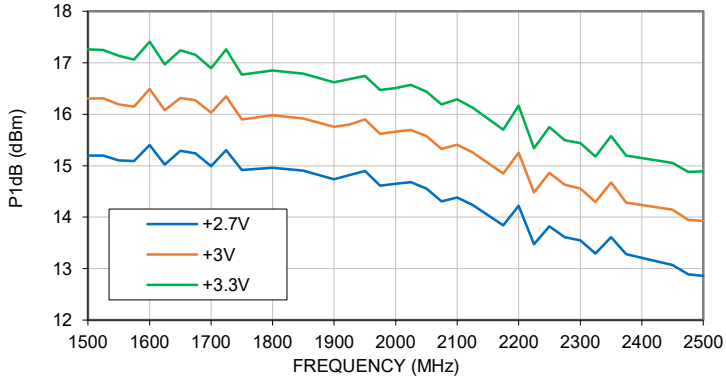
OUTPUT IP3 vs. DEVICE VOLTAGE,
P_{OUT} = +2 dBm/TONE, TEMPERATURE = +25°C



P1dB vs. TEMPERATURE,
V_S = +3V

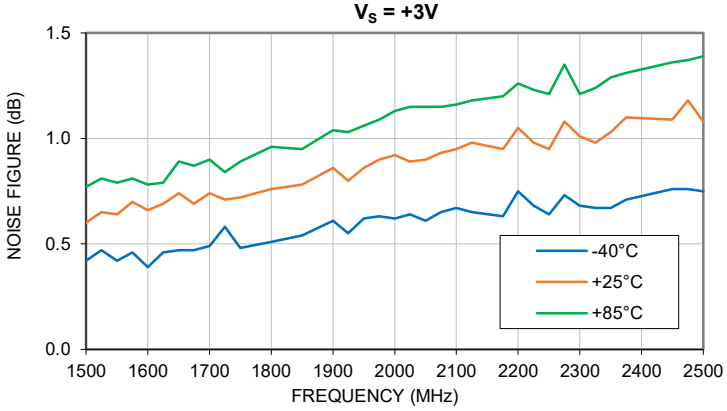


P1dB vs. DEVICE VOLTAGE,
TEMPERATURE = +25°C

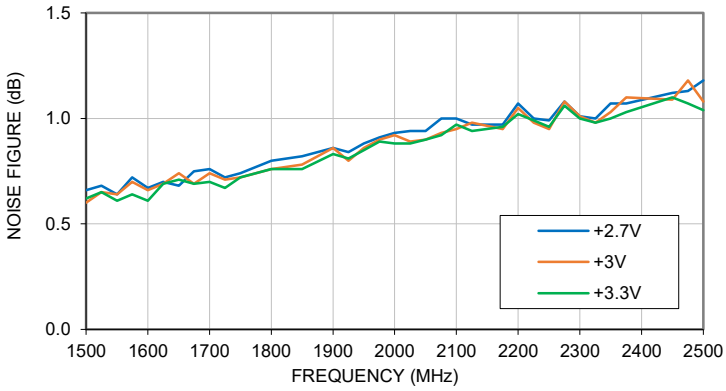


Typical Performance Curves

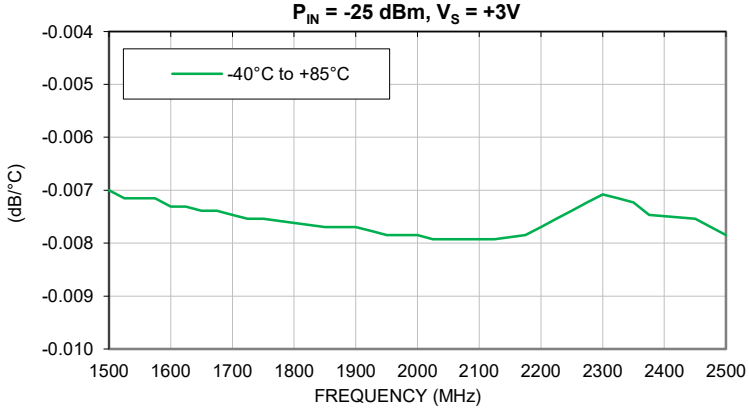
NOISE FIGURE vs. TEMPERATURE, V_S = +3V



