



Mini-Circuits

LOW NOISE, WIDEBAND, HIGH IP3

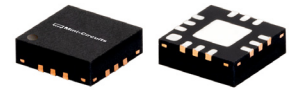
Monolithic Amplifier

PMA3-83LN+

50Ω 0.5 to 8.0 GHz

THE BIG DEAL

- Flat gain over wideband
- Low noise figure, 1.3 dB at 2 GHz
- High IP3, +35 dBm at 2 GHz
- High Pout, P1dB 20.7 dBm at 2 GHz and +6V
- Suitable for low phase noise applications



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

+RoHS Compliant

The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- WiFi
- WLAN
- UMTS
- LTE
- WiMAX
- S-band Radar
- C-band Satcom

PRODUCT OVERVIEW

The PMA3-83LN+ is a PHEMT based wideband, low noise MMIC amplifier with a unique combination of low noise, high IP3, and flat gain over wideband making it ideal for sensitive, high-dynamic-range receiver applications. This design operates on a single +5V or +6V supply, is well matched for 50Ω and comes in a tiny, low profile package (3 x 3 x 0.89mm), accommodating dense circuit board layouts.

KEY FEATURES

Feature	Advantages
Low noise, 1.3 dB at 2 GHz	Enables lower system noise figure performance.
High IP3 • +35 dBm at 2 GHz • +28.5 dBm at 8 GHz	Combination of low noise and high IP3 makes this MMIC amplifier ideal for use in low noise receiver front end (RFE) as it gives the user advantages of sensitivity and two-tone IM performance at both ends of the dynamic range.
Low operating voltage, +5V/+6V.	Achieves high IP3 using low voltage.
3 x 3mm 12-lead MCLP package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.
Wide bandwidth with flat gain • ±0.9 dB over 0.5 to 7 GHz • ±1.5 dB over 0.5 to 8 GHz	Enables a single amplifier to be used in many wideband applications including defense, instrumentation and more.
Low additive phase noise, typically -155 dBc/Hz @10 KHz offset	Ideal for low phase noise synthesizer applications

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ELECTRICAL SPECIFICATIONS¹ AT +25°C AND +5V, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	V _{DD} = +6			V _{DD} = +5			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range		0.5		8.0	0.5		8.0	GHz
Noise Figure	0.5		1.8			1.9		dB
	2.0		1.3	1.7		1.3		
	4.0		1.5			1.5	1.9	
	5.0		1.5			1.6		
	8.0		2.2			2.2		
Additive Phase Noise	2.0 GHz, 10KHz offset		-155			-155		dBc/Hz
Gain	0.5		21.8			21.0		dB
	2.0	19.9	22.1	24.3		21.3		
	4.0		21.5			20.8		
	5.0		21.2		18.7	20.5		
	8.0		19.2			18.7		
Input Return Loss	0.5		14.2			13.1		dB
	2.0		16.0			16.0		
	4.0		13.0			12.2		
	5.0		12.5			12.4		
	8.0		6.3			6.3		
Output Return Loss	0.5		12.9			13.7		dB
	2.0		13.0			14.3		
	4.0		28.8			27.5		
	5.0		20.3			18.4		
	8.0		12.9			12.6		
Output Power at 1dB Compression ²	0.5		+18.6			+16.3		dBm
	2.0		+20.7			+19.1		
	4.0		+19.6			+17.6		
	5.0		+20.3		+17.2	+18.9		
	8.0		+18.0			+17.3		
Output IP3	0.5		+34.2			+29.7		dBm
	2.0		+35.2			+30.0		
	4.0		+34.0			+29.6		
	5.0		+34.0		+24.0	+29.7		
	8.0		+28.5			+26.2		
Device Operating Voltage (V _{DD})			+6			+5		V
Device Operating Current (I _{DD})			77	94		60		mA
Device Current Variation vs. Temperature ³			-152			-109		μA/°C
Device Current Variation vs. Voltage			0.016			0.016		mA/mV
Thermal Resistance, junction-to-ground lead			47			47		°C/W

1. Measured on Mini-Circuits Characterization test board TB-830A+. See Characterization Test Circuit (Fig. 1)

2. Current increases at P1dB to 109 mA typ. at +6V V_{DD} and 88mA typ. at +5V V_{DD}

3. (Current at 85°C - Current at -45°C)/130

ABSOLUTE MAXIMUM RATINGS⁴

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to +105°C
Storage Temperature	-65°C to +150°C
Junction Temperature	+150°C
Total Power Dissipation	0.95 W
Input Power (CW), V _d = +5, +6V ⁵	+19 dBm (5 minutes max.) +16 dBm (continuous)
DC Voltage	+7 V

4. Permanent damage may occur if any of these limits are exceeded. Electrical maximum ratings are not intended for continuous normal operation.

5. Measured on Mini-Circuits test board, TB-830A+





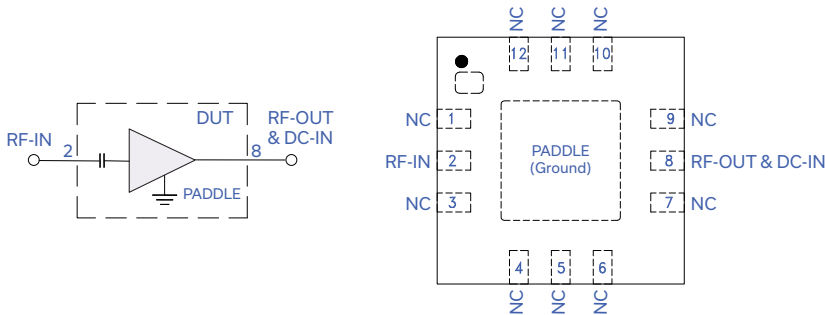
LOW NOISE, WIDEBAND, HIGH IP3

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PMA3-83LN+

50Ω 0.5 to 8.0 GHz

SIMPLIFIED SCHEMATIC & PAD DESCRIPTION



Function	Pad Number	Description (See Figure 1)
RF-IN	2	Connects to RF input and to ground via L1 (optional blocking capacitor of 100pF may be used)
RF-OUT & DC-IN	8	Connects to RF out via C3 and V_{DD} via L2
Ground	Paddle	Connects to ground
No Connection	1, 3 to 7, 9 to 12	Not used internally. Connected to ground on test board (except 11 and 12)

RECOMMENDED APPLICATION AND CHARACTERIZATION TEST CIRCUIT

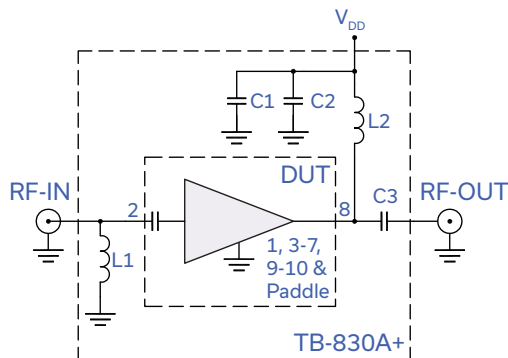


Fig 1. Application and Characterization Circuit

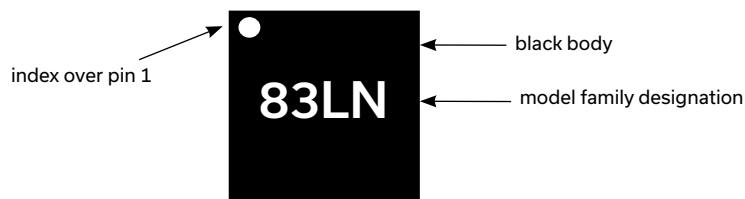
Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-830A+) Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:

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

Component	Vendor	Vendor P/N	Value	Size
C1	Murata	GRM155R71E103KA01D	0.01μF	0402
C2	Murata	GJM1555C1H100JB01D	10pF	0402
C3	Murata	GRM1555C1H101JA01D	100pF	0402
L1	Murata	LQG15HS18NJ02D	18nH	0402
L2	Coilcraft	0402CS-39NXGLW	39nH	0402

PRODUCT MARKING



Marking may contain other features or characters for internal lot control





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Monolithic Amplifier

PMA3-83LN+

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50Ω 0.5 to 8.0 GHz

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

Performance Data	Data Table
	Swept Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DQ1225 Plastic package, exposed paddle, lead finish: Matte-Tin
Tape & Reel	F66
Standard quantities available on reel	7" reels with 20, 50, 100, 200, 500, 1K, 2K or 3K devices
Suggested Layout for PCB Design	PL-456
Evaluation Board	TB-830A+
Environmental Ratings	ENV08T1

ESD RATING

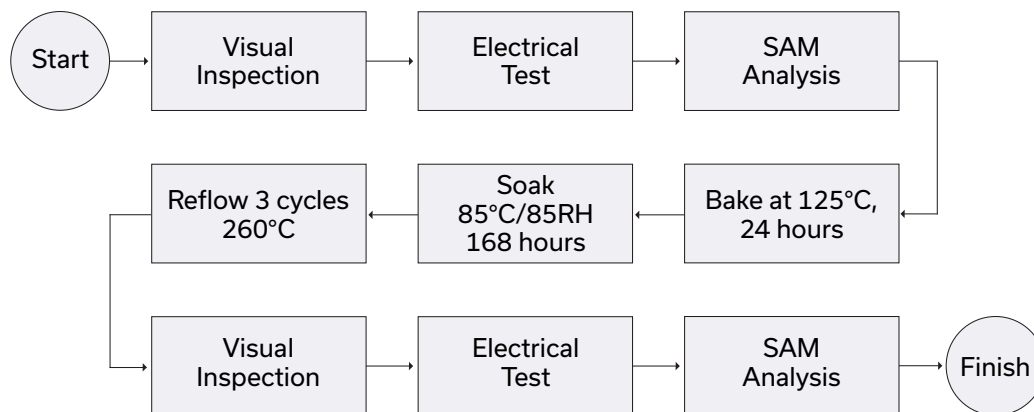
Human Body Model (HBM): Class 1A (250 to <500V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (pass 50V) in accordance with ANSI/ESD STM5.2-1999

MSL RATING

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

MSL TEST FLOW CHART



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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/MCLStore/terms.jsp



