ULTRA HIGH DYNAMIC RANGE

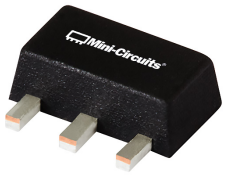
Monolithic Amplifier

PHA-83W+

50Ω 50 MHz to 8 GHz

THE BIG DEAL

- Ultra Wideband, 50 MHz to 8 GHz
- Excellent Gain Flatness 15.7±1.4 dB Typ.
- High Linearity, +23.3 dBm P1dB & +35.5 dBm OIP3
- Robust ESD performance (Class 1B)



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

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

PRODUCT OVERVIEW

PHA-83W+ (RoHS compliant) is an advanced wideband amplifier fabricated using PHEMT technology and offers extremely high dynamic range over a broad frequency range and with excellent gain flatness. In addition, the PHA-83W+ has good input and output return loss over a broad frequency range. PHA-83W+ is enclosed in a SOT-89 package and has very good thermal performance.

KEY FEATURES

Feature	Advantages
Ultra Wideband: 50 MHz to 8 GHz	Broadband covering primary wireless communications bands
Extremely High IP3 +36.6 dBm typ. at 50 MHz +37 dBm typ. at 6 GHz	The PHA-83W+ matches industry leading IP3 performance relative to device size and power consumption. The combination of the design and PHEMT Structure provides enhanced linearity over a broad frequency range as evidence in the IP3 being approximately 12 dB above the P1dB 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
Excellent Gain Flatness	Typical ±1.4 dB gain flatness across the entire frequency range minimizes the need for external equalizer networks making it a great fit for instrumentation and EW application.

REV. A
ECO-010399
PHA-83W+
MCL NY
240722

Monolithic Amplifier

PHA-83W+

50Ω 50 MHz to 8 GHz

ELECTRICAL SPECIFICATIONS AT +25°C, 50Ω, UNLESS NOTED OTHERWISE

Parameter	Condition (MHz)	Vd=+9V[1]			Vd=+5V[1]	Vd=+9V[2]	Vd=+5V[2]	Units
		Min.	Typ.	Max.	Typ.	Typ.	Typ.	
Frequency range		50		8000	50-8000	50-8000	50-8000	MHz
Gain	50	14.2	16.7	19.2	15.1	16.3	14.9	dB
	2000	13.7	16.3	18.6	14.4	16	14.2	
	4000	13.2	15.7	17.8	13.2	15.3	12.8	
	6000	13.7	16	18.5	12.6	15.5	12.4	
	8000	—	14.2	—	10	12.4	8.2	
Gain Flatness	50 - 8000		1.4		2.8	—	—	dB
Input Return Loss	50		23		20	16	16	dB
	2000		21		14	21	17	
	4000		13		11	14	12	
	6000		13		14	14	16	
	8000		4		6	3	5	
Output Return Loss	50		17		26	13	17	dB
	2000		30		17	33	22	
	4000		18		13	17	12	
	6000		18		12	15	20	
	8000		5		6	6	6	
Output Power @1 dB Compression	50		+23.8		+16.5	+23.7	+15.6	dBm
	2000		+23.8		+16.3	+24.3	+16	
	4000		+23.3		+15.9	+22.6	+14.1	
	6000		+22.6		+16.4	+22.6	+15.8	
	8000		+18.5		+13.2	+16.7	+11	
Output IP3 (Pout= 0dBm/Tone)	50		+36.6		+24.1	+36.5	+25.9	dBm
	2000		+36		+23.4	+35.4	+24.6	
	4000		+35.5		+23.4	+34.5	+22.8	
	6000		+37		+23.6	+35.6	+25.1	
	8000		+31.9		+20.9	+29.9	+19.5	
Noise Figure	50		3.3		2.8	3.4	2.8	dB
	2000		2.9		2.7	2.9	2.7	
	4000		3.3		3.1	3.5	3.1	
	6000		3.9		3.6	3.9	3.5	
	8000		5.1		4.7	5.4	4.9	
Device Operating Voltage		+8.5	+9	+9.5	+5	+9	+5	V
Device Operating Current			110	127	40.8	115	42.7	mA
Device Current Variation vs. Temperature[3]			34.6		30.8	34.6	30.8	µA/°C
Device Current Variation vs. Voltage[4]			0.018		0.015	0.018	0.015	mA/mV
Thermal Resistance, junction-to-ground Lead at 85°C stage temperature			41		41	41	41	°C/W

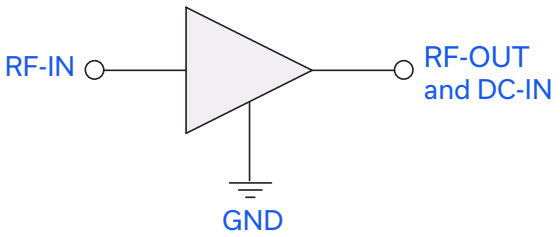
1. Measured on Mini-Circuits Characterization Test Board TB-PHA-83W+. See Characterization Test Circuit (Figure 1).
2. Measured on Mini-Circuits Application Evaluation Board TB-PHA-83WE+. See Application Test Circuit (Figure 2).
3. Device Current Variation vs. Temperature= (Current at 85°C - Current at -45°C)/130
4. Device Current Variation vs. Voltage = (Current at 9.5V - Current at 8.5V) / ((9.5V-8.5V)*1000 mV/V)

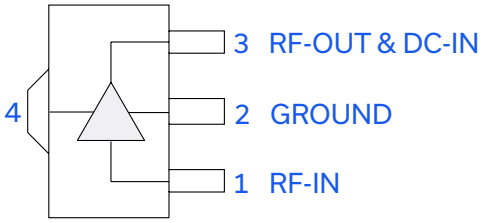
ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Power Dissipation	1.58 W
Input Power (CW)	+18 dBm (continuous) +24 dBm (5 minutes max)
DC Voltage on Pin 3	+10.5 V

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

SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION





Function	Pin Number	Description
RF IN	1	RF Input
RF-OUT and DC-IN	3	RF Output and DC Bias
GND	2,4	Connections to ground.

CHARACTERIZATION TEST CIRCUIT

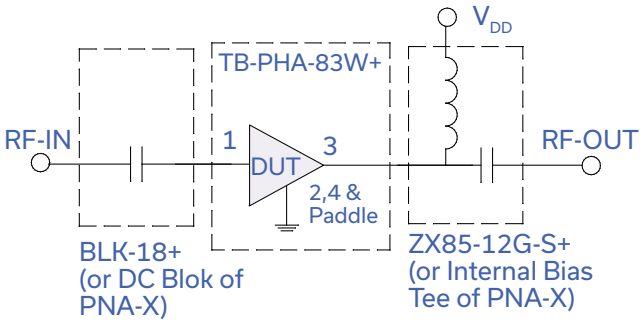
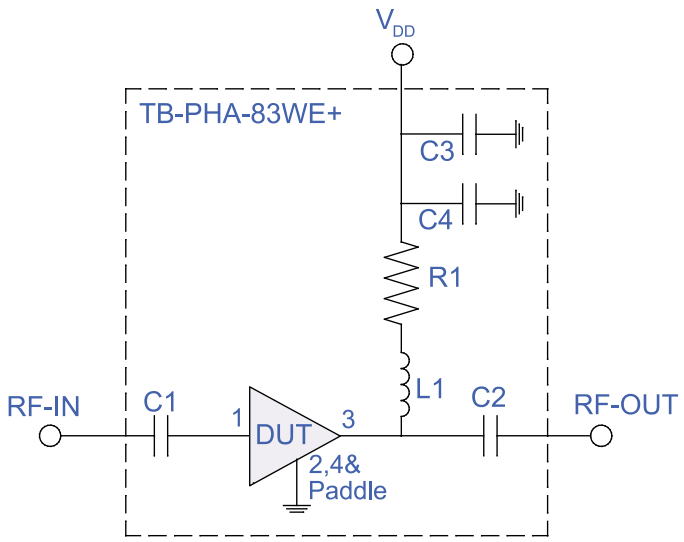


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-PHA-83W+)
Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

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

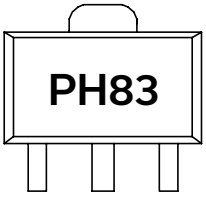
APPLICATION TEST CIRCUIT



Component	Size	Value	Part Number	Manufacturer
C1	0402	1000pF	GRM1555C1H102JA01D	Murata
C2	0402	180pF	GRM1555C1H181JA01D	Murata
C3	0402	0.1uF	GRM155R71C104KA88D	Murata
C4	0402	10000pF	GRM155R71E103KA01D	Murata
L1	0603	330nH	LQW18CNR33J00D	Murata
R1	0402	20hm	RK73H1ETTP2R00F	Koa

Fig 2. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Application test board TB-PHA-83WE+)
Gain, Return loss, Output power at1dB compression (P1dB), 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, 0 dBm/ tone at output.

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-653
Evaluation Board	TB-PHA-83WE+
Environmental Ratings	ENV08T1

ESD RATING

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

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 = 9.00V, Id = 116mA @ 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)
50	16.38	20.84	15.40	12.53	1.09	0.58	37.75	23.85	3.33
100	16.51	20.58	20.34	14.81	1.09	0.57	37.21	24.14	3.32
200	16.56	20.41	23.55	16.09	1.09	0.55	40.13	24.74	3.17
400	16.59	20.38	26.88	17.70	1.09	0.56	35.93	25.06	2.96
600	16.56	20.42	31.30	19.26	1.09	0.57	36.24	24.86	2.84
800	16.49	20.49	36.88	21.16	1.10	0.59	36.53	24.72	2.89
1000	16.46	20.50	34.07	23.90	1.11	0.60	36.90	24.26	2.78
1200	16.39	20.55	29.11	26.65	1.11	0.62	35.75	24.03	2.78
1400	16.30	20.60	26.25	29.45	1.12	0.63	35.95	24.32	2.81
1600	16.22	20.67	24.73	30.68	1.13	0.65	35.65	24.23	2.93
1800	16.12	20.76	24.15	29.50	1.14	0.66	35.28	24.29	2.93
2000	16.00	20.85	23.86	27.69	1.15	0.68	37.45	24.31	2.88
2200	15.92	20.92	24.41	26.49	1.16	0.69	35.08	24.24	2.89
2400	15.87	20.93	25.41	25.60	1.17	0.69	34.41	24.28	2.96
2600	15.81	20.97	26.22	24.74	1.17	0.70	36.09	24.70	2.98
2800	15.74	21.05	26.64	24.47	1.19	0.71	34.56	23.95	3.14
3000	15.69	21.09	26.42	25.65	1.19	0.71	34.60	23.59	3.20
3200	15.64	21.14	25.39	29.04	1.20	0.72	35.69	24.09	3.17
3400	15.60	21.24	22.93	42.09	1.21	0.73	35.45	22.85	3.23
3600	15.54	21.32	19.95	30.78	1.22	0.74	35.10	23.20	3.31
3800	15.48	21.43	17.15	22.88	1.23	0.75	34.72	23.32	3.31
4000	15.40	21.58	14.91	18.62	1.24	0.76	34.24	22.56	3.46
4200	15.32	21.71	13.12	15.82	1.24	0.76	34.88	22.83	3.52
4400	15.23	21.90	11.82	13.94	1.25	0.76	34.28	22.89	3.44
4600	15.16	22.01	10.97	12.72	1.24	0.76	34.94	22.66	3.52
4800	15.10	22.17	10.46	12.04	1.24	0.77	35.27	22.41	3.65
5000	15.09	22.25	10.33	11.84	1.24	0.78	35.08	22.59	3.59
5200	15.13	22.32	10.58	12.06	1.24	0.79	34.77	22.22	3.60
5400	15.20	22.37	11.15	12.62	1.23	0.81	34.80	22.78	3.73
5600	15.31	22.34	11.98	13.46	1.23	0.82	34.62	22.52	3.71
5800	15.45	22.32	12.95	14.29	1.22	0.82	34.73	22.49	3.79
6000	15.58	22.31	13.92	14.99	1.21	0.82	36.00	22.27	3.85
6200	15.72	22.27	14.70	15.58	1.20	0.81	36.22	21.71	3.99
6400	15.88	22.22	15.26	16.59	1.20	0.80	35.71	21.17	4.11
6600	16.02	22.19	15.08	19.07	1.20	0.80	35.85	20.46	4.23
6800	16.06	22.23	13.58	25.13	1.21	0.81	34.46	19.83	4.40
7000	15.92	22.49	11.02	24.69	1.23	0.84	33.45	18.67	4.61
7200	15.53	22.94	8.34	15.68	1.25	0.88	31.67	18.06	4.88
7400	14.85	23.73	6.19	11.03	1.29	0.91	30.04	16.93	5.04
7600	13.95	24.73	4.69	8.24	1.34	0.92	29.57	16.86	5.23
7800	12.99	25.76	3.70	6.49	1.39	0.91	28.60	15.95	5.39
8000	12.03	26.83	3.07	5.37	1.46	0.89	28.57	15.71	5.50
8200	11.20	27.67	2.70	4.53	1.51	0.84	27.93	15.37	5.58

