



MMIC SURFACE MOUNT

Low Noise Amplifier **PMA2-123LNW+**

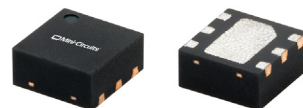
50Ω 0.01 to 12 GHz High Linearity

THE BIG DEAL

- Low Noise Figure, Typ. 1.7 dB
- High OIP3, Typ. +30 dBm
- High P1dB, Typ. +19.1 dBm
- Single +5 V Supply Voltage
- 2x2 mm, 6-Lead QFN-Style Package

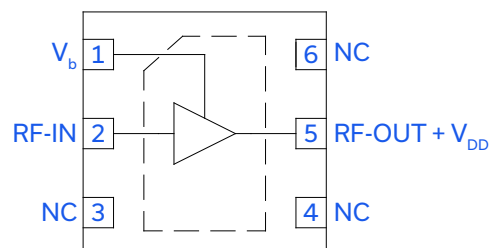
APPLICATIONS

- Test & Measurement Equipment
- WiFi, WAN, UMTS, LTE
- Back Haul Radio Systems
- Radar, EW, and ECM Defense Systems



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

The PMA2-123LNW+ is a GaAs pHEMT-based wideband, ultra-low noise MMIC amplifier with high OIP3 and flat gain. Operating from 0.01 to 12 GHz, this amplifier features typical 1.7 dB noise figure, 19.6 dB gain, +19.1 dBm P1dB, and +30 dBm OIP3. This combination of characteristics makes it ideal for sensitive, high dynamic range receiver applications. PMA2-123LNW+ operates on a single +5 V supply, is well matched to 50Ω, and comes in a small, low profile 2x2 mm QFN-style package for easy integration into dense circuit board layouts.

KEY FEATURES

Feature	Advantages
Low Noise Figure, Typ. 1.7 dB	This ultra-low noise MMIC device enables low system noise figure performance without the need for complicated discrete-based solutions.
High OIP3 • +34 dBm at 3 GHz • +29 dBm at 9 GHz	High operating OIP3 provides very low in-band distortion products, enabling minimal signal degradation in high fidelity measurement systems and demanding communication systems.
High Input Power Handling	The combination of low noise, high input power handling and OIP3 makes this MMIC amplifier ideal for use in a low-noise receiver front end (RFE), as it provides the user with the advantages of improved sensitivity and two-tone intermodulation (IM) performance at both the lower and upper end of the input dynamic range.
2x2mm 6-Lead QFN-Style Package	Small footprints save space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB. Industry-standard packaging allows for ease of assembly in high-volume manufacturing processes.



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ELECTRICAL SPECIFICATIONS¹ AT +25°C, $V_{DD} = +5\text{ V}$, $V_b = +5\text{ V}$ UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.01		12	GHz
Gain	0.01	19.3	20.5		dB
	3	18.5	19.7		
	6	18.4	19.6		
	9	17.4	19.0		
	12	15.4	17.6		
Input Return Loss	0.01		10		dB
	3		19		
	6		11		
	9		8		
	12		9		
Output Return Loss	0.01		14		dB
	3		22		
	6		18		
	9		13		
	12		8		
Isolation	0.01-12		26		dB
Output Power at 1 dB Compression (P1dB)	0.01		+17.7		dBm
	3		+20.8		
	6		+19.1		
	9		+17.2		
	12		+15.5		
Output Third-Order Intercept ($P_{OUT} = +5\text{ dBm/Tone}$)	0.01		+36		dBm
	3		+34		
	6		+30		
	9		+29		
	12		+28		
Noise Figure	0.01		8.1		dB
	3		1.4		
	6		1.7		
	9		2.5		
	12		2.4		
Device Operating Voltage (V_{DD})		+4	+5	+6	V
Device Operating Current (I_{DD}) ²			88		mA
Bias Voltage (V_b) ³		+2	+5	+6	V
Bias Current (I_b) at $V_b = +5\text{ V}$			4		mA
DC Current Variation vs. Temperature ⁴			-87.5		μA/°C
DC Current Variation vs. Voltage ⁵			0.023		mA/mV

1. Tested on Mini-Circuits Characterization Test Board TB-PMA2123LNWC+. See Figure 2. Board loss de-embedded to the device.

2. Current at $P_{IN} = -25\text{ dBm}$. Increases to 99 mA at P1dB.3. $V_b \leq V_{DD}$ under nominal operating conditions.

4. (Current at +105°C - Current at -55°C) / (+160°C)

5. (Current at $V_{DD} = V_b = +6\text{ V}$ - Current at $V_{DD} = V_b = +4\text{ V}$) / (+6 V - +4 V)



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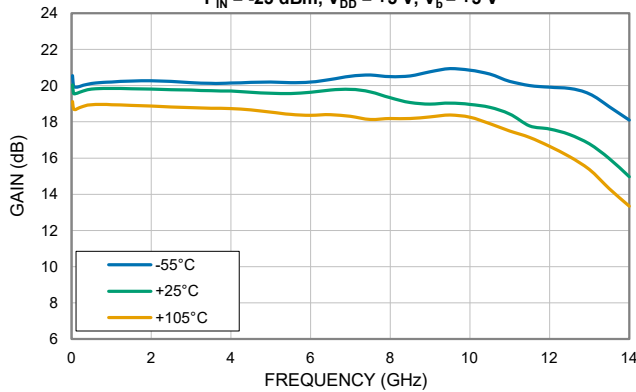
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TYPICAL PERFORMANCE GRAPHS

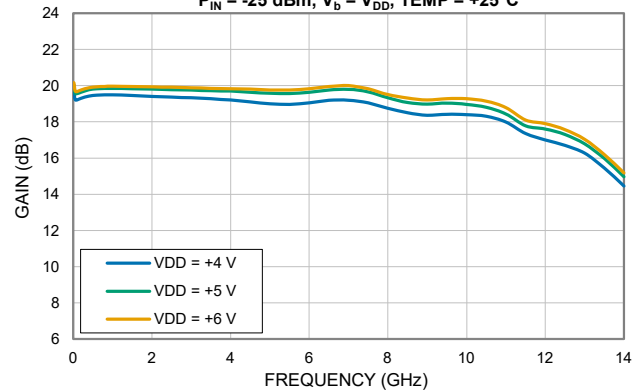
GAIN vs. TEMPERATURE

$P_{IN} = -25$ dBm, $V_{DD} = +5$ V, $V_b = +5$ V



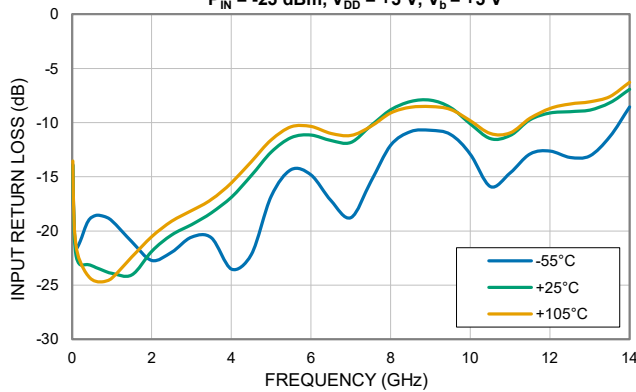
GAIN vs. DEVICE VOLTAGE

$P_{IN} = -25$ dBm, $V_b = V_{DD}$, TEMP = +25°C



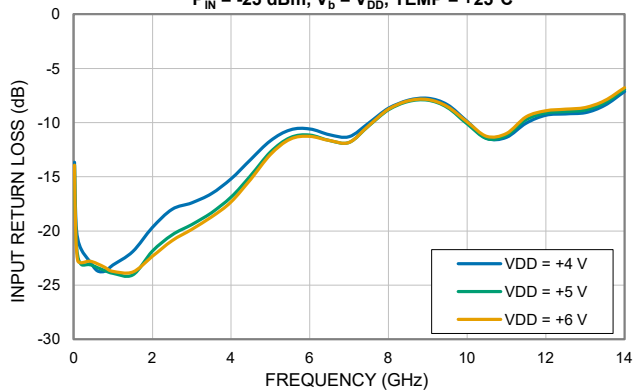
INPUT RETURN LOSS vs. TEMPERATURE

$P_{IN} = -25$ dBm, $V_{DD} = +5$ V, $V_b = +5$ V



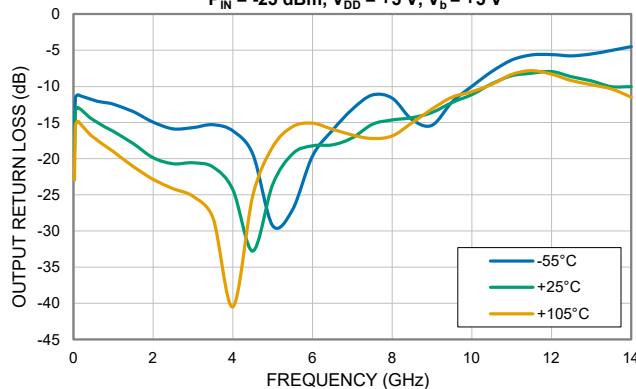
INPUT RETURN LOSS vs. DEVICE VOLTAGE

$P_{IN} = -25$ dBm, $V_b = V_{DD}$, TEMP = +25°C



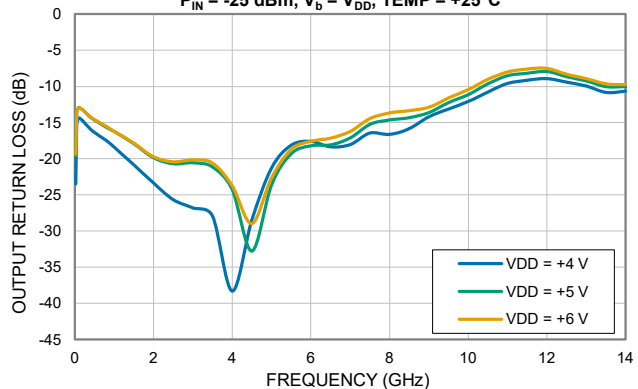
OUTPUT RETURN LOSS vs. TEMPERATURE

$P_{IN} = -25$ dBm, $V_{DD} = +5$ V, $V_b = +5$ V



OUTPUT RETURN LOSS vs. DEVICE VOLTAGE

$P_{IN} = -25$ dBm, $V_b = V_{DD}$, TEMP = +25°C





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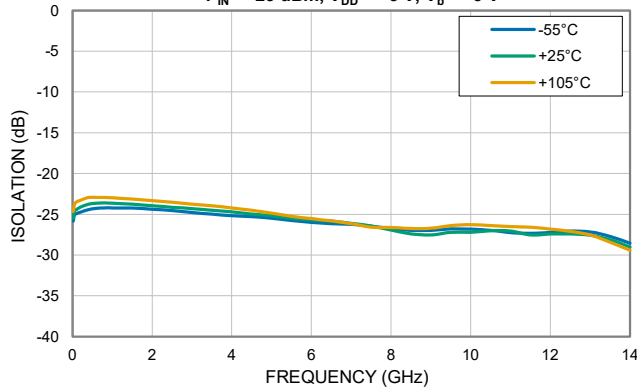
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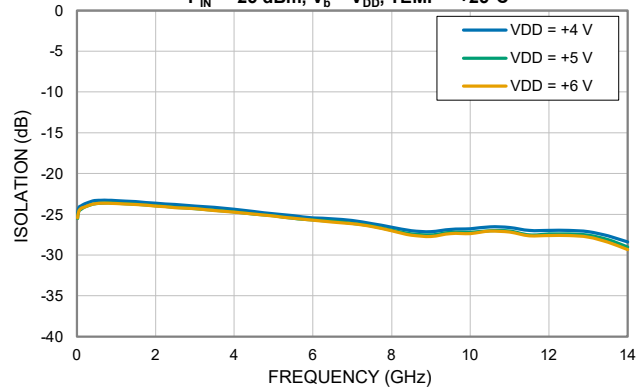
ISOLATION vs. TEMPERATURE

