ULTRA HIGH DYNAMIC RANGE

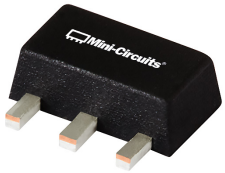
Monolithic Amplifier

PHA-1H+

50Ω 0.05 to 6 GHz

THE BIG DEAL

- Ultra High IP3
- High Pout, P1dB +22 dBm typ. at 2 GHz, +5V
- Low noise figure, 2.2 dB @2 GHz, +5V
- Usable to +4.0V
- Broadband High Dynamic Range without External Matching Components
- May be used as a replacement to WJ AH1[a,b]
- Suitable for low phase noise applications



Generic photo used for illustration purposes only

CASE STYLE: DF782

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

APPLICATIONS

- Base station infrastructure
- Portable Wireless
- CATV & DBS
- MMDS & Wireless LAN
- LTE

PRODUCT OVERVIEW

PHA-1H+ (RoHS compliant) is an advanced wideband amplifier fabricated using E-PHEMT* technology and offers extremely high dynamic range over a broad frequency range and with low noise figure. In addition, the PHA-1H+, unlike competitive models, has good input and output return loss over a broad frequency range without the need for external matching components and has demonstrated excellent reliability. It has repeatable performance from lot to lot and is enclosed in a SOT-89 package for very good thermal performance.

KEY FEATURES

Feature	Advantages
Broad Band: 0.05 to 6.0 GHz	Broadband covering primary wireless communications bands: Cellular, PCS, LTE, WiMAX
Extremely High IP3 Versus DC power Consumption +40.4 dBm typical at 2.4 GHz	The PHA-1H+ matches industry leading IP3 performance relative to device size and power consumption. The combination of the design and E-PHEMT Structure provides enhanced linearity over a broad frequency range as evidence in the IP3 being typically 20 dB above the P 1dB point. This feature makes this amplifier ideal for use in: • Driver amplifiers for complex waveform up converter paths • Drivers in linearized transmit systems • Secondary amplifiers in ultra High Dynamic range receivers
No External Matching Components Required	Unlike competing products, Mini-Circuits PHA-1H+ provides Input and Output Return Loss of 10-23 dB up to 4 GHz without the need for any external matching components
Low Noise Figure: 2.6 dB typ. up to 4 GHz 3.4 dB typ. up to 6 GHz	A unique feature of the PHA-1H+ which separates this design from all competitors is the low noise figure performance in combination with the high dynamic range.
Low Juction Temperature Tj=115°C at +85°C lead temperature and 135°C at +105°C lead temperature	Results in excellent reliability.
Low additive phase noise, typically -164 dBc/Hz @10 KHz offset	Ideal for low phase noise synthesizer applications

* Enhancement mode pseudomorphic High Electron Mobility Transistor.

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 WJ AH1 part number is used for identification and comparison purposes only.

REV. C
ECO-010399
PHA-1H+
MCL NY
240722

Monolithic Amplifier

PHA-1H+

50Ω 0.05 to 6 GHz

ELECTRICAL SPECIFICATIONS AT +25°C, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Vd=+5.0V[1] Min.	Typ.	Max.	Units
Frequency range		0.05		6.0	GHz
Gain	0.05	15.9	17.7	19.5	dB
	0.8	14.3	15.9	17.5	
	2.0	—	13.8	—	
	3.0	—	12.1	—	
	4.0	9.8	10.9	12.0	
	6.0	—	9.6	—	
Input Return Loss	0.05	—	11.9	—	dB
	0.8	13.0	18.2	—	
	2.0	—	12.5	—	
	3.0	—	10.8	—	
	4.0	—	10.3	—	
	6.0	—	8.1	—	
Output Return Loss	0.05	—	14.2	—	dB
	0.8	13.0	22.9	—	
	2.0	—	19.7	—	
	3.0	—	17.1	—	
	4.0	—	15.5	—	
	6.0	—	13.7	—	
Reverse Isolation	2.0		19.6		dB
Output Power @1 dB Compression	0.05	+20.0	+22.1	—	dBm
	0.8	+20.0	+21.8	—	
	2.0	+20.0	+22.6	—	
	3.0	—	+22.2	—	
	4.0	—	+22.5	—	
	6.0	—	+22.0	—	
Output IP3	0.05	—	+39.6	—	dBm
	0.8	+38.0	+40.6	—	
	2.0	—	+40.4	—	
	3.0	—	+40.8	—	
	4.0	—	+41.4	—	
	6.0	—	+41.0	—	
Noise Figure	0.5		1.7		dB
	1.0		1.8		
	2.0		2.2		
	3.0		2.4		
	4.0		2.6		
	6.0		3.4		
Additive Phase Noise 2 GHz, 10 KHz offset			-164.1		dBc/Hz
Device Operating Voltage		+4.8	+5.0	+5.2	V
Device Operating Current		—	132	165	mA
Device Current Variation vs. Temperature[2]			101		µA/°C
Device Current Variation vs Voltage			0.057		mA/mV
Thermal resistance, junction-to-ground lead at 88°C			36.1		°C/W

1. Measured on Mini-Circuits characterization test board TB-313. See characterization test circuit (Fig. 1)
2. (Current at 85°C — Current at -45°C)/130

Monolithic Amplifier

PHA-1H+

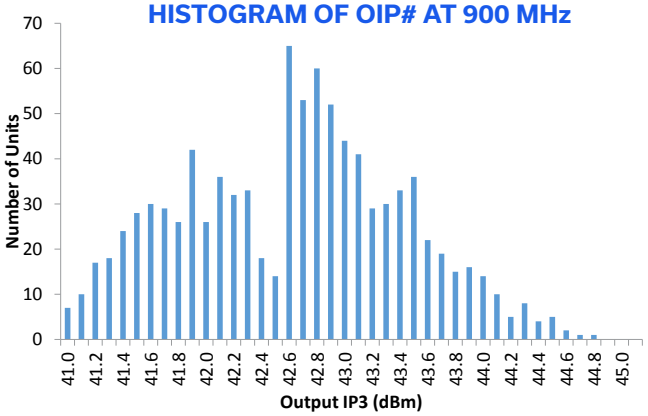
50Ω 0.05 to 6 GHz

ABSOLUTE MAXIMUM RATINGS[3]

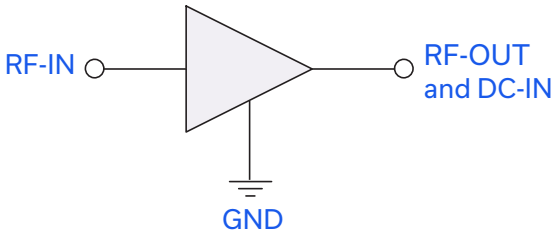
Parameter	Ratings
Operating Temperature (ground lead)	-40°C to +105°C
Storage Temperature	-65°C to +150°C
Operating Current at 5V	210 mA
Power Dissipation	1 W
Input Power (CW)	+24 dBm
DC Voltage on Pin 3	+6 V

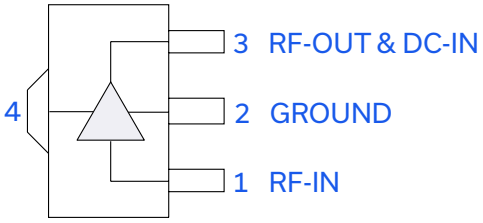
Permanent damage may occur if any of these limits are exceeded.
Electrical maximum ratings are not intended for continuous normal operation.

HISTOGRAM OF OIP# AT 900 MHz



SIMPLIFIED SCHEMATIC AND PIN DESCRIPTION





Function	Pin Number	Description
RF IN	1	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN	3	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit", Fig. 2
GND	2,4	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

CHARACTERIZATION TEST CIRCUIT

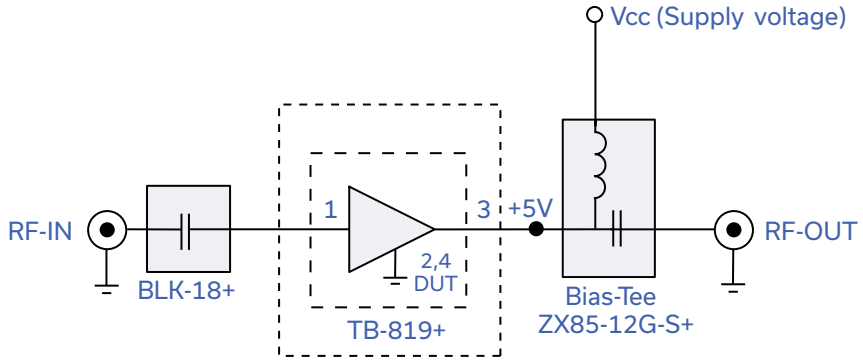


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-313)

Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

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

RECOMMENDED APPLICATION CIRCUIT

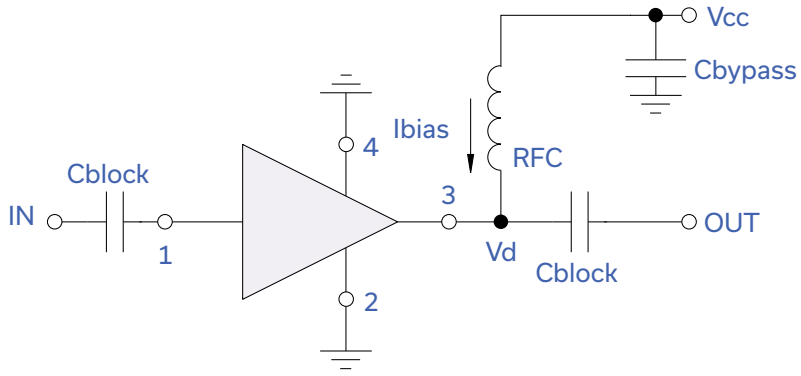
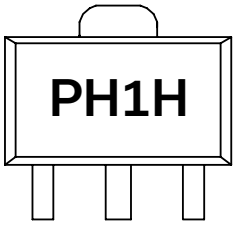


Fig 2. Test Board includes case, connectors, and components soldered to PCB

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DF782 (SOT 89) Plastic package, exposed paddle lead finish: matte-tin
Tape & Reel **Standard quantities available on reel**	F55 7" reels with 20, 50, 100, 200, 500 or 1K devices
Suggested Layout for PCB Design	PL-313
Evaluation Board	TB-545-1H+
Environmental Ratings	ENV08T8