NOISE FIGURE vs. DEVICE VOLTAGE, TEMPERATURE = +25°C

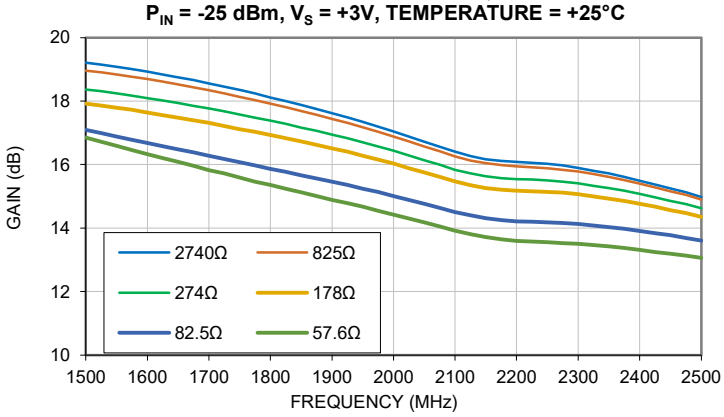


GAIN VARIATION vs. TEMPERATURE, P_{IN} = -25 dBm, V_S = +3V

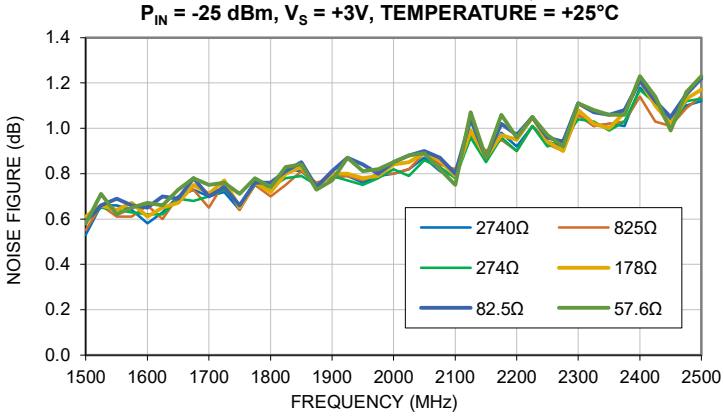


Typical Performance Curves

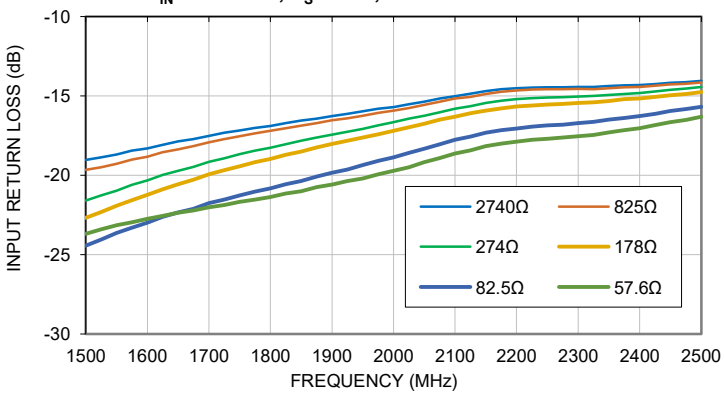
GAIN vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



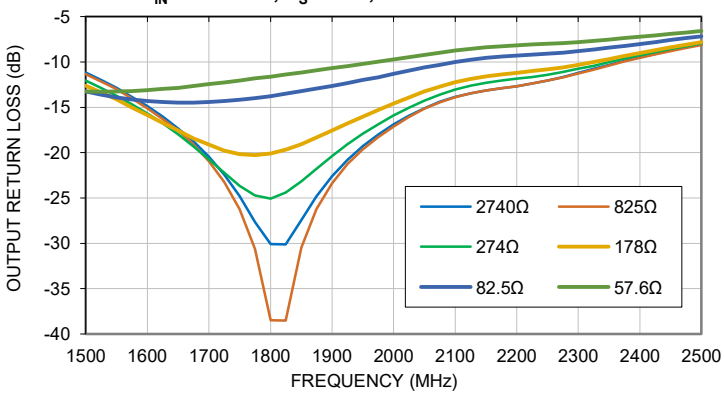
NOISE FIGURE vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



INPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C



OUTPUT RETURN LOSS vs. R1 VALUES,
P_{IN} = -25 dBm, V_S = +3V, TEMPERATURE = +25°C

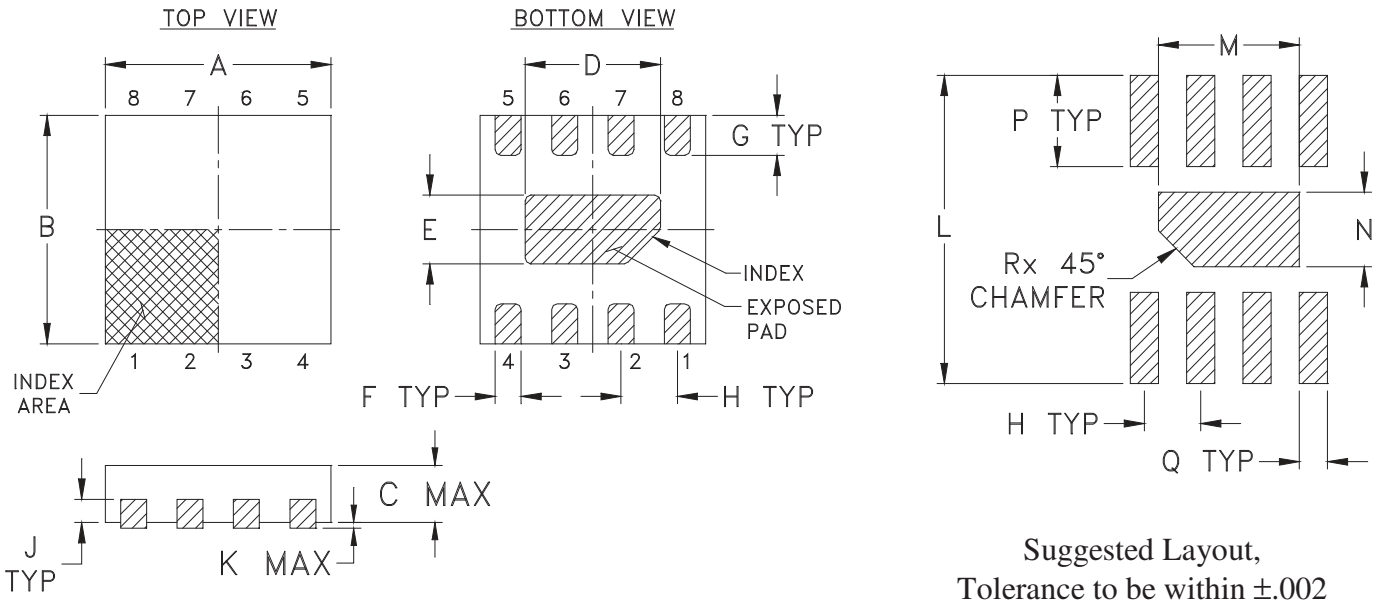


Case Style MC

MC1631-1

Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

SE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MC1631-1	.079 (2.00)	.079 (2.00)	.039 (1.00)	.047 (1.20)	.024 (.60)	.009 (.23)	.014 (.35)	.020 (.50)	.008 (.20)	.002 (.05)	.106 (2.70)	.049 (1.25)	.026 (.65)	.031 (.80)

CASE #.	Q	R	WT, GRAM
MC1631-1	.010 (.25)	.012 (.30)	.006

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

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver over Nickel plated or Matte-Tin Plated (See Data sheet).
   All models, (+) suffix.
3. Lead #1 identifier shall be located in the cross-hatched area shown.
   Identifier may be either a molded or marked feature.