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: Vd = 6.00V, Id = 81.87mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	13.84	35.30	1.66	2.64	1.40	0.68	37.67	18.04	4.33
300	18.80	30.12	4.49	5.62	1.21	0.80	33.86	17.25	2.40
400	20.85	27.93	9.09	9.59	1.15	0.77	34.91	18.03	1.70
500	21.61	27.07	15.30	12.30	1.12	0.69	34.65	18.90	1.51
600	21.90	26.74	24.64	12.65	1.10	0.63	35.85	19.80	1.39
700	22.00	26.59	30.55	12.08	1.10	0.58	36.68	20.34	1.28
800	22.03	26.53	22.97	11.50	1.09	0.56	37.84	20.71	1.21
1000	22.04	26.47	18.25	10.82	1.09	0.53	37.89	21.19	1.19
1200	22.03	26.45	16.79	10.62	1.09	0.52	41.54	21.49	1.18
1400	22.01	26.44	16.26	10.71	1.09	0.52	39.67	21.70	1.25
1600	21.99	26.44	16.13	10.96	1.09	0.53	41.73	21.56	1.35
1800	21.96	26.45	16.16	11.31	1.09	0.55	41.15	21.59	1.33
2000	21.96	26.42	16.30	11.81	1.09	0.56	37.28	21.19	1.25
2200	21.93	26.41	16.46	12.39	1.10	0.58	36.02	20.87	1.33
2400	21.90	26.44	16.61	13.08	1.10	0.59	38.37	21.35	1.30
2600	21.85	26.47	16.69	13.84	1.11	0.61	37.84	20.80	1.38
2800	21.78	26.51	16.78	14.78	1.12	0.64	36.52	20.70	1.42
3000	21.75	26.53	16.71	15.98	1.12	0.65	34.15	20.45	1.36
3200	21.74	26.53	16.19	17.29	1.12	0.67	35.65	20.17	1.37
3400	21.73	26.52	15.70	18.67	1.12	0.68	35.40	19.83	1.39
3600	21.69	26.55	15.23	20.28	1.12	0.69	35.85	19.89	1.47
3800	21.67	26.58	14.83	22.08	1.13	0.71	34.07	19.62	1.41
4000	21.63	26.58	14.58	24.04	1.13	0.72	34.28	19.84	1.41
4200	21.60	26.64	14.36	26.48	1.13	0.73	35.08	19.98	1.42
4400	21.57	26.67	14.21	28.86	1.14	0.73	34.28	20.02	1.44
4600	21.53	26.69	14.22	29.98	1.14	0.74	35.77	20.27	1.44
4800	21.49	26.72	14.29	30.23	1.15	0.74	34.70	20.17	1.41
5000	21.46	26.78	14.35	30.24	1.15	0.75	32.87	20.51	1.39
5200	21.44	26.81	14.42	28.49	1.16	0.75	33.57	20.35	1.44
5400	21.42	26.89	14.45	28.47	1.16	0.76	33.60	19.99	1.44
5600	21.39	26.93	14.52	27.58	1.17	0.76	34.54	20.34	1.47
5800	21.37	27.00	14.31	26.47	1.17	0.77	34.65	20.76	1.45
6000	21.36	27.08	14.18	26.12	1.18	0.78	33.13	20.38	1.49
6200	21.31	27.15	13.88	25.34	1.18	0.79	32.54	20.01	1.55
6400	21.25	27.29	13.28	24.04	1.19	0.81	33.30	19.94	1.58
6600	21.18	27.37	12.78	24.41	1.20	0.82	33.76	20.07	1.62
6800	21.04	27.62	12.15	25.00	1.22	0.85	33.11	19.81	1.71
7000	20.49	28.20	12.13	23.47	1.33	0.89	31.54	18.75	1.83
7200	20.39	28.32	11.71	18.75	1.33	0.91	31.02	18.59	1.99
7400	20.53	28.21	9.78	18.04	1.24	0.94	30.53	18.55	1.86
7600	20.41	28.36	8.69	17.28	1.22	0.98	30.21	18.54	1.91
7800	20.10	28.67	7.66	16.18	1.22	1.04	29.64	18.49	1.99
8000	19.77	28.96	6.79	15.07	1.22	1.09	29.31	18.00	2.10
8200	19.40	29.33	6.02	13.96	1.22	1.14	28.79	17.78	2.19
8400	18.98	29.65	5.40	12.83	1.22	1.18	28.14	17.57	2.31
8600	18.49	30.00	4.83	11.71	1.22	1.21	27.62	17.19	2.43
8800	17.97	30.25	4.38	10.76	1.22	1.24	27.63	17.20	2.57
9000	17.40	30.67	3.95	9.96	1.23	1.26	27.43	17.26	2.74
9200	16.81	31.00	3.60	9.24	1.24	1.28	26.49	16.50	2.95
9400	16.15	31.29	3.29	8.72	1.26	1.29	26.29	16.36	3.10
9600	15.45	31.49	3.05	8.42	1.31	1.30	25.95	16.17	3.35
9800	14.59	31.86	2.85	8.46	1.45	1.32	25.31	15.32	3.55
10000	13.28	32.32	2.71	8.60	1.76	1.33	23.64	13.91	3.83

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: Vd = 5.00V, Id = 64.76mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	13.29	34.75	1.64	2.80	1.42	0.71	32.25	15.61	4.34
300	18.17	29.63	4.33	5.84	1.22	0.83	29.86	14.94	2.46
400	20.21	27.45	8.57	9.93	1.16	0.79	31.16	15.74	1.72
500	21.00	26.56	13.96	13.07	1.13	0.71	31.24	16.57	1.52
600	21.31	26.21	21.08	13.75	1.11	0.65	31.58	17.51	1.40
700	21.44	26.05	31.64	13.21	1.10	0.61	32.68	18.17	1.29
800	21.48	25.97	27.38	12.58	1.10	0.58	32.94	18.71	1.23
1000	21.50	25.90	20.56	11.82	1.09	0.55	31.72	19.54	1.21
1200	21.49	25.89	18.50	11.60	1.09	0.54	34.79	19.76	1.22
1400	21.48	25.88	17.62	11.70	1.09	0.55	35.38	20.05	1.26
1600	21.45	25.89	17.21	11.98	1.10	0.56	34.66	19.90	1.37
1800	21.42	25.92	16.87	12.38	1.10	0.58	33.35	19.99	1.32
2000	21.40	25.90	16.75	12.96	1.10	0.59	31.91	19.47	1.30
2200	21.37	25.91	16.53	13.64	1.10	0.61	32.00	19.15	1.34
2400	21.33	25.95	16.37	14.44	1.11	0.63	33.22	19.72	1.30
2600	21.27	26.00	16.14	15.33	1.11	0.65	31.60	18.86	1.42
2800	21.20	26.07	15.96	16.46	1.13	0.67	30.99	18.82	1.41
3000	21.15	26.10	15.60	17.90	1.13	0.69	30.13	18.54	1.40
3200	21.14	26.12	15.00	19.54	1.13	0.70	31.01	18.04	1.38
3400	21.12	26.12	14.46	21.32	1.13	0.72	30.71	17.51	1.39
3600	21.09	26.15	14.00	23.41	1.13	0.73	30.77	17.52	1.47
3800	21.07	26.19	13.63	25.73	1.13	0.74	30.00	17.22	1.41
4000	21.03	26.20	13.41	27.94	1.13	0.75	30.19	17.73	1.44
4200	21.01	26.26	13.24	29.86	1.14	0.76	30.63	18.11	1.45
4400	20.97	26.31	13.12	29.78	1.14	0.76	30.29	18.08	1.43
4600	20.95	26.33	13.16	28.22	1.14	0.77	30.82	18.49	1.45
4800	20.91	26.36	13.25	26.68	1.15	0.77	30.55	18.43	1.40
5000	20.89	26.43	13.36	25.83	1.16	0.77	29.28	18.80	1.40
5200	20.87	26.46	13.43	24.38	1.16	0.78	29.96	19.00	1.43
5400	20.85	26.54	13.49	24.02	1.17	0.78	30.02	18.69	1.45
5600	20.83	26.58	13.54	23.26	1.17	0.78	30.75	19.16	1.47
5800	20.81	26.65	13.41	22.47	1.17	0.79	30.56	19.66	1.46
6000	20.80	26.73	13.31	22.00	1.18	0.80	29.46	19.34	1.48
6200	20.75	26.79	13.04	21.50	1.18	0.81	29.49	18.99	1.57
6400	20.70	26.93	12.54	20.62	1.18	0.83	29.95	18.97	1.56
6600	20.63	27.01	12.12	20.86	1.19	0.84	30.44	19.09	1.63
6800	20.49	27.26	11.57	21.37	1.22	0.87	30.03	18.92	1.70
7000	19.93	27.85	11.61	21.12	1.34	0.91	28.81	17.86	1.80
7200	19.82	27.97	11.24	17.06	1.33	0.92	28.31	17.71	1.99
7400	19.96	27.86	9.42	16.45	1.23	0.96	28.07	17.68	1.87
7600	19.84	28.00	8.39	15.92	1.21	1.00	27.68	17.72	1.90
7800	19.53	28.30	7.43	15.10	1.21	1.05	27.46	17.63	1.99
8000	19.20	28.59	6.62	14.25	1.21	1.10	27.14	17.13	2.10
8200	18.83	28.95	5.88	13.36	1.21	1.15	26.52	16.92	2.18
8400	18.41	29.27	5.28	12.42	1.21	1.19	26.07	16.71	2.29
8600	17.93	29.62	4.73	11.44	1.21	1.22	25.53	16.34	2.44
8800	17.42	29.88	4.29	10.59	1.21	1.25	25.64	16.38	2.57
9000	16.86	30.29	3.90	9.86	1.23	1.27	25.41	16.32	2.73
9200	16.28	30.63	3.56	9.19	1.24	1.28	24.49	15.61	2.94
9400	15.63	30.95	3.27	8.71	1.27	1.29	24.29	15.39	3.12
9600	14.95	31.17	3.02	8.46	1.32	1.31	24.00	15.20	3.32
9800	14.08	31.57	2.84	8.55	1.48	1.32	23.52	14.34	3.55
10000	12.77	32.07	2.70	8.73	1.82	1.34	22.05	12.89	3.82

