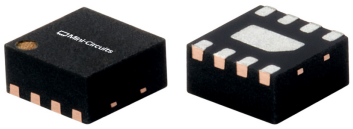
ULTRA LOW NOISE, HIGH IP3

Monolithic Amplifier PMA2-162LN+

50Ω 0.7 to 1.6 GHz

THE BIG DEAL

- Ultra Low Noise Figure, 0.5 dB at 1 GHz
- High IP3, 30 dBm typ. at 1 GHz
- Class 1B HBM ESD (500V)
- Adjustable gain, 19.7-23.5 dB at 1 GHz
- High Pout, P1dB 20 dBm typ. at 1 GHz
- May be used as a replacement for MGA-631P8 [a,b]



Generic photo used for illustration purposes only

CASE STYLE: MC1631

+RoHS Compliant

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

APPLICATIONS

- Base station infrastructure
- Portable Wireless
- LTE
- GPS
- GSM
- Airborne radar

PRODUCT OVERVIEW

Mini-Circuits PMA2-162LN+ is a E-PHEMT* based Ultra-Low Noise MMIC Amplifier with a unique combinations of low noise and high IP3 making this amplifier ideal for sensitive high dynamic range receiver applications. This design operates on a single 4V supply.

KEY FEATURES

Feature	Advantages
Ultra Low Noise, 0.5 dB at 1.0 GHz	Outstanding world class noise figure performance.
High IP3, +30 dBm at 1.0 GHz	Combining 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 at both ends of the dynamic range: sensitivity & two-tone IM performance.
Adjustable Gain	By changing feedback resistor R1, gain can be changed from19.7 to 23.5 dB at 1GHz
2mm x 2mm 8 lead MCLP Package	Low Inductance, repeatable transitions, excellent thermal contact to PCB
Max Input Power, +25 dBm	Ruggedized design operates up to high input powers often seen at Receiver inputs eliminating the need for an external resistor.
High Reliability	Low, small signal operating current of 55 mA nominal maintains junction temperatures typically below 100°C at 85°C ground lead temperature.
Class 1B ESD (500V HBM)	The PMA2-162LN+ is a super low noise PHEMT based design. Mini-Circuits incorporates ESD protection on die to achieve industry leading ESD performance for a low noise amplifier.

A. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.
B. The Avago MGA-631P8 part number is used for identification and comparison purposes only.
*Enhancement mode Pseudomorphic High Electron Mobility Transistor

REV. E
ECO-011027
PMA2-162LN+
TH/RS/CP/AM
211213

Monolithic Amplifier PMA2-162LN+

ELECTRICAL SPECIFICATIONS[1,2] AT 25°C AND 4V, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	R1=267Ω1			R1=93Ω2			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Frequency Range		0.7		1.6	0.7		1.6	GHz
Noise Figure	0.7		0.55			0.57		dB
	0.8		0.51			0.54		
	1.0		0.47			0.48		
	1.3		0.64			0.65		
	1.6		0.80			0.81		
Gain	0.7	—	24.4	—	—	22.7		dB
	0.8	—	24.1	—	—	22.2		
	1.0	20.9	22.7	24.5	18.6	20.8	23.1	
	1.3	—	20.7	—	—	19.1		
	1.6	—	18.8	—	—	17.7		
Input Return Loss	0.7		9.5			11.5		dB
	0.8		15.5			18.8		
	1.0		17.9			20.0		
	1.3		12.4			14.5		
	1.6		10.8			12.4		
Output Return Loss	0.7		13.6			21.6		dB
	0.8		16.1			17.8		
	1.0		18.9			16.0		
	1.3		15.6			15.1		
	1.6		10.7			11.6		
Output Power @1 dB compression[3]	0.7		19.5			18.3		dBm
	0.8		19.8			18.9		
	1.0		19.9			19.7		
	1.3		19.7			19.8		
	1.6		18.8			19.0		
Output IP3	0.7		29.1			28.3		dBm
	0.8		30.3			29.5		
	1.0		30.0			29.0		
	1.3		30.1			29.2		
	1.6		29.4			28.5		
Device Operating Voltage		3.8	4.0	4.2	3.8	4.0	4.2	V
Device Operating Current at 4V			55	60		55	60	mA
Device Current Variation vs. Temperature at 4V[4]			2			2		µA/°C
Device Current Variation vs Voltage at 25°C			0.016			0.016		mA/mV
Thermal Resistance, junction-to-ground lead			53			53		°C/W

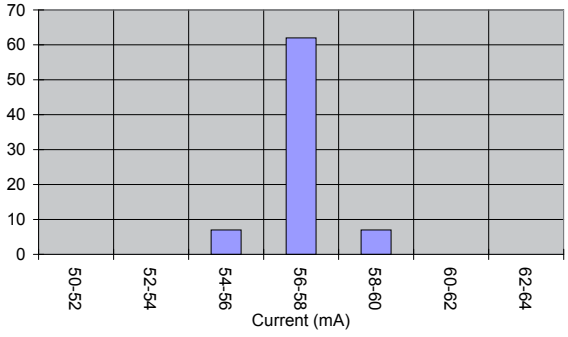
1. Measured on Mini-Circuits Characterization test board TB-615+. See Characterization Test Circuit (Fig. 1) R1=267Ω
2. Measured on Mini-Circuits Characterization test board TB-615+. See Characterization Test Circuit (Fig. 1) R1=93Ω
3. Current increases at P1dB
4. (Current at 85°C - Current at -45°C)/130

MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Junction Temperature	150°C
Total Power Dissipation	0.55 W
Input Power (CW), Vd=4V	25 dBm
DC Voltage	5.5V

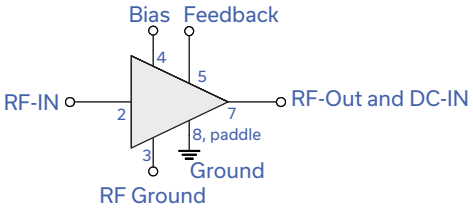
Permanent damage may occur if any of these limits are exceeded.
Electrical maximum ratings are not intended for continuous normal operation.

