HIGH DIRECTIVITY

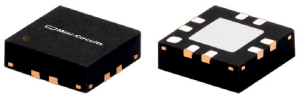
Monolithic Amplifier

MNA-3A+

50Ω 0.5 to 2.5 GHz

THE BIG DEAL

- Integrated matching, DC Blocks and bias circuits
- High Active Directivity, 16-25 dB typ.
- Choice of supply voltage, 2.8V to 5V
- Micro-miniature size .120"X.120"
- Output power, up to +11.6 dBm typ. at 500 MHz
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: DQ849

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

APPLICATIONS

- Buffer amplifier
- Cellular
- PCN
- Communications satellite
- Defense

PRODUCT OVERVIEW

MNA-3A+ is a wideband PHEMT based MMIC amplifier with high active Directivity. MNA integrates the entire matching network and majority of the bias circuit inside the package, reducing the need for complicated external circuits. This approach makes the MNA amplifier extremely straightforward to use. This design operates on a single 2.8 to 5V supply, is well matched for 50Ω and comes in a tiny, low profile 3x3mm 8-lead MCLP package accommodating dense circuit board layouts. MNA-3A+ belongs to MNA series of models available in Die and packaged form.

KEY FEATURES

Feature	Advantages
Excellent Active Directivity (Isolation- Gain) 16-25 dB	Ideal for use as a buffer amplifier minimizing interaction of adjacent circuits
Integrates DC blocks and RF choke	Minimizes external components, component count and circuit area.
Single 2.8 to +5V operation	Amplifier can be used at low voltage such as +3V or standard +5V. +5V operation results in higher P1dB and OIP3.
3 x 3mm 8-lead MCLP package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

REV. A
ECO-011187
MNA-3A+
MCL NY
220928

ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter	Condition (GHz)	Vs=5V Min.	Vs=5V Typ.	Vs=5V Max.	Vs=2.8V Typ.	Units
Frequency Range		0.5		2.5	0.5-2.5	GHz
Gain	0.5	—	12.9	—	12.0	dB
	0.75	—	15.5	—	14.4	
	1.0	—	16.4	—	15.2	
	1.5	—	16.8	—	15.5	
	2.0	14.9	16.5	18.2	15.2	
	2.5	—	15.5	—	14.2	
Input Return Loss	0.5		4.4		4.7	dB
	0.75		14.1		14.2	
	1.0		24.4		21.5	
	1.5		16.7		17.0	
	2.0		19.4		18.6	
	2.5		14.2		13.8	
Output Return Loss	0.5		15.0		13.9	dB
	0.75		22.3		18.8	
	1.0		30.7		22.4	
	1.5		25.1		22.9	
	2.0		20.2		18.0	
	2.5		18.5		15.0	
Output Power at P1dB	0.5		11.6		10.0	dBm
	0.75		11.6		10.4	
	1.0		11.0		10.0	
	1.5		10.3		9.3	
	2.0		9.5		8.6	
	2.5		9.5		8.4	
Output IP3	0.5		23.3		21.0	dBm
	0.75		24.1		21.7	
	1.0		22.9		21.0	
	1.5		22.0		20.2	
	2.0		21.0		19.4	
	2.5		21.0		19.2	
Noise Figure	0.5		4.5		4.5	dB
	0.75		4.1		4.2	
	1.0		3.9		4.0	
	1.5		3.9		4.0	
	2.0		4.0		4.1	
	2.5		4.1		4.2	
Active Directivity (Isolation-Gain)	0.5		25.4		25.9	dB
	0.75		19.3		20.0	
	1.0		17.3		18.0	
	1.5		16.3		16.7	
	2.0		16.8		16.7	
	2.5		18.7		17.7	
DC Current		—	34.3	43	32.6	mA
Device Current Variation vs. Temperature(2)			16		6	µA/°C
Device Current Variation vs Voltage			0.0004[3]		0.0012[4]	mA/mV
Thermal resitance at 85°C			69.9		69.9	°C/W

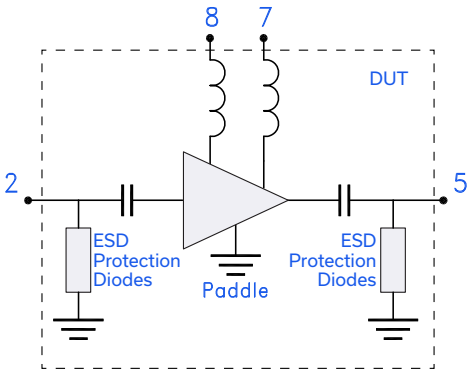
1. Measured on Mini-Circuits Characterization test board TB-186-3A+. See Characterization Test Circuit (Fig. 1)
2. (Current at 85°C -Current at -45°C)/130
3. (Current at 5.25V-Current at 3.9V)/1.35
4. (Current at 3.9V-Current at 2.66V)/1.24

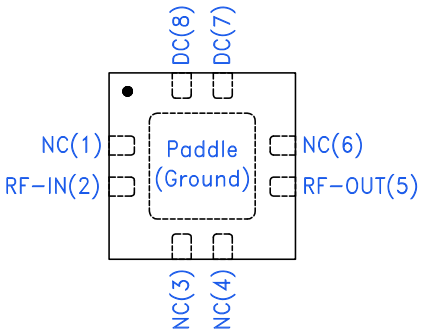
MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
DC Voltage	7V at pad 7 (on TB-186-3A+) 1V at pads 2 & 5
Power Dissipation	650 mW
Input Power	6 dBm (continuous operation) 28 dBm (5 minutes max)

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

SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION





Function	Pad Number	Description (See Fig 1)
RF IN	2	RF input pin
RF-OUT	5	RF output pin
DC	7,8	DC Bias pads 7,8. Pad 7 connected to ground via 1000 pF. Pad 8 connected to pad 7 via 33.2 ohms.
NC	1,3,4,6	Not Connected, connect pad 3 and 4 to ground externally
GND	Paddle	Ground
OPTIONAL	1,6	No internal connection; recommended use: per PCB Layout PL-078

CHARACTERIZATION & APPLICATION TEST CIRCUIT

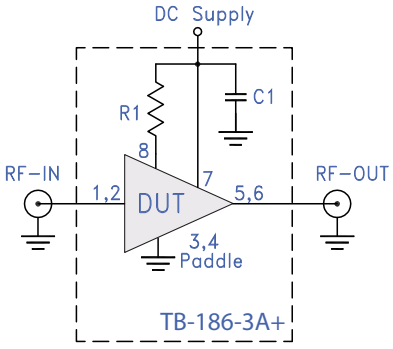


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-313-3A+)
Gain, Return loss, Output power at 1dB compression (P1 dB) , output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain and Return loss: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -5dBm/tone at output.

Component	Size	Value	Units
R1	0805	33.2	Ω
C1	0402	1000	ρ F

RECOMMENDED APPLICATION CIRCUIT

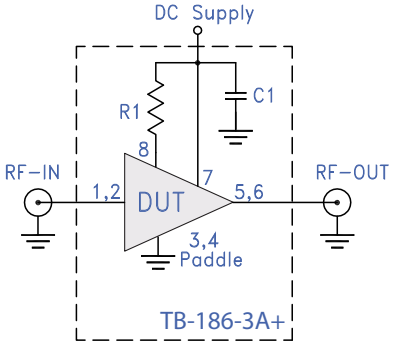
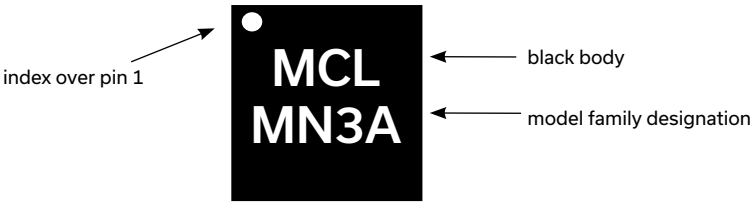


Fig 2. Test Board includes case, connectors, and components soldered to PCB

Component	Size	Value	Units
R1	0805	33.2	Ω
C1	0402	1000	ρ F

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

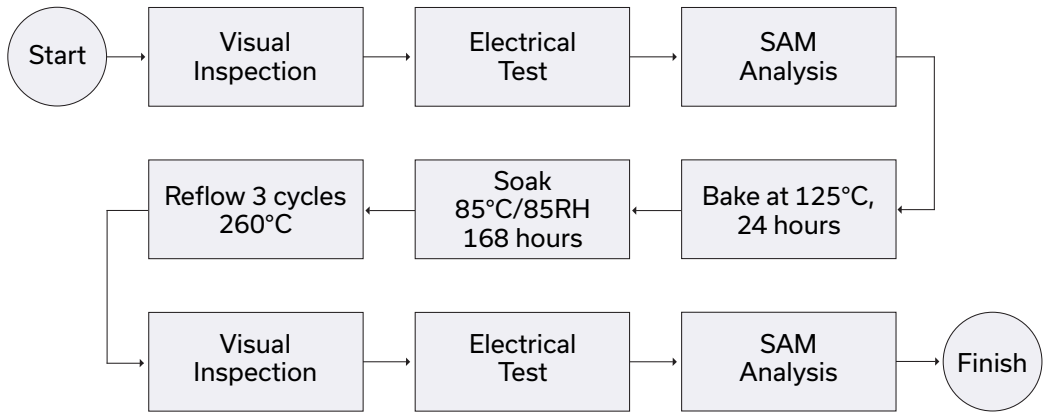
ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DQ849 3x3x0.9 mm MCLP Plastic package, exposed paddle lead finish: Matte-Tin
Tape & Reel **Standard quantities available on reel**	F104 7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices
Suggested Layout for PCB Design	PL-078
Evaluation Board	TB-186-3A+
Environmental Ratings	ENV08T1

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

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 = 5.00V, Id = 34.21mA @ 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)
400	10.60	41.12	3.91	11.89	9.19	1.32	21.84	9.70	4.94
500	12.96	39.11	6.11	15.26	7.38	1.21	23.19	11.73	4.99
600	14.37	37.35	9.09	18.33	6.08	1.11	24.10	11.85	4.27
700	15.24	36.24	12.79	21.27	5.30	1.04	24.11	11.93	4.05
800	15.81	35.39	17.66	24.38	4.71	1.00	23.68	11.68	3.97
900	16.19	34.74	24.37	27.65	4.27	0.99	23.59	11.79	3.88
1000	16.46	34.28	28.54	31.32	3.95	0.98	22.73	11.17	3.87
1100	16.64	33.95	23.53	35.16	3.72	0.99	22.83	11.36	3.93
1200	16.76	33.75	20.37	36.36	3.57	0.99	22.48	11.01	3.88
1300	16.86	33.59	18.65	33.80	3.46	0.99	22.27	10.84	3.89
1400	16.90	33.46	17.66	30.58	3.37	1.00	22.24	10.86	3.90
1500	16.91	33.36	17.13	27.92	3.32	1.00	21.84	10.44	3.87
1600	16.94	33.47	16.92	25.69	3.34	1.00	21.86	10.46	3.92
1700	16.89	33.41	17.45	24.55	3.35	0.99	21.55	10.19	3.88
1800	16.83	33.35	17.96	23.22	3.35	0.99	21.65	10.19	3.90
1900	16.76	33.45	18.81	22.15	3.42	0.99	21.47	10.04	3.88
2000	16.64	33.51	19.73	21.32	3.49	0.98	21.10	9.70	3.94
2100	16.51	33.60	20.55	20.61	3.58	0.98	21.22	9.77	3.91
2200	16.35	33.79	20.56	20.01	3.72	0.98	20.81	9.53	3.90
2300	16.17	33.87	19.61	19.41	3.82	0.98	20.99	9.62	3.94
2400	15.98	33.98	17.39	18.87	3.91	0.99	21.09	9.77	4.04
2500	15.63	34.54	15.51	19.04	4.29	1.00	21.00	9.65	3.99
2600	15.33	35.04	13.83	19.21	4.64	1.02	21.06	9.63	4.18
2700	15.01	35.10	12.25	19.07	4.75	1.03	21.15	9.73	4.20
2800	14.56	35.56	10.63	19.95	5.13	1.07	21.22	9.76	4.33
2900	14.15	35.77	9.43	20.24	5.34	1.09	21.08	9.72	4.38
3000	13.75	36.17	8.40	20.53	5.66	1.13	21.02	9.64	4.42
3100	13.23	36.56	7.42	21.80	6.02	1.17	21.04	9.59	4.58
3200	12.80	37.26	6.67	22.15	6.56	1.20	21.01	9.65	4.59
3300	12.29	37.43	6.01	22.55	6.77	1.24	20.72	9.18	4.72
3400	11.80	37.82	5.39	23.90	7.12	1.28	21.19	9.69	4.90
3600	10.83	38.95	4.45	25.32	8.17	1.35	21.30	9.78	5.22
3800	9.91	39.69	3.77	25.55	8.94	1.41	21.68	10.08	5.53
4000	9.00	40.57	3.28	25.23	10.03	1.46	21.61	10.00	5.95
4200	8.17	41.21	2.84	24.72	10.75	1.51	21.70	10.10	6.40
4400	7.39	39.93	2.56	24.02	9.42	1.55	21.83	10.29	6.87
4600	6.66	39.67	2.38	22.48	9.39	1.57	21.96	10.54	7.26
4800	6.02	40.69	2.18	20.51	10.57	1.59	22.05	10.78	7.65
5000	5.39	35.74	1.98	19.00	5.91	1.62	22.34	11.35	8.06
5200	4.58	37.79	2.02	16.79	8.23	1.60	21.93	10.89	8.63
5400	3.25	42.33	2.00	14.72	15.90	1.58	20.91	10.03	9.12