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: Vd = 6.25V, Id = 85.52mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	13.95	35.41	1.66	2.62	1.40	0.67	38.20	18.82	4.35
300	18.91	30.20	4.50	5.60	1.21	0.79	34.50	18.03	2.41
400	20.96	28.02	9.15	9.55	1.15	0.76	35.82	18.83	1.70
500	21.72	27.16	15.44	12.23	1.12	0.69	35.10	19.65	1.51
600	22.00	26.83	25.04	12.57	1.10	0.62	35.71	20.54	1.40
700	22.11	26.69	29.96	12.00	1.10	0.58	37.75	21.03	1.26
800	22.14	26.62	22.64	11.43	1.09	0.55	37.98	21.32	1.19
1000	22.14	26.57	18.05	10.75	1.09	0.53	38.98	21.75	1.18
1200	22.13	26.55	16.65	10.55	1.09	0.52	40.80	22.03	1.18
1400	22.11	26.54	16.16	10.64	1.09	0.52	39.69	22.23	1.24
1600	22.09	26.53	16.06	10.89	1.09	0.53	40.39	22.10	1.32
1800	22.07	26.55	16.08	11.22	1.09	0.54	45.08	22.14	1.31
2000	22.06	26.51	16.28	11.72	1.09	0.56	39.04	21.68	1.27
2200	22.03	26.50	16.44	12.30	1.10	0.57	37.07	21.41	1.31
2400	22.00	26.52	16.58	12.98	1.10	0.59	39.26	21.88	1.29
2600	21.95	26.55	16.73	13.74	1.11	0.61	38.77	21.34	1.38
2800	21.89	26.60	16.88	14.67	1.12	0.63	37.77	21.24	1.40
3000	21.85	26.61	16.79	15.85	1.12	0.65	35.23	20.93	1.36
3200	21.84	26.61	16.32	17.13	1.12	0.67	36.40	20.71	1.38
3400	21.83	26.60	15.80	18.49	1.12	0.68	35.88	20.41	1.38
3600	21.79	26.62	15.35	20.08	1.12	0.69	36.53	20.47	1.43
3800	21.77	26.65	14.93	21.85	1.13	0.70	34.59	20.25	1.43
4000	21.73	26.65	14.65	23.79	1.13	0.71	35.57	20.40	1.38
4200	21.70	26.70	14.44	26.21	1.13	0.72	35.86	20.48	1.41
4400	21.66	26.74	14.28	28.69	1.14	0.73	35.68	20.50	1.43
4600	21.63	26.75	14.28	30.13	1.14	0.73	36.40	20.71	1.44
4800	21.58	26.79	14.36	30.75	1.15	0.74	35.27	20.60	1.39
5000	21.55	26.85	14.44	31.02	1.15	0.75	33.66	20.90	1.39
5200	21.53	26.88	14.47	29.26	1.16	0.75	34.62	20.69	1.40
5400	21.51	26.96	14.50	29.34	1.16	0.76	34.65	20.33	1.43
5600	21.48	27.00	14.57	28.43	1.17	0.76	35.48	20.66	1.47
5800	21.45	27.07	14.33	27.16	1.17	0.77	35.33	21.06	1.46
6000	21.44	27.15	14.20	26.82	1.18	0.78	33.79	20.65	1.49
6200	21.40	27.22	13.87	25.93	1.18	0.79	33.66	20.27	1.54
6400	21.33	27.36	13.30	24.54	1.19	0.80	33.98	20.21	1.57
6600	21.26	27.44	12.79	24.92	1.20	0.82	34.69	20.31	1.62
6800	21.12	27.69	12.14	25.43	1.22	0.85	34.15	20.06	1.68
7000	20.58	28.26	12.09	23.70	1.33	0.89	32.31	19.03	1.76
7200	20.47	28.39	11.72	18.85	1.33	0.91	31.63	18.85	1.97
7400	20.61	28.29	9.78	18.14	1.24	0.94	31.27	18.81	1.83
7600	20.49	28.43	8.68	17.36	1.22	0.98	30.76	18.76	1.89
7800	20.18	28.74	7.64	16.21	1.23	1.04	30.26	18.72	2.00
8000	19.84	29.04	6.77	15.08	1.22	1.09	29.78	18.22	2.08
8200	19.47	29.40	6.00	13.95	1.22	1.14	29.24	17.99	2.17
8400	19.04	29.72	5.39	12.81	1.22	1.18	28.58	17.80	2.30
8600	18.55	30.07	4.82	11.68	1.22	1.21	28.06	17.41	2.41
8800	18.04	30.32	4.36	10.72	1.22	1.24	28.10	17.41	2.56
9000	17.46	30.72	3.94	9.93	1.23	1.26	27.81	17.50	2.75
9200	16.86	31.05	3.59	9.21	1.24	1.28	26.93	16.74	2.92
9400	16.20	31.34	3.28	8.68	1.26	1.29	26.70	16.58	3.13
9600	15.51	31.52	3.04	8.38	1.30	1.30	26.35	16.37	3.32
9800	14.65	31.89	2.84	8.42	1.43	1.32	25.74	15.46	3.56
10000	13.35	32.33	2.70	8.58	1.74	1.33	24.10	14.18	3.84

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: Vd = 6.00V, Id = 90.29mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	12.97	35.05	1.62	2.30	1.38	0.60	32.02	19.75	3.76
300	18.24	29.52	4.91	4.95	1.19	0.71	36.62	19.65	1.89
400	20.29	27.31	11.22	8.07	1.13	0.68	33.62	20.39	1.32
500	20.94	26.57	21.90	9.23	1.11	0.60	32.36	21.19	1.14
600	21.11	26.35	20.09	8.86	1.10	0.54	31.60	21.67	1.13
700	21.13	26.28	15.39	8.33	1.09	0.50	31.36	21.97	1.02
800	21.12	26.25	13.30	7.97	1.08	0.48	31.45	22.20	0.93
1000	21.09	26.22	11.60	7.58	1.08	0.46	32.37	22.41	0.93
1200	21.09	26.19	11.10	7.49	1.08	0.45	30.97	22.53	0.95
1400	21.09	26.17	10.89	7.46	1.08	0.44	30.45	22.61	0.99
1600	21.10	26.14	10.88	7.54	1.08	0.44	30.63	22.63	1.10
1800	21.10	26.14	11.08	7.60	1.08	0.45	31.54	22.63	1.05
2000	21.16	26.05	11.34	7.88	1.08	0.45	32.15	22.48	1.00
2200	21.19	25.99	11.76	8.11	1.07	0.45	30.55	22.38	1.03
2400	21.22	25.96	12.17	8.40	1.08	0.46	30.39	22.58	1.01
2600	21.25	25.92	12.89	8.84	1.08	0.48	32.27	22.43	1.08
2800	21.26	25.90	13.74	9.44	1.09	0.50	32.64	22.23	1.10
3000	21.31	25.84	15.04	10.21	1.09	0.52	33.08	21.77	1.07
3200	21.39	25.77	16.06	10.70	1.09	0.52	31.57	21.58	1.06
3400	21.45	25.69	17.37	11.22	1.08	0.52	32.64	21.30	1.05
3600	21.49	25.65	18.60	11.77	1.08	0.53	32.77	21.13	1.09
3800	21.53	25.62	20.60	12.57	1.08	0.54	34.70	20.86	1.06
4000	21.57	25.59	22.73	13.24	1.08	0.55	33.48	20.44	1.04
4200	21.58	25.60	24.51	13.67	1.08	0.55	32.81	20.48	1.04
4400	21.58	25.60	26.55	14.16	1.08	0.56	32.92	20.44	1.09
4600	21.59	25.62	28.31	14.35	1.08	0.56	33.24	20.59	1.05
4800	21.59	25.64	31.03	14.58	1.09	0.57	33.26	20.36	1.02
5000	21.59	25.68	31.48	14.53	1.09	0.57	36.91	21.00	0.99
5200	21.60	25.69	32.15	14.88	1.09	0.57	34.73	20.47	1.05
5400	21.62	25.74	33.07	15.22	1.09	0.58	32.55	19.99	1.08
5600	21.63	25.76	31.89	15.24	1.09	0.58	33.17	20.54	1.08
5800	21.67	25.81	30.26	15.41	1.10	0.58	33.44	21.01	1.07
6000	21.73	25.84	31.24	16.30	1.10	0.59	35.97	20.75	1.07
6200	21.76	25.90	28.31	17.17	1.10	0.59	33.82	20.27	1.15
6400	21.78	26.00	25.65	17.77	1.11	0.60	33.06	20.23	1.15
6600	21.80	26.04	23.72	17.76	1.11	0.60	32.05	20.26	1.18
6800	21.80	26.21	21.83	17.72	1.12	0.62	31.66	20.39	1.23
7000	21.59	26.56	19.28	17.93	1.16	0.66	31.78	19.79	1.33
7200	21.05	27.16	21.85	26.30	1.25	0.76	29.70	18.25	1.52
7400	21.73	26.69	17.55	21.62	1.15	0.69	30.74	18.57	1.40
7600	21.82	26.77	14.69	21.86	1.14	0.70	30.02	18.58	1.40
7800	21.73	27.01	12.59	23.90	1.14	0.74	30.02	18.39	1.50
8000	21.62	27.30	10.85	26.69	1.15	0.80	29.07	17.25	1.58
8200	21.43	27.72	9.25	30.03	1.16	0.87	29.14	16.84	1.70
8400	21.21	28.12	8.12	24.64	1.17	0.94	28.66	16.25	1.82
8600	20.89	28.58	7.05	19.53	1.18	1.01	28.42	15.62	1.94
8800	20.53	29.03	6.23	15.58	1.19	1.05	28.60	15.56	2.02
9000	20.07	29.69	5.35	12.87	1.20	1.10	29.07	16.20	2.13
9200	19.60	30.23	4.73	10.94	1.21	1.13	28.43	15.04	2.30
9400	19.10	30.84	4.23	9.75	1.23	1.15	28.10	14.95	2.44
9600	18.51	31.30	3.81	8.82	1.24	1.17	28.10	15.15	2.61
9800	17.83	31.95	3.39	8.15	1.28	1.19	27.41	14.09	2.77
10000	16.95	32.49	2.99	8.28	1.39	1.24	27.43	14.39	2.99