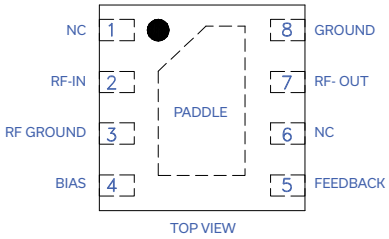
DC CURRENT HISTOGRAM



Monolithic Amplifier PMA2-162LN+

SIMPLIFIED SCHEMATIC & PAD CONNECTIONS





Function	Pad Number	Description
RF IN	2	Connects to RF input via C1 and Pad 3 via L1
RF-OUT & DC-IN	7	Connects to RF out via C2, Pad 5 via R1, and C3
RF-Ground	3	Connects to ground via C4 and Pad 2 via L1
Bias	4	Connects to Supply voltage (Vs) via Rbias
Feedback	5	Connected to pads 7, 4 via R1 and C3
No Connection	1,6	Not used internally. Pin 1 Connected to ground on test board
Ground	8 & paddle	Connects to ground

RECOMMENDED APPLICATION AND CHARACTERIZATION TEST CIRCUIT

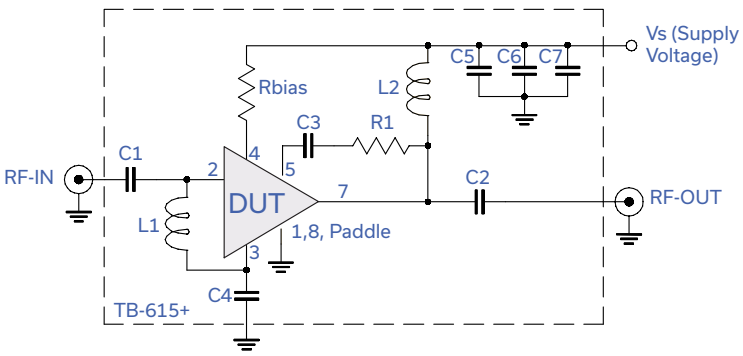


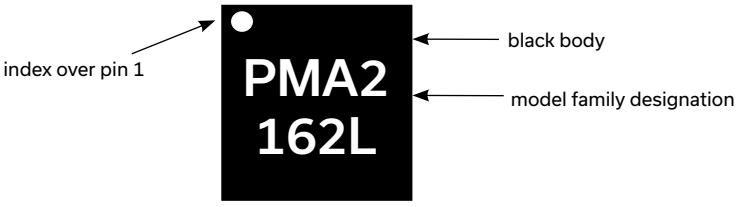
Fig 1. Application and Characterization circuit
Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-615+)

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: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.

Compo-nents	Size	Value	Manufacturer	P/N
C1, C6	0402	9.1pF	AVX CORP	04025U9R1CAT2A
C2, C4	0402	100pF	Murata	GRM1555C1H101JA01D
C3	0402	5.6pF	Murata	GJM1555C1H5R6BB01D
C5, C7	0402	0.1uF	Murata	GRM155R71C104KA88D
R1	0402	267 Ohm	KOA Speer Electronics	RK73H1ETTP2670F
Rbias	0402	750 Ohm	KOA Speer Electronics	RK73H1ETTP7500F
L1	0402	6.8nH	Coilcraft, Inc.	0402CS-6N8XGLW
L2	0402	15nH	Coilcraft, Inc.	0402CS-15NXGLW

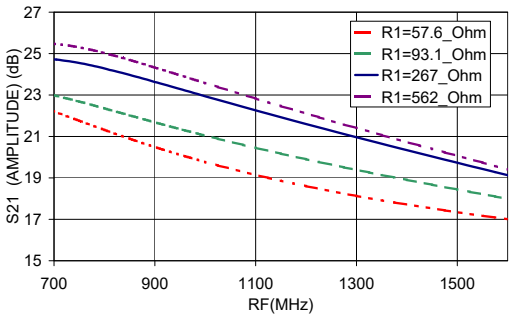
PRODUCT MARKING



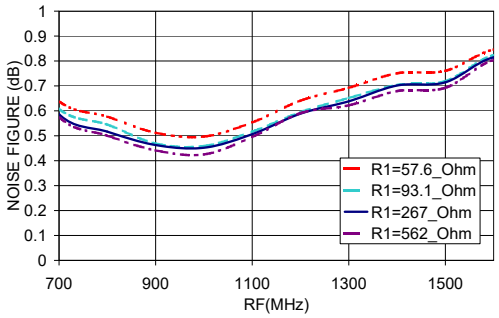
Marking may contain other features or characters for internal lot control

ADJUSTABLE GAIN PERFORMANCE (VS. R1)

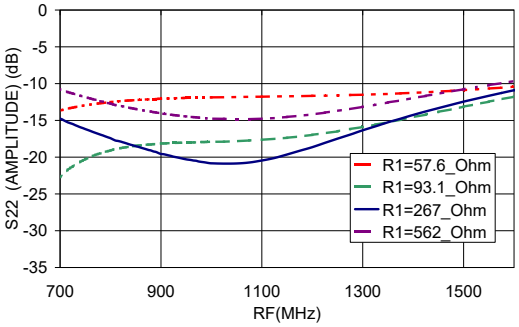
S21 (AMPLITUDE,dB) Vs. Freqency and R1 Values



