



MMIC SURFACE MOUNT

Low Noise Amplifier **PMA2-162LNA+**

Mini-Circuits

50Ω 700 to 1600 MHz Ultra Low Noise

THE BIG DEAL

- Noise Figure, Typ 0.5 dB
- Adjustable Gain, Typ. 19.7 dB to 23.5 dB
- Class 1B HBM ESD (500V)
- OIP3, Typ. +30 dBm
- P1dB, Typ +20 dBm
- 2x2mm 8-Lead SMT Package
- May be used as a replacement for MGA-631P8^{a,b}

APPLICATIONS

- Base Station Infrastructure
- Portable Wireless
- LTE
- GPS
- GSM
- Airborn Radar

PRODUCT OVERVIEW

The PMA2-162LNA+ is an E-pHEMT* amplifier that operates from 700 to 1600 MHz. The amplifier has a low noise figure of 0.5 dB typical while providing 22.7 dB of gain, +30 dBm OIP3, and +20 dBm P1dB with 18 dB typical return loss with a +4V and 55mA DC power. Gain is adjustable from 19.7 dB to 23.5 dB. 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. 0.5 dB	Excellent noise figure performance.
High OIP3 • OIP3, Typ. +30 dBm	Suitable as a driver amplifier in receiver/transmitter chains.
Adjustable Gain	By changing feedback resistor R1, gain can be changed from 19.7 dB to 23.5 dB.
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.
Class 1B ESD (500V HBM)	The PMA2-162LNA+ is a super low noise E-pHEMT based design. Mini-Circuits incorporates ESD protection on die to achieve industry leading ESD performance for a low noise amplifier.
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.

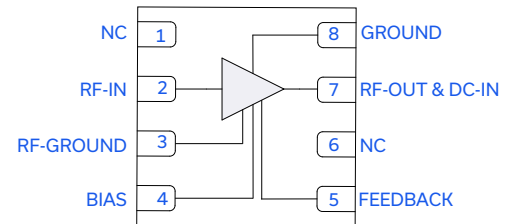
b. The Avago MGA-631P8 part number is used for identification and comparison purposes only.

*Enhanced mode Pseudomorphic High Electron Mobility Transistor



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM





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ELECTRICAL SPECIFICATIONS^{1,2} AT +25°C, Z_o = 50Ω, AND V_s = +4V UNLESS NOTED OTHERWISE

Parameter	Condition (MHz)	R1 = 267Ω ¹			R1 = 93Ω ²			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range		700		1600	700		1600	MHz
Gain	700		24.4			22.7		dB
	800		24.1			22.2		
	1000	20.9	22.7	24.5	18.6	20.8	23.1	
	1300		20.7			19.1		
	1600		18.8			17.7		
Input Return Loss	700		9.5			11.5		dB
	800		15.5			18.8		
	1000		17.9			20.0		
	1300		12.4			14.5		
	1600		10.8			12.4		
Output Return Loss	700		13.6			21.6		dB
	800		16.1			17.8		
	1000		18.9			16.0		
	1300		15.6			15.1		
	1600		10.7			11.6		
Isolation	700-1600		38.2			34.2		dB
Output Power at 1 dB Compression (P1dB)	700		+19.5			+18.3		dBm
	800		+19.8			+18.9		
	1000		+19.9			+19.7		
	1300		+19.7			+19.8		
	1600		+18.8			+19.0		
Output Third-Order Intercept Point (Pout = 0 dBm/Tone)	700		+29.1			+28.3		dBm
	800		+30.3			+38.5		
	1000		+30.0			+29.0		
	1300		+30.1			+29.2		
	1600		+29.4			+28.5		
Noise Figure	700		0.55			0.57		dB
	800		0.51			0.54		
	1000		0.47			0.48		
	1300		0.64			0.65		
	1600		0.80			0.81		
Device Operating Voltage (V _s)		+3.8	+4.0	+4.2	+3.8	+4.0	+4.2	V
Device Operating Current (I _s) ³			55			55		mA
Device Current Variation Vs. Temperature ⁴			2			2		μA/°C
Device Current Variation Vs. Voltage ⁵			0.018			0.016		mA/mV

1. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-PMA2162LNAC+ with R1 = 267Ω. See Figure 2. De-embedded to the device reference plane.

2. Tested in Mini-Circuits Characterization Test/Evaluation Board TB-PMA2162LNAC+ with R1* = 93Ω. See Figure 2. De-embedded to the device reference plane.

3. Current at P_{IN} = -25 dBm. Increases to 95 mA at P1dB.

4. ((Current at Tmax°C - Current at -Tmin°C)/(Tmax °C -Tmin °C)

5. (Current at Nominal V +ΔV in mA)- (Current at Nominal V -ΔV mA)/(2ΔV mV)





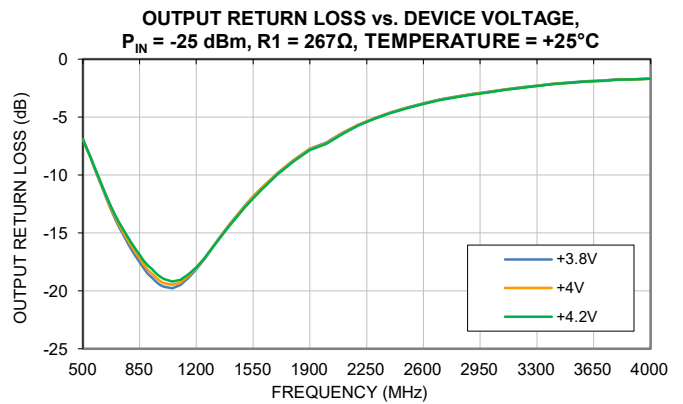
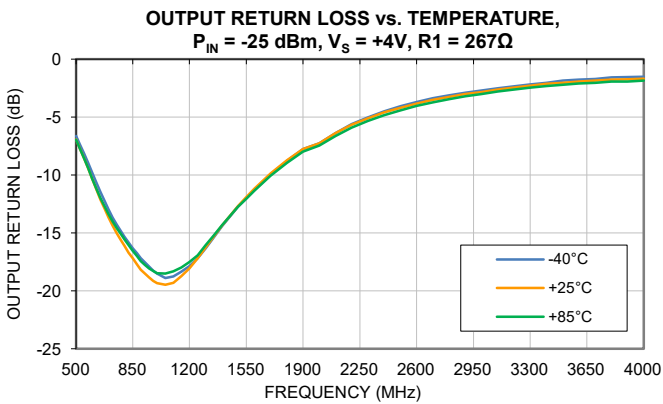
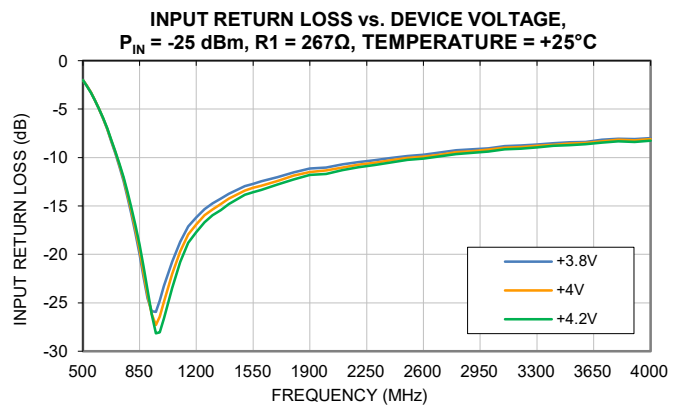
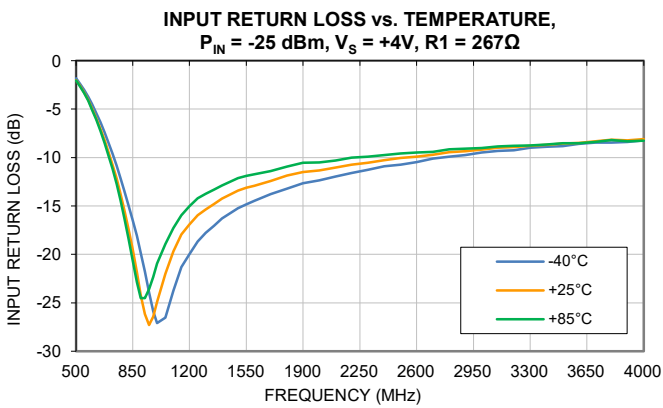
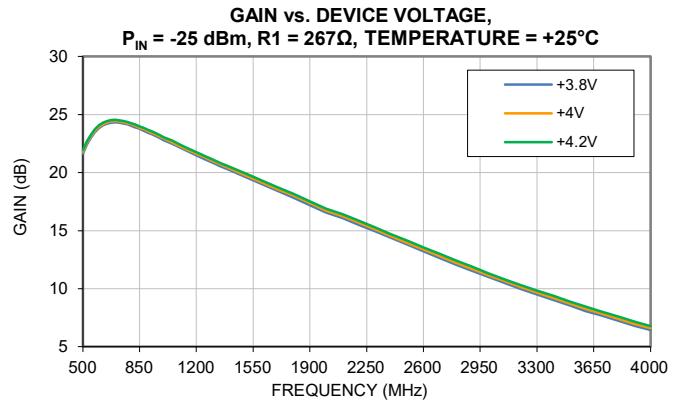
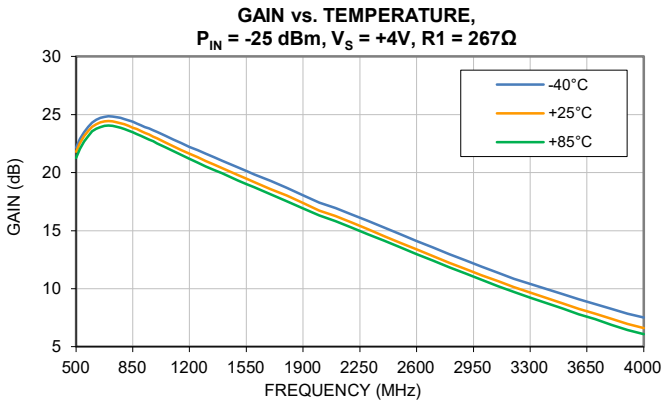
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TYPICAL PERFORMANCE GRAPHS





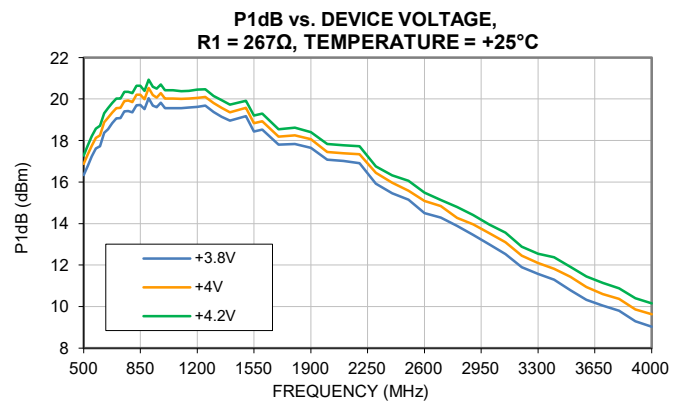
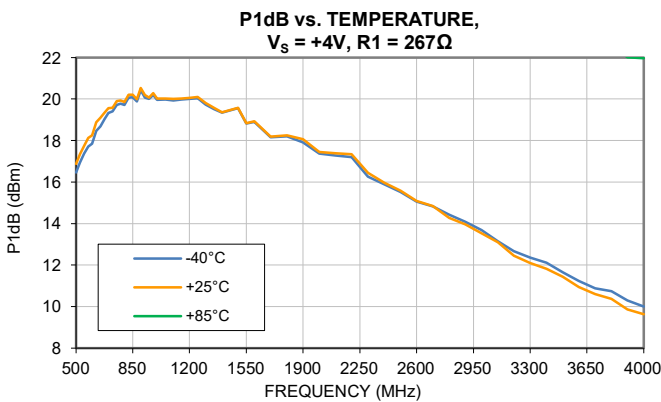
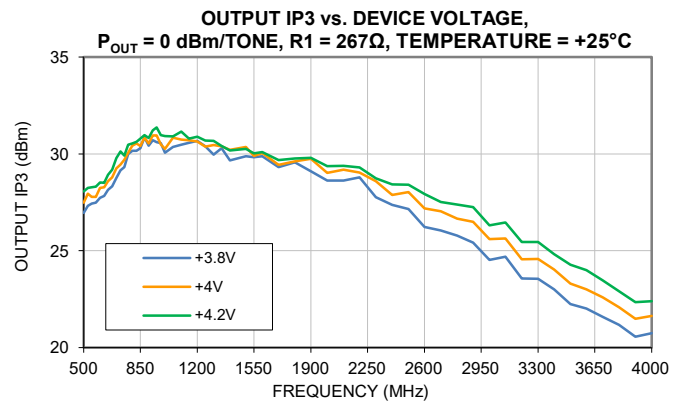
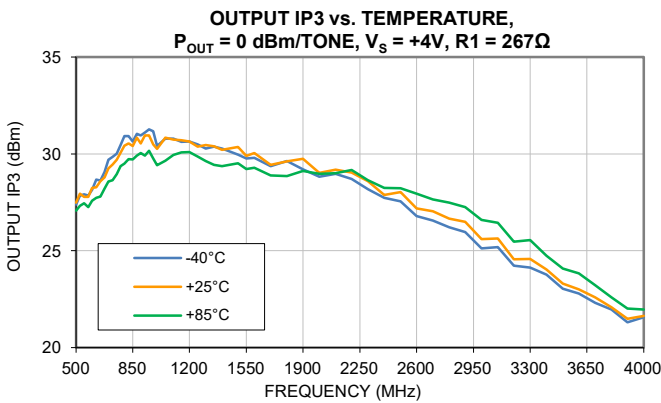
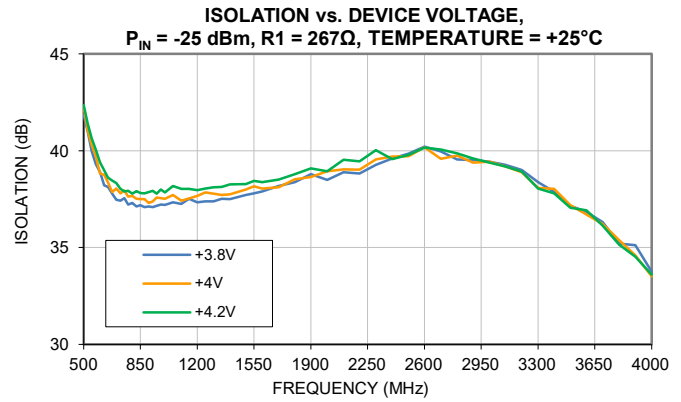
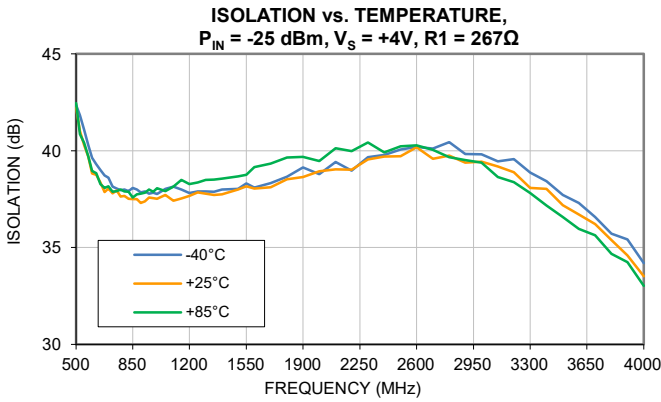
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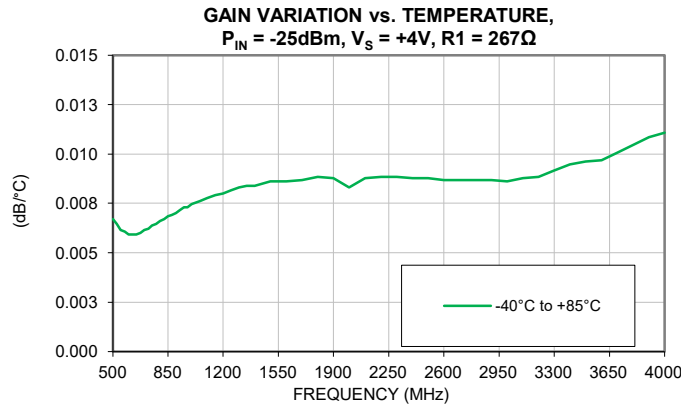
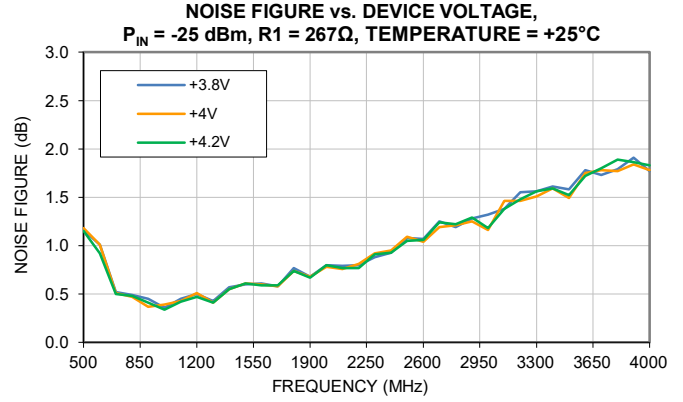
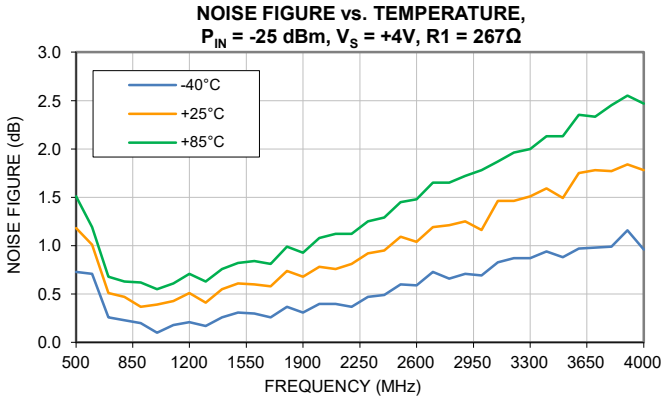