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 = 3.90V, Id = 33.72mA @ 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)
400	10.40	41.17	3.93	11.77	9.48	1.32	21.34	9.40	4.98
500	12.72	39.10	6.14	14.86	7.58	1.21	22.71	11.42	5.03
600	14.09	37.31	9.07	17.57	6.22	1.11	23.55	11.59	4.30
700	14.92	36.18	12.67	20.12	5.43	1.04	23.57	11.67	4.07
800	15.48	35.31	17.27	22.74	4.83	1.00	23.19	11.44	3.97
900	15.83	34.64	23.05	25.36	4.38	0.99	23.07	11.54	3.95
1000	16.09	34.16	26.96	28.35	4.05	0.98	22.29	10.95	3.90
1100	16.25	33.80	23.67	32.02	3.82	0.99	22.36	11.11	3.94
1200	16.37	33.55	20.79	36.41	3.65	0.99	22.04	10.76	3.91
1300	16.45	33.35	19.08	36.49	3.53	0.99	21.81	10.59	3.91
1400	16.49	33.18	18.10	32.61	3.43	0.99	21.78	10.60	3.90
1500	16.49	33.04	17.56	29.22	3.37	1.00	21.40	10.18	3.91
1600	16.51	33.10	17.30	26.12	3.38	1.00	21.42	10.18	3.96
1700	16.46	32.98	17.79	24.63	3.35	0.99	21.10	9.92	3.94
1800	16.40	32.87	18.26	23.06	3.33	0.99	21.22	9.91	3.96
1900	16.33	32.90	19.04	21.73	3.37	0.99	21.04	9.75	4.01
2000	16.22	32.89	19.85	20.69	3.41	0.98	20.68	9.43	3.94
2100	16.10	32.91	20.59	19.83	3.47	0.98	20.80	9.47	3.96
2200	15.94	33.02	20.51	19.06	3.57	0.98	20.37	9.23	3.92
2300	15.77	33.01	19.62	18.32	3.62	0.98	20.54	9.31	3.97
2400	15.59	33.12	17.49	17.57	3.70	0.98	20.59	9.44	4.04
2500	15.26	33.55	15.66	17.47	4.00	0.99	20.52	9.31	3.99
2600	14.98	33.89	14.02	17.44	4.23	1.00	20.60	9.28	4.23
2700	14.68	33.85	12.42	17.09	4.28	1.02	20.66	9.37	4.23
2800	14.25	34.26	10.81	17.53	4.58	1.05	20.75	9.43	4.31
2900	13.85	34.33	9.58	17.60	4.70	1.08	20.62	9.35	4.43
3000	13.46	34.62	8.56	17.61	4.91	1.11	20.55	9.27	4.42
3100	12.95	34.90	7.54	18.33	5.16	1.15	20.59	9.24	4.58
3200	12.54	35.43	6.78	18.43	5.51	1.18	20.53	9.30	4.61
3300	12.04	35.55	6.11	18.37	5.65	1.22	20.28	8.85	4.77
3400	11.55	35.84	5.48	18.97	5.87	1.26	20.68	9.34	4.90
3600	10.59	36.69	4.53	19.55	6.52	1.33	20.80	9.42	5.22
3800	9.67	37.24	3.84	19.50	7.00	1.39	21.17	9.72	5.62
4000	8.75	37.78	3.34	19.01	7.54	1.44	21.13	9.67	6.03
4200	7.90	38.24	2.88	18.58	7.91	1.49	21.22	9.74	6.44
4400	7.10	37.22	2.61	18.18	7.18	1.52	21.34	9.95	6.88
4600	6.33	36.97	2.43	17.37	7.18	1.54	21.41	10.21	7.34
4800	5.65	37.69	2.22	16.27	7.80	1.56	21.50	10.43	7.69
5000	4.97	34.40	2.04	15.40	5.34	1.58	21.52	10.94	8.13
5200	4.10	35.93	2.09	13.94	7.03	1.56	20.96	10.42	8.67
5400	2.70	39.48	2.11	12.36	12.33	1.53	19.61	9.39	9.18

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 = 5.25V, Id = 34.27mA @ 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)
400	10.61	41.09	3.91	11.91	9.14	1.32	21.89	9.75	4.90
500	12.99	39.10	6.11	15.32	7.36	1.21	23.24	11.77	4.92
600	14.40	37.34	9.08	18.44	6.06	1.11	24.18	11.89	4.29
700	15.27	36.24	12.79	21.42	5.28	1.04	24.17	11.96	4.06
800	15.85	35.39	17.71	24.56	4.69	1.00	23.73	11.70	3.94
900	16.23	34.74	24.56	27.79	4.25	0.99	23.64	11.83	3.89
1000	16.50	34.29	28.75	31.14	3.93	0.98	22.79	11.21	3.87
1100	16.68	33.96	23.48	33.85	3.71	0.99	22.88	11.39	3.89
1200	16.81	33.76	20.30	33.91	3.55	0.99	22.53	11.04	3.86
1300	16.91	33.61	18.57	31.93	3.44	0.99	22.31	10.88	3.87
1400	16.95	33.48	17.58	29.45	3.36	1.00	22.28	10.90	3.87
1500	16.96	33.39	17.06	27.19	3.31	1.00	21.89	10.48	3.88
1600	16.99	33.50	16.85	25.26	3.33	1.00	21.91	10.49	3.89
1700	16.94	33.45	17.35	24.24	3.34	0.99	21.60	10.22	3.86
1800	16.89	33.41	17.87	23.02	3.34	0.99	21.69	10.24	3.87
1900	16.81	33.52	18.71	22.04	3.42	0.99	21.52	10.08	3.85
2000	16.70	33.58	19.64	21.27	3.49	0.99	21.14	9.74	3.88
2100	16.57	33.69	20.43	20.61	3.59	0.98	21.28	9.82	3.90
2200	16.40	33.89	20.43	20.06	3.73	0.98	20.87	9.56	3.90
2300	16.21	33.98	19.51	19.49	3.84	0.98	21.05	9.67	3.91
2400	16.03	34.10	17.29	19.03	3.94	0.99	21.14	9.82	3.99
2500	15.67	34.67	15.47	19.24	4.34	1.00	21.06	9.70	3.94
2600	15.37	35.20	13.80	19.46	4.70	1.02	21.10	9.68	4.14
2700	15.04	35.27	12.20	19.37	4.82	1.04	21.22	9.78	4.15
2800	14.59	35.75	10.60	20.35	5.22	1.07	21.30	9.83	4.30
2900	14.17	35.97	9.41	20.72	5.45	1.10	21.14	9.76	4.37
3000	13.77	36.40	8.39	21.08	5.79	1.13	21.06	9.70	4.39
3100	13.25	36.79	7.41	22.48	6.16	1.17	21.11	9.65	4.51
3200	12.81	37.51	6.66	22.87	6.74	1.21	21.09	9.70	4.55
3300	12.30	37.70	6.00	23.40	6.97	1.24	20.76	9.24	4.66
3400	11.80	38.12	5.38	24.93	7.36	1.28	21.26	9.75	4.83
3600	10.84	39.29	4.45	26.44	8.49	1.35	21.39	9.83	5.18
3800	9.92	40.02	3.78	26.67	9.29	1.42	21.76	10.14	5.51
4000	9.02	40.96	3.29	26.48	10.49	1.46	21.70	10.06	5.90
4200	8.18	41.58	2.85	25.95	11.22	1.51	21.78	10.16	6.36
4400	7.42	40.14	2.57	25.14	9.65	1.55	21.87	10.34	6.85
4600	6.67	39.69	2.38	23.37	9.40	1.57	22.00	10.59	7.23
4800	6.05	41.27	2.21	21.11	11.37	1.59	22.12	10.83	7.59
5000	5.43	36.07	1.99	19.35	6.13	1.62	22.45	11.41	7.99
5200	4.64	38.07	2.03	17.09	8.48	1.60	22.05	10.96	8.55
5400	3.31	42.48	2.01	14.99	16.17	1.58	21.04	10.11	9.11

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 = 32.92mA @ 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)
400	11.00	41.28	3.77	12.15	8.78	1.34	21.89	9.47	4.13
500	13.34	39.25	5.92	15.40	7.09	1.22	23.29	11.43	4.38
600	14.74	37.44	8.82	18.39	5.84	1.12	24.19	11.50	3.53
700	15.60	36.33	12.42	21.17	5.11	1.04	24.15	11.58	3.37
800	16.19	35.50	17.31	24.37	4.56	1.00	23.73	11.33	3.21
900	16.58	34.80	24.48	27.94	4.11	0.99	23.62	11.45	3.16
1000	16.86	34.36	31.02	30.74	3.81	0.98	22.73	10.80	3.15
1100	17.05	34.04	24.50	31.77	3.59	0.98	22.84	11.02	3.21
1200	17.19	33.83	21.03	31.05	3.44	0.99	22.49	10.68	3.18
1300	17.29	33.68	19.28	30.13	3.33	0.99	22.27	10.54	3.17
1400	17.36	33.55	18.13	29.13	3.25	0.99	22.26	10.60	3.18
1500	17.37	33.45	17.42	27.52	3.19	0.99	21.83	10.17	3.15
1600	17.41	33.56	17.09	25.90	3.21	0.99	21.87	10.21	3.20
1700	17.38	33.52	17.49	25.17	3.21	0.99	21.56	9.93	3.17
1800	17.34	33.49	18.01	23.81	3.22	0.99	21.68	9.97	3.16
1900	17.27	33.56	18.88	22.44	3.27	0.99	21.50	9.83	3.13
2000	17.17	33.64	19.68	21.47	3.34	0.98	21.08	9.45	3.17
2100	17.05	33.75	20.28	20.80	3.42	0.98	21.25	9.56	3.19
2200	16.90	33.92	20.10	20.14	3.54	0.98	20.77	9.27	3.15
2300	16.73	34.01	19.31	19.56	3.64	0.98	20.98	9.39	3.18
2400	16.56	34.15	17.31	19.10	3.74	0.99	21.09	9.56	3.22
2500	16.22	34.72	15.45	19.42	4.10	1.00	21.01	9.43	3.20
2600	15.94	35.23	13.83	19.64	4.43	1.02	21.10	9.45	3.40
2700	15.63	35.34	12.31	19.42	4.56	1.03	21.18	9.55	3.36
2800	15.18	35.86	10.64	20.35	4.95	1.07	21.23	9.56	3.49
2900	14.74	35.89	9.38	20.56	5.06	1.10	21.08	9.52	3.55
3000	14.39	36.45	8.43	20.90	5.43	1.13	21.04	9.44	3.56
3100	13.88	36.77	7.45	22.48	5.74	1.17	21.09	9.43	3.63
3200	13.47	37.56	6.71	22.92	6.31	1.20	20.98	9.42	3.68
3300	12.95	37.76	5.98	23.74	6.51	1.24	20.68	8.92	3.80
3400	12.44	38.19	5.38	25.51	6.90	1.28	21.15	9.45	3.97
3600	11.47	39.37	4.40	27.76	7.92	1.36	21.26	9.52	4.26
3800	10.52	40.02	3.65	28.66	8.48	1.43	21.67	9.82	4.61
4000	9.60	41.17	3.12	27.98	9.70	1.48	21.52	9.68	4.98
4200	8.79	41.62	2.66	27.79	10.03	1.54	21.62	9.77	5.35
4400	8.04	40.29	2.40	26.75	8.68	1.57	21.76	10.00	5.80
4600	7.34	40.20	2.21	24.72	8.73	1.60	21.85	10.18	6.13
4800	6.77	40.92	2.01	22.63	9.36	1.62	22.02	10.51	6.45
5000	6.22	36.13	1.79	20.55	5.21	1.65	22.32	11.03	6.83
5200	5.53	38.18	1.80	18.00	7.08	1.64	22.03	10.77	7.37
5400	4.41	42.54	1.80	15.69	13.18	1.62	21.38	10.20	7.81

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 = 3.90V, Id = 32.53mA @ 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)
400	10.85	41.31	3.79	12.10	8.99	1.34	21.47	9.23	4.10
500	13.15	39.24	5.95	15.20	7.23	1.22	22.81	11.21	4.43
600	14.52	37.42	8.81	18.02	5.96	1.11	23.65	11.30	3.60
700	15.36	36.30	12.33	20.63	5.22	1.05	23.63	11.38	3.31
800	15.93	35.45	16.97	23.64	4.66	1.01	23.23	11.13	3.22
900	16.30	34.74	23.35	27.19	4.21	0.99	23.12	11.25	3.17
1000	16.58	34.29	29.12	31.17	3.90	0.98	22.34	10.61	3.11
1100	16.76	33.94	24.85	35.39	3.67	0.98	22.41	10.82	3.18
1200	16.89	33.71	21.54	37.94	3.51	0.99	22.06	10.49	3.16
1300	16.99	33.53	19.78	36.60	3.39	0.99	21.87	10.34	3.11
1400	17.05	33.38	18.57	33.43	3.30	0.99	21.84	10.39	3.17
1500	17.06	33.25	17.83	30.02	3.24	0.99	21.44	9.95	3.15
1600	17.09	33.32	17.45	27.18	3.25	0.99	21.47	10.01	3.13
1700	17.06	33.23	17.82	25.87	3.23	0.99	21.13	9.72	3.18
1800	17.01	33.16	18.29	24.02	3.22	0.99	21.28	9.76	3.19
1900	16.95	33.18	19.12	22.35	3.25	0.98	21.07	9.60	3.14
2000	16.85	33.23	19.84	21.21	3.30	0.98	20.70	9.24	3.15
2100	16.74	33.28	20.40	20.40	3.36	0.98	20.84	9.33	3.17
2200	16.60	33.39	20.19	19.58	3.45	0.98	20.37	9.04	3.15
2300	16.44	33.42	19.41	18.91	3.52	0.98	20.56	9.16	3.18
2400	16.28	33.52	17.52	18.26	3.59	0.98	20.62	9.31	3.22
2500	15.95	34.02	15.66	18.37	3.91	0.99	20.55	9.18	3.20
2600	15.69	34.40	14.07	18.44	4.15	1.01	20.65	9.20	3.38
2700	15.40	34.43	12.55	18.06	4.23	1.02	20.70	9.30	3.36
2800	14.96	34.91	10.85	18.66	4.57	1.05	20.79	9.31	3.48
2900	14.53	34.82	9.57	18.76	4.61	1.08	20.69	9.25	3.55
3000	14.20	35.30	8.62	18.93	4.90	1.11	20.62	9.17	3.55
3100	13.70	35.53	7.60	20.05	5.12	1.15	20.68	9.15	3.67
3200	13.31	36.18	6.86	20.30	5.53	1.19	20.52	9.14	3.70
3300	12.80	36.34	6.12	20.62	5.69	1.23	20.24	8.66	3.82
3400	12.30	36.67	5.49	21.64	5.95	1.27	20.68	9.18	3.99
3600	11.34	37.61	4.50	22.91	6.65	1.34	20.77	9.23	4.31
3800	10.39	38.12	3.73	23.27	7.03	1.41	21.10	9.54	4.60
4000	9.46	38.97	3.19	22.50	7.77	1.47	20.99	9.45	5.00
4200	8.64	39.29	2.73	22.21	7.95	1.52	21.06	9.55	5.37
4400	7.87	38.23	2.47	21.69	7.12	1.55	21.13	9.73	5.75
4600	7.15	38.06	2.28	20.57	7.12	1.58	21.13	9.97	6.21
4800	6.55	38.58	2.07	19.21	7.45	1.60	21.25	10.31	6.46
5000	5.96	35.00	1.86	17.89	4.83	1.63	21.07	10.81	6.88
5200	5.22	36.84	1.88	15.93	6.42	1.61	20.74	10.52	7.40
5400	4.05	40.68	1.92	14.07	11.49	1.58	19.93	9.83	7.92

