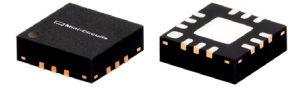




# Monolithic Amplifier

### THE BIG DEAL

- Ultra-wideband, 0.5 to 18 GHz
- Positive gain slope
- Single positive supply voltage



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

### APPLICATIONS

- Wi-Fi
- WLAN
- LTE
- WiMAX
- C-band Satcom

#### +RoHS Compliant

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

### PRODUCT OVERVIEW

The AVA-183P+ is a InGaAs E-PHEMT\* based wideband, positive gain slope MMIC amplifier. This design operates on a single +5V supply, is well matched for 50Ω and comes in a tiny, low profile package (3 x 3 x 0.89mm), accommodating dense circuit board layouts.

### KEY FEATURES

Feature	Advantages
Positive Gain Slope vs. Frequency +0.13 dB/GHz (0.5-10 GHz) +0.25 dB/GHz (10-18 GHz)	Useful for compensating negative gain slope of most wideband microwave components and eliminating the need for equalization
Positive Supply Voltage	Simplifies external circuit by eliminating need for negative voltage and sequencing
3 x 3mm, 12-lead MCLP package	Tiny footprint saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

\*Enhancement mode Pseudomorphic High Electron Mobility Transistor



WIDEBAND, POSITIVE GAIN SLOPE

# Monolithic Amplifier

## AVA-183P+

### ELECTRICAL SPECIFICATIONS<sup>1</sup> AT 25°C AND +5V, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		0.5		18	GHz
Gain	0.5	6.1	6.8	7.5	dB
	5	—	7.5	—	
	10	7.3	8.1	8.9	
	15	—	9.8	—	
	18	9.2	10.8	11.9	
Gain Slope	0.5 - 10	—	0.13	—	dB/GHz
	10 - 18	—	0.25	—	
Input Return Loss	0.5		15		dB
	5		13		
	10		10		
	15		23		
	18		14		
Output Return Loss	0.5		11		dB
	5		8		
	10		7		
	15		9		
	18		19		
Output Power at 1dB Compression	0.5		10.9		dBm
	5		10.6		
	10		11.7		
	15		12.3		
	18		11.6		
OIP3	0.5		22.8		dBm
	5		21.4		
	10		21.5		
	15		20.6		
	18		19.1		
Noise Figure	0.5		7.5		dB
	5		5.3		
	10		4.8		
	15		4.6		
	18		5.0		
Device Operating Voltage(VDD)		+4.75	+5	+5.25	V
Device Operating Current (IDD)		—	46.3	54	mA
Device Current Variation vs. Temperature <sup>2</sup>			-168.13		µA/°C
Device Current Variation vs. Voltage <sup>3</sup>			0.0085		mA/mV
Thermal Resistance, Junction to Ground			292.5		°C/W

1. Measured on Mini-Circuits Characterization test board TB-AVA-183P+. See Characterization Test Circuit (Fig. 1)

2. Current variation vs temperature=(Current at 100°C-Current at -55°C)/155°C

3. Current variation vs Voltage=(Current at 5.25V - Current at 4.75V)/(5.25V-4.75V)

### MAXIMUM RATINGS<sup>4</sup>

Parameter	Ratings
Operating Temperature (ground lead)	-55°C to 100°C
Storage Temperature	-65°C to 150°C
Junction Temperature	161°C
Total Power Dissipation	0.46W <sup>6</sup>
Input Power (CW), Vd=5V <sup>5</sup>	+22 dBm (5 minutes max.) +13 dBm (continuous)
DC Voltage	6V

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

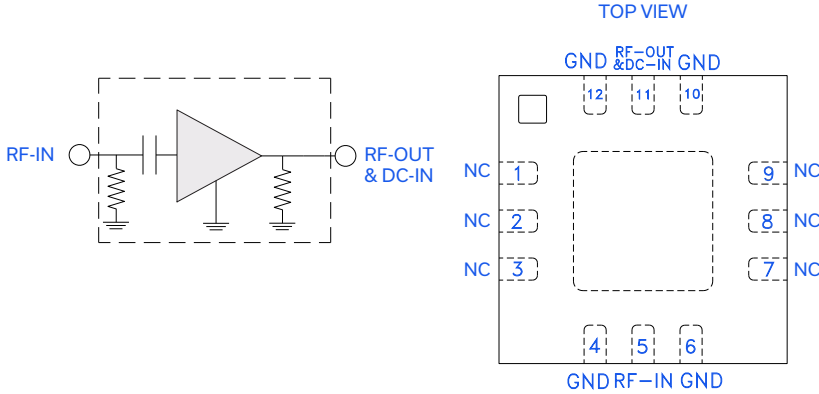
5. Measured on Mini-Circuits test board, TB-AVA-183P+

6. Derates linearly to 0.24W at 100°C





### SIMPLIFIED SCHEMATIC & PAD DESCRIPTION



Function	Pad Number	Description (See Figure 1)
RF-IN	5	Connects to RF input via external DC blocking capacitor
RF-OUT & DC-IN	11	Connects to RF output & $V_{DD}$ via external bias-tee
Ground	4,6,10,12 & Paddle	Connects to ground
No Connection	1-3, 7-9	Not used internally. Connected to ground on test board

### RECOMMENDED CHARACTERIZATION TEST CIRCUIT

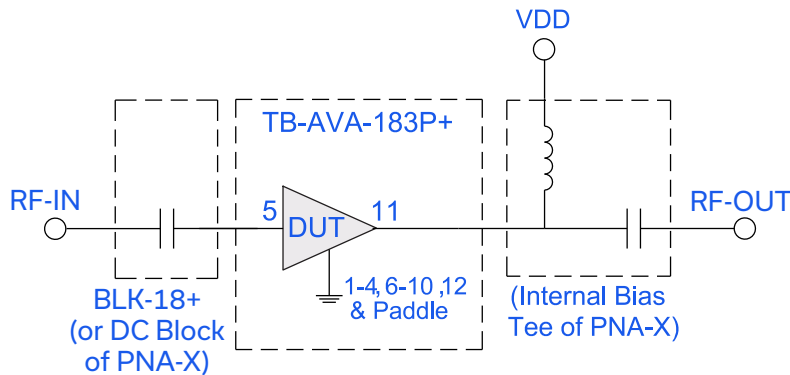


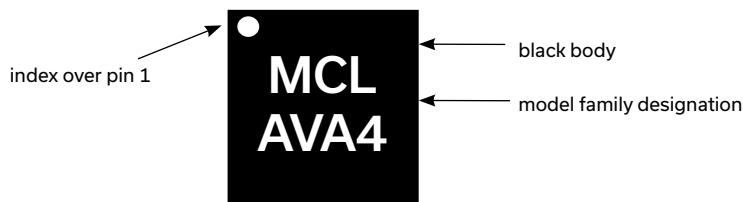
Fig 1. Characterization Test Circuit

Note: This block diagram is used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-AVA-183P+)  
 Gain, Return loss, Output power at 1dB compression (P1 dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:

1. Gain and Return loss: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -3 dBm/tone at output.

### PRODUCT MARKING



Marking may contain other features or characters for internal lot control



WIDEBAND, POSITIVE GAIN SLOPE

# Monolithic Amplifier

## AVA-183P+

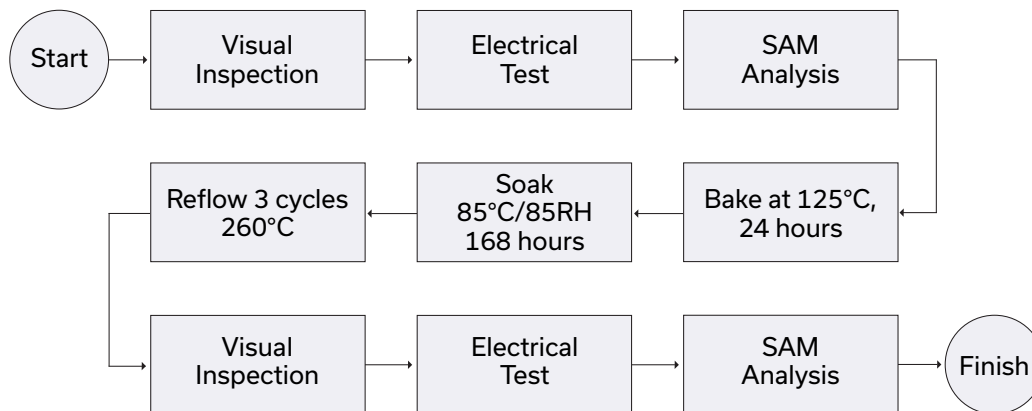
ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DQ1225 Plastic package, exposed paddle, lead finish: Matte-Tin
Tape & Reel Standard quantities available on reel	F66 7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices.
Suggested Layout for PCB Design	PL-666
Evaluation Board	TB-AVA-183P+ (no connectors), TB-AVA-183PC+ (with connectors)
Environmental Ratings	ENV08T9