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 = 8.5V, Id = 106mA @ 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)
50	16.35	20.85	15.47	12.53	1.10	0.58	35.63	23.26	3.29
100	16.48	20.54	20.54	14.90	1.09	0.57	36.10	23.59	3.26
200	16.54	20.41	23.93	16.21	1.09	0.56	35.64	24.19	3.12
400	16.56	20.38	27.55	17.84	1.09	0.56	37.61	24.49	2.92
600	16.53	20.43	32.39	19.40	1.10	0.58	37.08	24.30	2.86
800	16.46	20.47	37.55	21.33	1.10	0.60	36.70	24.15	2.79
1000	16.43	20.47	33.57	24.14	1.11	0.60	36.14	23.68	2.72
1200	16.36	20.54	28.74	27.11	1.11	0.62	35.68	23.44	2.75
1400	16.26	20.61	25.89	30.35	1.12	0.64	35.93	23.74	2.78
1600	16.18	20.68	24.53	32.19	1.13	0.65	35.57	23.64	2.88
1800	16.08	20.74	23.98	31.10	1.14	0.66	35.14	23.84	2.86
2000	15.95	20.84	23.81	28.97	1.16	0.68	35.36	23.73	2.85
2200	15.87	20.89	24.40	27.60	1.16	0.69	36.53	23.79	2.85
2400	15.82	20.94	25.41	26.42	1.17	0.70	34.53	23.70	2.86
2600	15.76	20.99	26.34	25.32	1.18	0.70	34.94	24.25	2.96
2800	15.69	21.06	26.85	24.78	1.19	0.71	32.94	23.37	3.08
3000	15.63	21.13	26.56	25.73	1.20	0.72	35.83	23.01	3.16
3200	15.57	21.18	25.56	28.41	1.21	0.73	34.65	23.63	3.24
3400	15.52	21.29	23.11	34.75	1.22	0.74	34.68	22.39	3.23
3600	15.46	21.37	20.08	29.94	1.23	0.75	34.08	22.73	3.28
3800	15.40	21.50	17.31	23.02	1.24	0.76	34.24	22.86	3.29
4000	15.32	21.61	15.05	18.90	1.25	0.76	34.58	22.09	3.37
4200	15.23	21.78	13.25	16.16	1.26	0.77	33.78	22.36	3.47
4400	15.15	21.94	11.94	14.33	1.26	0.77	33.98	22.42	3.46
4600	15.07	22.09	11.10	13.12	1.26	0.78	33.96	22.20	3.52
4800	15.02	22.20	10.60	12.49	1.26	0.78	35.16	22.06	3.57
5000	15.01	22.31	10.47	12.36	1.26	0.79	34.82	22.25	3.49
5200	15.04	22.40	10.73	12.69	1.26	0.81	33.45	21.89	3.52
5400	15.12	22.41	11.29	13.40	1.26	0.82	34.71	22.44	3.67
5600	15.22	22.42	12.17	14.49	1.26	0.83	35.35	22.19	3.70
5800	15.33	22.42	13.17	15.53	1.25	0.84	35.15	22.14	3.74
6000	15.45	22.42	14.18	16.36	1.25	0.83	35.35	21.91	3.83
6200	15.57	22.38	15.07	16.90	1.24	0.82	35.66	21.44	3.94
6400	15.69	22.37	15.75	17.81	1.24	0.81	35.38	20.77	4.08
6600	15.81	22.35	15.80	20.23	1.24	0.81	33.50	20.15	4.18
6800	15.83	22.43	14.44	27.28	1.25	0.82	33.19	19.50	4.36
7000	15.69	22.66	11.83	27.50	1.27	0.85	31.72	18.33	4.56
7200	15.33	23.11	9.02	16.62	1.30	0.89	30.25	17.62	4.72
7400	14.70	23.82	6.72	11.70	1.34	0.93	28.63	16.51	4.97
7600	13.86	24.78	5.08	8.77	1.39	0.94	28.17	16.49	5.08
7800	12.95	25.75	4.00	6.92	1.44	0.93	27.43	15.63	5.27
8000	12.04	26.69	3.29	5.72	1.49	0.91	27.62	15.54	5.45
8200	11.25	27.51	2.87	4.83	1.54	0.87	26.94	15.10	5.47

Typical Performance Data

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

TEST CONDITIONS: Vd = 9.5V, Id = 125mA @ 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)
50	16.39	20.90	15.34	12.60	1.10	0.58	36.69	24.23	3.42
100	16.52	20.56	20.24	14.80	1.09	0.56	36.65	24.50	3.39
200	16.58	20.41	23.33	16.04	1.09	0.55	38.06	25.08	3.22
400	16.61	20.38	26.51	17.62	1.09	0.56	36.67	25.41	3.00
600	16.58	20.43	30.64	19.14	1.09	0.57	36.23	25.21	2.94
800	16.51	20.49	36.25	21.04	1.10	0.59	36.94	25.08	2.83
1000	16.48	20.48	34.39	23.76	1.10	0.60	36.14	24.62	2.76
1200	16.41	20.55	29.40	26.41	1.11	0.61	37.18	24.53	2.80
1400	16.32	20.62	26.33	28.86	1.12	0.63	37.35	24.69	2.79
1600	16.24	20.68	24.84	29.76	1.13	0.64	35.79	24.60	2.90
1800	16.14	20.74	24.17	28.65	1.14	0.66	36.47	24.78	2.93
2000	16.02	20.86	23.84	26.81	1.15	0.68	35.57	24.67	2.93
2200	15.94	20.91	24.44	25.72	1.16	0.69	35.66	24.73	2.94
2400	15.89	20.93	25.30	24.94	1.16	0.69	35.62	24.65	3.08
2600	15.84	20.96	26.09	24.31	1.17	0.69	35.69	25.06	3.02
2800	15.78	21.03	26.44	24.10	1.18	0.70	36.02	24.31	3.12
3000	15.73	21.06	26.19	25.38	1.19	0.71	35.10	23.96	3.20
3200	15.68	21.13	25.18	28.74	1.20	0.72	34.78	24.45	3.27
3400	15.64	21.21	22.75	39.25	1.21	0.73	35.45	23.21	3.25
3600	15.59	21.28	19.78	29.99	1.21	0.74	35.91	23.57	3.39
3800	15.53	21.40	17.02	22.45	1.22	0.74	35.43	23.58	3.37
4000	15.46	21.48	14.77	18.27	1.22	0.75	34.07	22.91	3.48
4200	15.37	21.64	12.98	15.54	1.23	0.75	34.44	23.18	3.54
4400	15.29	21.84	11.68	13.64	1.23	0.76	34.55	23.14	3.52
4600	15.21	21.98	10.83	12.42	1.23	0.76	33.49	22.89	3.56
4800	15.15	22.11	10.35	11.72	1.23	0.76	34.71	22.74	3.66
5000	15.14	22.24	10.22	11.48	1.23	0.77	35.11	22.81	3.56
5200	15.18	22.28	10.46	11.64	1.22	0.79	34.16	22.43	3.72
5400	15.26	22.32	11.00	12.10	1.21	0.80	35.43	22.99	3.76
5600	15.38	22.30	11.81	12.84	1.20	0.81	34.34	22.73	3.80
5800	15.52	22.29	12.76	13.53	1.20	0.81	34.36	22.72	3.87
6000	15.67	22.18	13.70	14.16	1.18	0.81	36.27	22.51	3.93
6200	15.83	22.21	14.43	14.77	1.18	0.80	36.39	21.96	4.10
6400	16.00	22.11	14.87	15.79	1.17	0.79	36.59	21.44	4.19
6600	16.16	22.08	14.54	18.10	1.17	0.79	34.63	20.74	4.31
6800	16.21	22.13	12.95	22.59	1.18	0.80	34.01	20.13	4.50
7000	16.06	22.38	10.41	21.50	1.19	0.83	33.79	19.08	4.69
7200	15.63	22.89	7.84	14.64	1.22	0.87	32.22	18.46	4.87
7400	14.91	23.71	5.80	10.41	1.26	0.90	30.75	17.32	5.11
7600	13.96	24.80	4.39	7.81	1.31	0.91	30.35	17.21	5.26
7800	12.96	25.85	3.48	6.16	1.36	0.90	29.35	16.40	5.44
8000	11.97	26.94	2.91	5.10	1.43	0.87	29.63	16.14	5.61
8200	11.11	27.86	2.58	4.32	1.49	0.83	28.72	15.78	5.62

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 = 9.00V, Id = 107mA @ 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)
50	16.46	20.92	15.21	12.46	1.09	0.58	36.50	23.70	2.53
100	16.61	20.60	20.27	14.84	1.09	0.56	37.79	23.95	2.56
200	16.67	20.44	23.77	16.29	1.08	0.55	36.58	24.67	2.49
400	16.70	20.40	26.61	17.62	1.08	0.55	36.38	24.84	2.25
600	16.68	20.45	30.40	19.07	1.09	0.56	35.97	24.63	2.24
800	16.62	20.51	34.23	20.64	1.10	0.58	36.56	24.49	2.27
1000	16.60	20.53	34.62	23.06	1.10	0.59	37.45	23.89	2.22
1200	16.55	20.56	29.90	25.51	1.10	0.60	36.56	23.67	2.22
1400	16.46	20.64	26.91	28.32	1.11	0.62	35.87	23.97	2.33
1600	16.40	20.66	25.09	30.73	1.12	0.63	35.62	23.90	2.36
1800	16.30	20.73	24.38	30.22	1.13	0.64	35.32	24.11	2.33
2000	16.18	20.85	23.96	28.06	1.14	0.66	36.12	24.15	2.32
2200	16.09	20.89	24.27	26.72	1.15	0.67	35.35	24.21	2.33
2400	16.06	20.95	25.37	25.44	1.16	0.68	34.75	24.29	2.47
2600	16.01	21.00	25.95	24.07	1.16	0.68	36.02	24.90	2.44
2800	15.95	21.07	26.06	23.20	1.17	0.69	36.50	23.99	2.48
3000	15.90	21.13	25.83	23.48	1.18	0.70	34.18	23.65	2.43
3200	15.86	21.15	25.74	25.05	1.19	0.70	34.92	24.44	2.47
3400	15.81	21.25	24.47	28.96	1.20	0.72	34.76	22.86	2.60
3600	15.77	21.34	21.57	33.73	1.21	0.73	34.95	23.38	2.62
3800	15.72	21.41	18.65	26.65	1.21	0.74	35.55	23.39	2.68
4000	15.66	21.53	16.11	21.34	1.22	0.74	34.21	22.81	2.72
4200	15.59	21.64	14.17	17.95	1.22	0.75	34.51	23.18	2.76
4400	15.53	21.77	12.77	15.83	1.22	0.75	34.84	23.53	2.80
4600	15.50	21.89	11.80	14.52	1.22	0.76	35.19	23.50	2.79
4800	15.46	22.03	11.21	13.84	1.22	0.77	35.59	23.27	2.80
5000	15.46	22.14	11.07	13.72	1.22	0.78	36.35	23.64	2.81
5200	15.52	22.18	11.27	14.04	1.22	0.79	35.39	23.36	2.81
5400	15.60	22.18	11.79	14.88	1.21	0.80	35.93	24.02	2.88
5600	15.69	22.19	12.58	16.04	1.21	0.81	36.65	23.80	2.91
5800	15.80	22.21	13.44	16.80	1.20	0.81	35.44	23.82	2.97
6000	15.94	22.15	14.23	17.21	1.18	0.80	36.18	23.75	3.05
6200	16.07	22.13	14.75	17.00	1.18	0.79	37.16	23.22	3.15
6400	16.21	22.10	15.04	16.67	1.17	0.77	35.95	22.63	3.26
6600	16.36	22.08	15.05	17.25	1.16	0.76	42.92	22.13	3.43
6800	16.50	22.03	14.57	19.58	1.15	0.76	40.71	21.63	3.53
7000	16.56	22.02	12.96	26.17	1.15	0.77	35.27	20.57	3.69
7200	16.43	22.24	10.39	22.92	1.16	0.80	32.39	20.23	3.87
7400	16.04	22.78	7.74	15.05	1.18	0.85	29.82	18.99	4.01
7600	15.35	23.53	5.64	10.90	1.20	0.90	29.58	18.96	4.19
7800	14.51	24.44	4.23	8.38	1.23	0.93	27.76	17.79	4.32
8000	13.70	25.40	3.27	6.38	1.24	0.89	28.34	17.77	4.48
8200	12.77	26.42	2.70	5.50	1.29	0.90	27.27	17.04	4.57

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 = 8.5V, Id = 97mA @ 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)
50	16.39	20.76	15.37	12.61	1.09	0.57	36.50	22.86	2.49
100	16.53	20.53	20.63	15.17	1.09	0.56	36.49	23.20	2.52
200	16.60	20.38	24.59	16.70	1.08	0.55	36.69	23.91	2.46
400	16.63	20.33	28.00	18.11	1.08	0.55	36.47	24.06	2.25
600	16.61	20.38	32.69	19.60	1.09	0.57	35.97	23.72	2.21
800	16.54	20.45	35.80	21.28	1.10	0.59	36.69	23.57	2.26
1000	16.53	20.46	33.52	23.92	1.10	0.59	36.87	22.96	2.19
1200	16.47	20.50	28.87	26.63	1.11	0.61	36.08	22.87	2.23
1400	16.38	20.56	26.11	30.02	1.11	0.62	35.72	23.04	2.27
1600	16.32	20.62	24.46	32.97	1.12	0.63	35.62	22.97	2.35
1800	16.22	20.70	23.81	32.33	1.13	0.65	35.32	23.18	2.33
2000	16.10	20.82	23.49	29.62	1.14	0.67	34.70	23.23	2.31
2200	16.01	20.85	23.84	28.12	1.15	0.68	35.45	23.28	2.31
2400	15.98	20.93	25.05	26.59	1.16	0.68	34.75	23.37	2.38
2600	15.93	20.95	25.78	25.00	1.17	0.69	36.46	23.98	2.38
2800	15.87	21.00	26.05	23.91	1.17	0.69	35.37	23.21	2.44
3000	15.82	21.07	25.86	24.18	1.18	0.70	34.18	22.87	2.41
3200	15.78	21.13	25.54	25.64	1.19	0.71	34.92	23.66	2.49
3400	15.73	21.23	24.05	29.23	1.20	0.72	34.76	22.08	2.54
3600	15.68	21.27	21.21	31.30	1.21	0.73	34.95	22.61	2.59
3800	15.62	21.38	18.37	25.40	1.22	0.74	35.19	22.76	2.62
4000	15.57	21.50	15.89	20.80	1.22	0.75	34.73	22.03	2.72
4200	15.49	21.60	14.02	17.68	1.23	0.75	34.46	22.52	2.75
4400	15.43	21.77	12.65	15.67	1.23	0.76	34.51	22.75	2.75
4600	15.40	21.89	11.71	14.43	1.23	0.76	35.04	22.72	2.75
4800	15.36	22.02	11.13	13.81	1.23	0.77	34.99	22.62	2.76
5000	15.36	22.11	10.99	13.75	1.23	0.78	35.21	22.89	2.76
5200	15.42	22.14	11.21	14.13	1.23	0.79	35.11	22.71	2.85
5400	15.50	22.17	11.73	15.08	1.22	0.80	35.19	23.38	2.88
5600	15.59	22.17	12.49	16.41	1.22	0.82	36.50	23.27	2.90
5800	15.70	22.16	13.37	17.38	1.21	0.82	35.44	23.21	2.94
6000	15.83	22.13	14.17	17.94	1.20	0.81	36.18	23.13	3.02
6200	15.96	22.11	14.74	17.67	1.19	0.80	36.58	22.70	3.10
6400	16.08	22.10	15.05	17.23	1.18	0.78	38.91	22.11	3.23
6600	16.22	22.07	15.10	17.69	1.17	0.77	39.33	21.60	3.38
6800	16.34	22.04	14.65	19.79	1.17	0.76	39.34	21.08	3.49
7000	16.39	22.10	13.09	24.77	1.17	0.78	35.27	20.11	3.66
7200	16.26	22.31	10.55	21.64	1.18	0.81	32.39	19.64	3.80
7400	15.86	22.79	7.91	14.91	1.20	0.86	29.82	18.38	3.98
7600	15.19	23.52	5.80	10.94	1.22	0.90	29.40	18.35	4.13
7800	14.37	24.44	4.35	8.46	1.25	0.93	27.76	17.19	4.26
8000	13.58	25.34	3.37	6.47	1.26	0.90	28.34	17.06	4.41
8200	12.67	26.34	2.77	5.58	1.31	0.90	27.27	16.47	4.51