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: Vd = 5.00V, Id = 67.90mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	12.42	34.31	1.61	2.49	1.40	0.65	36.27	17.13	3.75
300	17.59	28.88	4.76	5.29	1.20	0.75	33.63	15.89	1.85
400	19.63	26.69	10.56	8.66	1.14	0.71	36.19	16.53	1.35
500	20.31	25.92	20.23	10.13	1.12	0.63	33.99	17.89	1.18
600	20.51	25.67	24.11	9.81	1.10	0.57	34.36	19.16	1.15
700	20.55	25.58	17.64	9.24	1.10	0.53	34.43	19.70	1.04
800	20.56	25.54	15.00	8.83	1.09	0.51	34.59	20.02	0.98
1000	20.55	25.51	12.94	8.40	1.09	0.48	40.62	20.35	0.96
1200	20.55	25.49	12.31	8.30	1.08	0.48	33.31	20.48	0.97
1400	20.55	25.47	12.04	8.27	1.08	0.47	32.28	20.58	1.04
1600	20.55	25.45	12.00	8.36	1.08	0.48	32.76	20.57	1.12
1800	20.55	25.47	12.16	8.44	1.09	0.48	34.14	20.62	1.07
2000	20.60	25.40	12.43	8.76	1.08	0.49	32.95	20.35	1.01
2200	20.62	25.36	12.85	9.02	1.08	0.49	30.86	19.98	1.05
2400	20.64	25.35	13.23	9.36	1.09	0.50	31.25	20.38	1.04
2600	20.67	25.34	13.96	9.86	1.09	0.52	33.45	20.14	1.11
2800	20.67	25.34	14.81	10.54	1.10	0.54	33.74	19.87	1.11
3000	20.70	25.32	16.08	11.44	1.10	0.56	31.47	19.50	1.08
3200	20.77	25.27	16.89	12.02	1.10	0.56	31.11	19.10	1.06
3400	20.84	25.22	17.88	12.64	1.10	0.57	31.89	18.59	1.07
3600	20.87	25.20	18.75	13.26	1.09	0.58	32.32	18.40	1.10
3800	20.91	25.19	20.18	14.15	1.09	0.59	32.23	17.99	1.05
4000	20.95	25.17	21.63	14.91	1.09	0.59	31.65	17.73	1.04
4200	20.96	25.19	22.67	15.34	1.10	0.60	31.23	18.15	1.04
4400	20.97	25.21	23.63	15.86	1.10	0.60	31.07	18.07	1.07
4600	20.99	25.23	24.71	16.01	1.10	0.60	32.50	18.40	1.07
4800	20.99	25.27	26.24	16.12	1.10	0.61	31.58	18.16	1.02
5000	21.00	25.31	27.62	16.01	1.10	0.61	31.56	18.91	1.01
5200	21.01	25.34	27.73	16.26	1.10	0.61	31.78	18.56	1.04
5400	21.04	25.40	27.13	16.70	1.11	0.62	30.16	18.12	1.07
5600	21.06	25.43	27.46	16.65	1.11	0.62	32.01	18.75	1.10
5800	21.09	25.49	26.34	16.67	1.11	0.62	33.56	19.32	1.09
6000	21.15	25.53	26.08	17.65	1.11	0.62	32.26	19.22	1.09
6200	21.18	25.60	24.14	18.57	1.12	0.63	30.78	18.81	1.14
6400	21.22	25.70	22.24	19.30	1.12	0.64	31.08	18.77	1.15
6600	21.24	25.75	21.24	19.31	1.12	0.64	31.23	18.79	1.19
6800	21.25	25.92	20.04	19.23	1.13	0.65	31.06	19.10	1.26
7000	21.03	26.28	18.32	19.75	1.17	0.70	30.66	18.68	1.33
7200	20.47	26.91	21.03	28.49	1.28	0.78	28.20	17.17	1.54
7400	21.14	26.44	16.34	22.10	1.16	0.72	28.78	17.73	1.40
7600	21.24	26.53	13.79	22.89	1.15	0.74	28.27	17.87	1.41
7800	21.14	26.78	11.88	25.10	1.15	0.79	28.05	17.86	1.49
8000	21.01	27.08	10.26	29.28	1.16	0.85	27.28	17.11	1.62
8200	20.81	27.49	8.77	38.54	1.16	0.92	27.02	17.02	1.68
8400	20.58	27.90	7.71	25.18	1.17	0.98	26.42	16.76	1.81
8600	20.26	28.38	6.70	19.61	1.18	1.05	26.10	16.47	1.91
8800	19.90	28.80	5.94	15.66	1.19	1.10	26.28	16.41	2.03
9000	19.45	29.45	5.13	13.01	1.20	1.14	26.75	16.89	2.14
9200	18.99	29.98	4.55	11.15	1.21	1.17	25.76	16.18	2.32
9400	18.50	30.56	4.09	9.94	1.23	1.19	25.57	15.96	2.45
9600	17.92	31.02	3.68	9.04	1.24	1.20	25.58	15.99	2.59
9800	17.26	31.66	3.30	8.42	1.29	1.22	24.72	15.04	2.77
10000	16.38	32.15	2.93	8.60	1.41	1.27	24.74	15.09	2.95

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: Vd = 6.25V, Id = 95.62mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	13.13	35.20	1.62	2.28	1.37	0.60	31.90	20.19	3.75
300	18.41	29.67	4.91	4.93	1.19	0.71	35.47	20.21	1.91
400	20.46	27.47	11.22	8.05	1.13	0.67	33.17	20.87	1.30
500	21.10	26.72	21.94	9.22	1.11	0.60	32.10	21.56	1.19
600	21.27	26.50	20.03	8.86	1.10	0.54	31.41	22.05	1.14
700	21.29	26.44	15.35	8.32	1.09	0.50	31.17	22.36	1.01
800	21.28	26.41	13.27	7.96	1.08	0.48	31.20	22.61	0.97
1000	21.26	26.38	11.59	7.58	1.08	0.45	32.00	22.81	0.93
1200	21.25	26.35	11.09	7.48	1.08	0.45	30.77	22.93	0.95
1400	21.26	26.32	10.89	7.46	1.07	0.44	30.30	23.01	1.00
1600	21.26	26.29	10.88	7.53	1.07	0.44	30.47	23.03	1.09
1800	21.26	26.29	11.07	7.60	1.08	0.45	31.32	23.03	1.05
2000	21.32	26.20	11.35	7.88	1.07	0.45	32.00	22.89	0.99
2200	21.35	26.14	11.76	8.11	1.07	0.45	30.44	22.83	1.03
2400	21.38	26.11	12.18	8.40	1.08	0.46	30.32	23.00	1.01
2600	21.41	26.06	12.90	8.85	1.08	0.48	31.97	22.86	1.09
2800	21.42	26.04	13.76	9.45	1.09	0.50	32.27	22.68	1.06
3000	21.46	25.99	15.07	10.23	1.09	0.52	32.98	22.21	1.04
3200	21.54	25.91	16.10	10.72	1.09	0.52	31.40	22.04	1.06
3400	21.60	25.83	17.39	11.24	1.08	0.52	32.49	21.77	1.05
3600	21.64	25.79	18.65	11.80	1.08	0.53	32.73	21.60	1.10
3800	21.68	25.76	20.65	12.61	1.08	0.54	34.37	21.37	1.05
4000	21.71	25.72	22.78	13.30	1.08	0.55	33.47	20.95	1.04
4200	21.72	25.74	24.52	13.75	1.08	0.55	32.80	20.95	1.05
4400	21.72	25.74	26.55	14.24	1.08	0.56	33.02	20.92	1.04
4600	21.73	25.75	28.27	14.45	1.08	0.56	33.12	21.07	1.04
4800	21.72	25.77	30.88	14.70	1.09	0.57	33.47	20.83	1.01
5000	21.72	25.81	31.58	14.65	1.09	0.57	37.38	21.45	1.02
5200	21.73	25.83	32.16	15.04	1.09	0.58	35.52	20.90	1.04
5400	21.74	25.87	32.83	15.36	1.09	0.58	33.01	20.46	1.05
5600	21.75	25.89	31.80	15.42	1.10	0.58	33.41	20.93	1.07
5800	21.79	25.94	30.03	15.62	1.10	0.58	33.95	21.39	1.05
6000	21.84	25.97	30.83	16.53	1.10	0.59	36.40	21.13	1.08
6200	21.87	26.03	27.80	17.43	1.10	0.60	34.56	20.62	1.13
6400	21.89	26.13	25.12	18.07	1.11	0.61	33.47	20.55	1.14
6600	21.90	26.17	23.34	18.05	1.11	0.61	32.43	20.60	1.17
6800	21.90	26.35	21.53	18.05	1.12	0.62	32.27	20.69	1.22
7000	21.68	26.69	19.06	18.22	1.16	0.67	32.53	20.08	1.31
7200	21.14	27.29	21.66	27.32	1.26	0.76	30.20	18.49	1.54
7400	21.81	26.83	17.29	22.32	1.15	0.69	31.20	18.73	1.39
7600	21.90	26.91	14.51	22.60	1.14	0.71	30.73	18.73	1.41
7800	21.81	27.16	12.41	24.85	1.15	0.75	30.52	18.55	1.51
8000	21.68	27.45	10.70	28.03	1.15	0.81	29.91	17.36	1.59
8200	21.48	27.87	9.13	30.23	1.16	0.88	29.90	16.90	1.70
8400	21.25	28.27	8.01	24.10	1.17	0.95	29.47	16.28	1.79
8600	20.93	28.75	6.96	19.19	1.18	1.02	29.35	15.69	1.90
8800	20.56	29.17	6.14	15.35	1.19	1.06	29.21	15.57	2.02
9000	20.10	29.82	5.29	12.73	1.20	1.11	29.96	16.34	2.17
9200	19.62	30.36	4.69	10.89	1.21	1.14	29.12	15.15	2.29
9400	19.12	30.93	4.19	9.70	1.22	1.16	29.05	15.08	2.41
9600	18.52	31.37	3.77	8.81	1.23	1.18	28.97	15.26	2.58
9800	17.85	32.02	3.36	8.17	1.28	1.20	28.04	14.24	2.79
10000	16.97	32.42	2.98	8.29	1.37	1.24	28.16	14.57	2.99