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 = 5.25V, Id = 33.02mA @ 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)
400	11.02	41.27	3.76	12.15	8.74	1.34	21.92	9.50	4.08
500	13.36	39.25	5.92	15.41	7.07	1.22	23.32	11.48	4.40
600	14.76	37.44	8.81	18.43	5.82	1.12	24.22	11.55	3.59
700	15.63	36.33	12.42	21.23	5.10	1.04	24.21	11.62	3.75
800	16.23	35.50	17.34	24.43	4.54	1.00	23.73	11.37	3.20
900	16.61	34.80	24.59	27.92	4.10	0.99	23.64	11.49	3.15
1000	16.90	34.37	31.26	30.44	3.80	0.98	22.75	10.86	3.10
1100	17.08	34.05	24.45	31.17	3.58	0.98	22.88	11.06	3.18
1200	17.22	33.84	20.97	30.34	3.43	0.99	22.51	10.71	3.16
1300	17.33	33.69	19.22	29.46	3.32	0.99	22.31	10.58	3.14
1400	17.40	33.57	18.07	28.58	3.24	0.99	22.31	10.63	3.16
1500	17.41	33.47	17.36	27.13	3.18	0.99	21.88	10.21	3.13
1600	17.45	33.59	17.05	25.65	3.20	0.99	21.90	10.26	3.11
1700	17.43	33.55	17.45	24.99	3.20	0.99	21.58	9.98	3.13
1800	17.38	33.52	17.96	23.71	3.21	0.99	21.71	10.03	3.18
1900	17.31	33.60	18.84	22.39	3.27	0.99	21.55	9.86	3.12
2000	17.21	33.70	19.63	21.47	3.34	0.98	21.12	9.51	3.17
2100	17.09	33.80	20.20	20.82	3.43	0.98	21.27	9.60	3.11
2200	16.94	33.98	20.04	20.18	3.55	0.98	20.81	9.30	3.10
2300	16.76	34.08	19.25	19.62	3.65	0.98	21.01	9.44	3.14
2400	16.60	34.24	17.28	19.21	3.76	0.99	21.14	9.61	3.17
2500	16.25	34.81	15.42	19.55	4.13	1.00	21.03	9.48	3.17
2600	15.97	35.32	13.79	19.79	4.46	1.02	21.14	9.51	3.35
2700	15.66	35.46	12.28	19.60	4.60	1.04	21.23	9.60	3.35
2800	15.20	35.99	10.63	20.59	5.02	1.07	21.29	9.62	3.45
2900	14.77	36.03	9.37	20.82	5.12	1.10	21.15	9.53	3.54
3000	14.42	36.59	8.42	21.24	5.50	1.13	21.07	9.48	3.48
3100	13.89	36.95	7.42	22.94	5.84	1.17	21.12	9.47	3.66
3200	13.49	37.74	6.70	23.30	6.42	1.20	21.03	9.46	3.67
3300	12.95	37.94	5.95	24.33	6.64	1.25	20.68	9.00	3.76
3400	12.47	38.39	5.38	26.42	7.03	1.28	21.18	9.49	3.94
3600	11.49	39.58	4.38	28.47	8.07	1.36	21.32	9.56	4.25
3800	10.53	40.20	3.64	29.45	8.64	1.43	21.70	9.89	4.55
4000	9.62	41.42	3.11	28.80	9.95	1.49	21.58	9.75	4.97
4200	8.80	41.86	2.66	28.62	10.29	1.54	21.67	9.81	5.32
4400	8.06	40.52	2.40	27.37	8.89	1.57	21.79	10.05	5.73
4600	7.38	40.22	2.21	25.17	8.69	1.60	21.86	10.26	6.10
4800	6.80	41.11	2.00	22.96	9.52	1.62	22.06	10.56	6.43
5000	6.25	36.09	1.78	20.79	5.13	1.65	22.29	11.09	6.78
5200	5.57	38.41	1.79	18.16	7.22	1.64	22.08	10.83	7.26
5400	4.46	42.69	1.79	15.84	13.30	1.62	21.49	10.23	7.76

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 = 34.94mA @ 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)
400	10.08	40.88	4.03	11.57	9.62	1.31	21.59	9.59	5.59
500	12.47	38.88	6.24	15.08	7.66	1.20	23.00	11.71	5.25
600	13.92	37.17	9.21	18.45	6.30	1.10	23.96	11.89	4.85
700	14.80	36.03	12.88	21.90	5.45	1.04	23.97	11.97	4.63
800	15.37	35.16	17.59	25.64	4.83	1.01	23.56	11.74	4.55
900	15.74	34.52	23.21	29.92	4.38	0.99	23.46	11.84	4.47
1000	16.01	34.08	24.95	35.64	4.05	0.99	22.60	11.23	4.44
1100	16.17	33.76	21.61	38.14	3.82	0.99	22.71	11.38	4.51
1200	16.29	33.56	19.14	33.28	3.67	0.99	22.34	11.03	4.47
1300	16.36	33.40	17.69	29.96	3.56	1.00	22.12	10.86	4.42
1400	16.40	33.28	16.84	27.60	3.48	1.00	22.11	10.88	4.47
1500	16.39	33.18	16.42	25.66	3.43	1.00	21.74	10.47	4.44
1600	16.41	33.32	16.38	24.29	3.47	1.00	21.72	10.47	4.49
1700	16.35	33.23	16.93	23.50	3.47	1.00	21.47	10.25	4.49
1800	16.29	33.19	17.52	22.52	3.48	0.99	21.53	10.22	4.49
1900	16.19	33.31	18.46	21.83	3.57	0.99	21.35	10.07	4.46
2000	16.07	33.36	19.40	21.19	3.65	0.99	20.99	9.76	4.53
2100	15.93	33.45	20.22	20.56	3.75	0.98	21.11	9.81	4.50
2200	15.75	33.67	20.20	20.03	3.91	0.98	20.74	9.61	4.51
2300	15.55	33.76	19.18	19.48	4.03	0.99	20.89	9.67	4.57
2400	15.35	33.87	17.12	19.03	4.15	0.99	20.99	9.80	4.64
2500	14.98	34.45	15.17	19.15	4.57	1.01	20.90	9.67	4.60
2600	14.69	34.96	13.61	19.26	4.93	1.02	20.92	9.61	4.79
2700	14.34	35.04	12.04	19.22	5.08	1.04	21.03	9.72	4.82
2800	13.88	35.35	10.50	19.77	5.39	1.07	21.09	9.77	4.93
2900	13.49	35.81	9.39	20.00	5.77	1.10	20.94	9.70	5.03
3000	13.05	36.15	8.37	20.34	6.10	1.13	20.83	9.58	5.04
3100	12.54	36.57	7.41	21.47	6.51	1.17	20.85	9.51	5.19
3200	12.10	37.15	6.70	21.69	7.02	1.20	20.88	9.62	5.28
3300	11.58	37.41	6.03	22.22	7.33	1.24	20.56	9.15	5.41
3400	11.09	37.98	5.40	23.32	7.86	1.28	21.01	9.62	5.60
3600	10.16	38.89	4.55	24.57	8.86	1.34	21.16	9.73	5.92
3800	9.25	39.49	3.87	24.86	9.57	1.40	21.51	10.04	6.30
4000	8.36	40.32	3.38	24.81	10.69	1.45	21.51	10.00	6.68
4200	7.51	40.74	2.97	24.37	11.33	1.50	21.59	10.10	7.17
4400	6.74	39.50	2.71	23.39	10.05	1.53	21.69	10.29	7.64
4600	6.01	39.22	2.56	21.56	10.11	1.54	21.87	10.60	8.11
4800	5.34	40.23	2.38	19.37	11.55	1.56	21.92	10.76	8.51
5000	4.66	36.03	2.19	17.84	7.16	1.58	22.24	11.31	8.97
5200	3.76	37.26	2.27	15.55	9.25	1.55	21.65	10.74	9.53
5400	2.18	40.79	2.24	13.76	16.30	1.53	20.35	9.54	10.19

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 = 3.90V, Id = 34.09mA @ 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)
400	9.86	40.93	4.07	11.44	9.96	1.30	20.99	9.20	5.64
500	12.21	38.86	6.27	14.68	7.87	1.20	22.43	11.33	5.29
600	13.62	37.11	9.20	17.68	6.45	1.10	23.33	11.58	4.86
700	14.47	35.95	12.77	20.62	5.59	1.04	23.33	11.66	4.64
800	15.02	35.07	17.22	23.62	4.95	1.01	22.96	11.43	4.52
900	15.38	34.40	22.05	26.71	4.49	0.99	22.87	11.53	4.48
1000	15.63	33.93	23.90	30.36	4.15	0.99	22.06	10.94	4.45
1100	15.78	33.58	21.45	34.86	3.92	0.99	22.14	11.08	4.53
1200	15.89	33.35	19.27	36.59	3.76	0.99	21.80	10.72	4.49
1300	15.94	33.15	17.90	33.48	3.63	1.00	21.58	10.55	4.49
1400	15.97	32.99	17.12	30.19	3.55	1.00	21.54	10.56	4.51
1500	15.96	32.86	16.68	27.58	3.49	1.00	21.19	10.15	4.49
1600	15.97	32.96	16.65	25.33	3.51	1.00	21.21	10.14	4.52
1700	15.90	32.80	17.19	24.18	3.48	1.00	20.91	9.92	4.53
1800	15.84	32.71	17.75	22.83	3.47	0.99	20.99	9.87	4.52
1900	15.75	32.77	18.63	21.73	3.54	0.99	20.81	9.71	4.50
2000	15.63	32.76	19.55	20.79	3.59	0.99	20.46	9.40	4.54
2100	15.49	32.78	20.29	19.91	3.65	0.98	20.57	9.44	4.53
2200	15.32	32.92	20.19	19.14	3.78	0.98	20.18	9.23	4.52
2300	15.13	32.94	19.18	18.42	3.85	0.98	20.32	9.26	4.60
2400	14.93	33.05	17.18	17.70	3.95	0.99	20.38	9.38	4.63
2500	14.59	33.50	15.31	17.55	4.27	1.00	20.29	9.24	4.64
2600	14.31	33.85	13.73	17.46	4.53	1.01	20.32	9.17	4.83
2700	13.98	33.87	12.16	17.19	4.62	1.03	20.42	9.27	4.84
2800	13.54	34.12	10.61	17.37	4.87	1.05	20.48	9.32	4.96
2900	13.17	34.43	9.50	17.43	5.11	1.08	20.33	9.22	5.02
3000	12.73	34.68	8.46	17.50	5.34	1.11	20.24	9.11	5.09
3100	12.25	35.04	7.50	18.15	5.65	1.15	20.25	9.04	5.26
3200	11.82	35.46	6.77	18.20	5.98	1.18	20.24	9.15	5.31
3300	11.30	35.64	6.09	18.32	6.18	1.22	19.96	8.71	5.44
3400	10.84	36.07	5.46	18.91	6.51	1.26	20.37	9.16	5.65
3600	9.90	36.82	4.59	19.56	7.21	1.33	20.52	9.28	6.00
3800	8.98	37.27	3.91	19.62	7.65	1.39	20.87	9.55	6.36
4000	8.08	37.86	3.41	19.26	8.32	1.44	20.85	9.57	6.79
4200	7.22	38.22	2.99	18.80	8.73	1.48	20.96	9.67	7.21
4400	6.42	37.25	2.73	18.20	8.02	1.51	21.09	9.86	7.76
4600	5.65	37.03	2.58	17.13	8.13	1.52	21.23	10.17	8.23
4800	4.93	37.79	2.41	15.78	9.05	1.54	21.27	10.32	8.64
5000	4.21	35.12	2.23	14.76	6.77	1.55	21.46	10.79	9.05
5200	3.23	36.01	2.32	13.17	8.43	1.52	20.88	10.14	9.65
5400	1.60	38.72	2.31	11.72	13.60	1.49	19.61	8.83	10.29