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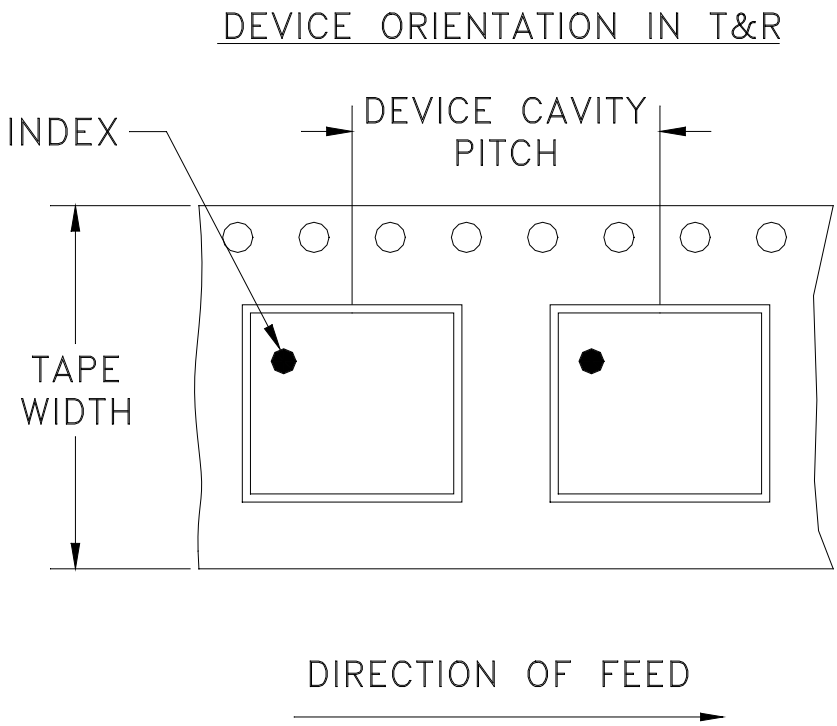
Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

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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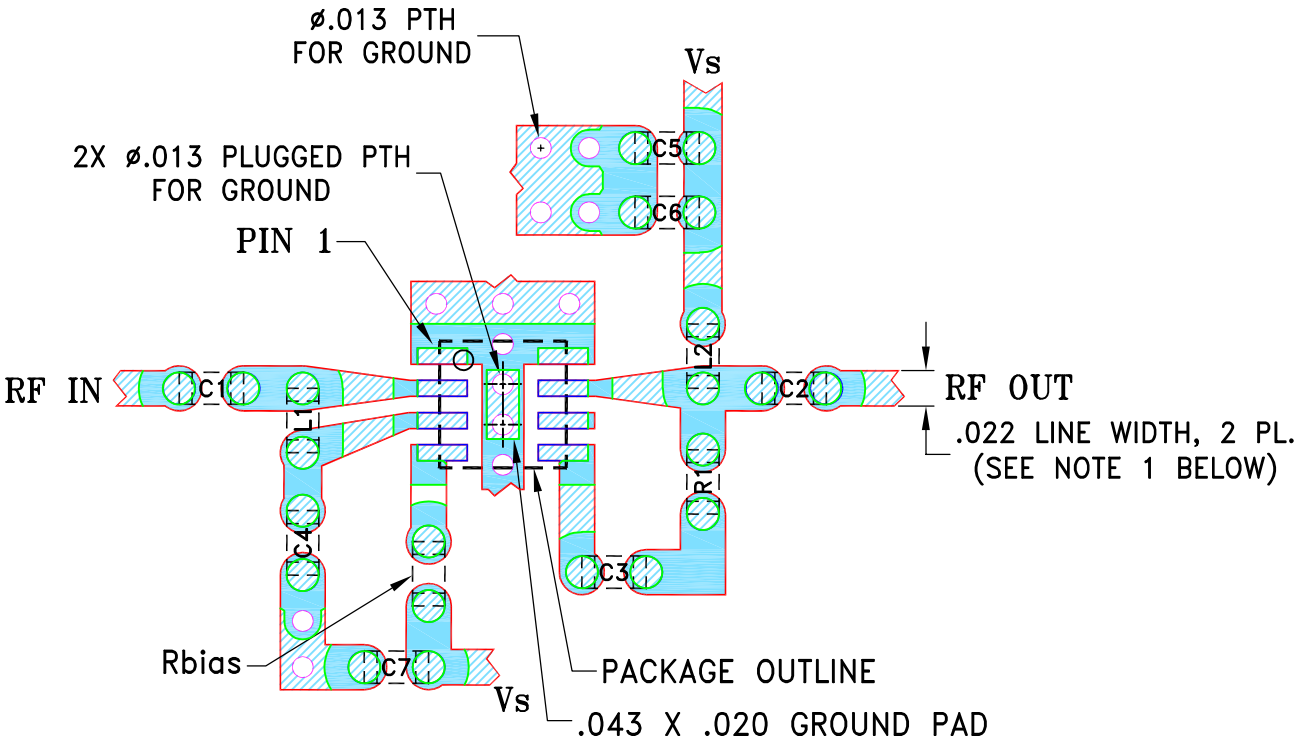
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-014708	NEW RELEASE	08/26/22	ITG	IL
A	ECO-017341	UPDATED THE REFERENCE OF TB	03/30/23	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR MC1631-1 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010±.001"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. UNIT FOOT PRINT FOR GROUND PAD IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE MC1631-1 RECOMMENDATIONS.
3. 0402 SIZE COMPONENTS FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUE REFER TO TB-PMA2252LNAC+.
4. BOTTOM SIDE OF THIS PATTERN OF PCB IS 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	08/25/22
TOLERANCES ON:	CHECKED	GF	08/25/22
2 PL DECIMALS ±	APPROVED	IL	08/26/22
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