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: Vd = 6.00V, Id = 71.82mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	14.22	35.74	1.60	2.90	1.43	0.73	31.04	17.59	4.92
300	18.97	30.77	3.90	5.95	1.23	0.86	30.35	17.49	2.90
400	21.05	28.56	7.18	10.22	1.16	0.84	31.38	18.23	2.11
500	21.91	27.62	10.78	14.70	1.13	0.76	31.31	18.95	1.79
600	22.30	27.19	14.45	17.85	1.11	0.70	31.50	19.60	1.68
700	22.48	26.98	18.01	18.51	1.10	0.66	32.02	20.01	1.52
800	22.57	26.86	21.14	18.01	1.10	0.63	32.42	20.31	1.46
1000	22.62	26.76	23.43	17.12	1.09	0.60	31.53	20.79	1.40
1200	22.60	26.74	21.39	16.93	1.09	0.60	33.39	21.04	1.42
1400	22.55	26.74	19.17	17.30	1.09	0.61	33.99	21.31	1.49
1600	22.48	26.78	17.55	17.96	1.10	0.63	33.62	21.20	1.58
1800	22.39	26.84	16.09	18.71	1.10	0.65	33.20	21.37	1.55
2000	22.32	26.85	15.08	20.00	1.10	0.67	32.22	20.98	1.54
2200	22.22	26.90	14.15	21.58	1.11	0.69	32.71	20.69	1.60
2400	22.11	26.98	13.39	23.69	1.12	0.72	33.65	21.12	1.57
2600	21.99	27.06	12.70	26.50	1.12	0.74	32.00	20.51	1.67
2800	21.86	27.15	12.13	30.80	1.13	0.76	31.70	20.60	1.69
3000	21.74	27.22	11.50	40.01	1.14	0.79	31.10	20.39	1.69
3200	21.64	27.29	10.94	36.30	1.15	0.80	32.04	20.09	1.72
3400	21.55	27.32	10.41	29.58	1.14	0.82	31.51	19.80	1.75
3600	21.45	27.38	10.02	25.88	1.15	0.83	31.49	19.94	1.77
3800	21.35	27.44	9.70	23.60	1.15	0.85	30.76	19.78	1.77
4000	21.26	27.45	9.52	22.02	1.15	0.86	30.99	20.05	1.76
4200	21.17	27.53	9.33	20.72	1.16	0.87	31.55	20.09	1.81
4400	21.08	27.58	9.20	19.68	1.17	0.88	31.43	20.09	1.83
4600	20.99	27.57	9.17	18.93	1.17	0.88	31.38	20.18	1.82
4800	20.91	27.64	9.12	18.15	1.17	0.89	31.10	20.00	1.81
5000	20.84	27.68	9.18	17.65	1.18	0.89	29.92	19.98	1.79
5200	20.78	27.69	9.24	17.10	1.18	0.89	30.35	19.87	1.84
5400	20.70	27.73	9.31	16.74	1.19	0.90	30.49	19.55	1.85
5600	20.64	27.72	9.42	16.22	1.19	0.90	30.50	19.62	1.86
5800	20.57	27.76	9.38	15.75	1.19	0.91	30.20	19.56	1.86
6000	20.48	27.79	9.40	15.36	1.19	0.92	29.25	19.15	1.89
6200	20.39	27.86	9.25	14.94	1.19	0.93	29.09	18.88	1.94
6400	20.23	27.93	8.94	14.44	1.19	0.95	29.40	18.72	2.00
6600	20.05	28.03	8.59	14.27	1.19	0.97	29.55	18.62	2.06
6800	19.74	28.21	8.21	14.30	1.22	1.00	29.02	18.09	2.13
7000	19.13	28.71	8.31	13.62	1.35	1.02	27.71	17.36	2.27
7200	18.84	28.83	7.78	12.05	1.33	1.04	27.52	17.31	2.45
7400	18.76	28.76	6.73	11.42	1.22	1.08	27.16	17.17	2.33
7600	18.49	28.85	6.11	11.04	1.20	1.12	26.91	17.10	2.38
7800	18.06	29.04	5.59	10.63	1.20	1.15	26.68	16.97	2.48
8000	17.64	29.15	5.15	10.23	1.19	1.18	26.29	16.72	2.62
8200	17.13	29.37	4.70	9.85	1.20	1.21	25.73	16.48	2.72
8400	16.61	29.57	4.35	9.51	1.21	1.23	25.48	16.29	2.84
8600	16.05	29.80	4.03	9.19	1.23	1.25	24.94	15.95	3.03
8800	15.46	29.91	3.71	8.88	1.23	1.27	24.79	15.78	3.17
9000	14.81	30.18	3.47	8.58	1.29	1.28	24.36	15.47	3.39
9200	14.13	30.28	3.23	8.27	1.31	1.29	23.70	15.07	3.64
9400	13.40	30.63	3.02	8.18	1.41	1.31	23.53	14.84	3.90
9600	12.63	30.78	2.85	8.22	1.51	1.33	22.99	14.38	4.16
9800	11.66	31.10	2.73	8.51	1.75	1.34	22.39	13.51	4.48
10000	10.34	31.75	2.63	8.65	2.21	1.35	20.68	11.72	4.78

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: Vd = 5.00V, Id = 54.81mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	13.39	35.05	1.57	3.04	1.46	0.76	28.15	15.47	4.96
300	18.07	30.15	3.73	6.05	1.24	0.89	27.23	15.44	2.83
400	20.15	27.94	6.72	10.23	1.17	0.86	28.37	16.19	2.14
500	21.05	26.97	9.91	14.83	1.14	0.78	28.56	16.92	1.85
600	21.47	26.52	13.03	18.98	1.12	0.72	28.44	17.55	1.68
700	21.66	26.29	15.89	20.98	1.11	0.68	28.99	18.08	1.54
800	21.76	26.16	18.28	20.94	1.11	0.65	29.04	18.45	1.48
1000	21.83	26.05	20.41	19.96	1.10	0.63	28.17	19.14	1.44
1200	21.81	26.03	19.45	19.75	1.10	0.63	29.76	19.39	1.45
1400	21.77	26.05	17.71	20.24	1.10	0.64	30.09	19.71	1.51
1600	21.69	26.09	16.28	21.17	1.10	0.66	29.91	19.67	1.64
1800	21.60	26.16	14.94	22.27	1.11	0.68	29.50	19.92	1.58
2000	21.53	26.20	13.98	24.29	1.11	0.70	28.99	19.56	1.54
2200	21.42	26.26	13.10	27.03	1.11	0.72	29.14	19.19	1.60
2400	21.31	26.34	12.39	31.43	1.12	0.75	29.84	19.63	1.59
2600	21.19	26.43	11.74	40.56	1.13	0.77	28.87	19.09	1.69
2800	21.05	26.54	11.21	40.57	1.14	0.79	28.40	19.22	1.73
3000	20.93	26.62	10.64	30.45	1.14	0.81	27.82	19.18	1.68
3200	20.83	26.71	10.15	26.07	1.15	0.83	28.70	18.48	1.71
3400	20.74	26.75	9.67	23.21	1.14	0.85	28.22	18.14	1.75
3600	20.65	26.81	9.32	21.30	1.15	0.86	28.19	18.26	1.80
3800	20.55	26.88	9.07	19.93	1.15	0.87	27.71	18.14	1.79
4000	20.47	26.89	8.88	18.87	1.15	0.88	27.75	18.59	1.79
4200	20.39	26.98	8.75	18.03	1.15	0.89	28.18	18.62	1.82
4400	20.30	27.03	8.67	17.28	1.16	0.89	27.99	18.71	1.84
4600	20.22	27.01	8.65	16.73	1.16	0.90	28.41	18.83	1.84
4800	20.16	27.08	8.63	16.17	1.16	0.90	28.01	18.76	1.81
5000	20.10	27.11	8.70	15.80	1.17	0.90	27.08	18.97	1.80
5200	20.05	27.11	8.76	15.36	1.17	0.91	27.56	18.87	2.23
5400	19.97	27.15	8.85	15.08	1.17	0.91	27.70	18.57	1.87
5600	19.92	27.14	8.96	14.65	1.17	0.91	27.90	18.65	1.88
5800	19.87	27.18	8.94	14.26	1.17	0.92	27.72	18.71	1.88
6000	19.78	27.20	8.97	13.95	1.17	0.93	26.92	18.42	1.92
6200	19.70	27.27	8.84	13.62	1.16	0.94	26.83	18.12	1.97
6400	19.54	27.33	8.58	13.21	1.16	0.96	27.14	17.91	1.99
6600	19.36	27.43	8.28	13.12	1.17	0.98	27.40	17.76	2.08
6800	19.06	27.61	7.95	13.21	1.20	1.01	26.81	17.33	2.15
7000	18.45	28.12	8.08	12.81	1.33	1.02	25.59	16.60	2.28
7200	18.16	28.25	7.59	11.35	1.30	1.04	25.43	16.55	2.45
7400	18.09	28.18	6.56	10.80	1.20	1.08	25.16	16.48	2.35
7600	17.83	28.27	5.98	10.48	1.17	1.12	24.98	16.40	2.40
7800	17.40	28.46	5.49	10.14	1.17	1.15	24.68	16.30	2.51
8000	17.00	28.58	5.07	9.83	1.17	1.18	24.38	16.09	2.62
8200	16.50	28.83	4.64	9.51	1.18	1.21	23.85	15.90	2.74
8400	15.97	29.03	4.30	9.21	1.19	1.23	23.59	15.70	2.87
8600	15.42	29.30	3.99	8.94	1.22	1.25	23.03	15.41	3.02
8800	14.83	29.44	3.68	8.66	1.24	1.27	23.01	15.31	3.16
9000	14.20	29.74	3.44	8.39	1.29	1.28	22.54	15.08	3.37
9200	13.51	29.86	3.21	8.10	1.32	1.29	21.96	14.76	3.66
9400	12.79	30.23	3.00	8.03	1.42	1.30	21.81	14.58	3.93
9600	12.03	30.39	2.83	8.09	1.53	1.32	21.32	14.22	4.18
9800	11.07	30.77	2.73	8.42	1.80	1.34	20.73	13.29	4.46
10000	9.74	31.41	2.64	8.62	2.28	1.35	19.14	11.28	4.77