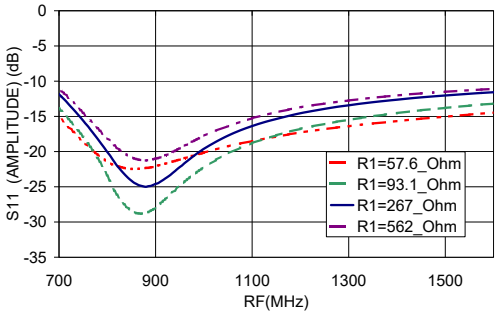
NOISE FIGURE (dB) Vs. Freqency and R1 Values



S22 (AMPLITUDE,dB) Vs. Freqency and R1 Values



S11 (AMPLITUDE,dB) Vs. Freqency and R1 Values



Monolithic Amplifier PMA2-162LN+

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 **Tape & Reel**	MC1631 Plastic package, exposed paddle, lead finish: matte tin F108
Standard quantities available on reel	7" reels with 20, 50, 100, 200, 500,1K, 2K or 3K devices
Suggested Layout for PCB Design	PL-344
Evaluation Board	TB-615+
Environmental Ratings	ENV08T1

ESD RATING

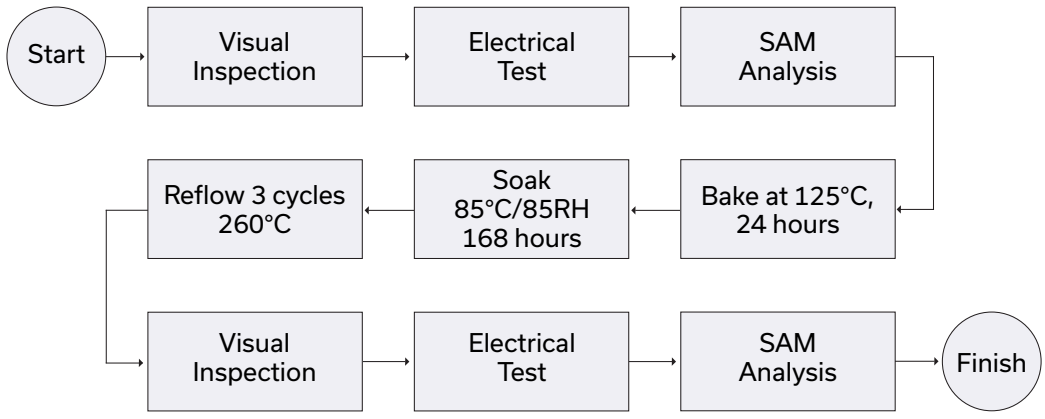
Human Body Model (HBM): Class 1B (500 to <1000V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (pass 25V) 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

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/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 = 4V, Id = 54.09mA, R1=267 Ohms @ Temperature = +25degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	1.18
600.0	1.01
700.0	0.51
800.0	0.47
900.0	0.37
1000.0	0.39
1100.0	0.43
1200.0	0.51
1300.0	0.41
1400.0	0.55
1500.0	0.61
1600.0	0.60
1700.0	0.58
1800.0	0.74
1900.0	0.68
2000.0	0.78
2100.0	0.76
2200.0	0.81
2300.0	0.92
2400.0	0.95
2500.0	1.09
2600.0	1.04
2700.0	1.19
2800.0	1.21
2900.0	1.25
3000.0	1.16
3100.0	1.46
3200.0	1.46
3300.0	1.51
3400.0	1.59
3500.0	1.49
3600.0	1.75
3700.0	1.78
3800.0	1.77
3900.0	1.84
4000.0	1.78

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 = 3.8V, Id = 50.72mA, R1=267 Ohms @ Temperature = +25degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	1.16
600.0	1.01
700.0	0.52
800.0	0.49
900.0	0.45
1000.0	0.36
1100.0	0.45
1200.0	0.50
1300.0	0.43
1400.0	0.57
1500.0	0.60
1600.0	0.61
1700.0	0.58
1800.0	0.77
1900.0	0.68
2000.0	0.80
2100.0	0.79
2200.0	0.80
2300.0	0.88
2400.0	0.93
2500.0	1.08
2600.0	1.07
2700.0	1.25
2800.0	1.19
2900.0	1.28
3000.0	1.32
3100.0	1.38
3200.0	1.55
3300.0	1.56
3400.0	1.61
3500.0	1.58
3600.0	1.78
3700.0	1.73
3800.0	1.79
3900.0	1.91
4000.0	1.77

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 =4.2V, Id = 57.17mA, R1=267 Ohms @ Temperature = +25degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	1.15
600.0	0.92
700.0	0.50
800.0	0.48
900.0	0.41
1000.0	0.34
1100.0	0.42
1200.0	0.47
1300.0	0.41
1400.0	0.55
1500.0	0.61
1600.0	0.59
1700.0	0.59
1800.0	0.74
1900.0	0.67
2000.0	0.80
2100.0	0.77
2200.0	0.77
2300.0	0.91
2400.0	0.93
2500.0	1.05
2600.0	1.06
2700.0	1.24
2800.0	1.22
2900.0	1.29
3000.0	1.18
3100.0	1.38
3200.0	1.48
3300.0	1.56
3400.0	1.59
3500.0	1.52
3600.0	1.72
3700.0	1.80
3800.0	1.89
3900.0	1.86
4000.0	1.83

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 = 4V, Id = 53.52mA, R1=267 Ohms @ Temperature = -45degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	0.73
600.0	0.71
700.0	0.26
800.0	0.23
900.0	0.20
1000.0	0.10
1100.0	0.18
1200.0	0.21
1300.0	0.17
1400.0	0.26
1500.0	0.31
1600.0	0.30
1700.0	0.26
1800.0	0.37
1900.0	0.31
2000.0	0.40
2100.0	0.40
2200.0	0.37
2300.0	0.47
2400.0	0.49
2500.0	0.60
2600.0	0.59
2700.0	0.73
2800.0	0.66
2900.0	0.71
3000.0	0.69
3100.0	0.83
3200.0	0.87
3300.0	0.87
3400.0	0.94
3500.0	0.88
3600.0	0.97
3700.0	0.98
3800.0	0.99
3900.0	1.16
4000.0	0.96