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

NOTES
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

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

TEST CONDITIONS: Vd = 5V, Id = 134.69 mA @ Temperature = +25degC

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)
20	19.46	23.74	7.35	9.70	0.90	0.69	38.74	22.12	1.85
30	18.68	22.49	9.08	11.45	0.92	0.67	39.26	22.80	1.85
40	18.11	21.81	10.67	13.11	0.96	0.65	39.00	22.96	1.82
50	17.71	21.33	12.10	14.56	0.99	0.63	38.54	22.68	1.76
60	17.42	21.37	13.22	15.96	1.02	0.65	39.62	22.57	1.82
70	17.24	21.13	14.24	16.97	1.04	0.64	39.57	22.73	1.84
80	17.10	21.04	15.11	17.99	1.05	0.63	39.96	22.77	1.84
90	17.00	20.95	15.86	18.82	1.06	0.63	40.62	22.76	1.84
100	16.92	20.89	16.48	19.59	1.07	0.63	40.68	22.96	1.84
200	16.61	20.76	19.79	24.15	1.10	0.63	42.77	22.66	1.80
400	16.39	20.70	20.53	26.61	1.11	0.64	42.99	22.68	2.03
600	16.18	20.57	19.63	26.42	1.12	0.65	43.74	22.75	2.08
800	15.93	20.52	18.38	25.57	1.12	0.67	43.66	22.69	1.98
1000	15.63	20.43	17.17	24.39	1.13	0.69	43.25	22.55	2.07
1200	15.31	20.29	16.02	23.38	1.14	0.71	45.00	22.71	2.10
1400	14.96	20.15	15.06	22.33	1.14	0.73	44.89	22.71	2.13
1600	14.60	20.00	14.26	21.50	1.15	0.75	43.74	22.83	2.19
1800	14.24	19.85	13.58	20.56	1.15	0.77	43.96	22.65	2.25
2000	13.89	19.67	13.03	19.83	1.15	0.79	43.45	22.76	2.24
2200	13.54	19.50	12.60	19.20	1.16	0.81	43.40	22.56	2.29
2400	13.21	19.29	12.23	18.55	1.16	0.82	44.03	22.89	2.32
2600	12.87	19.13	12.04	18.03	1.16	0.84	43.68	22.98	2.37
2800	12.58	18.93	11.81	17.40	1.16	0.85	42.22	22.80	2.51
3000	12.31	18.73	11.57	16.79	1.16	0.85	43.63	22.83	2.49
3200	12.03	18.55	11.52	16.41	1.16	0.86	42.35	23.08	2.53
3400	11.75	18.30	11.31	16.19	1.15	0.87	41.75	22.90	2.60
3600	11.56	18.10	11.09	15.75	1.14	0.87	41.62	22.95	2.68
3800	11.30	17.98	11.04	15.72	1.15	0.88	41.26	22.93	2.72
4000	11.11	17.72	10.66	15.54	1.14	0.88	40.64	22.94	2.80
4200	10.93	17.54	10.41	15.43	1.13	0.89	41.08	22.97	2.90
4400	10.68	17.27	10.02	15.58	1.12	0.90	40.44	22.79	3.02
4600	10.58	17.05	9.59	15.18	1.09	0.90	40.21	22.91	3.00
4800	10.45	16.92	9.29	15.01	1.08	0.91	40.12	22.82	3.10
5000	10.33	16.79	9.00	14.92	1.06	0.92	40.31	23.02	3.21
5200	10.14	16.58	8.73	15.06	1.05	0.93	39.70	22.74	3.21
5400	10.05	16.43	8.53	14.99	1.04	0.94	40.26	22.86	3.28
5600	9.91	16.15	8.22	14.62	1.01	0.94	40.00	22.53	3.36
5800	9.79	15.85	7.99	14.48	0.99	0.94	39.70	22.38	3.42
6000	9.76	15.63	7.95	14.51	0.98	0.94	39.71	22.11	3.51
6200	9.72	15.34	7.77	14.28	0.95	0.93	39.62	22.14	3.53
6400	9.71	15.13	7.61	13.73	0.92	0.93	38.89	21.92	3.63
6600	9.74	14.84	7.53	13.70	0.90	0.91	38.81	21.65	3.70
6800	9.63	14.59	7.20	13.52	0.88	0.91	38.86	21.72	3.79
7000	9.50	14.32	6.98	13.47	0.87	0.91	38.29	21.65	3.93
7200	9.38	14.05	6.52	13.51	0.86	0.91	39.10	21.74	4.09
7400	9.11	13.94	6.06	13.19	0.85	0.92	38.08	21.56	4.20
7600	8.68	13.90	5.51	12.59	0.85	0.95	38.05	21.64	4.41
7800	8.22	13.91	4.92	11.79	0.85	0.99	38.14	21.25	4.67
8000	7.59	13.83	4.62	11.17	0.87	1.00	37.75	21.24	4.89

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 = 4.75V, Id =120.33 mA @ Temperature = +25degC

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)
20	19.41	23.76	7.23	9.65	0.89	0.70	37.67	21.43	1.79
30	18.64	22.40	8.93	11.35	0.91	0.67	38.68	22.13	1.84
40	18.06	21.80	10.52	12.99	0.96	0.66	38.18	22.28	1.78
50	17.65	21.39	11.96	14.48	0.99	0.64	38.19	22.02	1.73
60	17.36	21.01	13.18	15.88	1.01	0.62	39.04	21.98	1.77
70	17.17	21.02	14.07	16.84	1.03	0.63	39.03	22.07	1.81
80	17.03	20.96	14.94	17.82	1.05	0.63	39.69	22.10	1.80
90	16.93	20.89	15.70	18.68	1.06	0.63	40.38	22.13	1.79
100	16.84	20.81	16.32	19.41	1.06	0.63	39.97	22.30	1.82
200	16.52	20.66	19.62	23.93	1.10	0.63	42.60	22.02	1.78
400	16.31	20.58	20.35	26.22	1.11	0.64	46.42	22.03	1.99
600	16.10	20.53	19.52	25.91	1.12	0.65	44.65	22.14	2.06
800	15.84	20.45	18.30	25.00	1.12	0.67	42.62	22.07	1.98
1000	15.55	20.34	17.10	23.76	1.13	0.69	41.77	21.94	2.02
1200	15.22	20.21	15.97	22.75	1.13	0.71	41.16	22.11	2.08
1400	14.88	20.07	15.00	21.72	1.14	0.73	41.20	22.08	2.07
1600	14.52	19.92	14.20	20.89	1.15	0.75	40.17	22.21	2.13
1800	14.16	19.74	13.54	20.00	1.15	0.77	39.50	21.98	2.22
2000	13.81	19.60	12.98	19.31	1.15	0.79	39.53	22.08	2.18
2200	13.45	19.42	12.58	18.72	1.16	0.81	39.15	21.96	2.27
2400	13.13	19.21	12.20	18.13	1.15	0.82	39.86	22.25	2.28
2600	12.79	19.01	12.03	17.69	1.16	0.83	39.74	22.30	2.35
2800	12.49	18.82	11.79	17.13	1.16	0.84	39.01	22.13	2.48
3000	12.23	18.62	11.57	16.57	1.15	0.85	39.19	22.18	2.47
3200	11.95	18.44	11.52	16.26	1.15	0.86	39.15	22.39	2.48
3400	11.67	18.20	11.31	16.04	1.15	0.86	38.68	22.23	2.58
3600	11.48	17.99	11.10	15.66	1.14	0.87	38.55	22.30	2.59
3800	11.22	17.88	11.05	15.69	1.15	0.88	38.77	22.30	2.73
4000	11.04	17.62	10.69	15.48	1.13	0.88	38.10	22.28	2.79
4200	10.85	17.42	10.42	15.43	1.13	0.89	38.20	22.28	2.85
4400	10.60	17.17	10.05	15.53	1.12	0.90	38.08	22.13	2.99
4600	10.50	16.95	9.63	15.19	1.09	0.90	38.11	22.29	2.97
4800	10.37	16.81	9.33	15.05	1.08	0.91	37.91	22.16	3.08
5000	10.26	16.68	9.04	14.99	1.06	0.92	38.28	22.38	3.14
5200	10.07	16.47	8.78	15.12	1.06	0.93	37.73	22.08	3.18
5400	9.97	16.36	8.58	15.07	1.05	0.94	38.28	22.18	3.24
5600	9.83	16.04	8.26	14.71	1.02	0.94	37.83	21.90	3.32
5800	9.72	15.79	8.04	14.56	0.99	0.94	37.51	21.76	3.41
6000	9.69	15.54	8.00	14.63	0.98	0.93	37.45	21.48	3.48
6200	9.65	15.26	7.83	14.41	0.95	0.93	37.18	21.55	3.50
6400	9.63	15.06	7.68	13.88	0.93	0.92	36.64	21.31	3.59
6600	9.66	14.75	7.60	13.84	0.91	0.91	36.27	21.06	3.64
6800	9.55	14.53	7.27	13.62	0.89	0.91	36.42	21.11	3.75
7000	9.43	14.26	7.04	13.53	0.88	0.91	36.00	21.01	3.91
7200	9.30	14.00	6.57	13.48	0.86	0.90	36.68	21.15	4.02
7400	9.03	13.92	6.12	13.10	0.86	0.92	35.73	20.91	4.15
7600	8.60	13.87	5.57	12.43	0.86	0.94	35.80	21.04	4.34
7800	8.15	13.86	4.96	11.60	0.86	0.97	35.37	20.59	4.60
8000	7.52	13.80	4.66	10.96	0.87	0.99	35.14	20.60	4.84

Typical Performance Data

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

TEST CONDITIONS: Vd = 5.25V, Id = 148.69 mA @ Temperature = +25degC

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)
20	19.47	23.72	7.50	9.78	0.90	0.69	37.94	22.56	2.11
30	18.70	22.49	9.23	11.52	0.93	0.66	39.36	23.33	2.05
40	18.13	21.87	10.82	13.20	0.96	0.65	38.78	23.51	2.01
50	17.74	21.39	12.21	14.63	0.99	0.63	38.92	23.26	1.97
60	17.46	21.46	13.51	16.09	1.03	0.65	39.88	23.08	2.00
70	17.28	21.18	14.40	17.10	1.04	0.64	39.76	23.26	2.02
80	17.15	21.08	15.27	18.11	1.05	0.63	40.10	23.29	2.02
90	17.04	21.03	16.02	18.98	1.06	0.63	40.58	23.29	2.01
100	16.97	20.97	16.61	19.75	1.07	0.63	40.71	23.52	2.03
200	16.66	20.80	19.95	24.50	1.10	0.63	42.43	23.20	1.99
400	16.45	20.75	20.63	27.05	1.11	0.64	43.87	23.19	2.20
600	16.24	20.66	19.70	27.04	1.12	0.65	44.26	23.25	2.26
800	15.98	20.58	18.44	26.14	1.12	0.67	46.05	23.20	2.17
1000	15.69	20.48	17.20	24.97	1.13	0.69	44.44	23.05	2.27
1200	15.36	20.38	16.05	23.95	1.14	0.71	46.53	23.24	2.28
1400	15.02	20.21	15.07	22.87	1.14	0.73	46.18	23.21	2.32
1600	14.66	20.09	14.26	22.00	1.15	0.76	45.56	23.36	2.38
1800	14.30	19.94	13.60	21.02	1.16	0.78	45.91	23.17	2.44
2000	13.95	19.74	13.04	20.22	1.16	0.79	43.58	23.30	2.44
2200	13.59	19.59	12.61	19.51	1.16	0.81	45.19	23.11	2.50
2400	13.26	19.37	12.21	18.81	1.16	0.83	44.45	23.47	2.48
2600	12.93	19.23	12.03	18.23	1.17	0.84	43.21	23.52	2.57
2800	12.63	19.01	11.79	17.53	1.16	0.85	42.66	23.33	2.75
3000	12.36	18.80	11.56	16.89	1.16	0.86	43.57	23.36	2.69
3200	12.08	18.64	11.49	16.47	1.16	0.86	42.66	23.58	2.75
3400	11.80	18.41	11.29	16.22	1.16	0.87	41.84	23.42	2.82
3600	11.61	18.19	11.05	15.74	1.15	0.87	41.56	23.48	2.91
3800	11.35	18.10	11.02	15.71	1.16	0.88	41.45	23.45	3.00
4000	11.16	17.83	10.63	15.47	1.14	0.89	41.01	23.43	3.07
4200	10.97	17.64	10.36	15.38	1.13	0.89	41.27	23.43	3.14
4400	10.73	17.35	9.98	15.52	1.12	0.90	40.74	23.26	3.28
4600	10.62	17.14	9.54	15.12	1.09	0.91	40.63	23.41	3.28
4800	10.49	16.99	9.24	14.92	1.08	0.92	40.39	23.28	3.33
5000	10.38	16.89	8.95	14.80	1.06	0.93	40.39	23.50	3.45
5200	10.19	16.68	8.69	14.93	1.05	0.94	40.03	23.20	3.50
5400	10.10	16.52	8.48	14.86	1.04	0.94	40.41	23.34	3.61
5600	9.95	16.19	8.15	14.46	1.01	0.95	39.90	23.00	3.66
5800	9.84	15.94	7.93	14.33	0.99	0.95	39.88	22.85	3.75
6000	9.81	15.71	7.88	14.36	0.97	0.94	39.61	22.55	3.81
6200	9.77	15.39	7.71	14.13	0.94	0.93	39.67	22.61	3.84
6400	9.75	15.18	7.54	13.58	0.92	0.93	38.71	22.36	3.93
6600	9.78	14.89	7.46	13.51	0.90	0.92	38.89	22.12	4.05
6800	9.67	14.65	7.14	13.39	0.88	0.92	39.11	22.15	4.15
7000	9.55	14.36	6.91	13.35	0.86	0.92	38.60	22.07	4.29
7200	9.42	14.09	6.45	13.45	0.85	0.92	39.30	22.21	4.40
7400	9.15	13.97	6.00	13.19	0.85	0.93	38.61	21.98	4.52
7600	8.72	13.95	5.45	12.67	0.85	0.96	38.44	22.12	4.79
7800	8.26	13.92	4.86	11.91	0.84	1.00	38.71	21.70	5.06
8000	7.62	13.85	4.57	11.32	0.86	1.01	38.48	21.53	5.29