$P_{IN} = -25 \text{ dBm}$, $V_{DD} = +5 \text{ V}$, $V_b = +5 \text{ V}$



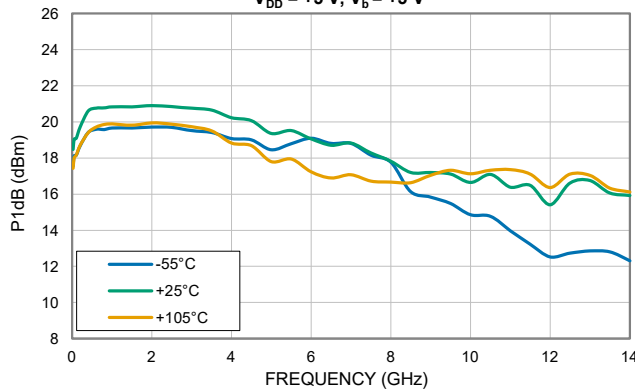
ISOLATION vs. DEVICE VOLTAGE

$P_{IN} = -25 \text{ dBm}$, $V_b = V_{DD}$, $TEMP = +25^\circ\text{C}$



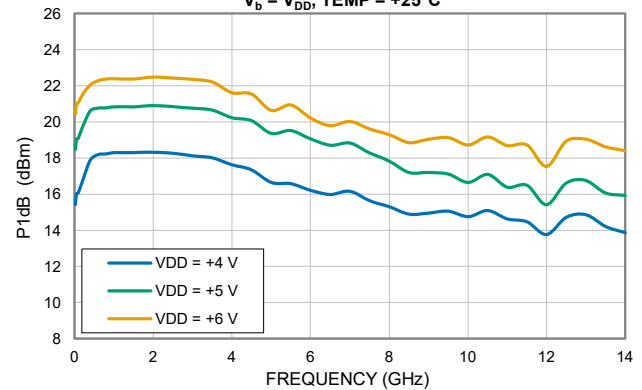
P1dB vs. TEMPERATURE

$V_{DD} = +5 \text{ V}$, $V_b = +5 \text{ V}$



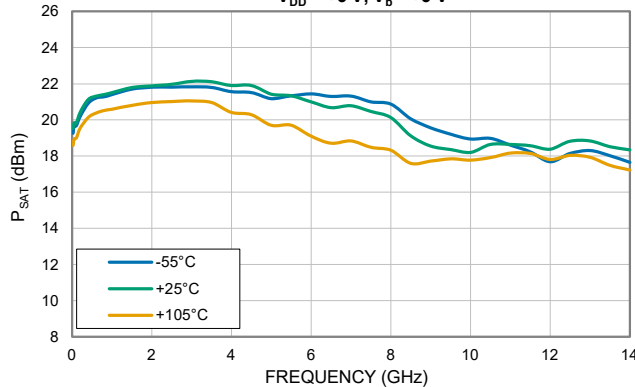
P1dB vs. DEVICE VOLTAGE

$V_b = V_{DD}$, $TEMP = +25^\circ\text{C}$



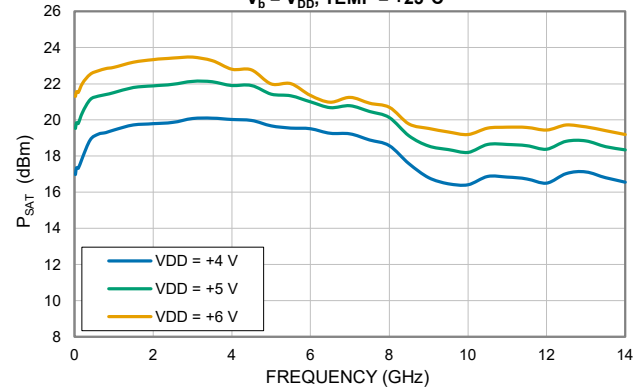
P_{SAT} vs. TEMPERATURE

$V_{DD} = +5 \text{ V}$, $V_b = +5 \text{ V}$



P_{SAT} vs. DEVICE VOLTAGE

$V_b = V_{DD}$, $TEMP = +25^\circ\text{C}$



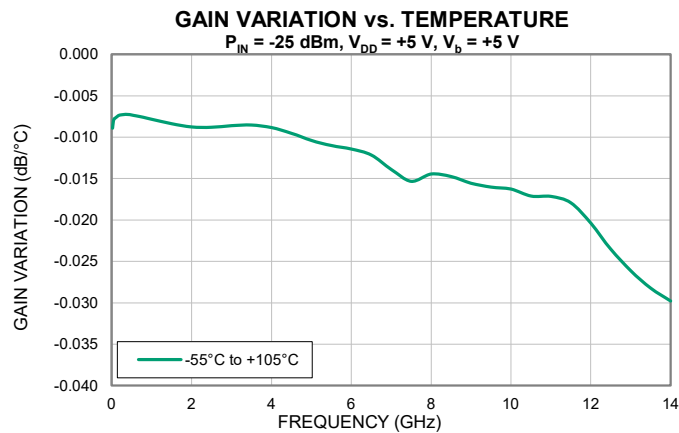
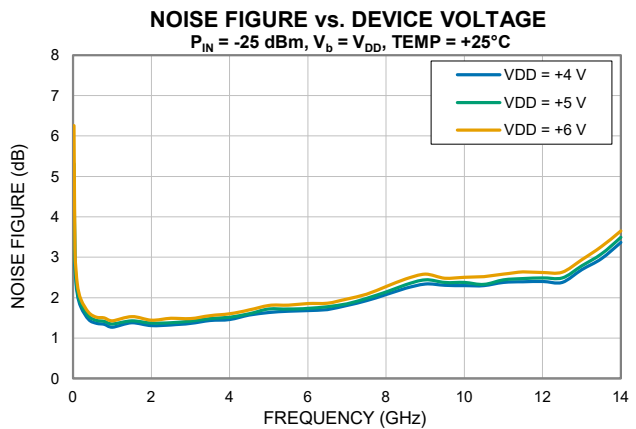
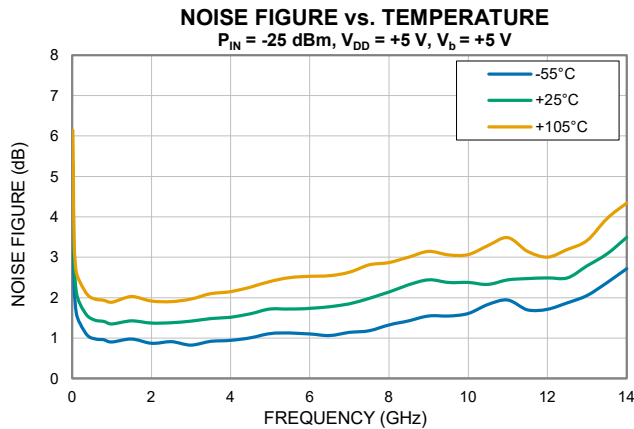
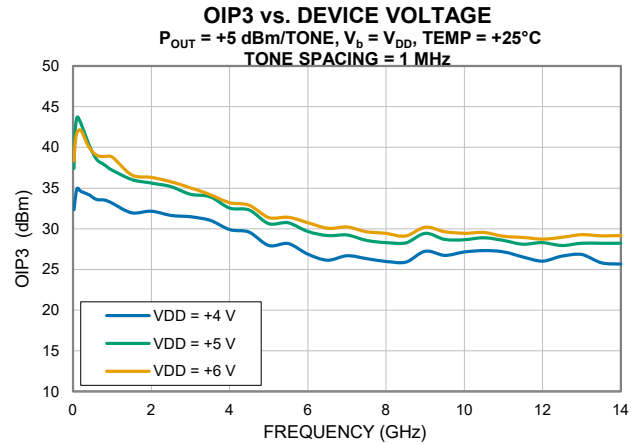
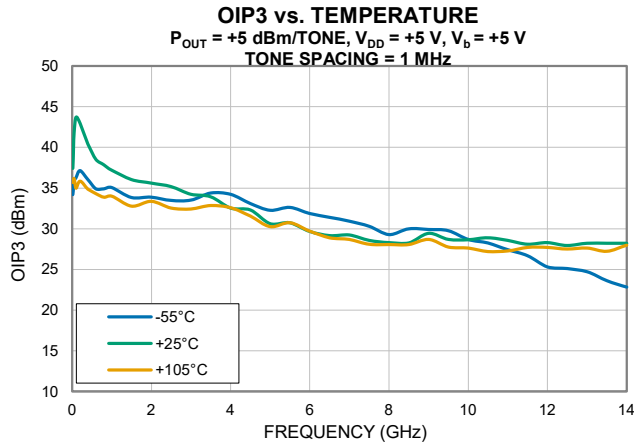


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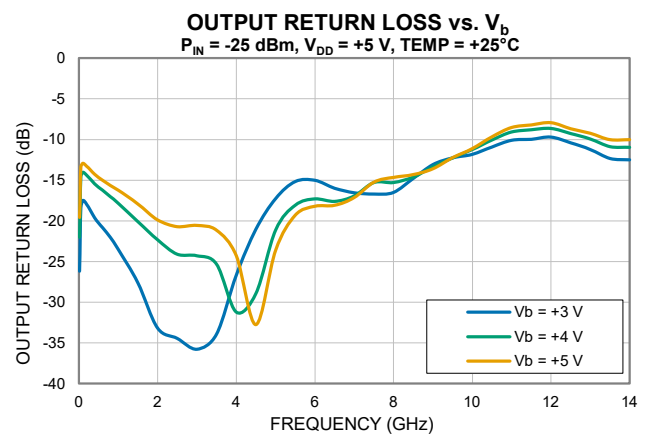
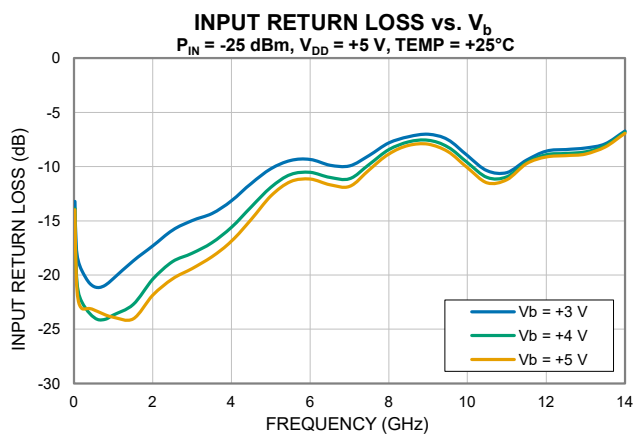
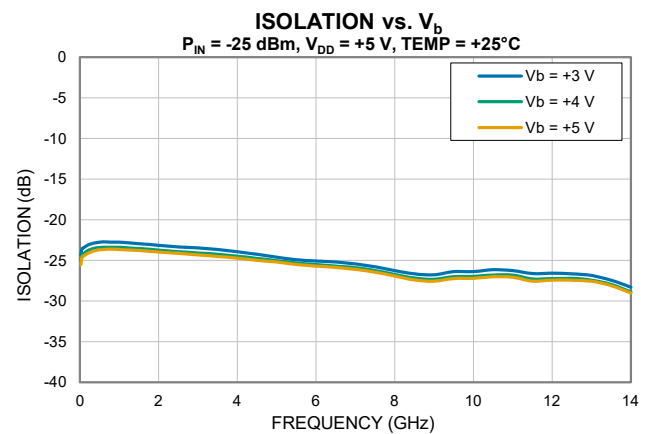
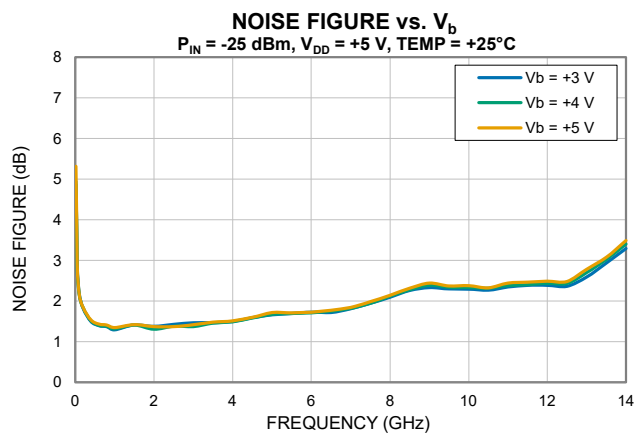
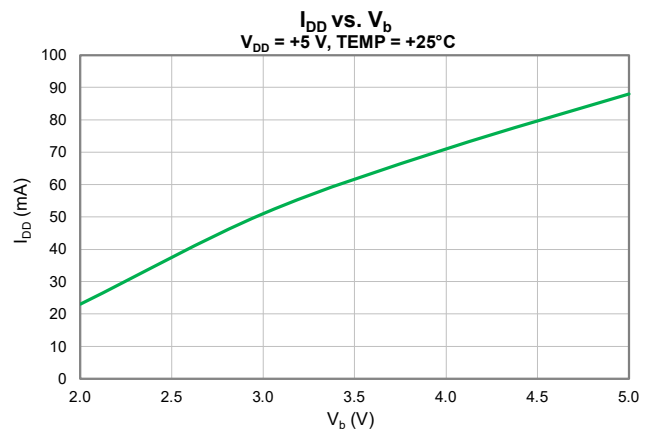
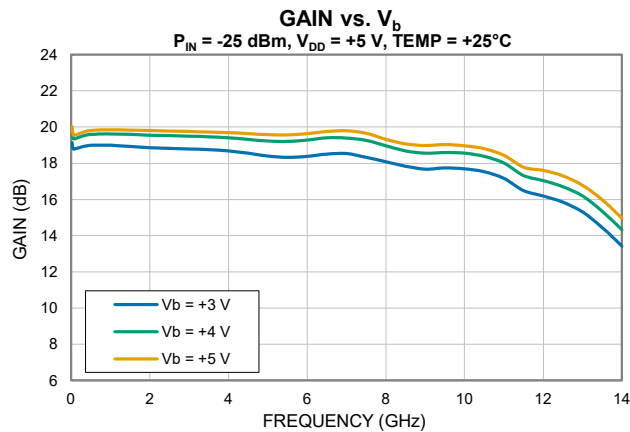


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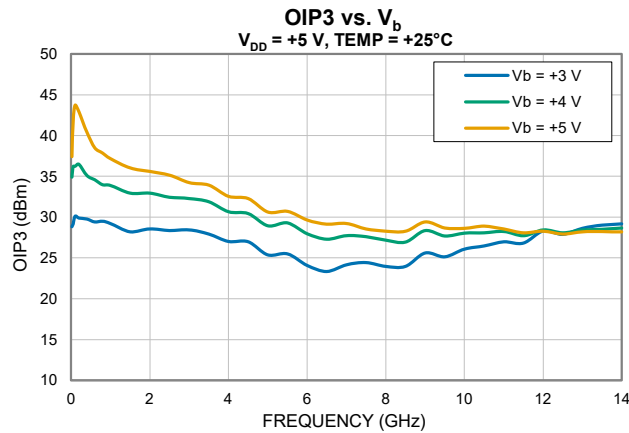
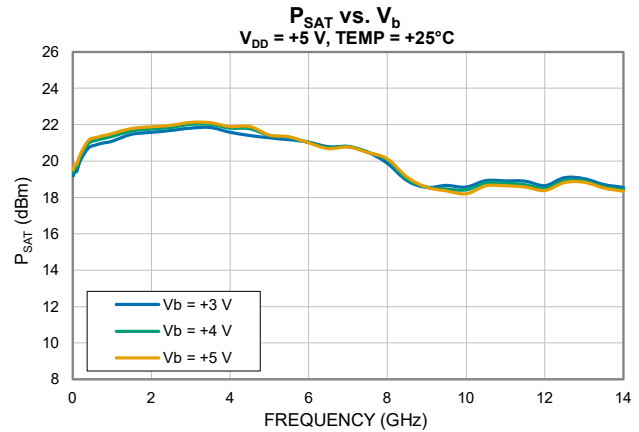
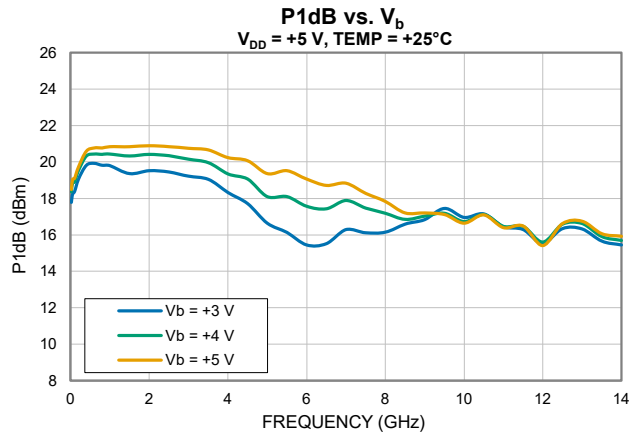
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ABSOLUTE MAXIMUM RATINGS⁶

Parameter	Ratings
Operating Temperature	-55°C to +105°C
Storage Temperature	-65°C to +150°C
Junction Temperature ⁷	+175°C
Total Power Dissipation	1.14 W
Input Power (CW), $V_{DD} = +5\text{ V}$, $V_b = +5\text{ V}$	+28 dBm
DC Voltage at V_{DD}	+8 V
Current I_{DD}	150 mA
DC Voltage at V_b	+8 V
Current I_b	6 mA

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	97.7°C/W

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

ESD RATING

	Class	Voltage Range	Reference Standard
HBM	1B	500 V to <1000 V	ANSI/ESDA/JEDEC JS-001-2023
CDM	C3	≥1000 V	ANSI/ESDA/JEDEC JS-001-2022



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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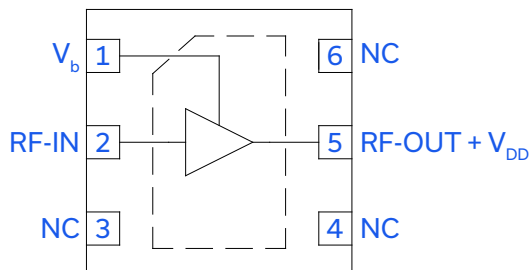


Figure 1. PMA2-123LNW+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description (Refer to Figure 2)
RF-IN	2	RF-IN Pad connects to RF-Input port.
RF-OUT + V _{DD}	5	RF-OUT Pad connects to RF-Output port.
V _b	1	DC Input Pad connects to bias voltage input port V _b .
GND	Paddle	Connects to ground.
NC	3-4, 6	Not used internally. Connected to ground on test board.

CHARACTERIZATION TEST BOARD

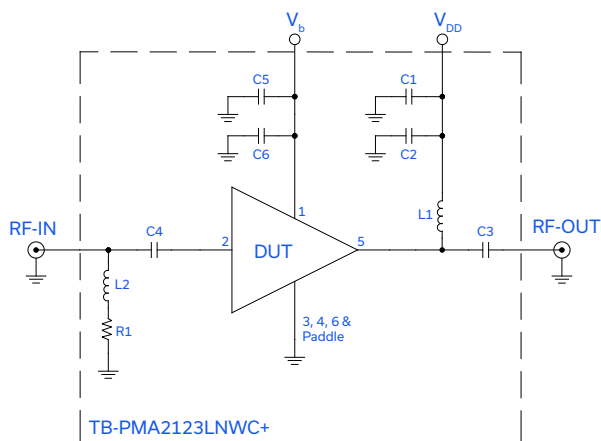


Figure 2. PMA2-123LNW+ Characterization and Application Circuit.

Electrical Parameters and Conditions

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

Conditions:

- Gain and Return Loss: P_{IN} = -25 dBm
- Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +5 dBm/Tone at output.
- V_{DD} = +5 V, V_b = +5 V

Component	Vendor	Vendor P/N	Value	Size
C1, C5	Murata	GRM155R71H104KE14J	0.1 μF	0402
C2, C6	Murata	GRM1555C1H101JA01D	100 pF	0402
C3	Murata	GRM155R71E103KA01D	0.01 μF	0402
C4	Murata	GRM155C81E105KE11D	1 μF	0402
L1, L2	Coilcraft	0402DF-901XJRU	900 nH	0402
R1	KOA Speer	RK73B1ETTP820J	82 Ω	0402

Power ON/Power OFF Sequence:

Parts are not sensitive to power ON/OFF sequence. V_{DD} and V_b can be applied in any order, but it is recommended to turn on V_b first.