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

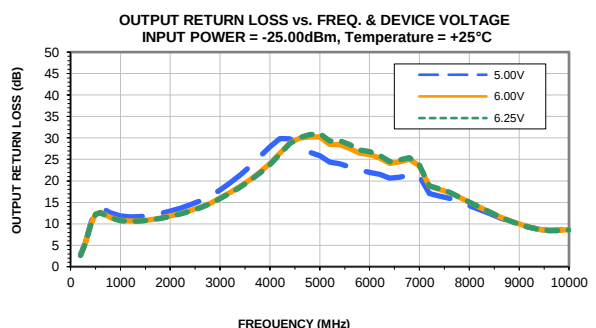
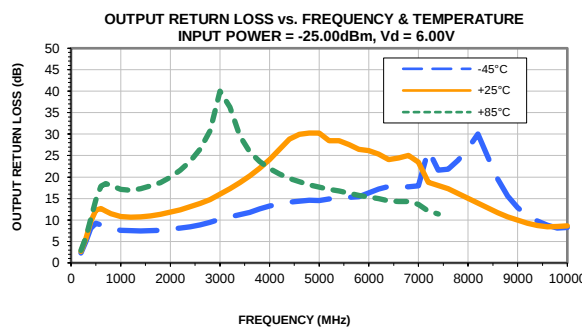
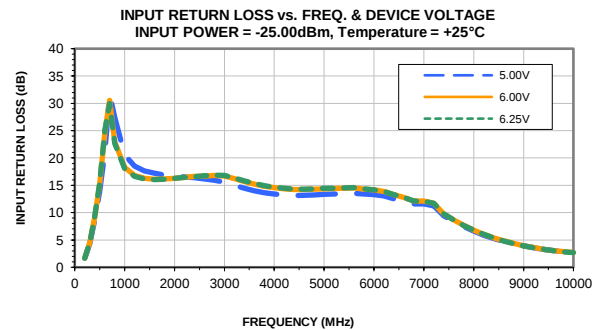
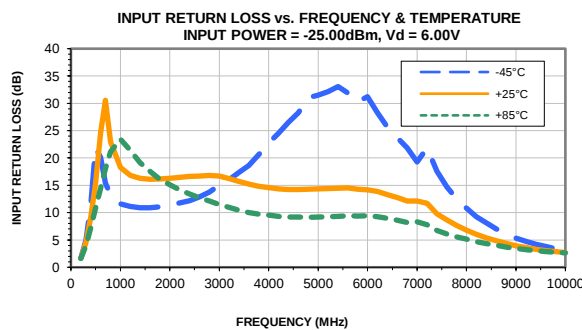
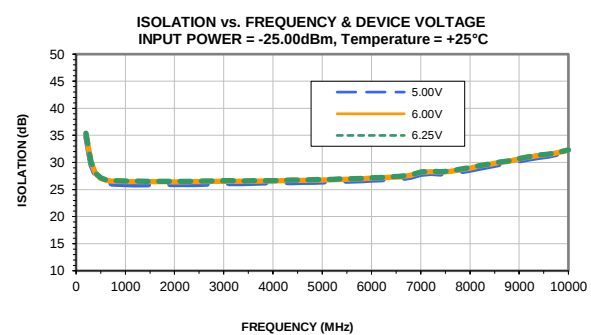
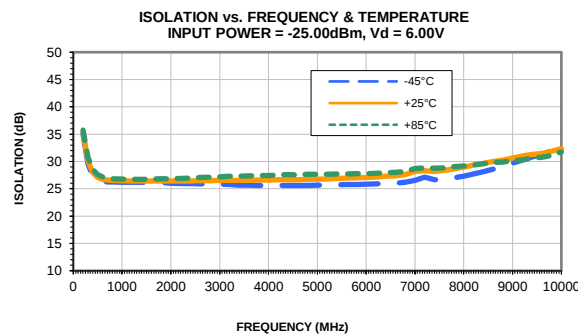
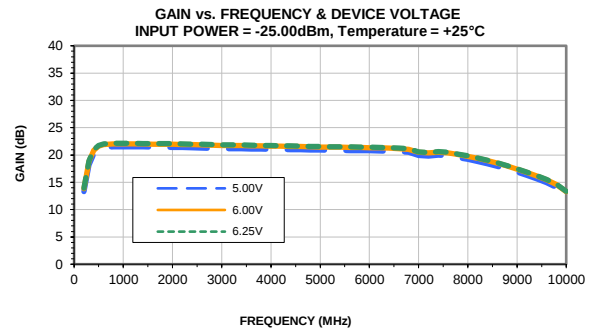
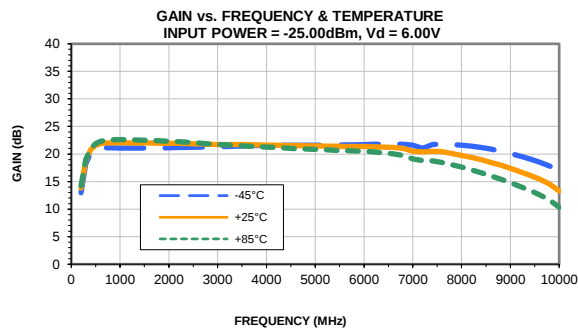
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