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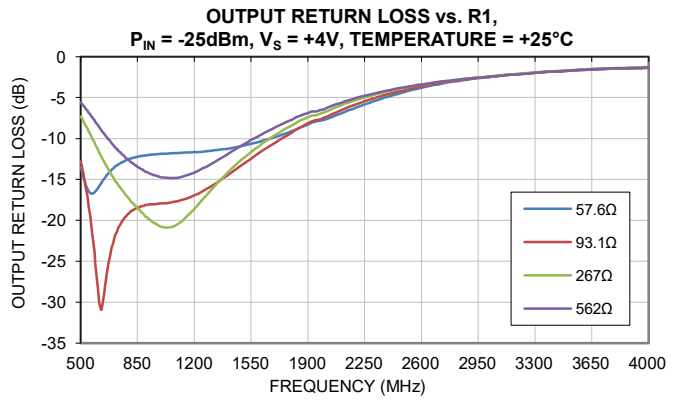
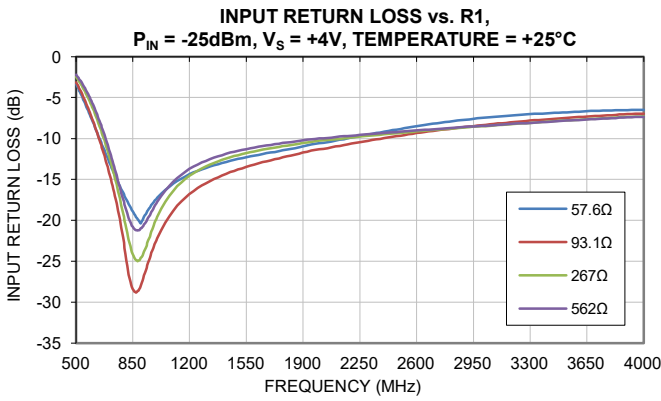
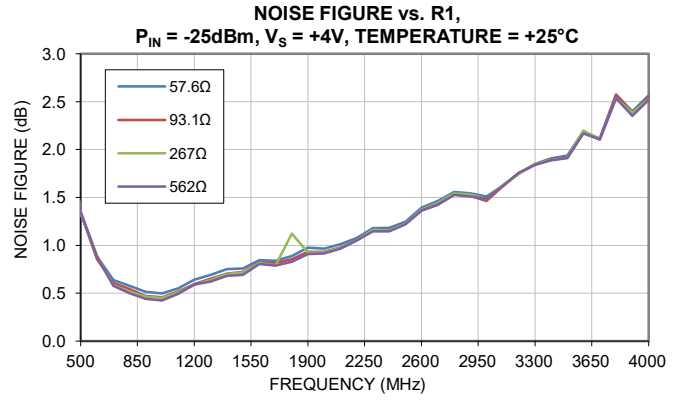
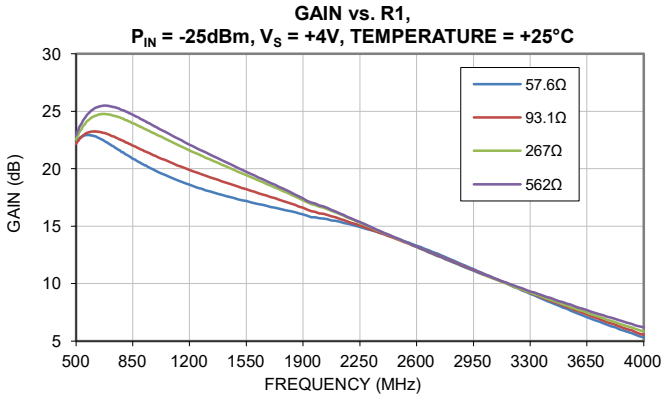
TYPICAL PERFORMANCE GRAPHS





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ABSOLUTE MAXIMUM RATINGS⁶

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Total Power Dissipation	0.55W
Junction Temperature ⁷	+150°C
Input Power (CW), $V_S = +4V$	+25 dBm
DC Voltage on V_S	+5.5V
Current I_S	130mA

6. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.

7. Peak temperature on top of Die.

THERMAL RESISTANCE

Parameter	Ratings
Thermal Resistance (Θ_{jc}) ⁸	53°C/W

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

ESD RATING

	Class	Voltage Range	Reference Standard
Human Body Model (HBM)	1B	500V to <1000V	ANSI/ESDA/JEDEC JS-001-2017
Machine Model (MM)	M1	25V	JESD22-C101F



ESD HANDLING PRECAUTION: This device is designed to be Class 1B 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-020E/JEDEC J-STD-033C



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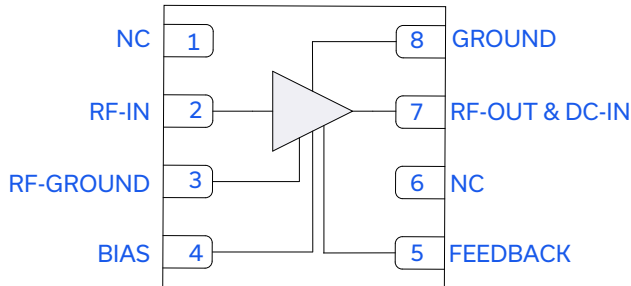
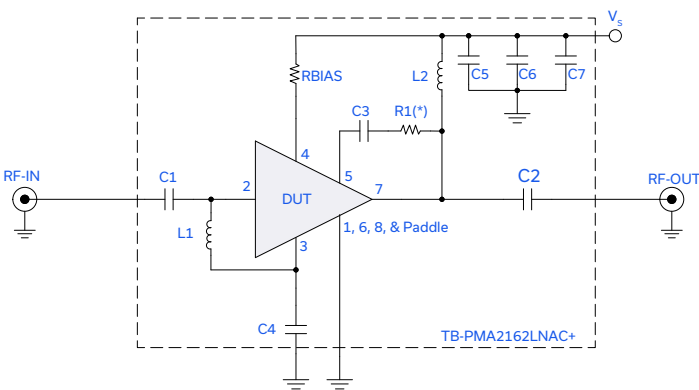


Figure 1. PMA2-162LNA+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
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 RBIAS resistor.
FEEDBACK	5	Feedback Pad used to reflect any feedback into the DUT.
RF-GROUND	3	RF-Ground 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



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

Conditions:

1. Gain and Return Loss: $P_{IN} = -25$ dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.
3. $V_s = +4V$

Figure 2. DUT soldered on Mini-Circuits Characterization Test Board: TB-PMA2162LNAC+

Component	Vendor	Vendor P/N	Value	Size
C1, C6	AVX CORP	04025U9R1CAT2A	9.1pF	0402
C2, C4	Murata	GRM15555C1H101JA01D	100pF	0402
C3	Murata	GJM1555C1H5R6BB01D	5.6pF	0402
C5, C7	Murata	GRM155R71C104KA88D	0.1μF	0402
R1	KOA Speer Electronics	RK73H1ETTP2670F	267Ω	0402
R1*	KOA Speer Electronics	RK73H1ETTP930F	93Ω	0402
Rbias	KOA Speer Electronics	RK73H1ETTP7500F	750Ω	0402
L1	Coilcraft	0402CS-6N8XGLW	6.8nH	0402
L2	Coilcraft	0402CS-15NXGLW	15nH	0402





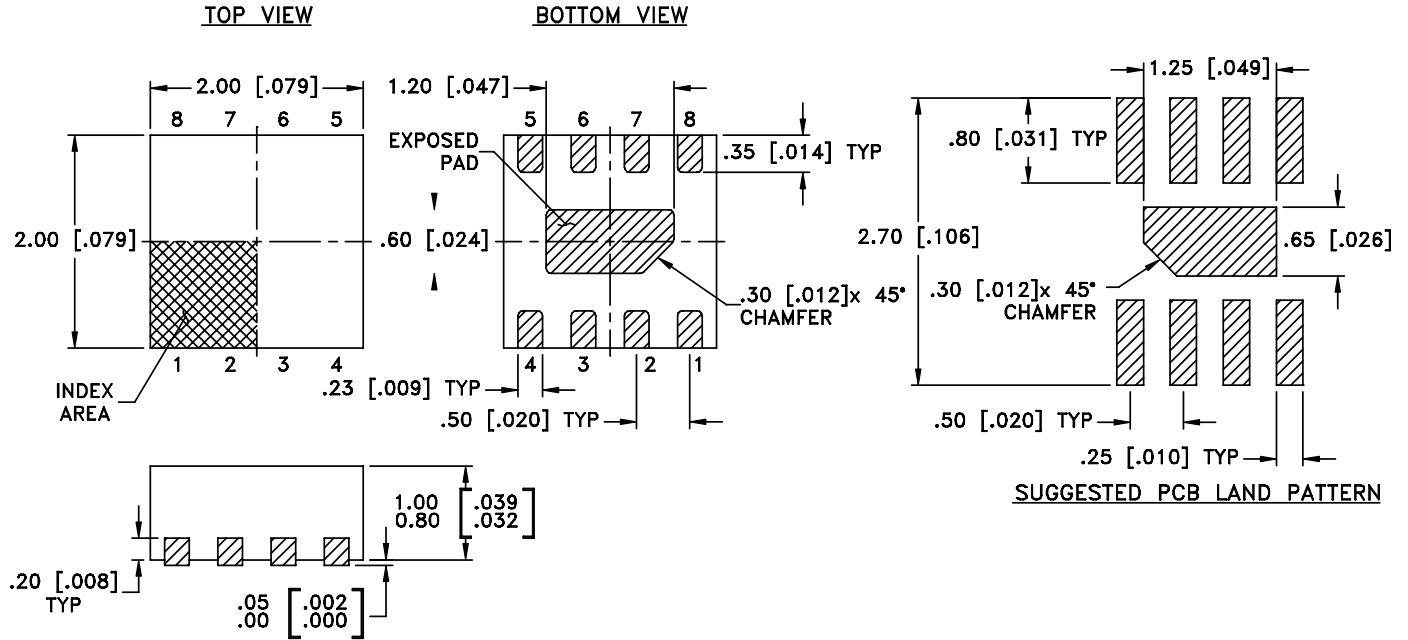
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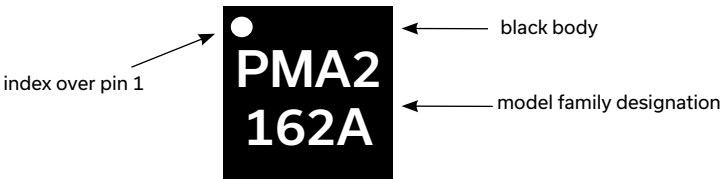
CASE STYLE DRAWING



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. PMA2-162LNA+ Product Marking



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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	F66
Standard quantities available on reel	7" reels with 20, 50, 100, 200, 500, or 1000 devices
Suggested Layout for PCB Design	PL-737
Evaluation Board	TB-PMA2162LNAC+ 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)
- Reverse Isolation = -S12 (dB)
- Output Return Loss = -S22 (dB)