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 = 5.25V, Id = 35.05mA @ 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)
400	10.10	40.86	4.03	11.59	9.58	1.31	21.65	9.63	5.59
500	12.50	38.87	6.23	15.15	7.63	1.21	23.02	11.74	5.27
600	13.95	37.16	9.21	18.60	6.28	1.11	24.02	11.93	4.84
700	14.84	36.03	12.89	22.11	5.43	1.04	24.03	12.00	4.53
800	15.41	35.17	17.67	25.90	4.81	1.01	23.63	11.77	4.52
900	15.79	34.54	23.40	30.15	4.36	0.99	23.52	11.87	4.44
1000	16.06	34.09	25.11	34.70	4.04	0.99	22.66	11.26	4.38
1100	16.22	33.78	21.55	34.78	3.81	0.99	22.75	11.42	4.51
1200	16.34	33.58	19.08	31.25	3.66	0.99	22.42	11.05	4.44
1300	16.42	33.43	17.62	28.67	3.55	1.00	22.18	10.89	4.45
1400	16.45	33.32	16.77	26.68	3.47	1.00	22.18	10.91	4.43
1500	16.45	33.23	16.34	24.99	3.43	1.00	21.80	10.51	4.43
1600	16.47	33.38	16.30	23.83	3.47	1.00	21.79	10.50	4.50
1700	16.41	33.30	16.84	23.14	3.47	1.00	21.52	10.30	4.49
1800	16.34	33.27	17.43	22.27	3.49	0.99	21.58	10.26	4.49
1900	16.25	33.40	18.37	21.69	3.58	0.99	21.41	10.10	4.45
2000	16.13	33.46	19.33	21.14	3.67	0.99	21.05	9.79	4.47
2100	15.99	33.57	20.14	20.58	3.77	0.99	21.16	9.85	4.49
2200	15.80	33.80	20.11	20.12	3.95	0.99	20.81	9.64	4.49
2300	15.60	33.91	19.09	19.62	4.08	0.99	20.96	9.71	4.55
2400	15.39	34.04	17.02	19.28	4.20	0.99	21.06	9.84	4.59
2500	15.02	34.63	15.13	19.44	4.63	1.01	20.96	9.71	4.59
2600	14.73	35.16	13.55	19.59	5.02	1.02	20.98	9.66	4.76
2700	14.37	35.27	11.99	19.62	5.19	1.04	21.12	9.79	4.78
2800	13.91	35.59	10.45	20.28	5.52	1.07	21.20	9.83	4.97
2900	13.52	36.08	9.36	20.53	5.93	1.10	21.02	9.74	4.98
3000	13.07	36.44	8.34	20.93	6.28	1.13	20.92	9.62	5.03
3100	12.56	36.88	7.39	22.14	6.71	1.17	20.93	9.57	5.17
3200	12.12	37.49	6.68	22.38	7.28	1.20	20.96	9.67	5.26
3300	11.59	37.75	6.01	23.03	7.61	1.24	20.62	9.21	5.39
3400	11.12	38.34	5.40	24.20	8.16	1.28	21.10	9.68	5.58
3600	10.17	39.34	4.55	25.37	9.31	1.35	21.24	9.79	5.94
3800	9.26	39.96	3.87	25.63	10.09	1.41	21.61	10.08	6.26
4000	8.37	40.84	3.38	25.80	11.34	1.45	21.54	10.05	6.77
4200	7.53	41.29	2.96	25.49	12.02	1.50	21.65	10.14	7.14
4400	6.76	39.88	2.71	24.47	10.46	1.53	21.72	10.33	7.69
4600	6.03	39.59	2.55	22.46	10.49	1.55	21.91	10.63	8.10
4800	5.37	40.65	2.38	20.07	12.07	1.56	21.96	10.80	8.50
5000	4.71	36.08	2.18	18.40	7.16	1.58	22.27	11.37	8.96
5200	3.82	37.38	2.26	15.96	9.33	1.56	21.61	10.78	9.59
5400	2.25	41.23	2.23	14.14	17.05	1.54	20.27	9.63	10.23

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 = 2.80V, Id = 32.51mA @ 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)
400	9.86	41.22	4.01	11.50	10.21	1.31	19.83	8.42	5.09
500	12.11	39.04	6.22	14.15	8.06	1.20	21.11	10.13	5.16
600	13.43	37.20	9.10	16.31	6.59	1.10	21.83	10.50	4.41
700	14.22	36.03	12.54	18.20	5.74	1.04	21.86	10.63	4.16
800	14.74	35.12	16.70	19.92	5.10	1.00	21.67	10.53	4.07
900	15.06	34.42	21.19	21.32	4.63	0.99	21.57	10.60	4.00
1000	15.30	33.89	23.85	22.56	4.27	0.98	21.00	10.16	3.95
1100	15.44	33.49	22.41	23.58	4.02	0.98	21.04	10.29	4.07
1200	15.53	33.19	20.37	24.28	3.84	0.99	20.76	9.99	4.02
1300	15.59	32.94	18.96	24.40	3.70	0.99	20.57	9.86	3.99
1400	15.61	32.71	18.09	24.07	3.59	0.99	20.51	9.84	3.98
1500	15.60	32.51	17.60	23.44	3.50	0.99	20.23	9.48	3.99
1600	15.60	32.51	17.31	22.15	3.49	0.99	20.24	9.47	4.03
1700	15.54	32.31	17.73	21.31	3.44	0.99	19.96	9.24	4.04
1800	15.47	32.13	18.11	20.37	3.39	0.98	20.10	9.22	4.05
1900	15.39	32.08	18.70	19.36	3.40	0.98	19.91	9.07	3.99
2000	15.28	32.00	19.27	18.53	3.41	0.98	19.64	8.78	4.04
2100	15.16	31.94	19.69	17.80	3.43	0.97	19.71	8.79	4.02
2200	15.00	31.97	19.45	17.08	3.49	0.97	19.31	8.58	4.01
2300	14.84	31.88	18.58	16.41	3.51	0.97	19.44	8.61	4.05
2400	14.66	31.93	16.76	15.61	3.56	0.97	19.41	8.69	4.12
2500	14.35	32.23	15.19	15.36	3.77	0.98	19.39	8.58	4.11
2600	14.09	32.39	13.67	15.18	3.91	0.99	19.45	8.53	4.30
2700	13.79	32.28	12.17	14.75	3.91	1.00	19.45	8.58	4.32
2800	13.38	32.61	10.62	14.86	4.14	1.03	19.54	8.62	4.46
2900	12.99	32.58	9.44	14.79	4.19	1.05	19.44	8.56	4.55
3000	12.62	32.76	8.45	14.62	4.31	1.08	19.39	8.47	4.58
3100	12.13	32.96	7.45	14.92	4.48	1.12	19.42	8.42	4.69
3200	11.72	33.34	6.70	14.80	4.69	1.16	19.32	8.49	4.76
3300	11.21	33.39	6.04	14.58	4.77	1.19	19.18	8.10	4.88
3400	10.75	33.57	5.42	14.79	4.88	1.23	19.47	8.51	5.08
3600	9.78	34.21	4.47	14.82	5.28	1.30	19.56	8.61	5.42
3800	8.83	34.58	3.81	14.55	5.56	1.36	19.91	8.89	5.79
4000	7.89	34.90	3.31	14.09	5.84	1.40	19.90	8.86	6.18
4200	7.01	35.29	2.87	13.65	6.09	1.44	19.99	8.96	6.62
4400	6.17	34.50	2.63	13.30	5.71	1.47	20.07	9.10	7.07
4600	5.34	34.25	2.47	12.73	5.74	1.48	20.08	9.36	7.54
4800	4.61	34.87	2.26	11.99	6.14	1.50	20.17	9.49	7.92
5000	3.85	32.94	2.12	11.40	5.04	1.50	20.01	9.67	8.34
5200	2.87	34.13	2.19	10.47	6.43	1.47	19.61	9.11	8.92
5400	1.35	36.56	2.25	9.43	10.09	1.42	18.74	7.93	9.50

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 = 2.66V, Id = 32.36mA @ 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)
400	9.77	41.24	4.02	11.45	10.35	1.30	19.41	8.04	5.08
500	12.01	39.04	6.23	14.03	8.15	1.20	20.67	9.59	5.14
600	13.31	37.19	9.10	16.11	6.67	1.10	21.37	10.02	4.42
700	14.10	36.02	12.52	17.92	5.80	1.04	21.42	10.22	4.20
800	14.61	35.11	16.60	19.52	5.15	1.00	21.28	10.16	4.07
900	14.93	34.40	20.91	20.81	4.68	0.99	21.17	10.23	4.05
1000	15.16	33.87	23.43	21.91	4.32	0.98	20.67	9.88	3.99
1100	15.30	33.46	22.23	22.81	4.07	0.98	20.71	9.96	4.07
1200	15.39	33.15	20.33	23.40	3.88	0.99	20.44	9.73	4.00
1300	15.44	32.89	18.97	23.49	3.73	0.99	20.27	9.60	4.01
1400	15.46	32.65	18.13	23.22	3.62	0.99	20.21	9.56	4.01
1500	15.45	32.45	17.64	22.69	3.54	0.99	19.94	9.26	4.01
1600	15.44	32.44	17.35	21.55	3.52	0.99	19.96	9.26	4.03
1700	15.38	32.22	17.79	20.79	3.46	0.99	19.69	9.02	4.02
1800	15.31	32.03	18.15	19.93	3.41	0.98	19.83	9.02	4.05
1900	15.23	31.97	18.70	18.98	3.42	0.98	19.66	8.87	4.06
2000	15.12	31.88	19.25	18.18	3.43	0.98	19.39	8.60	4.04
2100	15.00	31.81	19.61	17.48	3.44	0.97	19.46	8.61	4.06
2200	14.84	31.82	19.31	16.78	3.49	0.97	19.07	8.40	4.03
2300	14.68	31.72	18.44	16.13	3.50	0.97	19.20	8.44	4.07
2400	14.50	31.79	16.61	15.35	3.56	0.97	19.16	8.49	4.14
2500	14.20	32.05	15.06	15.09	3.76	0.98	19.14	8.40	4.12
2600	13.93	32.18	13.58	14.88	3.87	0.99	19.20	8.33	4.33
2700	13.64	32.07	12.08	14.45	3.88	1.00	19.19	8.39	4.34
2800	13.23	32.40	10.55	14.54	4.10	1.03	19.26	8.42	4.47
2900	12.85	32.36	9.38	14.46	4.14	1.05	19.17	8.37	4.58
3000	12.48	32.51	8.40	14.24	4.25	1.08	19.12	8.28	4.56
3100	11.99	32.73	7.40	14.51	4.41	1.12	19.15	8.22	4.72
3200	11.58	33.07	6.66	14.36	4.60	1.15	19.04	8.29	4.75
3300	11.07	33.13	6.00	14.13	4.68	1.18	18.90	7.91	4.91
3400	10.61	33.30	5.38	14.31	4.78	1.22	19.17	8.30	5.07
3600	9.64	33.90	4.44	14.30	5.15	1.30	19.28	8.41	5.38
3800	8.68	34.26	3.78	14.00	5.41	1.35	19.60	8.69	5.81
4000	7.74	34.58	3.29	13.55	5.68	1.39	19.60	8.66	6.18
4200	6.85	34.97	2.86	13.12	5.92	1.44	19.72	8.75	6.68
4400	6.00	34.21	2.62	12.77	5.58	1.46	19.78	8.87	7.14
4600	5.16	33.98	2.46	12.21	5.62	1.47	19.77	9.07	7.56
4800	4.42	34.60	2.26	11.51	6.03	1.48	19.84	9.20	7.94
5000	3.64	32.84	2.13	10.94	5.06	1.49	19.65	9.31	8.43
5200	2.64	34.02	2.20	10.06	6.44	1.45	19.30	8.71	8.91
5400	1.11	36.38	2.25	9.08	10.04	1.41	18.38	7.50	9.58

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 = 3.30V, Id = 33.37mA @ 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)
400	10.17	41.21	3.96	11.63	9.79	1.31	20.80	9.09	5.03
500	12.45	39.08	6.17	14.49	7.78	1.20	22.15	11.04	5.04
600	13.79	37.26	9.07	16.90	6.39	1.10	22.90	11.26	4.35
700	14.60	36.11	12.59	19.09	5.57	1.04	22.89	11.35	4.10
800	15.14	35.23	16.97	21.22	4.95	1.00	22.59	11.15	4.00
900	15.48	34.53	22.09	23.13	4.49	0.99	22.44	11.22	3.98
1000	15.73	34.03	25.48	25.02	4.15	0.98	21.75	10.66	3.88
1100	15.88	33.65	23.35	26.80	3.91	0.99	21.80	10.81	3.99
1200	15.99	33.37	20.82	28.19	3.73	0.99	21.47	10.47	3.97
1300	16.06	33.14	19.22	28.44	3.60	0.99	21.28	10.32	3.95
1400	16.09	32.94	18.27	27.65	3.49	0.99	21.21	10.31	3.94
1500	16.08	32.77	17.74	26.31	3.42	0.99	20.88	9.90	3.96
1600	16.10	32.79	17.43	24.25	3.41	0.99	20.89	9.90	3.99
1700	16.04	32.62	17.90	23.07	3.37	0.99	20.59	9.64	3.97
1800	15.98	32.46	18.33	21.79	3.34	0.99	20.71	9.62	4.00
1900	15.90	32.45	19.02	20.57	3.36	0.98	20.52	9.46	3.94
2000	15.79	32.40	19.72	19.60	3.38	0.98	20.21	9.14	4.01
2100	15.67	32.38	20.31	18.78	3.42	0.97	20.30	9.19	3.97
2200	15.52	32.44	20.12	18.00	3.49	0.97	19.90	8.94	3.98
2300	15.35	32.38	19.24	17.28	3.52	0.97	20.03	8.99	3.98
2400	15.18	32.45	17.20	16.46	3.58	0.97	20.05	9.10	4.07
2500	14.86	32.80	15.52	16.26	3.82	0.98	20.00	8.98	4.05
2600	14.59	33.03	13.92	16.13	4.00	1.00	20.07	8.95	4.25
2700	14.29	32.95	12.37	15.72	4.02	1.01	20.10	9.02	4.29
2800	13.87	33.32	10.77	15.96	4.28	1.04	20.19	9.04	4.38
2900	13.48	33.32	9.57	15.96	4.35	1.06	20.09	9.00	4.47
3000	13.10	33.54	8.55	15.84	4.50	1.09	20.02	8.91	4.51
3100	12.60	33.77	7.54	16.30	4.70	1.13	20.06	8.86	4.65
3200	12.19	34.21	6.78	16.26	4.96	1.17	19.95	8.93	4.65
3300	11.69	34.29	6.11	16.09	5.07	1.20	19.76	8.49	4.79
3400	11.22	34.49	5.48	16.43	5.20	1.24	20.10	8.98	5.00
3600	10.25	35.21	4.52	16.65	5.69	1.31	20.22	9.08	5.35
3800	9.31	35.65	3.85	16.46	6.04	1.37	20.55	9.35	5.67
4000	8.39	36.03	3.35	15.98	6.40	1.42	20.53	9.31	6.07
4200	7.52	36.43	2.90	15.55	6.68	1.47	20.64	9.41	6.54
4400	6.70	35.55	2.64	15.19	6.18	1.49	20.75	9.58	6.97
4600	5.90	35.28	2.47	14.55	6.18	1.51	20.77	9.84	7.42
4800	5.19	35.90	2.26	13.69	6.63	1.53	20.87	10.05	7.81
5000	4.47	33.47	2.10	13.01	5.09	1.54	20.84	10.48	8.21
5200	3.53	34.77	2.18	11.89	6.58	1.51	20.59	9.94	8.82
5400	2.06	37.65	2.22	10.64	10.82	1.47	19.87	8.79	9.37