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 = 9.5V, Id = 116mA @ 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)
50	16.51	20.94	15.09	12.38	1.09	0.57	36.58	24.30	2.64
100	16.65	20.65	20.04	14.67	1.09	0.56	38.13	24.62	2.61
200	16.72	20.47	23.27	16.09	1.08	0.55	39.05	25.26	2.52
400	16.75	20.45	25.88	17.39	1.08	0.55	38.55	25.56	2.28
600	16.73	20.50	29.32	18.77	1.09	0.56	37.94	25.23	2.25
800	16.67	20.55	32.94	20.28	1.10	0.58	37.80	25.09	2.33
1000	16.66	20.55	34.63	22.59	1.10	0.59	38.45	24.63	2.25
1200	16.60	20.58	30.47	24.88	1.10	0.60	37.28	24.42	2.29
1400	16.51	20.66	27.38	27.47	1.11	0.62	36.35	24.72	2.37
1600	16.45	20.69	25.47	29.55	1.12	0.63	38.02	24.64	2.42
1800	16.36	20.76	24.67	29.05	1.13	0.64	37.48	24.84	2.40
2000	16.24	20.89	24.15	27.12	1.14	0.66	36.56	24.75	2.34
2200	16.15	20.93	24.45	25.91	1.15	0.67	35.72	24.81	2.35
2400	16.11	20.95	25.52	24.70	1.15	0.67	35.35	24.89	2.50
2600	16.06	20.97	25.95	23.50	1.16	0.68	37.44	25.49	2.46
2800	16.01	21.06	25.97	22.69	1.17	0.69	36.75	24.72	2.52
3000	15.96	21.12	25.72	23.01	1.17	0.69	34.86	24.39	2.49
3200	15.92	21.19	25.79	24.60	1.18	0.70	36.59	25.17	2.56
3400	15.88	21.24	24.67	28.74	1.19	0.71	36.34	23.46	2.61
3600	15.83	21.30	21.81	36.26	1.20	0.72	36.12	23.97	2.68
3800	15.79	21.40	18.81	27.58	1.21	0.73	36.04	23.99	2.72
4000	15.74	21.53	16.22	21.66	1.21	0.74	37.41	23.41	2.78
4200	15.66	21.69	14.24	18.07	1.22	0.75	36.87	23.78	2.81
4400	15.61	21.79	12.83	15.88	1.22	0.75	35.80	24.14	2.83
4600	15.58	21.92	11.84	14.53	1.22	0.76	35.89	23.97	2.83
4800	15.54	22.03	11.25	13.81	1.22	0.76	36.93	23.85	2.85
5000	15.54	22.14	11.10	13.66	1.22	0.78	36.25	24.12	2.83
5200	15.60	22.16	11.30	13.92	1.21	0.78	36.70	23.83	2.91
5400	15.68	22.17	11.81	14.67	1.20	0.80	37.63	24.50	2.99
5600	15.77	22.19	12.59	15.72	1.20	0.81	36.44	24.37	2.97
5800	15.88	22.17	13.45	16.32	1.18	0.81	38.39	24.29	3.06
6000	16.02	22.15	14.22	16.69	1.17	0.80	36.81	24.21	3.11
6200	16.17	22.09	14.71	16.50	1.16	0.78	37.22	23.77	3.23
6400	16.31	22.07	14.95	16.25	1.15	0.77	36.99	23.08	3.30
6600	16.48	21.99	14.93	16.92	1.14	0.75	38.43	22.60	3.46
6800	16.63	21.95	14.40	19.32	1.14	0.75	39.39	22.11	3.58
7000	16.70	21.98	12.76	26.99	1.13	0.76	35.99	21.06	3.80
7200	16.59	22.19	10.20	23.95	1.14	0.80	34.91	20.75	3.92
7400	16.19	22.67	7.58	15.16	1.15	0.84	31.85	19.53	4.12
7600	15.49	23.48	5.50	10.85	1.18	0.90	31.41	19.49	4.24
7800	14.64	24.44	4.11	8.29	1.21	0.92	29.72	18.44	4.38
8000	13.81	25.38	3.18	6.29	1.22	0.89	30.33	18.40	4.56
8200	12.87	26.46	2.62	5.42	1.27	0.89	29.39	17.65	4.66

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 = 9.00V, Id = 111mA @ 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)
50	16.06	20.59	15.83	13.27	1.10	0.60	34.95	22.04	3.74
100	16.19	20.35	21.19	15.70	1.10	0.59	34.60	22.50	3.78
200	16.26	20.23	25.18	17.02	1.10	0.57	35.32	23.41	3.53
400	16.29	20.23	30.17	18.89	1.10	0.58	35.29	23.97	3.13
600	16.25	20.29	39.59	20.81	1.10	0.60	35.15	23.79	3.09
800	16.17	20.37	36.77	23.47	1.11	0.62	36.38	23.78	3.13
1000	16.13	20.39	29.66	27.37	1.12	0.63	33.87	23.29	3.12
1200	16.05	20.43	26.16	31.62	1.13	0.64	35.13	23.06	3.19
1400	15.95	20.51	24.06	33.91	1.14	0.65	34.98	23.35	3.27
1600	15.86	20.58	23.06	32.59	1.15	0.67	34.14	23.26	3.37
1800	15.74	20.65	22.81	30.16	1.16	0.68	34.40	23.31	3.30
2000	15.63	20.78	22.96	28.09	1.17	0.70	34.34	23.21	3.26
2200	15.54	20.81	23.74	26.94	1.18	0.71	34.23	23.25	3.39
2400	15.48	20.85	24.92	26.27	1.19	0.71	33.83	23.15	3.39
2600	15.42	20.90	25.96	26.02	1.20	0.72	34.96	23.68	3.45
2800	15.35	20.96	26.63	26.48	1.21	0.73	34.28	22.80	3.53
3000	15.29	21.04	25.95	29.45	1.22	0.74	32.96	22.43	3.57
3200	15.24	21.10	23.89	37.39	1.23	0.75	33.89	23.05	3.58
3400	15.16	21.18	20.96	32.08	1.24	0.76	32.74	21.80	3.71
3600	15.08	21.28	18.00	23.63	1.25	0.76	33.31	22.15	3.77
3800	14.99	21.47	15.50	18.95	1.27	0.77	33.43	22.10	3.88
4000	14.87	21.60	13.49	15.85	1.27	0.77	32.22	21.26	3.94
4200	14.74	21.77	11.97	13.66	1.28	0.77	32.66	21.49	4.02
4400	14.64	21.95	10.87	12.18	1.28	0.77	32.23	21.42	4.01
4600	14.56	22.10	10.15	11.23	1.28	0.77	32.30	21.08	4.04
4800	14.49	22.28	9.78	10.72	1.29	0.78	32.72	21.04	4.05
5000	14.47	22.39	9.77	10.60	1.29	0.79	32.30	21.06	4.05
5200	14.53	22.43	10.14	10.86	1.28	0.81	31.66	20.70	4.14
5400	14.60	22.46	10.81	11.42	1.28	0.82	32.67	21.39	4.19
5600	14.69	22.47	11.75	12.25	1.28	0.84	32.19	21.01	4.26
5800	14.79	22.47	12.78	12.98	1.28	0.85	32.31	20.96	4.30
6000	14.92	22.49	13.82	13.91	1.28	0.85	32.27	20.72	4.43
6200	15.02	22.49	14.70	14.91	1.29	0.85	31.69	20.10	4.58
6400	15.08	22.50	15.09	16.40	1.30	0.85	31.55	19.49	4.69
6600	15.10	22.61	14.24	19.41	1.33	0.86	30.40	18.78	4.93
6800	15.04	22.77	12.09	22.20	1.35	0.88	29.81	18.21	5.09
7000	14.81	23.12	9.53	16.79	1.37	0.90	29.30	17.43	5.32
7200	14.39	23.65	7.32	11.49	1.39	0.90	28.63	17.01	5.50
7400	13.70	24.41	5.63	8.11	1.40	0.87	27.72	16.14	5.70
7600	12.71	25.50	4.38	6.19	1.46	0.85	27.58	15.97	5.87
7800	11.80	26.42	3.62	4.65	1.48	0.77	27.00	15.04	5.99
8000	10.86	27.46	3.13	3.62	1.51	0.68	27.28	15.14	6.13
8200	9.74	28.65	2.85	3.42	1.70	0.71	26.15	14.25	6.24

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 = 8.5V, Id = 102mA @ 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)
50	16.05	20.56	15.93	13.26	1.10	0.60	35.84	21.69	3.62
100	16.18	20.34	21.34	15.70	1.10	0.59	35.02	22.15	3.64
200	16.24	20.22	25.61	17.08	1.09	0.57	35.87	22.95	3.43
400	16.27	20.21	31.06	19.01	1.10	0.58	35.19	23.45	3.10
600	16.23	20.27	42.94	20.96	1.10	0.60	34.83	23.38	3.07
800	16.15	20.33	35.31	23.70	1.11	0.62	34.67	23.25	3.08
1000	16.10	20.35	28.99	27.65	1.12	0.63	34.68	22.75	3.07
1200	16.02	20.42	25.74	32.57	1.13	0.64	34.59	22.51	3.13
1400	15.92	20.50	23.81	35.95	1.14	0.66	34.02	22.81	3.21
1600	15.83	20.56	22.86	34.56	1.15	0.67	33.63	22.72	3.28
1800	15.71	20.65	22.63	31.99	1.16	0.69	34.15	22.90	3.28
2000	15.60	20.76	22.85	29.51	1.17	0.70	34.12	22.80	3.26
2200	15.50	20.78	23.72	28.28	1.18	0.71	33.12	22.71	3.29
2400	15.44	20.84	24.98	27.32	1.19	0.72	33.13	22.74	3.34
2600	15.37	20.91	26.05	27.02	1.20	0.72	34.06	23.16	3.42
2800	15.30	21.00	26.76	27.34	1.22	0.73	32.52	22.39	3.44
3000	15.24	21.04	26.12	30.37	1.23	0.74	32.35	22.01	3.50
3200	15.17	21.10	24.06	40.90	1.24	0.75	32.69	22.52	3.53
3400	15.10	21.23	21.08	32.39	1.25	0.76	32.58	21.25	3.65
3600	15.01	21.34	18.16	23.81	1.27	0.77	32.11	21.71	3.72
3800	14.91	21.49	15.62	19.14	1.28	0.78	32.14	21.67	3.79
4000	14.80	21.65	13.61	16.08	1.29	0.78	30.95	20.83	3.83
4200	14.67	21.82	12.09	13.88	1.29	0.78	32.33	21.06	3.93
4400	14.56	22.02	11.00	12.42	1.30	0.78	31.25	20.99	3.95
4600	14.48	22.17	10.28	11.49	1.30	0.78	30.96	20.78	3.95
4800	14.41	22.34	9.91	11.02	1.31	0.79	32.12	20.63	3.95
5000	14.39	22.46	9.91	10.95	1.31	0.80	31.42	20.77	3.97
5200	14.45	22.50	10.29	11.26	1.31	0.82	30.65	20.42	4.01
5400	14.51	22.49	10.99	11.95	1.30	0.83	31.76	21.00	4.06
5600	14.59	22.49	11.95	12.91	1.30	0.85	31.82	20.72	4.13
5800	14.68	22.55	13.04	13.79	1.31	0.86	31.83	20.67	4.21
6000	14.79	22.53	14.17	14.84	1.31	0.86	31.19	20.41	4.31
6200	14.87	22.56	15.16	15.89	1.33	0.85	30.63	19.78	4.45
6400	14.91	22.62	15.72	17.53	1.35	0.86	29.87	19.14	4.61
6600	14.92	22.73	15.01	21.23	1.37	0.87	28.58	18.42	4.78
6800	14.85	22.90	12.81	26.74	1.40	0.89	27.74	17.83	4.95
7000	14.63	23.23	10.12	18.40	1.42	0.92	26.72	17.04	5.20
7200	14.23	23.71	7.80	12.32	1.43	0.92	26.31	16.64	5.39
7400	13.60	24.44	6.02	8.66	1.45	0.89	25.16	15.80	5.52
7600	12.68	25.40	4.69	6.54	1.50	0.86	25.40	15.69	5.64
7800	11.79	26.32	3.86	5.01	1.53	0.80	24.87	14.66	5.86
8000	10.90	27.26	3.31	3.86	1.55	0.71	25.10	14.65	6.01
8200	9.82	28.46	2.99	3.58	1.72	0.72	24.21	13.80	6.09