TEST CONDITIONS: $V_s = +4V$, $I_s = 54.09mA$, $R1=267 \Omega$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	FREQ	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(MHz)	(dB)
500.0	21.78	42.23	-2.02	-6.93	1.92	1.23	27.48	16.87	500.0	1.18
525.0	22.53	41.02	-2.59	-7.73	1.89	1.21	27.95	17.34	600.0	1.01
550.0	23.13	40.30	-3.28	-8.57	1.92	1.19	27.79	17.75	700.0	0.51
575.0	23.59	39.70	-4.08	-9.45	1.97	1.16	27.79	18.12	800.0	0.47
600.0	23.94	38.83	-4.97	-10.31	1.94	1.12	28.24	18.25	900.0	0.37
625.0	24.18	38.76	-5.96	-11.21	2.04	1.09	28.29	18.88	1000.0	0.39
650.0	24.32	38.36	-7.04	-12.10	2.06	1.06	28.58	19.09	1100.0	0.43
675.0	24.40	37.86	-8.21	-12.90	2.06	1.02	28.79	19.35	1200.0	0.51
700.0	24.43	38.04	-9.45	-13.64	2.18	1.01	29.24	19.57	1300.0	0.41
725.0	24.40	37.80	-10.77	-14.36	2.20	0.99	29.44	19.58	1400.0	0.55
750.0	24.33	37.95	-12.21	-15.02	2.31	0.97	29.69	19.91	1500.0	0.61
775.0	24.25	37.63	-13.78	-15.57	2.30	0.96	30.06	19.94	1600.0	0.60
800.0	24.14	37.66	-15.47	-16.12	2.37	0.95	30.42	19.85	1700.0	0.58
825.0	24.02	37.52	-17.41	-16.70	2.39	0.95	30.54	20.22	1800.0	0.74
850.0	23.88	37.50	-19.50	-17.20	2.44	0.94	30.40	20.22	1900.0	0.68
875.0	23.73	37.50	-21.84	-17.71	2.49	0.94	30.84	19.99	2000.0	0.78
900.0	23.58	37.31	-24.22	-18.16	2.49	0.94	30.53	20.53	2100.0	0.76
925.0	23.42	37.40	-26.19	-18.51	2.56	0.95	30.94	20.18	2200.0	0.81
950.0	23.26	37.59	-27.29	-18.85	2.66	0.95	30.95	20.07	2300.0	0.92
975.0	23.10	37.56	-26.41	-19.15	2.70	0.95	30.49	20.28	2400.0	0.95
1000.0	22.93	37.52	-24.92	-19.33	2.74	0.96	30.25	20.02	2500.0	1.09
1050.0	22.60	37.72	-22.00	-19.47	2.89	0.96	30.84	20.02	2600.0	1.04
1100.0	22.27	37.43	-19.69	-19.29	2.88	0.97	30.74	20.00	2700.0	1.19
1150.0	21.94	37.53	-17.93	-18.72	3.00	0.98	30.71	20.02	2800.0	1.21
1200.0	21.62	37.66	-16.93	-18.08	3.12	0.98	30.64	20.06	2900.0	1.25
1250.0	21.30	37.84	-15.96	-17.18	3.27	0.99	30.37	20.10	3000.0	1.16
1300.0	20.99	37.78	-15.35	-16.24	3.32	0.99	30.44	19.81	3100.0	1.46
1350.0	20.68	37.72	-14.83	-15.27	3.38	0.99	30.39	19.58	3200.0	1.46
1400.0	20.38	37.76	-14.26	-14.36	3.46	0.99	30.21	19.36	3300.0	1.51
1500.0	19.78	37.99	-13.41	-12.69	3.69	0.99	30.35	19.58	3400.0	1.59
1550.0	19.47	38.16	-13.13	-11.92	3.83	0.98	29.89	18.84	3500.0	1.49
1600.0	19.18	38.04	-12.91	-11.19	3.84	0.97	30.04	18.92	3600.0	1.75
1700.0	18.59	38.11	-12.40	-9.85	3.98	0.95	29.43	18.19	3700.0	1.78
1800.0	17.99	38.52	-11.88	-8.73	4.26	0.93	29.60	18.25	3800.0	1.77
1900.0	17.37	38.65	-11.50	-7.76	4.42	0.90	29.74	18.07	3900.0	1.84
2000.0	16.73	38.95	-11.33	-7.25	4.78	0.88	29.02	17.45	4000.0	1.78
2100.0	16.25	39.04	-11.02	-6.38	4.79	0.84	29.18	17.40		
2200.0	15.69	39.02	-10.74	-5.66	4.78	0.81	29.04	17.34		
2300.0	15.12	39.54	-10.55	-5.10	5.11	0.77	28.59	16.44		
2400.0	14.53	39.69	-10.27	-4.60	5.20	0.73	27.88	15.96		
2500.0	13.95	39.71	-10.05	-4.19	5.25	0.70	28.02	15.58		
2600.0	13.38	40.18	-9.92	-3.83	5.58	0.66	27.18	15.10		
2700.0	12.81	39.59	-9.71	-3.51	5.21	0.63	27.03	14.84		
2800.0	12.24	39.75	-9.48	-3.25	5.34	0.60	26.66	14.26		
2900.0	11.70	39.38	-9.36	-3.02	5.15	0.58	26.49	13.97		
3000.0	11.17	39.44	-9.21	-2.83	5.23	0.55	25.59	13.54		
3100.0	10.65	39.19	-9.00	-2.62	5.06	0.53	25.64	13.10		
3200.0	10.14	38.88	-8.93	-2.46	4.91	0.51	24.56	12.46		
3300.0	9.67	38.08	-8.81	-2.29	4.43	0.48	24.57	12.11		
3400.0	9.20	38.03	-8.68	-2.14	4.38	0.46	24.03	11.83		
3500.0	8.74	37.19	-8.56	-2.02	3.97	0.44	23.31	11.43		
3600.0	8.26	36.71	-8.50	-1.92	3.79	0.43	23.01	10.94		
3700.0	7.85	36.22	-8.32	-1.86	3.62	0.42	22.59	10.60		
3800.0	7.41	35.38	-8.17	-1.75	3.23	0.40	22.07	10.37		
3900.0	6.98	34.60	-8.24	-1.72	3.06	0.40	21.48	9.86		
4000.0	6.60	33.52	-8.12	-1.68	2.72	0.40	21.64	9.63		

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: $V_s = +3.8V$, $I_s = 50.72mA$, $R1=267 \Omega$ @ Temperature = +25°C

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	FREQ (MHz)	Noise Figure (dB)
					K	Measure				
500.0	21.62	41.85	-2.00	-6.93	1.87	1.23	26.95	16.34	500.0	1.16
525.0	22.38	40.96	-2.59	-7.74	1.90	1.21	27.32	16.79	600.0	1.01
550.0	22.99	39.98	-3.27	-8.59	1.89	1.19	27.42	17.22	700.0	0.52
575.0	23.46	39.30	-4.08	-9.49	1.92	1.15	27.48	17.62	800.0	0.49
600.0	23.82	38.92	-4.99	-10.38	1.98	1.12	27.72	17.73	900.0	0.45
625.0	24.06	38.22	-5.98	-11.31	1.96	1.08	27.83	18.37	1000.0	0.36
650.0	24.21	38.13	-7.08	-12.21	2.05	1.05	28.15	18.54	1100.0	0.45
675.0	24.29	37.79	-8.28	-13.02	2.07	1.02	28.33	18.84	1200.0	0.50
700.0	24.32	37.47	-9.56	-13.83	2.09	1.00	28.75	19.06	1300.0	0.43
725.0	24.29	37.43	-10.93	-14.56	2.15	0.98	29.16	19.08	1400.0	0.57
750.0	24.22	37.55	-12.41	-15.21	2.25	0.97	29.32	19.40	1500.0	0.60
775.0	24.14	37.23	-14.06	-15.84	2.24	0.95	29.99	19.43	1600.0	0.61
800.0	24.02	37.31	-15.81	-16.42	2.32	0.95	30.16	19.36	1700.0	0.58
825.0	23.90	37.13	-17.82	-16.99	2.33	0.94	30.16	19.70	1800.0	0.77
850.0	23.76	37.19	-20.00	-17.52	2.40	0.94	30.29	19.73	1900.0	0.68
875.0	23.61	37.10	-22.28	-18.03	2.43	0.94	30.85	19.51	2000.0	0.80
900.0	23.45	37.13	-24.55	-18.51	2.48	0.94	30.42	20.04	2100.0	0.79
925.0	23.29	37.10	-25.87	-18.85	2.52	0.95	30.71	19.68	2200.0	0.80
950.0	23.13	37.16	-25.95	-19.19	2.58	0.95	30.60	19.61	2300.0	0.88
975.0	22.97	37.21	-24.77	-19.47	2.64	0.95	30.55	19.82	2400.0	0.93
1000.0	22.80	37.20	-23.26	-19.64	2.68	0.96	30.05	19.57	2500.0	1.08
1050.0	22.47	37.33	-20.74	-19.78	2.80	0.97	30.35	19.57	2600.0	1.07
1100.0	22.14	37.26	-18.70	-19.50	2.86	0.97	30.48	19.55	2700.0	1.25
1150.0	21.80	37.51	-17.14	-18.89	3.03	0.98	30.57	19.60	2800.0	1.19
1200.0	21.48	37.34	-16.20	-18.14	3.05	0.99	30.68	19.62	2900.0	1.28
1250.0	21.16	37.39	-15.32	-17.25	3.15	0.99	30.38	19.68	3000.0	1.32
1300.0	20.85	37.39	-14.73	-16.23	3.22	0.99	29.97	19.37	3100.0	1.38
1350.0	20.53	37.51	-14.25	-15.26	3.34	0.99	30.28	19.15	3200.0	1.55
1400.0	20.23	37.50	-13.74	-14.33	3.40	1.00	29.67	18.96	3300.0	1.56
1500.0	19.62	37.72	-12.94	-12.65	3.62	0.99	29.88	19.17	3400.0	1.61
1550.0	19.32	37.80	-12.70	-11.86	3.72	0.98	29.83	18.43	3500.0	1.58
1600.0	19.02	37.90	-12.48	-11.15	3.82	0.98	29.87	18.53	3600.0	1.78
1700.0	18.43	38.18	-12.03	-9.82	4.05	0.96	29.32	17.80	3700.0	1.73
1800.0	17.83	38.38	-11.53	-8.70	4.24	0.93	29.56	17.83	3800.0	1.79
1900.0	17.21	38.79	-11.16	-7.73	4.54	0.91	29.09	17.65	3900.0	1.91
2000.0	16.56	38.50	-11.04	-7.21	4.59	0.89	28.62	17.07	4000.0	1.77
2100.0	16.09	38.88	-10.71	-6.35	4.75	0.85	28.62	17.01		
2200.0	15.53	38.83	-10.48	-5.64	4.72	0.81	28.80	16.92		
2300.0	14.95	39.28	-10.28	-5.07	5.00	0.77	27.75	15.92		
2400.0	14.37	39.60	-10.04	-4.56	5.20	0.73	27.36	15.46		
2500.0	13.78	39.85	-9.85	-4.17	5.39	0.70	27.16	15.15		
2600.0	13.21	40.21	-9.71	-3.81	5.65	0.66	26.22	14.50		
2700.0	12.64	39.97	-9.51	-3.49	5.50	0.63	26.05	14.30		
2800.0	12.07	39.55	-9.27	-3.23	5.26	0.60	25.77	13.89		
2900.0	11.54	39.52	-9.18	-3.01	5.29	0.58	25.41	13.45		
3000.0	11.00	39.44	-9.04	-2.81	5.27	0.55	24.53	12.99		
3100.0	10.48	39.27	-8.84	-2.61	5.16	0.53	24.69	12.52		
3200.0	9.97	39.01	-8.76	-2.44	5.03	0.51	23.56	11.90		
3300.0	9.50	38.38	-8.65	-2.27	4.63	0.48	23.54	11.57		
3400.0	9.03	37.87	-8.52	-2.13	4.33	0.46	23.01	11.30		
3500.0	8.57	37.16	-8.42	-2.01	3.99	0.44	22.24	10.79		
3600.0	8.08	36.84	-8.37	-1.90	3.87	0.43	22.01	10.32		
3700.0	7.68	36.31	-8.18	-1.85	3.68	0.42	21.58	10.04		
3800.0	7.24	35.22	-8.04	-1.74	3.20	0.41	21.17	9.81		
3900.0	6.81	35.13	-8.08	-1.73	3.33	0.40	20.56	9.30		
4000.0	6.44	33.75	-7.98	-1.68	2.84	0.40	20.73	9.03		