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 = 2.80V, Id = 31.58mA @ 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)
400	10.32	41.41	3.88	11.88	9.77	1.33	19.97	8.53	4.20
500	12.54	39.22	6.05	14.54	7.75	1.21	21.16	10.30	4.58
600	13.85	37.35	8.86	16.80	6.35	1.11	21.83	10.57	3.63
700	14.64	36.18	12.22	18.77	5.55	1.04	21.83	10.67	3.39
800	15.18	35.29	16.42	20.79	4.95	1.01	21.61	10.53	3.29
900	15.52	34.56	21.31	22.85	4.47	0.99	21.49	10.59	3.24
1000	15.77	34.06	24.73	24.89	4.14	0.98	20.97	10.11	3.20
1100	15.93	33.66	23.47	26.68	3.90	0.98	20.97	10.25	3.27
1200	16.04	33.37	21.30	28.26	3.72	0.99	20.70	9.96	3.22
1300	16.12	33.13	19.83	28.64	3.58	0.99	20.53	9.86	3.20
1400	16.15	32.91	18.71	27.69	3.46	0.99	20.46	9.86	3.23
1500	16.15	32.72	18.01	26.37	3.38	0.99	20.18	9.52	3.22
1600	16.17	32.74	17.62	24.45	3.37	0.99	20.20	9.53	3.24
1700	16.12	32.55	17.92	23.18	3.32	0.99	19.94	9.29	3.26
1800	16.07	32.40	18.30	21.64	3.28	0.99	20.09	9.30	3.24
1900	16.00	32.33	18.91	20.27	3.28	0.98	19.92	9.15	3.25
2000	15.90	32.29	19.35	19.25	3.30	0.98	19.65	8.85	3.24
2100	15.79	32.24	19.63	18.47	3.32	0.97	19.75	8.90	3.23
2200	15.66	32.26	19.23	17.63	3.36	0.97	19.33	8.65	3.22
2300	15.51	32.19	18.48	16.96	3.38	0.97	19.47	8.73	3.24
2400	15.35	32.25	16.84	16.19	3.43	0.97	19.44	8.83	3.30
2500	15.05	32.60	15.19	15.99	3.65	0.98	19.42	8.72	3.29
2600	14.81	32.77	13.74	15.81	3.77	0.99	19.50	8.71	3.45
2700	14.53	32.68	12.31	15.30	3.79	1.00	19.47	8.76	3.46
2800	14.12	33.06	10.71	15.43	4.03	1.03	19.53	8.78	3.56
2900	13.70	32.86	9.45	15.34	4.01	1.06	19.47	8.71	3.64
3000	13.40	33.19	8.53	15.25	4.17	1.09	19.43	8.64	3.64
3100	12.92	33.35	7.54	15.72	4.31	1.13	19.46	8.61	3.79
3200	12.54	33.76	6.81	15.65	4.53	1.16	19.30	8.62	3.84
3300	12.04	33.86	6.07	15.55	4.61	1.20	19.20	8.23	3.92
3400	11.56	34.03	5.45	15.84	4.73	1.24	19.43	8.61	4.12
3600	10.59	34.66	4.46	16.02	5.09	1.31	19.51	8.71	4.42
3800	9.62	35.01	3.71	15.81	5.29	1.38	19.77	9.00	4.70
4000	8.67	35.53	3.18	15.22	5.63	1.43	19.77	8.95	5.18
4200	7.82	35.79	2.72	14.85	5.71	1.48	19.89	9.01	5.57
4400	7.01	35.03	2.48	14.48	5.34	1.50	19.97	9.24	5.95
4600	6.22	34.86	2.31	13.88	5.37	1.52	19.93	9.46	6.34
4800	5.56	35.34	2.10	13.09	5.57	1.54	20.05	9.71	6.72
5000	4.88	33.42	1.93	12.37	4.46	1.55	19.81	10.02	7.08
5200	4.03	34.93	1.96	11.27	5.73	1.52	19.63	9.66	7.54
5400	2.72	37.41	2.02	10.16	8.87	1.48	19.09	8.84	8.06

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 = 2.66V, Id = 31.48mA @ 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)
400	10.26	41.44	3.89	11.83	9.88	1.32	19.58	8.23	4.22
500	12.45	39.23	6.05	14.40	7.83	1.21	20.78	9.84	4.62
600	13.75	37.36	8.85	16.56	6.43	1.11	21.41	10.20	3.61
700	14.53	36.19	12.19	18.42	5.62	1.04	21.43	10.35	3.46
800	15.06	35.30	16.29	20.28	5.01	1.01	21.26	10.23	3.31
900	15.40	34.56	21.00	22.14	4.53	0.99	21.14	10.29	3.29
1000	15.64	34.04	24.41	23.93	4.19	0.98	20.66	9.87	3.23
1100	15.79	33.64	23.49	25.43	3.94	0.98	20.66	10.00	3.29
1200	15.90	33.33	21.47	26.69	3.76	0.99	20.41	9.74	3.26
1300	15.98	33.08	20.04	27.01	3.61	0.99	20.25	9.63	3.27
1400	16.01	32.85	18.92	26.30	3.50	0.99	20.18	9.62	3.26
1500	16.00	32.65	18.22	25.30	3.41	0.99	19.94	9.31	3.25
1600	16.02	32.65	17.82	23.68	3.40	0.99	19.94	9.31	3.26
1700	15.97	32.45	18.13	22.53	3.34	0.99	19.70	9.10	3.27
1800	15.92	32.29	18.50	21.13	3.30	0.98	19.85	9.12	3.30
1900	15.85	32.19	19.10	19.85	3.28	0.98	19.69	8.98	3.24
2000	15.75	32.14	19.52	18.88	3.30	0.98	19.43	8.70	3.27
2100	15.64	32.08	19.73	18.13	3.31	0.97	19.52	8.74	3.27
2200	15.51	32.07	19.27	17.30	3.34	0.97	19.12	8.50	3.23
2300	15.36	31.98	18.46	16.63	3.35	0.97	19.25	8.57	3.24
2400	15.20	32.05	16.76	15.86	3.40	0.97	19.21	8.65	3.33
2500	14.91	32.36	15.16	15.63	3.60	0.98	19.20	8.57	3.31
2600	14.67	32.49	13.66	15.42	3.71	0.99	19.27	8.54	3.47
2700	14.39	32.39	12.25	14.89	3.71	1.00	19.23	8.57	3.52
2800	13.99	32.76	10.67	14.98	3.94	1.03	19.29	8.59	3.58
2900	13.58	32.56	9.42	14.88	3.92	1.05	19.24	8.57	3.65
3000	13.28	32.85	8.50	14.74	4.06	1.08	19.21	8.50	3.69
3100	12.80	33.01	7.51	15.15	4.19	1.12	19.25	8.44	3.78
3200	12.42	33.38	6.77	15.03	4.38	1.15	19.09	8.46	3.85
3300	11.91	33.47	6.02	14.90	4.45	1.19	18.99	8.04	4.00
3400	11.44	33.63	5.41	15.13	4.56	1.23	19.20	8.47	4.12
3600	10.47	34.21	4.43	15.23	4.88	1.31	19.27	8.55	4.44
3800	9.49	34.56	3.68	14.98	5.06	1.37	19.53	8.81	4.76
4000	8.54	35.06	3.14	14.40	5.35	1.42	19.54	8.78	5.24
4200	7.68	35.31	2.70	14.03	5.43	1.47	19.64	8.86	5.62
4400	6.85	34.60	2.45	13.67	5.10	1.50	19.71	9.04	5.95
4600	6.05	34.45	2.30	13.11	5.15	1.51	19.67	9.20	6.46
4800	5.37	34.90	2.09	12.39	5.33	1.53	19.75	9.45	6.76
5000	4.67	33.18	1.93	11.73	4.39	1.54	19.39	9.65	7.13
5200	3.81	34.62	1.96	10.72	5.61	1.51	19.26	9.26	7.57
5400	2.49	36.99	2.02	9.71	8.57	1.46	18.69	8.43	8.15

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 = 3.30V, Id = 32.24mA @ 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)
400	10.65	41.35	3.81	12.01	9.25	1.33	20.89	9.02	4.13
500	12.91	39.22	5.97	14.91	7.42	1.22	22.16	11.00	4.49
600	14.25	37.39	8.80	17.47	6.11	1.11	22.92	11.16	3.62
700	15.06	36.25	12.24	19.80	5.35	1.05	22.89	11.21	3.38
800	15.62	35.38	16.64	22.38	4.77	1.01	22.58	10.98	3.24
900	15.97	34.67	22.26	25.31	4.32	0.99	22.46	11.09	3.22
1000	16.24	34.19	27.12	28.63	4.00	0.98	21.78	10.48	3.15
1100	16.40	33.82	24.81	32.53	3.77	0.98	21.79	10.67	3.21
1200	16.53	33.55	21.91	38.56	3.60	0.99	21.50	10.35	3.19
1300	16.62	33.34	20.17	40.74	3.47	0.99	21.33	10.20	3.16
1400	16.67	33.15	18.95	34.74	3.37	0.99	21.26	10.24	3.17
1500	16.67	32.99	18.19	30.45	3.29	0.99	20.92	9.81	3.16
1600	16.70	33.03	17.77	27.01	3.29	0.99	20.93	9.84	3.22
1700	16.66	32.88	18.12	25.32	3.25	0.99	20.63	9.57	3.21
1800	16.62	32.77	18.54	23.31	3.23	0.99	20.79	9.60	3.23
1900	16.55	32.73	19.26	21.60	3.23	0.98	20.62	9.44	3.14
2000	16.46	32.73	19.86	20.41	3.27	0.98	20.28	9.09	3.20
2100	16.34	32.73	20.30	19.54	3.30	0.98	20.39	9.17	3.16
2200	16.21	32.78	20.00	18.66	3.36	0.97	19.94	8.89	3.17
2300	16.05	32.75	19.25	17.94	3.40	0.97	20.12	8.99	3.18
2400	15.90	32.84	17.41	17.19	3.46	0.98	20.13	9.14	3.25
2500	15.60	33.25	15.66	17.11	3.72	0.99	20.08	8.99	3.24
2600	15.35	33.50	14.09	17.02	3.89	1.00	20.17	8.99	3.40
2700	15.06	33.45	12.61	16.54	3.92	1.01	20.20	9.07	3.40
2800	14.64	33.89	10.93	16.89	4.21	1.04	20.28	9.09	3.55
2900	14.22	33.70	9.65	16.91	4.20	1.07	20.21	9.07	3.57
3000	13.91	34.09	8.70	16.90	4.41	1.09	20.15	8.96	3.55
3100	13.41	34.27	7.67	17.66	4.58	1.14	20.21	8.91	3.69
3200	13.03	34.77	6.93	17.70	4.87	1.17	20.05	8.93	3.72
3300	12.54	34.90	6.18	17.73	4.98	1.21	19.85	8.46	3.83
3400	12.04	35.13	5.55	18.28	5.15	1.25	20.19	8.97	4.05
3600	11.08	35.86	4.55	18.84	5.63	1.32	20.26	9.01	4.32
3800	10.12	36.27	3.78	18.80	5.89	1.39	20.59	9.32	4.64
4000	9.18	36.92	3.24	18.13	6.37	1.45	20.56	9.24	5.03
4200	8.36	37.20	2.78	17.77	6.48	1.50	20.67	9.33	5.42
4400	7.55	36.18	2.50	17.41	5.84	1.53	20.73	9.55	5.79
4600	6.79	35.95	2.30	16.65	5.79	1.55	20.71	9.82	6.24
4800	6.17	36.50	2.11	15.63	6.12	1.57	20.91	10.17	6.56
5000	5.54	33.89	1.93	14.72	4.49	1.59	20.77	10.62	6.91
5200	4.75	35.47	1.93	13.28	5.75	1.57	20.57	10.27	7.42
5400	3.49	38.16	2.00	11.88	9.15	1.53	20.09	9.51	7.95

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 = 2.80V, Id = 32.54mA @ 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)
400	9.37	40.97	4.12	11.25	10.63	1.29	19.39	8.04	5.73
500	11.66	38.81	6.31	14.12	8.32	1.19	20.74	9.81	5.38
600	13.01	37.01	9.19	16.61	6.80	1.10	21.49	10.26	4.97
700	13.83	35.81	12.60	18.88	5.87	1.04	21.54	10.45	4.73
800	14.35	34.89	16.56	20.89	5.20	1.01	21.35	10.37	4.63
900	14.67	34.20	20.37	22.54	4.72	0.99	21.26	10.42	4.59
1000	14.90	33.69	21.94	23.97	4.37	0.99	20.67	10.01	4.55
1100	15.03	33.29	20.64	25.19	4.11	0.99	20.72	10.08	4.61
1200	15.11	33.01	19.03	25.92	3.93	0.99	20.42	9.82	4.58
1300	15.15	32.76	17.89	25.93	3.79	1.00	20.24	9.67	4.60
1400	15.16	32.55	17.19	25.37	3.69	1.00	20.19	9.63	4.56
1500	15.14	32.37	16.83	24.48	3.61	1.00	19.90	9.30	4.58
1600	15.13	32.40	16.77	23.01	3.62	1.00	19.91	9.29	4.60
1700	15.06	32.17	17.28	22.16	3.56	0.99	19.64	9.08	4.62
1800	14.99	32.01	17.76	21.07	3.53	0.99	19.75	9.04	4.60
1900	14.89	32.00	18.51	20.01	3.57	0.99	19.57	8.88	4.60
2000	14.77	31.92	19.18	19.10	3.58	0.98	19.29	8.61	4.62
2100	14.63	31.87	19.63	18.25	3.61	0.98	19.37	8.58	4.62
2200	14.47	31.93	19.39	17.47	3.69	0.97	18.98	8.40	4.63
2300	14.28	31.87	18.43	16.74	3.73	0.97	19.10	8.42	4.66
2400	14.09	31.93	16.63	15.96	3.80	0.98	19.09	8.45	4.73
2500	13.76	32.27	14.93	15.67	4.04	0.99	19.04	8.37	4.75
2600	13.50	32.45	13.47	15.44	4.20	1.00	19.09	8.27	4.91
2700	13.17	32.40	11.98	15.07	4.24	1.01	19.12	8.33	4.95
2800	12.75	32.59	10.48	15.03	4.42	1.04	19.19	8.38	5.06
2900	12.39	32.76	9.40	14.97	4.57	1.06	19.09	8.30	5.17
3000	11.97	32.91	8.39	14.88	4.71	1.09	19.02	8.19	5.21
3100	11.49	33.18	7.42	15.21	4.92	1.13	19.05	8.11	5.38
3200	11.07	33.47	6.71	15.11	5.12	1.16	18.96	8.21	5.40
3300	10.56	33.60	6.03	15.03	5.25	1.20	18.77	7.85	5.54
3400	10.10	33.92	5.41	15.27	5.46	1.24	19.09	8.22	5.77
3600	9.16	34.46	4.55	15.42	5.89	1.30	19.20	8.35	6.13
3800	8.23	34.76	3.88	15.23	6.15	1.36	19.54	8.62	6.54
4000	7.31	35.15	3.39	14.82	6.53	1.40	19.53	8.63	7.01
4200	6.42	35.41	2.98	14.35	6.79	1.44	19.59	8.73	7.42
4400	5.58	34.69	2.75	13.87	6.45	1.47	19.69	8.90	7.91
4600	4.76	34.47	2.62	13.15	6.59	1.47	19.68	9.15	8.39
4800	3.99	35.02	2.46	12.25	7.18	1.48	19.71	9.22	8.83
5000	3.19	33.66	2.32	11.54	6.35	1.48	19.58	9.37	9.31
5200	2.12	34.22	2.42	10.50	7.66	1.44	19.10	8.67	9.91
5400	0.38	35.93	2.46	9.49	11.25	1.40	18.09	7.19	10.62