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 = 9.5V, Id = 119mA @ 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)
50	16.05	20.58	15.75	13.40	1.10	0.60	34.69	22.35	3.80
100	16.18	20.37	21.08	15.75	1.10	0.59	36.27	22.73	3.80
200	16.25	20.23	24.97	17.03	1.10	0.58	35.38	23.66	3.58
400	16.29	20.25	29.71	18.89	1.10	0.58	34.65	24.32	3.19
600	16.25	20.29	38.36	20.82	1.10	0.60	35.80	24.14	3.16
800	16.17	20.36	37.59	23.51	1.11	0.62	35.91	24.14	3.18
1000	16.13	20.38	30.01	27.34	1.12	0.62	35.41	23.66	3.20
1200	16.05	20.43	26.37	31.32	1.13	0.64	36.14	23.55	3.24
1400	15.95	20.49	24.17	32.82	1.13	0.65	35.82	23.71	3.31
1600	15.87	20.58	23.14	31.22	1.15	0.67	34.61	23.62	3.39
1800	15.75	20.64	22.83	29.13	1.16	0.68	33.99	23.80	3.38
2000	15.65	20.75	22.97	27.12	1.17	0.70	34.52	23.69	3.38
2200	15.56	20.81	23.68	26.13	1.18	0.71	34.24	23.62	3.40
2400	15.50	20.82	24.86	25.53	1.18	0.71	34.05	23.63	3.41
2600	15.44	20.89	25.79	25.42	1.20	0.72	34.44	24.04	3.52
2800	15.37	20.98	26.41	25.89	1.21	0.73	34.24	23.16	3.59
3000	15.32	21.01	25.66	28.59	1.22	0.73	33.54	22.80	3.62
3200	15.26	21.07	23.71	34.09	1.23	0.74	33.72	23.30	3.67
3400	15.20	21.18	20.76	30.44	1.24	0.75	33.19	22.17	3.78
3600	15.11	21.28	17.86	23.13	1.25	0.76	33.54	22.51	3.85
3800	15.02	21.38	15.36	18.62	1.26	0.76	33.81	22.47	3.92
4000	14.91	21.55	13.35	15.57	1.26	0.77	32.38	21.63	3.98
4200	14.78	21.77	11.84	13.41	1.27	0.77	33.41	21.85	4.07
4400	14.67	21.94	10.74	11.93	1.27	0.77	32.62	21.78	4.10
4600	14.60	22.11	10.03	10.97	1.27	0.77	32.37	21.44	4.11
4800	14.52	22.27	9.67	10.45	1.27	0.78	32.52	21.38	4.11
5000	14.50	22.36	9.65	10.31	1.27	0.79	32.13	21.40	4.15
5200	14.57	22.41	10.00	10.51	1.26	0.80	31.95	21.04	4.29
5400	14.64	22.41	10.66	11.01	1.26	0.81	32.99	21.62	4.26
5600	14.74	22.43	11.57	11.73	1.26	0.83	32.27	21.35	4.28
5800	14.85	22.45	12.57	12.38	1.25	0.84	32.18	21.21	4.35
6000	14.99	22.45	13.56	13.25	1.26	0.84	31.77	20.97	4.50
6200	15.10	22.40	14.35	14.19	1.26	0.84	31.83	20.37	4.62
6400	15.18	22.44	14.61	15.61	1.28	0.84	31.04	19.77	4.77
6600	15.21	22.53	13.65	18.10	1.30	0.85	30.47	19.07	5.01
6800	15.15	22.71	11.51	19.70	1.32	0.88	29.97	18.52	5.17
7000	14.91	23.06	9.04	15.37	1.34	0.90	29.60	17.74	5.41
7200	14.45	23.63	6.94	10.72	1.35	0.89	29.01	17.43	5.59
7400	13.71	24.44	5.32	7.61	1.38	0.85	28.17	16.53	5.80
7600	12.64	25.59	4.15	5.91	1.44	0.84	28.10	16.29	5.92
7800	11.74	26.53	3.45	4.35	1.45	0.74	27.69	15.61	6.11
8000	10.75	27.65	2.99	3.43	1.50	0.67	27.90	15.41	6.24
8200	9.60	28.90	2.75	3.31	1.70	0.70	26.50	14.62	6.35

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 = 44mA @ 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)
50	15.03	19.85	16.04	16.39	1.12	0.66	26.57	16.41	2.89
100	15.15	19.56	20.78	21.02	1.12	0.64	25.76	16.88	2.88
200	15.19	19.44	23.51	24.56	1.11	0.63	26.47	17.42	2.78
400	15.18	19.49	22.89	29.42	1.12	0.64	25.86	17.67	2.70
600	15.12	19.55	21.32	30.63	1.13	0.65	25.35	17.50	2.64
800	15.00	19.67	19.69	28.31	1.14	0.67	25.62	17.16	2.58
1000	14.92	19.71	18.46	25.05	1.14	0.68	25.49	16.60	2.52
1200	14.81	19.78	17.70	23.14	1.15	0.69	25.18	16.27	2.55
1400	14.68	19.89	17.10	21.95	1.17	0.70	25.14	16.41	2.57
1600	14.57	19.98	16.87	21.24	1.18	0.72	24.84	16.34	2.62
1800	14.44	20.04	17.01	21.32	1.20	0.73	24.95	16.54	2.66
2000	14.29	20.18	17.31	21.79	1.22	0.75	25.04	16.70	2.66
2200	14.19	20.27	17.90	21.71	1.24	0.76	25.27	16.89	2.62
2400	14.11	20.31	18.84	21.08	1.25	0.76	25.40	16.81	2.78
2600	14.01	20.36	19.71	20.08	1.26	0.77	25.95	17.34	2.73
2800	13.88	20.47	20.30	18.97	1.28	0.78	24.89	16.54	2.86
3000	13.75	20.60	20.01	17.72	1.30	0.79	24.22	16.04	2.92
3200	13.59	20.72	18.98	16.61	1.32	0.80	25.08	16.67	2.97
3400	13.43	20.89	17.45	15.51	1.34	0.81	24.15	15.25	2.97
3600	13.27	21.10	15.79	14.48	1.37	0.82	24.55	15.87	2.99
3800	13.10	21.27	14.20	13.47	1.39	0.83	24.52	15.67	3.03
4000	12.93	21.46	12.85	12.61	1.41	0.83	23.46	14.85	3.14
4200	12.78	21.63	11.74	11.90	1.43	0.84	23.76	15.36	3.19
4400	12.65	21.80	10.91	11.46	1.46	0.84	23.75	15.42	3.17
4600	12.55	21.93	10.41	11.33	1.48	0.85	23.79	15.43	3.22
4800	12.48	22.05	10.17	11.50	1.50	0.86	24.26	15.60	3.30
5000	12.46	22.09	10.26	12.15	1.52	0.87	24.21	15.64	3.24
5200	12.46	22.10	10.72	13.39	1.55	0.89	23.53	15.66	3.31
5400	12.49	22.14	11.53	15.36	1.58	0.90	24.72	16.41	3.38
5600	12.50	22.14	12.78	18.52	1.61	0.91	24.80	16.28	3.37
5800	12.47	22.20	14.43	22.21	1.64	0.92	25.55	16.41	3.51
6000	12.38	22.31	16.49	21.12	1.68	0.91	25.76	16.29	3.48
6200	12.22	22.47	18.84	17.33	1.73	0.90	25.02	15.98	3.56
6400	12.02	22.64	21.06	14.49	1.77	0.89	24.36	15.61	3.71
6600	11.76	22.88	21.03	12.48	1.81	0.88	23.40	15.01	3.78
6800	11.41	23.18	18.18	11.05	1.86	0.88	22.80	14.49	4.00
7000	10.97	23.58	14.70	9.95	1.93	0.89	21.78	13.76	4.15
7200	10.45	24.00	11.74	8.98	2.00	0.91	21.20	12.92	4.29
7400	9.86	24.50	9.40	8.12	2.07	0.92	19.99	12.04	4.54
7600	9.23	25.02	7.63	7.32	2.14	0.94	20.02	11.57	4.70
7800	8.62	25.50	6.33	6.61	2.18	0.94	19.14	11.00	4.82
8000	8.03	25.92	5.39	6.03	2.21	0.94	19.47	10.84	5.00
8200	7.54	26.22	4.75	5.50	2.21	0.92	18.92	10.21	5.03

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 = 39mA @ 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)
50	14.72	19.54	15.68	17.60	1.13	0.67	25.11	15.91	2.89
100	14.82	19.32	19.46	23.49	1.12	0.65	24.33	16.39	2.89
200	14.86	19.20	21.07	29.03	1.12	0.64	25.02	16.92	2.79
400	14.85	19.27	20.42	36.68	1.12	0.65	24.42	17.17	2.73
600	14.78	19.35	19.18	29.99	1.13	0.66	23.89	17.17	2.68
800	14.65	19.45	17.92	25.69	1.14	0.68	24.20	16.98	2.63
1000	14.57	19.51	16.91	22.60	1.15	0.69	24.00	16.59	2.55
1200	14.45	19.60	16.30	20.98	1.16	0.70	23.80	16.24	2.58
1400	14.31	19.71	15.81	19.92	1.18	0.71	23.82	16.22	2.60
1600	14.20	19.78	15.66	19.37	1.19	0.72	23.46	16.15	2.69
1800	14.07	19.87	15.83	19.45	1.21	0.74	23.62	16.19	2.69
2000	13.92	19.98	16.13	19.92	1.23	0.76	23.66	16.66	2.70
2200	13.82	20.04	16.63	19.91	1.24	0.76	23.89	16.69	2.66
2400	13.74	20.07	17.44	19.52	1.25	0.77	24.03	16.46	2.68
2600	13.64	20.18	18.17	18.79	1.27	0.78	24.63	17.11	2.77
2800	13.50	20.24	18.67	17.91	1.29	0.78	23.50	16.17	2.87
3000	13.36	20.41	18.41	16.75	1.31	0.79	22.76	15.66	2.95
3200	13.19	20.55	17.55	15.66	1.33	0.80	23.72	16.27	2.98
3400	13.02	20.69	16.25	14.59	1.35	0.81	22.74	15.01	3.02
3600	12.84	20.90	14.80	13.57	1.38	0.82	23.21	15.45	3.03
3800	12.66	21.11	13.41	12.61	1.40	0.83	23.17	15.24	3.07
4000	12.48	21.29	12.20	11.81	1.43	0.83	22.13	14.57	3.15
4200	12.31	21.45	11.19	11.18	1.45	0.84	22.50	15.06	3.23
4400	12.18	21.64	10.46	10.80	1.47	0.84	22.50	15.13	3.20
4600	12.07	21.74	10.02	10.70	1.49	0.85	22.51	15.14	3.28
4800	12.00	21.86	9.82	10.89	1.52	0.86	22.91	15.14	3.36
5000	11.98	21.90	9.91	11.53	1.55	0.87	23.00	15.33	3.27
5200	11.99	21.91	10.39	12.70	1.57	0.89	22.27	15.35	3.38
5400	12.01	21.92	11.19	14.50	1.60	0.90	23.56	15.93	3.43
5600	12.02	21.89	12.41	17.20	1.63	0.91	23.73	15.94	3.43
5800	11.98	21.95	14.00	20.04	1.67	0.92	24.35	15.91	3.48
6000	11.88	22.02	15.99	19.53	1.71	0.91	24.60	15.79	3.52
6200	11.70	22.19	18.22	16.55	1.76	0.90	24.05	15.46	3.64
6400	11.47	22.39	20.02	13.94	1.81	0.89	23.57	15.07	3.78
6600	11.19	22.66	19.68	11.98	1.86	0.88	22.51	14.59	3.86
6800	10.80	22.95	17.06	10.57	1.91	0.88	22.03	14.04	4.05
7000	10.32	23.39	13.95	9.48	1.99	0.89	21.17	13.30	4.20
7200	9.76	23.84	11.26	8.52	2.06	0.90	20.74	12.74	4.35
7400	9.15	24.34	9.08	7.71	2.13	0.92	19.70	12.01	4.59
7600	8.50	24.90	7.43	6.97	2.21	0.93	19.78	11.54	4.75
7800	7.88	25.33	6.21	6.32	2.25	0.93	18.98	11.12	4.90
8000	7.29	25.72	5.32	5.80	2.28	0.93	19.29	10.81	5.06
8200	6.81	25.98	4.71	5.31	2.27	0.91	18.87	10.36	5.10

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 = 48mA @ 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)
50	15.28	20.04	16.28	15.53	1.12	0.65	28.37	17.15	2.95
100	15.40	19.75	21.71	19.45	1.11	0.63	26.84	17.48	2.94
200	15.44	19.61	25.82	22.20	1.11	0.62	27.67	18.01	2.82
400	15.44	19.66	25.59	25.71	1.11	0.62	27.15	18.12	2.72
600	15.38	19.71	23.47	28.19	1.12	0.64	26.63	17.94	2.69
800	15.27	19.82	21.40	28.97	1.13	0.66	26.98	17.60	2.56
1000	15.20	19.87	19.92	27.11	1.14	0.67	26.80	17.06	2.57
1200	15.09	19.96	18.96	25.21	1.15	0.68	26.51	16.73	2.64
1400	14.97	20.03	18.25	23.90	1.16	0.69	26.52	16.87	2.57
1600	14.86	20.11	17.96	23.06	1.18	0.71	26.24	16.81	2.68
1800	14.73	20.21	18.08	23.11	1.19	0.72	26.30	17.01	2.70
2000	14.59	20.33	18.41	23.61	1.21	0.74	26.19	17.17	2.70
2200	14.48	20.38	19.03	23.43	1.23	0.75	26.70	17.36	2.63
2400	14.41	20.44	20.11	22.50	1.24	0.75	26.77	17.28	2.58
2600	14.31	20.54	21.15	21.19	1.25	0.76	27.16	17.97	2.77
2800	14.18	20.62	21.83	19.94	1.27	0.77	26.09	17.02	2.88
3000	14.06	20.77	21.49	18.61	1.29	0.78	25.56	16.69	2.92
3200	13.91	20.88	20.27	17.52	1.31	0.79	26.48	17.32	2.98
3400	13.77	21.06	18.53	16.44	1.33	0.80	25.42	15.93	3.01
3600	13.61	21.22	16.67	15.36	1.35	0.81	25.93	16.40	3.07
3800	13.46	21.41	14.90	14.29	1.38	0.82	25.91	16.21	3.06
4000	13.31	21.58	13.40	13.34	1.40	0.83	24.66	15.41	3.17
4200	13.16	21.76	12.18	12.56	1.42	0.83	25.02	16.08	3.20
4400	13.04	21.93	11.28	12.06	1.44	0.84	25.14	15.99	3.20
4600	12.94	22.05	10.72	11.86	1.46	0.85	25.13	15.99	3.25
4800	12.88	22.15	10.45	12.01	1.48	0.86	25.47	16.17	3.35
5000	12.85	22.24	10.51	12.66	1.51	0.87	25.36	16.21	3.26
5200	12.86	22.28	10.96	13.94	1.53	0.88	24.77	16.08	3.33
5400	12.89	22.28	11.78	16.07	1.55	0.90	25.84	16.98	3.38
5600	12.90	22.31	13.03	19.70	1.58	0.91	26.07	16.85	3.40
5800	12.88	22.35	14.67	24.72	1.61	0.91	26.52	16.99	3.57
6000	12.81	22.44	16.75	22.94	1.64	0.91	26.73	16.89	3.48
6200	12.67	22.65	19.14	18.20	1.69	0.90	25.91	16.58	3.58
6400	12.50	22.76	21.57	15.10	1.72	0.88	25.21	16.10	3.74
6600	12.27	23.04	22.05	13.02	1.77	0.88	24.16	15.66	3.86
6800	11.96	23.31	19.07	11.59	1.81	0.88	23.62	15.03	4.01
7000	11.55	23.66	15.29	10.49	1.87	0.89	22.44	14.18	4.15
7200	11.07	24.11	12.10	9.48	1.94	0.91	21.81	13.34	4.36
7400	10.50	24.61	9.60	8.55	2.01	0.93	20.45	12.32	4.57
7600	9.88	25.15	7.74	7.66	2.07	0.94	20.51	11.86	4.71
7800	9.27	25.62	6.38	6.87	2.11	0.95	19.55	11.14	4.84
8000	8.68	26.13	5.39	6.23	2.15	0.95	19.94	10.96	5.02
8200	8.17	26.43	4.72	5.64	2.15	0.93	19.31	10.47	5.06