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 = 3.8V, Id = 50.44mA, R1=267 Ohms @ Temperature = -45degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	0.77
600.0	0.67
700.0	0.28
800.0	0.26
900.0	0.18
1000.0	0.17
1100.0	0.22
1200.0	0.27
1300.0	0.22
1400.0	0.31
1500.0	0.32
1600.0	0.33
1700.0	0.29
1800.0	0.41
1900.0	0.33
2000.0	0.43
2100.0	0.42
2200.0	0.40
2300.0	0.52
2400.0	0.55
2500.0	0.63
2600.0	0.64
2700.0	0.77
2800.0	0.72
2900.0	0.72
3000.0	0.71
3100.0	0.74
3200.0	0.91
3300.0	0.91
3400.0	1.02
3500.0	0.91
3600.0	1.11
3700.0	1.07
3800.0	1.03
3900.0	1.18
4000.0	0.97

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 = 4.2V, Id = 53.41mA, R1=267 Ohms @ Temperature = -45degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	0.76
600.0	0.73
700.0	0.29
800.0	0.26
900.0	0.21
1000.0	0.15
1100.0	0.23
1200.0	0.28
1300.0	0.18
1400.0	0.32
1500.0	0.34
1600.0	0.34
1700.0	0.28
1800.0	0.43
1900.0	0.36
2000.0	0.45
2100.0	0.41
2200.0	0.42
2300.0	0.49
2400.0	0.52
2500.0	0.62
2600.0	0.59
2700.0	0.75
2800.0	0.67
2900.0	0.77
3000.0	0.71
3100.0	0.80
3200.0	0.89
3300.0	0.91
3400.0	0.97
3500.0	0.90
3600.0	1.09
3700.0	1.10
3800.0	1.13
3900.0	1.15
4000.0	0.98

Typical Performance Data

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

TEST CONDITIONS: Vd = 4V, Id = 53.86mA, R1=267 Ohms @ Temperature = +85degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	1.51
600.0	1.19
700.0	0.68
800.0	0.63
900.0	0.62
1000.0	0.55
1100.0	0.61
1200.0	0.71
1300.0	0.63
1400.0	0.76
1500.0	0.82
1600.0	0.84
1700.0	0.81
1800.0	0.99
1900.0	0.93
2000.0	1.08
2100.0	1.12
2200.0	1.12
2300.0	1.25
2400.0	1.29
2500.0	1.45
2600.0	1.48
2700.0	1.65
2800.0	1.65
2900.0	1.72
3000.0	1.78
3100.0	1.87
3200.0	1.96
3300.0	2.00
3400.0	2.13
3500.0	2.13
3600.0	2.35
3700.0	2.33
3800.0	2.45
3900.0	2.55
4000.0	2.47

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 = 3.8V, Id = 50.72mA, R1=267 Ohms @ Temperature = +85degC

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

FREQ	Noise Figure
(MHz)	(dB)
500.0	1.51
600.0	1.20
700.0	0.72
800.0	0.65
900.0	0.59
1000.0	0.56
1100.0	0.64
1200.0	0.69
1300.0	0.61
1400.0	0.75
1500.0	0.84
1600.0	0.83
1700.0	0.84
1800.0	1.00
1900.0	0.95
2000.0	1.11
2100.0	1.09
2200.0	1.14
2300.0	1.22
2400.0	1.30
2500.0	1.46
2600.0	1.45
2700.0	1.65
2800.0	1.62
2900.0	1.70
3000.0	1.70
3100.0	1.84
3200.0	1.96
3300.0	1.96
3400.0	2.09
3500.0	2.09
3600.0	2.31
3700.0	2.36
3800.0	2.39
3900.0	2.61
4000.0	2.50

Typical Performance Data

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

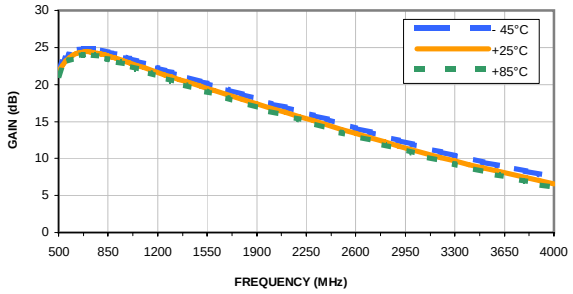
TEST CONDITIONS: Vd =4.2V, Id = 57.08mA, R1=267 Ohms @ Temperature = +85degC

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

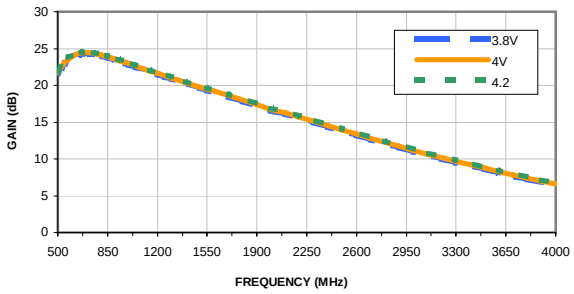
FREQ	Noise Figure
(MHz)	(dB)
500.0	1.47
600.0	1.18
700.0	0.70
800.0	0.64
900.0	0.57
1000.0	0.56
1100.0	0.61
1200.0	0.69
1300.0	0.61
1400.0	0.74
1500.0	0.83
1600.0	0.85
1700.0	0.82
1800.0	0.99
1900.0	0.95
2000.0	1.09
2100.0	1.06
2200.0	1.11
2300.0	1.20
2400.0	1.27
2500.0	1.44
2600.0	1.43
2700.0	1.59
2800.0	1.58
2900.0	1.70
3000.0	1.66
3100.0	1.81
3200.0	1.99
3300.0	1.99
3400.0	2.09
3500.0	2.04
3600.0	2.24
3700.0	2.33
3800.0	2.42
3900.0	2.49
4000.0	2.34