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 = 2.66V, Id = 32.32mA @ 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)
400	9.27	40.99	4.13	11.21	10.79	1.29	18.97	7.62	5.77
500	11.54	38.81	6.33	14.02	8.42	1.19	20.28	9.23	5.41
600	12.89	37.00	9.19	16.43	6.88	1.10	21.02	9.75	5.01
700	13.70	35.79	12.56	18.60	5.94	1.04	21.10	9.98	4.76
800	14.21	34.87	16.44	20.48	5.27	1.01	20.96	9.97	4.68
900	14.53	34.18	20.04	21.99	4.77	0.99	20.89	10.03	4.64
1000	14.75	33.66	21.55	23.25	4.42	0.99	20.35	9.70	4.62
1100	14.88	33.26	20.39	24.32	4.16	0.99	20.41	9.77	4.66
1200	14.96	32.97	18.91	24.96	3.98	0.99	20.13	9.53	4.61
1300	15.00	32.71	17.85	24.99	3.83	1.00	19.96	9.41	4.62
1400	15.00	32.49	17.18	24.55	3.73	1.00	19.92	9.36	4.60
1500	14.98	32.30	16.83	23.82	3.65	1.00	19.64	9.08	4.64
1600	14.97	32.33	16.78	22.49	3.66	1.00	19.66	9.05	4.62
1700	14.89	32.09	17.28	21.71	3.60	0.99	19.40	8.86	4.65
1800	14.82	31.92	17.76	20.69	3.56	0.99	19.52	8.82	4.66
1900	14.72	31.90	18.46	19.68	3.59	0.98	19.35	8.67	4.60
2000	14.60	31.81	19.09	18.79	3.60	0.98	19.08	8.42	4.65
2100	14.47	31.75	19.50	17.96	3.63	0.98	19.16	8.40	4.64
2200	14.30	31.79	19.18	17.19	3.70	0.97	18.78	8.23	4.65
2300	14.12	31.72	18.22	16.47	3.73	0.97	18.89	8.22	4.70
2400	13.92	31.79	16.45	15.71	3.80	0.98	18.87	8.24	4.75
2500	13.60	32.10	14.82	15.40	4.03	0.98	18.84	8.16	4.80
2600	13.33	32.27	13.36	15.16	4.18	0.99	18.88	8.07	4.98
2700	13.01	32.22	11.88	14.79	4.22	1.01	18.89	8.11	4.99
2800	12.59	32.40	10.41	14.72	4.39	1.03	18.99	8.18	5.11
2900	12.23	32.55	9.34	14.65	4.52	1.06	18.86	8.10	5.21
3000	11.81	32.68	8.34	14.52	4.65	1.09	18.80	7.98	5.23
3100	11.34	32.95	7.38	14.82	4.86	1.13	18.81	7.91	5.39
3200	10.92	33.23	6.66	14.70	5.05	1.16	18.73	8.02	5.46
3300	10.41	33.34	6.00	14.60	5.17	1.19	18.56	7.67	5.59
3400	9.95	33.65	5.38	14.80	5.36	1.23	18.87	8.03	5.80
3600	9.01	34.18	4.52	14.90	5.77	1.30	18.98	8.15	6.11
3800	8.08	34.47	3.86	14.69	6.02	1.36	19.31	8.41	6.54
4000	7.15	34.84	3.37	14.28	6.38	1.40	19.29	8.44	6.97
4200	6.25	35.11	2.97	13.82	6.64	1.44	19.40	8.53	7.47
4400	5.41	34.40	2.74	13.35	6.33	1.46	19.47	8.68	7.94
4600	4.57	34.21	2.62	12.65	6.49	1.46	19.46	8.89	8.43
4800	3.79	34.77	2.46	11.79	7.06	1.47	19.47	8.92	8.86
5000	2.98	33.52	2.32	11.11	6.35	1.47	19.31	8.95	9.35
5200	1.88	34.10	2.43	10.13	7.70	1.43	18.81	8.26	9.96
5400	0.13	35.76	2.47	9.17	11.26	1.39	17.78	6.85	10.70

Typical Performance Data

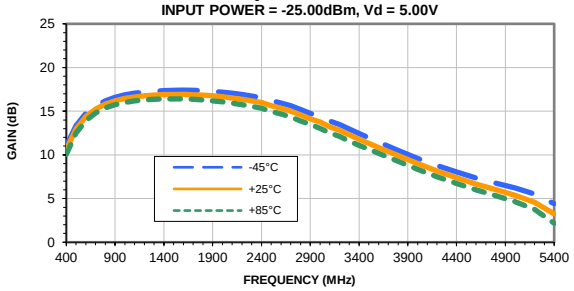
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 3.30V, Id = 33.24mA @ Temperature = +85°C

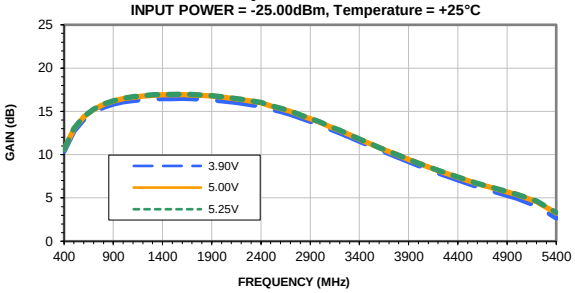
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
400	9.64	40.97	4.09	11.35	10.28	1.30	20.30	8.78	5.69
500	11.96	38.84	6.29	14.40	8.07	1.20	21.69	10.86	5.36
600	13.34	37.06	9.21	17.13	6.61	1.10	22.53	11.15	4.94
700	14.18	35.88	12.71	19.70	5.71	1.04	22.56	11.26	4.70
800	14.72	34.98	16.93	22.13	5.06	1.01	22.30	11.09	4.58
900	15.06	34.31	21.27	24.32	4.59	0.99	22.19	11.15	4.53
1000	15.29	33.82	22.93	26.43	4.25	0.99	21.46	10.59	4.50
1100	15.43	33.45	21.10	28.41	4.01	0.99	21.55	10.71	4.55
1200	15.53	33.19	19.17	29.55	3.84	0.99	21.20	10.39	4.52
1300	15.58	32.97	17.94	29.27	3.71	1.00	21.00	10.22	4.54
1400	15.59	32.78	17.19	28.03	3.61	1.00	20.95	10.22	4.55
1500	15.57	32.62	16.78	26.46	3.54	1.00	20.63	9.82	4.52
1600	15.58	32.69	16.76	24.49	3.56	1.00	20.62	9.80	4.55
1700	15.50	32.50	17.28	23.45	3.52	1.00	20.34	9.57	4.54
1800	15.44	32.37	17.82	22.17	3.50	0.99	20.44	9.51	4.55
1900	15.34	32.39	18.67	21.03	3.55	0.99	20.25	9.35	4.54
2000	15.22	32.35	19.51	20.05	3.58	0.98	19.93	9.06	4.56
2100	15.09	32.33	20.12	19.15	3.63	0.98	20.01	9.08	4.53
2200	14.92	32.42	19.94	18.35	3.73	0.98	19.63	8.88	4.55
2300	14.73	32.40	18.93	17.59	3.78	0.98	19.76	8.88	4.63
2400	14.54	32.49	16.98	16.81	3.86	0.98	19.78	8.96	4.72
2500	14.20	32.87	15.17	16.56	4.14	0.99	19.72	8.84	4.67
2600	13.93	33.14	13.62	16.38	4.34	1.00	19.75	8.77	4.88
2700	13.60	33.13	12.08	16.03	4.41	1.02	19.79	8.85	4.91
2800	13.17	33.35	10.54	16.06	4.62	1.04	19.88	8.89	5.00
2900	12.81	33.58	9.45	16.04	4.81	1.07	19.74	8.81	5.12
3000	12.39	33.77	8.42	15.99	4.98	1.10	19.66	8.68	5.14
3100	11.91	34.10	7.46	16.44	5.24	1.14	19.68	8.61	5.29
3200	11.48	34.45	6.73	16.40	5.50	1.17	19.62	8.71	5.36
3300	10.97	34.60	6.05	16.39	5.66	1.21	19.39	8.29	5.50
3400	10.51	34.97	5.42	16.76	5.91	1.25	19.77	8.73	5.68
3600	9.57	35.62	4.55	17.11	6.46	1.32	19.91	8.86	6.03
3800	8.65	36.00	3.87	17.02	6.80	1.38	20.24	9.14	6.43
4000	7.74	36.52	3.37	16.62	7.31	1.42	20.23	9.16	6.83
4200	6.86	36.83	2.96	16.17	7.64	1.47	20.33	9.26	7.28
4400	6.04	36.04	2.71	15.66	7.17	1.49	20.42	9.47	7.87
4600	5.24	35.83	2.57	14.84	7.31	1.50	20.46	9.76	8.31
4800	4.50	36.48	2.41	13.79	8.05	1.51	20.47	9.88	8.71
5000	3.73	34.51	2.25	12.98	6.58	1.52	20.37	10.26	9.19
5200	2.72	35.30	2.34	11.74	8.13	1.48	19.67	9.49	9.80
5400	1.05	37.54	2.34	10.53	12.47	1.45	18.14	8.07	10.47

Typical Performance Curves

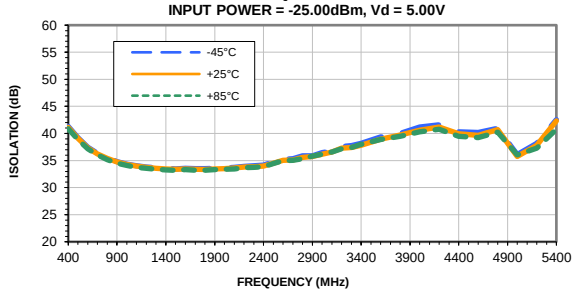
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



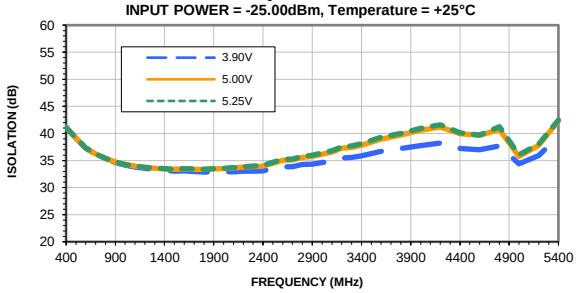
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



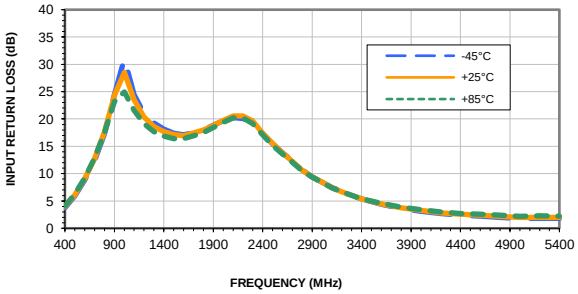
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



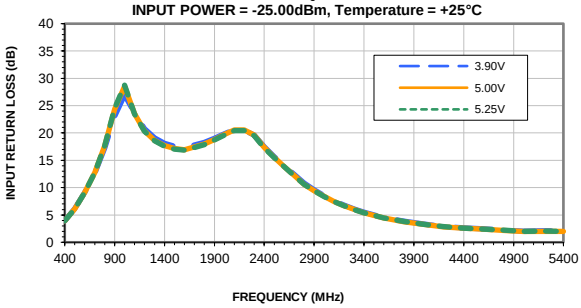
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



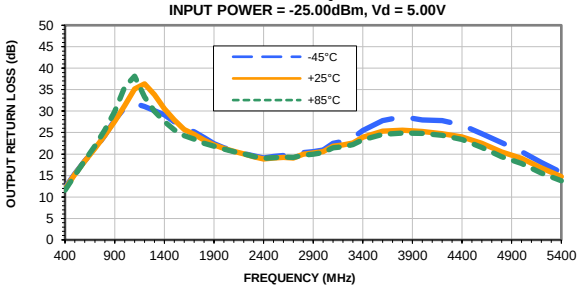
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



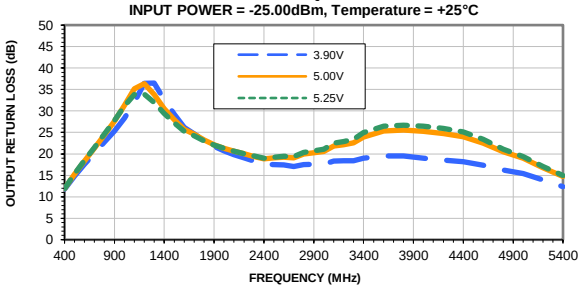
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