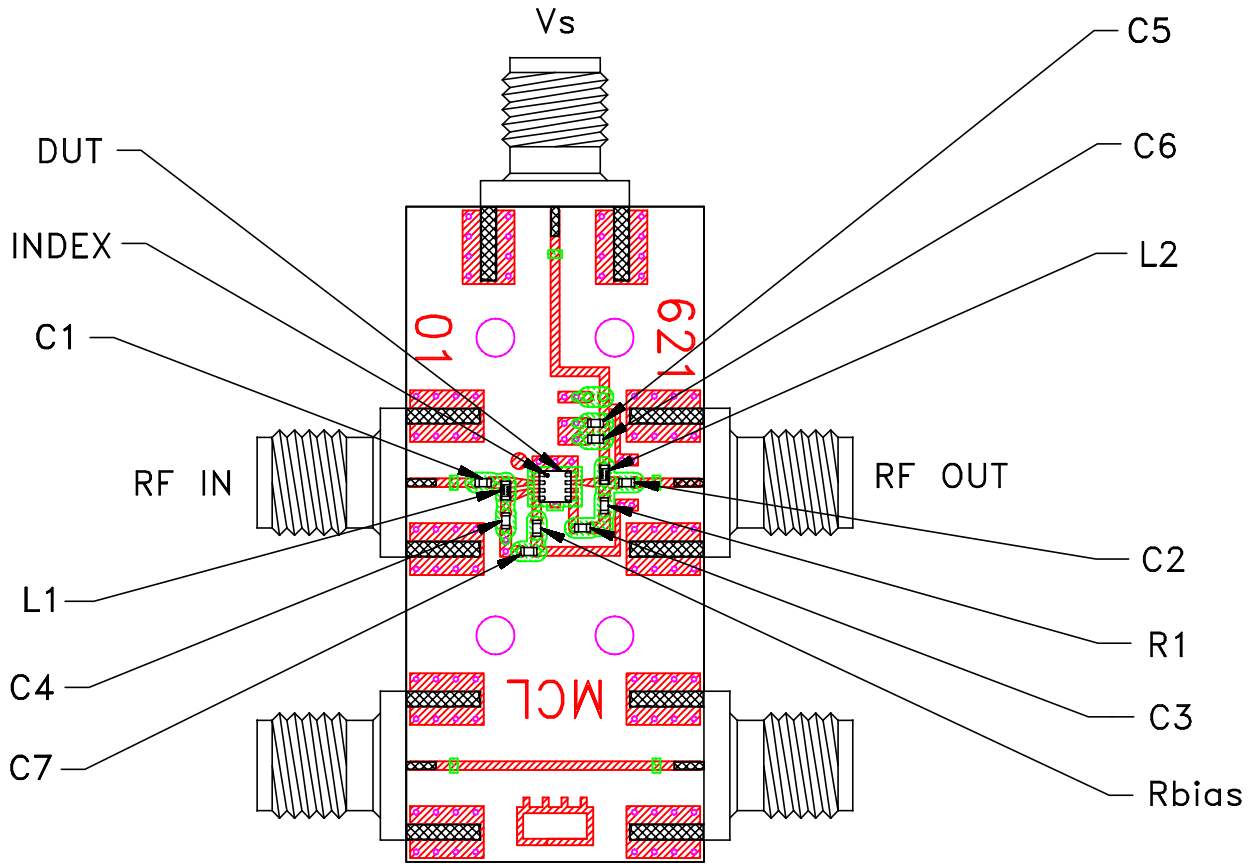
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL,MC1631-1,TB-PMA2252LNAC+