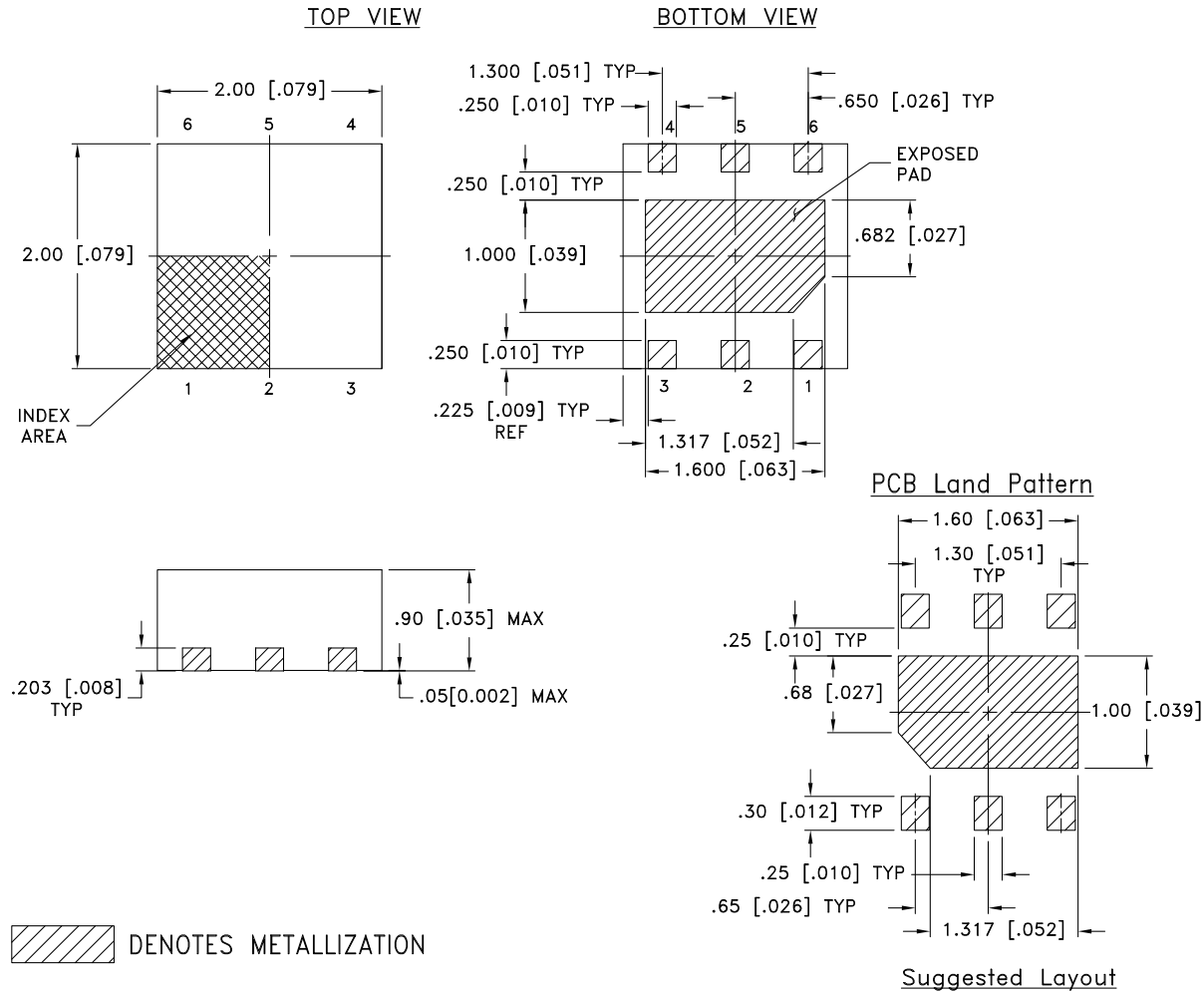
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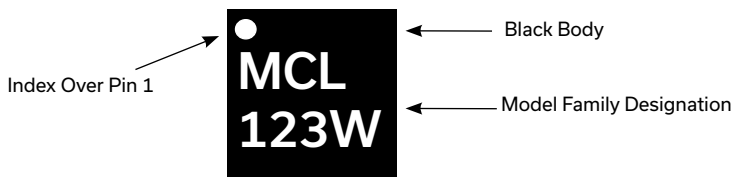
CASE STYLE DRAWING



Weight: 0.0108 grams

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

PRODUCT MARKING



Marking may contain other features or characters for internal lot control.

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MC1630-2. 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, 1000, 2000, or 3000 devices
Suggested Layout for PCB Design	PL-828
Evaluation Board	TB-PMA2123LNWC+
	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: $V_{DD} = +2\text{ V}$, $V_b = +2\text{ V}$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	10.05	20.91	6.92	5.23	1.36	0.64	5.44	6.79	4.69	9.97
0.05	10.63	19.36	5.96	7.13	1.22	0.72	6.04	7.22	3.15	8.33
0.1	10.78	18.93	5.68	7.55	1.18	0.73	5.90	7.10	2.65	7.11
0.2	10.87	18.71	5.69	7.60	1.17	0.72	6.58	7.43	2.49	10.23
0.4	10.87	18.55	5.77	7.50	1.16	0.70	7.68	8.04	2.40	9.95
0.6	10.81	18.57	5.79	7.43	1.17	0.70	8.33	8.44	2.30	13.59
0.8	10.71	18.63	5.76	7.32	1.18	0.70	8.49	8.57	2.37	12.61
1.0	10.59	18.72	5.73	7.22	1.19	0.71	8.68	8.66	2.26	12.88
1.5	10.24	19.00	5.62	7.02	1.23	0.73	9.07	8.95	2.49	12.67
2.0	9.91	19.26	5.59	6.95	1.28	0.76	8.83	8.84	2.38	12.65
2.5	9.65	19.32	5.47	6.90	1.30	0.78	8.81	8.84	2.58	12.63
3.0	9.52	19.29	5.41	6.86	1.31	0.79	8.91	9.00	2.49	12.70
3.5	9.30	19.33	5.34	6.81	1.33	0.80	8.96	9.09	2.57	12.45
4.0	8.81	19.56	5.20	6.47	1.37	0.81	9.23	9.26	2.57	12.32
4.5	8.16	19.96	4.89	5.98	1.43	0.81	8.84	8.98	2.78	12.17
5.0	7.47	20.41	4.68	5.61	1.51	0.81	8.90	8.99	2.98	11.08
5.5	6.96	20.66	4.68	5.49	1.60	0.82	8.36	8.72	3.11	11.26
6.0	6.81	20.54	4.91	5.74	1.66	0.84	8.52	8.79	3.14	11.03
6.5	6.96	20.18	5.41	6.34	1.68	0.84	8.57	8.86	3.15	10.02
7.0	7.06	19.82	5.97	7.11	1.70	0.87	8.25	8.68	3.26	10.29
7.5	6.91	19.66	6.07	7.61	1.71	0.92	8.27	8.79	3.41	9.86
8.0	6.58	19.73	5.80	7.35	1.70	0.95	7.83	8.58	3.63	8.57
8.5	6.15	19.81	5.38	6.72	1.71	0.93	7.48	8.15	3.80	7.13
9.0	5.94	19.63	5.08	6.26	1.68	0.90	6.72	7.43	4.02	6.91
9.5	6.22	18.93	4.90	6.56	1.58	0.90	7.14	7.96	3.96	7.45
10.0	6.69	18.11	5.39	7.66	1.54	0.92	7.25	8.61	3.99	8.69
10.5	7.14	17.24	6.17	10.28	1.50	0.98	7.57	8.90	3.82	9.52
11.0	7.35	16.75	6.80	14.26	1.49	1.01	7.86	9.42	3.81	8.24
11.5	7.11	16.69	6.67	20.21	1.49	1.07	7.88	9.67	3.78	10.82
12.0	7.23	16.25	6.34	22.62	1.42	1.11	8.04	9.91	3.57	11.04
12.5	7.14	16.13	6.21	20.52	1.41	1.13	8.01	9.76	3.56	12.63
13.0	7.02	16.06	6.35	19.76	1.43	1.14	7.75	9.51	3.78	13.23
13.5	6.57	16.32	6.46	18.98	1.48	1.16	7.42	9.38	3.89	13.68
14.0	5.70	17.15	5.92	18.14	1.64	1.19	7.43	9.50	4.19	15.00

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: $V_{DD} = +3\text{ V}$, $V_b = +2\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	11.88	21.14	7.56	5.93	1.26	0.64	12.31	12.17	4.71	23.07
0.05	12.34	19.67	6.94	8.26	1.17	0.70	12.95	12.52	3.05	21.48
0.1	12.47	19.29	6.72	8.81	1.14	0.70	12.84	12.41	2.44	21.56
0.2	12.54	19.11	6.74	8.88	1.13	0.69	13.44	12.89	2.14	20.23
0.4	12.55	19.01	6.83	8.76	1.13	0.67	14.48	13.72	2.02	19.43
0.6	12.50	19.00	6.82	8.61	1.14	0.67	15.01	14.21	1.95	19.19
0.8	12.44	19.10	6.77	8.47	1.15	0.68	15.18	14.45	1.91	19.16
1.0	12.34	19.19	6.68	8.31	1.16	0.68	15.34	14.56	1.87	19.04
1.5	12.05	19.51	6.48	8.00	1.19	0.71	15.77	15.08	2.04	18.64
2.0	11.76	19.82	6.35	7.84	1.23	0.74	15.67	15.00	1.99	18.71
2.5	11.59	19.97	6.35	7.79	1.26	0.76	15.73	14.98	2.07	18.56
3.0	11.51	20.07	6.35	7.80	1.27	0.77	15.90	15.18	2.04	18.63
3.5	11.36	20.21	6.20	7.62	1.28	0.78	15.94	15.25	2.12	18.56
4.0	11.02	20.51	5.87	7.13	1.31	0.79	16.03	15.33	2.15	18.48
4.5	10.50	21.03	5.36	6.48	1.36	0.79	15.50	15.09	2.29	18.36
5.0	9.88	21.62	4.95	5.99	1.44	0.80	15.52	15.19	2.39	18.23
5.5	9.48	22.04	4.79	5.81	1.51	0.81	15.15	14.76	2.54	18.68
6.0	9.43	22.13	4.94	6.03	1.56	0.83	15.53	15.07	2.56	18.39
6.5	9.65	21.95	5.33	6.63	1.58	0.85	15.72	15.25	2.60	18.15
7.0	9.89	21.71	5.87	7.44	1.58	0.87	15.46	15.20	2.68	18.50
7.5	9.93	21.63	6.01	7.94	1.57	0.92	15.38	15.48	2.75	19.07
8.0	9.71	21.84	5.50	7.66	1.56	0.96	14.56	14.91	2.94	19.63
8.5	9.42	22.04	5.00	6.97	1.55	0.95	13.97	14.20	3.09	19.30
9.0	9.37	21.95	4.64	6.43	1.50	0.91	13.16	13.32	3.19	19.11
9.5	9.76	21.23	4.33	6.69	1.38	0.92	13.54	13.57	3.18	18.61
10.0	10.34	20.37	4.66	7.82	1.31	0.93	13.56	13.84	3.14	19.49
10.5	10.97	19.40	5.14	10.61	1.27	0.98	13.88	14.19	3.06	19.11
11.0	11.27	18.88	5.61	15.08	1.26	1.00	13.74	14.27	3.03	20.26
11.5	10.99	18.87	5.29	23.31	1.27	1.09	13.60	14.32	2.98	21.75
12.0	11.16	18.52	5.12	24.49	1.18	1.13	13.42	14.44	2.83	22.49
12.5	11.04	18.46	4.97	25.16	1.12	1.17	13.79	14.55	2.81	22.60
13.0	10.80	18.49	5.06	22.50	1.13	1.18	13.70	14.64	2.99	23.67
13.5	10.19	19.02	5.20	22.03	1.25	1.20	13.09	14.43	3.23	22.30
14.0	9.17	20.04	4.89	20.80	1.44	1.27	13.01	14.35	3.47	22.99

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: $V_{DD} = +3\text{ V}$, $V_b = +3\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	18.13	23.85	12.18	22.32	1.17	0.78	10.89	12.96	4.82	19.84
0.05	18.00	23.07	14.46	23.83	1.14	0.74	11.53	13.53	2.85	21.96
0.1	18.02	22.84	14.98	22.38	1.12	0.71	11.55	13.54	2.15	22.54
0.2	18.09	22.56	15.58	23.12	1.11	0.68	12.23	14.09	1.77	23.95
0.4	18.20	22.26	16.62	26.20	1.10	0.65	13.38	15.15	1.48	25.74
0.6	18.23	22.18	17.11	28.91	1.10	0.64	14.00	15.70	1.38	25.84
0.8	18.23	22.21	16.96	31.32	1.10	0.64	14.19	15.88	1.34	26.01
1.0	18.21	22.23	16.55	32.85	1.11	0.65	14.25	16.04	1.32	25.73
1.5	18.11	22.43	15.42	31.29	1.13	0.68	14.41	16.34	1.42	25.30
2.0	18.01	22.62	14.53	28.01	1.15	0.72	14.36	16.37	1.35	25.25
2.5	17.94	22.77	13.58	25.99	1.16	0.74	14.28	16.41	1.38	25.09
3.0	17.88	22.98	12.87	24.02	1.17	0.76	14.10	16.57	1.39	24.59
3.5	17.79	23.14	12.14	22.55	1.18	0.78	13.89	16.59	1.48	24.13
4.0	17.64	23.38	11.26	19.81	1.21	0.81	13.58	16.56	1.50	23.33
4.5	17.43	23.73	10.09	16.85	1.24	0.84	13.09	16.38	1.59	22.74
5.0	17.24	24.13	9.22	14.82	1.28	0.86	12.37	16.18	1.67	21.35
5.5	17.15	24.40	8.73	13.55	1.30	0.86	11.56	16.00	1.71	21.35
6.0	17.21	24.54	8.81	13.54	1.32	0.87	10.92	16.06	1.72	20.79
6.5	17.36	24.58	9.39	15.34	1.33	0.88	10.76	15.96	1.74	20.46
7.0	17.42	24.72	9.60	18.31	1.35	0.90	10.97	15.83	1.83	20.54
7.5	17.25	24.99	8.92	19.92	1.38	0.94	10.85	15.64	1.93	20.21
8.0	16.92	25.35	7.94	18.60	1.42	1.00	10.70	15.26	2.11	19.72
8.5	16.60	25.76	7.44	16.33	1.46	1.02	10.88	14.38	2.27	19.60
9.0	16.48	25.76	7.26	14.30	1.48	1.01	11.28	13.54	2.38	20.48
9.5	16.57	25.45	7.70	14.34	1.47	0.97	11.86	13.40	2.33	20.92
10.0	16.61	25.21	9.13	15.23	1.50	0.94	11.84	13.34	2.33	21.26
10.5	16.58	24.98	10.93	14.97	1.51	0.90	12.00	13.78	2.32	21.69
11.0	16.31	25.01	11.32	12.64	1.55	0.89	11.72	13.78	2.40	20.92
11.5	15.74	25.27	10.21	11.64	1.64	0.91	11.44	13.65	2.40	20.44
12.0	15.35	25.41	9.30	11.42	1.63	0.93	11.09	13.56	2.41	19.88
12.5	15.08	25.37	9.30	11.81	1.68	0.95	11.74	14.03	2.38	21.03
13.0	14.70	25.60	9.18	12.09	1.81	0.97	11.75	14.17	2.65	21.11
13.5	13.97	26.09	8.72	12.67	2.05	1.00	11.32	13.89	2.96	19.79
14.0	13.03	26.75	7.42	12.22	2.30	1.06	11.20	13.75	3.27	19.72

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: $V_{DD} = +4\text{ V}$, $V_b = +4\text{ V}$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.61	24.97	13.66	23.51	1.14	0.76	15.44	16.97	4.84	32.34
0.05	19.23	24.19	18.86	15.03	1.12	0.68	16.02	17.34	2.79	33.39
0.1	19.22	23.98	20.69	14.39	1.11	0.65	16.09	17.33	2.11	34.93
0.2	19.30	23.73	21.75	14.77	1.10	0.63	16.73	17.91	1.76	34.57
0.4	19.42	23.38	22.79	15.93	1.09	0.59	17.86	18.89	1.46	34.19
0.6	19.47	23.28	23.67	16.76	1.09	0.58	18.19	19.21	1.36	33.58
0.8	19.49	23.28	23.70	17.49	1.09	0.59	18.23	19.30	1.34	33.53
1.0	19.49	23.32	23.14	18.41	1.10	0.60	18.29	19.44	1.27	33.13
1.5	19.45	23.46	21.91	20.85	1.11	0.63	18.30	19.71	1.37	31.93
2.0	19.41	23.66	19.68	23.38	1.13	0.67	18.32	19.78	1.30	32.16
2.5	19.37	23.82	18.00	25.67	1.14	0.69	18.26	19.86	1.33	31.64
3.0	19.32	23.98	17.40	26.81	1.15	0.71	18.13	20.07	1.36	31.45
3.5	19.27	24.17	16.56	27.90	1.17	0.73	18.01	20.09	1.43	31.03
4.0	19.21	24.39	15.19	38.34	1.19	0.76	17.63	20.02	1.46	29.88
4.5	19.10	24.67	13.40	28.49	1.22	0.79	17.35	19.97	1.57	29.57
5.0	18.99	24.95	11.68	21.27	1.24	0.82	16.64	19.66	1.63	27.92
5.5	18.97	25.19	10.67	18.16	1.25	0.83	16.58	19.55	1.66	28.15
6.0	19.04	25.44	10.59	17.60	1.27	0.84	16.21	19.51	1.68	26.85
6.5	19.18	25.55	11.11	18.37	1.28	0.84	15.98	19.25	1.70	26.13
7.0	19.19	25.78	11.31	18.06	1.30	0.85	16.16	19.22	1.81	26.67
7.5	19.04	26.14	10.03	16.46	1.34	0.89	15.63	18.89	1.92	26.31
8.0	18.75	26.58	8.68	16.65	1.39	0.94	15.30	18.57	2.07	25.98
8.5	18.50	27.00	7.95	15.85	1.44	0.97	14.89	17.57	2.23	25.88
9.0	18.36	27.13	7.76	14.19	1.47	0.96	14.96	16.80	2.34	27.23
9.5	18.42	26.84	8.36	13.11	1.45	0.92	15.05	16.47	2.31	26.72
10.0	18.40	26.76	9.88	12.09	1.48	0.87	14.76	16.41	2.29	27.13
10.5	18.31	26.54	11.45	10.78	1.48	0.82	15.09	16.87	2.30	27.31
11.0	17.99	26.63	11.37	9.61	1.52	0.81	14.63	16.83	2.37	27.16
11.5	17.35	26.99	10.05	9.15	1.60	0.84	14.47	16.73	2.39	26.51
12.0	17.00	26.97	9.33	8.93	1.62	0.85	13.77	16.50	2.40	26.01
12.5	16.70	26.98	9.20	9.42	1.68	0.88	14.71	17.03	2.38	26.63
13.0	16.27	27.13	9.09	9.96	1.81	0.91	14.86	17.12	2.69	26.82
13.5	15.44	27.65	8.42	10.83	2.04	0.96	14.21	16.80	2.96	25.80
14.0	14.46	28.40	7.13	10.67	2.33	1.03	13.86	16.55	3.36	25.64