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: $V_s = +4.2V$, $I_s = 57.17mA$, $R1=267 \Omega$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	FREQ	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(MHz)	(dB)
500.0	21.93	42.37	-2.03	-6.92	1.92	1.23	28.05	17.28	500.0	1.15
525.0	22.67	41.37	-2.61	-7.72	1.93	1.21	28.24	17.78	600.0	0.92
550.0	23.25	40.64	-3.29	-8.54	1.96	1.19	28.26	18.21	700.0	0.50
575.0	23.71	40.04	-4.08	-9.40	2.00	1.16	28.32	18.58	800.0	0.48
600.0	24.06	39.41	-4.96	-10.26	2.02	1.12	28.52	18.72	900.0	0.41
625.0	24.29	38.99	-5.93	-11.14	2.05	1.09	28.51	19.31	1000.0	0.34
650.0	24.43	38.62	-6.98	-11.99	2.09	1.06	28.91	19.56	1100.0	0.42
675.0	24.51	38.47	-8.13	-12.73	2.15	1.03	29.18	19.81	1200.0	0.47
700.0	24.53	38.33	-9.34	-13.46	2.20	1.01	29.78	20.02	1300.0	0.41
725.0	24.50	38.02	-10.63	-14.14	2.22	0.99	30.12	20.02	1400.0	0.55
750.0	24.43	37.90	-12.02	-14.74	2.26	0.97	29.91	20.36	1500.0	0.61
775.0	24.35	37.94	-13.53	-15.30	2.34	0.96	30.48	20.36	1600.0	0.59
800.0	24.25	37.78	-15.16	-15.84	2.36	0.95	30.54	20.28	1700.0	0.59
825.0	24.12	37.92	-16.99	-16.39	2.46	0.95	30.63	20.64	1800.0	0.74
850.0	23.98	37.81	-18.99	-16.88	2.49	0.95	30.80	20.63	1900.0	0.67
875.0	23.84	37.80	-21.19	-17.36	2.54	0.95	30.97	20.40	2000.0	0.80
900.0	23.69	37.86	-23.69	-17.79	2.61	0.95	30.83	20.93	2100.0	0.77
925.0	23.53	37.94	-26.21	-18.10	2.68	0.95	31.22	20.59	2200.0	0.77
950.0	23.38	37.79	-28.14	-18.48	2.69	0.95	31.36	20.49	2300.0	0.91
975.0	23.22	37.99	-28.05	-18.75	2.80	0.95	30.97	20.70	2400.0	0.93
1000.0	23.05	37.85	-26.63	-18.98	2.80	0.96	30.92	20.42	2500.0	1.05
1050.0	22.73	38.18	-23.46	-19.21	3.00	0.96	30.90	20.42	2600.0	1.06
1100.0	22.40	38.02	-20.79	-19.04	3.04	0.97	31.15	20.38	2700.0	1.24
1150.0	22.07	38.02	-18.82	-18.61	3.13	0.98	30.78	20.40	2800.0	1.22
1200.0	21.76	37.96	-17.71	-18.00	3.19	0.98	30.89	20.45	2900.0	1.29
1250.0	21.44	38.05	-16.67	-17.20	3.31	0.98	30.69	20.47	3000.0	1.18
1300.0	21.13	38.12	-15.97	-16.25	3.42	0.99	30.68	20.15	3100.0	1.38
1350.0	20.82	38.13	-15.41	-15.34	3.50	0.99	30.40	19.95	3200.0	1.48
1400.0	20.52	38.27	-14.81	-14.44	3.63	0.99	30.17	19.74	3300.0	1.56
1500.0	19.92	38.29	-13.87	-12.78	3.78	0.98	30.25	19.92	3400.0	1.59
1550.0	19.62	38.45	-13.59	-12.00	3.92	0.98	30.03	19.20	3500.0	1.52
1600.0	19.33	38.38	-13.34	-11.28	3.96	0.97	30.08	19.30	3600.0	1.72
1700.0	18.74	38.51	-12.81	-9.94	4.13	0.95	29.68	18.55	3700.0	1.80
1800.0	18.15	38.80	-12.25	-8.81	4.36	0.93	29.75	18.62	3800.0	1.89
1900.0	17.53	39.09	-11.81	-7.83	4.61	0.90	29.80	18.40	3900.0	1.86
2000.0	16.88	38.95	-11.68	-7.31	4.74	0.88	29.36	17.83	4000.0	1.83
2100.0	16.42	39.53	-11.29	-6.45	5.03	0.84	29.38	17.77		
2200.0	15.86	39.45	-11.00	-5.72	4.99	0.80	29.30	17.73		
2300.0	15.29	40.02	-10.78	-5.15	5.36	0.77	28.73	16.76		
2400.0	14.70	39.57	-10.51	-4.64	5.10	0.73	28.42	16.33		
2500.0	14.12	39.78	-10.26	-4.22	5.25	0.70	28.40	16.06		
2600.0	13.55	40.16	-10.13	-3.87	5.53	0.66	27.92	15.48		
2700.0	12.98	40.06	-9.90	-3.55	5.47	0.63	27.51	15.14		
2800.0	12.41	39.86	-9.66	-3.28	5.36	0.60	27.38	14.80		
2900.0	11.88	39.60	-9.54	-3.05	5.24	0.58	27.24	14.40		
3000.0	11.34	39.38	-9.38	-2.85	5.15	0.55	26.31	13.96		
3100.0	10.82	39.18	-9.16	-2.65	5.02	0.53	26.46	13.56		
3200.0	10.31	38.93	-9.09	-2.48	4.91	0.51	25.45	12.89		
3300.0	9.84	38.04	-8.96	-2.31	4.39	0.48	25.44	12.56		
3400.0	9.37	37.80	-8.81	-2.16	4.23	0.46	24.83	12.37		
3500.0	8.91	37.05	-8.72	-2.04	3.87	0.45	24.28	11.91		
3600.0	8.44	36.93	-8.63	-1.93	3.85	0.43	24.00	11.44		
3700.0	8.03	36.13	-8.46	-1.87	3.54	0.42	23.47	11.15		
3800.0	7.59	35.16	-8.31	-1.76	3.12	0.41	22.90	10.89		
3900.0	7.16	34.53	-8.38	-1.74	3.02	0.40	22.34	10.41		
4000.0	6.78	33.61	-8.27	-1.69	2.74	0.40	22.39	10.16		

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: $V_S = +4V$, $I_S = 53.52mA$, $R1=267 \Omega$ @ Temperature = $-40^\circ C$

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	FREQ (MHz)	Noise Figure (dB)
					K	Measure				
500.0	22.14	42.36	-1.83	-6.64	1.76	1.22	27.38	16.47	500.0	0.73
525.0	22.88	41.83	-2.37	-7.39	1.86	1.22	27.85	16.94	600.0	0.71
550.0	23.47	41.10	-2.99	-8.15	1.89	1.20	27.90	17.37	700.0	0.26
575.0	23.94	40.30	-3.71	-8.97	1.91	1.17	27.84	17.72	800.0	0.23
600.0	24.30	39.63	-4.52	-9.78	1.92	1.13	28.14	17.85	900.0	0.20
625.0	24.54	39.31	-5.40	-10.62	1.98	1.10	28.67	18.46	1000.0	0.10
650.0	24.70	39.00	-6.35	-11.46	2.03	1.07	28.62	18.69	1100.0	0.18
675.0	24.79	38.72	-7.39	-12.24	2.08	1.05	29.06	19.03	1200.0	0.21
700.0	24.84	38.61	-8.48	-12.95	2.14	1.02	29.69	19.33	1300.0	0.17
725.0	24.82	38.15	-9.63	-13.66	2.12	1.00	29.85	19.40	1400.0	0.26
750.0	24.77	38.06	-10.87	-14.28	2.18	0.98	30.01	19.72	1500.0	0.31
775.0	24.70	37.97	-12.16	-14.81	2.22	0.97	30.44	19.78	1600.0	0.30
800.0	24.60	37.99	-13.49	-15.32	2.29	0.96	30.91	19.73	1700.0	0.26
825.0	24.49	37.92	-14.96	-15.83	2.33	0.95	30.91	20.08	1800.0	0.37
850.0	24.36	38.08	-16.49	-16.30	2.43	0.95	30.64	20.09	1900.0	0.31
875.0	24.22	37.99	-18.06	-16.75	2.47	0.95	31.03	19.89	2000.0	0.40
900.0	24.08	37.85	-19.86	-17.19	2.48	0.95	30.95	20.43	2100.0	0.40
925.0	23.93	37.91	-21.76	-17.55	2.55	0.95	31.10	20.07	2200.0	0.37
950.0	23.79	37.78	-23.93	-17.90	2.56	0.95	31.27	20.00	2300.0	0.47
975.0	23.63	37.83	-25.88	-18.27	2.62	0.95	31.17	20.19	2400.0	0.49
1000.0	23.48	37.77	-27.10	-18.50	2.65	0.95	30.40	19.96	2500.0	0.60
1050.0	23.16	38.02	-26.53	-18.89	2.82	0.96	30.80	19.97	2600.0	0.59
1100.0	22.84	38.14	-23.74	-18.75	2.95	0.96	30.79	19.93	2700.0	0.73
1150.0	22.53	37.99	-21.32	-18.34	2.98	0.97	30.61	19.97	2800.0	0.66
1200.0	22.22	37.81	-20.00	-17.88	3.01	0.97	30.64	20.00	2900.0	0.71
1250.0	21.91	37.90	-18.66	-17.19	3.12	0.97	30.49	20.05	3000.0	0.69
1300.0	21.61	37.90	-17.77	-16.32	3.19	0.97	30.26	19.74	3100.0	0.83
1350.0	21.31	37.88	-17.04	-15.35	3.26	0.97	30.37	19.52	3200.0	0.87
1400.0	21.01	37.99	-16.29	-14.43	3.37	0.97	30.27	19.35	3300.0	0.87
1500.0	20.43	38.03	-15.24	-12.75	3.52	0.97	29.96	19.55	3400.0	0.94
1550.0	20.13	38.32	-14.85	-12.02	3.70	0.96	29.76	18.82	3500.0	0.88
1600.0	19.84	38.10	-14.50	-11.32	3.67	0.96	29.80	18.90	3600.0	0.97
1700.0	19.27	38.33	-13.80	-9.94	3.86	0.94	29.37	18.15	3700.0	0.98
1800.0	18.68	38.66	-13.22	-8.76	4.09	0.91	29.63	18.21	3800.0	0.99
1900.0	18.06	39.14	-12.66	-7.75	4.41	0.89	29.20	17.92	3900.0	1.16
2000.0	17.39	38.79	-12.36	-7.26	4.43	0.87	28.83	17.37	4000.0	0.96
2100.0	16.96	39.42	-11.96	-6.37	4.71	0.83	28.97	17.28		
2200.0	16.41	38.98	-11.61	-5.60	4.44	0.79	28.71	17.20		
2300.0	15.84	39.66	-11.26	-5.02	4.80	0.75	28.17	16.26		
2400.0	15.26	39.78	-10.91	-4.50	4.86	0.71	27.73	15.89		
2500.0	14.67	40.05	-10.74	-4.06	5.01	0.67	27.55	15.53		
2600.0	14.10	40.20	-10.48	-3.68	5.09	0.64	26.80	15.06		
2700.0	13.54	40.12	-10.12	-3.37	5.01	0.61	26.55	14.83		
2800.0	12.97	40.45	-9.92	-3.11	5.23	0.58	26.21	14.42		
2900.0	12.43	39.83	-9.77	-2.88	4.87	0.55	25.97	14.08		
3000.0	11.89	39.81	-9.49	-2.72	4.91	0.54	25.12	13.69		
3100.0	11.38	39.46	-9.32	-2.52	4.69	0.51	25.19	13.15		
3200.0	10.87	39.58	-9.25	-2.35	4.77	0.49	24.23	12.66		
3300.0	10.41	38.87	-9.00	-2.18	4.31	0.46	24.13	12.36		
3400.0	9.99	38.43	-8.90	-2.04	4.05	0.44	23.76	12.12		
3500.0	9.54	37.71	-8.84	-1.86	3.61	0.41	23.03	11.66		
3600.0	9.07	37.31	-8.59	-1.75	3.42	0.40	22.79	11.24		
3700.0	8.69	36.58	-8.48	-1.70	3.17	0.39	22.32	10.88		
3800.0	8.27	35.72	-8.47	-1.58	2.79	0.37	21.97	10.74		
3900.0	7.86	35.43	-8.39	-1.56	2.79	0.37	21.31	10.29		
4000.0	7.52	34.20	-8.24	-1.51	2.40	0.36	21.57	10.01		



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: $V_S = +3.8V$, $I_S = 50.44mA$, $R1=267 \Omega$ @ Temperature = $-40^\circ C$

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	FREQ (MHz)	Noise Figure (dB)
					K	Measure				
500.0	21.94	41.79	-1.81	-6.65	1.70	1.22	26.76	15.84	500.0	0.77
525.0	22.69	41.40	-2.34	-7.41	1.81	1.22	27.31	16.31	600.0	0.67
550.0	23.30	40.44	-2.97	-8.18	1.82	1.19	27.26	16.68	700.0	0.28
575.0	23.77	40.14	-3.69	-9.01	1.91	1.17	27.29	17.06	800.0	0.26
600.0	24.14	39.30	-4.51	-9.85	1.90	1.13	27.73	17.12	900.0	0.18
625.0	24.39	38.84	-5.39	-10.71	1.92	1.10	27.81	17.80	1000.0	0.17
650.0	24.56	38.70	-6.37	-11.59	2.01	1.07	28.29	18.00	1100.0	0.22
675.0	24.66	38.26	-7.44	-12.39	2.02	1.04	28.42	18.37	1200.0	0.27
700.0	24.71	38.15	-8.55	-13.16	2.08	1.02	29.06	18.61	1300.0	0.22
725.0	24.69	38.01	-9.75	-13.88	2.13	1.00	29.48	18.74	1400.0	0.31
750.0	24.64	37.73	-11.02	-14.53	2.15	0.98	29.31	19.07	1500.0	0.32
775.0	24.57	37.63	-12.37	-15.08	2.19	0.97	29.94	19.16	1600.0	0.33
800.0	24.46	37.64	-13.76	-15.65	2.25	0.96	30.24	19.13	1700.0	0.29
825.0	24.36	37.69	-15.29	-16.19	2.32	0.95	30.32	19.50	1800.0	0.41
850.0	24.22	37.56	-16.87	-16.64	2.35	0.95	30.33	19.53	1900.0	0.33
875.0	24.08	37.60	-18.53	-17.13	2.41	0.94	30.54	19.32	2000.0	0.43
900.0	23.94	37.47	-20.34	-17.57	2.43	0.94	30.28	19.84	2100.0	0.42
925.0	23.79	37.58	-22.26	-17.89	2.50	0.94	30.73	19.52	2200.0	0.40
950.0	23.64	37.52	-24.30	-18.28	2.53	0.94	30.68	19.46	2300.0	0.52
975.0	23.49	37.50	-25.65	-18.65	2.58	0.95	30.44	19.63	2400.0	0.55
1000.0	23.33	37.59	-26.05	-18.90	2.64	0.95	29.85	19.44	2500.0	0.63
1050.0	23.01	37.52	-24.50	-19.19	2.71	0.96	30.35	19.43	2600.0	0.64
1100.0	22.69	37.48	-22.00	-19.02	2.78	0.96	30.31	19.44	2700.0	0.77
1150.0	22.37	37.65	-19.92	-18.50	2.91	0.97	30.09	19.47	2800.0	0.72
1200.0	22.06	37.61	-18.79	-17.94	2.98	0.97	30.22	19.49	2900.0	0.72
1250.0	21.75	37.61	-17.61	-17.21	3.06	0.98	30.18	19.55	3000.0	0.71
1300.0	21.44	37.58	-16.84	-16.27	3.13	0.98	29.87	19.27	3100.0	0.74
1350.0	21.14	37.68	-16.19	-15.28	3.23	0.98	30.07	19.03	3200.0	0.91
1400.0	20.84	37.76	-15.52	-14.35	3.33	0.98	29.41	18.84	3300.0	0.91
1500.0	20.25	37.79	-14.55	-12.68	3.46	0.97	29.82	19.09	3400.0	1.02
1550.0	19.95	37.88	-14.20	-11.93	3.56	0.97	29.38	18.38	3500.0	0.91
1600.0	19.66	38.10	-13.87	-11.23	3.71	0.96	29.46	18.45	3600.0	1.11
1700.0	19.08	38.33	-13.27	-9.85	3.91	0.94	29.12	17.69	3700.0	1.07
1800.0	18.49	38.41	-12.73	-8.68	4.02	0.92	29.34	17.73	3800.0	1.03
1900.0	17.87	38.52	-12.22	-7.69	4.15	0.89	28.88	17.52	3900.0	1.18
2000.0	17.20	38.41	-11.91	-7.19	4.29	0.87	28.44	16.89	4000.0	0.97
2100.0	16.76	38.88	-11.57	-6.32	4.47	0.83	28.41	16.77		
2200.0	16.21	38.77	-11.25	-5.54	4.38	0.79	28.45	16.62		
2300.0	15.63	39.50	-10.93	-4.97	4.77	0.75	27.59	15.64		
2400.0	15.05	39.60	-10.62	-4.45	4.80	0.71	27.09	15.33		
2500.0	14.47	39.73	-10.46	-4.02	4.88	0.67	26.96	14.99		
2600.0	13.90	39.95	-10.23	-3.65	4.99	0.64	26.05	14.49		
2700.0	13.33	39.93	-9.88	-3.34	4.95	0.61	25.90	14.15		
2800.0	12.76	39.81	-9.69	-3.07	4.89	0.58	25.59	13.86		
2900.0	12.22	40.00	-9.56	-2.85	5.03	0.55	25.27	13.47		
3000.0	11.68	40.03	-9.29	-2.68	5.09	0.53	24.32	13.07		
3100.0	11.17	39.88	-9.13	-2.50	4.99	0.51	24.54	12.59		
3200.0	10.66	39.55	-9.06	-2.33	4.80	0.48	23.37	12.01		
3300.0	10.21	39.02	-8.83	-2.15	4.42	0.46	23.39	11.71		
3400.0	9.78	38.58	-8.73	-1.99	4.12	0.44	22.95	11.46		
3500.0	9.33	37.61	-8.67	-1.84	3.60	0.41	22.17	10.99		
3600.0	8.86	37.82	-8.42	-1.74	3.67	0.40	21.89	10.55		
3700.0	8.47	36.90	-8.32	-1.68	3.32	0.39	21.46	10.20		
3800.0	8.06	35.70	-8.30	-1.56	2.82	0.37	21.13	10.02		
3900.0	7.64	35.76	-8.22	-1.55	2.95	0.37	20.44	9.62		
4000.0	7.30	34.39	-8.07	-1.50	2.49	0.36	20.81	9.24		