### ESD RATING

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

### MSL TEST FLOW CHART



#### NOTES

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



## 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 = 47.74mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.64	18.31	10.01	10.48	1.76	0.90	22.95	11.32	8.41
300	6.75	18.09	12.71	10.67	1.78	0.87	22.03	11.22	7.94
400	6.78	18.00	14.28	10.82	1.79	0.85	22.14	11.19	7.71
500	6.79	17.94	15.20	10.94	1.79	0.85	22.49	11.06	7.55
600	6.80	17.90	15.66	11.06	1.79	0.84	22.40	11.11	7.42
700	6.81	17.85	15.84	11.21	1.79	0.84	22.47	11.13	7.24
800	6.83	17.80	15.86	11.36	1.78	0.85	22.87	11.10	7.29
900	6.84	17.76	15.73	11.50	1.77	0.85	22.49	11.29	7.30
1000	6.86	17.71	15.57	11.66	1.76	0.86	22.83	10.83	6.93
1500	7.00	17.50	14.33	12.43	1.65	0.90	22.03	10.93	6.84
2000	7.12	17.34	13.12	12.68	1.56	0.93	21.84	10.34	6.33
2500	7.22	17.23	12.28	12.24	1.56	0.90	21.96	10.77	6.22
3000	7.28	17.19	11.84	11.37	1.58	0.84	21.37	10.33	6.00
3500	7.32	17.18	11.85	10.47	1.53	0.84	21.70	10.90	5.95
4000	7.39	17.17	12.17	9.74	1.41	0.87	21.27	10.53	5.62
4500	7.46	17.15	12.73	9.15	1.35	0.87	21.52	10.82	5.46
5000	7.55	17.14	13.30	8.67	1.40	0.80	21.27	10.95	5.39
5500	7.63	17.15	13.61	8.21	1.46	0.72	21.02	10.66	5.14
6000	7.69	17.18	13.44	7.79	1.41	0.72	20.93	10.93	4.97
6500	7.75	17.23	13.00	7.45	1.28	0.78	21.02	11.16	5.04
7000	7.80	17.31	12.26	7.13	1.20	0.81	21.05	11.31	5.01
7500	7.83	17.40	11.56	6.90	1.26	0.76	21.32	11.24	4.88
8000	7.85	17.50	10.96	6.77	1.37	0.68	20.94	11.20	4.68
8500	7.89	17.61	10.51	6.71	1.38	0.67	21.08	11.43	4.93
9000	7.93	17.72	10.17	6.76	1.26	0.76	21.04	11.65	4.89
9500	7.98	17.84	9.98	6.92	1.15	0.86	20.95	11.52	4.89
10000	8.06	17.95	9.96	7.17	1.18	0.86	21.09	11.87	4.93
10500	8.15	18.05	10.11	7.46	1.34	0.79	21.04	11.92	4.78
11000	8.28	18.12	10.48	7.81	1.45	0.73	20.90	11.98	4.87
11500	8.45	18.16	11.11	8.15	1.44	0.75	20.93	11.95	5.11
12000	8.64	18.20	11.99	8.46	1.36	0.81	20.62	12.24	4.94
12500	8.85	18.24	13.18	8.70	1.31	0.84	20.58	12.30	4.82
13000	9.07	18.28	14.87	8.82	1.33	0.81	20.26	12.46	4.82
13500	9.27	18.35	17.13	8.74	1.39	0.75	20.35	12.34	4.71
14000	9.46	18.45	20.12	8.73	1.42	0.72	20.38	12.47	4.70
14500	9.61	18.61	23.81	8.53	1.39	0.73	20.29	12.28	4.59
15000	9.75	18.79	24.85	8.48	1.37	0.75	20.20	12.47	4.70
15500	9.89	19.00	22.71	8.50	1.38	0.75	20.07	12.39	4.77
16000	10.03	19.22	20.71	8.75	1.43	0.74	20.06	12.44	4.48
16500	10.19	19.44	19.76	9.35	1.48	0.75	19.55	12.52	4.89
17000	10.39	19.66	19.56	10.56	1.51	0.79	19.68	12.33	4.90
17500	10.62	19.86	18.71	13.03	1.55	0.83	19.02	12.26	5.04
18000	10.80	20.13	15.99	16.68	1.58	0.88	18.65	11.81	4.97
18500	10.88	20.55	12.60	18.08	1.60	0.92	18.74	11.54	4.98
19000	10.78	21.15	10.20	13.30	1.62	0.93	18.31	11.19	4.82
19500	10.52	21.94	8.93	9.80	1.59	0.93	18.16	11.10	4.87
20000	10.17	22.86	8.01	7.77	1.52	0.96	17.74	10.88	5.28
21000	9.47	24.77	8.53	6.07	1.83	0.88	16.94	10.23	4.95
22000	8.80	26.91	10.11	5.69	2.79	0.77	16.37	10.18	5.59
23000	7.78	29.27	9.02	5.49	3.95	0.77	16.39	10.49	6.66
24000	6.45	31.70	6.65	5.39	5.03	0.87	15.99	10.29	6.84

## 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 = 45.64mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.79	18.27	10.00	10.25	1.72	0.89	24.34	11.00	8.39
300	6.91	18.01	12.65	10.53	1.73	0.86	23.79	10.91	7.79
400	6.95	17.89	14.18	10.74	1.74	0.84	24.52	10.97	7.39
500	6.97	17.81	15.11	10.90	1.74	0.84	24.59	10.76	7.30
600	6.98	17.75	15.56	11.06	1.74	0.84	24.68	10.83	7.00
700	7.00	17.70	15.73	11.23	1.73	0.84	24.71	10.85	6.74
800	7.02	17.64	15.77	11.40	1.72	0.84	24.45	10.83	6.63
900	7.04	17.60	15.64	11.56	1.71	0.84	24.75	11.02	6.67
1000	7.06	17.55	15.50	11.73	1.70	0.85	23.68	10.54	6.53
1500	7.20	17.35	14.26	12.52	1.60	0.89	22.74	10.66	6.27
2000	7.33	17.21	13.04	12.74	1.51	0.92	22.00	10.08	5.77
2500	7.42	17.13	12.21	12.27	1.51	0.89	22.17	10.51	5.74
3000	7.48	17.11	11.78	11.38	1.54	0.84	21.49	10.08	5.71
3500	7.53	17.12	11.79	10.48	1.49	0.83	22.02	10.64	5.16
4000	7.60	17.12	12.11	9.75	1.38	0.87	21.65	10.28	5.24
4500	7.68	17.11	12.68	9.17	1.32	0.87	21.83	10.65	5.04
5000	7.77	17.11	13.26	8.69	1.37	0.79	21.59	10.71	4.88
5500	7.86	17.13	13.58	8.23	1.43	0.72	21.29	10.42	4.75
6000	7.92	17.16	13.40	7.81	1.38	0.72	21.38	10.76	4.99
6500	7.98	17.22	12.97	7.46	1.25	0.78	21.39	10.91	4.66
7000	8.03	17.30	12.24	7.14	1.17	0.81	21.46	11.06	4.54
7500	8.06	17.39	11.55	6.89	1.23	0.75	21.73	11.00	4.38
8000	8.09	17.49	10.96	6.76	1.35	0.67	21.46	10.98	4.56
8500	8.13	17.61	10.51	6.69	1.35	0.66	21.54	11.22	4.64
9000	8.17	17.72	10.20	6.75	1.23	0.76	21.51	11.44	4.41
9500	8.23	17.84	10.02	6.90	1.12	0.85	21.44	11.30	4.48
10000	8.31	17.94	10.03	7.13	1.16	0.85	21.56	11.71	4.54
10500	8.40	18.05	10.20	7.44	1.31	0.78	21.49	11.68	4.50
11000	8.54	18.11	10.59	7.77	1.42	0.72	21.36	11.73	4.49
11500	8.71	18.15	11.25	8.11	1.41	0.74	21.40	11.68	4.49
12000	8.89	18.20	12.15	8.43	1.33	0.80	21.13	11.98	4.56
12500	9.12	18.22	13.39	8.64	1.28	0.83	21.14	12.05	4.40
13000	9.35	18.25	15.16	8.73	1.30	0.80	20.84	12.21	4.20
13500	9.55	18.32	17.57	8.67	1.36	0.74	20.94	12.09	4.19
14000	9.74	18.42	20.76	8.66	1.38	0.71	20.92	12.22	4.33
14500	9.89	18.57	24.90	8.44	1.35	0.72	20.82	12.03	4.40
15000	10.04	18.75	25.94	8.37	1.33	0.74	20.77	12.22	4.59
15500	10.19	18.94	23.41	8.40	1.34	0.73	20.61	12.14	4.30
16000	10.34	19.15	21.43	8.66	1.38	0.73	20.62	12.13	4.35
16500	10.53	19.36	20.63	9.26	1.42	0.73	19.93	12.27	4.53
17000	10.74	19.56	20.68	10.49	1.45	0.77	20.05	12.09	4.45
17500	10.99	19.74	19.62	13.02	1.48	0.82	19.15	11.91	4.56
18000	11.19	20.00	16.22	17.16	1.51	0.86	18.90	11.54	4.54
18500	11.27	20.42	12.48	18.91	1.53	0.91	19.08	11.18	4.95
19000	11.15	21.04	9.96	13.51	1.55	0.92	18.74	10.85	4.54
19500	10.87	21.86	8.63	9.72	1.52	0.93	18.64	10.84	4.82
20000	10.49	22.82	7.71	7.64	1.43	0.96	18.18	10.62	4.78
21000	9.76	24.83	8.23	5.99	1.74	0.88	17.31	9.94	4.54
22000	9.10	26.98	9.99	5.59	2.69	0.76	16.69	9.74	5.19
23000	8.11	29.39	9.19	5.36	3.84	0.76	16.78	10.06	6.19
24000	6.78	31.91	6.80	5.22	4.93	0.85	16.29	10.02	6.44