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: $V_{DD} = +5\text{ V}$, $V_b = +2\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	14.42	21.99	8.96	8.05	1.20	0.69	18.34	17.67	4.91	21.95
0.05	14.64	20.48	8.89	11.58	1.14	0.70	18.92	18.13	3.02	22.66
0.1	14.72	20.19	8.79	12.47	1.12	0.70	18.79	18.05	2.37	22.99
0.2	14.79	19.97	8.90	12.48	1.11	0.68	19.53	18.73	1.94	22.73
0.4	14.81	19.84	9.05	12.12	1.11	0.66	20.27	19.20	1.76	22.46
0.6	14.78	19.83	9.04	11.83	1.11	0.65	20.46	19.40	1.64	22.34
0.8	14.73	19.89	8.94	11.56	1.12	0.66	20.56	19.59	1.66	22.25
1.0	14.68	19.96	8.81	11.26	1.12	0.66	20.69	19.84	1.60	22.11
1.5	14.47	20.28	8.43	10.67	1.15	0.69	21.13	20.34	1.75	21.55
2.0	14.24	20.58	8.13	10.29	1.18	0.72	21.12	20.24	1.67	21.51
2.5	14.13	20.76	8.06	10.23	1.20	0.75	21.22	20.25	1.74	21.21
3.0	14.09	20.87	7.97	10.27	1.21	0.76	21.36	20.44	1.70	21.25
3.5	13.99	21.06	7.73	10.02	1.22	0.78	21.48	20.34	1.91	21.13
4.0	13.78	21.38	7.20	9.29	1.25	0.79	21.32	20.21	1.85	20.78
4.5	13.38	21.88	6.50	8.32	1.28	0.80	20.82	19.92	1.92	20.64
5.0	12.91	22.45	5.85	7.51	1.34	0.81	20.83	19.98	2.04	19.94
5.5	12.62	22.88	5.54	7.15	1.38	0.82	20.47	19.62	2.08	20.36
6.0	12.64	23.02	5.64	7.38	1.42	0.84	20.54	19.87	2.14	20.46
6.5	12.89	22.97	5.99	8.14	1.43	0.86	20.52	19.66	2.18	20.34
7.0	13.15	22.85	6.27	9.21	1.43	0.88	20.16	19.79	2.22	20.89
7.5	13.19	22.98	6.15	9.87	1.43	0.93	19.68	19.85	2.27	20.79
8.0	12.98	23.27	5.59	9.53	1.43	0.99	18.74	18.94	2.46	20.18
8.5	12.76	23.61	5.07	8.61	1.43	0.98	18.49	18.29	2.63	19.45
9.0	12.76	23.55	4.84	7.90	1.40	0.95	18.21	18.03	2.74	19.92
9.5	13.14	22.94	4.73	8.27	1.33	0.94	18.73	18.23	2.68	19.70
10.0	13.61	22.26	5.26	9.65	1.31	0.94	18.56	18.30	2.67	20.40
10.5	14.03	21.60	6.04	12.54	1.26	0.95	18.82	18.70	2.61	20.61
11.0	14.04	21.36	6.55	15.31	1.26	0.98	17.80	18.72	2.64	21.62
11.5	13.55	21.63	6.16	17.09	1.29	1.05	17.18	18.65	2.60	22.42
12.0	13.45	21.51	5.94	16.66	1.28	1.06	15.93	18.52	2.55	23.79
12.5	13.15	21.64	5.90	18.72	1.32	1.10	16.76	18.79	2.46	24.69
13.0	12.65	21.95	6.01	19.38	1.42	1.11	16.74	18.81	2.68	26.20
13.5	11.76	22.74	5.89	18.63	1.64	1.14	15.92	18.58	2.93	26.67
14.0	10.66	23.81	5.25	20.21	1.93	1.23	17.63	18.41	3.24	26.94

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: $V_{DD} = +5\text{ V}$, $V_b = +3\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.13	24.31	13.21	26.19	1.15	0.77	17.78	19.19	4.86	28.82
0.05	18.80	23.56	17.24	18.41	1.11	0.69	18.24	19.48	2.89	29.19
0.1	18.80	23.42	18.64	17.49	1.10	0.67	18.37	19.41	2.21	30.11
0.2	18.86	23.10	19.62	17.97	1.09	0.63	19.05	20.06	1.82	29.89
0.4	18.97	22.80	20.79	19.61	1.09	0.60	19.81	20.72	1.50	29.76
0.6	19.00	22.72	21.17	20.85	1.09	0.60	19.93	20.90	1.40	29.41
0.8	19.00	22.75	20.92	22.03	1.09	0.60	19.82	21.01	1.37	29.50
1.0	18.99	22.76	20.31	23.53	1.10	0.61	19.80	21.09	1.30	29.24
1.5	18.93	22.93	18.71	27.62	1.11	0.64	19.36	21.47	1.41	28.22
2.0	18.86	23.14	17.31	33.19	1.13	0.68	19.52	21.58	1.38	28.57
2.5	18.82	23.33	15.86	34.45	1.14	0.70	19.45	21.68	1.43	28.37
3.0	18.79	23.47	14.99	35.82	1.16	0.73	19.21	21.82	1.47	28.45
3.5	18.75	23.67	14.34	33.96	1.17	0.75	19.05	21.85	1.47	27.93
4.0	18.68	23.94	13.15	26.67	1.19	0.78	18.32	21.59	1.50	27.03
4.5	18.55	24.25	11.56	21.05	1.22	0.81	17.71	21.41	1.59	26.97
5.0	18.40	24.60	10.21	17.25	1.24	0.83	16.65	21.28	1.67	25.38
5.5	18.33	24.89	9.43	15.17	1.26	0.84	16.13	21.18	1.69	25.50
6.0	18.38	25.07	9.34	15.04	1.27	0.84	15.45	21.03	1.73	24.08
6.5	18.51	25.19	9.87	15.99	1.29	0.85	15.51	20.78	1.72	23.35
7.0	18.53	25.42	9.95	16.54	1.31	0.86	16.28	20.79	1.82	24.16
7.5	18.33	25.78	8.96	16.72	1.34	0.90	16.12	20.49	1.95	24.43
8.0	18.08	26.24	7.82	16.50	1.39	0.96	16.14	19.87	2.10	23.97
8.5	17.84	26.66	7.24	14.80	1.44	0.99	16.59	18.92	2.26	23.96
9.0	17.68	26.76	7.02	13.10	1.47	0.98	16.84	18.55	2.33	25.62
9.5	17.74	26.38	7.50	12.26	1.45	0.94	17.46	18.66	2.30	25.13
10.0	17.69	26.35	9.00	11.83	1.50	0.89	16.96	18.57	2.30	26.09
10.5	17.54	26.13	10.39	10.91	1.51	0.85	17.15	18.92	2.27	26.47
11.0	17.15	26.23	10.54	10.10	1.55	0.84	16.44	18.91	2.35	26.97
11.5	16.48	26.61	9.40	9.97	1.66	0.89	16.29	18.89	2.39	26.83
12.0	16.19	26.57	8.57	9.70	1.67	0.90	15.53	18.65	2.39	28.31
12.5	15.85	26.65	8.42	10.41	1.77	0.94	16.35	19.09	2.37	27.89
13.0	15.31	26.85	8.29	11.22	1.93	0.97	16.32	19.04	2.59	28.62
13.5	14.44	27.44	7.90	12.34	2.21	1.02	15.65	18.71	2.94	29.02
14.0	13.43	28.28	6.72	12.50	2.55	1.10	15.45	18.55	3.29	29.16

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: $V_{DD} = +5\text{ V}$, $V_b = +4\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.79	25.16	13.86	22.05	1.15	0.76	18.36	19.37	4.95	34.90
0.05	19.38	24.23	19.40	14.66	1.12	0.67	18.85	19.67	2.84	36.19
0.1	19.36	24.11	21.45	14.03	1.11	0.65	18.91	19.64	2.18	36.22
0.2	19.44	23.77	22.53	14.39	1.09	0.61	19.52	20.26	1.83	36.46
0.4	19.56	23.46	23.56	15.44	1.08	0.58	20.32	20.97	1.52	35.12
0.6	19.61	23.38	24.11	16.25	1.08	0.57	20.43	21.15	1.40	34.57
0.8	19.62	23.38	24.07	17.02	1.09	0.58	20.42	21.25	1.38	33.96
1.0	19.62	23.39	23.69	17.84	1.09	0.59	20.44	21.35	1.31	33.89
1.5	19.59	23.53	22.73	20.10	1.11	0.62	20.33	21.66	1.42	32.95
2.0	19.55	23.72	20.39	22.35	1.13	0.66	20.41	21.76	1.31	32.95
2.5	19.52	23.92	18.77	24.11	1.14	0.68	20.34	21.85	1.38	32.45
3.0	19.50	24.07	17.99	24.29	1.15	0.70	20.15	22.02	1.38	32.29
3.5	19.46	24.25	17.03	25.32	1.17	0.72	19.96	22.01	1.46	31.89
4.0	19.41	24.49	15.59	31.24	1.19	0.75	19.34	21.81	1.49	30.65
4.5	19.32	24.73	13.72	28.96	1.21	0.79	19.06	21.77	1.58	30.45
5.0	19.23	25.01	11.91	21.14	1.23	0.81	18.10	21.41	1.67	28.95
5.5	19.21	25.29	10.72	18.07	1.24	0.82	18.09	21.30	1.69	29.28
6.0	19.28	25.51	10.54	17.32	1.26	0.83	17.57	21.01	1.72	27.97
6.5	19.40	25.69	11.00	17.61	1.27	0.83	17.42	20.73	1.75	27.29
7.0	19.39	25.88	11.13	16.95	1.29	0.84	17.88	20.81	1.82	27.74
7.5	19.27	26.23	9.78	15.31	1.32	0.87	17.47	20.49	1.95	27.60
8.0	18.97	26.71	8.45	15.31	1.37	0.93	17.19	20.07	2.12	27.17
8.5	18.68	27.16	7.73	14.62	1.42	0.97	16.85	19.00	2.28	26.93
9.0	18.56	27.30	7.56	13.36	1.46	0.96	17.03	18.58	2.39	28.35
9.5	18.60	26.98	8.18	12.27	1.44	0.91	17.19	18.46	2.34	27.70
10.0	18.55	26.95	9.65	11.24	1.48	0.86	16.73	18.41	2.34	28.04
10.5	18.38	26.79	11.01	10.05	1.50	0.81	17.11	18.79	2.32	28.09
11.0	18.00	26.81	10.94	9.07	1.53	0.80	16.47	18.78	2.38	28.25
11.5	17.32	27.27	9.62	8.80	1.65	0.84	16.46	18.69	2.41	27.71
12.0	17.04	27.23	8.90	8.65	1.63	0.85	15.61	18.50	2.44	28.44
12.5	16.70	27.21	8.79	9.26	1.71	0.89	16.58	18.93	2.44	28.09
13.0	16.19	27.41	8.64	9.94	1.85	0.92	16.62	18.91	2.70	28.42
13.5	15.34	27.95	8.06	10.87	2.12	0.98	15.90	18.58	3.03	28.50
14.0	14.33	28.85	6.82	10.95	2.43	1.05	15.70	18.43	3.40	28.69

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: $V_{DD} = +5\text{ V}$, $V_b = +5\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	20.03	25.51	13.97	19.61	1.14	0.77	18.48	19.53	5.32	37.42
0.05	19.58	24.58	19.95	13.45	1.11	0.66	19.05	19.83	2.91	41.82
0.1	19.56	24.42	22.28	12.93	1.11	0.64	19.10	19.81	2.19	43.71
0.2	19.64	24.13	23.10	13.28	1.09	0.61	19.71	20.42	1.84	42.91
0.4	19.77	23.75	23.10	14.28	1.08	0.57	20.59	21.13	1.54	40.40
0.6	19.82	23.65	23.37	15.01	1.08	0.56	20.77	21.31	1.43	38.52
0.8	19.84	23.61	23.68	15.66	1.09	0.57	20.77	21.40	1.41	37.86
1.0	19.85	23.65	23.91	16.24	1.09	0.58	20.84	21.51	1.35	37.18
1.5	19.83	23.78	24.06	17.92	1.11	0.61	20.84	21.79	1.42	36.03
2.0	19.80	23.95	21.86	19.88	1.12	0.65	20.90	21.89	1.37	35.59
2.5	19.78	24.14	20.36	20.71	1.14	0.67	20.85	21.96	1.37	35.16
3.0	19.75	24.30	19.41	20.57	1.15	0.69	20.75	22.14	1.42	34.23
3.5	19.72	24.51	18.31	21.15	1.16	0.72	20.66	22.10	1.48	33.92
4.0	19.69	24.71	16.88	24.30	1.18	0.74	20.24	21.91	1.51	32.54
4.5	19.63	24.97	14.88	32.78	1.21	0.78	20.07	21.90	1.60	32.29
5.0	19.58	25.19	12.72	23.62	1.22	0.80	19.36	21.43	1.72	30.62
5.5	19.57	25.50	11.38	19.33	1.24	0.82	19.52	21.33	1.71	30.70
6.0	19.64	25.70	11.16	18.21	1.25	0.82	19.06	20.99	1.73	29.65
6.5	19.76	25.86	11.67	18.10	1.26	0.82	18.71	20.68	1.78	29.16
7.0	19.80	26.11	11.84	17.14	1.28	0.83	18.83	20.78	1.85	29.22
7.5	19.66	26.44	10.29	15.24	1.32	0.86	18.28	20.47	1.98	28.55
8.0	19.32	26.93	8.83	14.65	1.36	0.92	17.83	20.13	2.14	28.29
8.5	19.07	27.39	8.04	14.33	1.42	0.96	17.20	19.11	2.32	28.26
9.0	18.98	27.54	7.94	13.61	1.44	0.94	17.20	18.56	2.44	29.41
9.5	19.04	27.21	8.60	12.23	1.43	0.89	17.11	18.35	2.37	28.68
10.0	18.97	27.20	10.12	11.14	1.47	0.84	16.64	18.20	2.38	28.64
10.5	18.80	27.01	11.49	9.65	1.46	0.79	17.09	18.63	2.33	28.89
11.0	18.44	27.06	11.20	8.52	1.49	0.77	16.39	18.64	2.44	28.54
11.5	17.77	27.54	9.72	8.20	1.59	0.80	16.49	18.57	2.47	28.09
12.0	17.60	27.42	9.12	7.94	1.57	0.81	15.42	18.38	2.49	28.28
12.5	17.30	27.43	8.99	8.68	1.64	0.85	16.62	18.82	2.49	27.93
13.0	16.78	27.56	8.85	9.24	1.77	0.88	16.75	18.84	2.78	28.21
13.5	15.97	28.11	8.19	10.02	2.02	0.94	16.06	18.52	3.08	28.22
14.0	14.97	29.00	6.93	10.02	2.30	1.01	15.93	18.34	3.49	28.19