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: $V_s = +4.2V$, $I_s = 53.41mA$, $R1=267 \Omega$ @ Temperature = $-40^\circ C$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	FREQ	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(MHz)	(dB)
500.0	22.17	42.83	-1.83	-6.61	1.81	1.23	27.53	16.93	500.0	0.76
525.0	22.91	42.14	-2.36	-7.36	1.90	1.22	28.13	17.36	600.0	0.73
550.0	23.50	41.28	-2.98	-8.10	1.91	1.20	27.94	17.74	700.0	0.29
575.0	23.96	40.40	-3.69	-8.89	1.92	1.16	27.95	18.10	800.0	0.26
600.0	24.32	40.20	-4.49	-9.66	2.01	1.14	28.24	18.28	900.0	0.21
625.0	24.56	39.66	-5.35	-10.51	2.03	1.11	28.46	18.89	1000.0	0.15
650.0	24.72	39.20	-6.29	-11.30	2.05	1.08	28.90	19.18	1100.0	0.23
675.0	24.82	39.09	-7.31	-12.05	2.13	1.05	29.22	19.49	1200.0	0.28
700.0	24.86	38.42	-8.39	-12.74	2.08	1.02	29.81	19.80	1300.0	0.18
725.0	24.85	38.55	-9.52	-13.40	2.19	1.00	30.33	19.88	1400.0	0.32
750.0	24.80	38.52	-10.73	-14.02	2.27	0.99	30.16	20.20	1500.0	0.34
775.0	24.73	38.29	-12.00	-14.52	2.28	0.97	30.75	20.27	1600.0	0.34
800.0	24.63	38.28	-13.30	-15.02	2.34	0.96	31.20	20.22	1700.0	0.28
825.0	24.53	38.24	-14.73	-15.50	2.40	0.96	31.00	20.56	1800.0	0.43
850.0	24.39	38.25	-16.21	-15.94	2.46	0.95	30.98	20.58	1900.0	0.36
875.0	24.26	38.22	-17.75	-16.39	2.51	0.95	31.28	20.39	2000.0	0.45
900.0	24.11	38.20	-19.50	-16.77	2.56	0.95	31.04	20.92	2100.0	0.41
925.0	23.97	38.32	-21.33	-17.13	2.64	0.95	31.39	20.55	2200.0	0.42
950.0	23.82	38.11	-23.43	-17.49	2.64	0.95	31.29	20.49	2300.0	0.49
975.0	23.67	38.37	-25.32	-17.83	2.76	0.95	31.46	20.70	2400.0	0.52
1000.0	23.52	38.31	-26.76	-18.11	2.79	0.95	30.77	20.47	2500.0	0.62
1050.0	23.20	38.26	-26.85	-18.46	2.87	0.96	31.06	20.43	2600.0	0.59
1100.0	22.89	38.38	-24.25	-18.39	3.01	0.96	30.82	20.43	2700.0	0.75
1150.0	22.57	38.38	-21.76	-18.06	3.09	0.97	30.91	20.46	2800.0	0.67
1200.0	22.27	38.25	-20.35	-17.65	3.14	0.97	30.99	20.48	2900.0	0.77
1250.0	21.96	38.23	-18.98	-17.06	3.22	0.97	30.89	20.53	3000.0	0.71
1300.0	21.66	38.34	-18.06	-16.22	3.34	0.97	30.44	20.23	3100.0	0.80
1350.0	21.35	38.45	-17.28	-15.30	3.46	0.97	30.49	19.99	3200.0	0.89
1400.0	21.06	38.68	-16.54	-14.40	3.63	0.97	30.06	19.80	3300.0	0.91
1500.0	20.48	38.41	-15.46	-12.78	3.66	0.97	30.24	20.01	3400.0	0.97
1550.0	20.18	38.35	-15.04	-12.04	3.70	0.96	29.71	19.27	3500.0	0.90
1600.0	19.89	38.61	-14.66	-11.33	3.87	0.96	29.82	19.35	3600.0	1.09
1700.0	19.32	38.76	-13.96	-9.96	4.04	0.94	29.40	18.57	3700.0	1.10
1800.0	18.74	39.00	-13.37	-8.79	4.24	0.91	29.77	18.62	3800.0	1.13
1900.0	18.12	39.41	-12.78	-7.79	4.54	0.89	29.27	18.39	3900.0	1.15
2000.0	17.44	39.25	-12.48	-7.31	4.67	0.87	28.69	17.77	4000.0	0.98
2100.0	17.01	40.02	-12.08	-6.41	5.04	0.83	28.78	17.70		
2200.0	16.47	39.91	-11.71	-5.63	4.94	0.79	28.81	17.54		
2300.0	15.90	40.18	-11.35	-5.04	5.09	0.75	28.08	16.73		
2400.0	15.32	39.84	-11.01	-4.53	4.88	0.71	27.67	16.33		
2500.0	14.74	39.86	-10.84	-4.08	4.89	0.68	27.43	15.92		
2600.0	14.17	40.31	-10.59	-3.70	5.14	0.64	26.95	15.45		
2700.0	13.61	40.01	-10.22	-3.39	4.95	0.61	26.60	15.27		
2800.0	13.03	40.42	-10.02	-3.12	5.20	0.58	26.33	14.90		
2900.0	12.49	39.96	-9.90	-2.89	4.95	0.55	26.01	14.51		
3000.0	11.96	39.66	-9.62	-2.73	4.82	0.54	25.27	14.15		
3100.0	11.45	39.34	-9.45	-2.54	4.63	0.51	25.30	13.72		
3200.0	10.94	39.47	-9.39	-2.36	4.71	0.48	24.37	13.04		
3300.0	10.49	38.96	-9.13	-2.19	4.36	0.46	24.29	12.74		
3400.0	10.06	38.32	-9.03	-2.04	3.98	0.44	23.97	12.60		
3500.0	9.62	37.39	-8.99	-1.87	3.49	0.42	23.28	12.16		
3600.0	9.15	37.33	-8.71	-1.77	3.43	0.40	23.01	11.74		
3700.0	8.77	36.74	-8.62	-1.71	3.24	0.39	22.63	11.42		
3800.0	8.35	35.54	-8.61	-1.59	2.75	0.37	22.23	11.29		
3900.0	7.94	35.20	-8.54	-1.57	2.73	0.37	21.66	10.77		
4000.0	7.60	33.95	-8.41	-1.51	2.33	0.36	21.87	10.52		

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: $V_s = +4V$, $I_s = 53.86mA$, $R1=267 \Omega$ @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	FREQ	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(MHz)	(dB)
500.0	21.27	42.46	-2.05	-6.95	2.08	1.23	27.07	16.50	500.0	1.51
525.0	22.04	40.86	-2.63	-7.74	1.96	1.21	27.32	16.95	600.0	1.19
550.0	22.67	40.42	-3.32	-8.57	2.05	1.19	27.46	17.33	700.0	0.68
575.0	23.15	39.72	-4.15	-9.43	2.07	1.16	27.25	17.80	800.0	0.63
600.0	23.53	38.96	-5.09	-10.29	2.06	1.12	27.57	17.83	900.0	0.62
625.0	23.77	38.84	-6.11	-11.15	2.16	1.09	27.73	18.51	1000.0	0.55
650.0	23.93	38.28	-7.24	-11.98	2.14	1.05	27.80	18.71	1100.0	0.61
675.0	24.01	38.08	-8.49	-12.71	2.20	1.02	28.20	18.99	1200.0	0.71
700.0	24.04	38.16	-9.80	-13.37	2.31	1.00	28.57	19.24	1300.0	0.63
725.0	24.01	37.89	-11.19	-14.00	2.33	0.98	28.65	19.27	1400.0	0.76
750.0	23.94	37.92	-12.74	-14.57	2.41	0.97	28.95	19.60	1500.0	0.82
775.0	23.86	37.99	-14.45	-15.05	2.49	0.96	29.37	19.64	1600.0	0.84
800.0	23.74	37.91	-16.30	-15.56	2.54	0.95	29.50	19.60	1700.0	0.81
825.0	23.62	37.89	-18.41	-16.05	2.59	0.95	29.73	19.96	1800.0	0.99
850.0	23.47	37.59	-20.66	-16.54	2.57	0.94	29.71	19.96	1900.0	0.93
875.0	23.32	37.76	-22.89	-17.00	2.67	0.95	29.90	19.74	2000.0	1.08
900.0	23.17	37.78	-24.51	-17.43	2.73	0.95	30.04	20.25	2100.0	1.12
925.0	23.00	37.83	-24.51	-17.76	2.80	0.95	29.90	19.94	2200.0	1.12
950.0	22.84	37.99	-23.59	-18.06	2.90	0.96	30.16	19.85	2300.0	1.25
975.0	22.68	37.89	-22.32	-18.30	2.91	0.96	29.76	20.09	2400.0	1.29
1000.0	22.51	38.07	-20.96	-18.46	3.02	0.96	29.41	19.80	2500.0	1.45
1050.0	22.17	37.92	-18.95	-18.50	3.07	0.97	29.65	19.85	2600.0	1.48
1100.0	21.83	38.14	-17.27	-18.32	3.23	0.98	29.93	19.82	2700.0	1.65
1150.0	21.50	38.49	-15.95	-18.00	3.46	0.99	30.07	19.87	2800.0	1.65
1200.0	21.18	38.29	-15.03	-17.52	3.47	1.00	30.09	19.93	2900.0	1.72
1250.0	20.85	38.36	-14.21	-16.93	3.59	1.00	29.86	19.93	3000.0	1.78
1300.0	20.53	38.50	-13.73	-16.07	3.74	1.01	29.63	19.65	3100.0	1.87
1350.0	20.22	38.51	-13.31	-15.18	3.82	1.01	29.42	19.44	3200.0	1.96
1400.0	19.92	38.57	-12.90	-14.32	3.93	1.01	29.36	19.26	3300.0	2.00
1500.0	19.31	38.68	-12.15	-12.75	4.14	1.00	29.52	19.47	3400.0	2.13
1550.0	19.01	38.77	-11.90	-12.03	4.26	1.00	29.22	18.73	3500.0	2.13
1600.0	18.72	39.16	-11.72	-11.36	4.53	0.99	29.29	18.84	3600.0	2.35
1700.0	18.14	39.33	-11.38	-10.05	4.76	0.97	28.88	18.09	3700.0	2.33
1800.0	17.53	39.65	-10.93	-8.94	5.06	0.95	28.86	18.17	3800.0	2.45
1900.0	16.92	39.68	-10.55	-7.99	5.19	0.93	29.13	17.99	3900.0	2.55
2000.0	16.31	39.47	-10.52	-7.47	5.29	0.91	28.97	17.37	4000.0	2.47
2100.0	15.82	40.14	-10.30	-6.63	5.72	0.87	29.00	17.33		
2200.0	15.26	39.98	-10.02	-5.89	5.63	0.83	29.17	17.26		
2300.0	14.69	40.44	-9.92	-5.32	6.00	0.79	28.65	16.32		
2400.0	14.12	39.92	-9.78	-4.83	5.69	0.76	28.24	15.91		
2500.0	13.53	40.24	-9.59	-4.41	5.97	0.72	28.22	15.60		
2600.0	12.97	40.29	-9.49	-4.05	6.06	0.69	27.93	15.09		
2700.0	12.41	40.04	-9.40	-3.72	5.93	0.66	27.65	14.83		
2800.0	11.84	39.67	-9.17	-3.44	5.71	0.63	27.49	14.40		
2900.0	11.30	39.52	-9.09	-3.20	5.67	0.60	27.24	13.94		
3000.0	10.77	39.39	-9.03	-3.00	5.67	0.58	26.58	13.47		
3100.0	10.24	38.65	-8.85	-2.79	5.20	0.55	26.43	13.05		
3200.0	9.72	38.37	-8.80	-2.62	5.09	0.53	25.47	12.42		
3300.0	9.22	37.82	-8.75	-2.45	4.79	0.51	25.54	12.03		
3400.0	8.76	37.17	-8.66	-2.31	4.45	0.49	24.73	11.81		
3500.0	8.29	36.59	-8.54	-2.21	4.21	0.47	24.08	11.38		
3600.0	7.81	35.97	-8.52	-2.10	3.96	0.46	23.83	10.94		
3700.0	7.38	35.64	-8.37	-2.03	3.87	0.45	23.22	10.55		
3800.0	6.91	34.67	-8.21	-1.93	3.44	0.43	22.59	10.34		
3900.0	6.45	34.25	-8.32	-1.93	3.49	0.43	22.01	9.78		
4000.0	6.08	33.02	-8.26	-1.85	3.01	0.42	21.96	9.57		



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: $V_S = +3.8V$, $I_S = 50.72mA$, $R1=267 \Omega$ @ Temperature = +85°C