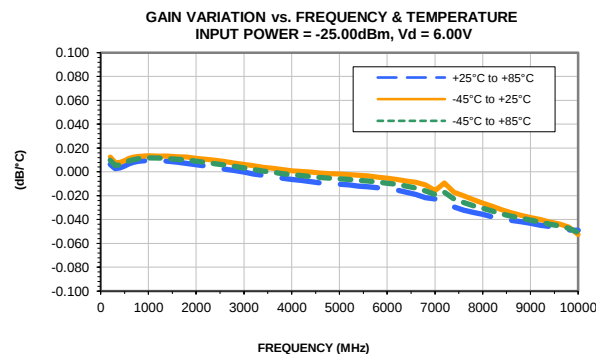
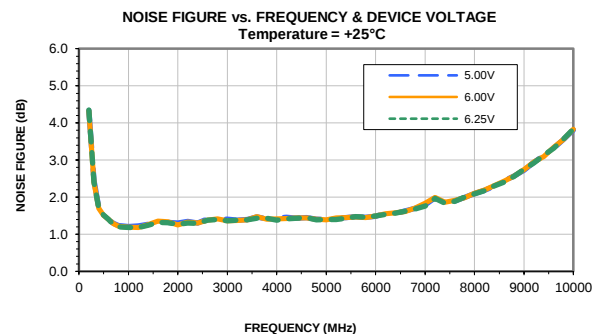
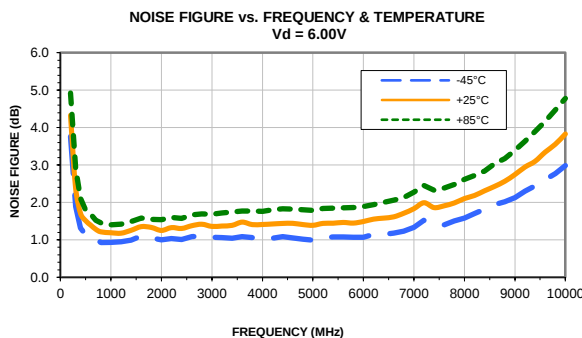
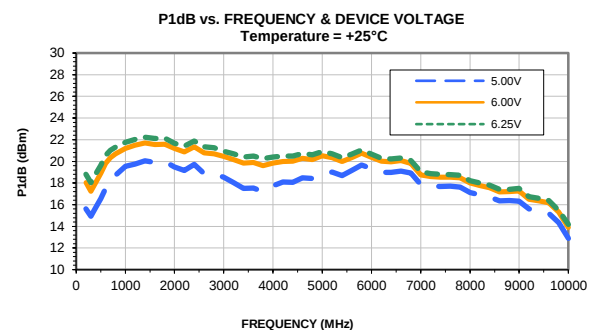
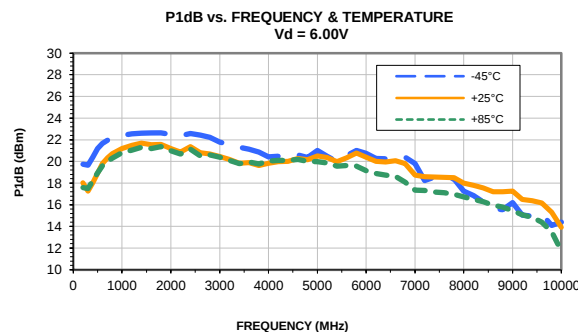
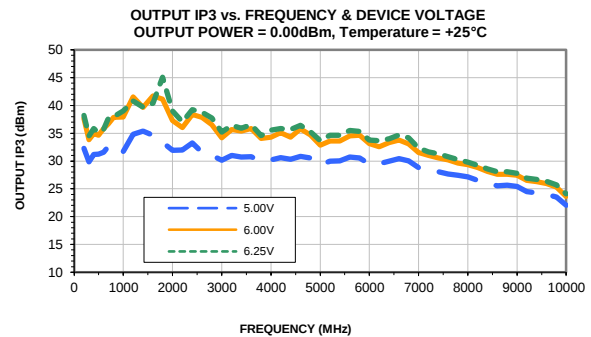
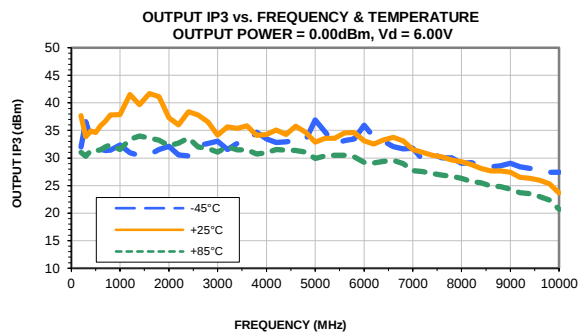
TEST CONDITIONS: Vd = 6.25V, Id = 76.15mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	14.38	35.87	1.61	2.88	1.43	0.73	31.41	18.17	4.94
300	19.14	30.89	3.92	5.93	1.22	0.86	30.71	18.05	2.91
400	21.21	28.69	7.25	10.21	1.16	0.83	31.88	18.80	2.11
500	22.07	27.74	10.93	14.66	1.13	0.76	31.81	19.45	1.81
600	22.46	27.32	14.69	17.66	1.11	0.70	32.18	20.10	1.66
700	22.63	27.11	18.38	18.18	1.10	0.65	32.98	20.44	1.53
800	22.71	26.99	21.66	17.66	1.10	0.62	33.10	20.77	1.45
1000	22.76	26.89	23.88	16.78	1.09	0.60	32.23	21.16	1.40
1200	22.74	26.87	21.65	16.60	1.09	0.60	34.26	21.44	1.40
1400	22.70	26.88	19.33	16.96	1.09	0.61	34.39	21.67	1.47
1600	22.62	26.91	17.71	17.60	1.10	0.63	34.44	21.57	1.60
1800	22.53	26.97	16.23	18.32	1.10	0.65	33.61	21.66	1.53
2000	22.46	26.98	15.22	19.54	1.10	0.67	32.90	21.33	1.51
2200	22.36	27.03	14.30	21.03	1.11	0.69	33.62	21.06	1.57
2400	22.25	27.10	13.53	22.98	1.12	0.71	34.15	21.46	1.56
2600	22.13	27.17	12.83	25.53	1.12	0.74	32.70	20.86	1.66
2800	21.99	27.26	12.28	29.20	1.13	0.76	32.32	20.94	1.69
3000	21.88	27.33	11.65	36.17	1.14	0.78	31.68	20.71	1.67
3200	21.78	27.40	11.09	38.15	1.15	0.80	32.62	20.49	1.69
3400	21.69	27.43	10.54	31.03	1.15	0.82	32.02	20.24	1.70
3600	21.58	27.49	10.14	26.80	1.15	0.83	31.99	20.31	1.78
3800	21.48	27.56	9.83	24.27	1.15	0.85	31.45	20.22	1.76
4000	21.39	27.57	9.63	22.56	1.16	0.85	31.72	20.40	1.77
4200	21.30	27.65	9.43	21.17	1.16	0.87	32.33	20.40	1.80
4400	21.20	27.70	9.29	20.05	1.17	0.87	32.08	20.38	1.80
4600	21.11	27.68	9.25	19.29	1.17	0.88	32.05	20.42	1.81
4800	21.03	27.75	9.18	18.45	1.18	0.89	31.60	20.26	1.80
5000	20.96	27.79	9.23	17.92	1.18	0.89	30.44	20.16	1.78
5200	20.90	27.80	9.28	17.39	1.18	0.89	30.83	20.07	1.81
5400	20.81	27.84	9.35	17.01	1.19	0.90	31.08	19.75	1.84
5600	20.75	27.84	9.46	16.48	1.19	0.90	31.04	19.80	1.86
5800	20.68	27.88	9.41	16.03	1.19	0.91	30.62	19.74	1.87
6000	20.59	27.89	9.46	15.65	1.19	0.92	29.80	19.32	1.88
6200	20.50	27.97	9.29	15.22	1.19	0.93	29.64	19.04	1.93
6400	20.33	28.04	8.99	14.70	1.19	0.95	29.98	18.89	1.98
6600	20.14	28.14	8.62	14.52	1.20	0.97	29.92	18.80	2.06
6800	19.83	28.33	8.25	14.54	1.23	1.00	29.30	18.27	2.10
7000	19.22	28.82	8.34	13.74	1.35	1.02	28.13	17.55	2.27
7200	18.93	28.95	7.80	12.18	1.33	1.04	27.97	17.48	2.42
7400	18.83	28.88	6.75	11.50	1.24	1.08	27.52	17.34	2.34
7600	18.56	28.97	6.14	11.11	1.21	1.12	27.37	17.22	2.51
7800	18.12	29.16	5.61	10.67	1.21	1.15	27.09	17.13	2.50
8000	17.70	29.27	5.18	10.23	1.20	1.18	26.67	16.89	2.63
8200	17.20	29.49	4.75	9.85	1.21	1.21	26.19	16.64	2.73
8400	16.68	29.68	4.39	9.51	1.22	1.23	25.87	16.44	2.85
8600	16.11	29.90	4.09	9.17	1.25	1.25	25.26	16.09	3.00
8800	15.53	29.99	3.77	8.87	1.25	1.27	25.16	15.89	3.15
9000	14.89	30.25	3.52	8.58	1.30	1.28	24.66	15.63	3.40
9200	14.21	30.35	3.28	8.29	1.32	1.29	24.15	15.22	3.62
9400	13.47	30.68	3.06	8.18	1.42	1.31	23.88	14.93	3.91
9600	12.70	30.86	2.88	8.23	1.52	1.32	23.34	14.52	4.14
9800	11.73	31.15	2.77	8.52	1.76	1.34	22.83	13.64	4.46
10000	10.40	31.76	2.66	8.62	2.21	1.35	21.04	11.88	4.79

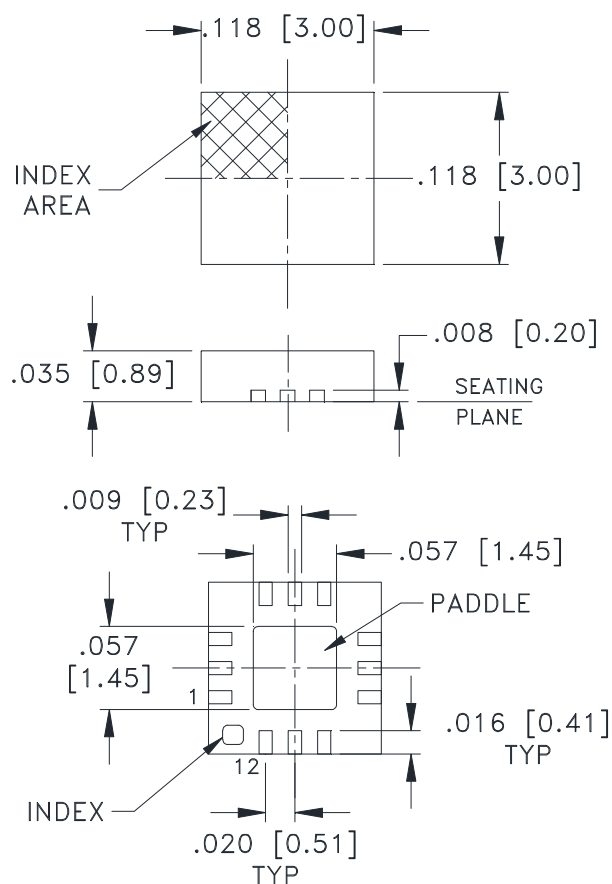
Typical Performance Curves



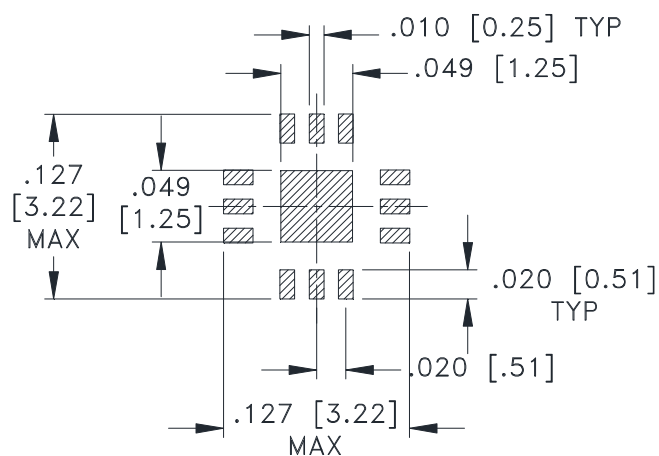
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



SUGGESTED LAYOUT,
TOLERANCE TO BE WITHIN $\pm .002$

Weight: .02 Grams

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .01$; 3 Pl. $\pm .004$

Notes:

- Case material: Plastic.
- Termination finish:
 - For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin. All models, (+) suffix. See Data sheet.
 - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



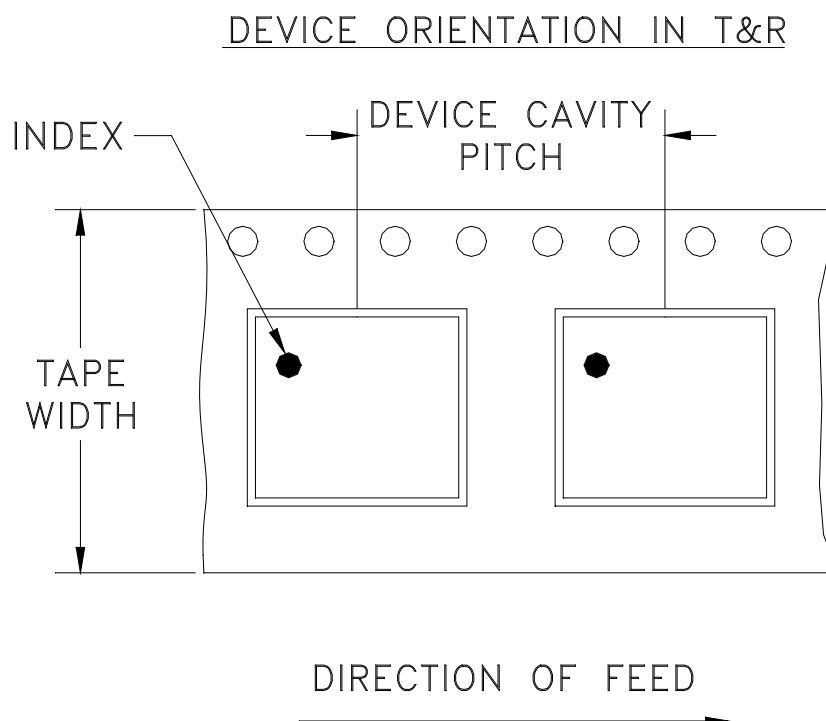
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Tape & Reel Packaging TR-F66