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 = 5V, Id =124.36 mA @ Temperature = -45degC

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)
20	19.62	23.65	6.93	9.20	0.86	0.68	40.89	21.97	1.64
30	18.80	22.31	8.53	10.70	0.87	0.67	41.27	22.63	1.55
40	18.13	21.51	10.06	12.16	0.91	0.64	39.56	22.72	1.46
50	17.65	21.16	11.49	13.39	0.95	0.64	39.01	22.56	1.37
60	17.28	20.72	12.63	14.68	0.98	0.62	38.73	22.43	1.41
70	17.04	20.68	13.68	15.48	1.00	0.62	39.29	22.50	1.45
80	16.86	20.59	14.62	16.32	1.02	0.62	38.20	22.57	1.42
90	16.72	20.49	15.45	17.03	1.04	0.62	38.78	22.58	1.41
100	16.61	20.44	16.14	17.64	1.05	0.62	38.76	22.77	1.42
200	16.20	20.24	20.50	21.05	1.09	0.62	37.66	22.55	1.37
400	15.98	20.20	22.23	22.04	1.11	0.62	37.25	22.61	1.60
600	15.80	20.13	21.26	22.09	1.11	0.63	37.55	22.69	1.60
800	15.59	20.04	19.85	21.68	1.12	0.65	37.89	22.65	1.54
1000	15.34	19.95	18.51	21.32	1.13	0.66	37.76	22.53	1.59
1200	15.06	19.86	17.31	20.89	1.13	0.68	38.34	22.67	1.62
1400	14.76	19.74	16.20	20.63	1.14	0.70	38.66	22.66	1.63
1600	14.45	19.61	15.38	20.51	1.15	0.72	39.34	22.75	1.66
1800	14.14	19.49	14.75	20.13	1.15	0.73	38.31	22.54	1.76
2000	13.83	19.31	14.08	20.01	1.16	0.75	38.94	22.63	1.70
2200	13.51	19.20	13.77	19.96	1.16	0.77	38.44	22.43	1.74
2400	13.22	18.98	13.26	19.97	1.16	0.78	39.89	22.78	1.72
2600	12.93	18.85	13.13	19.77	1.17	0.80	40.44	22.85	1.79
2800	12.66	18.64	12.93	19.30	1.17	0.81	40.37	22.64	1.95
3000	12.41	18.44	12.72	18.69	1.16	0.81	40.31	22.70	1.91
3200	12.17	18.29	12.64	18.39	1.16	0.82	41.67	22.94	1.93
3400	11.89	18.14	12.44	18.52	1.17	0.83	41.25	22.79	2.01
3600	11.74	17.88	12.08	17.87	1.15	0.83	41.17	22.84	2.03
3800	11.50	17.77	12.02	17.80	1.16	0.84	42.82	22.88	2.11
4000	11.32	17.52	11.52	17.62	1.14	0.84	42.63	22.91	2.14
4200	11.15	17.36	11.11	17.40	1.13	0.85	42.19	22.92	2.19
4400	10.89	17.15	10.73	17.73	1.13	0.86	42.61	22.81	2.27
4600	10.78	16.93	10.21	17.06	1.11	0.87	42.96	22.99	2.27
4800	10.66	16.79	9.85	16.56	1.09	0.88	42.71	22.94	2.36
5000	10.55	16.69	9.56	16.39	1.08	0.89	44.21	23.15	2.41
5200	10.39	16.51	9.30	16.33	1.07	0.90	43.47	22.82	2.44
5400	10.30	16.36	9.22	16.01	1.06	0.90	45.37	23.04	2.49
5600	10.16	16.08	9.01	15.58	1.03	0.90	43.74	22.65	2.59
5800	10.11	15.78	8.95	15.64	1.02	0.89	44.28	22.49	2.59
6000	10.14	15.61	8.86	15.14	0.99	0.88	43.76	22.10	2.63
6200	10.16	15.28	8.82	14.99	0.97	0.86	43.65	22.19	2.65
6400	10.17	15.04	8.60	14.82	0.95	0.85	42.01	21.94	2.71
6600	10.20	14.74	8.34	14.83	0.92	0.84	41.75	21.67	2.78
6800	10.19	14.43	7.88	15.16	0.90	0.83	41.83	21.75	2.89
7000	10.06	14.24	7.32	14.89	0.88	0.84	42.05	21.67	3.03
7200	9.96	13.97	6.72	14.80	0.87	0.84	42.40	21.71	3.13
7400	9.63	13.74	6.17	13.94	0.86	0.85	42.64	21.52	3.25
7600	9.19	13.75	5.48	12.76	0.85	0.89	42.53	21.59	3.47
7800	8.83	14.00	4.63	11.46	0.83	0.94	42.18	21.16	3.65
8000	8.19	13.82	4.49	10.88	0.85	0.95	41.96	21.13	3.84

Typical Performance Data

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

TEST CONDITIONS: Vd = 4.75V, Id =109.28 mA @ Temperature = -45degC

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)
20	19.54	23.65	6.85	9.09	0.85	0.69	39.02	21.22	1.51
30	18.71	22.20	8.42	10.58	0.87	0.66	39.25	21.87	1.50
40	18.05	21.46	9.94	12.02	0.91	0.65	37.97	21.93	1.38
50	17.56	20.90	11.35	13.30	0.94	0.62	37.92	21.69	1.31
60	17.19	20.92	12.55	14.51	0.99	0.65	38.21	21.67	1.33
70	16.95	20.60	13.55	15.39	1.00	0.63	38.85	21.71	1.39
80	16.77	20.52	14.47	16.25	1.02	0.63	38.33	21.78	1.36
90	16.62	20.41	15.30	16.98	1.03	0.62	38.82	21.80	1.37
100	16.51	20.36	16.00	17.59	1.05	0.62	38.86	21.97	1.36
200	16.10	20.13	20.36	21.19	1.09	0.62	38.47	21.76	1.36
400	15.87	20.08	22.20	22.24	1.11	0.62	37.74	21.84	1.56
600	15.70	20.01	21.25	22.35	1.11	0.63	38.32	21.93	1.59
800	15.48	19.95	19.83	21.88	1.12	0.65	38.57	21.89	1.50
1000	15.24	19.85	18.49	21.50	1.13	0.66	38.85	21.78	1.54
1200	14.97	19.76	17.30	20.97	1.13	0.68	39.20	21.91	1.59
1400	14.67	19.65	16.20	20.66	1.14	0.70	39.61	21.89	1.59
1600	14.36	19.55	15.38	20.51	1.15	0.72	39.77	21.98	1.62
1800	14.05	19.40	14.72	20.05	1.15	0.73	38.77	21.79	1.71
2000	13.74	19.25	14.09	19.87	1.16	0.75	39.04	21.88	1.68
2200	13.43	19.11	13.75	19.78	1.16	0.77	38.50	21.72	1.69
2400	13.14	18.93	13.24	19.76	1.16	0.79	39.76	22.05	1.70
2600	12.85	18.78	13.10	19.51	1.17	0.80	40.32	22.09	1.74
2800	12.58	18.62	12.88	19.03	1.17	0.81	40.35	21.88	1.88
3000	12.33	18.39	12.68	18.44	1.16	0.82	40.11	21.94	1.83
3200	12.10	18.25	12.58	18.19	1.16	0.82	40.89	22.16	1.87
3400	11.82	18.10	12.46	18.28	1.17	0.83	40.22	22.08	1.94
3600	11.67	17.84	12.04	17.69	1.15	0.83	40.32	22.10	1.91
3800	11.44	17.77	11.97	17.64	1.16	0.84	40.93	22.11	2.01
4000	11.25	17.48	11.53	17.43	1.14	0.85	40.24	22.14	2.06
4200	11.08	17.31	11.06	17.23	1.13	0.86	40.14	22.17	2.09
4400	10.83	17.13	10.74	17.53	1.14	0.87	40.14	22.05	2.19
4600	10.71	16.93	10.21	16.91	1.11	0.87	39.92	22.21	2.21
4800	10.58	16.79	9.84	16.41	1.09	0.88	39.73	22.13	2.31
5000	10.49	16.67	9.54	16.27	1.08	0.89	40.48	22.40	2.30
5200	10.32	16.49	9.28	16.20	1.07	0.90	40.24	22.07	2.34
5400	10.25	16.36	9.21	15.91	1.06	0.90	40.58	22.27	2.41
5600	10.09	16.07	9.00	15.48	1.04	0.90	40.20	21.95	2.49
5800	10.06	15.78	8.95	15.58	1.02	0.89	40.24	21.81	2.50
6000	10.07	15.62	8.82	15.09	1.00	0.88	40.64	21.49	2.52
6200	10.09	15.28	8.79	14.96	0.97	0.86	40.12	21.54	2.56
6400	10.11	15.01	8.59	14.80	0.95	0.85	40.17	21.31	2.62
6600	10.14	14.75	8.33	14.83	0.93	0.84	39.67	21.05	2.64
6800	10.13	14.43	7.89	15.11	0.90	0.84	39.06	21.16	2.71
7000	10.00	14.24	7.31	14.83	0.88	0.85	39.28	21.05	2.88
7200	9.90	13.97	6.72	14.71	0.87	0.84	39.89	21.12	2.95
7400	9.56	13.76	6.17	13.84	0.86	0.85	39.15	20.92	3.08
7600	9.12	13.74	5.47	12.66	0.85	0.89	38.99	20.94	3.32
7800	8.78	14.02	4.66	11.36	0.83	0.94	38.67	20.61	3.46
8000	8.14	13.81	4.49	10.79	0.84	0.95	37.95	20.53	3.70