## 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 = 49.36mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.47	18.32	10.00	10.72	1.79	0.91	21.07	11.61	8.45
300	6.59	18.12	12.73	10.89	1.82	0.87	20.72	11.44	8.05
400	6.61	18.05	14.35	11.01	1.83	0.86	20.77	11.47	7.89
500	6.61	18.01	15.31	11.09	1.84	0.85	20.60	11.27	7.78
600	6.61	17.98	15.79	11.18	1.84	0.85	20.74	11.36	7.63
700	6.62	17.95	15.98	11.30	1.84	0.85	20.68	11.37	7.62
800	6.63	17.91	15.99	11.44	1.84	0.85	20.74	11.28	7.62
900	6.64	17.87	15.87	11.56	1.83	0.86	20.37	11.46	7.55
1000	6.65	17.84	15.70	11.70	1.82	0.86	20.65	11.08	7.36
1500	6.77	17.64	14.44	12.45	1.72	0.90	20.52	11.16	7.26
2000	6.90	17.48	13.22	12.73	1.62	0.93	20.67	10.50	6.78
2500	7.00	17.36	12.39	12.32	1.61	0.91	20.80	10.92	6.84
3000	7.06	17.31	11.94	11.45	1.63	0.85	20.60	10.47	6.66
3500	7.10	17.27	11.96	10.54	1.58	0.84	20.84	11.11	6.42
4000	7.17	17.25	12.27	9.79	1.46	0.87	20.47	10.73	6.04
4500	7.24	17.22	12.84	9.18	1.40	0.87	20.80	11.02	5.95
5000	7.32	17.20	13.43	8.68	1.44	0.81	20.73	11.07	5.75
5500	7.40	17.20	13.74	8.20	1.49	0.73	20.55	10.84	5.57
6000	7.46	17.22	13.55	7.79	1.45	0.73	20.42	11.12	5.56
6500	7.51	17.26	13.11	7.44	1.31	0.78	20.58	11.28	5.43
7000	7.56	17.33	12.35	7.12	1.23	0.82	20.61	11.49	5.36
7500	7.58	17.42	11.64	6.88	1.28	0.76	20.74	11.43	5.36
8000	7.61	17.52	11.02	6.76	1.40	0.68	20.39	11.33	5.17
8500	7.64	17.62	10.53	6.69	1.41	0.68	20.55	11.58	5.31
9000	7.67	17.73	10.18	6.76	1.29	0.77	20.53	11.80	5.11
9500	7.72	17.84	9.98	6.92	1.18	0.86	20.52	11.66	5.26
10000	7.79	17.96	9.94	7.17	1.21	0.87	20.59	12.02	5.23
10500	7.87	18.06	10.06	7.49	1.37	0.80	20.53	12.10	5.35
11000	8.00	18.13	10.39	7.83	1.49	0.74	20.41	12.16	5.12
11500	8.16	18.18	10.99	8.19	1.48	0.76	20.41	12.15	5.35
12000	8.34	18.22	11.82	8.51	1.40	0.82	20.18	12.43	4.99
12500	8.56	18.24	12.96	8.70	1.34	0.85	20.13	12.50	5.12
13000	8.78	18.28	14.60	8.79	1.36	0.82	19.83	12.66	5.25
13500	8.98	18.35	16.78	8.73	1.43	0.76	19.84	12.53	4.93
14000	9.17	18.46	19.57	8.73	1.46	0.73	19.91	12.68	5.09
14500	9.30	18.62	22.94	8.52	1.43	0.74	19.80	12.48	5.15
15000	9.44	18.81	23.82	8.46	1.40	0.76	19.69	12.67	5.08
15500	9.56	19.03	22.08	8.49	1.42	0.76	19.59	12.63	5.24
16000	9.69	19.26	20.14	8.73	1.47	0.75	19.55	12.60	5.09
16500	9.84	19.49	19.08	9.30	1.52	0.76	19.20	12.77	5.28
17000	10.02	19.72	18.71	10.43	1.57	0.79	19.39	12.50	5.21
17500	10.23	19.93	17.98	12.67	1.61	0.84	18.77	12.50	5.42
18000	10.40	20.22	15.75	15.72	1.64	0.89	18.42	12.11	5.29
18500	10.49	20.63	12.74	16.99	1.67	0.92	18.36	11.81	5.32
19000	10.41	21.20	10.46	13.28	1.68	0.94	17.82	11.39	5.19
19500	10.18	21.94	9.20	9.85	1.65	0.94	17.71	11.37	5.28
20000	9.86	22.82	8.27	7.88	1.58	0.96	17.40	11.16	5.47
21000	9.19	24.69	8.74	6.21	1.92	0.88	16.68	10.55	5.46
22000	8.53	26.74	10.16	5.84	2.85	0.78	16.20	10.42	6.12
23000	7.52	28.99	8.88	5.64	3.98	0.78	16.22	10.72	7.22
24000	6.19	31.32	6.56	5.50	4.97	0.89	15.80	10.67	7.16

## 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 = 60.79mA @ Temperature = -55°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.78	18.61	10.12	9.76	1.76	0.88	21.37	13.22	8.16
300	6.90	18.40	12.74	9.91	1.78	0.85	20.69	13.13	7.66
400	6.95	18.30	14.48	10.10	1.78	0.83	20.84	13.17	7.47
500	6.96	18.26	15.36	9.98	1.79	0.82	20.85	12.99	7.35
600	6.97	18.23	15.79	9.98	1.79	0.82	21.19	13.07	7.22
700	7.00	18.18	15.83	10.23	1.78	0.82	21.22	13.13	7.02
800	7.03	18.13	15.98	10.37	1.77	0.83	21.33	13.06	6.94
900	7.06	18.09	15.82	10.48	1.76	0.83	21.10	13.25	7.02
1000	7.11	18.03	15.72	10.76	1.75	0.84	21.04	12.77	6.93
1500	7.29	17.81	14.80	11.21	1.63	0.88	21.68	12.89	6.55
2000	7.47	17.61	13.62	11.62	1.53	0.91	21.58	12.26	6.19
2500	7.62	17.45	12.71	11.58	1.52	0.88	21.95	12.70	6.12
3000	7.72	17.36	12.05	11.10	1.54	0.83	21.52	12.42	5.79
3500	7.82	17.30	12.17	10.29	1.49	0.81	22.01	12.76	5.39
4000	7.88	17.28	12.35	9.42	1.36	0.85	21.34	12.42	5.19
4500	7.98	17.24	13.17	8.78	1.29	0.84	21.79	12.69	5.11
5000	8.07	17.21	13.78	8.21	1.33	0.77	21.85	13.01	5.09
5500	8.19	17.17	13.79	7.92	1.38	0.69	21.65	12.81	4.88
6000	8.31	17.14	13.52	7.69	1.33	0.70	21.52	13.06	4.77
6500	8.40	17.14	13.17	7.41	1.20	0.76	21.80	13.21	4.78
7000	8.42	17.24	12.30	6.88	1.10	0.79	21.79	13.27	4.51
7500	8.41	17.36	11.49	6.50	1.16	0.72	21.59	12.95	4.50
8000	8.41	17.48	10.72	6.21	1.28	0.61	21.73	12.83	4.31
8500	8.47	17.55	10.33	6.16	1.28	0.61	21.91	13.31	4.48
9000	8.59	17.56	10.40	6.36	1.15	0.71	22.03	13.37	4.45
9500	8.73	17.58	10.81	6.59	1.05	0.80	21.59	13.50	4.39
10000	8.72	17.75	10.51	6.40	1.06	0.79	21.64	13.91	4.37
10500	8.71	17.94	10.15	6.28	1.21	0.68	21.67	13.55	4.66
11000	8.81	18.04	9.85	6.62	1.33	0.64	21.47	13.91	4.39
11500	9.02	18.01	10.29	7.29	1.31	0.69	21.38	13.67	4.80
12000	9.35	17.90	11.29	8.24	1.23	0.78	21.40	14.07	4.59
12500	9.65	17.82	12.93	8.87	1.18	0.82	21.24	14.22	4.57
13000	9.85	17.87	16.23	8.45	1.20	0.76	21.32	14.25	4.26
13500	9.94	18.02	19.93	7.67	1.25	0.66	20.94	14.29	4.01
14000	9.98	18.26	19.03	6.93	1.26	0.62	21.22	14.07	4.11
14500	10.16	18.37	18.90	7.03	1.21	0.66	21.15	14.14	3.89
15000	10.47	18.37	20.06	7.81	1.20	0.70	21.12	14.19	4.31
15500	10.84	18.32	22.47	9.44	1.23	0.73	20.94	14.37	4.11
16000	11.04	18.46	23.92	10.22	1.25	0.74	20.74	14.72	3.99
16500	11.05	18.82	41.37	8.91	1.26	0.70	20.76	14.16	4.14
17000	11.01	19.24	21.93	7.64	1.23	0.68	20.54	14.55	4.28
17500	11.15	19.52	18.53	7.45	1.20	0.71	20.54	13.40	4.33
18000	11.57	19.55	21.18	9.32	1.27	0.74	20.17	13.28	4.37
18500	11.92	19.69	14.41	13.17	1.32	0.83	19.77	13.12	4.70
19000	11.78	20.32	8.71	12.44	1.31	0.91	19.48	12.98	4.62
19500	11.44	21.18	6.56	9.37	1.23	0.97	18.96	12.62	4.26
20000	11.20	21.99	6.04	7.89	1.11	1.03	18.83	12.82	4.60
21000	11.36	23.09	7.26	8.66	1.37	1.02	17.82	12.91	4.37
22000	10.91	25.11	10.97	6.46	2.01	0.74	17.35	12.13	4.86
23000	9.33	28.40	11.64	3.95	2.60	0.59	16.91	10.96	5.18
24000	7.90	31.20	6.90	4.23	3.46	0.75	17.48	11.34	6.37



## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 58.96mA @ Temperature = -55°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.91	18.59	10.12	9.56	1.73	0.88	22.62	12.98	7.93
300	7.02	18.36	12.69	9.73	1.75	0.84	22.08	12.91	7.35
400	7.09	18.24	14.39	9.98	1.75	0.83	22.64	12.90	7.12
500	7.11	18.18	15.41	9.85	1.75	0.82	23.21	12.76	6.99
600	7.12	18.14	15.82	9.86	1.75	0.81	23.37	12.86	6.72
700	7.16	18.08	15.81	10.13	1.74	0.82	23.56	12.88	6.60
800	7.19	18.02	15.98	10.27	1.73	0.82	24.04	12.86	6.52
900	7.22	17.97	15.83	10.39	1.72	0.82	23.64	13.00	6.60
1000	7.27	17.91	15.62	10.65	1.70	0.83	23.88	12.55	6.16
1500	7.45	17.68	14.85	11.19	1.59	0.87	24.29	12.64	6.12
2000	7.63	17.48	13.66	11.59	1.49	0.90	24.08	12.07	5.50
2500	7.78	17.34	12.66	11.53	1.48	0.87	24.17	12.50	5.53
3000	7.88	17.27	11.97	11.06	1.51	0.82	23.22	12.21	5.23
3500	7.95	17.23	12.01	10.22	1.46	0.81	23.68	12.55	5.26
4000	8.02	17.22	12.26	9.36	1.33	0.85	22.63	12.24	4.73
4500	8.12	17.19	13.09	8.73	1.27	0.84	23.14	12.51	4.59
5000	8.21	17.18	13.67	8.16	1.31	0.76	22.85	12.85	4.56
5500	8.34	17.13	13.71	7.95	1.36	0.69	22.62	12.66	4.03
6000	8.46	17.11	13.51	7.73	1.32	0.69	22.42	12.85	4.22
6500	8.55	17.12	13.14	7.44	1.18	0.76	22.60	12.98	4.01
7000	8.56	17.23	12.36	6.88	1.09	0.78	22.48	13.03	4.01
7500	8.58	17.33	11.63	6.52	1.15	0.71	22.44	12.73	4.04
8000	8.57	17.46	10.82	6.19	1.27	0.61	22.31	12.64	3.96
8500	8.64	17.53	10.51	6.20	1.27	0.61	22.43	13.13	4.23
9000	8.76	17.54	10.57	6.40	1.14	0.71	22.51	13.17	4.04
9500	8.90	17.57	10.93	6.57	1.03	0.80	22.18	13.35	3.86
10000	8.88	17.76	10.49	6.32	1.05	0.78	22.09	13.73	4.00
10500	8.86	17.97	10.02	6.17	1.20	0.68	22.23	13.36	4.00
11000	8.95	18.07	9.68	6.52	1.32	0.63	21.97	13.71	4.06
11500	9.19	18.03	10.12	7.30	1.30	0.69	22.04	13.40	4.21
12000	9.52	17.89	11.22	8.30	1.21	0.78	21.91	13.75	3.86
12500	9.82	17.83	12.84	8.85	1.16	0.82	21.75	13.88	3.82
13000	10.00	17.89	16.27	8.30	1.19	0.75	21.63	13.87	3.94
13500	10.08	18.06	19.67	7.45	1.24	0.65	21.30	13.95	3.71
14000	10.12	18.31	18.66	6.76	1.24	0.61	21.46	13.72	3.91
14500	10.31	18.39	19.04	7.00	1.20	0.65	21.36	13.85	3.88
15000	10.67	18.35	20.69	8.10	1.20	0.70	21.20	13.87	3.75
15500	11.02	18.31	22.11	9.85	1.23	0.73	21.08	14.02	3.96
16000	11.21	18.47	23.10	10.35	1.24	0.74	20.80	14.36	3.81
16500	11.19	18.87	31.95	8.49	1.24	0.69	20.80	13.92	3.79
17000	11.16	19.30	20.41	7.21	1.20	0.68	20.30	14.15	3.73
17500	11.32	19.55	17.75	7.10	1.17	0.71	20.21	13.05	4.13
18000	11.78	19.53	22.07	9.42	1.26	0.74	19.64	12.84	4.14
18500	12.16	19.67	14.44	13.96	1.31	0.82	19.38	12.73	4.60
19000	12.01	20.31	8.66	12.83	1.30	0.90	19.35	12.55	4.54
19500	11.63	21.18	6.56	9.47	1.22	0.96	19.06	12.28	4.11
20000	11.40	21.97	6.15	8.08	1.12	1.03	19.09	12.45	4.28
21000	11.51	23.13	7.33	8.65	1.36	1.01	18.11	12.59	3.87
22000	10.86	25.44	10.48	5.67	2.02	0.71	17.43	11.37	4.19
23000	9.26	28.76	10.66	3.66	2.64	0.58	16.84	10.40	4.54
24000	7.95	31.47	6.47	4.26	3.53	0.78	17.59	10.64	6.26

## 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 = 64.83mA @ Temperature = -55°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.29	18.66	10.13	9.90	1.86	0.90	18.78	13.43	8.73
300	6.40	18.46	12.80	10.05	1.88	0.86	18.66	13.33	8.26
400	6.46	18.36	14.61	10.28	1.89	0.85	18.73	13.33	8.05
500	6.45	18.34	15.72	10.12	1.90	0.84	18.66	13.19	8.05
600	6.45	18.33	16.15	10.09	1.90	0.83	19.24	13.26	7.86
700	6.48	18.30	16.17	10.33	1.90	0.84	19.27	13.27	7.96
800	6.49	18.27	16.35	10.46	1.90	0.84	19.26	13.25	7.70
900	6.52	18.24	16.17	10.54	1.89	0.84	19.06	13.41	7.80
1000	6.55	18.19	15.96	10.81	1.88	0.85	18.82	12.96	7.66
1500	6.70	18.01	15.10	11.33	1.77	0.89	19.00	13.05	7.71
2000	6.87	17.83	13.87	11.78	1.67	0.92	18.68	12.44	7.04
2500	7.02	17.68	12.88	11.79	1.65	0.90	19.16	12.86	7.09
3000	7.13	17.59	12.23	11.36	1.66	0.86	19.01	12.53	6.95
3500	7.22	17.53	12.31	10.49	1.60	0.84	19.35	12.91	6.63
4000	7.29	17.49	12.59	9.58	1.48	0.87	19.18	12.58	6.37
4500	7.38	17.45	13.43	8.88	1.40	0.86	19.49	12.83	6.26
5000	7.47	17.41	14.02	8.26	1.43	0.79	19.87	13.15	5.89
5500	7.60	17.35	14.02	8.02	1.48	0.72	19.69	12.94	5.76
6000	7.72	17.30	13.77	7.79	1.42	0.72	19.80	13.17	5.72
6500	7.81	17.30	13.39	7.50	1.29	0.78	19.96	13.37	5.78
7000	7.82	17.38	12.58	6.93	1.19	0.80	20.04	13.38	5.45
7500	7.84	17.47	11.81	6.58	1.25	0.74	19.86	13.08	5.45
8000	7.82	17.60	10.96	6.24	1.36	0.64	20.05	12.92	5.35
8500	7.88	17.65	10.59	6.23	1.36	0.64	20.23	13.39	5.41
9000	8.00	17.65	10.61	6.43	1.24	0.73	20.29	13.39	5.46
9500	8.13	17.67	10.93	6.61	1.12	0.81	20.07	13.54	5.15
10000	8.10	17.85	10.48	6.37	1.13	0.80	20.24	13.96	5.37
10500	8.07	18.05	9.99	6.24	1.28	0.71	20.09	13.66	5.74
11000	8.14	18.15	9.57	6.58	1.41	0.67	20.02	14.07	5.26
11500	8.36	18.11	9.95	7.36	1.40	0.72	19.75	13.87	5.41
12000	8.69	17.97	10.99	8.36	1.31	0.81	19.88	14.29	5.59
12500	8.99	17.88	12.60	8.96	1.26	0.84	19.85	14.42	5.38
13000	9.17	17.93	15.92	8.40	1.27	0.78	20.13	14.45	5.13
13500	9.24	18.10	19.06	7.53	1.33	0.69	19.96	14.50	4.94
14000	9.26	18.35	18.10	6.83	1.34	0.64	20.11	14.33	4.92
14500	9.42	18.46	18.13	7.02	1.30	0.68	20.11	14.36	4.87
15000	9.75	18.44	19.36	8.05	1.30	0.73	20.05	14.46	5.17
15500	10.09	18.39	21.45	9.76	1.32	0.77	19.85	14.57	5.39
16000	10.27	18.53	24.21	10.40	1.35	0.78	19.86	14.95	4.81
16500	10.24	18.91	33.39	8.65	1.36	0.73	19.77	14.36	5.12
17000	10.15	19.38	19.96	7.29	1.33	0.71	19.84	14.75	5.03
17500	10.21	19.70	16.81	7.00	1.29	0.74	19.52	13.61	5.16
18000	10.58	19.76	19.01	8.75	1.37	0.78	19.26	13.53	5.39
18500	10.93	19.89	14.78	11.84	1.43	0.85	18.72	13.39	5.43
19000	10.89	20.39	9.53	12.04	1.42	0.93	18.42	13.23	5.61
19500	10.66	21.09	7.29	9.87	1.34	0.99	17.90	12.92	5.26
20000	10.52	21.77	6.75	8.62	1.26	1.04	17.86	13.08	5.41
21000	10.63	22.82	7.80	9.25	1.53	1.01	17.22	13.12	5.22
22000	10.01	24.90	10.73	6.22	2.15	0.75	16.90	12.52	5.80
23000	8.51	27.88	10.35	4.12	2.75	0.63	16.48	11.93	6.53
24000	7.19	30.38	6.24	4.74	3.54	0.84	17.22	12.42	7.58