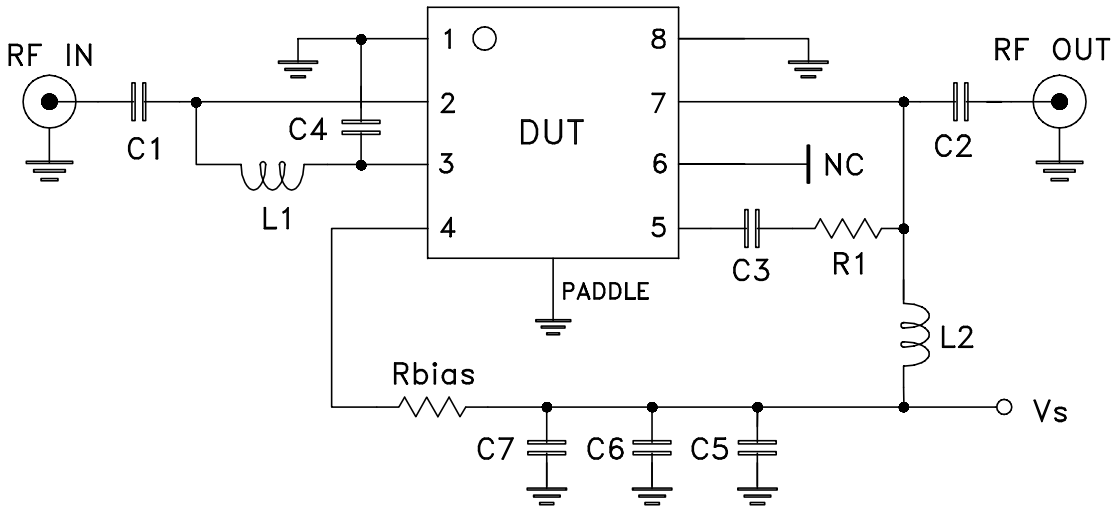
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-738	A

FILE:	SCALE:	SHEET:
98PL738	8:1	1 OF 1

Evaluation Board and Circuit



TB-PMA2252LNAC+



Schematic Diagram

ITEM	DESCRIPTION
C1	CAP, 27pF
C2	CAP, 2.7pF
C3	CAP, 1.2pF
C4	CAP, 220pF
C5	CAP, 7pF
C6, C7	CAP, 0.1uF
R1	RES, 825 Ohm
Rbias	RES, 619 Ohm
L1	IND, 6.8nH
L2	IND, 2.2nH
DUT	PMA2-252LNA+

NOTES:

1. SMA Female connectors.
2. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric thickness=.010 inch.

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Environmental Specifications ENV08T1

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	-40° to 85° C or -45° to 85° C or -55° to 105° C or -40° to 105° C or -40° to 95° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
HTOL	1000 hours at 125°C	MIL-STD-883, Method 1005, Condition B
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

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Specification	Test/Inspection Condition	Reference/Spec
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215

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