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 = 5.25V, Id = 139.75 mA @ Temperature = -45degC

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)
20	19.68	23.65	7.02	9.31	0.86	0.68	42.88	22.65	1.75
30	18.85	22.29	8.63	10.82	0.87	0.66	42.08	23.27	1.73
40	18.20	21.57	10.16	12.25	0.91	0.64	40.92	23.39	1.56
50	17.71	21.27	11.58	13.50	0.95	0.64	39.71	23.23	1.46
60	17.35	20.84	12.87	14.75	0.98	0.62	39.18	23.10	1.49
70	17.12	20.73	13.81	15.59	1.00	0.62	39.09	23.20	1.52
80	16.94	20.64	14.74	16.40	1.02	0.62	38.67	23.26	1.50
90	16.80	20.56	15.56	17.10	1.04	0.62	38.54	23.27	1.48
100	16.69	20.51	16.27	17.72	1.05	0.62	38.68	23.46	1.47
200	16.29	20.33	20.59	21.04	1.09	0.61	37.43	23.21	1.42
400	16.07	20.27	22.30	21.92	1.11	0.62	37.01	23.27	1.63
600	15.89	20.20	21.27	22.07	1.11	0.63	37.38	23.35	1.67
800	15.67	20.10	19.86	21.64	1.12	0.64	37.61	23.30	1.60
1000	15.43	20.02	18.50	21.32	1.13	0.66	37.51	23.17	1.63
1200	15.14	19.92	17.29	20.90	1.13	0.68	38.15	23.33	1.66
1400	14.84	19.80	16.19	20.67	1.14	0.70	38.36	23.29	1.69
1600	14.53	19.67	15.36	20.63	1.15	0.71	39.18	23.43	1.72
1800	14.21	19.53	14.71	20.27	1.15	0.73	38.25	23.19	1.78
2000	13.90	19.38	14.07	20.17	1.16	0.75	38.79	23.27	1.77
2200	13.58	19.24	13.75	20.15	1.16	0.77	38.35	23.09	1.80
2400	13.29	19.05	13.25	20.19	1.16	0.78	39.48	23.41	1.82
2600	12.99	18.88	13.12	19.95	1.17	0.80	40.48	23.47	1.87
2800	12.72	18.69	12.91	19.45	1.16	0.81	40.15	23.30	1.99
3000	12.48	18.47	12.71	18.84	1.16	0.81	40.51	23.31	1.97
3200	12.23	18.34	12.64	18.55	1.16	0.82	41.01	23.63	1.98
3400	11.95	18.15	12.44	18.66	1.17	0.83	41.28	23.50	2.04
3600	11.79	17.90	12.08	17.97	1.15	0.83	41.28	23.50	2.07
3800	11.56	17.84	12.01	17.92	1.16	0.84	42.41	23.56	2.18
4000	11.38	17.54	11.52	17.73	1.14	0.84	42.65	23.57	2.20
4200	11.20	17.36	11.12	17.47	1.13	0.85	42.85	23.62	2.32
4400	10.94	17.21	10.73	17.81	1.13	0.86	42.45	23.47	2.37
4600	10.83	16.97	10.20	17.22	1.11	0.87	43.18	23.65	2.38
4800	10.71	16.79	9.83	16.69	1.09	0.88	44.68	23.59	2.46
5000	10.61	16.71	9.56	16.44	1.08	0.89	46.07	23.81	2.53
5200	10.44	16.52	9.30	16.39	1.07	0.90	43.20	23.49	2.58
5400	10.36	16.42	9.22	15.95	1.06	0.90	45.20	23.69	2.63
5600	10.20	16.13	9.00	15.76	1.04	0.90	43.40	23.25	2.69
5800	10.16	15.89	8.96	15.59	1.02	0.89	42.99	23.09	2.70
6000	10.18	15.59	8.82	15.14	0.99	0.88	41.91	22.72	2.86
6200	10.19	15.30	8.79	14.91	0.97	0.86	41.65	22.79	2.75
6400	10.22	15.03	8.58	14.80	0.94	0.85	39.89	22.57	2.86
6600	10.27	14.75	8.35	14.86	0.92	0.83	40.00	22.22	2.89
6800	10.23	14.42	7.86	15.11	0.90	0.83	41.10	22.35	2.98
7000	10.11	14.24	7.28	14.90	0.88	0.84	40.27	22.22	3.12
7200	10.03	13.95	6.74	14.96	0.87	0.83	40.24	22.27	3.25
7400	9.64	13.79	6.12	13.77	0.86	0.85	40.45	22.12	3.38
7600	9.28	13.82	5.26	12.60	0.84	0.90	40.38	22.12	3.63
7800	8.89	14.06	4.66	11.61	0.84	0.94	41.35	21.72	3.77
8000	8.24	13.80	4.46	10.95	0.84	0.95	40.55	21.63	3.98

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 = 5V, Id = 135.70 mA @ Temperature = +85degC

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)
20	19.18	23.70	7.80	9.96	0.93	0.69	36.02	21.96	2.44
30	18.46	22.59	9.56	11.81	0.96	0.67	37.09	22.65	2.38
40	17.96	22.00	11.12	13.55	1.00	0.66	37.10	22.82	2.34
50	17.63	21.58	12.53	15.11	1.02	0.64	37.05	22.53	2.29
60	17.38	21.34	13.52	16.54	1.04	0.64	37.64	22.46	2.33
70	17.24	21.38	14.44	17.59	1.06	0.65	37.92	22.60	2.34
80	17.13	21.26	15.20	18.64	1.07	0.64	38.00	22.63	2.33
90	17.04	21.24	15.84	19.55	1.08	0.65	38.60	22.62	2.34
100	16.98	21.18	16.35	20.33	1.09	0.64	38.47	22.81	2.32
200	16.72	21.05	18.75	25.26	1.11	0.65	40.34	22.50	2.30
400	16.51	20.98	18.86	28.11	1.12	0.66	40.52	22.49	2.51
600	16.28	20.92	18.10	28.01	1.13	0.68	40.64	22.56	2.55
800	16.01	20.81	17.11	26.69	1.13	0.69	40.29	22.51	2.49
1000	15.69	20.69	16.06	25.06	1.14	0.72	40.27	22.36	2.57
1200	15.34	20.54	15.10	23.59	1.14	0.74	39.65	22.54	2.64
1400	14.96	20.38	14.25	22.11	1.15	0.76	39.43	22.53	2.64
1600	14.58	20.25	13.51	20.88	1.15	0.78	38.95	22.67	2.70
1800	14.19	20.05	12.88	19.67	1.15	0.80	38.44	22.49	2.81
2000	13.82	19.88	12.34	18.74	1.16	0.82	38.57	22.62	2.80
2200	13.44	19.69	11.93	17.90	1.16	0.84	38.73	22.43	2.89
2400	13.09	19.50	11.55	17.14	1.16	0.85	38.61	22.77	2.87
2600	12.74	19.34	11.34	16.55	1.16	0.87	38.47	22.78	3.00
2800	12.43	19.14	11.10	15.97	1.16	0.88	38.09	22.58	3.13
3000	12.14	18.93	10.87	15.44	1.16	0.89	38.27	22.66	3.13
3200	11.85	18.76	10.81	15.05	1.16	0.89	37.97	22.78	3.18
3400	11.56	18.53	10.63	14.84	1.16	0.90	37.61	22.56	3.25
3600	11.35	18.30	10.43	14.47	1.14	0.90	37.59	22.66	3.28
3800	11.10	18.15	10.36	14.38	1.15	0.91	37.64	22.64	3.38
4000	10.89	17.93	10.15	14.33	1.14	0.91	37.18	22.56	3.47
4200	10.66	17.74	9.93	14.41	1.14	0.92	37.34	22.53	3.53
4400	10.50	17.35	9.43	14.13	1.10	0.92	37.36	22.43	3.64
4600	10.37	17.20	9.18	14.02	1.09	0.93	37.15	22.52	3.68
4800	10.24	17.10	8.97	13.99	1.08	0.94	37.05	22.41	3.76
5000	10.11	16.97	8.69	14.00	1.07	0.95	37.37	22.56	3.89
5200	9.89	16.64	8.29	13.94	1.04	0.96	36.81	22.30	3.91
5400	9.77	16.49	8.17	14.04	1.04	0.97	37.14	22.38	3.97
5600	9.69	16.29	7.91	13.78	1.01	0.97	36.86	22.12	4.10
5800	9.55	15.99	7.62	13.28	0.98	0.98	36.65	21.98	4.18
6000	9.47	15.71	7.52	13.33	0.96	0.97	36.40	21.69	4.27
6200	9.43	15.47	7.34	13.12	0.93	0.97	36.39	21.74	4.30
6400	9.36	15.27	7.18	12.61	0.91	0.97	35.83	21.50	4.42
6600	9.36	14.92	7.12	12.80	0.89	0.96	35.48	21.27	4.49
6800	9.25	14.65	6.94	12.51	0.87	0.95	35.75	21.27	4.62
7000	9.09	14.41	6.68	12.63	0.86	0.96	35.34	21.26	4.76
7200	8.88	14.17	6.36	12.70	0.85	0.96	35.79	21.26	4.91
7400	8.60	14.13	5.93	12.46	0.85	0.98	35.12	21.12	5.03
7600	8.16	13.98	5.55	12.26	0.86	1.00	34.95	21.15	5.27
7800	7.69	13.96	5.04	11.78	0.87	1.03	35.12	20.84	5.51
8000	6.99	13.83	4.93	11.36	0.90	1.03	34.45	20.68	5.76

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 = 4.75V, Id = 123.59 mA @ Temperature = +85degC