## 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 = 5.00V, Id = 35.06mA @ Temperature = +100°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.57	17.93	9.99	10.86	1.72	0.91	23.57	9.15	8.88
300	6.70	17.64	12.49	11.56	1.73	0.88	23.43	8.90	8.39
400	6.72	17.52	14.16	11.66	1.74	0.86	22.50	8.96	8.03
500	6.72	17.45	14.96	11.73	1.74	0.85	21.96	8.73	7.80
600	6.73	17.38	15.22	12.17	1.74	0.86	22.01	8.76	7.50
700	6.75	17.32	15.44	12.39	1.73	0.86	21.99	8.77	7.36
800	6.75	17.28	15.41	12.50	1.73	0.86	21.79	8.75	7.17
900	6.76	17.23	15.13	12.80	1.72	0.86	21.93	8.95	7.24
1000	6.78	17.19	14.96	13.03	1.71	0.87	21.30	8.44	7.09
1500	6.86	17.03	13.67	13.78	1.62	0.91	20.98	8.56	6.78
2000	6.93	16.94	12.55	13.51	1.54	0.94	20.11	8.05	6.28
2500	6.98	16.91	11.81	12.59	1.55	0.90	20.56	8.47	6.35
3000	7.01	16.92	11.42	11.48	1.58	0.85	19.84	7.97	6.23
3500	7.04	16.95	11.43	10.61	1.53	0.85	20.70	8.71	5.78
4000	7.08	16.97	11.70	9.93	1.42	0.89	20.32	8.26	5.60
4500	7.16	16.98	12.15	9.39	1.37	0.89	20.59	8.57	5.57
5000	7.22	17.01	12.55	8.85	1.42	0.82	20.22	8.42	5.46
5500	7.28	17.06	12.84	8.32	1.49	0.74	20.12	8.22	5.07
6000	7.32	17.12	12.77	7.89	1.45	0.74	20.45	8.52	5.01
6500	7.38	17.18	12.53	7.56	1.32	0.80	20.45	8.69	5.15
7000	7.44	17.26	12.03	7.35	1.24	0.83	20.76	8.82	5.04
7500	7.49	17.34	11.56	7.22	1.31	0.78	21.16	9.16	5.02
8000	7.53	17.44	11.02	7.17	1.42	0.71	21.29	9.14	4.84
8500	7.56	17.58	10.50	7.07	1.43	0.70	21.07	9.13	4.99
9000	7.56	17.73	10.04	7.06	1.32	0.79	21.20	9.42	4.85
9500	7.56	17.93	9.55	7.10	1.20	0.88	21.13	9.26	5.00
10000	7.61	18.07	9.34	7.43	1.24	0.90	21.18	9.36	5.14
10500	7.75	18.15	9.50	8.11	1.40	0.84	21.40	9.75	5.18
11000	7.95	18.17	10.07	8.85	1.53	0.80	21.14	9.61	4.98
11500	8.14	18.20	11.14	9.16	1.53	0.80	21.30	9.80	5.04
12000	8.30	18.28	12.63	8.96	1.45	0.83	20.96	9.55	5.15
12500	8.46	18.38	14.31	8.59	1.39	0.84	21.05	9.63	4.86
13000	8.60	18.51	15.30	8.37	1.41	0.80	21.12	9.76	4.86
13500	8.80	18.61	16.05	8.63	1.49	0.77	21.29	9.84	4.93
14000	9.05	18.68	17.21	9.32	1.52	0.76	21.38	10.15	4.91
14500	9.27	18.78	19.75	9.97	1.52	0.78	21.44	10.27	4.67
15000	9.44	18.96	24.68	10.15	1.51	0.80	21.31	10.18	5.00
15500	9.47	19.28	28.80	9.41	1.53	0.79	21.26	10.23	4.84
16000	9.43	19.69	19.33	8.49	1.57	0.75	21.05	9.90	4.86
16500	9.41	20.11	15.50	8.29	1.63	0.75	21.12	10.39	4.90
17000	9.61	20.37	14.91	9.59	1.68	0.81	20.44	9.78	5.17
17500	9.84	20.57	14.46	13.07	1.75	0.88	20.69	10.00	5.24
18000	9.94	20.95	12.20	16.34	1.81	0.94	19.87	9.24	5.20
18500	9.79	21.62	9.63	12.48	1.85	0.94	19.16	8.65	5.37
19000	9.55	22.37	8.46	9.66	1.90	0.92	18.74	8.37	5.40
19500	9.36	23.06	8.27	8.58	1.93	0.92	18.28	8.33	5.05
20000	9.31	23.68	9.05	8.10	1.97	0.94	18.15	8.54	5.57
21000	8.85	25.29	10.98	7.14	2.43	0.88	18.33	8.72	5.54
22000	7.62	27.89	14.18	5.12	3.52	0.70	17.93	8.19	5.61
23000	6.16	30.37	10.40	4.53	4.99	0.68	17.01	7.91	6.52
24000	4.98	32.31	6.13	5.80	6.39	0.92	18.00	8.52	7.50

## Typical Performance Data

**Definitions:**

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75V, Id = 32.91mA @ Temperature = +100°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.57	17.72	10.01	11.04	1.69	0.91	21.35	8.70	9.21
300	6.69	17.40	12.51	11.78	1.70	0.88	21.02	8.46	8.28
400	6.71	17.27	14.07	11.94	1.70	0.86	20.90	8.54	7.62
500	6.71	17.19	14.76	12.16	1.71	0.86	20.56	8.31	7.48
600	6.72	17.13	14.95	12.62	1.71	0.86	20.60	8.49	7.09
700	6.73	17.08	15.11	12.86	1.70	0.86	20.72	8.50	6.92
800	6.74	17.04	15.02	13.06	1.70	0.86	20.58	8.48	6.74
900	6.75	17.00	14.74	13.41	1.69	0.87	20.80	8.56	6.68
1000	6.77	16.97	14.57	13.64	1.68	0.88	20.37	8.18	6.50
1500	6.85	16.86	13.31	14.33	1.59	0.92	20.29	8.30	6.19
2000	6.92	16.82	12.28	13.76	1.52	0.94	19.51	7.68	5.91
2500	6.97	16.82	11.63	12.71	1.53	0.91	19.95	8.09	5.84
3000	7.00	16.85	11.29	11.57	1.57	0.85	19.22	7.60	5.91
3500	7.04	16.89	11.32	10.73	1.52	0.85	20.12	8.34	5.49
4000	7.10	16.92	11.58	10.08	1.41	0.89	19.72	8.01	5.51
4500	7.18	16.93	12.00	9.56	1.36	0.89	19.94	8.20	5.20
5000	7.23	16.98	12.30	8.95	1.42	0.82	19.55	8.05	5.06
5500	7.28	17.04	12.60	8.37	1.49	0.74	19.52	7.86	5.00
6000	7.32	17.11	12.60	7.93	1.45	0.74	19.83	8.14	4.89
6500	7.37	17.19	12.42	7.58	1.32	0.80	19.93	8.32	4.95
7000	7.44	17.27	11.97	7.38	1.24	0.83	20.20	8.57	4.88
7500	7.50	17.34	11.55	7.31	1.31	0.78	20.72	8.81	4.70
8000	7.55	17.44	11.05	7.29	1.43	0.71	20.84	8.90	4.50
8500	7.58	17.57	10.55	7.20	1.44	0.71	20.65	8.89	4.85
9000	7.58	17.73	10.04	7.19	1.32	0.80	20.78	9.08	4.71
9500	7.56	17.95	9.52	7.17	1.20	0.89	20.81	8.91	4.61
10000	7.61	18.10	9.26	7.49	1.24	0.90	20.74	9.00	4.93
10500	7.75	18.17	9.37	8.30	1.41	0.86	21.01	9.51	4.80
11000	7.96	18.18	9.96	9.17	1.53	0.81	20.74	9.25	4.95
11500	8.17	18.21	11.09	9.52	1.54	0.81	20.91	9.45	4.78
12000	8.33	18.29	12.80	9.20	1.47	0.83	20.57	9.29	5.00
12500	8.47	18.41	14.95	8.61	1.41	0.83	20.68	9.26	4.77
13000	8.59	18.56	16.02	8.23	1.43	0.79	20.76	9.38	4.57
13500	8.78	18.67	16.30	8.51	1.50	0.76	21.05	9.58	4.69
14000	9.03	18.74	16.98	9.30	1.53	0.76	21.09	9.78	4.78
14500	9.28	18.81	18.97	10.42	1.54	0.79	21.10	9.92	4.58
15000	9.48	18.97	22.45	10.98	1.53	0.82	20.98	9.82	4.56
15500	9.50	19.30	32.50	10.11	1.55	0.80	20.95	9.88	4.91
16000	9.43	19.74	20.63	8.78	1.59	0.76	20.78	9.56	4.58
16500	9.34	20.24	15.30	8.16	1.65	0.76	20.86	10.04	4.92
17000	9.48	20.55	14.19	9.06	1.69	0.81	20.20	9.43	5.06
17500	9.70	20.76	13.98	12.02	1.78	0.88	20.38	9.63	5.27
18000	9.79	21.14	12.01	14.96	1.86	0.93	19.54	8.85	5.22
18500	9.56	21.90	9.25	11.28	1.90	0.93	18.80	8.26	5.53
19000	9.19	22.78	7.89	8.48	1.96	0.90	18.47	7.98	5.43
19500	8.93	23.53	7.68	7.55	2.00	0.90	17.97	7.92	5.05
20000	8.92	24.11	8.58	7.44	2.06	0.92	18.11	8.13	5.84
21000	8.81	25.34	11.05	8.04	2.57	0.92	18.44	8.37	5.61
22000	7.71	27.72	14.89	5.81	3.64	0.75	18.15	7.99	5.48
23000	6.05	30.32	11.76	4.40	5.04	0.66	17.36	7.58	6.15
24000	4.67	32.07	6.86	5.30	6.46	0.86	18.58	8.20	6.94