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: $V_{DD} = +6\text{ V}$, $V_b = +2\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	15.54	22.07	9.59	9.52	1.17	0.69	19.96	19.60	5.06	25.92
0.05	15.64	20.95	10.11	14.12	1.13	0.70	20.64	19.97	3.06	26.84
0.1	15.71	20.68	10.13	15.40	1.11	0.69	20.59	19.89	2.38	27.16
0.2	15.76	20.47	10.29	15.31	1.10	0.67	21.31	20.53	1.93	26.64
0.4	15.80	20.29	10.49	14.66	1.10	0.64	21.80	20.85	1.73	26.29
0.6	15.78	20.31	10.50	14.27	1.10	0.64	21.95	21.01	1.58	26.15
0.8	15.75	20.35	10.38	13.86	1.11	0.65	22.05	21.22	1.57	26.01
1.0	15.70	20.46	10.19	13.42	1.11	0.65	22.14	21.64	1.53	25.64
1.5	15.51	20.70	9.66	12.55	1.14	0.68	22.58	22.14	1.63	24.95
2.0	15.33	20.98	9.28	12.04	1.16	0.71	22.61	21.89	1.55	24.90
2.5	15.24	21.18	9.14	11.96	1.18	0.74	22.70	21.85	1.61	24.36
3.0	15.20	21.31	8.94	12.03	1.19	0.76	22.81	22.00	1.63	24.36
3.5	15.14	21.50	8.62	11.75	1.20	0.78	22.84	21.82	1.75	24.18
4.0	14.96	21.82	7.99	10.85	1.22	0.79	22.43	21.66	1.72	23.65
4.5	14.61	22.30	7.18	9.60	1.26	0.81	21.98	21.39	1.86	23.34
5.0	14.21	22.82	6.44	8.54	1.30	0.82	21.87	21.29	2.02	22.28
5.5	13.98	23.25	6.04	8.06	1.34	0.83	21.72	21.01	2.13	22.93
6.0	14.01	23.39	6.11	8.30	1.36	0.85	21.41	21.05	2.09	23.77
6.5	14.25	23.37	6.46	9.18	1.38	0.86	21.03	20.82	2.15	23.97
7.0	14.50	23.36	6.72	10.42	1.38	0.88	20.95	20.97	2.22	25.15
7.5	14.48	23.53	6.46	11.18	1.39	0.93	20.32	20.90	2.35	23.90
8.0	14.25	23.94	5.84	10.73	1.41	0.99	19.62	19.95	2.43	22.14
8.5	14.05	24.27	5.35	9.62	1.41	0.99	19.62	19.38	2.59	21.40
9.0	14.02	24.26	5.14	8.79	1.40	0.96	19.58	19.36	2.67	22.10
9.5	14.34	23.67	5.16	9.16	1.35	0.95	19.97	19.56	2.72	22.08
10.0	14.71	23.15	5.84	10.48	1.32	0.93	19.79	19.67	2.73	22.76
10.5	14.98	22.61	6.77	12.71	1.30	0.93	19.57	19.99	2.70	23.25
11.0	14.84	22.51	7.24	13.86	1.32	0.95	17.42	19.95	2.69	24.45
11.5	14.27	22.88	6.77	14.53	1.38	1.02	16.91	19.86	2.64	25.15
12.0	14.10	22.82	6.51	14.29	1.38	1.03	16.05	19.73	2.49	26.94
12.5	13.74	22.94	6.47	16.04	1.45	1.07	16.81	19.93	2.38	28.95
13.0	13.16	23.32	6.53	16.76	1.58	1.09	16.85	19.81	2.64	29.67
13.5	12.21	24.16	6.26	17.10	1.84	1.12	16.17	19.59	2.88	26.45
14.0	11.10	25.28	5.47	19.12	2.19	1.21	17.25	19.45	3.22	28.61

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: $V_{DD} = +6\text{ V}$, $V_b = +3\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.53	24.96	13.72	27.62	1.15	0.76	19.64	20.99	5.19	29.71
0.05	19.27	24.08	17.88	17.35	1.11	0.69	19.95	21.23	3.04	30.64
0.1	19.29	23.80	19.02	16.49	1.10	0.66	20.22	21.19	2.36	31.76
0.2	19.37	23.58	20.15	17.00	1.09	0.63	20.79	21.84	1.89	31.48
0.4	19.49	23.27	21.53	18.59	1.08	0.59	21.08	22.33	1.53	31.34
0.6	19.52	23.18	22.08	19.77	1.08	0.59	21.05	22.49	1.39	31.18
0.8	19.52	23.21	21.94	20.93	1.09	0.59	20.85	22.59	1.39	31.13
1.0	19.51	23.22	21.34	22.42	1.09	0.60	20.74	22.69	1.32	31.06
1.5	19.45	23.38	19.26	27.46	1.11	0.64	20.12	23.03	1.48	29.93
2.0	19.37	23.59	17.00	36.22	1.13	0.67	20.27	23.20	1.38	30.26
2.5	19.31	23.75	15.38	37.06	1.14	0.70	20.16	23.27	1.34	29.86
3.0	19.28	23.94	14.37	35.15	1.15	0.73	19.93	23.31	1.38	29.85
3.5	19.24	24.13	13.57	33.02	1.16	0.75	19.77	23.26	1.48	29.57
4.0	19.19	24.32	12.72	27.94	1.18	0.77	19.05	22.79	1.57	28.90
4.5	19.08	24.63	11.66	22.56	1.20	0.80	18.64	22.58	1.72	29.08
5.0	18.96	24.93	10.53	18.51	1.23	0.82	17.64	22.36	1.88	27.76
5.5	18.93	25.21	9.73	16.30	1.24	0.83	17.59	22.36	1.93	28.16
6.0	19.00	25.39	9.62	15.71	1.26	0.84	16.88	21.83	1.96	26.81
6.5	19.11	25.50	10.01	16.05	1.27	0.84	16.74	21.51	1.96	25.91
7.0	19.12	25.74	9.91	15.89	1.29	0.85	17.46	21.58	2.10	26.79
7.5	18.86	26.15	8.80	14.81	1.33	0.89	17.48	21.33	2.20	27.27
8.0	18.49	26.65	7.58	14.09	1.38	0.95	17.69	20.87	2.30	26.97
8.5	18.17	27.04	6.94	13.53	1.43	0.98	17.84	20.16	2.46	27.12
9.0	18.02	27.13	6.93	13.03	1.46	0.98	17.90	19.96	2.63	28.83
9.5	18.04	26.80	7.55	12.73	1.46	0.95	18.04	19.98	2.62	28.59
10.0	18.00	26.62	9.06	12.51	1.50	0.90	17.32	19.85	2.59	29.27
10.5	17.89	26.42	10.71	11.71	1.52	0.86	17.49	20.13	2.72	29.45
11.0	17.52	26.52	10.73	10.62	1.57	0.85	17.06	20.15	2.75	29.93
11.5	16.77	26.95	9.41	10.28	1.69	0.89	16.71	19.94	2.59	29.78
12.0	16.39	27.02	8.34	9.32	1.71	0.89	16.16	19.85	2.40	30.51
12.5	16.01	27.03	8.26	10.09	1.79	0.93	16.60	20.06	2.38	30.43
13.0	15.47	27.23	8.42	10.98	1.95	0.97	16.48	19.95	2.39	30.37
13.5	14.67	27.74	8.04	12.38	2.24	1.02	15.91	19.64	2.71	29.74
14.0	13.80	28.54	6.90	13.49	2.56	1.10	15.82	19.48	3.04	29.49

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: $V_{DD} = +6\text{ V}$, $V_b = +4\text{ V}$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.96	25.79	14.23	22.91	1.18	0.78	20.50	21.25	5.48	33.82
0.05	19.64	24.67	19.35	14.91	1.12	0.68	20.83	21.47	3.08	35.87
0.1	19.65	24.30	20.91	14.28	1.10	0.65	20.94	21.45	2.30	37.49
0.2	19.74	24.03	22.12	14.71	1.09	0.61	21.51	22.06	1.90	36.29
0.4	19.87	23.70	23.38	15.95	1.08	0.58	22.00	22.55	1.55	35.99
0.6	19.92	23.59	24.13	16.85	1.08	0.57	22.04	22.73	1.44	35.34
0.8	19.92	23.63	24.27	17.70	1.09	0.58	22.00	22.82	1.41	34.87
1.0	19.92	23.65	23.90	18.71	1.09	0.59	21.95	22.92	1.36	34.57
1.5	19.88	23.76	22.02	21.77	1.11	0.62	21.54	23.22	1.45	33.70
2.0	19.83	23.93	19.26	26.02	1.12	0.66	21.64	23.38	1.39	33.52
2.5	19.79	24.13	17.17	30.04	1.13	0.69	21.49	23.44	1.37	33.37
3.0	19.76	24.29	15.90	31.63	1.14	0.71	21.24	23.48	1.41	32.84
3.5	19.73	24.45	14.93	32.07	1.16	0.73	21.03	23.37	1.49	32.52
4.0	19.69	24.68	13.97	33.65	1.17	0.76	20.39	22.93	1.50	32.05
4.5	19.62	24.94	12.82	27.74	1.19	0.78	20.15	22.82	1.59	31.51
5.0	19.54	25.21	11.53	21.61	1.21	0.80	19.26	22.39	1.68	30.42
5.5	19.55	25.46	10.57	18.44	1.23	0.82	19.44	22.41	1.70	30.63
6.0	19.63	25.64	10.41	17.39	1.24	0.82	18.84	21.79	1.71	29.48
6.5	19.74	25.80	10.78	17.17	1.25	0.82	18.55	21.43	1.77	28.78
7.0	19.73	26.03	10.55	16.06	1.27	0.83	18.84	21.53	1.83	29.12
7.5	19.48	26.45	9.25	14.45	1.31	0.86	18.53	21.29	1.96	29.08
8.0	19.12	26.99	7.90	13.69	1.36	0.92	18.55	21.01	2.13	28.93
8.5	18.83	27.39	7.23	13.25	1.41	0.96	18.37	20.21	2.29	28.78
9.0	18.70	27.48	7.19	12.88	1.44	0.96	18.27	19.95	2.38	29.96
9.5	18.73	27.20	7.86	12.48	1.43	0.92	18.21	19.88	2.31	29.29
10.0	18.69	27.05	9.41	12.02	1.47	0.88	17.53	19.72	2.29	29.71
10.5	18.57	26.83	11.07	10.95	1.48	0.83	17.91	20.03	2.28	29.79
11.0	18.21	26.98	10.98	9.79	1.52	0.81	17.43	20.06	2.29	29.50
11.5	17.41	27.46	9.48	9.31	1.65	0.85	17.25	19.88	2.38	29.09
12.0	17.11	27.37	8.45	8.43	1.63	0.84	16.39	19.78	2.24	29.76
12.5	16.74	27.41	8.36	9.10	1.71	0.88	17.08	19.99	2.37	29.75
13.0	16.20	27.66	8.50	9.87	1.87	0.92	16.99	19.85	2.62	29.74
13.5	15.40	28.21	8.08	11.14	2.16	0.99	16.39	19.55	2.82	29.28
14.0	14.56	28.94	6.91	12.04	2.44	1.07	16.25	19.36	3.14	29.64

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: $V_{DD} = +6\text{ V}$, $V_b = +5\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	20.10	25.24	13.92	19.96	1.13	0.74	20.52	21.18	5.67	36.85
0.05	19.64	24.52	20.07	13.70	1.11	0.65	20.95	21.45	3.06	39.51
0.1	19.61	24.29	22.57	13.16	1.10	0.63	21.03	21.41	2.27	42.02
0.2	19.69	24.05	23.29	13.51	1.09	0.60	21.51	21.94	1.92	43.74
0.4	19.82	23.74	23.17	14.51	1.08	0.57	22.04	22.43	1.60	39.23
0.6	19.87	23.58	23.48	15.23	1.08	0.56	22.21	22.62	1.48	38.44
0.8	19.88	23.61	23.81	15.88	1.08	0.57	22.24	22.74	1.47	37.38
1.0	19.89	23.62	24.09	16.54	1.09	0.58	22.24	22.80	1.38	37.14
1.5	19.88	23.74	24.30	18.23	1.10	0.61	22.14	23.11	1.50	35.83
2.0	19.85	23.93	22.07	20.24	1.12	0.64	22.25	23.27	1.41	35.44
2.5	19.83	24.09	20.52	21.02	1.13	0.66	22.18	23.36	1.40	35.05
3.0	19.81	24.27	19.51	20.72	1.14	0.68	22.07	23.41	1.47	34.29
3.5	19.78	24.44	18.38	21.19	1.16	0.71	21.83	23.25	1.53	33.91
4.0	19.75	24.68	16.89	24.60	1.18	0.74	21.14	22.78	1.57	32.86
4.5	19.71	24.94	14.79	29.51	1.20	0.77	20.97	22.74	1.66	32.18
5.0	19.67	25.14	12.58	22.18	1.21	0.79	19.99	22.08	1.74	30.79
5.5	19.67	25.44	11.20	18.42	1.22	0.80	20.21	22.13	1.77	31.05
6.0	19.73	25.62	10.95	17.37	1.23	0.81	19.52	21.46	1.77	30.36
6.5	19.84	25.88	11.37	17.05	1.25	0.81	19.21	21.11	1.80	29.66
7.0	19.89	26.08	11.55	16.09	1.27	0.82	19.62	21.39	1.89	29.75
7.5	19.73	26.44	10.03	14.35	1.30	0.85	19.25	21.06	2.02	29.04
8.0	19.39	26.91	8.59	13.79	1.35	0.91	18.94	20.81	2.18	28.85
8.5	19.16	27.43	7.82	13.38	1.40	0.95	18.69	19.81	2.35	28.70
9.0	19.03	27.56	7.71	12.76	1.43	0.93	18.86	19.68	2.51	29.94
9.5	19.09	27.29	8.35	11.49	1.42	0.88	18.83	19.60	2.41	29.28
10.0	19.05	27.21	9.80	10.42	1.45	0.83	18.26	19.45	2.42	29.37
10.5	18.88	27.04	11.08	9.15	1.45	0.78	18.83	19.75	2.38	29.48
11.0	18.50	27.15	10.90	8.18	1.49	0.76	17.98	19.81	2.48	29.06
11.5	17.80	27.61	9.44	7.94	1.58	0.79	18.17	19.76	2.53	28.75
12.0	17.57	27.51	8.80	7.82	1.58	0.81	16.80	19.63	2.49	29.16
12.5	17.22	27.54	8.68	8.58	1.65	0.85	18.24	19.87	2.54	28.88
13.0	16.68	27.71	8.54	9.28	1.79	0.90	18.44	19.75	2.83	29.26
13.5	15.81	28.38	7.93	10.09	2.08	0.96	17.81	19.52	3.14	29.16
14.0	14.79	29.25	6.71	10.30	2.38	1.03	18.23	19.31	3.54	29.18

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: $V_{DD} = +6\text{ V}$, $V_b = +6\text{ V}$ @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	20.17	25.45	13.92	19.43	1.14	0.75	20.45	21.29	6.26	38.32
0.05	19.70	24.62	20.19	13.45	1.11	0.65	20.97	21.55	3.20	40.33
0.1	19.67	24.29	22.74	12.94	1.10	0.62	21.07	21.52	2.36	41.84
0.2	19.75	24.10	22.92	13.28	1.09	0.59	21.51	22.03	1.95	42.06
0.4	19.89	23.76	22.79	14.24	1.08	0.56	22.04	22.52	1.63	40.09
0.6	19.94	23.65	23.01	14.92	1.08	0.55	22.27	22.71	1.52	39.02
0.8	19.96	23.65	23.38	15.54	1.08	0.56	22.37	22.84	1.49	38.88
1.0	19.97	23.69	23.72	16.22	1.09	0.57	22.39	22.90	1.43	38.80
1.5	19.95	23.80	23.78	17.85	1.10	0.60	22.37	23.19	1.53	36.60
2.0	19.93	23.99	22.35	19.75	1.12	0.64	22.48	23.34	1.44	36.29
2.5	19.91	24.18	20.90	20.42	1.13	0.66	22.42	23.41	1.49	35.77
3.0	19.88	24.31	19.85	20.18	1.14	0.68	22.35	23.47	1.48	35.02
3.5	19.85	24.54	18.71	20.61	1.16	0.70	22.21	23.28	1.55	34.19
4.0	19.83	24.74	17.32	23.76	1.18	0.73	21.62	22.80	1.60	33.19
4.5	19.81	24.97	15.22	28.99	1.20	0.76	21.54	22.77	1.69	32.88
5.0	19.76	25.23	12.95	22.64	1.21	0.79	20.64	21.99	1.80	31.36
5.5	19.76	25.49	11.53	18.70	1.23	0.80	20.94	22.00	1.81	31.40
6.0	19.83	25.74	11.27	17.59	1.24	0.81	20.21	21.34	1.85	30.74
6.5	19.95	25.95	11.66	17.18	1.25	0.81	19.79	20.98	1.86	30.04
7.0	20.00	26.15	11.83	16.23	1.27	0.81	20.02	21.25	1.97	30.19
7.5	19.82	26.49	10.27	14.45	1.30	0.84	19.61	20.92	2.08	29.63
8.0	19.50	27.03	8.78	13.69	1.35	0.90	19.29	20.70	2.27	29.41
8.5	19.31	27.55	8.00	13.37	1.40	0.94	18.85	19.77	2.46	29.09
9.0	19.21	27.72	7.89	12.89	1.43	0.92	19.04	19.53	2.58	30.19
9.5	19.28	27.36	8.53	11.60	1.40	0.87	19.12	19.33	2.48	29.62
10.0	19.27	27.35	9.94	10.45	1.44	0.82	18.72	19.19	2.50	29.43
10.5	19.15	27.07	11.28	9.02	1.43	0.76	19.16	19.55	2.52	29.53
11.0	18.78	27.18	11.00	8.01	1.46	0.74	18.70	19.59	2.58	29.05
11.5	18.10	27.63	9.48	7.60	1.53	0.77	18.73	19.58	2.63	28.92
12.0	17.89	27.60	8.90	7.50	1.54	0.79	17.54	19.44	2.62	28.73
12.5	17.57	27.60	8.77	8.32	1.61	0.83	18.93	19.71	2.63	28.93
13.0	17.03	27.80	8.60	8.95	1.74	0.88	19.03	19.60	2.94	29.25
13.5	16.19	28.44	7.97	9.65	1.99	0.94	18.62	19.40	3.26	29.11
14.0	15.18	29.32	6.78	9.79	2.30	1.01	18.41	19.18	3.65	29.14