Typical Performance Curves

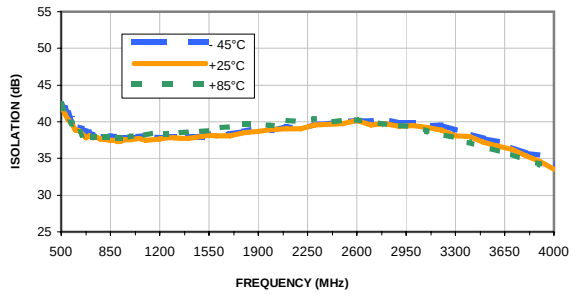
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 4V, R1 = 267 Ohms



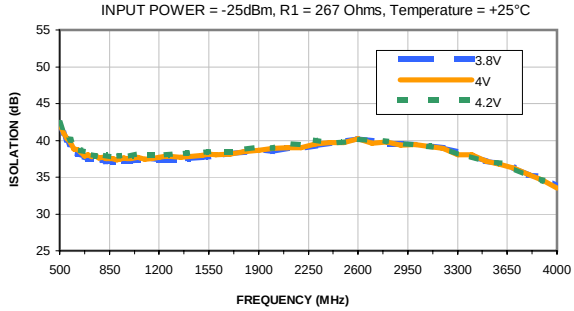
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, R1 = 267 Ohms, Temperature = +25°C



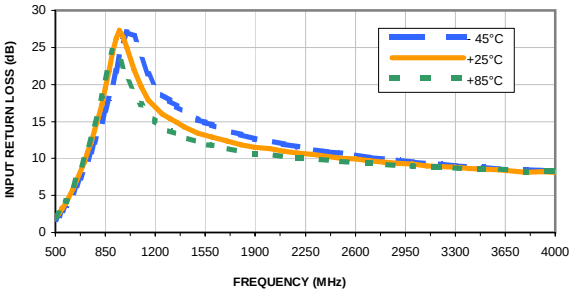
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 4V, R1 = 267 Ohms



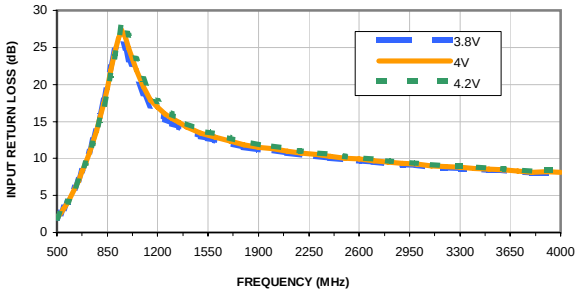
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, R1 = 267 Ohms, Temperature = +25°C



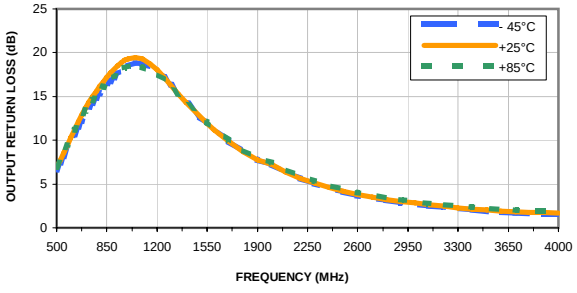
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 4V, R1 = 267 Ohms



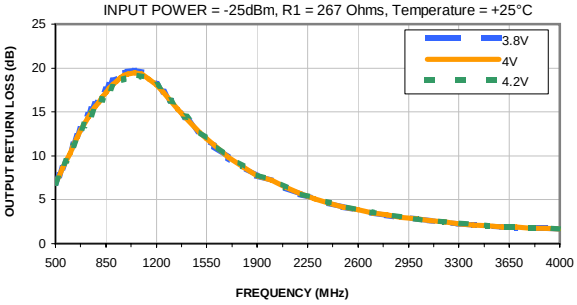
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, R1 = 267 Ohms ,Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 4V, R1 = 267 Ohms

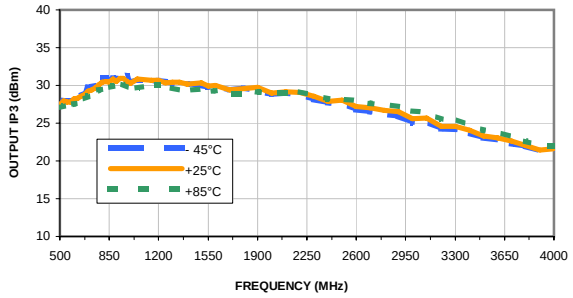


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, R1 = 267 Ohms, Temperature = +25°C

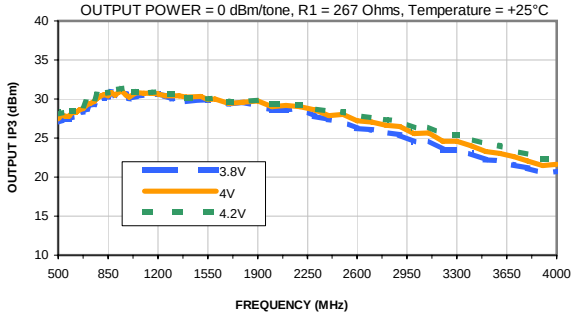


Typical Performance Curves

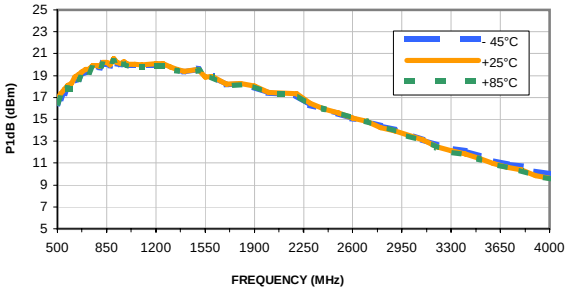
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = 0 dBm/tone, Vd = 4V, R1 = 267 Ohms