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)
20	19.18	23.65	7.60	9.87	0.93	0.69	35.55	21.43	2.22
30	18.46	22.48	9.34	11.74	0.95	0.67	36.97	22.07	2.22
40	17.95	21.95	10.90	13.47	0.99	0.66	36.80	22.23	2.15
50	17.60	21.52	12.21	14.93	1.01	0.64	36.83	22.02	2.11
60	17.36	21.57	13.43	16.49	1.05	0.66	37.69	21.89	2.14
70	17.21	21.32	14.20	17.52	1.06	0.65	37.60	22.02	2.16
80	17.10	21.23	14.98	18.57	1.07	0.65	38.37	22.03	2.15
90	17.01	21.17	15.60	19.46	1.08	0.64	38.57	22.05	2.17
100	16.95	21.13	16.09	20.24	1.08	0.64	38.17	22.21	2.15
200	16.68	20.96	18.51	25.10	1.11	0.64	39.77	21.94	2.16
400	16.47	20.93	18.63	27.71	1.12	0.66	40.37	21.93	2.36
600	16.24	20.82	17.90	27.43	1.12	0.67	40.17	22.00	2.39
800	15.96	20.72	16.94	26.01	1.13	0.69	39.35	21.96	2.33
1000	15.64	20.60	15.94	24.37	1.13	0.71	39.16	21.81	2.41
1200	15.29	20.47	15.00	22.89	1.14	0.74	38.43	21.98	2.45
1400	14.91	20.29	14.16	21.48	1.14	0.76	38.30	21.97	2.48
1600	14.52	20.14	13.44	20.35	1.15	0.78	37.83	22.09	2.56
1800	14.13	19.96	12.82	19.19	1.15	0.80	37.30	21.94	2.62
2000	13.76	19.78	12.28	18.33	1.15	0.82	37.36	22.06	2.61
2200	13.38	19.60	11.89	17.56	1.15	0.84	37.05	21.85	2.71
2400	13.03	19.38	11.52	16.88	1.15	0.85	37.44	22.20	2.77
2600	12.68	19.22	11.31	16.34	1.15	0.86	37.44	22.21	2.77
2800	12.37	19.02	11.08	15.81	1.15	0.87	36.92	22.05	2.89
3000	12.08	18.79	10.88	15.32	1.15	0.88	37.11	22.10	2.91
3200	11.79	18.63	10.81	15.00	1.15	0.89	36.96	22.23	2.97
3400	11.50	18.40	10.65	14.83	1.15	0.89	36.69	22.08	3.09
3600	11.30	18.17	10.44	14.47	1.14	0.90	36.65	22.14	3.12
3800	11.04	18.01	10.38	14.42	1.14	0.90	36.72	22.09	3.21
4000	10.83	17.78	10.18	14.37	1.13	0.91	36.19	22.07	3.29
4200	10.61	17.58	9.97	14.46	1.13	0.91	36.40	22.01	3.34
4400	10.44	17.20	9.47	14.20	1.09	0.92	36.24	21.92	3.46
4600	10.31	17.08	9.22	14.10	1.08	0.93	36.27	21.98	3.48
4800	10.18	16.99	9.01	14.10	1.08	0.94	36.03	21.91	3.60
5000	10.05	16.86	8.75	14.15	1.07	0.95	36.50	22.01	3.68
5200	9.83	16.50	8.33	14.05	1.04	0.96	35.93	21.79	3.72
5400	9.71	16.37	8.22	14.16	1.04	0.96	36.42	21.88	3.81
5600	9.63	16.17	7.97	13.93	1.01	0.97	35.87	21.60	3.88
5800	9.49	15.86	7.67	13.45	0.98	0.97	35.74	21.50	3.97
6000	9.41	15.61	7.58	13.49	0.96	0.97	35.52	21.20	4.05
6200	9.37	15.36	7.43	13.28	0.94	0.96	35.31	21.29	4.13
6400	9.31	15.15	7.26	12.77	0.91	0.96	34.73	21.03	4.22
6600	9.30	14.82	7.20	12.95	0.90	0.95	34.39	20.80	4.28
6800	9.19	14.57	7.01	12.65	0.88	0.95	34.47	20.83	4.38
7000	9.03	14.34	6.76	12.75	0.87	0.95	34.25	20.78	4.56
7200	8.82	14.12	6.44	12.77	0.86	0.95	34.77	20.81	4.70
7400	8.54	14.05	5.99	12.40	0.86	0.97	34.01	20.68	4.77
7600	8.10	13.89	5.61	12.14	0.87	0.99	33.88	20.69	5.04
7800	7.63	13.93	5.11	11.61	0.88	1.01	33.91	20.30	5.28
8000	6.93	13.79	4.98	11.15	0.91	1.02	33.40	20.16	5.52

Typical Performance Data

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

TEST CONDITIONS: Vd = 5.25V, Id = 146.96 mA @ Temperature = +85degC

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)
20	19.14	23.66	8.02	10.02	0.94	0.68	35.50	22.47	2.74
30	18.43	22.62	9.79	11.87	0.97	0.67	36.75	23.11	2.68
40	17.94	21.96	11.38	13.61	1.00	0.65	36.89	23.29	2.58
50	17.61	21.81	12.71	15.17	1.03	0.66	36.63	23.17	2.52
60	17.37	21.37	13.89	16.63	1.05	0.64	37.25	22.93	2.54
70	17.23	21.39	14.68	17.66	1.06	0.65	37.49	23.08	2.56
80	17.12	21.30	15.47	18.73	1.07	0.64	37.78	23.08	2.57
90	17.04	21.25	16.09	19.63	1.08	0.64	38.23	23.07	2.56
100	16.98	21.19	16.59	20.45	1.09	0.64	38.25	23.30	2.54
200	16.73	21.11	19.01	25.35	1.11	0.65	39.80	22.96	2.49
400	16.52	21.03	19.08	28.27	1.12	0.66	39.59	22.96	2.72
600	16.29	20.92	18.24	28.42	1.13	0.67	39.81	23.01	2.76
800	16.02	20.85	17.21	27.11	1.13	0.70	39.93	22.94	2.72
1000	15.70	20.73	16.15	25.56	1.14	0.72	40.17	22.84	2.78
1200	15.35	20.60	15.15	24.03	1.15	0.74	39.56	23.01	2.84
1400	14.98	20.49	14.30	22.52	1.15	0.77	39.55	23.00	2.85
1600	14.59	20.29	13.55	21.24	1.16	0.78	39.28	23.15	2.91
1800	14.21	20.14	12.90	19.98	1.16	0.81	38.87	22.99	3.01
2000	13.84	19.92	12.37	18.97	1.16	0.82	38.67	23.13	3.03
2200	13.46	19.81	11.95	18.11	1.17	0.84	39.36	22.90	3.08
2400	13.12	19.59	11.54	17.28	1.16	0.86	39.01	23.27	3.09
2600	12.76	19.41	11.32	16.63	1.17	0.87	38.83	23.27	3.19
2800	12.45	19.25	11.08	16.01	1.17	0.88	38.40	23.08	3.33
3000	12.16	19.03	10.86	15.44	1.16	0.89	38.81	23.12	3.30
3200	11.87	18.88	10.79	15.02	1.17	0.90	38.42	23.22	3.39
3400	11.58	18.61	10.61	14.80	1.16	0.90	38.05	23.07	3.45
3600	11.38	18.43	10.40	14.38	1.15	0.91	38.06	23.11	3.52
3800	11.12	18.26	10.32	14.29	1.15	0.91	37.89	23.07	3.62
4000	10.91	18.04	10.11	14.20	1.15	0.92	37.60	23.03	3.66
4200	10.69	17.85	9.89	14.26	1.14	0.92	37.95	22.95	3.78
4400	10.51	17.46	9.39	14.01	1.10	0.93	37.46	22.83	3.86
4600	10.39	17.30	9.13	13.87	1.09	0.94	37.56	22.90	3.88
4800	10.26	17.18	8.90	13.82	1.08	0.94	37.41	22.77	4.01
5000	10.13	17.09	8.63	13.81	1.07	0.96	37.41	22.92	4.10
5200	9.91	16.73	8.23	13.77	1.04	0.97	37.24	22.74	4.14
5400	9.79	16.58	8.10	13.85	1.03	0.97	37.35	22.76	4.24
5600	9.71	16.36	7.83	13.59	1.01	0.98	37.16	22.49	4.31
5800	9.57	16.07	7.54	13.13	0.97	0.98	37.19	22.39	4.43
6000	9.49	15.78	7.44	13.18	0.96	0.98	36.99	22.10	4.49
6200	9.45	15.53	7.28	12.95	0.93	0.98	36.94	22.15	4.58
6400	9.38	15.31	7.11	12.44	0.90	0.98	36.43	21.92	4.67
6600	9.38	14.98	7.04	12.62	0.88	0.96	36.32	21.67	4.77
6800	9.26	14.71	6.85	12.31	0.86	0.96	36.42	21.67	4.86
7000	9.10	14.46	6.60	12.50	0.85	0.97	36.18	21.62	5.05
7200	8.90	14.22	6.28	12.61	0.85	0.97	36.38	21.59	5.22
7400	8.61	14.15	5.85	12.43	0.84	0.99	35.94	21.48	5.31
7600	8.17	14.01	5.48	12.28	0.85	1.01	35.78	21.51	5.56
7800	7.70	13.99	4.99	11.87	0.86	1.04	36.00	21.16	5.80
8000	6.99	13.87	4.89	11.47	0.90	1.04	35.35	20.85	6.08

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 = 5V, Id = 133.86 mA @ Temperature = +105degC

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)
20	19.04	23.73	8.02	10.00	0.95	0.69	35.14	21.96	2.77
30	18.34	22.57	9.78	11.88	0.98	0.67	36.23	22.54	2.71
40	17.87	22.00	11.32	13.64	1.01	0.66	36.44	22.76	2.62
50	17.55	21.82	12.60	15.13	1.04	0.67	36.34	22.53	2.59
60	17.33	21.53	13.80	16.66	1.06	0.65	37.05	22.36	2.59
70	17.19	21.42	14.53	17.65	1.07	0.65	36.75	22.52	2.59
80	17.09	21.38	15.24	18.66	1.08	0.65	36.98	22.55	2.58
90	17.02	21.30	15.83	19.57	1.09	0.65	37.52	22.56	2.63
100	16.96	21.25	16.31	20.33	1.09	0.65	37.33	22.75	2.58
200	16.72	21.12	18.47	24.78	1.11	0.65	38.61	22.42	2.57
400	16.50	21.05	18.36	26.97	1.12	0.66	38.49	22.40	2.76
600	16.27	21.00	17.61	26.95	1.13	0.68	38.58	22.46	2.83
800	15.99	20.88	16.68	25.75	1.14	0.70	38.57	22.42	2.78
1000	15.66	20.76	15.75	24.31	1.14	0.72	38.63	22.28	2.80
1200	15.31	20.62	14.83	22.85	1.15	0.75	38.13	22.45	2.89
1400	14.93	20.46	14.02	21.51	1.15	0.77	38.18	22.46	2.91
1600	14.53	20.29	13.30	20.29	1.15	0.79	37.67	22.59	2.99
1800	14.14	20.13	12.67	19.17	1.16	0.81	37.18	22.45	3.07
2000	13.76	19.92	12.13	18.21	1.16	0.83	37.41	22.54	3.06
2200	13.37	19.76	11.74	17.40	1.16	0.85	37.33	22.36	3.14
2400	13.02	19.54	11.32	16.65	1.16	0.87	37.54	22.65	3.20
2600	12.66	19.41	11.11	16.10	1.17	0.88	37.44	22.65	3.23
2800	12.34	19.19	10.86	15.49	1.16	0.89	37.06	22.48	3.38
3000	12.04	18.98	10.66	14.96	1.16	0.90	37.20	22.54	3.40
3200	11.75	18.82	10.55	14.55	1.16	0.90	36.92	22.59	3.37
3400	11.45	18.62	10.41	14.39	1.16	0.91	36.68	22.44	3.55
3600	11.24	18.39	10.19	13.99	1.15	0.91	36.56	22.49	3.55
3800	10.99	18.21	10.14	13.90	1.15	0.92	36.71	22.42	3.66
4000	10.78	18.01	9.95	13.80	1.14	0.92	36.13	22.36	3.76
4200	10.55	17.80	9.81	13.92	1.14	0.93	36.49	22.29	3.84
4400	10.37	17.39	9.36	13.79	1.10	0.93	36.23	22.16	3.92
4600	10.25	17.26	9.10	13.65	1.09	0.94	36.23	22.28	3.94
4800	10.13	17.12	8.88	13.66	1.08	0.95	36.15	22.12	4.08
5000	10.00	16.98	8.58	13.71	1.07	0.96	36.30	22.30	4.15
5200	9.78	16.66	8.15	13.69	1.04	0.97	35.88	22.08	4.18
5400	9.67	16.54	7.99	13.76	1.03	0.98	36.23	22.09	4.32
5600	9.55	16.31	7.71	13.62	1.01	0.99	35.91	21.85	4.41
5800	9.40	16.02	7.38	13.16	0.97	0.99	35.82	21.77	4.50
6000	9.34	15.81	7.27	13.21	0.96	0.99	35.55	21.41	4.60
6200	9.25	15.53	7.06	12.99	0.93	1.00	35.61	21.57	4.65
6400	9.16	15.32	6.89	12.49	0.90	1.00	34.94	21.26	4.76
6600	9.16	14.97	6.86	12.59	0.89	0.98	34.81	21.04	4.81
6800	9.04	14.72	6.72	12.34	0.87	0.98	34.82	21.03	5.00
7000	8.87	14.48	6.52	12.49	0.86	0.98	34.58	21.03	5.10
7200	8.68	14.23	6.27	12.63	0.86	0.99	34.91	20.98	5.25
7400	8.42	14.18	5.90	12.46	0.86	1.00	34.29	20.80	5.31
7600	7.98	14.02	5.54	12.39	0.87	1.02	34.13	20.85	5.56
7800	7.51	14.03	5.10	11.97	0.88	1.04	34.39	20.53	5.81
8000	6.80	13.82	4.92	11.41	0.91	1.05	33.71	20.30	6.12