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

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

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

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



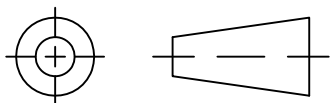
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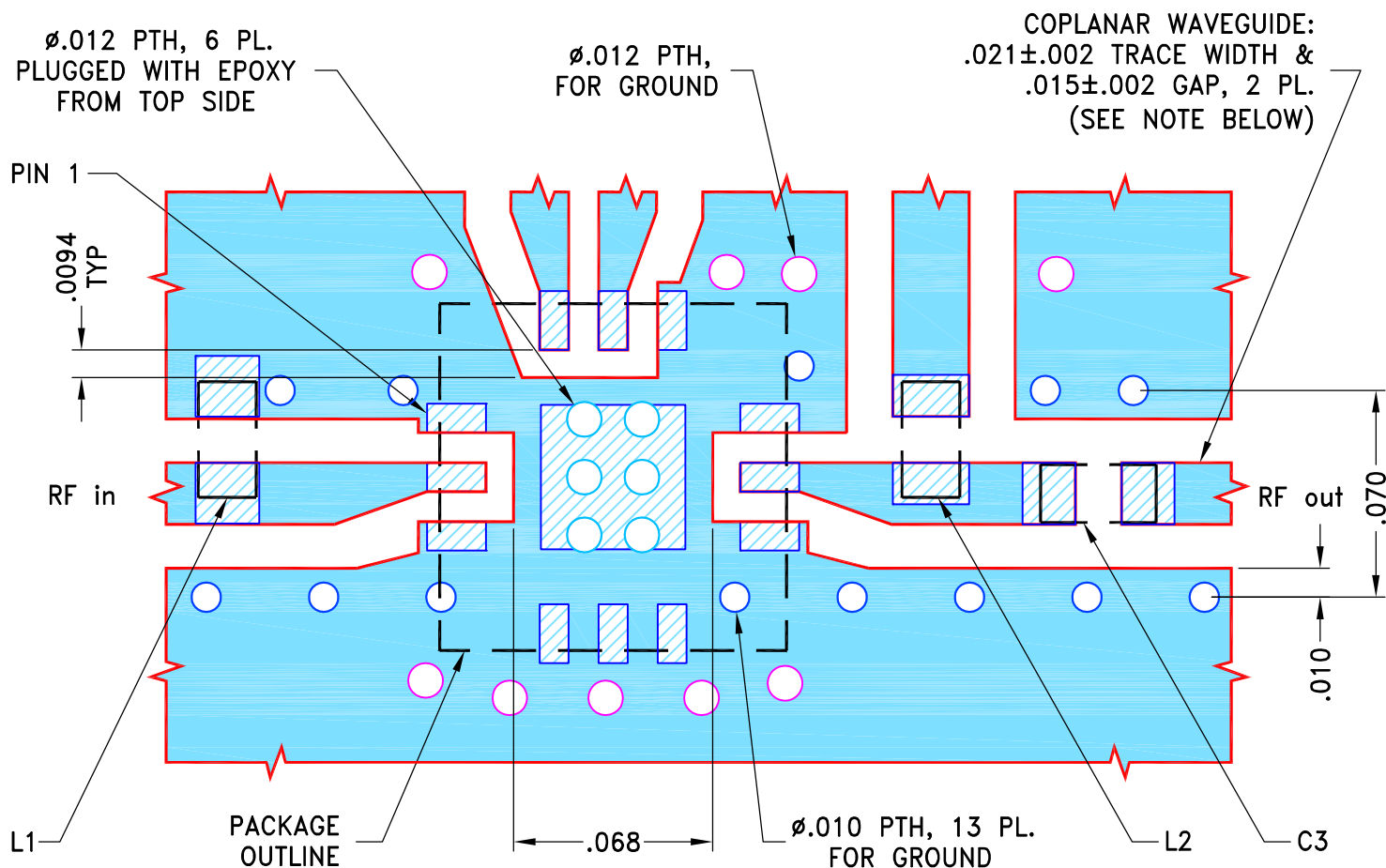
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M152657	NEW RELEASE	09/11/15	ITG	RS

SUGGESTED MOUNTING CONFIGURATION
FOR DQ1225 CASE STYLE, "12AM02" PIN CODE



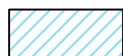
COMPONENT	SIZE
L1, L2	0402
C3	0402

NOTES:

- TRACE WIDTH PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.010" \pm .001"$. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
- BOTTOM SIDE OF THE 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

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm .005$ ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

ITG

09/10/15

CHECKED

GF

09/11/15

APPROVED

RS

09/11/15

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



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, 12AM02, DQ1225, TB-830A+

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-456

REV:

OR

FILE:

98PL456

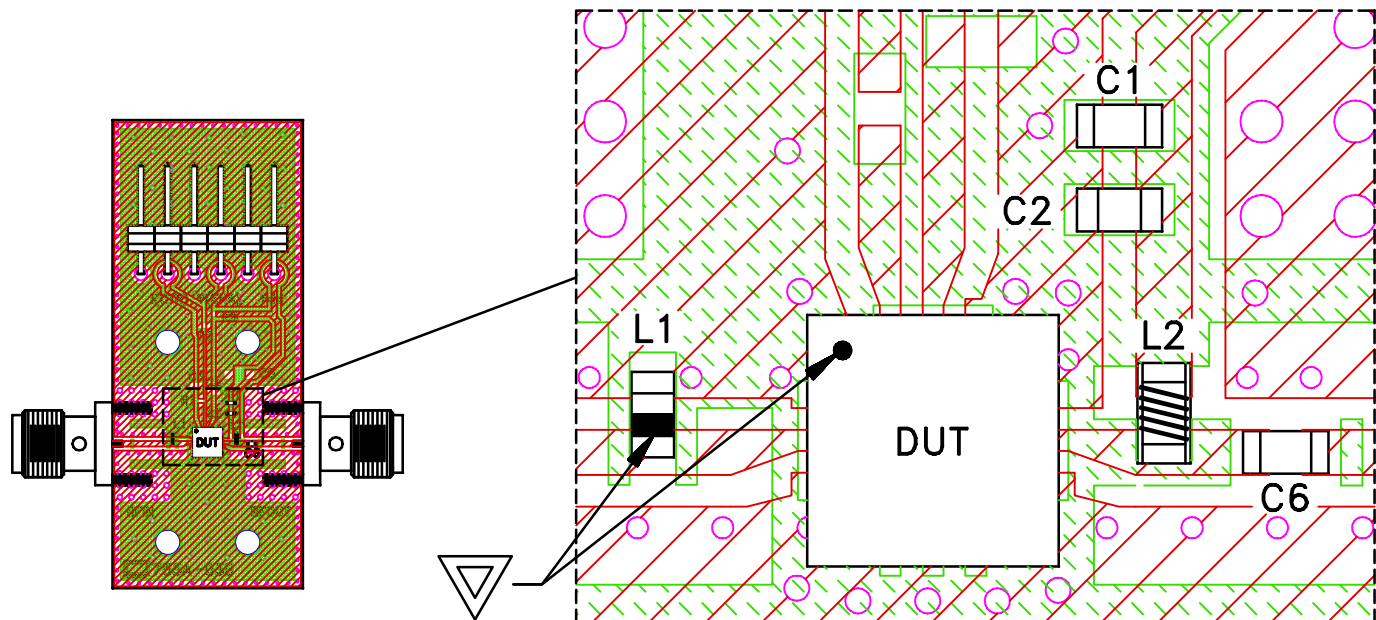
SCALE:

16:1

SHEET:

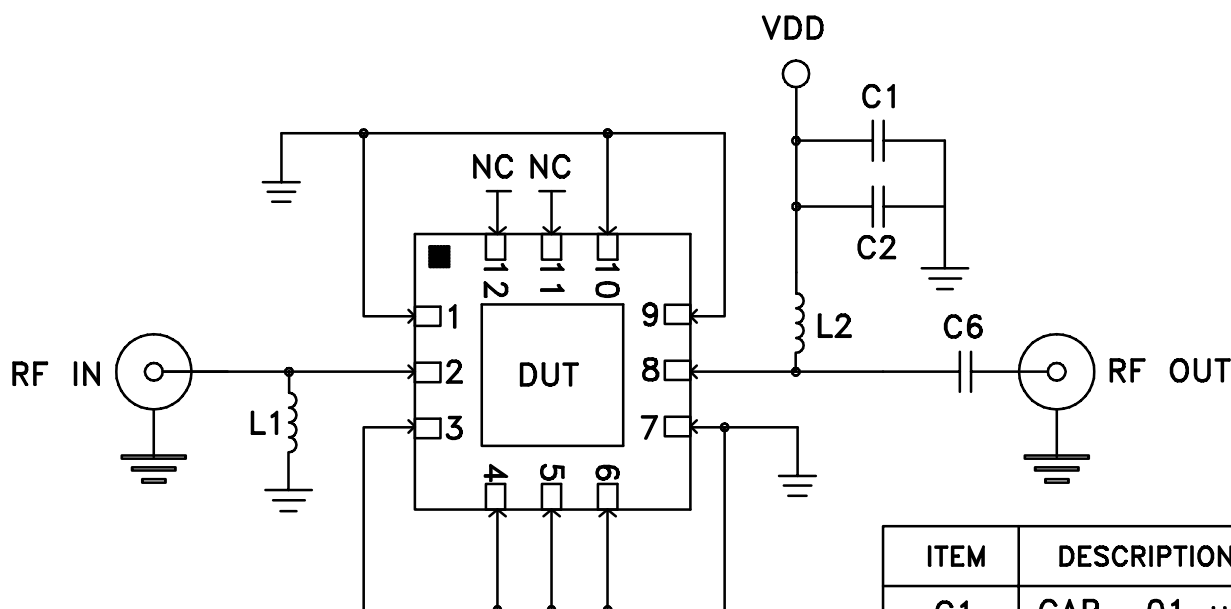
1 OF 1

Evaluation Board and Circuit



TB-830A+

(SCALE 8:1)



Schematic Diagram

ITEM	DESCRIPTION	SIZE
C1	CAP, .01 uF	0402
C2	CAP, 10 pF	0402
C6	CAP, 100 pF	0402
L1	IND, 18 nH	0402
L2	IND, 39 nH	0402

Notes:

1. SMA Female Connectors.
2. PCB Material: Roger R04350B or equivalent,
Dielectric constant=3.5, 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 Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +	MIL-STD-202, Method 215



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

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