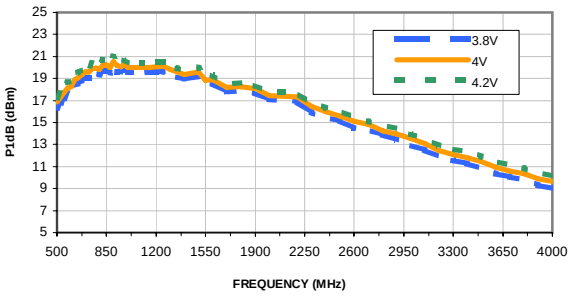
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = 0 dBm/tone, R1 = 267 Ohms, Temperature = +25°C



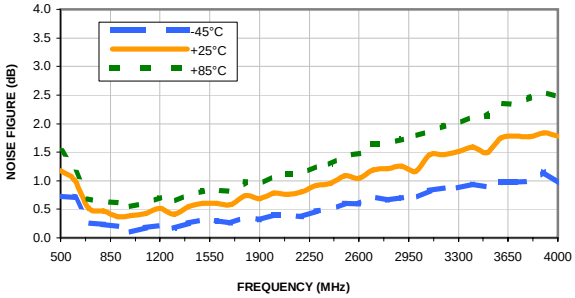
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 4V, R1 = 267 Ohms



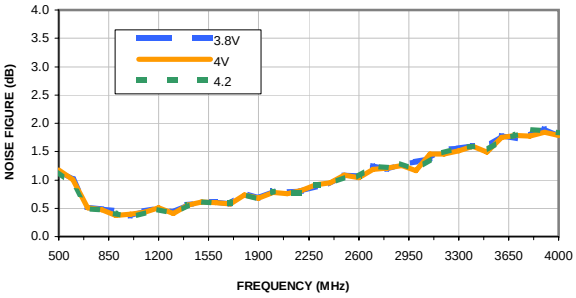
P1dB vs. FREQUENCY & DEVICE VOLTAGE
R1 = 267 Ohms, Temperature = +25°C



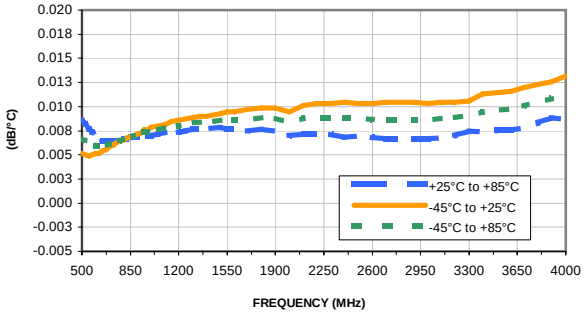
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 4V, R1 = 267 Ohms



NOISE FIGURE vs. FREQUENCY & DEVICE VOLTAGE
R1 = 267 Ohms, Temperature = +25°C



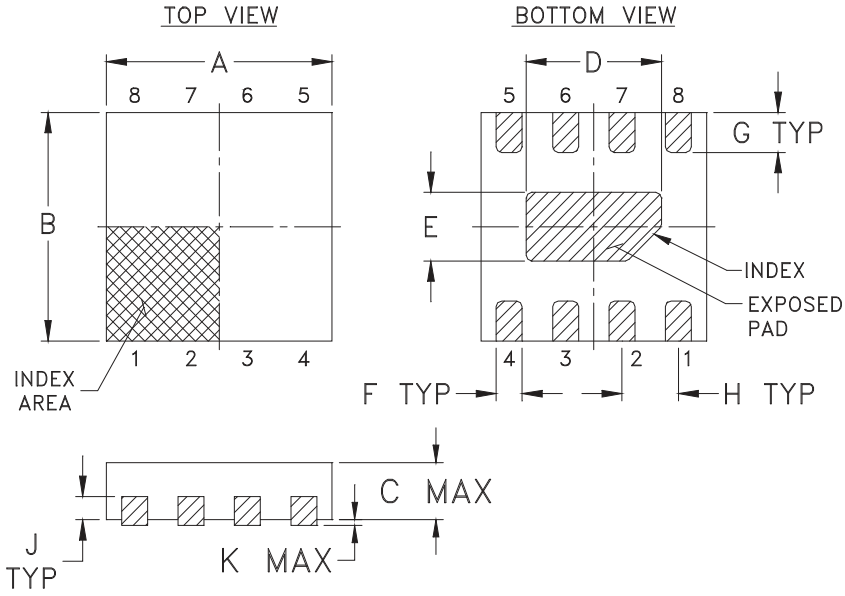
GAIN VARIATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 4V, R1 = 267 Ohms

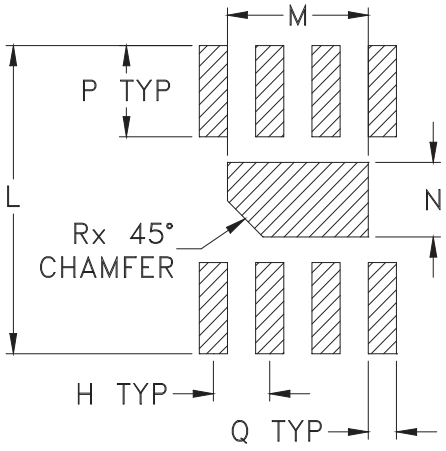


MC1631

Outline Dimensions

PCB Land Pattern





Suggested Layout,
Tolerance to be within ±.002

CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MC1631	.079 (2.00)	.079 (2.00)	.022 (.55)	.047 (1.20)	.024 (.60)	.009 (.23)	.014 (.35)	.020 (.50)	.008 (.20)	.002 (.05)	.106 (2.70)	.049 (1.25)	.026 (.65)	.031 (.80)