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 = 4.75V, Id = 122.85 mA @ Temperature = +105degC

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)
20	19.06	23.76	7.78	9.98	0.94	0.70	35.17	21.37	2.49
30	18.36	22.56	9.52	11.84	0.97	0.67	36.16	22.03	2.48
40	17.87	22.01	11.05	13.59	1.00	0.67	36.39	22.19	2.37
50	17.55	21.62	12.39	15.16	1.03	0.65	36.25	21.96	2.33
60	17.32	21.51	13.41	16.51	1.05	0.65	36.78	21.88	2.37
70	17.18	21.38	14.24	17.59	1.07	0.65	36.74	21.99	2.39
80	17.08	21.30	14.95	18.60	1.08	0.65	37.13	21.99	2.37
90	17.00	21.27	15.54	19.49	1.08	0.65	37.51	22.00	2.44
100	16.94	21.23	16.01	20.27	1.09	0.65	37.32	22.22	2.37
200	16.70	21.07	18.20	24.78	1.11	0.65	38.56	21.89	2.35
400	16.48	21.02	18.13	26.91	1.12	0.66	38.78	21.85	2.57
600	16.25	20.91	17.37	26.65	1.13	0.68	38.53	21.92	2.62
800	15.96	20.81	16.50	25.32	1.13	0.70	38.12	21.90	2.58
1000	15.63	20.69	15.60	23.80	1.14	0.72	38.05	21.76	2.63
1200	15.27	20.51	14.72	22.35	1.14	0.74	37.46	21.94	2.71
1400	14.89	20.38	13.92	21.01	1.14	0.77	37.33	21.91	2.71
1600	14.49	20.18	13.23	19.83	1.14	0.79	37.00	22.06	2.80
1800	14.10	20.03	12.62	18.78	1.15	0.81	36.44	21.89	2.89
2000	13.72	19.82	12.07	17.88	1.15	0.83	36.62	22.02	2.87
2200	13.33	19.67	11.69	17.14	1.15	0.85	36.40	21.83	2.95
2400	12.97	19.45	11.30	16.44	1.15	0.86	36.78	22.13	2.99
2600	12.61	19.26	11.10	15.92	1.15	0.87	36.72	22.13	3.02
2800	12.29	19.09	10.85	15.37	1.15	0.89	36.27	21.96	3.22
3000	11.99	18.85	10.64	14.90	1.15	0.89	36.35	22.00	3.20
3200	11.70	18.69	10.55	14.52	1.15	0.90	36.29	22.08	3.22
3400	11.41	18.46	10.43	14.37	1.15	0.91	35.96	21.95	3.33
3600	11.20	18.23	10.21	14.02	1.14	0.91	35.86	21.99	3.39
3800	10.95	18.07	10.17	13.95	1.14	0.91	36.03	21.94	3.47
4000	10.74	17.84	10.00	13.90	1.13	0.92	35.56	21.90	3.54
4200	10.51	17.63	9.86	14.04	1.13	0.92	35.81	21.86	3.60
4400	10.32	17.25	9.39	13.87	1.10	0.93	35.59	21.74	3.74
4600	10.21	17.10	9.15	13.77	1.08	0.93	35.64	21.82	3.74
4800	10.08	17.00	8.93	13.81	1.08	0.94	35.52	21.69	3.82
5000	9.95	16.86	8.63	13.88	1.07	0.95	35.86	21.87	3.93
5200	9.73	16.53	8.20	13.82	1.04	0.97	35.25	21.62	3.96
5400	9.62	16.43	8.05	13.92	1.04	0.97	35.65	21.64	4.09
5600	9.50	16.20	7.77	13.77	1.01	0.98	35.21	21.41	4.14
5800	9.35	15.92	7.45	13.30	0.98	0.99	35.03	21.34	4.26
6000	9.29	15.71	7.34	13.38	0.96	0.99	34.85	21.05	4.41
6200	9.20	15.42	7.13	13.13	0.94	0.99	34.79	21.11	4.41
6400	9.12	15.22	6.97	12.65	0.91	0.99	34.05	20.86	4.52
6600	9.12	14.90	6.95	12.77	0.89	0.97	33.86	20.63	4.58
6800	9.00	14.63	6.80	12.51	0.88	0.97	33.89	20.65	4.71
7000	8.83	14.41	6.61	12.60	0.87	0.97	33.70	20.59	4.83
7200	8.64	14.16	6.35	12.71	0.87	0.98	34.16	20.57	5.02
7400	8.37	14.13	5.97	12.45	0.87	0.99	33.47	20.38	5.03
7600	7.93	13.95	5.63	12.28	0.88	1.00	33.35	20.43	5.29
7800	7.46	14.01	5.16	11.82	0.89	1.03	33.49	20.11	5.52
8000	6.76	13.77	4.96	11.25	0.92	1.03	32.91	19.87	5.83

Typical Performance Data

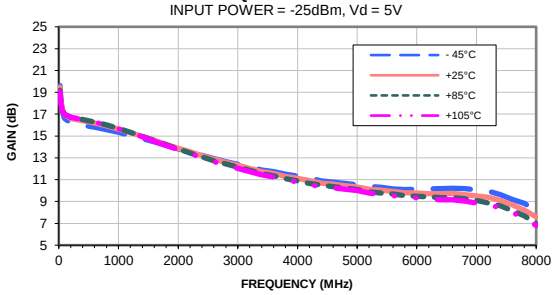
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 143.97 mA @ Temperature = +105degC

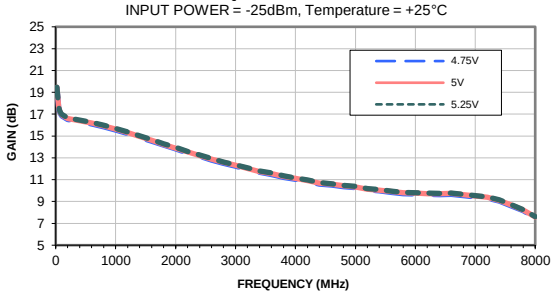
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
20	18.98	23.74	8.28	10.07	0.97	0.69	34.90	22.32	3.07
30	18.30	22.55	10.05	11.94	0.98	0.67	35.87	23.02	2.99
40	17.83	22.03	11.62	13.72	1.02	0.66	36.28	23.22	2.85
50	17.52	21.82	12.92	15.26	1.05	0.66	36.15	22.97	2.80
60	17.30	21.42	14.02	16.66	1.06	0.64	36.42	22.84	2.84
70	17.17	21.46	14.83	17.67	1.08	0.65	36.77	22.99	2.82
80	17.07	21.39	15.55	18.70	1.09	0.65	36.66	23.02	2.83
90	17.00	21.33	16.15	19.58	1.09	0.65	37.36	23.00	2.85
100	16.94	21.32	16.62	20.34	1.10	0.65	37.17	23.22	2.82
200	16.71	21.16	18.82	24.77	1.12	0.65	38.42	22.89	2.77
400	16.49	21.13	18.64	26.78	1.13	0.67	38.19	22.86	2.99
600	16.26	21.02	17.76	26.98	1.13	0.68	38.32	22.89	3.04
800	15.98	20.92	16.84	25.88	1.14	0.70	38.28	22.86	2.99
1000	15.66	20.81	15.85	24.55	1.15	0.73	38.62	22.72	3.04
1200	15.30	20.65	14.91	23.17	1.15	0.75	38.10	22.93	3.10
1400	14.93	20.54	14.09	21.78	1.16	0.77	38.21	22.91	3.14
1600	14.54	20.37	13.35	20.54	1.16	0.80	37.79	23.04	3.24
1800	14.14	20.18	12.72	19.37	1.16	0.82	37.36	22.90	3.33
2000	13.77	20.03	12.16	18.39	1.17	0.84	37.51	23.01	3.31
2200	13.38	19.88	11.77	17.55	1.17	0.86	37.79	22.80	3.36
2400	13.03	19.65	11.33	16.75	1.17	0.87	37.62	23.12	3.39
2600	12.67	19.48	11.12	16.14	1.17	0.88	37.78	23.10	3.43
2800	12.35	19.30	10.86	15.51	1.17	0.89	37.38	22.91	3.61
3000	12.05	19.08	10.64	14.95	1.16	0.90	37.38	22.96	3.61
3200	11.76	18.90	10.53	14.50	1.16	0.91	37.17	23.03	3.69
3400	11.46	18.71	10.39	14.31	1.17	0.91	37.04	22.83	3.75
3600	11.25	18.46	10.17	13.91	1.15	0.92	36.97	22.90	3.79
3800	11.00	18.31	10.10	13.77	1.15	0.92	36.94	22.82	3.89
4000	10.79	18.10	9.92	13.68	1.15	0.93	36.64	22.77	3.97
4200	10.56	17.90	9.77	13.79	1.15	0.93	36.75	22.70	4.05
4400	10.37	17.49	9.31	13.64	1.11	0.94	36.54	22.57	4.15
4600	10.26	17.34	9.05	13.51	1.09	0.94	36.46	22.66	4.18
4800	10.13	17.25	8.83	13.49	1.09	0.95	36.36	22.49	4.24
5000	10.00	17.07	8.52	13.54	1.07	0.96	36.40	22.66	4.39
5200	9.79	16.75	8.10	13.51	1.04	0.98	36.17	22.44	4.45
5400	9.68	16.65	7.92	13.59	1.03	0.98	36.35	22.42	4.56
5600	9.56	16.41	7.64	13.41	1.01	0.99	36.25	22.18	4.63
5800	9.40	16.11	7.31	13.00	0.97	1.00	36.18	22.10	4.72
6000	9.35	15.89	7.21	13.03	0.96	1.00	35.89	21.79	4.86
6200	9.25	15.58	6.99	12.81	0.93	1.00	35.99	21.91	4.90
6400	9.16	15.39	6.82	12.30	0.90	1.00	35.32	21.60	4.99
6600	9.17	15.04	6.79	12.41	0.88	0.99	35.34	21.39	5.07
6800	9.04	14.78	6.65	12.18	0.86	0.99	35.37	21.37	5.19
7000	8.87	14.53	6.45	12.33	0.85	0.99	35.19	21.33	5.36
7200	8.69	14.26	6.20	12.50	0.85	1.00	35.45	21.33	5.53
7400	8.42	14.20	5.82	12.41	0.85	1.01	34.86	21.18	5.64
7600	7.97	14.05	5.50	12.39	0.86	1.03	34.68	21.25	5.83
7800	7.50	14.07	5.05	12.04	0.88	1.05	35.01	20.86	6.09
8000	6.80	13.85	4.86	11.53	0.90	1.06	34.27	20.50	6.40