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 = 5.00V, Id = 39mA @ 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)
50	14.76	19.50	15.42	17.63	1.12	0.67	23.63	14.49	2.18
100	14.87	19.27	19.12	24.50	1.12	0.65	22.68	14.82	2.29
200	14.92	19.16	20.59	31.98	1.11	0.63	23.55	15.52	2.22
400	14.93	19.20	20.29	43.79	1.12	0.64	22.93	16.11	2.08
600	14.87	19.29	19.10	30.60	1.12	0.65	22.51	15.96	2.10
800	14.77	19.38	17.98	26.09	1.13	0.66	22.78	15.29	2.15
1000	14.71	19.42	16.95	22.93	1.14	0.67	22.69	14.56	2.09
1200	14.62	19.50	16.25	21.17	1.15	0.68	22.38	14.23	2.12
1400	14.50	19.62	15.72	20.07	1.16	0.69	22.43	14.54	2.16
1600	14.42	19.67	15.35	19.33	1.17	0.70	22.01	14.36	2.23
1800	14.31	19.77	15.37	19.44	1.18	0.72	22.11	14.58	2.18
2000	14.18	19.87	15.56	20.18	1.20	0.73	22.29	15.09	2.20
2200	14.09	19.94	15.87	20.57	1.22	0.74	22.42	15.12	2.23
2400	14.06	19.96	16.73	20.62	1.22	0.74	22.57	15.10	2.34
2600	14.00	20.02	17.51	20.30	1.23	0.75	23.28	15.99	2.30
2800	13.91	20.11	18.07	19.58	1.25	0.76	22.18	15.06	2.31
3000	13.81	20.22	17.98	18.32	1.26	0.76	21.50	14.75	2.29
3200	13.70	20.34	17.25	17.05	1.28	0.77	22.42	15.58	2.36
3400	13.56	20.48	16.04	15.79	1.29	0.78	21.46	13.82	2.39
3600	13.42	20.68	14.62	14.54	1.31	0.79	21.86	14.65	2.42
3800	13.27	20.87	13.19	13.38	1.33	0.80	21.90	14.46	2.48
4000	13.12	21.06	11.90	12.43	1.35	0.81	20.85	13.64	2.56
4200	12.97	21.23	10.88	11.63	1.36	0.81	21.26	14.67	2.58
4400	12.86	21.38	10.09	11.13	1.38	0.81	21.34	14.56	2.62
4600	12.80	21.54	9.58	10.88	1.39	0.82	21.33	14.78	2.62
4800	12.75	21.64	9.30	10.99	1.40	0.83	21.65	15.03	2.62
5000	12.74	21.71	9.35	11.54	1.42	0.85	21.76	15.06	2.63
5200	12.79	21.72	9.64	12.44	1.43	0.86	21.03	15.09	2.70
5400	12.86	21.68	10.22	14.05	1.44	0.88	22.40	15.92	2.71
5600	12.92	21.66	11.10	16.52	1.46	0.89	22.57	16.15	2.74
5800	12.95	21.72	12.17	19.67	1.48	0.90	23.28	16.30	2.77
6000	12.96	21.70	13.40	20.88	1.49	0.89	23.47	16.30	2.85
6200	12.91	21.83	14.67	18.32	1.52	0.88	22.97	16.08	2.91
6400	12.78	22.00	15.82	15.44	1.55	0.87	22.39	15.77	3.00
6600	12.58	22.23	16.31	13.29	1.58	0.86	21.47	15.39	3.15
6800	12.31	22.49	15.49	11.64	1.62	0.86	20.96	15.07	3.25
7000	11.95	22.84	13.49	10.30	1.66	0.87	19.97	14.43	3.42
7200	11.45	23.35	11.06	9.13	1.72	0.88	19.62	13.94	3.58
7400	10.84	23.91	8.79	8.14	1.79	0.90	18.66	13.22	3.73
7600	10.13	24.56	6.98	7.34	1.86	0.92	18.88	12.99	3.85
7800	9.45	25.15	5.63	6.67	1.91	0.94	18.26	12.44	4.00
8000	8.84	25.77	4.66	5.77	1.92	0.92	18.59	12.29	4.17
8200	8.19	26.26	3.98	5.41	1.97	0.93	18.18	11.85	4.25

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 = 36mA @ 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)
50	14.36	19.23	14.80	19.03	1.13	0.68	22.05	14.92	2.15
100	14.47	19.02	17.56	27.71	1.13	0.66	21.11	15.42	2.28
200	14.52	18.92	18.40	34.90	1.12	0.65	21.87	16.11	2.21
400	14.52	18.96	18.06	30.14	1.12	0.65	21.41	16.51	2.09
600	14.46	19.05	17.17	25.32	1.13	0.66	20.86	16.69	2.11
800	14.35	19.16	16.29	22.46	1.14	0.68	21.23	16.56	2.13
1000	14.28	19.20	15.44	20.21	1.15	0.68	21.07	16.34	2.06
1200	14.18	19.29	14.89	18.85	1.16	0.69	20.80	16.19	2.16
1400	14.05	19.39	14.46	17.99	1.17	0.70	20.84	16.17	2.24
1600	13.97	19.45	14.17	17.40	1.18	0.71	20.44	15.97	2.22
1800	13.86	19.55	14.22	17.49	1.19	0.73	20.48	16.01	2.18
2000	13.72	19.65	14.43	18.08	1.21	0.74	20.65	16.19	2.19
2200	13.63	19.73	14.73	18.44	1.23	0.75	20.92	16.20	2.21
2400	13.60	19.73	15.46	18.42	1.23	0.75	21.07	16.20	2.18
2600	13.54	19.79	16.14	18.24	1.24	0.76	21.59	16.54	2.24
2800	13.45	19.86	16.65	17.71	1.26	0.76	20.42	16.13	2.32
3000	13.34	19.99	16.55	16.67	1.27	0.77	19.86	15.84	2.26
3200	13.21	20.10	15.93	15.56	1.29	0.78	20.65	15.96	2.36
3400	13.06	20.28	14.89	14.42	1.31	0.79	19.77	15.05	2.44
3600	12.90	20.45	13.64	13.31	1.33	0.80	20.26	15.18	2.45
3800	12.72	20.64	12.40	12.28	1.34	0.80	20.25	14.82	2.53
4000	12.56	20.83	11.24	11.45	1.36	0.81	19.30	14.15	2.59
4200	12.41	21.06	10.32	10.77	1.38	0.81	19.68	14.95	2.61
4400	12.28	21.18	9.63	10.36	1.39	0.81	19.71	15.02	2.65
4600	12.21	21.35	9.18	10.18	1.41	0.82	19.71	15.08	2.64
4800	12.16	21.42	8.95	10.32	1.42	0.83	20.04	15.11	2.65
5000	12.15	21.48	9.00	10.86	1.44	0.85	20.15	15.15	2.60
5200	12.20	21.48	9.32	11.71	1.46	0.86	19.53	15.30	2.67
5400	12.27	21.44	9.91	13.18	1.47	0.88	20.87	15.64	2.72
5600	12.32	21.41	10.78	15.27	1.49	0.89	20.98	15.60	2.75
5800	12.34	21.42	11.85	17.62	1.51	0.90	21.68	15.72	2.83
6000	12.34	21.48	13.07	18.30	1.54	0.90	21.98	15.70	2.84
6200	12.25	21.57	14.36	16.49	1.56	0.89	21.58	15.49	2.92
6400	12.09	21.71	15.50	14.18	1.59	0.87	21.18	15.16	3.05
6600	11.85	21.98	15.85	12.25	1.63	0.86	20.25	14.76	3.14
6800	11.53	22.29	14.98	10.73	1.68	0.86	19.79	14.39	3.31
7000	11.10	22.69	12.99	9.48	1.73	0.86	18.94	13.88	3.41
7200	10.56	23.19	10.71	8.42	1.79	0.87	18.67	13.49	3.57
7400	9.92	23.80	8.59	7.55	1.87	0.89	17.99	13.03	3.67
7600	9.20	24.38	6.90	6.88	1.94	0.91	18.34	12.69	3.92
7800	8.52	24.96	5.61	6.29	1.99	0.93	17.99	12.42	4.03
8000	7.91	25.50	4.69	5.52	2.00	0.91	18.34	12.18	4.16
8200	7.28	25.94	4.03	5.22	2.04	0.92	18.12	12.16	4.26

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 = 43mA @ 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)
50	15.08	19.74	15.79	16.77	1.12	0.65	25.10	14.63	2.20
100	15.19	19.50	20.41	22.07	1.11	0.63	24.12	14.96	2.29
200	15.25	19.37	22.90	26.78	1.11	0.62	24.91	15.49	2.24
400	15.26	19.39	22.71	33.35	1.11	0.62	24.48	15.92	2.09
600	15.21	19.46	21.17	35.01	1.12	0.63	23.92	15.61	2.09
800	15.12	19.58	19.71	30.12	1.13	0.65	24.16	15.28	2.16
1000	15.06	19.59	18.47	26.01	1.13	0.65	24.07	14.57	2.07
1200	14.98	19.69	17.59	23.72	1.14	0.67	23.95	14.41	2.14
1400	14.87	19.77	16.92	22.29	1.15	0.68	23.76	14.56	2.20
1600	14.79	19.85	16.46	21.40	1.16	0.69	23.50	14.54	2.22
1800	14.68	19.94	16.46	21.50	1.17	0.70	23.63	14.76	2.20
2000	14.55	20.07	16.65	22.44	1.19	0.72	23.52	14.94	2.18
2200	14.46	20.10	17.00	22.98	1.20	0.73	23.89	14.99	2.21
2400	14.43	20.11	17.93	23.03	1.21	0.73	24.27	15.12	2.19
2600	14.37	20.20	18.77	22.56	1.22	0.74	24.70	15.87	2.30
2800	14.29	20.30	19.45	21.49	1.24	0.75	23.50	15.09	2.32
3000	14.20	20.41	19.35	19.99	1.25	0.76	22.95	14.80	2.27
3200	14.10	20.54	18.53	18.60	1.27	0.77	23.88	15.65	2.33
3400	13.98	20.67	17.15	17.21	1.28	0.78	22.86	14.07	2.41
3600	13.85	20.84	15.53	15.82	1.30	0.79	23.34	14.90	2.43
3800	13.71	20.99	13.94	14.49	1.31	0.79	23.32	14.72	2.49
4000	13.58	21.18	12.50	13.39	1.33	0.80	22.25	13.93	2.56
4200	13.45	21.35	11.36	12.44	1.34	0.80	22.60	14.80	2.61
4400	13.35	21.51	10.50	11.85	1.36	0.81	22.78	14.70	2.64
4600	13.28	21.66	9.93	11.52	1.37	0.82	22.69	14.91	2.64
4800	13.23	21.76	9.61	11.59	1.38	0.83	23.01	15.17	2.58
5000	13.23	21.86	9.63	12.12	1.40	0.84	23.10	15.20	2.61
5200	13.28	21.89	9.91	13.04	1.41	0.86	22.39	15.23	2.70
5400	13.36	21.83	10.49	14.80	1.41	0.87	23.73	16.24	2.71
5600	13.42	21.88	11.35	17.63	1.43	0.89	23.84	16.33	2.72
5800	13.46	21.90	12.41	21.86	1.45	0.89	24.41	16.66	2.78
6000	13.49	21.92	13.59	24.44	1.46	0.89	24.70	16.81	2.86
6200	13.46	22.03	14.83	20.46	1.48	0.88	24.03	16.48	2.92
6400	13.37	22.18	15.97	16.82	1.50	0.87	23.44	16.32	3.00
6600	13.22	22.36	16.47	14.41	1.53	0.86	22.41	15.84	3.14
6800	13.01	22.60	15.79	12.66	1.56	0.86	21.79	15.43	3.28
7000	12.69	22.91	13.79	11.22	1.60	0.87	20.64	14.80	3.42
7200	12.24	23.40	11.25	9.92	1.65	0.88	20.22	14.31	3.58
7400	11.66	23.97	8.87	8.78	1.71	0.91	19.01	13.46	3.71
7600	10.96	24.65	6.98	7.81	1.78	0.93	19.24	12.96	3.88
7800	10.28	25.29	5.58	7.00	1.83	0.95	18.35	12.20	4.01
8000	9.66	25.83	4.58	6.00	1.83	0.93	18.66	11.89	4.15
8200	8.98	26.46	3.88	5.56	1.88	0.94	18.21	11.41	4.24