## Typical Performance Data

### Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

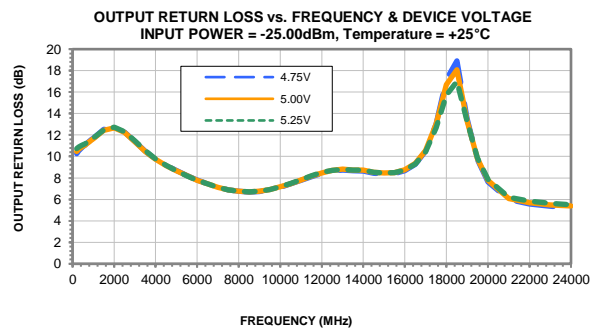
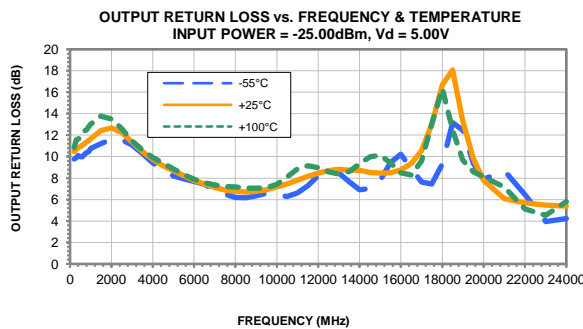
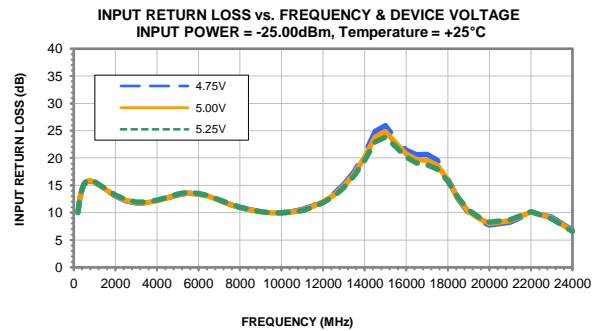
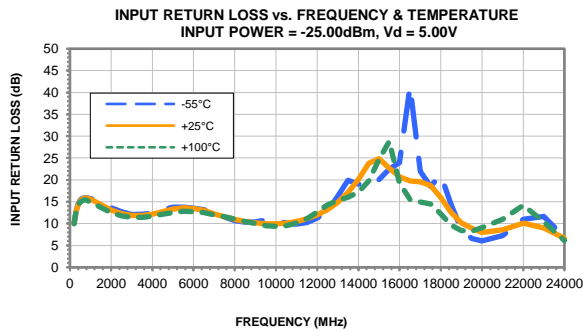
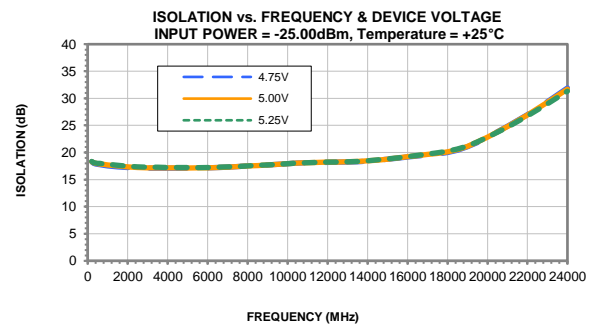
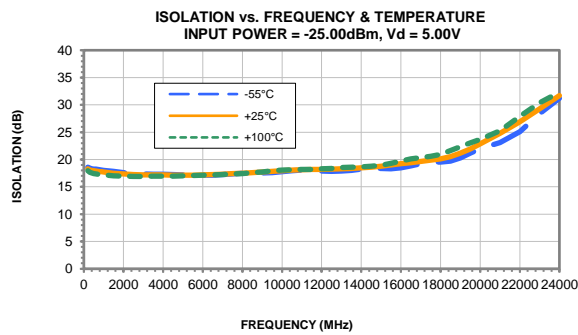
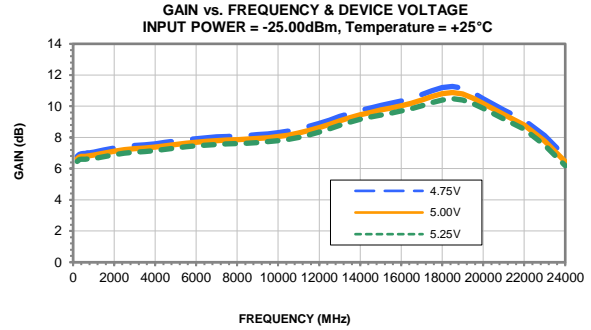
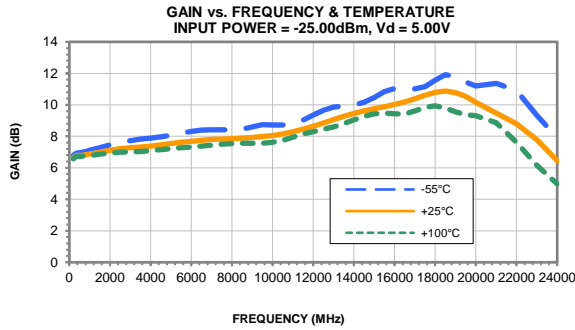
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