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

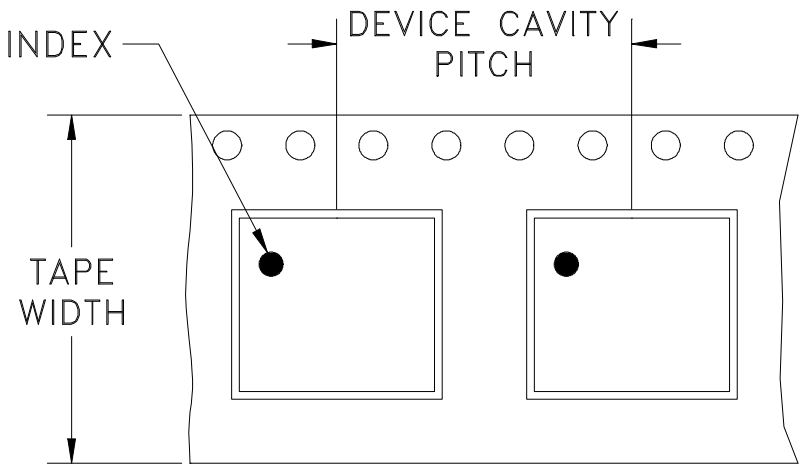
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Matte-Tin plate. 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.

Tape & Reel Packaging TR-F108

DEVICE ORIENTATION IN T&R



DIRECTION OF FEED

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	4	7	Small quantity standards	20
				50
				100
				200
				500
				1000
		7	Standard	2000
				3000

Note: Please Consult individual 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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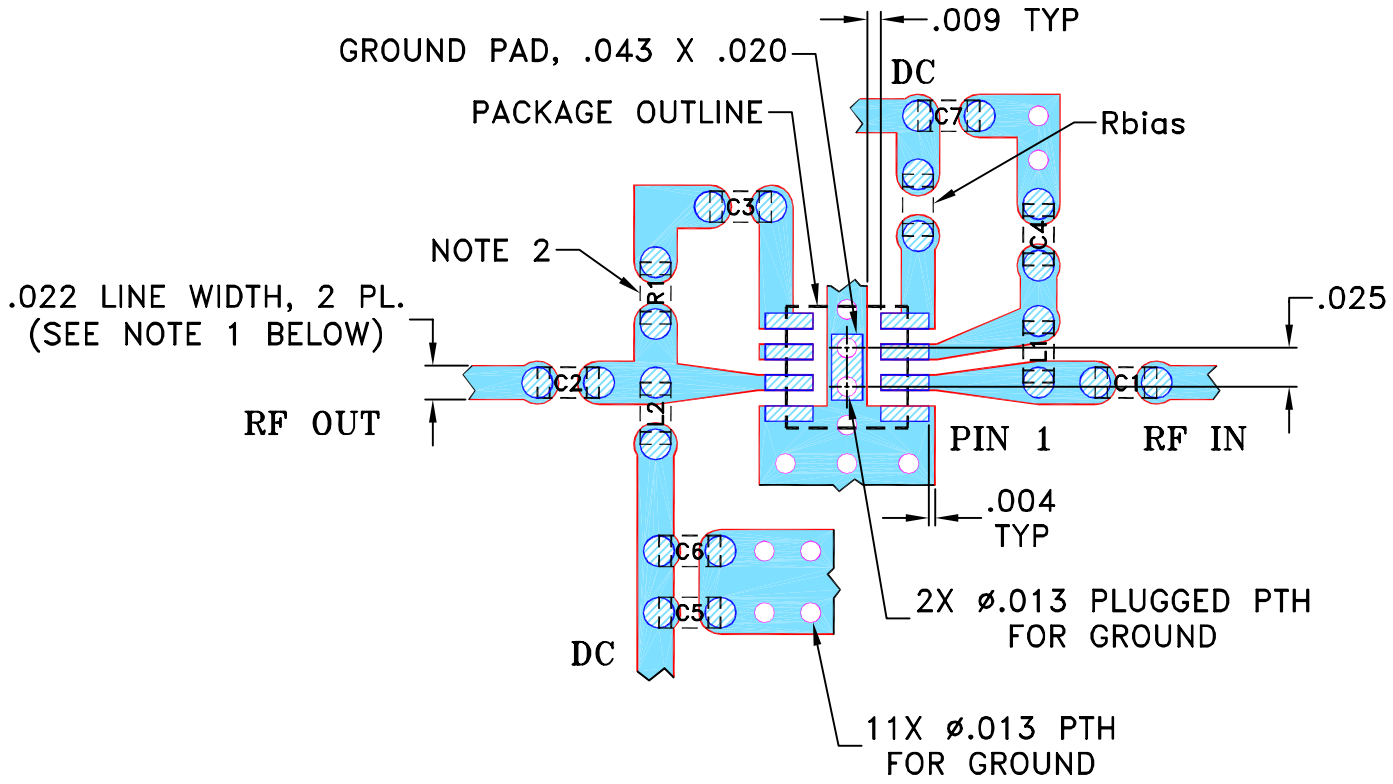
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M131518	NEW RELEASE	05/12/11	PW	CW
A	M135045	UPDATED NOTE 2 & REMOVED TABLE	12/30/11	AV	DJ