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 = 43mA @ 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)
50	14.80	19.68	16.05	17.05	1.13	0.67	26.98	15.99	3.24
100	14.90	19.39	20.24	22.01	1.12	0.65	25.97	16.31	3.26
200	14.94	19.30	22.24	26.12	1.12	0.64	27.02	16.84	3.11
400	14.92	19.33	21.40	32.88	1.12	0.65	26.25	17.08	2.89
600	14.84	19.43	19.94	31.63	1.13	0.66	25.74	16.92	2.87
800	14.71	19.55	18.38	27.23	1.15	0.68	26.08	16.73	3.04
1000	14.61	19.63	17.27	23.85	1.16	0.69	25.91	16.17	2.92
1200	14.49	19.70	16.59	22.10	1.17	0.70	25.63	15.98	3.02
1400	14.35	19.80	16.14	21.03	1.18	0.72	25.65	16.11	3.09
1600	14.23	19.89	16.03	20.60	1.20	0.73	25.23	16.04	3.13
1800	14.09	19.98	16.29	21.04	1.22	0.75	25.53	16.07	3.16
2000	13.95	20.11	16.75	21.73	1.24	0.76	25.57	16.24	3.18
2200	13.83	20.16	17.42	22.08	1.26	0.77	25.84	16.41	3.16
2400	13.74	20.23	18.38	21.83	1.28	0.78	25.74	16.15	3.22
2600	13.62	20.32	19.11	20.91	1.29	0.79	26.28	16.81	3.26
2800	13.48	20.46	19.41	19.73	1.32	0.80	24.98	15.85	3.29
3000	13.33	20.57	18.89	18.18	1.34	0.81	24.51	15.32	3.29
3200	13.16	20.76	17.66	16.80	1.36	0.82	25.34	15.95	3.40
3400	12.98	20.93	16.07	15.40	1.39	0.83	24.41	14.68	3.49
3600	12.79	21.10	14.47	14.09	1.41	0.84	24.76	15.10	3.50
3800	12.59	21.32	13.03	12.90	1.44	0.84	24.71	15.02	3.62
4000	12.40	21.56	11.78	11.96	1.47	0.85	23.71	14.20	3.68
4200	12.22	21.75	10.82	11.21	1.49	0.85	24.06	14.51	3.74
4400	12.07	21.93	10.13	10.76	1.52	0.85	24.19	14.60	3.79
4600	11.98	22.09	9.72	10.61	1.55	0.86	24.16	14.60	3.76
4800	11.90	22.18	9.58	10.85	1.58	0.87	24.40	14.54	3.74
5000	11.86	22.23	9.78	11.56	1.61	0.89	24.48	14.71	3.80
5200	11.89	22.21	10.36	12.81	1.63	0.90	23.86	14.62	3.88
5400	11.89	22.24	11.31	15.02	1.68	0.92	24.98	15.19	3.87
5600	11.86	22.30	12.69	18.78	1.73	0.93	25.03	15.15	3.93
5800	11.78	22.40	14.46	25.02	1.79	0.94	25.51	15.11	4.00
6000	11.66	22.53	16.62	25.54	1.85	0.94	25.47	14.93	4.09
6200	11.44	22.71	18.86	19.63	1.92	0.93	24.59	14.42	4.22
6400	11.16	23.00	20.00	16.25	2.01	0.92	23.78	13.81	4.35
6600	10.83	23.33	18.15	14.15	2.10	0.93	22.83	13.25	4.49
6800	10.47	23.66	14.97	12.50	2.17	0.94	22.39	12.70	4.69
7000	10.07	23.98	12.08	10.94	2.20	0.95	21.56	11.98	4.87
7200	9.62	24.37	9.81	9.34	2.22	0.96	21.19	11.36	5.07
7400	9.11	24.80	8.07	7.83	2.21	0.94	20.20	10.73	5.25
7600	8.49	25.22	6.76	6.58	2.21	0.92	20.30	10.51	5.38
7800	7.82	25.77	5.77	5.74	2.27	0.89	19.41	9.92	5.50
8000	7.26	26.17	5.07	4.77	2.21	0.83	19.85	9.74	5.66
8200	6.53	26.64	4.59	4.36	2.31	0.81	19.03	9.22	5.75

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 = 39mA @ 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)
50	14.51	19.47	15.66	18.21	1.13	0.69	25.66	15.23	3.18
100	14.60	19.19	18.98	24.46	1.13	0.66	25.00	15.70	3.23
200	14.64	19.08	20.24	30.93	1.12	0.65	25.76	16.22	3.09
400	14.62	19.15	19.44	38.04	1.13	0.66	24.98	16.59	2.89
600	14.52	19.27	18.24	28.63	1.14	0.68	24.58	16.45	2.92
800	14.39	19.37	16.97	24.33	1.15	0.69	24.92	16.41	2.96
1000	14.29	19.41	16.07	21.60	1.16	0.70	24.67	15.86	2.95
1200	14.16	19.54	15.49	20.14	1.18	0.71	24.47	15.50	3.02
1400	14.01	19.63	15.10	19.25	1.19	0.73	24.41	15.79	3.07
1600	13.89	19.70	15.05	18.93	1.21	0.74	24.13	15.56	3.14
1800	13.75	19.82	15.29	19.27	1.23	0.75	24.25	15.73	3.14
2000	13.61	19.91	15.72	19.88	1.25	0.77	24.35	15.91	3.13
2200	13.49	19.99	16.34	20.20	1.27	0.78	24.62	16.07	3.15
2400	13.39	20.07	17.17	20.10	1.29	0.79	24.63	15.81	3.41
2600	13.27	20.14	17.81	19.44	1.30	0.79	25.10	16.31	3.26
2800	13.13	20.28	18.04	18.46	1.33	0.80	24.01	15.50	3.32
3000	12.97	20.41	17.61	17.07	1.35	0.81	23.26	14.96	3.31
3200	12.79	20.59	16.55	15.79	1.38	0.82	24.16	15.43	3.39
3400	12.59	20.77	15.15	14.44	1.40	0.83	23.30	14.31	3.47
3600	12.39	20.98	13.73	13.23	1.43	0.84	23.62	14.56	3.52
3800	12.18	21.17	12.40	12.15	1.45	0.85	23.71	14.62	3.63
4000	11.98	21.38	11.27	11.29	1.48	0.85	22.65	13.79	3.68
4200	11.79	21.56	10.39	10.61	1.50	0.85	23.02	14.24	3.72
4400	11.63	21.78	9.76	10.23	1.54	0.85	23.06	14.34	3.75
4600	11.54	21.91	9.40	10.12	1.56	0.86	23.02	14.19	3.78
4800	11.46	22.02	9.28	10.39	1.60	0.87	23.34	14.26	3.81
5000	11.42	22.05	9.49	11.11	1.63	0.89	23.39	14.29	3.81
5200	11.45	22.08	10.07	12.31	1.66	0.90	22.83	14.35	3.97
5400	11.46	22.04	11.01	14.42	1.70	0.92	23.96	14.90	3.89
5600	11.42	22.11	12.37	17.86	1.76	0.94	24.01	14.73	3.93
5800	11.33	22.18	14.09	22.73	1.82	0.94	24.70	14.67	4.02
6000	11.19	22.31	16.14	23.12	1.89	0.94	24.63	14.48	4.12
6200	10.95	22.51	18.19	18.67	1.97	0.93	23.76	13.97	4.23
6400	10.64	22.82	19.01	15.59	2.07	0.93	23.06	13.49	4.37
6600	10.28	23.12	17.22	13.53	2.15	0.93	22.14	12.91	4.54
6800	9.89	23.48	14.32	11.90	2.23	0.94	21.78	12.33	4.69
7000	9.46	23.80	11.63	10.40	2.26	0.95	21.10	11.60	4.90
7200	8.99	24.19	9.52	8.88	2.27	0.95	20.80	11.10	5.08
7400	8.46	24.61	7.88	7.46	2.27	0.94	19.89	10.60	5.25
7600	7.83	25.06	6.63	6.30	2.27	0.91	19.98	10.37	5.41
7800	7.15	25.57	5.69	5.54	2.32	0.88	19.18	9.81	5.56
8000	6.60	25.93	5.03	4.62	2.26	0.82	19.63	9.63	5.69
8200	5.87	26.37	4.57	4.23	2.35	0.80	18.89	9.28	5.80

Typical Performance Data

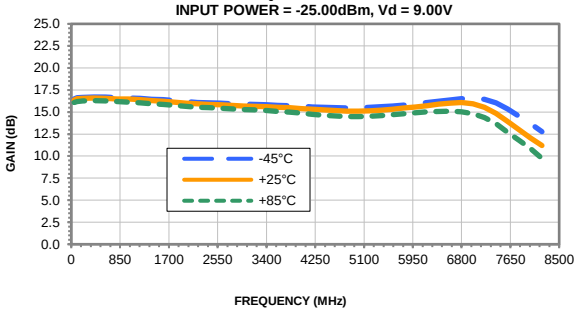
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id = 47mA @ Temperature = +85°C

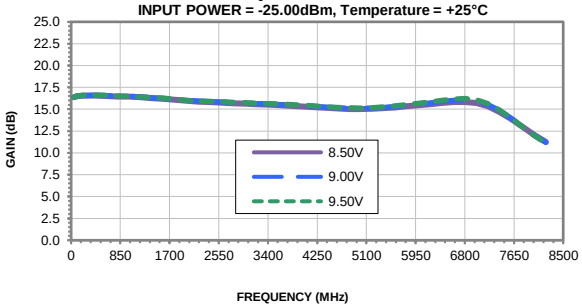
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50	15.03	19.82	16.32	16.04	1.12	0.66	28.14	16.45	3.24
100	15.14	19.60	21.21	20.35	1.12	0.64	27.29	16.90	3.28
200	15.18	19.47	24.17	23.48	1.11	0.63	27.81	17.43	3.12
400	15.17	19.50	23.44	28.28	1.12	0.64	27.64	17.69	2.90
600	15.09	19.58	21.61	30.93	1.13	0.65	26.85	17.51	2.92
800	14.97	19.69	19.73	29.51	1.14	0.67	27.15	17.17	2.96
1000	14.88	19.76	18.45	26.05	1.15	0.68	27.05	16.77	2.94
1200	14.76	19.82	17.64	24.05	1.16	0.70	26.76	16.44	3.03
1400	14.62	19.94	17.10	22.79	1.18	0.71	26.69	16.58	3.06
1600	14.51	20.04	16.97	22.36	1.19	0.73	26.43	16.50	3.13
1800	14.37	20.14	17.22	22.81	1.21	0.74	26.58	16.68	3.14
2000	14.23	20.24	17.68	23.67	1.23	0.76	26.66	16.71	3.14
2200	14.11	20.28	18.46	23.98	1.25	0.76	27.04	16.87	3.15
2400	14.02	20.40	19.50	23.59	1.27	0.77	26.84	16.76	3.22
2600	13.90	20.47	20.37	22.38	1.29	0.78	27.31	17.29	3.23
2800	13.77	20.58	20.73	20.94	1.31	0.79	26.08	16.48	3.30
3000	13.63	20.75	20.11	19.30	1.33	0.80	25.70	15.97	3.29
3200	13.47	20.88	18.72	17.81	1.35	0.81	26.45	16.46	3.38
3400	13.30	21.06	16.91	16.34	1.38	0.83	25.68	15.21	3.46
3600	13.12	21.24	15.17	14.92	1.40	0.83	25.98	15.63	3.52
3800	12.94	21.43	13.57	13.62	1.43	0.84	25.73	15.56	3.60
4000	12.76	21.63	12.21	12.58	1.45	0.85	24.78	14.75	3.67
4200	12.58	21.83	11.17	11.73	1.48	0.85	25.14	15.21	3.73
4400	12.44	22.02	10.43	11.22	1.50	0.85	25.23	15.16	3.75
4600	12.35	22.19	9.98	11.03	1.53	0.86	25.18	15.00	3.77
4800	12.28	22.29	9.82	11.23	1.55	0.87	25.44	15.10	3.78
5000	12.23	22.38	10.00	11.92	1.59	0.88	25.40	15.27	3.78
5200	12.26	22.41	10.56	13.15	1.62	0.90	24.77	15.03	3.90
5400	12.27	22.41	11.53	15.41	1.65	0.91	25.90	15.75	3.88
5600	12.24	22.47	12.91	19.40	1.70	0.93	25.96	15.71	3.90
5800	12.18	22.57	14.70	26.98	1.75	0.94	26.30	15.68	3.99
6000	12.07	22.72	16.89	28.67	1.81	0.93	26.17	15.52	4.06
6200	11.88	22.88	19.28	20.66	1.88	0.93	25.25	14.87	4.17
6400	11.62	23.15	20.69	17.02	1.96	0.92	24.46	14.42	4.33
6600	11.33	23.46	18.91	14.86	2.04	0.93	23.50	13.74	4.51
6800	11.00	23.72	15.52	13.18	2.09	0.94	22.99	13.08	4.66
7000	10.62	24.08	12.41	11.54	2.14	0.95	22.14	12.38	4.86
7200	10.20	24.48	10.02	9.80	2.15	0.96	21.71	11.77	5.06
7400	9.70	24.83	8.21	8.17	2.13	0.95	20.65	11.15	5.21
7600	9.08	25.33	6.83	6.82	2.15	0.92	20.75	10.93	5.35
7800	8.41	25.87	5.79	5.92	2.20	0.90	19.85	10.33	5.52
8000	7.84	26.34	5.07	4.87	2.16	0.84	20.32	10.01	5.66
8200	7.10	26.88	4.57	4.44	2.27	0.81	19.33	9.45	5.76

Typical Performance Curves

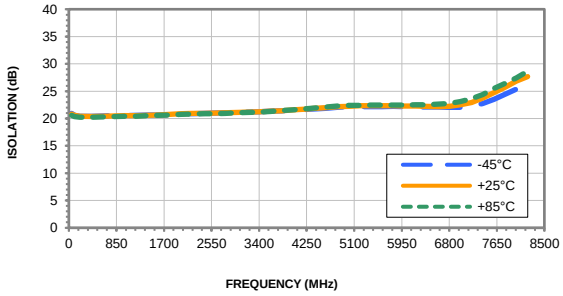
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



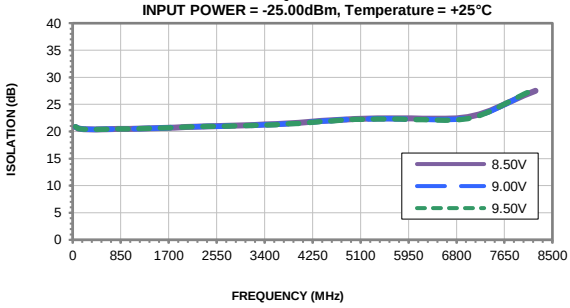
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



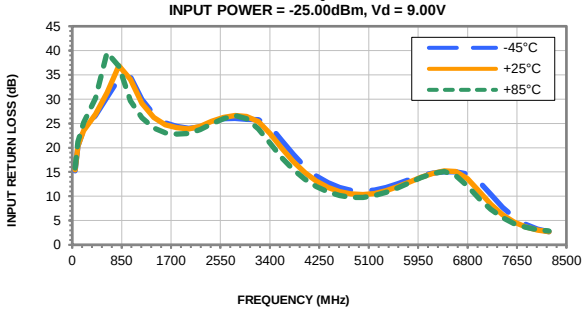
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