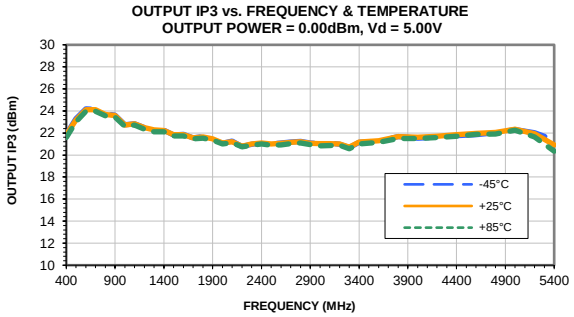
OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V

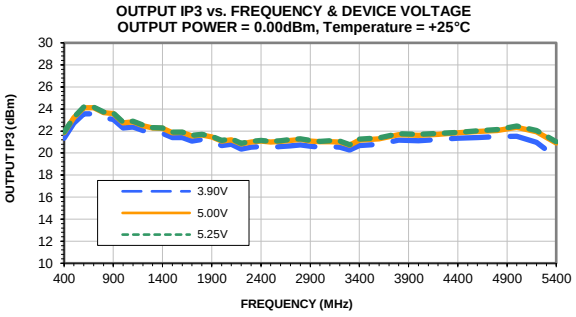


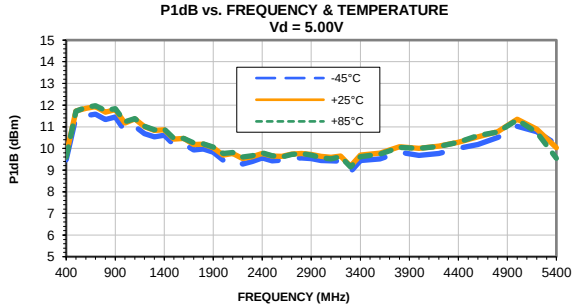
OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

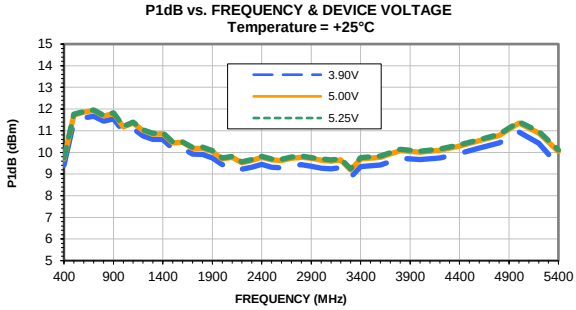


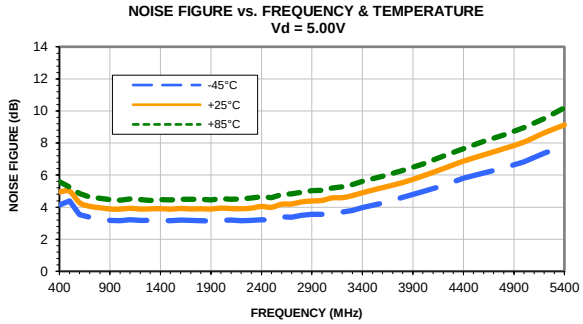
Typical Performance Curves

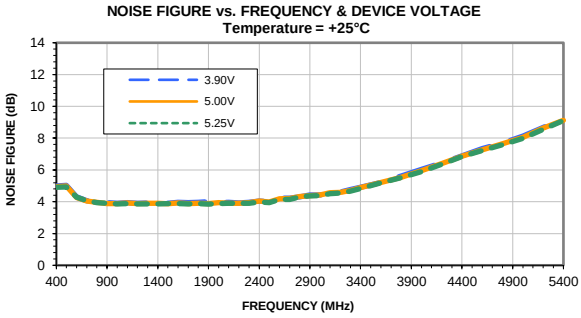


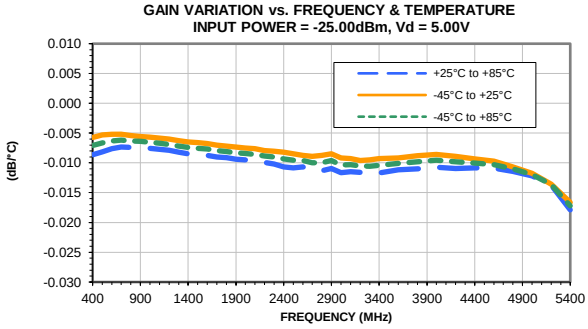






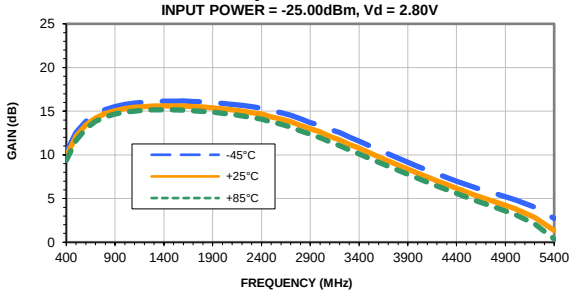




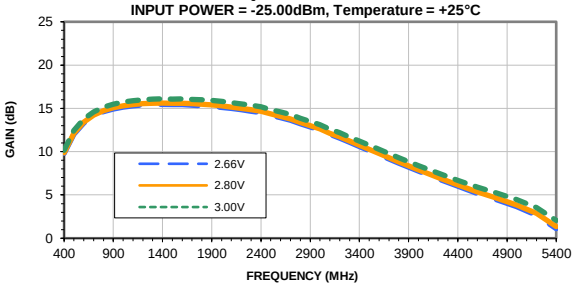


Typical Performance Curves

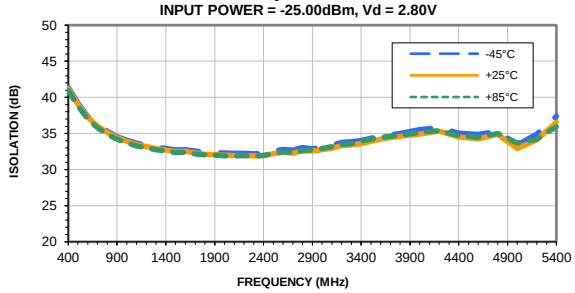
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.80V



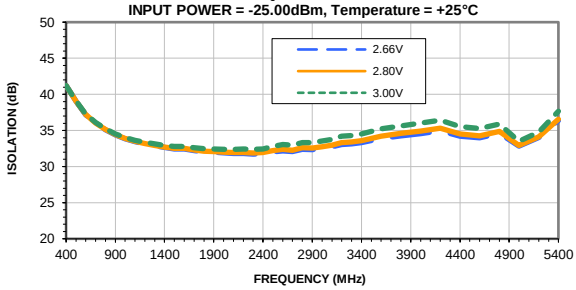
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



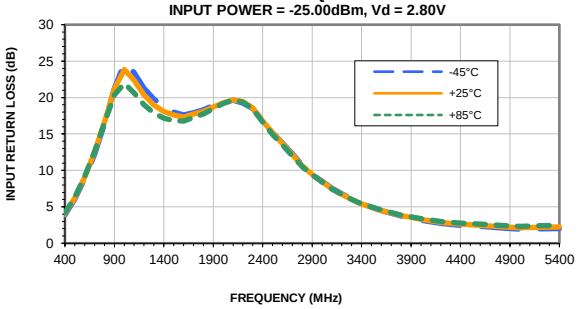
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.80V



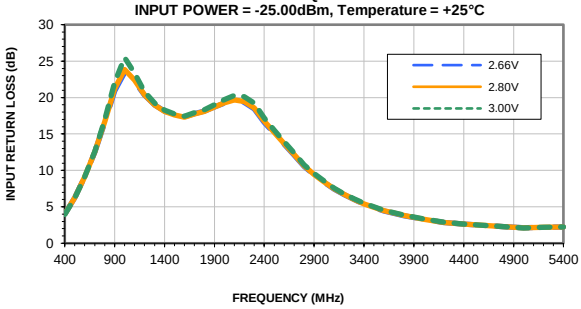
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



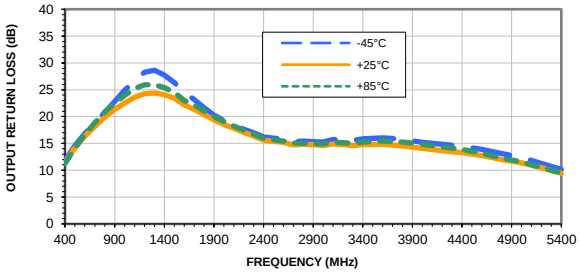
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.80V



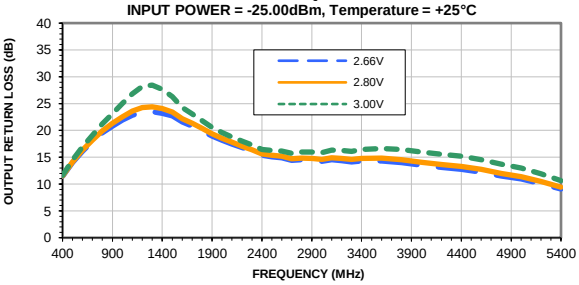
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



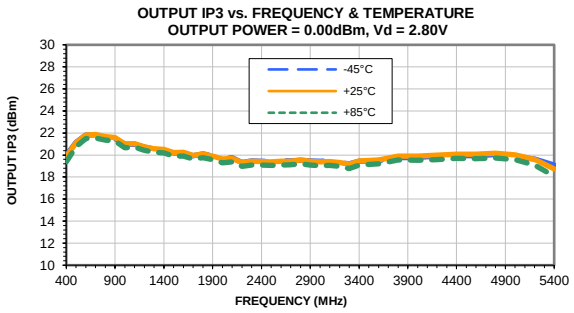
OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.80V

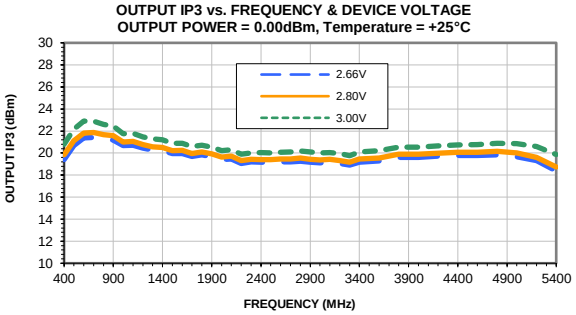


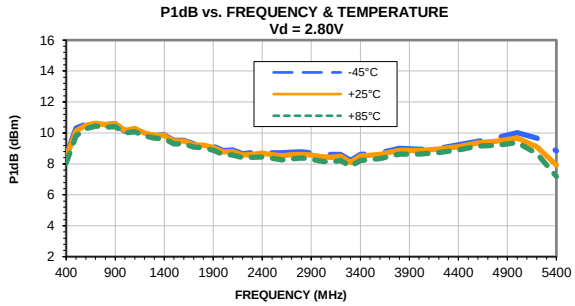
OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

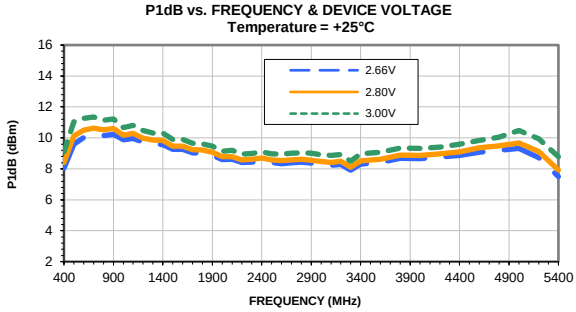


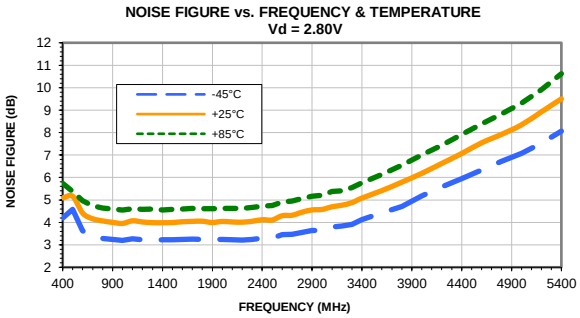
Typical Performance Curves

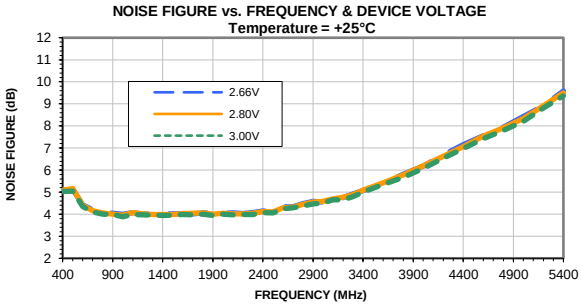


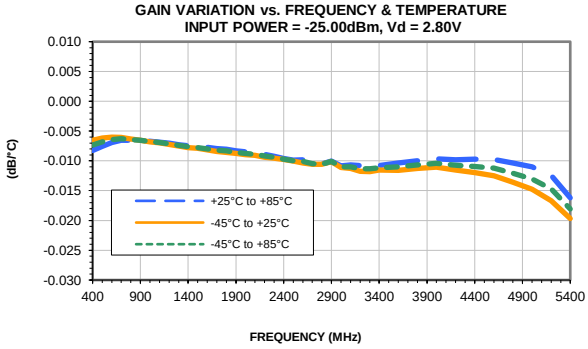








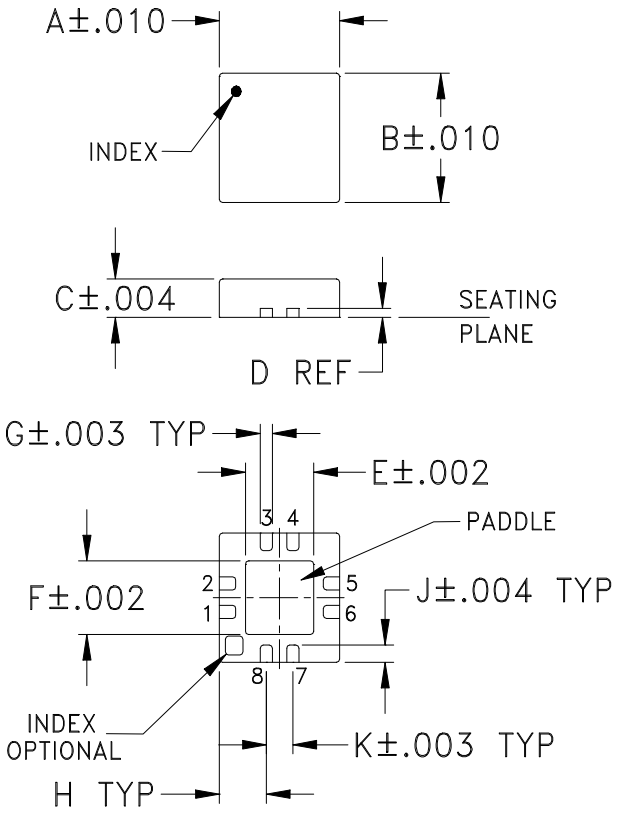




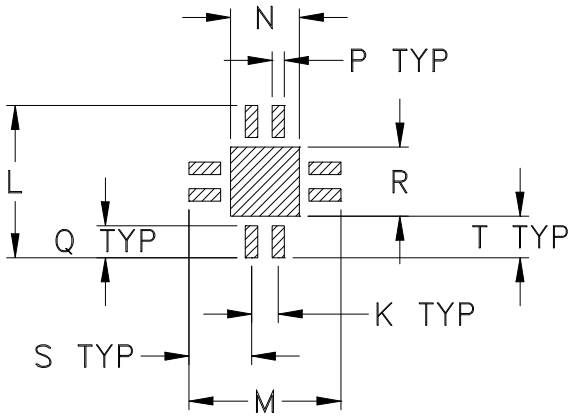
Case Style DQ

DQ849

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
DQ849	.118 (3.00)	.118 (3.00)	.035 (0.89)	.008 (0.20)	.067 (1.70)	.067 (1.70)	.012 (0.30)	.046 (1.17)	.016 (0.41)	.026 (0.66)	.148 (3.76)	.148 (3.76)	.067 (1.70)