SUGGESTED MOUNTING CONFIGURATION FOR MC1631 CASE STYLE, "08AM07" PIN CODE



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. 0402 SIZE CHIP FOOT PRINTS SHOWN FOR REFERENCE, FOR COMPONENT VALUE REFER TO TB-615+.
3. 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	DRAWN	PW	04/19/11
TOLERANCES ON:	CHECKED	AV	05/12/11
2 PL DECIMALS ±	APPROVED	CW	05/12/11
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

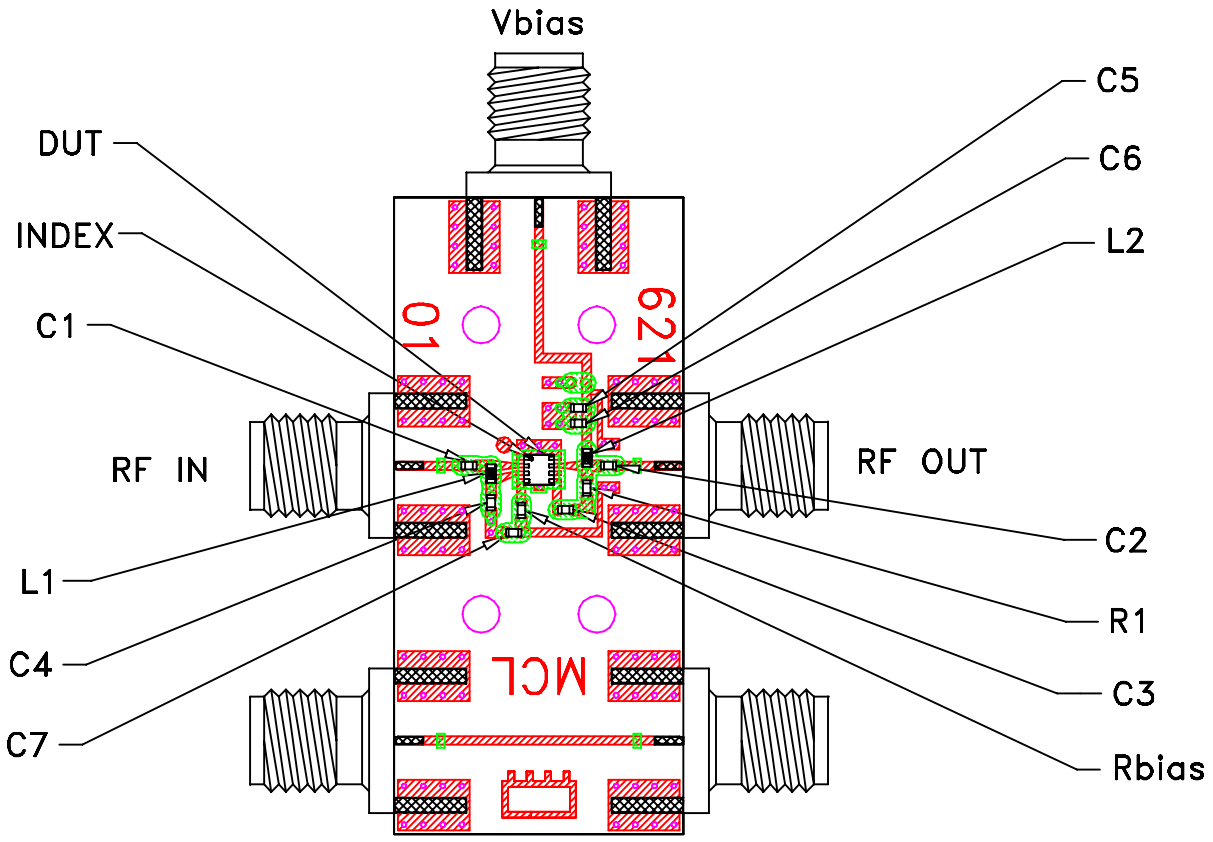
ASHEETA1.DWG REV:A DATE:01/12/95

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

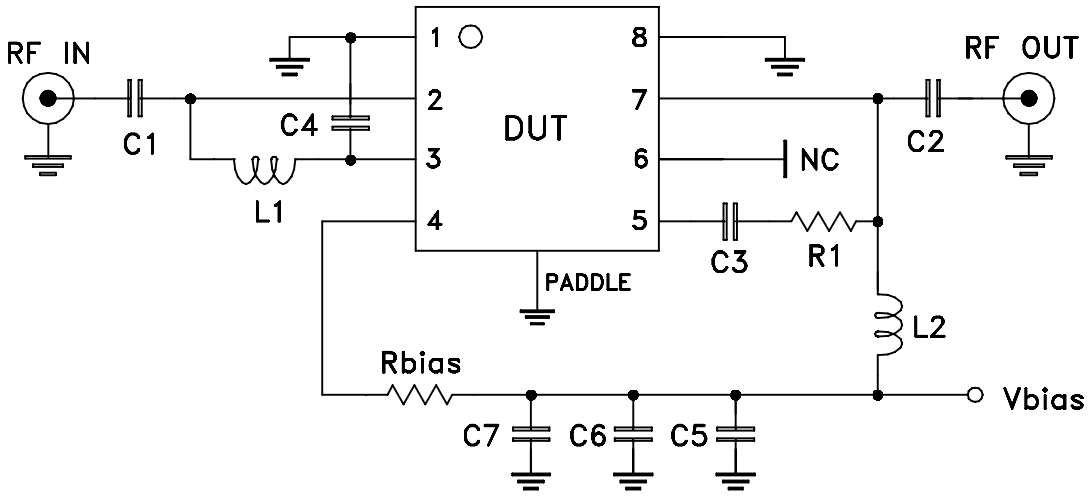
PL, 08AM07, MC1631, TB-615+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-344	A
FILE: 98PL344	SCALE: 8:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



TB-615+



Schematic Diagram

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

NOTES:

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

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Environmental Specifications ENV08T1

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

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C or -45° to 85°C 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	