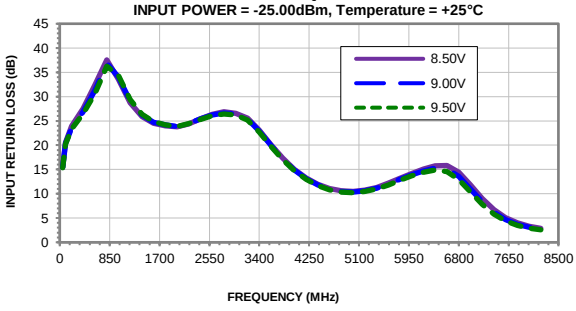
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



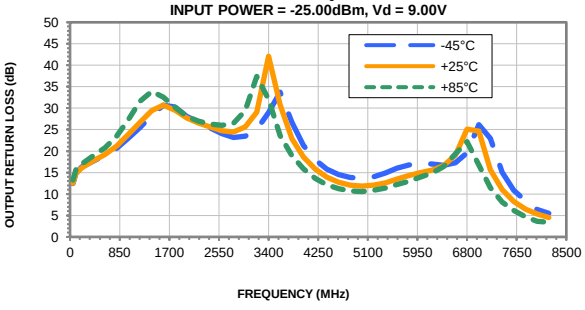
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V



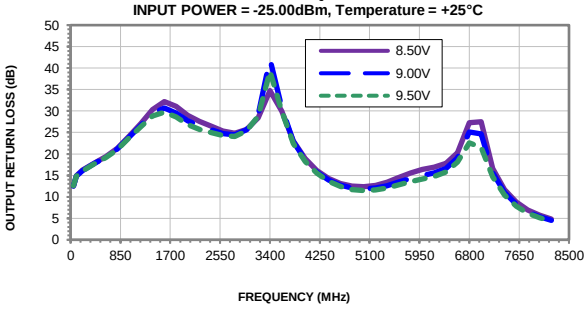
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V

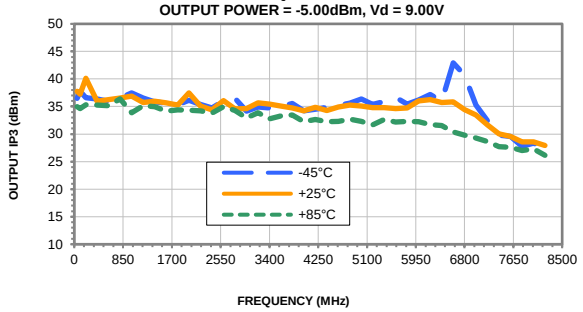


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

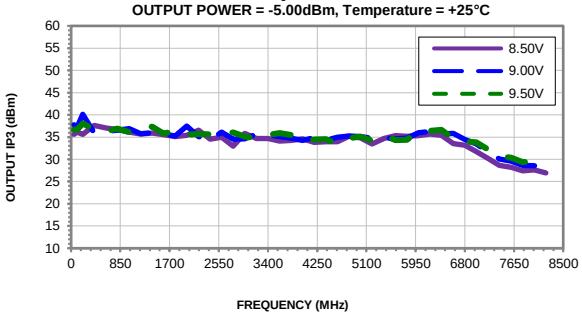


Typical Performance Curves

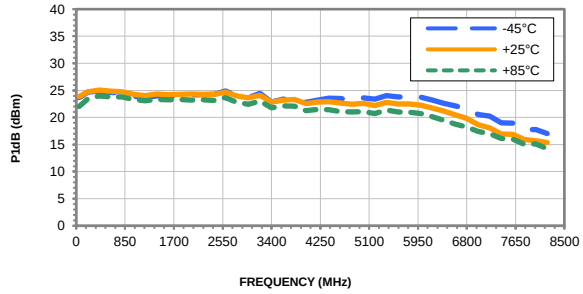
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = -5.00dBm, Vd = 9.00V



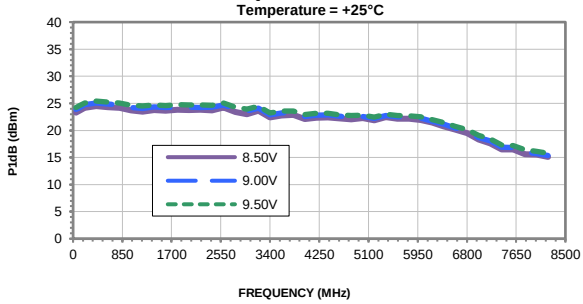
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = -5.00dBm, Temperature = +25°C



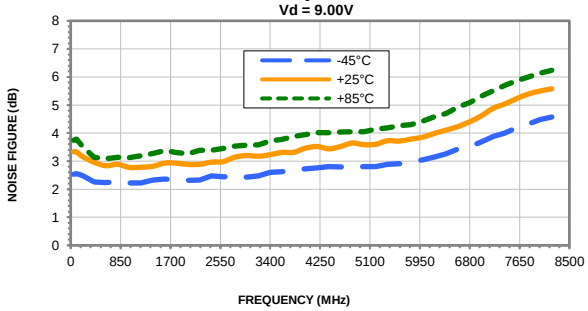
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 9.00V



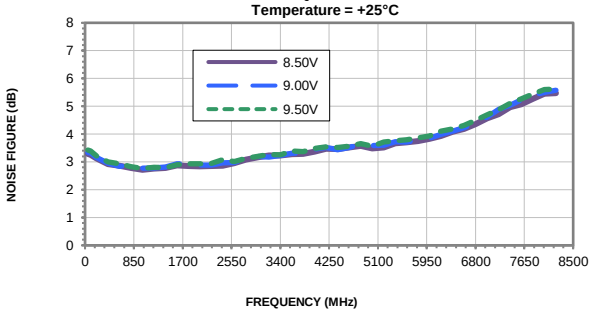
P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



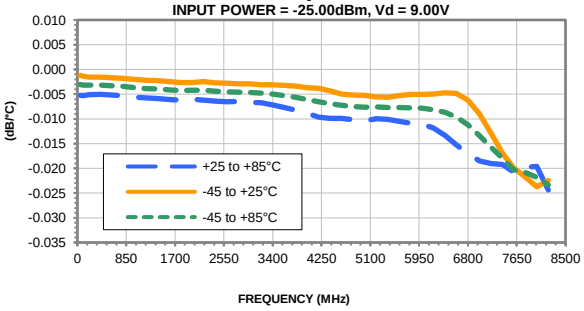
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 9.00V



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

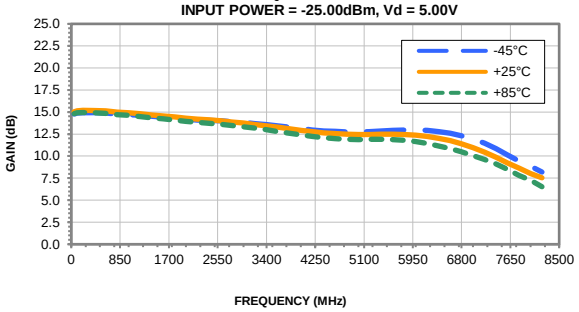


GAIN VARIANTS VS FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 9.00V

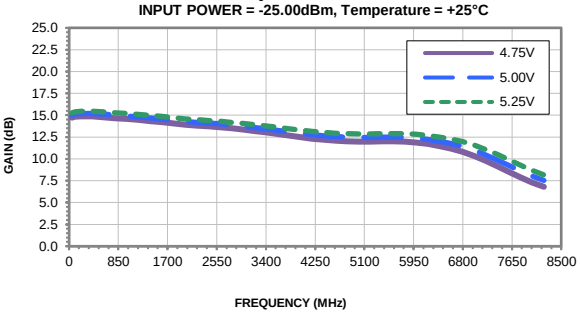


Typical Performance Curves

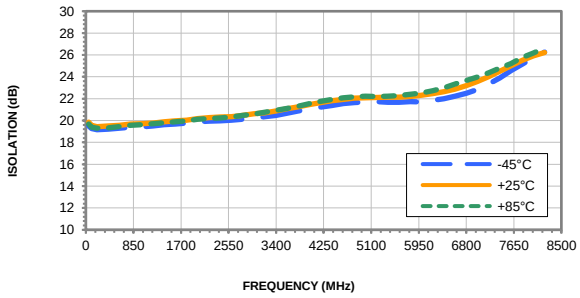
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



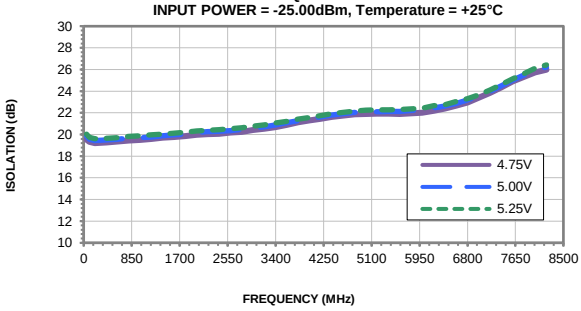
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



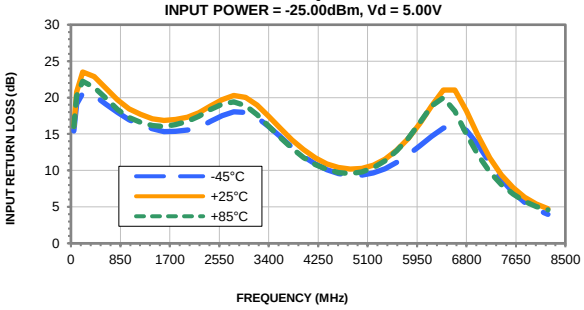
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



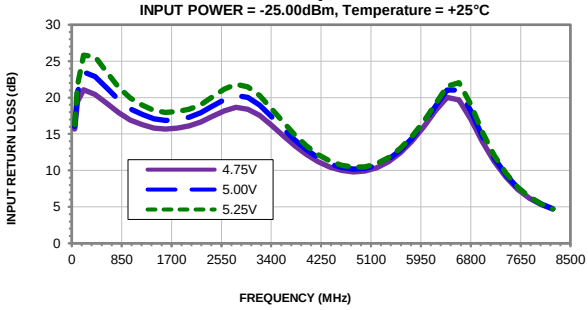
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



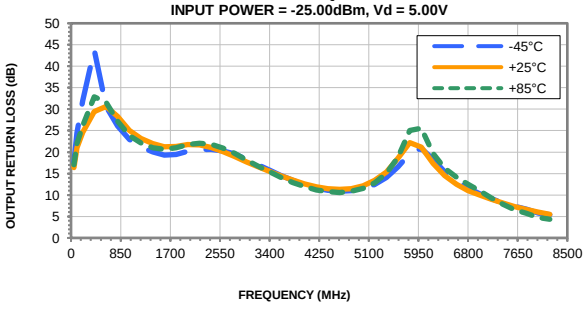
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V



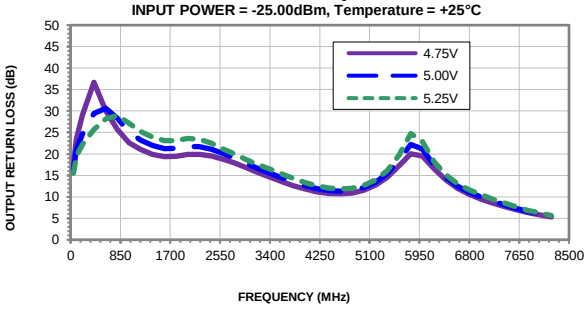
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



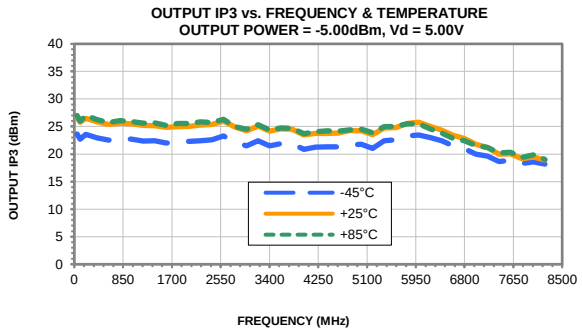
OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 5.00V

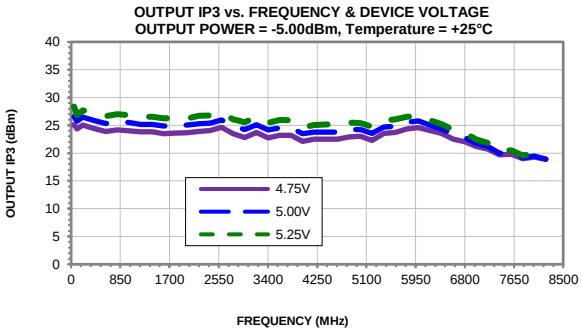


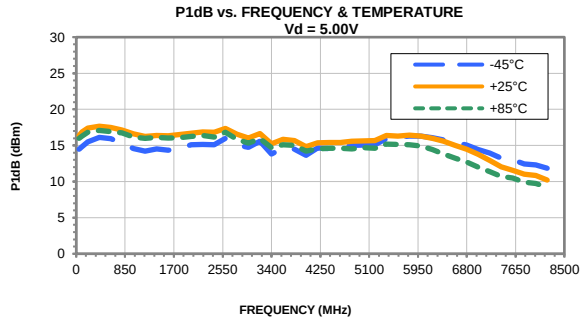
OUTPUT RETURN LOSS vs. FREQ. & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