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	FREQ (MHz)	Noise Figure (dB)
					K	Measure				
500.0	21.12	41.84	-2.03	-6.96	1.98	1.23	26.63	16.06	500.0	1.51
525.0	21.89	40.90	-2.61	-7.77	2.00	1.22	26.95	16.51	600.0	1.20
550.0	22.53	40.20	-3.31	-8.61	2.03	1.19	27.02	16.88	700.0	0.72
575.0	23.03	39.10	-4.14	-9.49	1.98	1.15	26.98	17.30	800.0	0.65
600.0	23.41	38.87	-5.09	-10.39	2.07	1.12	27.10	17.39	900.0	0.59
625.0	23.66	38.41	-6.13	-11.28	2.10	1.08	27.32	18.03	1000.0	0.56
650.0	23.82	38.13	-7.29	-12.16	2.15	1.05	27.63	18.25	1100.0	0.64
675.0	23.91	37.90	-8.55	-12.92	2.20	1.02	27.69	18.53	1200.0	0.69
700.0	23.94	37.57	-9.88	-13.62	2.21	0.99	28.25	18.80	1300.0	0.61
725.0	23.90	37.64	-11.33	-14.28	2.30	0.98	28.29	18.82	1400.0	0.75
750.0	23.83	37.50	-12.92	-14.89	2.34	0.96	28.52	19.14	1500.0	0.84
775.0	23.75	37.29	-14.65	-15.40	2.35	0.95	28.89	19.20	1600.0	0.83
800.0	23.63	37.42	-16.57	-15.95	2.45	0.95	29.17	19.15	1700.0	0.84
825.0	23.51	37.47	-18.73	-16.50	2.52	0.95	29.45	19.52	1800.0	1.00
850.0	23.36	37.33	-20.91	-16.98	2.54	0.94	29.52	19.53	1900.0	0.95
875.0	23.21	37.42	-22.83	-17.47	2.61	0.95	29.52	19.33	2000.0	1.11
900.0	23.05	37.39	-23.85	-17.90	2.66	0.95	29.66	19.83	2100.0	1.09
925.0	22.88	37.17	-23.39	-18.24	2.64	0.95	29.68	19.52	2200.0	1.14
950.0	22.72	37.46	-22.26	-18.54	2.77	0.96	29.80	19.44	2300.0	1.22
975.0	22.55	37.56	-21.09	-18.77	2.85	0.96	29.68	19.66	2400.0	1.30
1000.0	22.38	37.45	-19.86	-18.86	2.86	0.96	29.08	19.40	2500.0	1.46
1050.0	22.03	37.83	-18.04	-18.89	3.08	0.98	29.66	19.45	2600.0	1.45
1100.0	21.69	37.63	-16.53	-18.58	3.10	0.98	29.73	19.44	2700.0	1.65
1150.0	21.35	37.81	-15.28	-18.14	3.24	0.99	29.60	19.48	2800.0	1.62
1200.0	21.03	37.71	-14.45	-17.58	3.29	1.00	29.79	19.52	2900.0	1.70
1250.0	20.69	38.00	-13.69	-16.89	3.48	1.01	29.58	19.58	3000.0	1.70
1300.0	20.38	38.13	-13.24	-15.98	3.62	1.01	29.34	19.27	3100.0	1.84
1350.0	20.07	38.11	-12.86	-15.06	3.70	1.01	29.21	19.06	3200.0	1.96
1400.0	19.76	38.20	-12.46	-14.18	3.81	1.01	29.00	18.88	3300.0	1.96
1500.0	19.15	38.44	-11.77	-12.59	4.06	1.01	29.06	19.12	3400.0	2.09
1550.0	18.84	38.54	-11.54	-11.88	4.19	1.00	29.02	18.36	3500.0	2.09
1600.0	18.55	38.62	-11.36	-11.21	4.30	1.00	28.92	18.47	3600.0	2.31
1700.0	17.96	38.78	-11.05	-9.90	4.50	0.98	28.81	17.71	3700.0	2.36
1800.0	17.35	38.96	-10.63	-8.80	4.71	0.95	28.77	17.79	3800.0	2.39
1900.0	16.73	39.20	-10.28	-7.86	4.95	0.93	28.87	17.58	3900.0	2.61
2000.0	16.12	38.96	-10.27	-7.34	5.03	0.91	28.53	16.98	4000.0	2.50
2100.0	15.62	39.73	-10.06	-6.51	5.50	0.87	28.58	16.93		
2200.0	15.06	39.37	-9.79	-5.79	5.27	0.83	28.46	16.92		
2300.0	14.49	40.17	-9.70	-5.23	5.86	0.79	27.92	15.89		
2400.0	13.91	40.13	-9.56	-4.73	5.87	0.75	27.60	15.43		
2500.0	13.32	40.22	-9.38	-4.34	5.99	0.72	27.34	15.26		
2600.0	12.76	40.48	-9.31	-3.98	6.24	0.69	26.97	14.57		
2700.0	12.20	39.89	-9.21	-3.66	5.87	0.65	26.66	14.31		
2800.0	11.62	39.69	-9.00	-3.38	5.76	0.63	26.29	13.86		
2900.0	11.08	39.65	-8.92	-3.15	5.80	0.60	26.11	13.42		
3000.0	10.55	39.00	-8.86	-2.95	5.45	0.58	25.22	12.95		
3100.0	10.02	38.63	-8.68	-2.75	5.22	0.55	25.21	12.49		
3200.0	9.49	38.56	-8.64	-2.58	5.25	0.53	24.17	11.89		
3300.0	9.00	37.80	-8.59	-2.42	4.82	0.50	24.20	11.46		
3400.0	8.53	37.41	-8.49	-2.28	4.62	0.48	23.52	11.25		
3500.0	8.06	36.70	-8.37	-2.17	4.28	0.47	22.90	10.82		
3600.0	7.58	36.20	-8.35	-2.06	4.09	0.45	22.57	10.34		
3700.0	7.15	35.88	-8.20	-2.00	4.01	0.44	22.01	9.99		
3800.0	6.68	34.74	-8.06	-1.91	3.52	0.43	21.46	9.81		
3900.0	6.22	34.36	-8.16	-1.90	3.57	0.43	20.90	9.20		
4000.0	5.85	33.16	-8.09	-1.83	3.09	0.42	20.94	8.98		

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

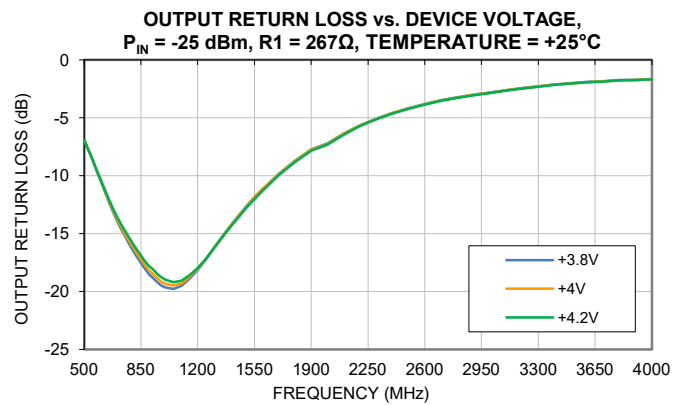
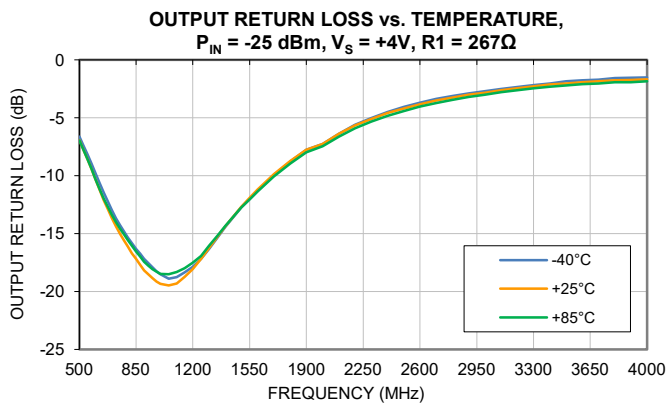
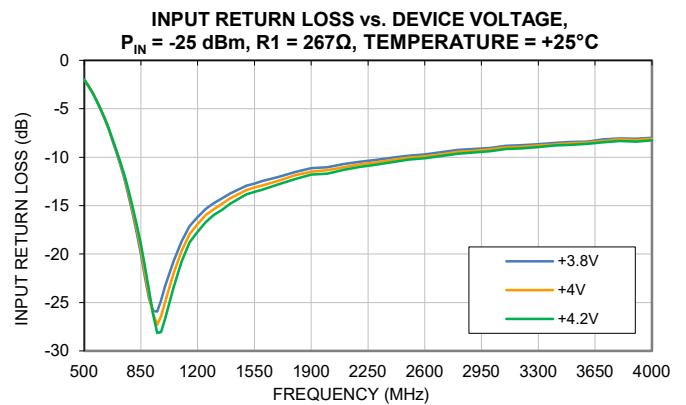
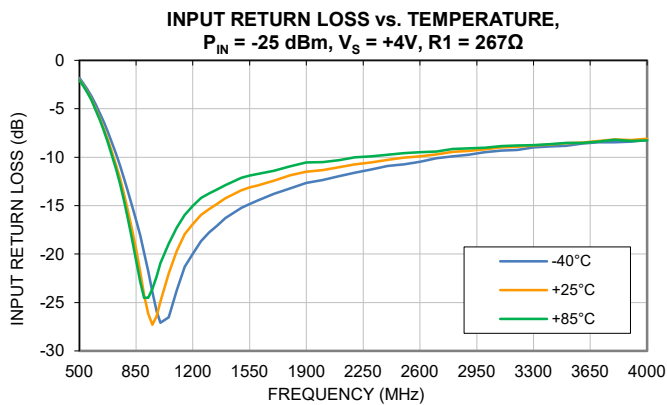
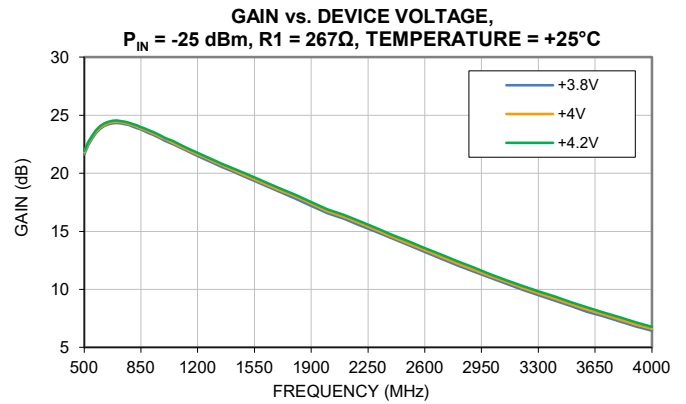
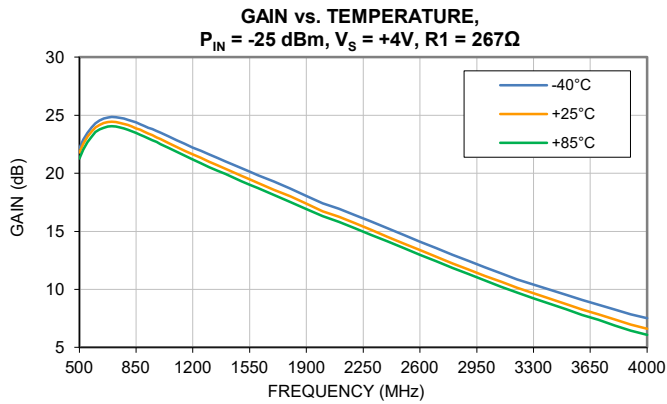
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