Typical Performance Curves

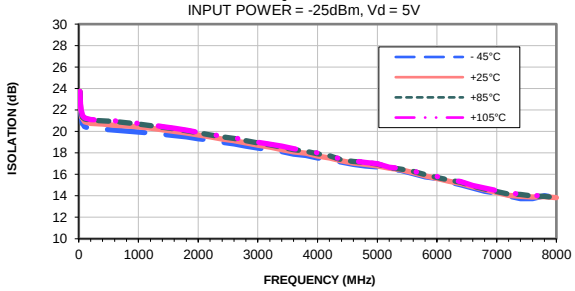
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



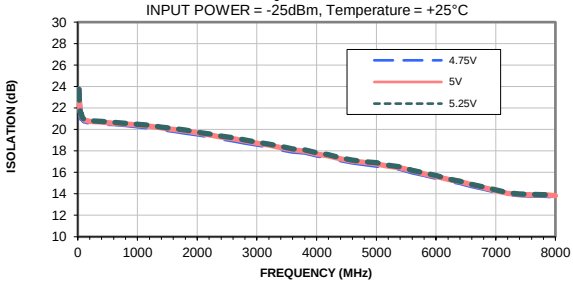
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



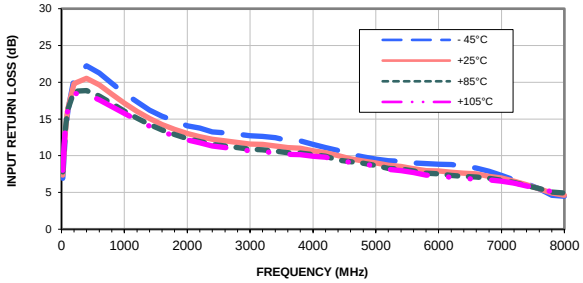
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



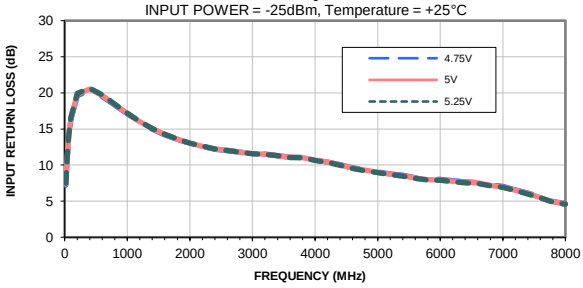
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



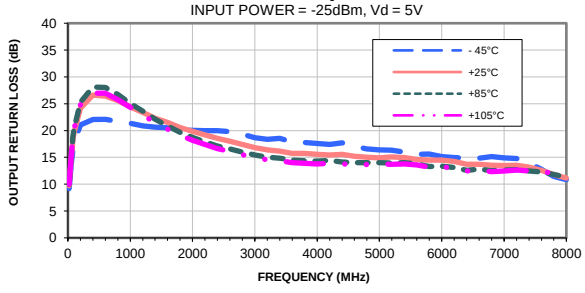
INPUT RETURN LOSS vs. FREQUECNY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



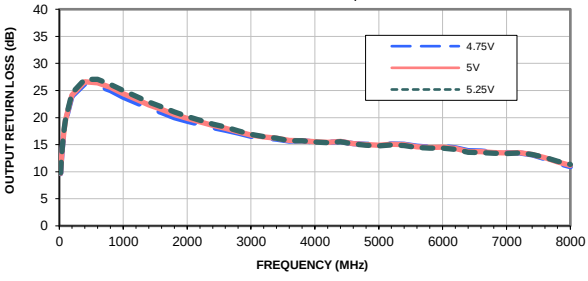
INPUT RETURN LOSS vs. FREQUECNY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V

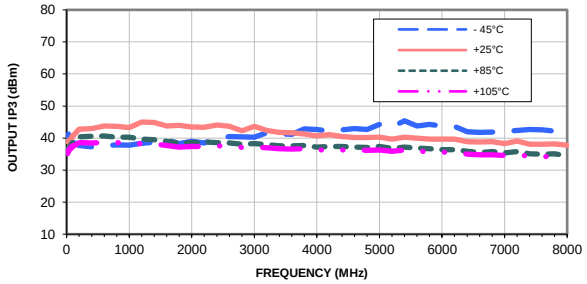


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C

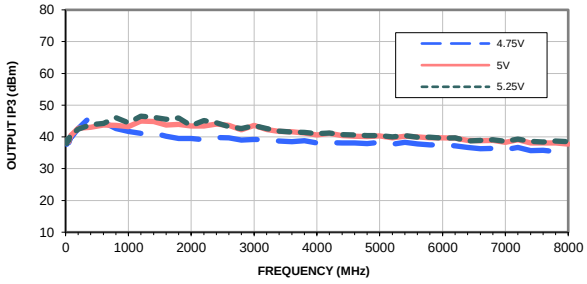


Typical Performance Curves

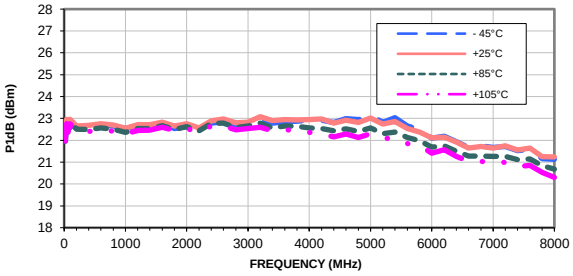
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = 5 dBm/tone, Vd = 5V



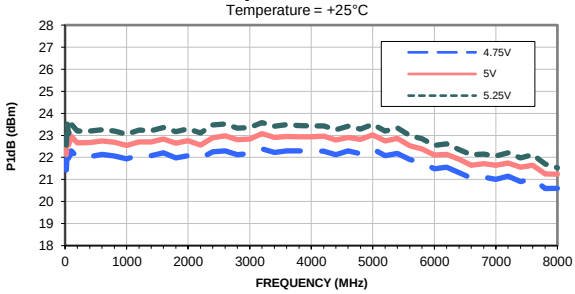
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = 5 dBm/tone, Temperature = +25°C



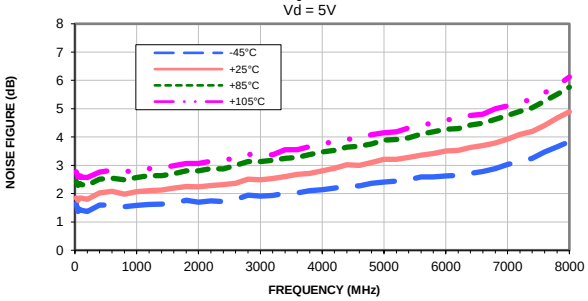
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 5V



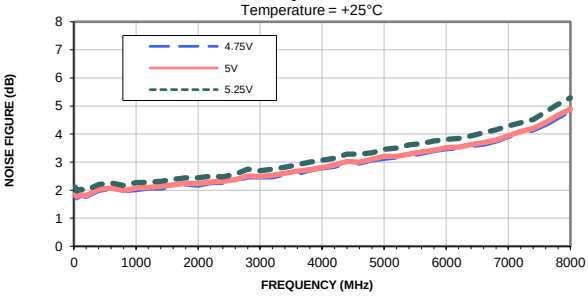
P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



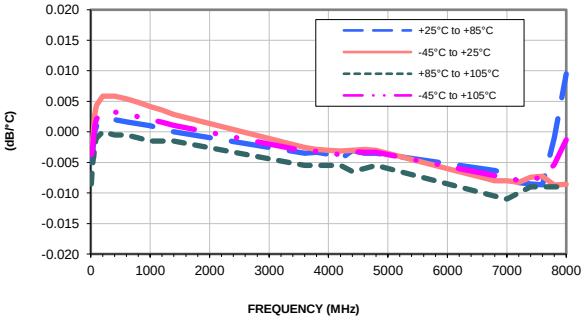
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 5V



NOISE FIGURE vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



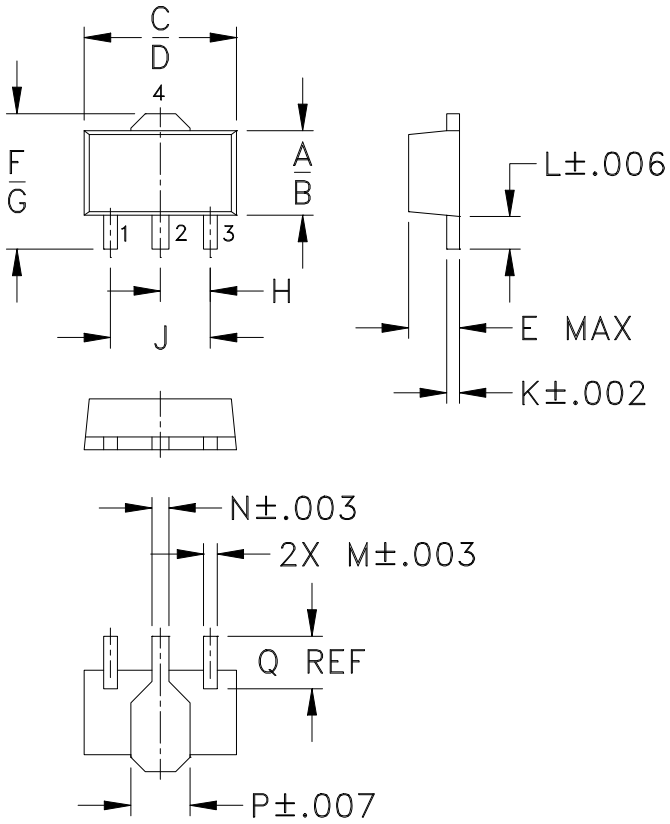
GAIN VARIATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