CASE #	P	Q	R	S	T	WT. GRAM
DQ849	.012 (0.30)	.031 (0.79)	.067 (1.70)	.061 (1.55)	.041 (1.04)	.02

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

Notes:

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

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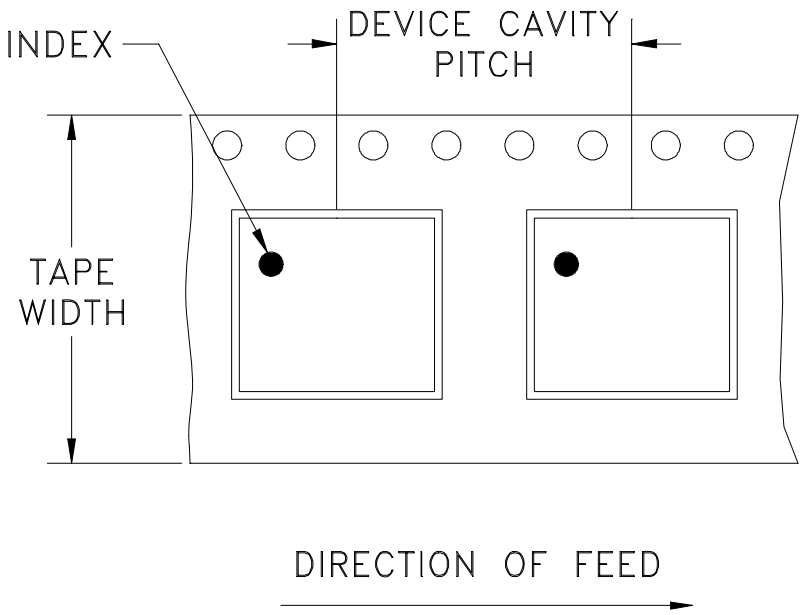
Tape & Reel Packaging TR-F104

DEVICE ORIENTATION IN T&R



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

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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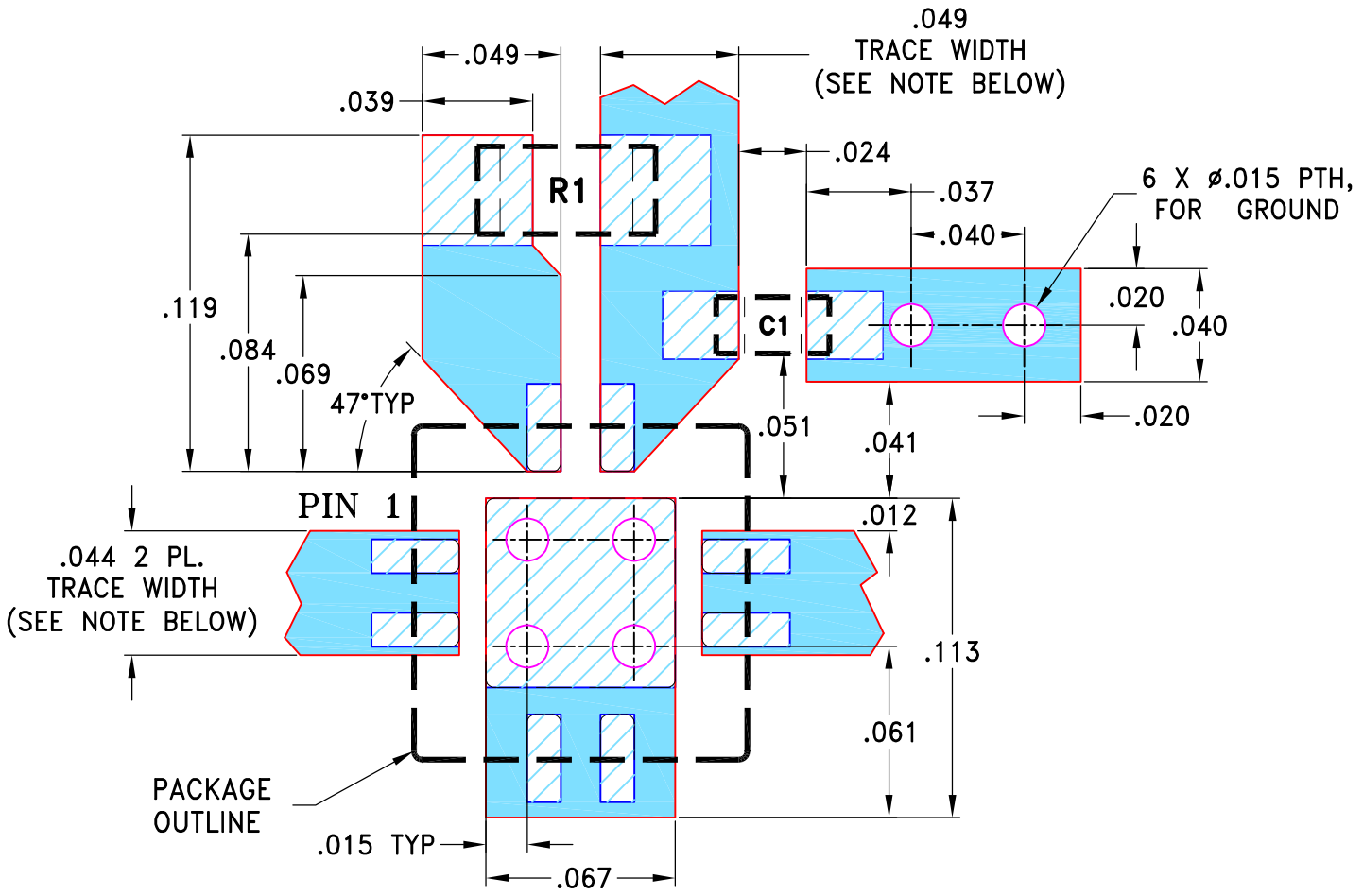
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	GF	DJ
A	M82598	MODIFIED LAYOUT	08/12/02	GF	MM
B	M102713	ADDED "...WITH SMOBC"	01/14/06	GF	IL
C	ECO-003400	REMOVED COMP. VALUE, ADDED NOTE REF. TO EVAL. BOARD	07/23/20	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR DQ849 CASE STYLE



RESISTOR R1: 0603 SIZE

CAPACITOR C1: 0402 SIZE

NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. FOR "R1" & "C1" VALUES REFER TO THE CORRESPONDING EVALUATION BOARD TB-186-XX+.
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	GF	07/19/02
TOLERANCES ON:	CHECKED	LC	08/01/02
2 PL DECIMALS ±	APPROVED	DJ	08/05/02
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

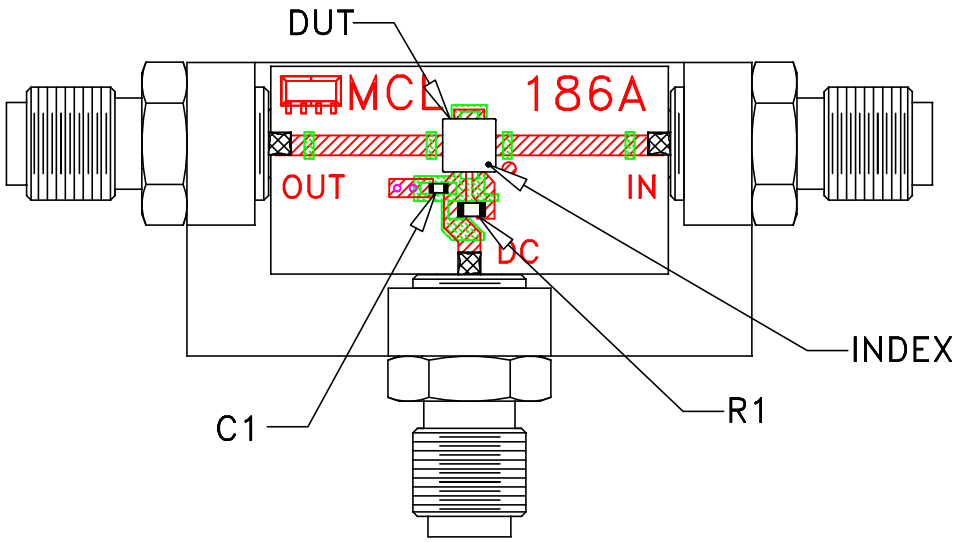
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, DQ849, TB-186-XX+

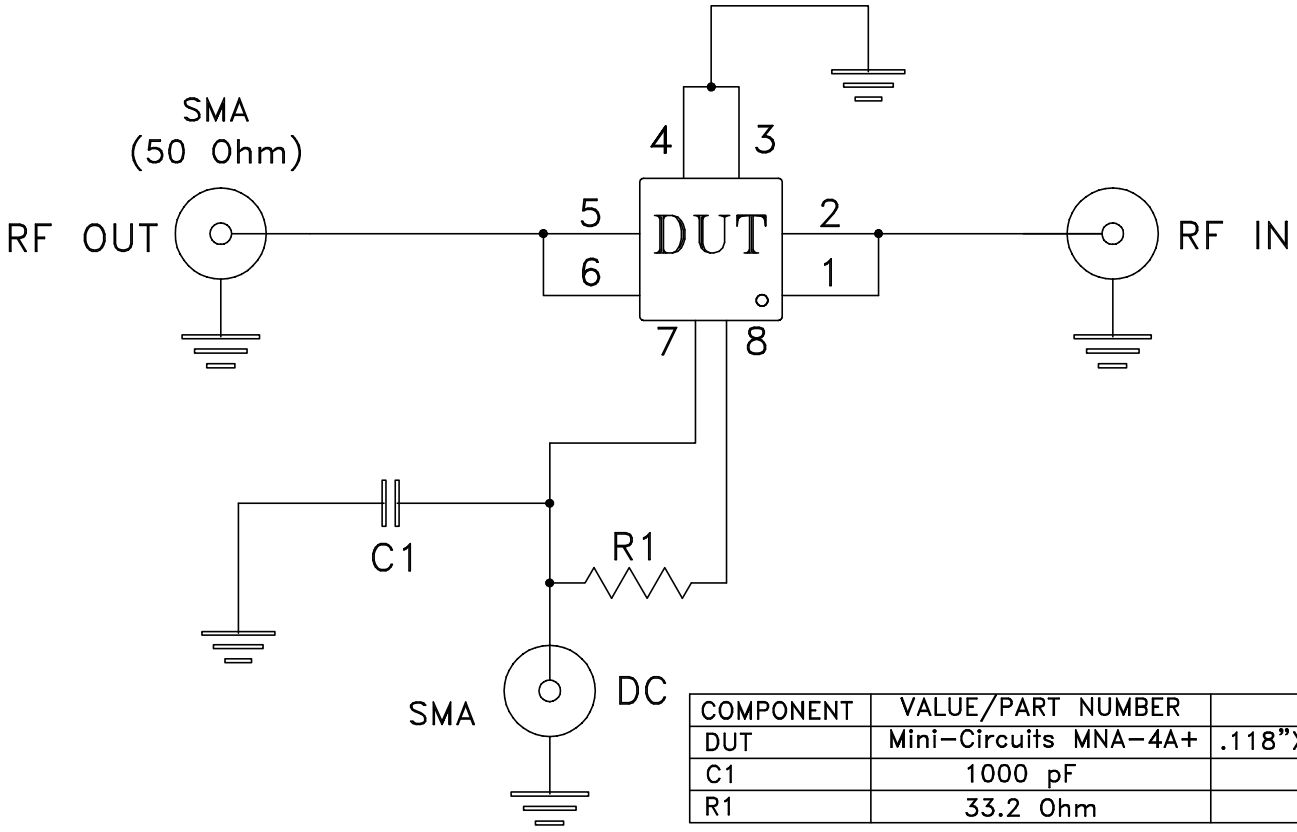
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-078	C

FILE:	SCALE:	SHEET:
98PL078	15:1	1 OF 1

Evaluation Board and Circuit



TB-186-3A+



COMPONENT	VALUE/PART NUMBER	SIZE
DUT	Mini-Circuits MNA-4A+	.118"X.118"(3X3MM)
C1	1000 pF	0603
R1	33.2 Ohm	0805

Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.
3. Pins 1 and 6 have no internal connecton.
4. Paddle underneath DUt must be grounded.

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Environmental Specifications **ENV08T1**

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

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85° C or -45° to 85° C or -55° to 105° C or -40° to 105° C or -40° to 95° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
HTOL	1000 hours at 125°C	MIL-STD-883, Method 1005, Condition B
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020

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

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