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: $V_{DD} = +7\text{ V}$, $V_b = +7\text{ V}$ @ Temperature = $+25^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	20.09	24.69	14.10	21.27	1.09	0.70	21.58	22.60	7.79	33.22
0.05	19.65	24.28	20.19	14.29	1.10	0.64	22.14	22.84	3.94	35.64
0.1	19.61	24.11	22.61	13.71	1.10	0.62	22.32	22.81	2.73	37.36
0.2	19.69	23.86	23.04	14.04	1.09	0.59	22.56	23.13	2.18	38.20
0.4	19.82	23.62	23.02	14.98	1.08	0.56	22.79	23.47	1.80	37.29
0.6	19.87	23.52	23.32	15.68	1.08	0.55	22.94	23.71	1.66	37.09
0.8	19.89	23.52	23.67	16.31	1.08	0.56	23.06	23.90	1.61	36.56
1.0	19.90	23.55	23.99	17.03	1.09	0.57	23.02	23.90	1.54	36.06
1.5	19.88	23.68	23.97	18.93	1.10	0.60	22.81	24.05	1.63	35.35
2.0	19.86	23.85	22.22	20.83	1.12	0.63	23.03	24.25	1.55	35.25
2.5	19.83	24.02	20.77	21.60	1.13	0.66	22.91	24.22	1.56	34.66
3.0	19.80	24.22	19.74	21.38	1.14	0.68	22.77	24.10	1.59	34.14
3.5	19.78	24.41	18.60	21.89	1.16	0.70	22.53	23.86	1.67	33.63
4.0	19.76	24.62	17.17	25.54	1.17	0.73	21.90	23.21	1.72	32.38
4.5	19.73	24.88	14.92	26.27	1.19	0.76	21.88	23.13	1.79	32.16
5.0	19.71	25.13	12.66	20.78	1.21	0.78	20.95	22.09	1.91	30.79
5.5	19.70	25.40	11.25	17.40	1.22	0.79	21.28	22.09	1.92	31.03
6.0	19.75	25.66	10.99	16.46	1.23	0.80	20.40	21.28	1.95	30.42
6.5	19.89	25.86	11.31	16.23	1.25	0.80	19.85	20.85	1.96	29.71
7.0	19.93	26.06	11.50	15.31	1.26	0.81	20.07	21.20	2.07	29.71
7.5	19.78	26.43	10.12	13.74	1.30	0.84	19.64	20.86	2.20	29.12
8.0	19.49	26.93	8.64	13.14	1.34	0.89	19.49	20.70	2.38	29.29
8.5	19.33	27.47	7.86	12.63	1.39	0.93	19.03	19.85	2.55	28.87
9.0	19.21	27.72	7.74	12.08	1.42	0.91	19.50	19.84	2.69	29.39
9.5	19.29	27.37	8.32	10.94	1.38	0.86	19.32	19.53	2.60	28.61
10.0	19.32	27.29	9.61	9.89	1.41	0.81	19.31	19.45	2.61	28.78
10.5	19.24	27.05	10.97	8.58	1.40	0.75	19.47	19.79	2.58	29.03
11.0	18.87	27.18	10.68	7.70	1.43	0.73	19.36	19.87	2.68	28.59
11.5	18.20	27.63	9.18	7.23	1.49	0.75	19.19	19.74	2.74	28.64
12.0	17.96	27.60	8.66	7.26	1.51	0.77	19.01	19.70	2.73	28.63
12.5	17.64	27.60	8.51	8.13	1.59	0.83	19.20	19.77	2.77	28.77
13.0	17.06	27.85	8.35	8.85	1.73	0.88	19.12	19.57	3.07	28.95
13.5	16.20	28.57	7.75	9.50	2.00	0.94	18.86	19.43	3.43	28.85
14.0	15.18	29.46	6.63	9.80	2.31	1.02	18.57	19.30	3.86	28.85

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: $V_{DD} = +5\text{ V}$, $V_b = +5\text{ V}$ @ Temperature = -55°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	20.55	25.83	13.88	16.07	1.12	0.72	17.55	19.26	4.43	34.17
0.05	19.97	25.00	19.41	11.58	1.11	0.61	18.13	19.67	2.33	35.90
0.1	19.91	24.92	21.54	11.18	1.11	0.59	18.15	19.67	1.66	36.25
0.2	19.96	24.75	20.97	11.37	1.10	0.58	18.68	20.19	1.35	37.11
0.4	20.08	24.44	19.08	11.71	1.09	0.55	19.41	20.91	1.06	36.01
0.6	20.14	24.28	18.57	12.06	1.09	0.53	19.59	21.21	0.97	34.91
0.8	20.18	24.22	18.66	12.25	1.08	0.53	19.58	21.28	0.96	34.90
1.0	20.20	24.21	19.05	12.49	1.09	0.54	19.66	21.40	0.90	35.04
1.5	20.25	24.24	20.99	13.51	1.09	0.56	19.67	21.70	0.98	33.82
2.0	20.26	24.37	22.71	14.96	1.11	0.59	19.71	21.80	0.87	33.87
2.5	20.23	24.54	21.97	15.89	1.12	0.62	19.70	21.81	0.91	33.46
3.0	20.17	24.79	20.56	15.69	1.15	0.65	19.52	21.82	0.83	33.50
3.5	20.12	24.99	20.64	15.31	1.16	0.67	19.41	21.80	0.92	34.36
4.0	20.14	25.16	23.52	16.16	1.18	0.69	19.08	21.55	0.94	34.21
4.5	20.18	25.29	22.16	19.34	1.19	0.72	19.01	21.51	1.00	33.10
5.0	20.20	25.49	16.80	29.26	1.20	0.76	18.45	21.18	1.11	32.27
5.5	20.17	25.76	14.35	27.06	1.22	0.78	18.80	21.33	1.12	32.61
6.0	20.20	25.98	14.84	19.63	1.25	0.77	19.09	21.44	1.10	31.87
6.5	20.34	26.16	17.20	16.08	1.25	0.75	18.81	21.29	1.06	31.40
7.0	20.52	26.23	18.77	13.16	1.22	0.72	18.81	21.32	1.14	30.92
7.5	20.58	26.47	15.47	11.20	1.21	0.70	18.16	21.00	1.18	30.28
8.0	20.50	26.74	12.10	11.63	1.23	0.75	17.76	20.87	1.33	29.28
8.5	20.54	26.96	10.82	14.59	1.25	0.82	16.14	20.06	1.42	29.99
9.0	20.76	26.96	10.72	15.41	1.25	0.81	15.84	19.56	1.55	29.88
9.5	20.93	26.79	11.09	12.18	1.22	0.74	15.48	19.21	1.55	29.76
10.0	20.86	26.83	12.91	10.01	1.21	0.68	14.85	18.94	1.61	28.66
10.5	20.63	26.96	15.90	7.96	1.20	0.62	14.78	18.97	1.83	28.23
11.0	20.24	27.25	14.64	6.35	1.20	0.56	13.99	18.60	1.94	27.41
11.5	20.00	27.33	12.88	5.64	1.19	0.52	13.22	18.24	1.70	26.66
12.0	19.91	27.23	12.63	5.59	1.19	0.51	12.53	17.69	1.71	25.31
12.5	19.85	27.07	13.21	5.76	1.19	0.53	12.74	18.14	1.87	25.08
13.0	19.55	27.16	13.08	5.51	1.21	0.52	12.85	18.31	2.05	24.71
13.5	18.83	27.72	11.30	5.03	1.29	0.53	12.81	18.02	2.37	23.59
14.0	18.10	28.54	8.57	4.48	1.38	0.54	12.32	17.64	2.71	22.81

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions**Definitions:**

Input Return Loss = S11 (dB)

Gain(Power Gain) = S21 (dB)

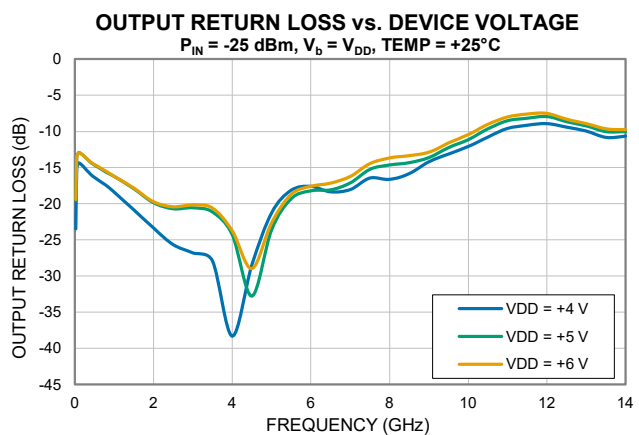
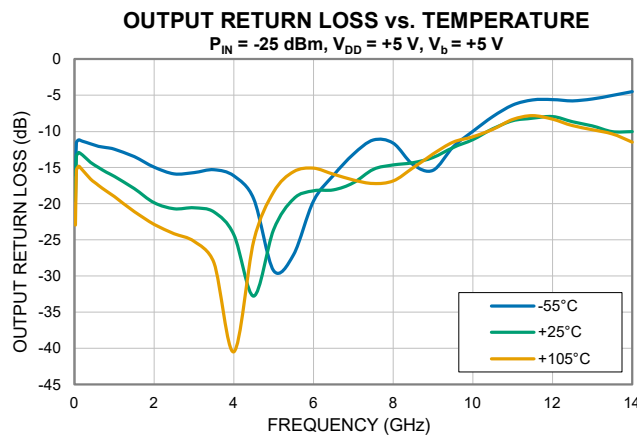
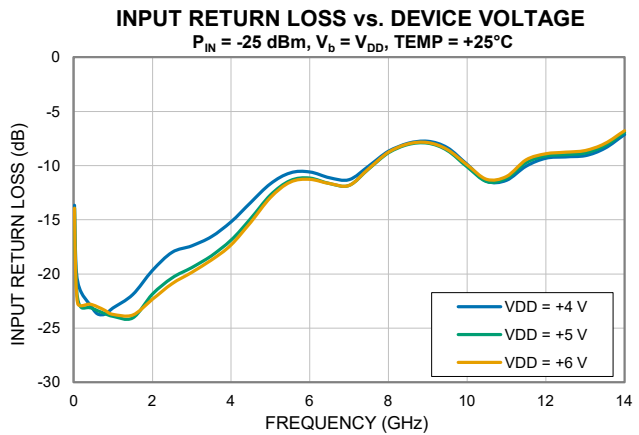
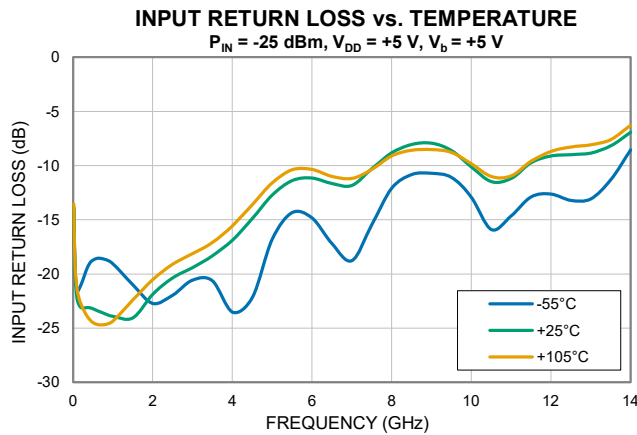
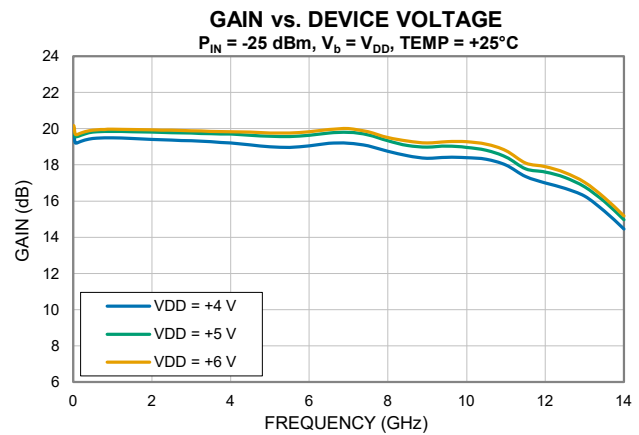
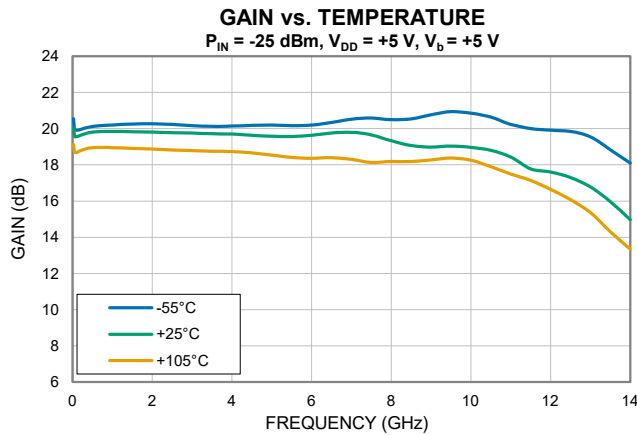
Reverse Isolation = S12 (dB)

Output Return Loss = S22 (dB)

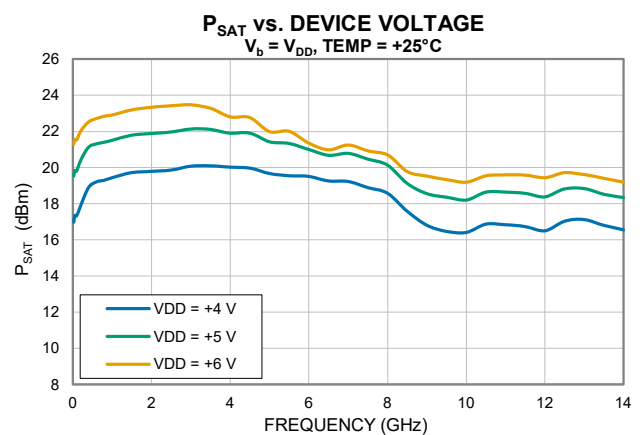
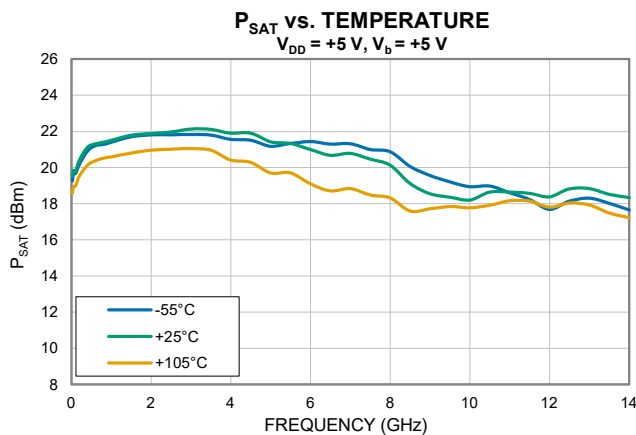
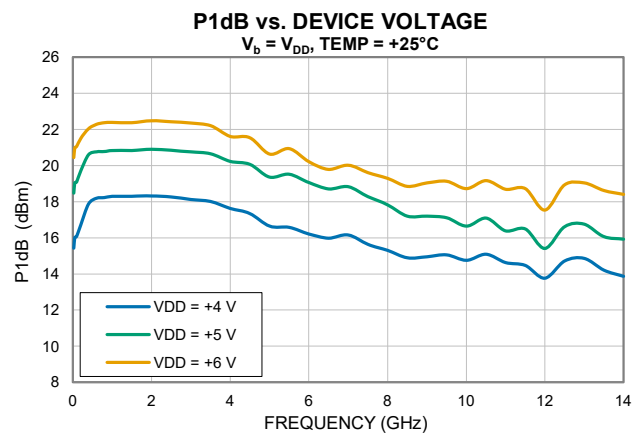
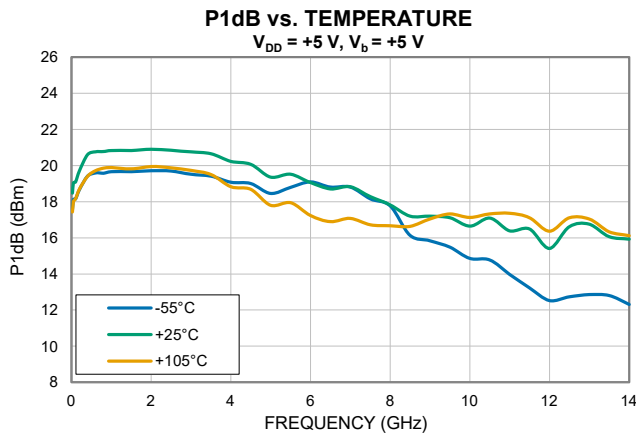
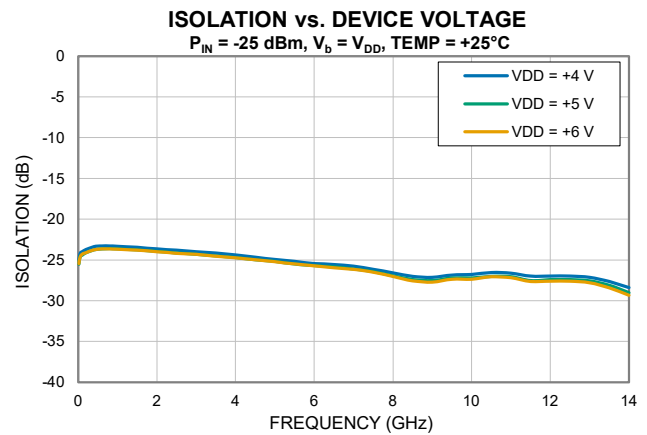
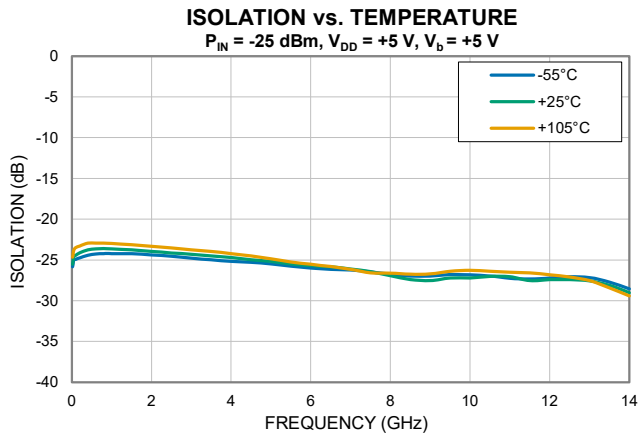
TEST CONDITIONS: $V_{DD} = +5\text{ V}$, $V_b = +5\text{ V}$ @ Temperature = $+105^\circ\text{C}$