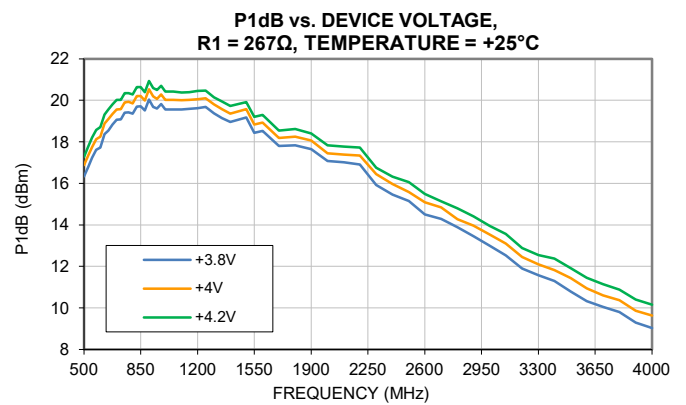
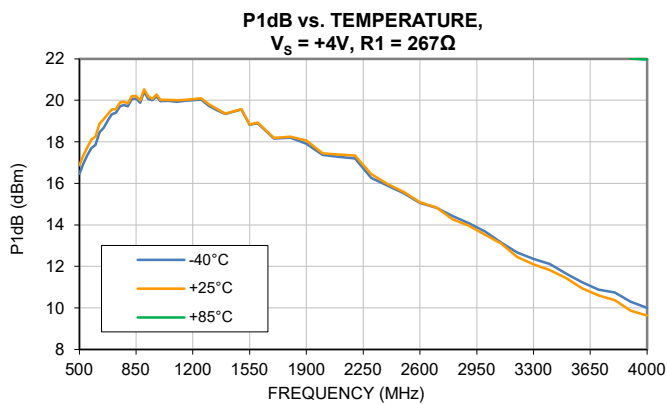
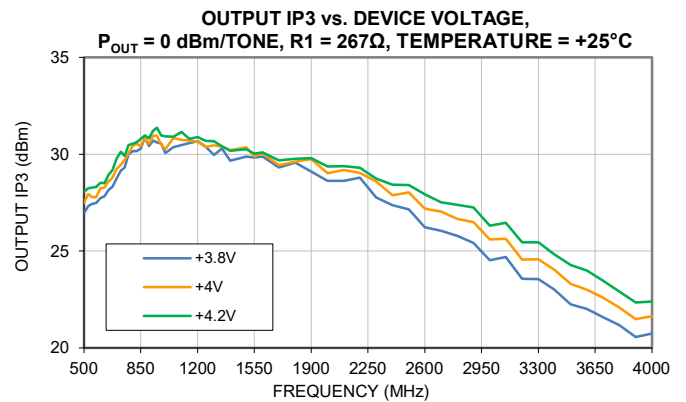
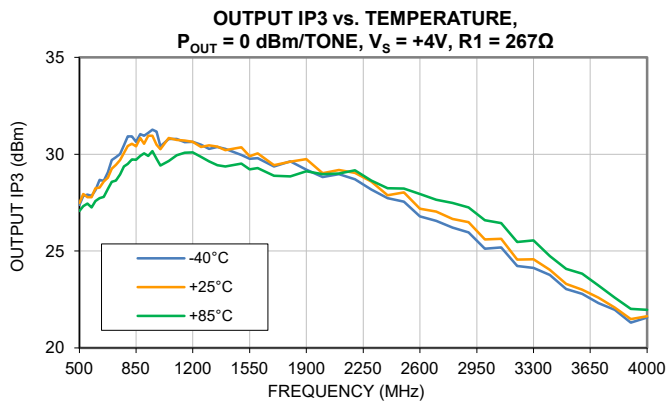
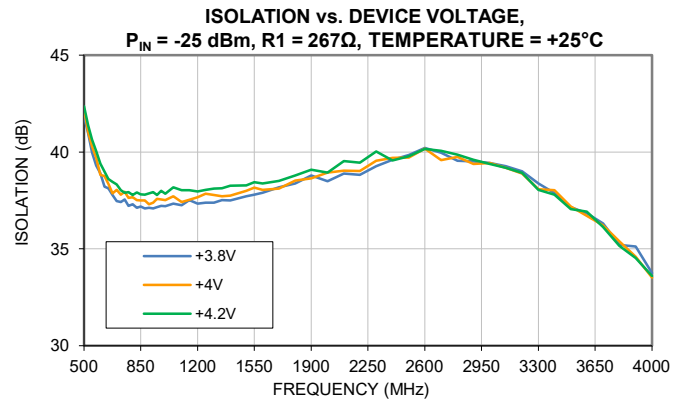
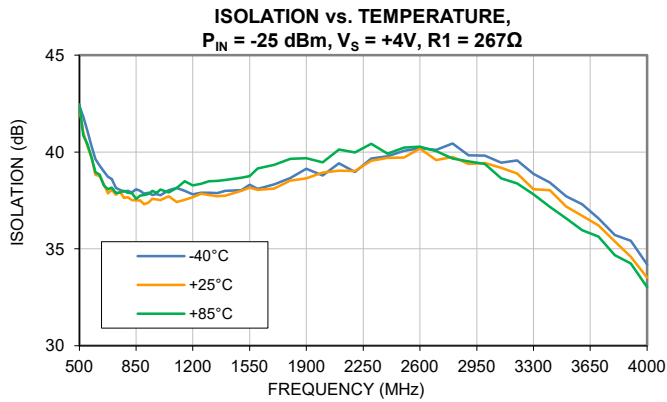
TEST CONDITIONS: $V_s = +4.2V$, $I_s = 57.08mA$, $R1=267 \Omega$ @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	FREQ	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(MHz)	(dB)
500.0	21.42	42.37	-2.07	-6.94	2.03	1.23	27.46	16.88	500.0	1.47
525.0	22.18	41.77	-2.65	-7.72	2.11	1.22	27.75	17.37	600.0	1.18
550.0	22.80	40.60	-3.34	-8.54	2.06	1.19	27.82	17.75	700.0	0.70
575.0	23.28	39.81	-4.16	-9.39	2.07	1.15	27.71	18.14	800.0	0.64
600.0	23.64	39.43	-5.09	-10.22	2.13	1.12	27.94	18.27	900.0	0.57
625.0	23.88	39.15	-6.10	-11.07	2.19	1.09	28.20	18.88	1000.0	0.56
650.0	24.04	38.88	-7.22	-11.86	2.25	1.05	28.38	19.06	1100.0	0.61
675.0	24.12	38.50	-8.45	-12.58	2.27	1.02	28.62	19.38	1200.0	0.69
700.0	24.14	38.50	-9.74	-13.20	2.36	1.00	28.97	19.62	1300.0	0.61
725.0	24.11	38.46	-11.11	-13.82	2.43	0.98	29.00	19.64	1400.0	0.74
750.0	24.04	38.27	-12.61	-14.34	2.46	0.97	29.22	19.99	1500.0	0.83
775.0	23.96	38.27	-14.27	-14.83	2.53	0.96	29.67	20.01	1600.0	0.85
800.0	23.85	38.15	-16.09	-15.31	2.57	0.95	29.80	19.96	1700.0	0.82
825.0	23.73	38.19	-18.15	-15.79	2.64	0.95	29.96	20.32	1800.0	0.99
850.0	23.58	38.36	-20.45	-16.23	2.75	0.95	30.27	20.32	1900.0	0.95
875.0	23.43	38.06	-22.82	-16.70	2.73	0.95	30.24	20.10	2000.0	1.09
900.0	23.28	38.19	-24.86	-17.12	2.82	0.95	30.41	20.61	2100.0	1.06
925.0	23.11	38.21	-25.57	-17.47	2.88	0.95	30.39	20.29	2200.0	1.11
950.0	22.96	38.17	-24.86	-17.74	2.92	0.95	30.43	20.22	2300.0	1.20
975.0	22.79	38.13	-23.53	-17.99	2.96	0.96	30.20	20.45	2400.0	1.27
1000.0	22.62	38.22	-22.01	-18.11	3.03	0.96	29.97	20.15	2500.0	1.44
1050.0	22.29	38.43	-19.81	-18.25	3.20	0.97	30.30	20.21	2600.0	1.43
1100.0	21.95	38.42	-18.00	-18.12	3.30	0.98	30.41	20.17	2700.0	1.59
1150.0	21.62	38.69	-16.52	-17.83	3.49	0.99	30.70	20.23	2800.0	1.58
1200.0	21.30	38.72	-15.58	-17.39	3.60	0.99	30.64	20.26	2900.0	1.70
1250.0	20.97	38.77	-14.71	-16.87	3.72	1.00	30.65	20.30	3000.0	1.66
1300.0	20.66	38.73	-14.18	-16.01	3.79	1.00	30.20	19.99	3100.0	1.81
1350.0	20.35	38.89	-13.74	-15.16	3.96	1.00	29.76	19.78	3200.0	1.99
1400.0	20.05	38.95	-13.31	-14.33	4.07	1.00	29.70	19.60	3300.0	1.99
1500.0	19.45	39.22	-12.51	-12.77	4.36	1.00	29.93	19.82	3400.0	2.09
1550.0	19.14	39.30	-12.26	-12.07	4.48	0.99	29.30	19.08	3500.0	2.04
1600.0	18.85	39.31	-12.05	-11.40	4.57	0.99	29.36	19.20	3600.0	2.24
1700.0	18.27	39.50	-11.70	-10.09	4.81	0.97	29.18	18.44	3700.0	2.33
1800.0	17.67	39.82	-11.21	-8.98	5.11	0.95	29.37	18.53	3800.0	2.42
1900.0	17.06	40.28	-10.81	-8.02	5.52	0.92	29.67	18.36	3900.0	2.49
2000.0	16.45	39.79	-10.79	-7.52	5.46	0.90	29.39	17.74	4000.0	2.34
2100.0	15.96	40.48	-10.56	-6.66	5.91	0.87	29.61	17.70		
2200.0	15.40	40.09	-10.25	-5.92	5.66	0.83	29.40	17.65		
2300.0	14.83	40.18	-10.15	-5.35	5.79	0.79	29.02	16.76		
2400.0	14.26	40.38	-9.99	-4.85	5.97	0.76	28.76	16.35		
2500.0	13.68	40.72	-9.78	-4.44	6.27	0.72	28.93	16.08		
2600.0	13.12	40.64	-9.70	-4.07	6.28	0.69	28.85	15.53		
2700.0	12.56	40.41	-9.59	-3.75	6.16	0.66	28.59	15.32		
2800.0	11.98	39.72	-9.36	-3.45	5.71	0.63	28.26	14.84		
2900.0	11.44	39.57	-9.27	-3.22	5.68	0.60	28.26	14.42		
3000.0	10.91	39.11	-9.20	-3.02	5.45	0.58	27.59	13.94		
3100.0	10.39	38.62	-9.02	-2.81	5.15	0.55	27.46	13.52		
3200.0	9.86	38.35	-8.96	-2.64	5.05	0.53	26.63	12.90		
3300.0	9.37	37.61	-8.92	-2.47	4.64	0.51	26.72	12.56		
3400.0	8.91	37.09	-8.81	-2.33	4.38	0.49	25.83	12.40		
3500.0	8.44	36.63	-8.69	-2.22	4.19	0.47	25.27	11.91		
3600.0	7.96	36.20	-8.68	-2.11	4.05	0.46	24.97	11.43		
3700.0	7.53	35.27	-8.52	-2.04	3.68	0.45	24.28	11.14		
3800.0	7.06	34.56	-8.36	-1.93	3.38	0.43	23.61	10.84		
3900.0	6.60	34.13	-8.48	-1.93	3.40	0.43	23.05	10.36		
4000.0	6.23	33.09	-8.43	-1.85	3.02	0.42	22.86	10.11		

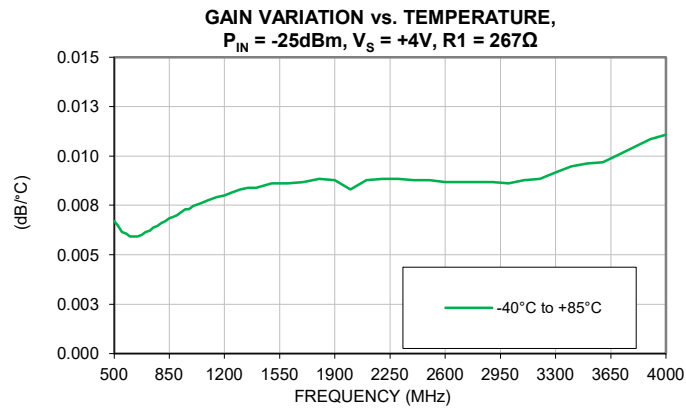
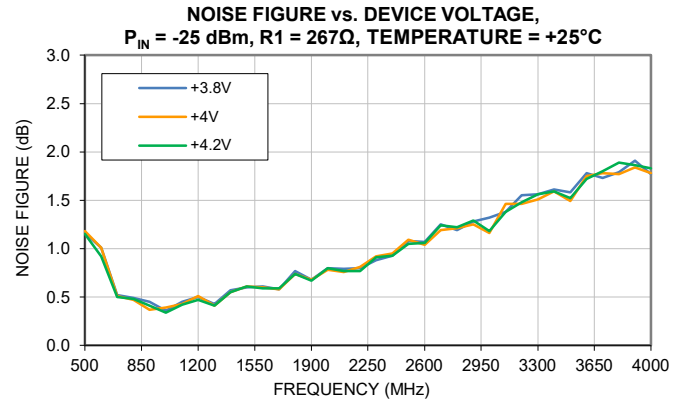
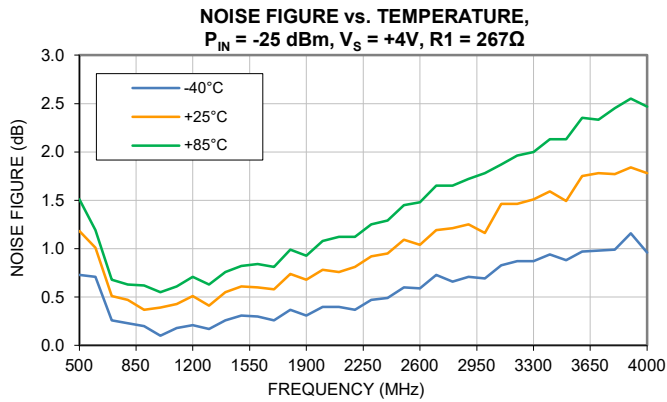
Typical Performance Curves



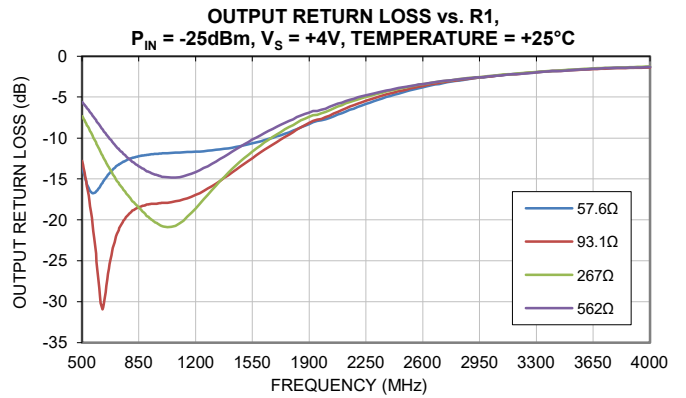
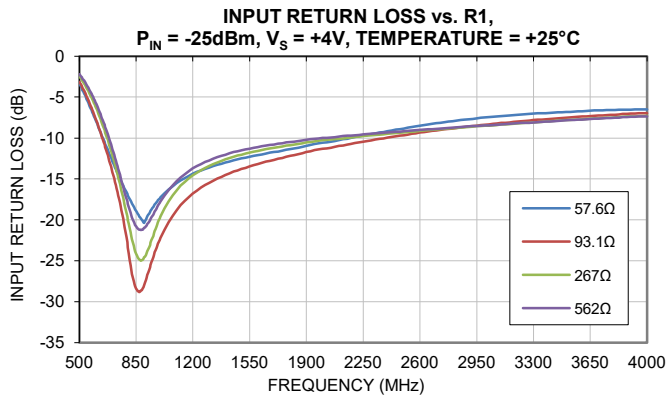
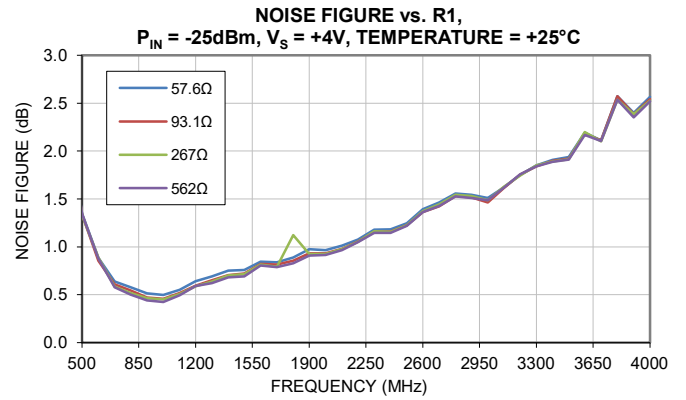
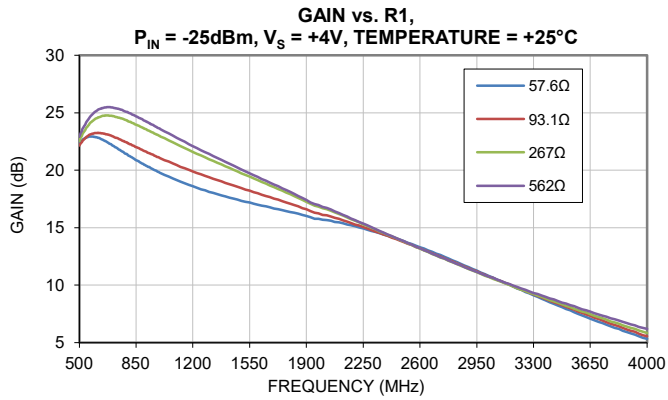
Typical Performance Curves