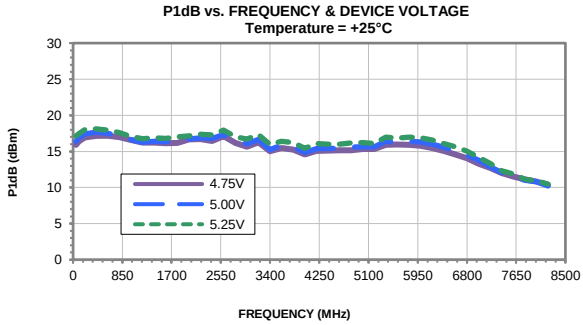


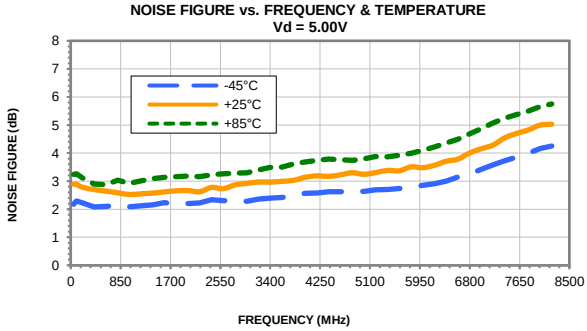
Typical Performance Curves

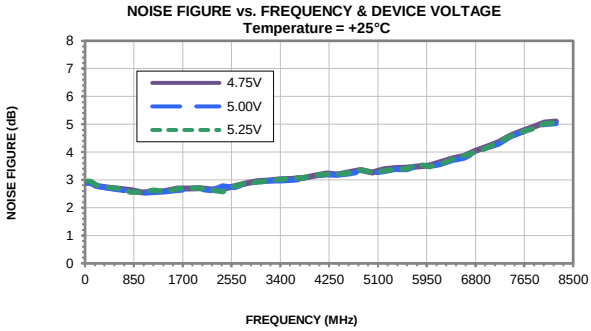


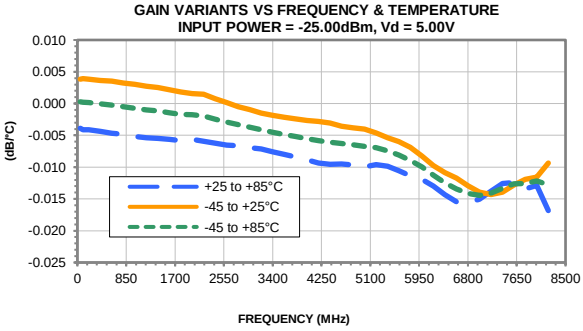








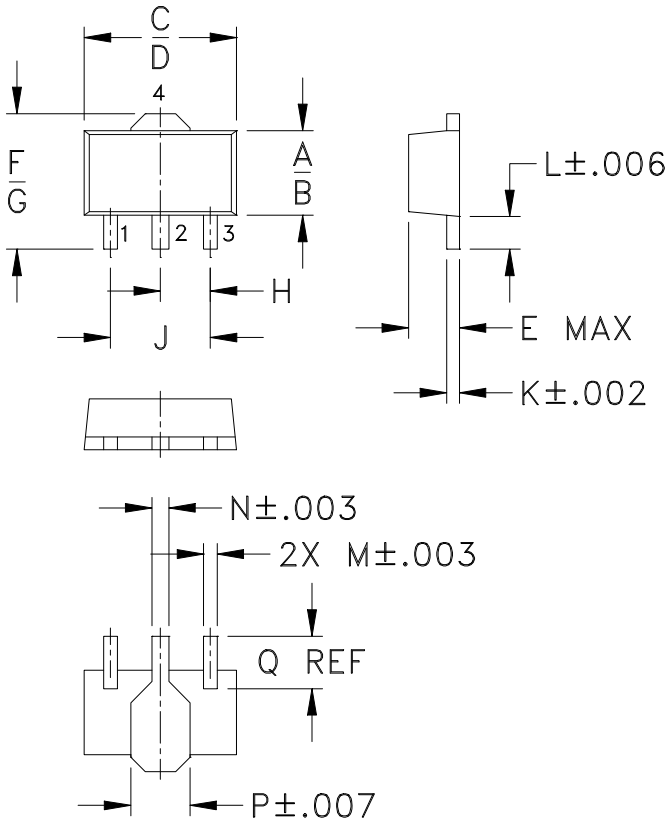




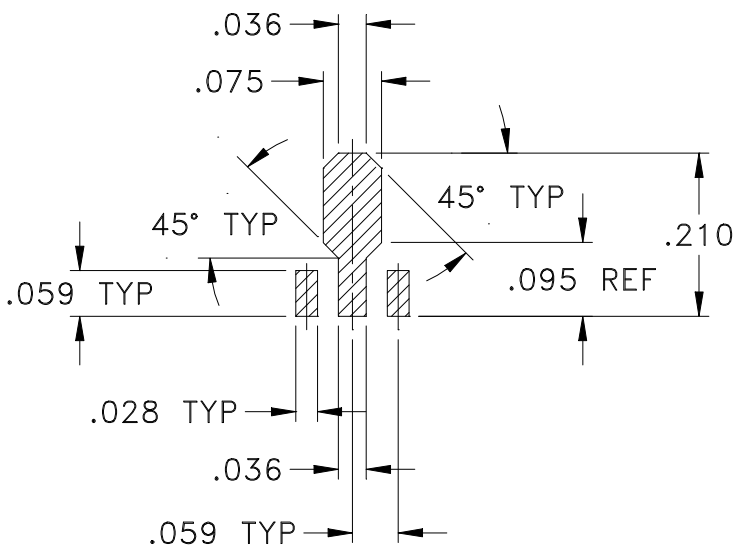
Case Style DF

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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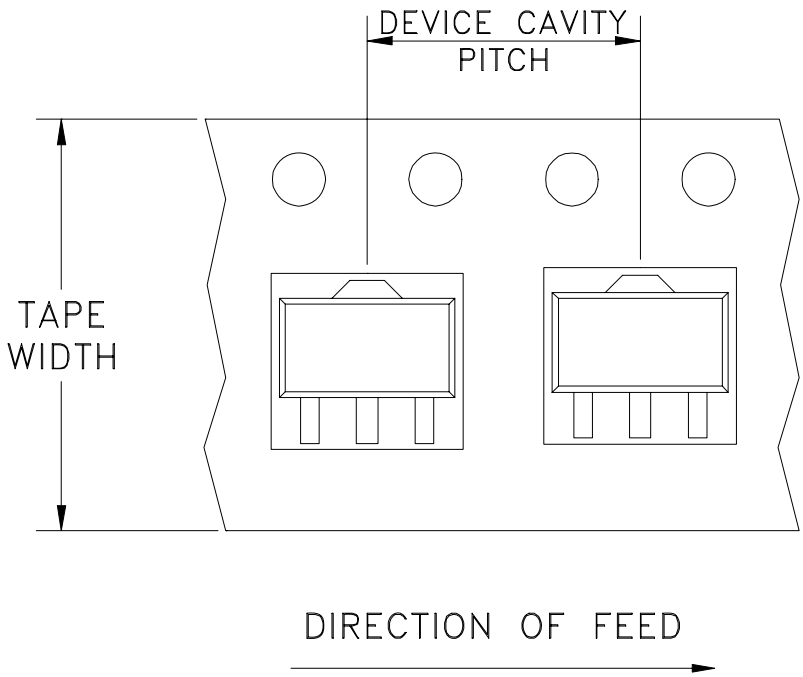
Tape & Reel Packaging TR-F55

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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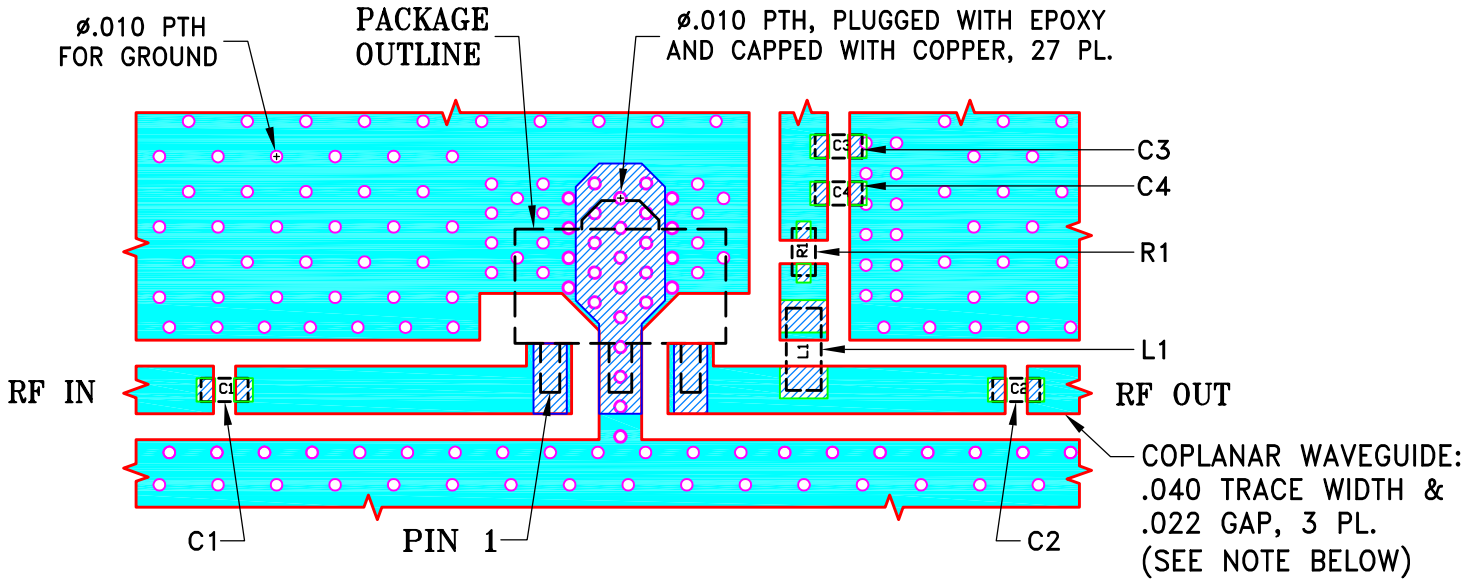
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-000234	NEW RELEASE	10/08/19	ITG	RS

SUGGESTED MOUNTING CONFIGURATION FOR DF782 CASE STYLE



COMPONENT	SIZE
C1...C4	0402
L1	0603
R1	0402

NOTES:

1. LINE WIDTH & GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. FOR OTHER MATERIALS LINE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-PHA-83WE+.
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	ITG	10/08/19
TOLERANCES ON:	CHECKED	GF	10/08/19
2 PL DECIMALS ±	APPROVED	RS	10/08/19
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

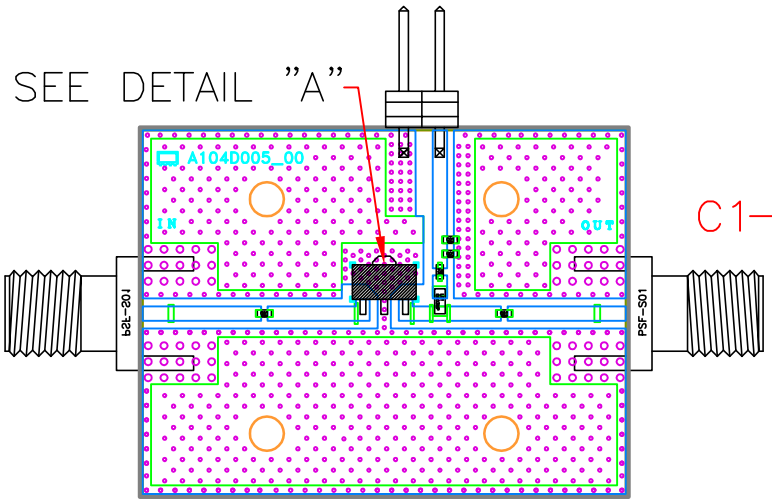
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

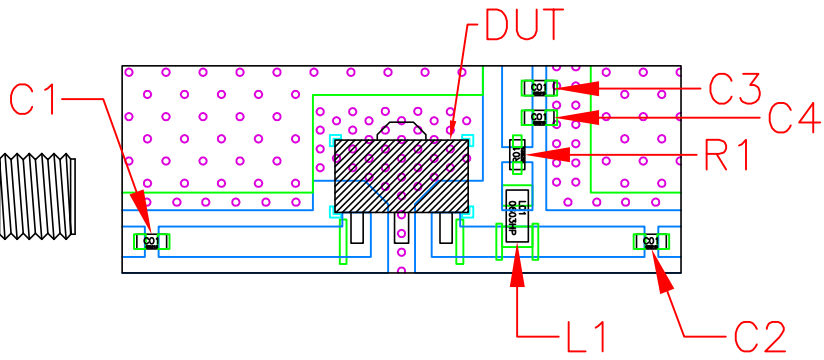
PL, DF782, TB-PHA-83WE+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-653	OR

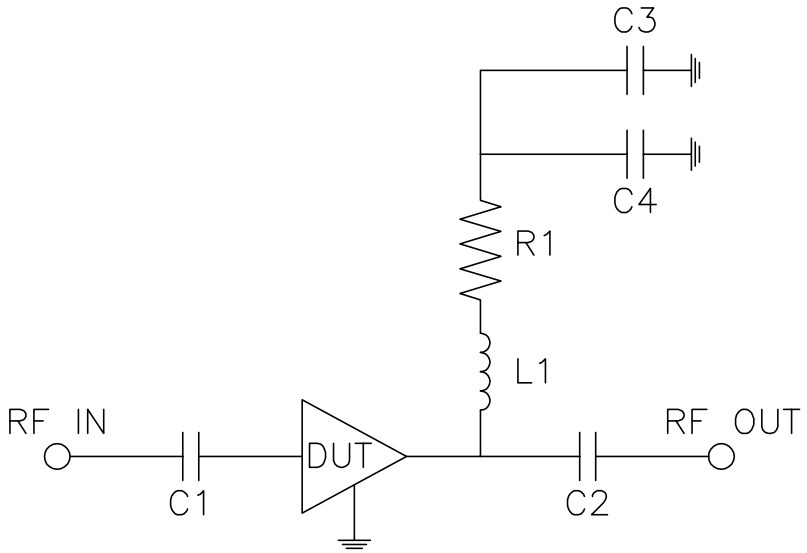
FILE:	SCALE:	SHEET:
98PL653	6:1	1 OF 1

Evaluation Board and Circuit





DETAIL "A"
LOCATION OF COMPONENTS
ON THE PCB
(SCALE 3:1)



SCHEMATIC DIAGRAM

Component	Size	Value	Part Number	Manufacturer
C1	0402	1000pF	GRM1555C1H102JA01D	Murata
C2	0402	180pF	GRM1555C1H181JA01D	Murata
C3	0402	0.1uF	GRM155R71C104KA88D	Murata
C4	0402	10000pF	GRM155R71E103KA01D	Murata
L1	0603	330nH	LQW18CNR33J00D	Murata
R1	0402	20hm	RK73H1ETTP2R00F	Koa

Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger RO4350B or equivalent,
   Dielectric constant=3.5, Thickness=0.020 inch

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Mini-Circuits

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

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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

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