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		1dB Comp. Output	Psat Output	Noise Figure	OIP3 Output
(GHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)	(dBm)
0.02	19.12	24.65	13.54	22.97	1.14	0.77	17.43	18.58	6.14	35.66
0.05	18.71	23.81	19.18	15.41	1.12	0.68	18.00	18.94	3.39	36.14
0.1	18.68	23.49	21.34	14.84	1.11	0.65	18.17	18.99	2.67	34.96
0.2	18.78	23.27	22.81	15.33	1.10	0.62	18.70	19.54	2.38	35.85
0.4	18.92	22.95	24.15	16.59	1.09	0.59	19.40	20.13	2.06	34.86
0.6	18.95	22.92	24.66	17.45	1.09	0.59	19.72	20.38	1.96	34.31
0.8	18.96	22.93	24.66	18.26	1.10	0.59	19.85	20.52	1.93	33.85
1.0	18.95	22.99	24.35	19.04	1.10	0.61	19.89	20.59	1.89	34.00
1.5	18.91	23.14	22.41	21.10	1.12	0.64	19.82	20.81	2.03	32.77
2.0	18.86	23.33	20.52	22.87	1.14	0.66	19.94	20.95	1.91	33.34
2.5	18.82	23.53	19.10	24.14	1.15	0.69	19.88	21.02	1.90	32.52
3.0	18.79	23.75	18.12	25.22	1.17	0.72	19.73	21.05	1.97	32.43
3.5	18.76	23.95	17.10	28.19	1.19	0.74	19.50	20.95	2.10	32.83
4.0	18.72	24.22	15.56	40.50	1.21	0.77	18.83	20.41	2.15	32.58
4.5	18.66	24.51	13.59	25.18	1.24	0.80	18.68	20.29	2.26	31.53
5.0	18.53	24.85	11.59	18.40	1.27	0.82	17.81	19.69	2.40	30.24
5.5	18.40	25.23	10.39	15.57	1.30	0.84	17.94	19.70	2.50	30.73
6.0	18.37	25.53	10.37	15.10	1.33	0.85	17.24	19.09	2.52	29.68
6.5	18.40	25.81	10.99	15.91	1.37	0.86	16.89	18.71	2.54	28.88
7.0	18.30	26.15	11.19	16.72	1.43	0.89	17.07	18.84	2.63	28.66
7.5	18.13	26.58	10.35	17.21	1.49	0.92	16.72	18.48	2.81	28.07
8.0	18.18	26.60	9.11	16.85	1.45	0.95	16.67	18.32	2.87	28.04
8.5	18.18	26.76	8.59	15.04	1.46	0.94	16.64	17.59	3.01	28.05
9.0	18.27	26.71	8.54	13.15	1.44	0.91	17.05	17.71	3.15	28.68
9.5	18.37	26.39	8.78	11.50	1.39	0.86	17.32	17.84	3.06	27.74
10.0	18.26	26.28	9.84	10.75	1.41	0.83	17.12	17.77	3.06	27.60
10.5	17.90	26.37	11.01	9.72	1.46	0.80	17.32	17.91	3.28	27.20
11.0	17.50	26.50	10.95	8.35	1.49	0.76	17.36	18.16	3.48	27.27
11.5	17.14	26.58	9.60	7.84	1.51	0.76	17.12	18.14	3.15	27.68
12.0	16.65	26.81	8.70	8.32	1.60	0.82	16.36	17.80	3.00	27.68
12.5	16.08	27.09	8.28	9.19	1.74	0.89	17.11	18.03	3.19	27.50
13.0	15.37	27.54	8.09	9.77	1.96	0.94	17.04	17.93	3.42	27.61
13.5	14.32	28.44	7.60	10.34	2.37	1.00	16.34	17.48	3.95	27.20
14.0	13.33	29.41	6.28	11.48	2.76	1.10	16.12	17.21	4.34	27.97

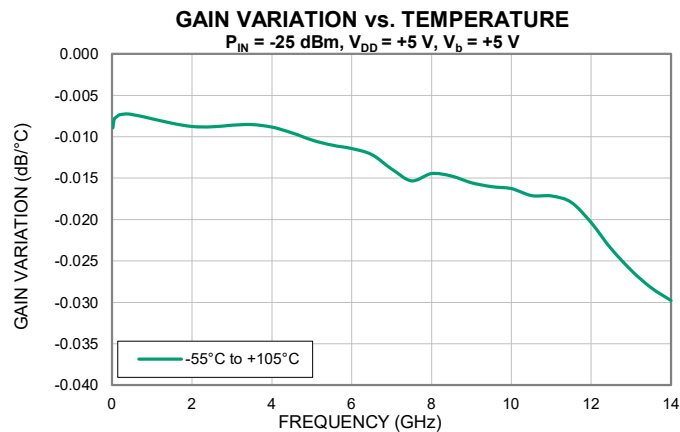
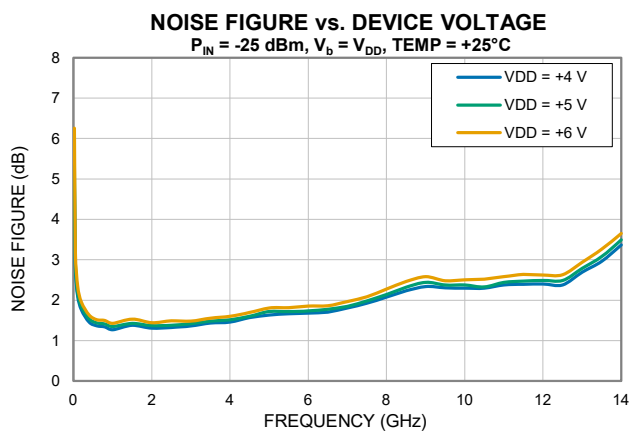
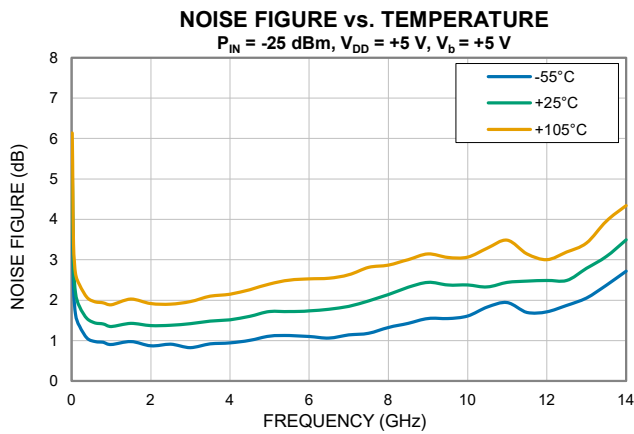
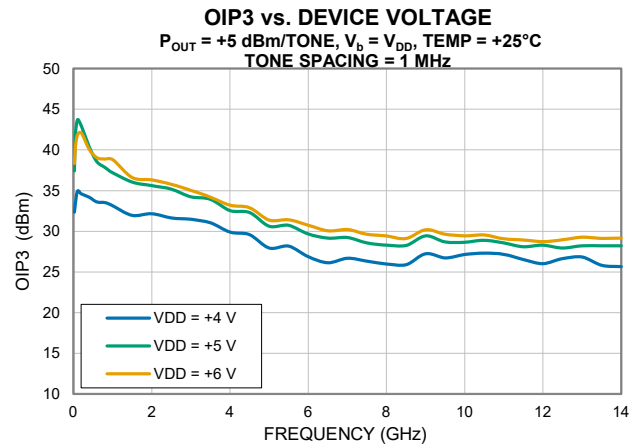
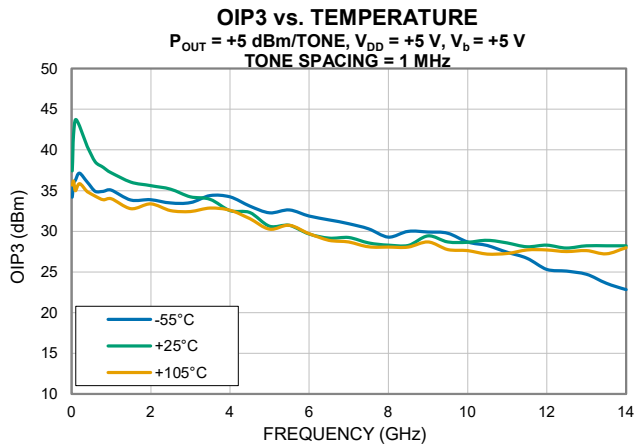
Typical Performance Curves



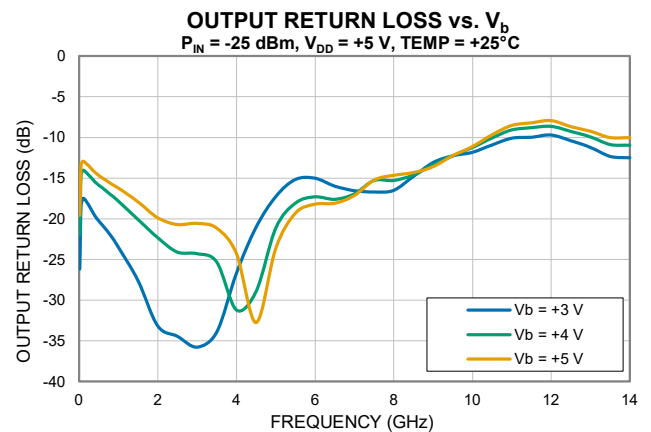
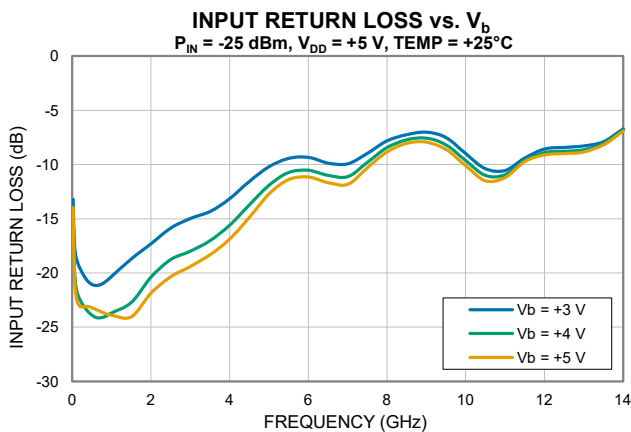
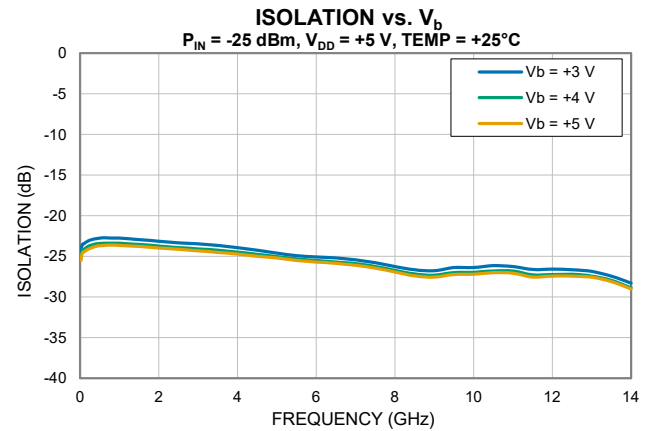
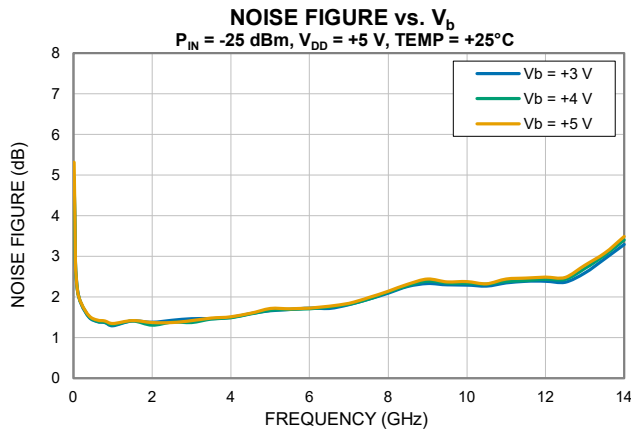
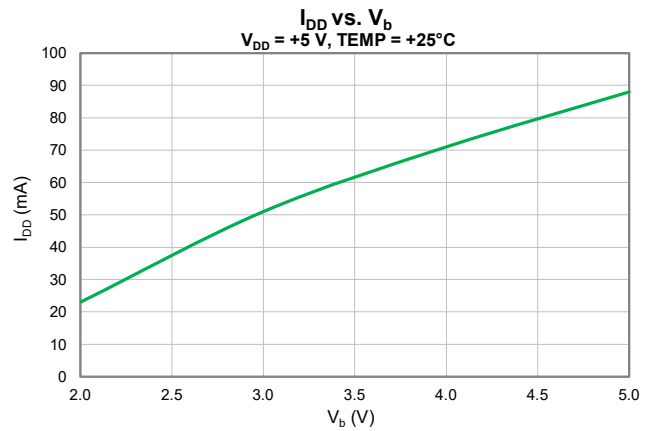
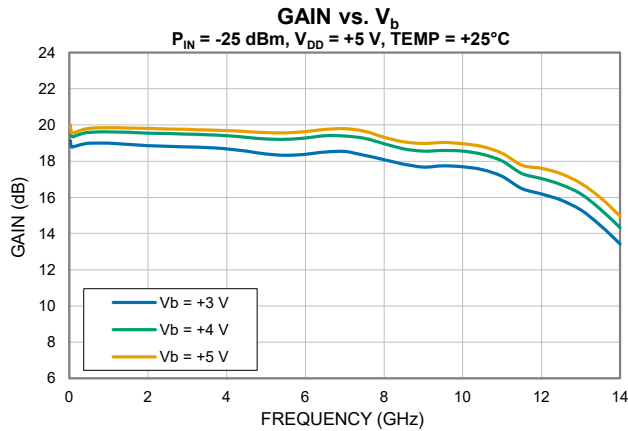
Typical Performance Curves