Typical Performance Curves

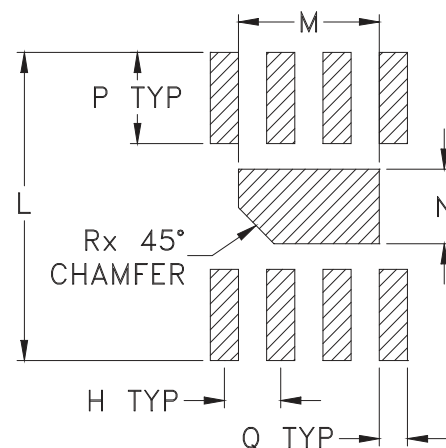
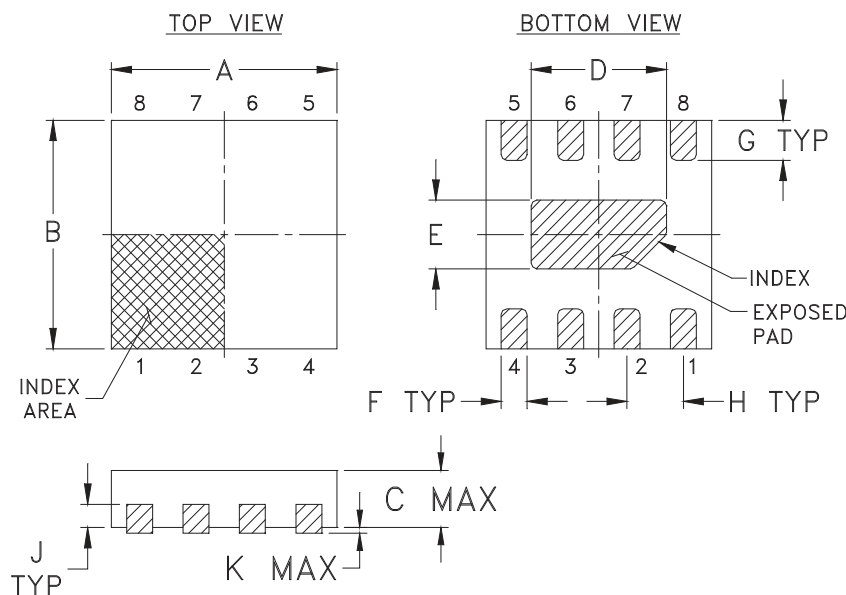


Typical Performance Curves



Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

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)

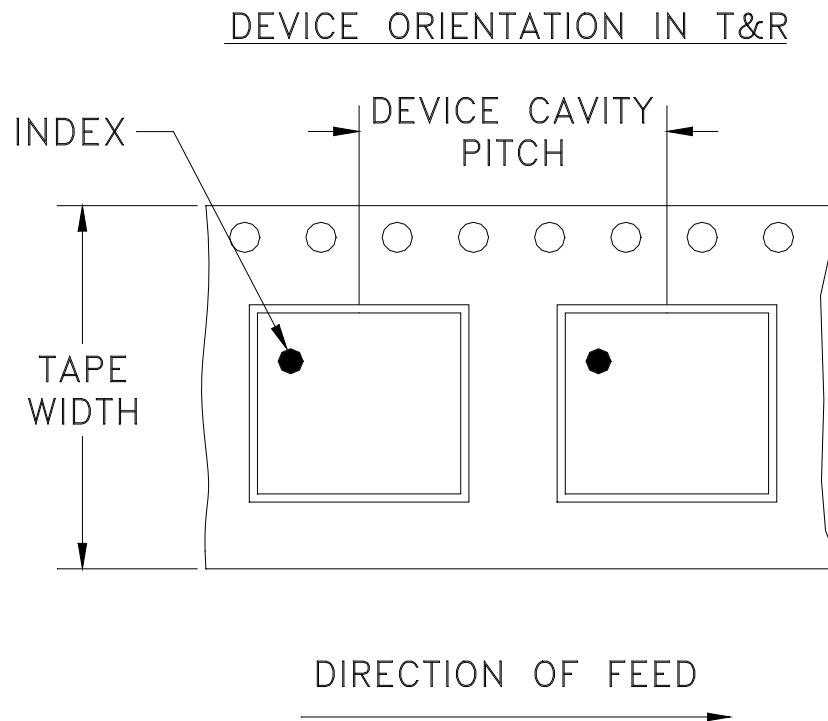
CASE #.	Q	R	WT, GRAM
MC1631-1	.010 (.25)	.012 (.30)	.006

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

Notes:

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

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

Mini-Circuits®

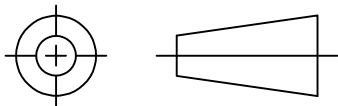
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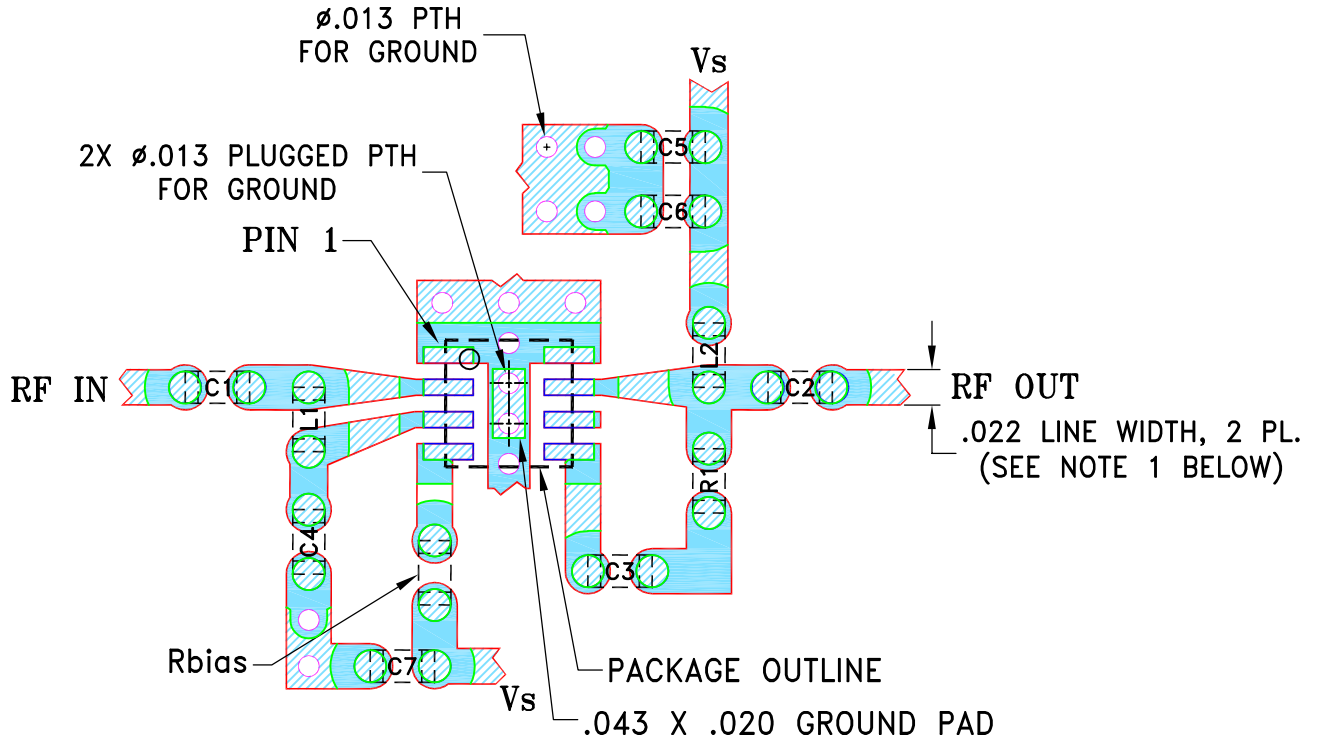
THIRD ANGLE PROJECTION



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 R04350B WITH DIELECTRIC THICKNESS $.010 \pm .001$ "; 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-PMA2162LNAC+.
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	ITG	08/25/22
TOLERANCES ON:	GF	08/25/22
2 PL DECIMALS \pm	IL	08/26/22
3 PL DECIMALS \pm .005		
ANGLES \pm		
FRACTIONS \pm		

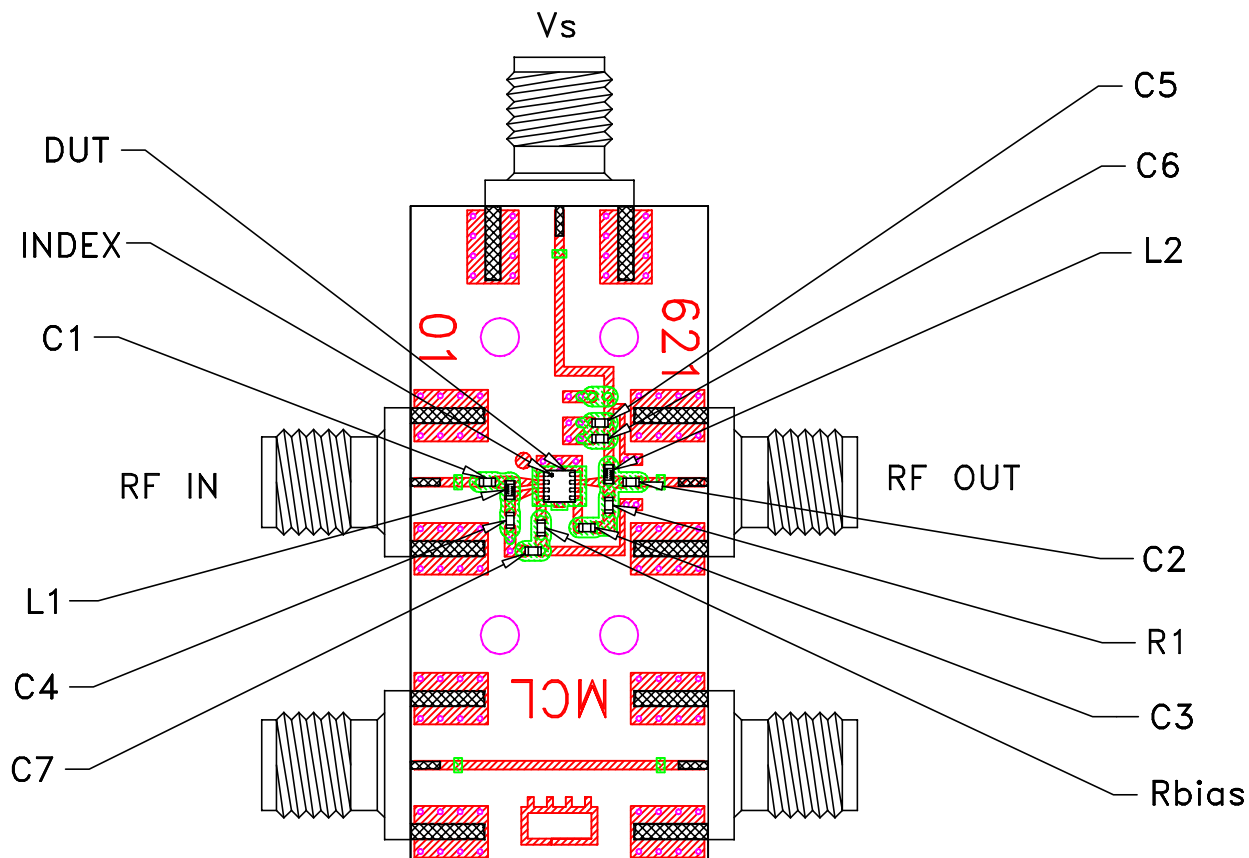
Mini-Circuits[®] 13 Neptune Avenue
Brooklyn NY 11235

PL,MC1631-1,TB-PMA2162LNAC+

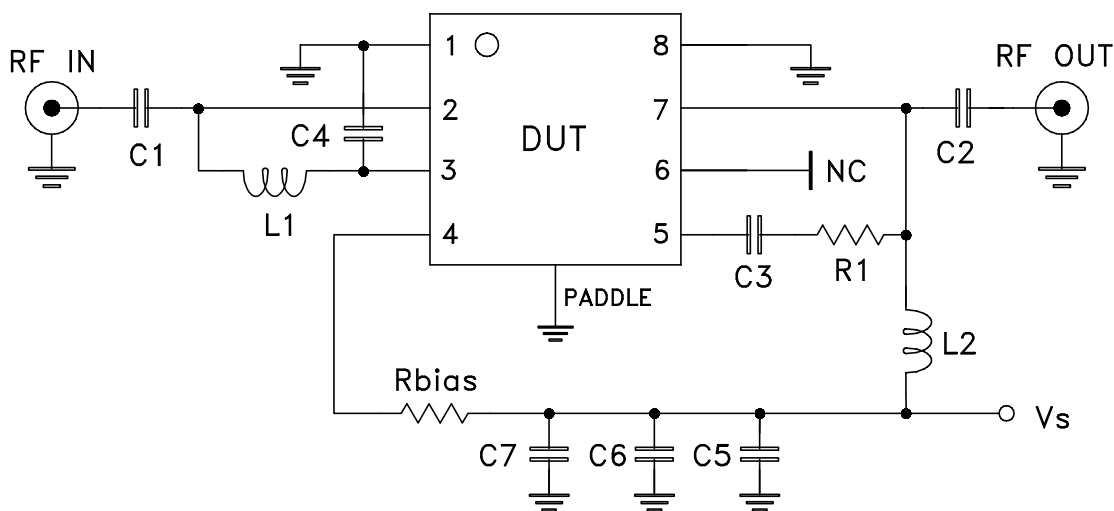
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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-737	A
FILE:	98PL737	SCALE: 8:1	SHEET: 1 OF 1

Evaluation Board and Circuit



TB-PMA2162LNAC+




Schematic Diagram

ITEM	DESCRIPTION
C1, C6	CAP, 9.1pF
C2, C4	CAP, 100pF
C3	CAP, 5.6pF
C5, C7	CAP, 0.1uF
R1	RES, 267 Ohm
Rbias	RES, 750 Ohm
L1	IND, 6.8nH
L2	IND, 15nH
DUT	PMA2-162LNA+

NOTES:

1. SMA Female connectors.
2. PCB material: Rogers R04350 or equivalent, dielectric constant=3.5, dielectric thickness=.010 inch.

 **Mini-Circuits®**

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

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
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