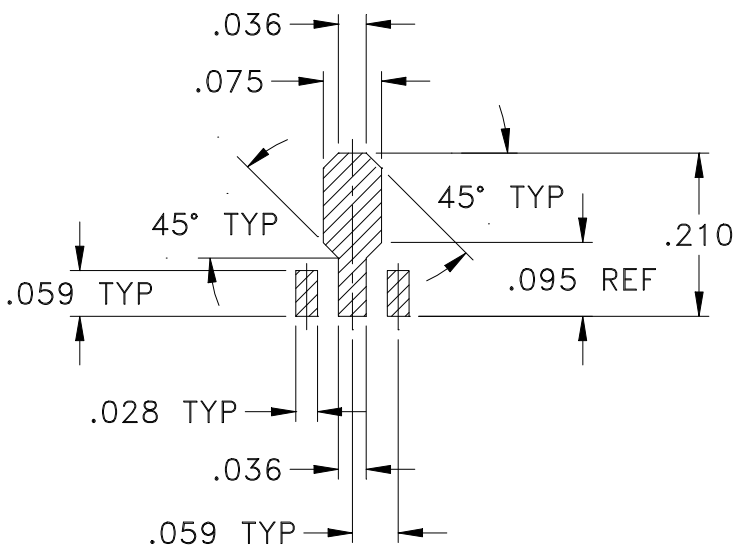
Case Style DF

DF782

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
DF782	.102 (2.59)	.090 (2.29)	.181 (4.60)	.173 (4.39)	.063 (1.60)	.167 (4.24)	.155 (3.94)	.059 (1.50)	.118 (3.00)	.015 (0.38)	.041 (1.04)	.016 (0.41)

CASE #	N	P	Q	WT. GRAM
DF782	.019 (0.48)	.065 (1.65)	.062 (1.57)	.2

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

Notes:

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

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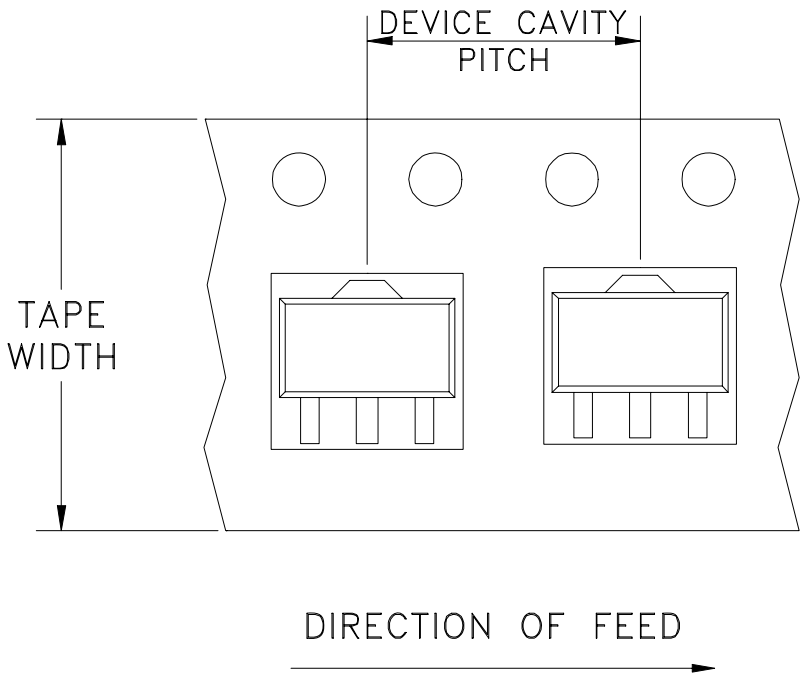
Tape & Reel Packaging TR-F55

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	8	7	Small quantity standard (see note)	20
				50
				100
				200
				500
			Standard	1000

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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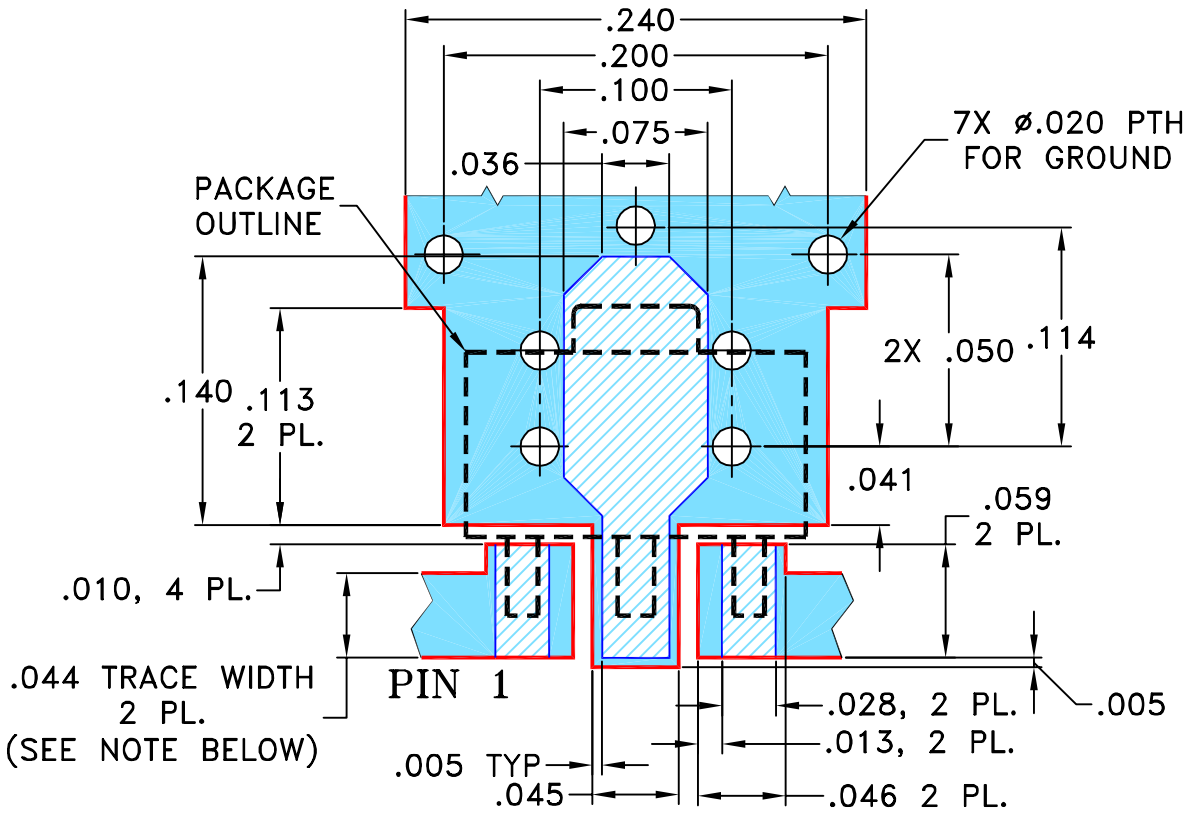
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M123948	NEW RELEASE	08/18/09	MMG	DJ

SUGGESTED MOUNTING CONFIGURATION FOR DF782 CASE STYLE, "04AM03" PIN CODE



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. 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	MMG	08/17/09
TOLERANCES ON:	CHECKED	AV	08/17/09
2 PL DECIMALS ±	APPROVED	DJ	08/18/09
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

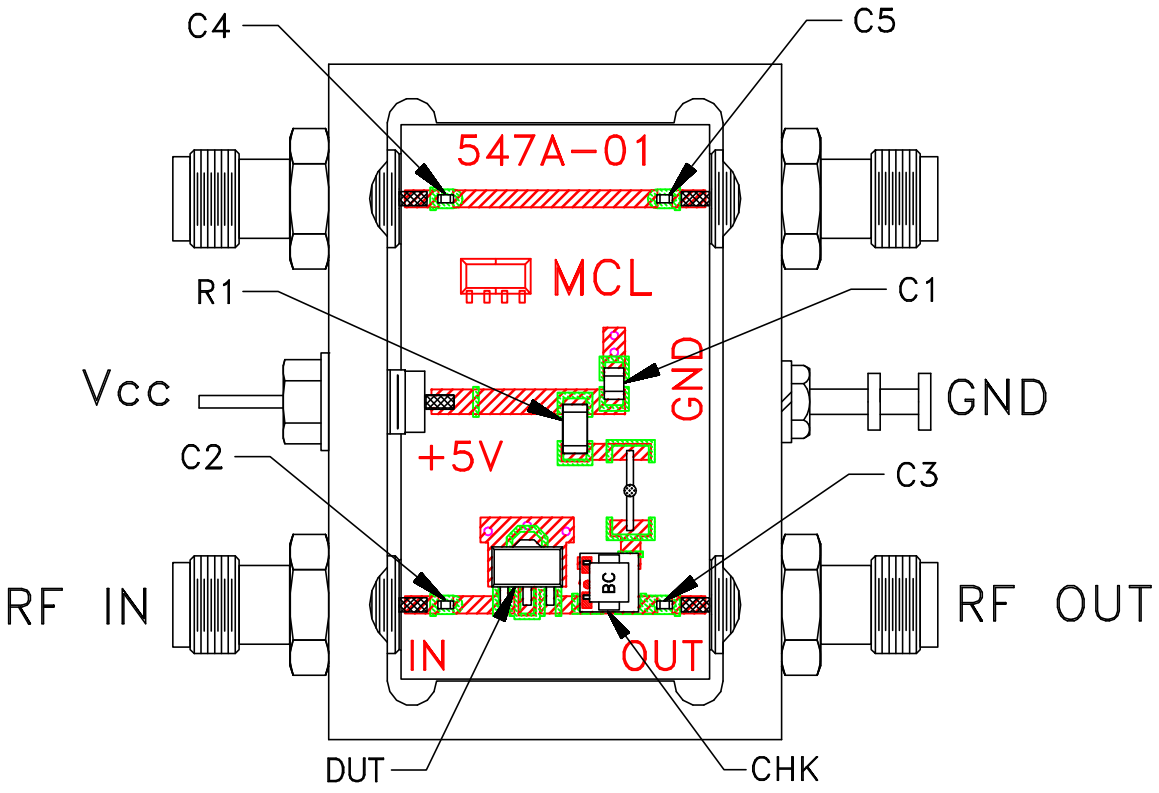
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 04AM03, DF782, TB-545-1+

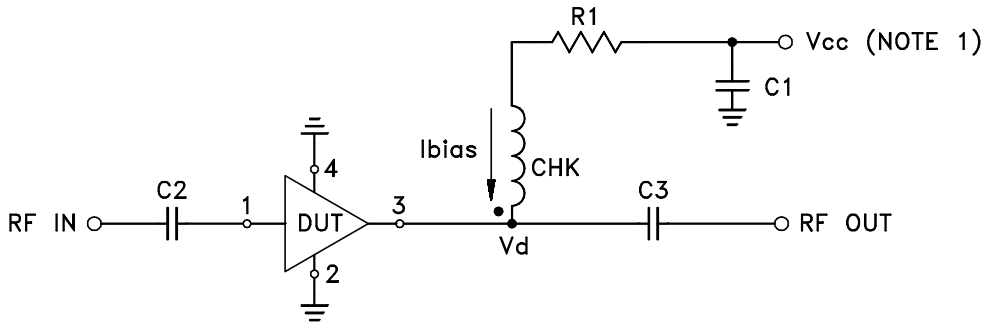
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-313	OR

FILE:	SCALE:	SHEET:
98PL313	10:1	1 OF 1

Evaluation Board and Circuit



TB-545-1H+



COMPONENT	VALUE
DUT	PHA-1H+
C1 (bypass)	0.1 uF
C2-C5 (Note 4)	0.001 uF
R1	0 Ohm, 0.25W
CHK	Mini-Circuits TCCH-80+

Schematic Diagram

NOTES:

1. Vcc voltage: +5±0.2V.
2. SMA Female connectors.
3. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric thickness=.020 inch.
4. Capacitor C2-C5 should be free of resonance up to the highest frequency specified.

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Environmental Specifications **ENV08T8**

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 105° 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-C, 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-020C, 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