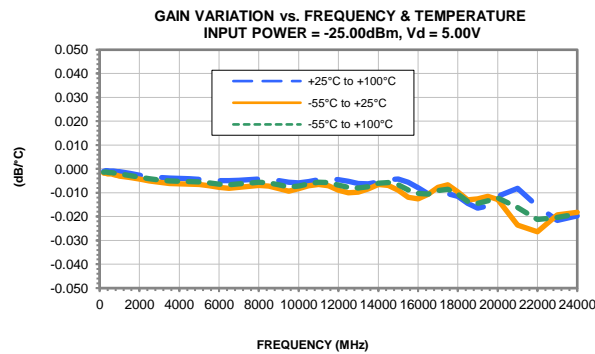
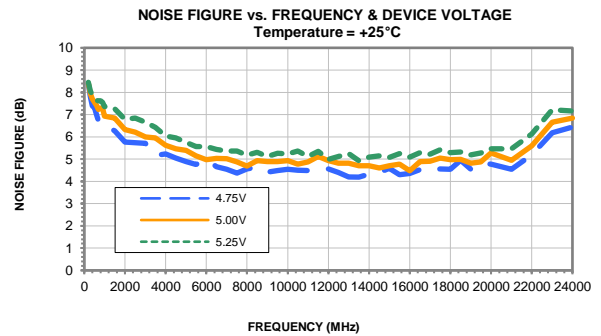
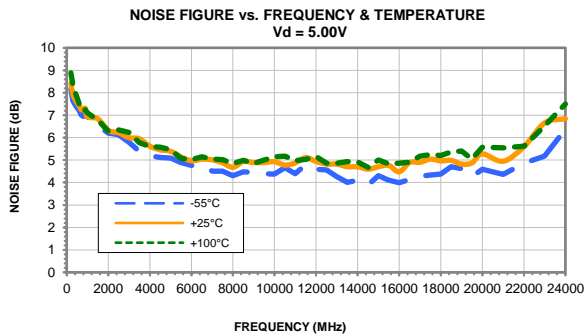
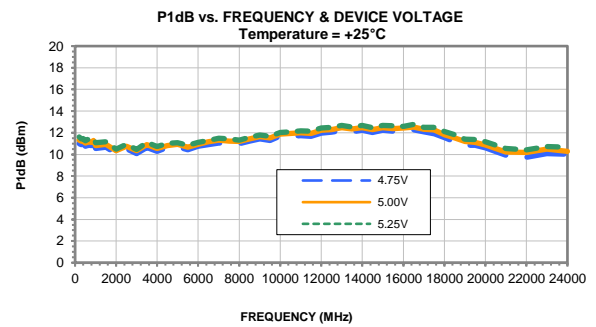
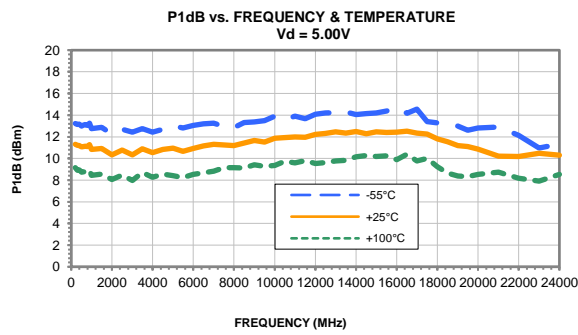
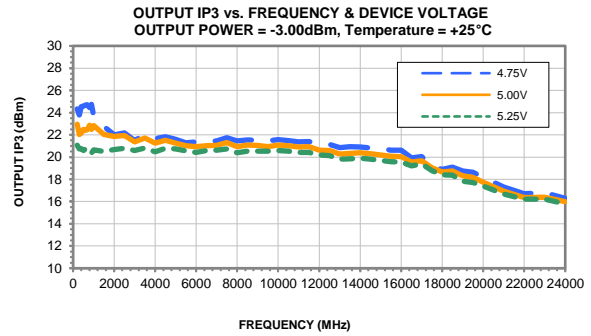
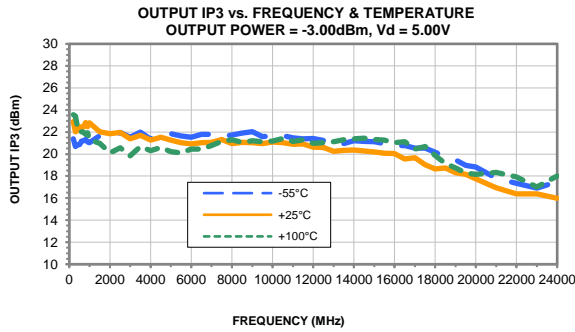
TEST CONDITIONS: Vd = 5.25V, Id = 36.37mA @ Temperature = +100°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
200	6.39	17.84	9.98	11.32	1.74	0.92	24.25	9.50	8.62
300	6.52	17.58	12.56	11.88	1.76	0.89	24.08	9.25	8.18
400	6.55	17.48	14.17	11.93	1.77	0.87	23.38	9.18	8.10
500	6.55	17.42	14.92	12.11	1.77	0.86	22.67	9.06	7.93
600	6.56	17.36	15.18	12.51	1.77	0.87	22.80	9.07	7.68
700	6.57	17.31	15.35	12.70	1.77	0.87	22.82	9.07	7.66
800	6.57	17.26	15.26	12.91	1.76	0.87	22.51	9.04	7.58
900	6.58	17.22	15.00	13.22	1.75	0.87	22.80	9.13	7.55
1000	6.59	17.18	14.85	13.45	1.74	0.88	21.77	8.75	7.46
1500	6.66	17.01	13.54	14.14	1.65	0.92	21.17	8.83	7.33
2000	6.71	16.93	12.46	13.59	1.57	0.95	20.32	8.21	6.79
2500	6.75	16.88	11.77	12.55	1.57	0.91	20.75	8.62	6.90
3000	6.76	16.89	11.39	11.43	1.61	0.85	20.04	8.12	6.80
3500	6.78	16.91	11.40	10.61	1.56	0.85	20.96	8.86	6.15
4000	6.83	16.92	11.65	9.98	1.45	0.89	20.62	8.51	6.19
4500	6.89	16.93	12.04	9.47	1.40	0.89	20.80	8.71	6.00
5000	6.93	16.97	12.33	8.88	1.45	0.83	20.40	8.55	5.70
5500	6.98	17.02	12.63	8.31	1.52	0.75	20.27	8.36	5.57
6000	7.02	17.08	12.63	7.86	1.48	0.74	20.74	8.76	5.53
6500	7.06	17.16	12.46	7.52	1.35	0.80	20.65	8.82	5.54
7000	7.12	17.23	12.01	7.34	1.27	0.84	20.96	9.05	5.37
7500	7.19	17.30	11.57	7.29	1.34	0.79	21.47	9.30	5.29
8000	7.23	17.39	11.05	7.29	1.46	0.72	21.53	9.38	5.12
8500	7.26	17.53	10.54	7.22	1.47	0.72	21.36	9.35	5.24
9000	7.26	17.69	10.01	7.22	1.36	0.80	21.38	9.54	5.40
9500	7.24	17.90	9.46	7.21	1.24	0.89	21.41	9.40	5.31
10000	7.28	18.06	9.16	7.53	1.27	0.91	21.43	9.48	5.42
10500	7.42	18.14	9.24	8.36	1.44	0.87	21.70	9.99	5.55
11000	7.62	18.15	9.78	9.27	1.57	0.83	21.43	9.74	5.55
11500	7.84	18.18	10.88	9.65	1.58	0.82	21.61	9.94	5.39
12000	8.00	18.26	12.59	9.30	1.51	0.84	21.16	9.76	5.03
12500	8.14	18.38	14.73	8.69	1.45	0.84	21.18	9.74	5.20
13000	8.25	18.54	15.77	8.30	1.47	0.80	21.24	9.94	5.06
13500	8.43	18.66	15.95	8.56	1.54	0.77	21.64	10.06	5.21
14000	8.67	18.74	16.41	9.39	1.59	0.78	21.63	10.36	4.94
14500	8.92	18.82	18.19	10.58	1.59	0.81	21.75	10.50	5.25
15000	9.12	18.98	21.25	11.28	1.59	0.83	21.49	10.41	5.11
15500	9.15	19.30	29.69	10.37	1.61	0.82	21.50	10.46	5.37
16000	9.07	19.76	20.85	8.98	1.66	0.78	21.35	10.15	5.27
16500	8.95	20.29	15.19	8.28	1.72	0.77	21.56	10.58	5.43
17000	9.05	20.64	13.79	9.08	1.77	0.82	20.85	10.02	5.50
17500	9.24	20.89	13.37	11.80	1.87	0.89	21.10	10.17	5.69
18000	9.32	21.28	11.74	14.38	1.96	0.94	20.10	9.54	5.84
18500	9.10	22.03	9.25	11.09	2.01	0.94	19.09	8.97	6.00
19000	8.74	22.89	7.98	8.41	2.06	0.90	18.65	8.59	6.16
19500	8.49	23.63	7.79	7.47	2.11	0.90	18.06	8.50	5.44
20000	8.50	24.19	8.75	7.41	2.19	0.92	18.13	8.69	5.97
21000	8.45	25.35	11.32	8.29	2.73	0.92	18.15	8.94	5.81
22000	7.38	27.69	14.73	6.06	3.82	0.77	17.73	8.48	6.19
23000	5.69	30.30	11.71	4.46	5.27	0.66	17.06	8.01	6.66
24000	4.27	32.10	6.90	5.25	6.79	0.85	18.02	8.68	8.12

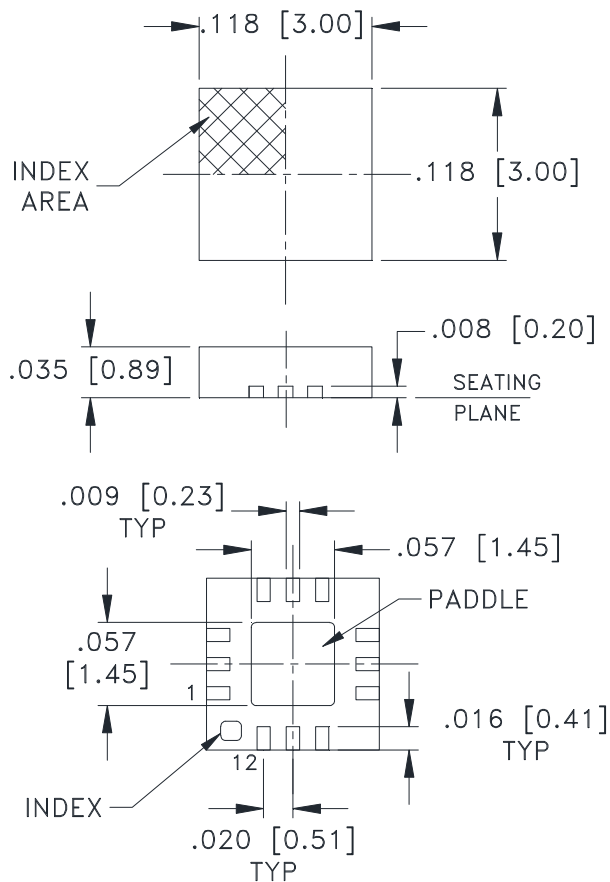
## Typical Performance Curves



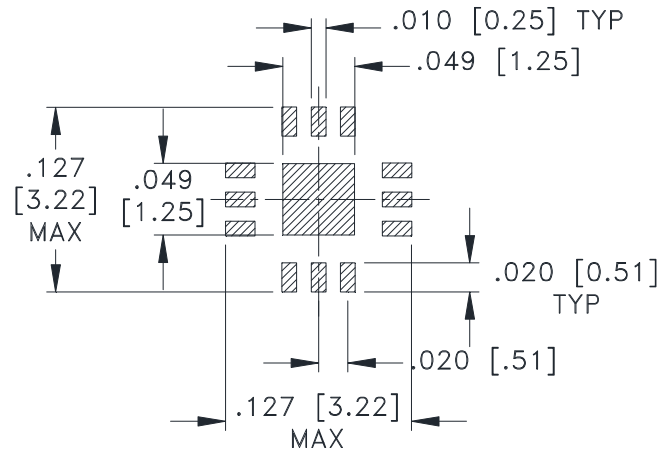
## Typical Performance Curves



### Outline Dimensions



### PCB Land Pattern



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

**Weight: .02 Grams**

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

### Notes:

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 Data sheet.
  - For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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# Tape & Reel Packaging TR-F66