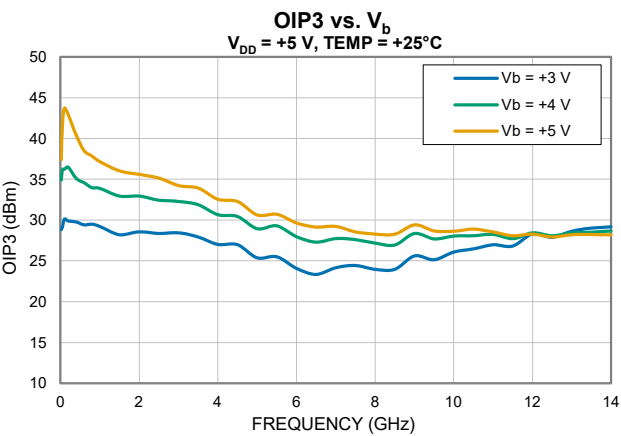
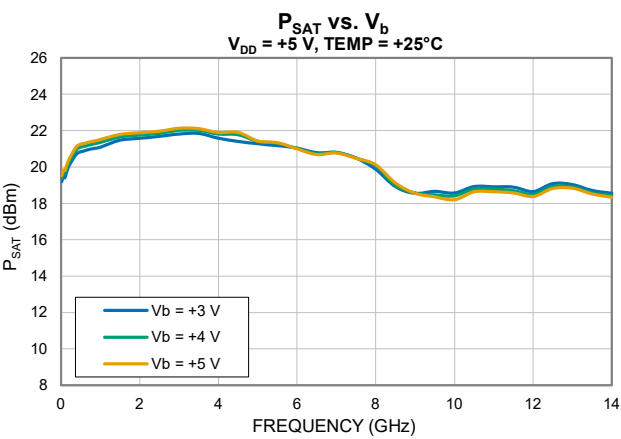
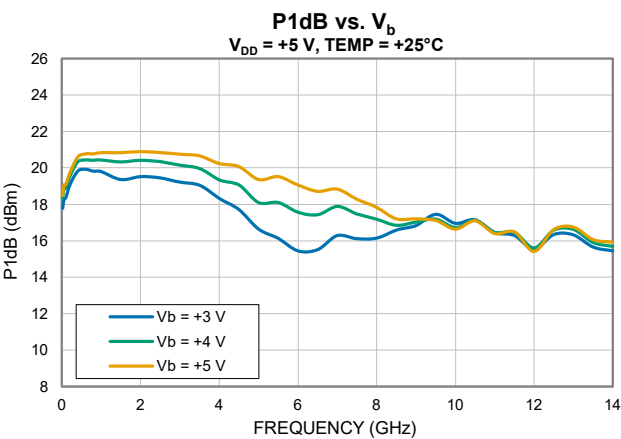
Typical Performance Curves



Typical Performance Curves



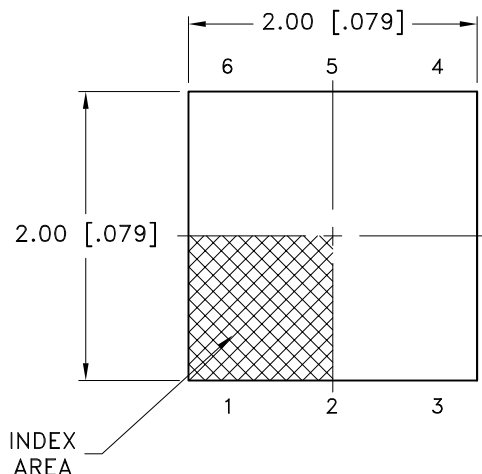
Typical Performance Curves



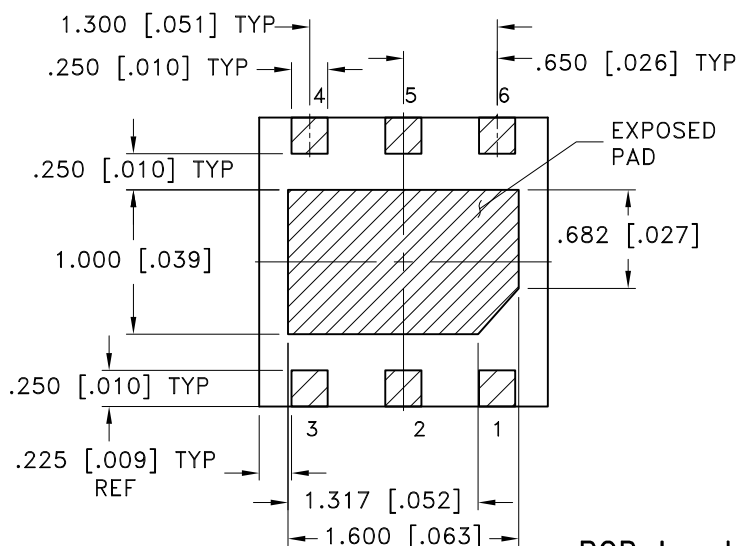
Outline Dimensions

MC1630-2

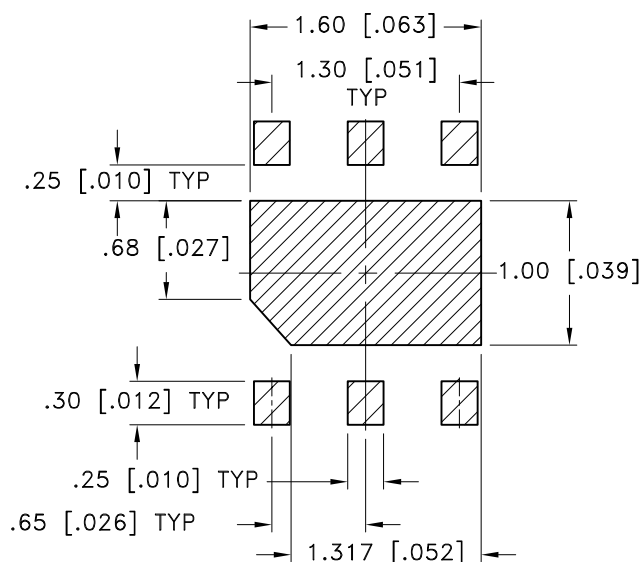
TOP VIEW



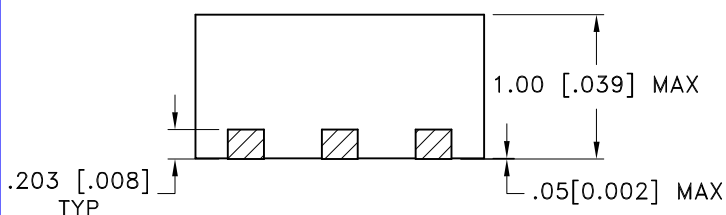
BOTTOM VIEW

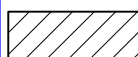


PCB Land Pattern



Suggested Layout



 DENOTES METALLIZATION

Weight: 0.0108 grams

Dimensions are in mm [inches]. Tolerances: 2 Pl. and 3 Pl. $\pm 0.05 [0.002]$ mm [Inches]

Notes:

1. Case material: Plastic.
2. Termination finish:
For RoHS Case Styles: Matte-Tin plated.
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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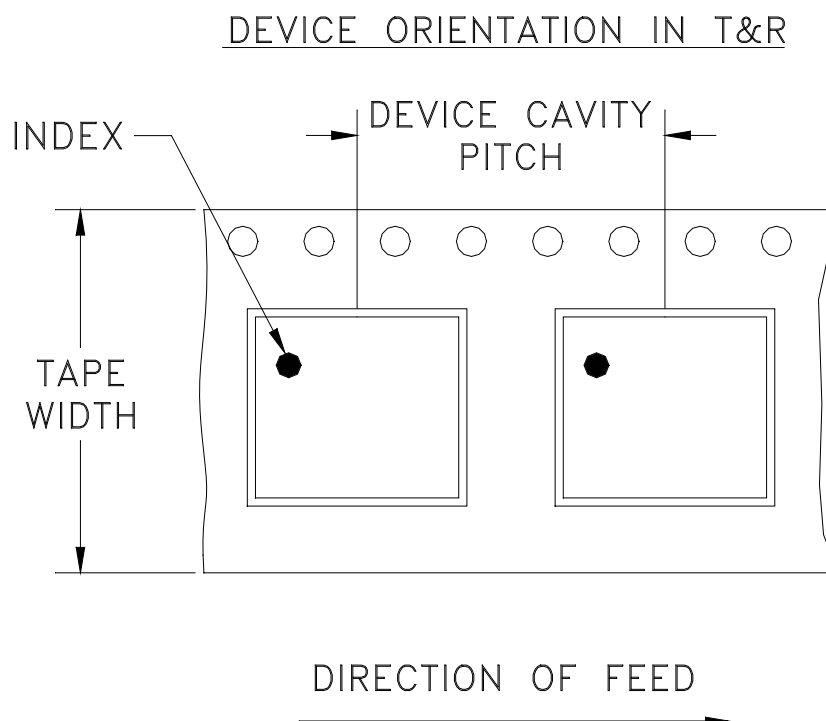
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

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

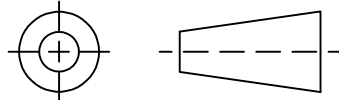


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P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

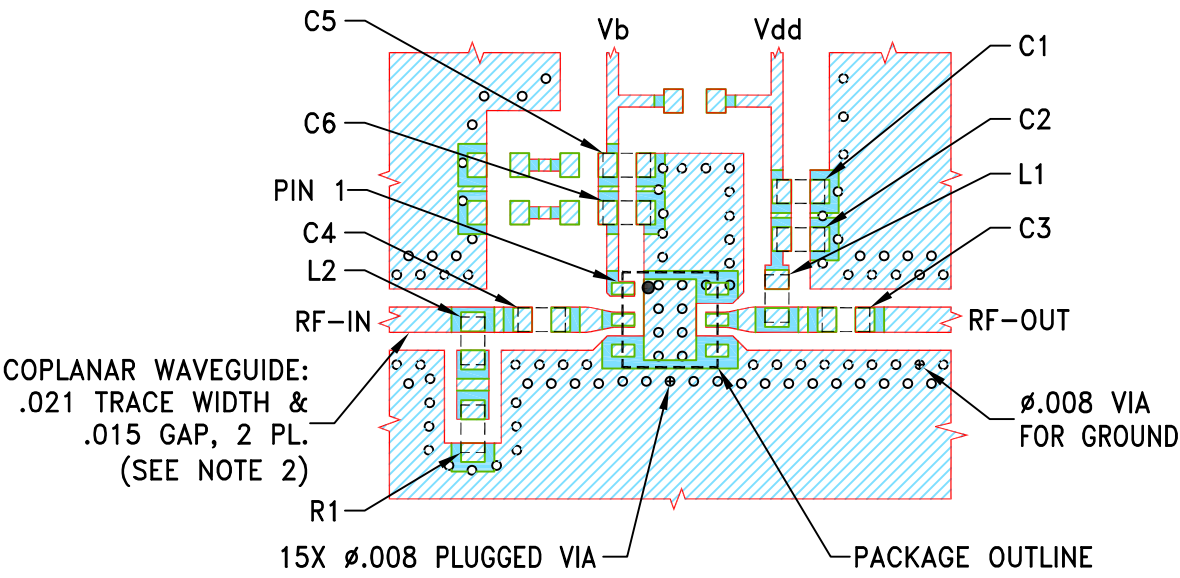
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

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THIRD ANGLE PROJECTION	
	

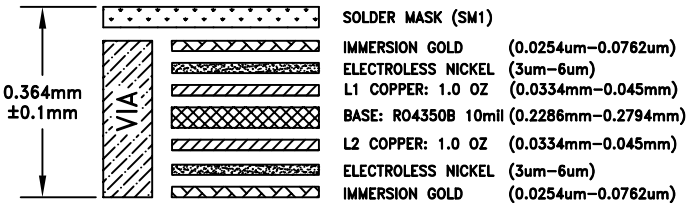
REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-025873	NEW RELEASE	06/12/25	ITG	IL

SUGGESTED MOUNTING CONFIGURATION
FOR MC1631-2 CASE STYLE

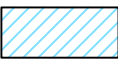


COMPONENT	SIZE
C1-C6	0402
L1, L2	0402
R1	0402

2 LAYER STACK-UP DETAIL



- NOTES:
- PCB IS 2 LAYER PCB, SEE STACK-UP DIAGRAM.
 - TRACE WIDTH & GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010".
COPPER: 1 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
 - CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUES REFER TO TB-PMA2-123LNW+.
 - LAYERS 2 OF PCB ARE CONTINUOUS GROUND PLANE.

-  DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
-  DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES	DRAWN	ITG	06/12/25
TOLERANCES ON:	CHECKED	GF	06/12/25
2 PL DECIMALS ±	APPROVED	IL	06/12/25
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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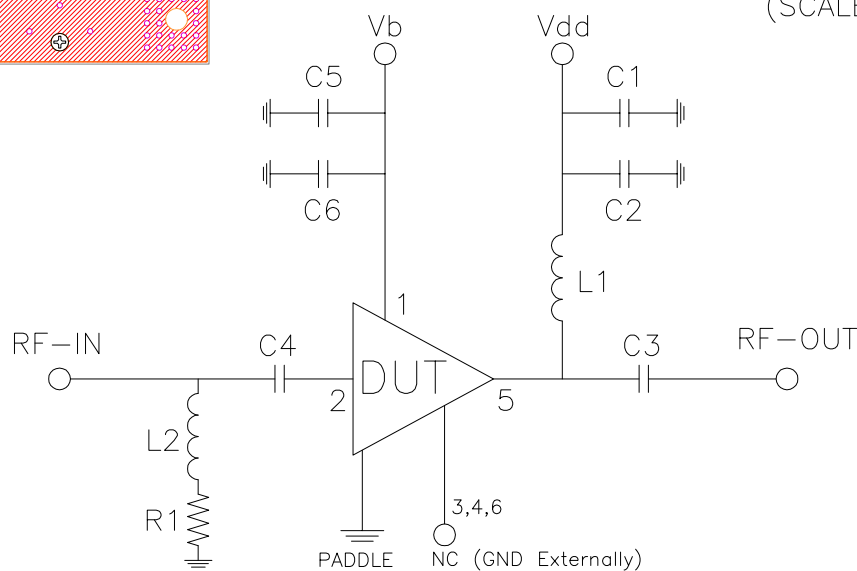
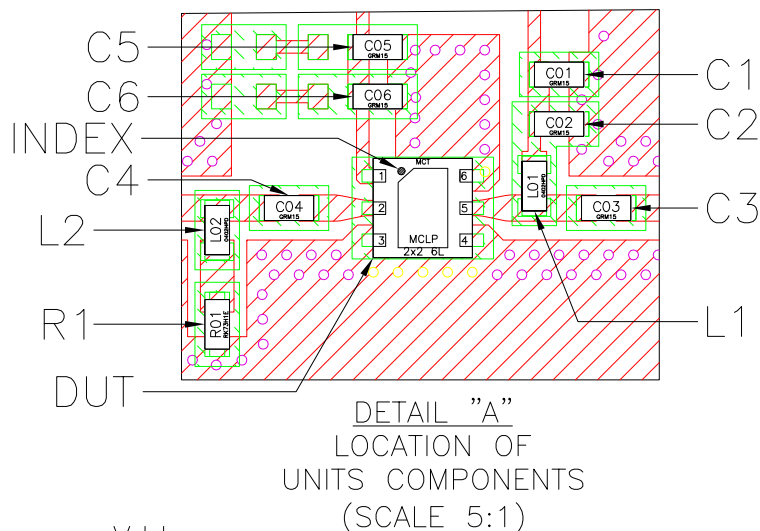
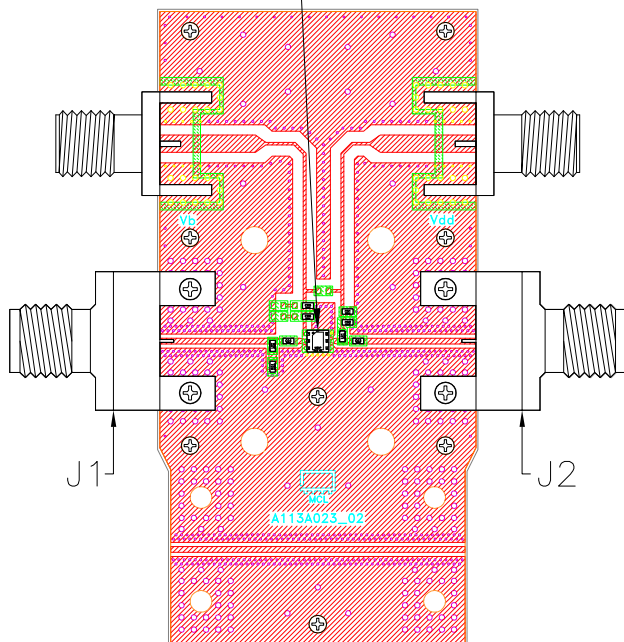
13 Neptune Avenue
Brooklyn NY 11235

PL,MC1630-2,TB-PMA2-123LNW(C)+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-828	OR
FILE:	98PL828	SCALE:	SHEET:
		6:1	1 OF 1

Evaluation Board and Circuit

SEE DETAIL "A"



SCHEMATIC DIAGRAM

Component	Size	Value	Part Number	Manufacturer
C1,C5	0402	0.1uF	GRM155R71H104KE14J	Murata
C2,C6	0402	100pF	GRM1555C1H101JA01D	Murata
C3	0402	0.01uF	GRM155R71E103KA01D	Murata
C4	0402	1uF	GRM155C81E105KE11D	Murata
L1,L2	0402	900nH	0402DF-901XJRU	Coilcraft
R1	0402	820hm	RK73B1ETTP820J	KOA Speer
J1,J2	N/A	N/A	1092-01A-5	Southwest

Notes:

- 2.92mm Female Connectors.
- PCB Material: Roger R04350B or equivalent,
Dielectric constant=3.5, Thickness=0.010 inch



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