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

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

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

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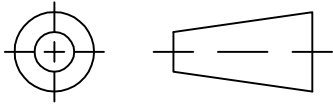
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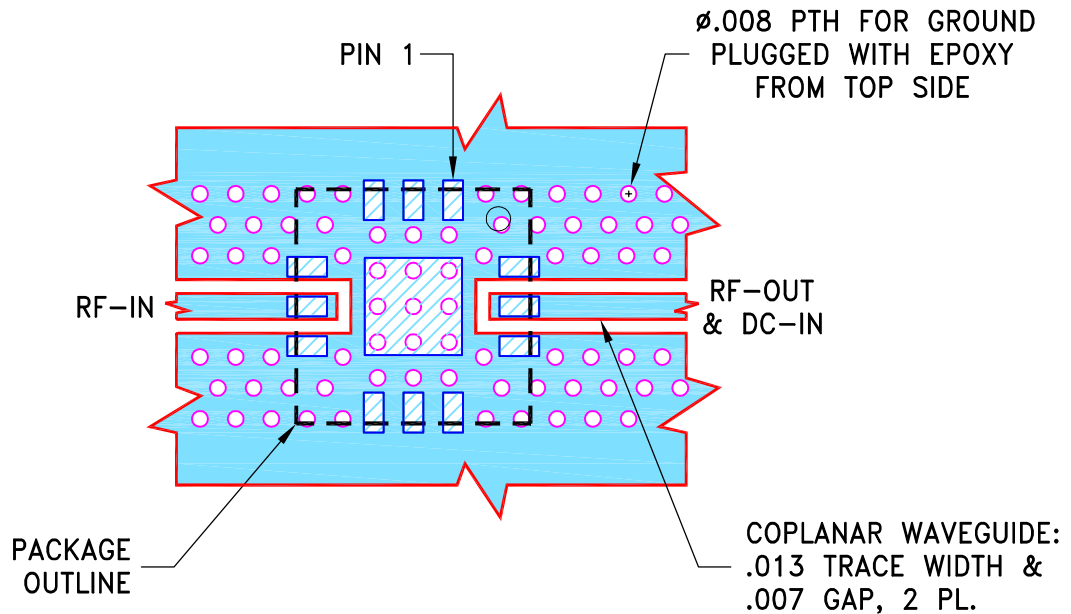
THIRD ANGLE PROJECTION



REVISIONS

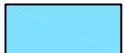
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-001427	NEW RELEASE	01/15/20	ITG	IL

SUGGESTED MOUNTING CONFIGURATION  
FOR DQ1225 CASE STYLE



NOTES:

1. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS  $.0066 \pm .0007$ ". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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 ITG	01/15/20
TOLERANCES ON:	CHECKED GF	01/15/20
2 PL DECIMALS $\pm$	APPROVED IL	01/15/20
3 PL DECIMALS $\pm$ .005		
ANGLES $\pm$		
FRACTIONS $\pm$		



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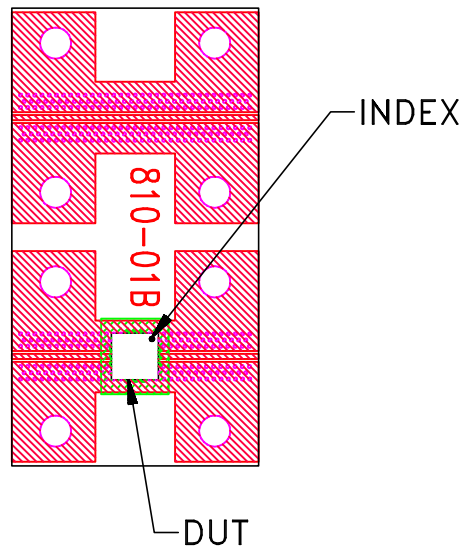
13 Neptune Avenue  
Brooklyn NY 11235

PL, DQ1225, TB-AVA-183P+

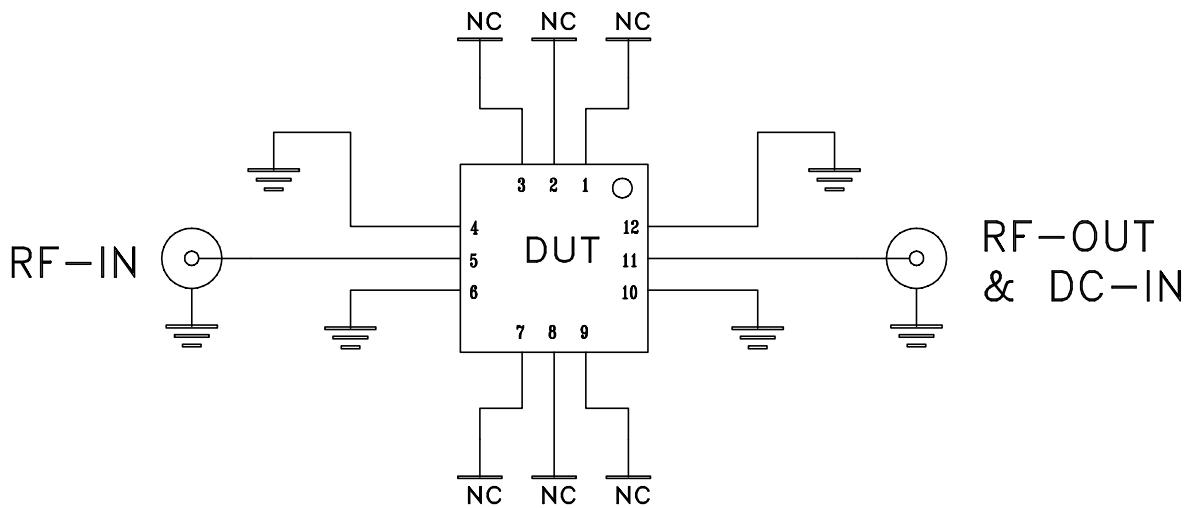
SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-666	REV: OR
FILE: 98PL666	SCALE: 10:1	SHEET: 1 OF 1	

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# Evaluation Board and Circuit




EVAL BOARD FOR AVA-183P+



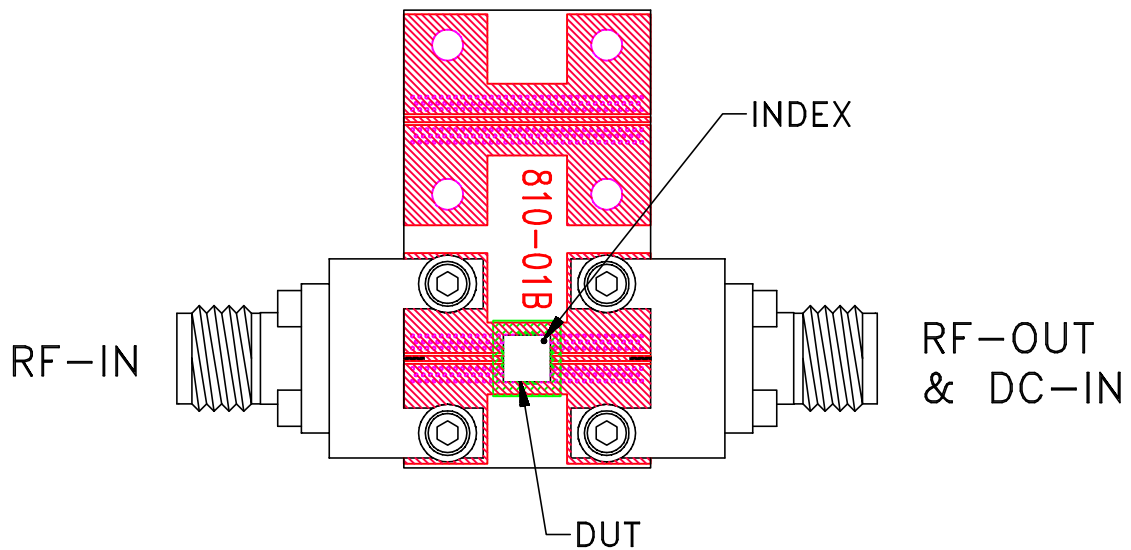
Schematic Diagram

## Notes:

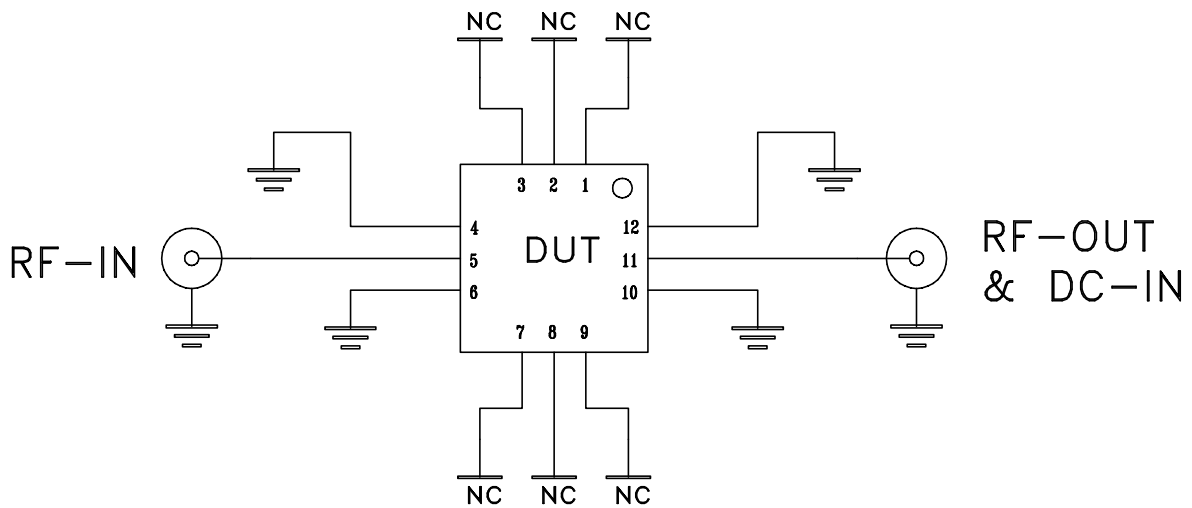
1. 50 Ohm 2.92 mm Female connectors.
2. PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.0066 inch.

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# Evaluation Board and Circuit




EVAL BOARD FOR AVA-183PC+



Schematic Diagram

## Notes:

1. 50 Ohm 2.92 mm Female connectors.
2. PCB Material: R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.0066 inch.

 **Mini-Circuits®**

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

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C or -45° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +	MIL-STD-202, Method 215



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