



FLAT GAIN, ULTRA-WIDEBAND

Monolithic Amplifier

PSA-14+

Mini-Circuits

50Ω 0.01 to 10 GHz

THE BIG DEAL

- Ultra broadband performance
- Broadband without external matching components
- May be used as a replacement to ADA-4743^{a,b}
- Suitable for low phase noise applications



Generic photo used for illustration purposes only

CASE STYLE: MMM1362

+RoHS Compliant

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

APPLICATIONS

- Base station infrastructure
- Test instruments
- MMDS & Wireless LAN
- LTE
- Satellite communication
- Avionics

PRODUCT OVERVIEW

PSA-14+ (RoHS compliant) is an advanced ultra-wideband amplifier fabricated using GaAs HBT technology and offers excellent gain flatness over a broad frequency range. In addition, the PSA-14+ has good input and output return loss over this frequency range without the need for external matching components. Lead finish is matte-tin. It has repeatable performance from lot to lot.

KEY FEATURES

Feature	Advantages
Ultra Broad Band: 0.01 to 10 GHz	Broadband covering primary wireless communications bands: Cellular, PCS, LTE, WiMAX in a single amplifier.
No External Matching Components Required	PSA-14+ provides good Input and Output Return Loss of 16-41dB over 0.05 - 8 GHz without the need for any external matching components
Excellent ESD HBM: class 1C (1000 to <2000V) MM: class M2 (100 to <200V)	Simplifies ESD handling.
Low additive phase noise, typically -164 dBc/Hz @10 KHz offset	Ideal for low phase noise synthesizer applications

A. Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, application, compatibility with other components and environmental conditions and stresses.

B. The ADA-4743 part number is used for identification and comparison purposes only.

REV. B
ECO-011279
PSA-14+
CM/RS/CP
220105



ELECTRICAL SPECIFICATIONS AT 25°C AND V_{CC}=5V, R=16.5Ω UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.01		10.0	GHz
Gain	0.05	-	16.2	-	dB
	0.85	-	17.1	-	
	2.0	14.8	16.5	18.1	
	6.0	-	14.1	-	
	8.0	-	13.7	-	
	10.0	-	12.8	-	
Gain Flatness	0.05-6.0		±1.7		dB
Input Return Loss	0.05	-	13.3	-	dB
	0.85	-	23.1	-	
	2.0	14	19.1	-	
	6.0	-	21.3	-	
	8.0	-	18.0	-	
	10.0	-	7.5	-	
Output Return Loss	0.05		14.1		dB
	0.85		30.0		
	2.0		34.9		
	6.0		18.4		
	8.0		18.9		
	10.0		8.7		
Reverse Isolation	6.0		21.8		dB
Output Power at 1dB Compression	0.05		16.7		dBm
	0.85		16.5		
	2.0		16.3		
	6.0		13.3		
	8.0		9.9		
	10.0		7.2		
Output IP3	0.2		29.6		dBm
	0.85		30.5		
	2.0		29.4		
	6.0		24.0		
	8.0		20.2		
	10.0		17.2		
Noise Figure	0.2		3.9		dB
	0.85		3.9		
	2.0		3.9		
	6.0		4.3		
	8.0		4.7		
	10.0		5.2		
Additive Phase Noise, 2.0 GHz, 10KHz offset			-164		dBc/Hz
Supply Operating Voltage (V _{CC})		4.8	5.0	5.2	V
Device Operating Current			47	57	mA
Device Current Variation vs. Temperature ²			42		μA/°C
Device Current Variation vs. Voltage			0.018		mA/mW
Thermal Resistance, junction-to-ground lead			156		°C/W

1. Measured on Mini-Circuits Characterization test board TB-PSA-14+. See Characterization Test Circuit (Fig. 1)

2. (Current at 85°C – Current at -45°C)/130

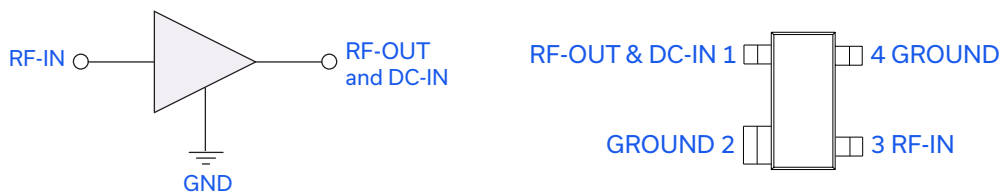


MAXIMUM RATINGS³

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Operating Current at 5V (Vcc) & 16.5Ω resistor	100 mA
Power Dissipation	0.34 W
Input Power (CW)	28 dBm (5 min max.) 11 dBm (continuous)
DC Voltage on Pin 1	6 V

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



CHARACTERIZATION TEST CIRCUIT

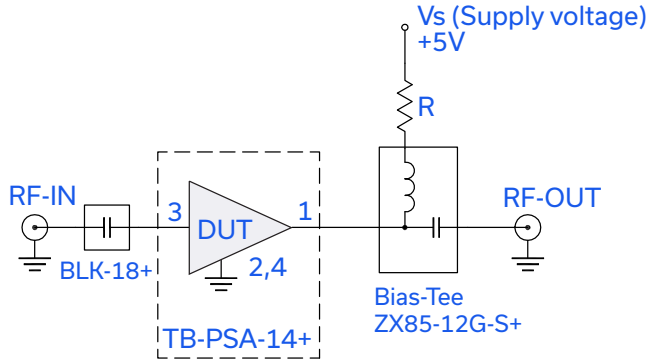


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-PSA-14+)

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. (R=16.5Ω)

Conditions:

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

RECOMMENDED APPLICATION CIRCUIT

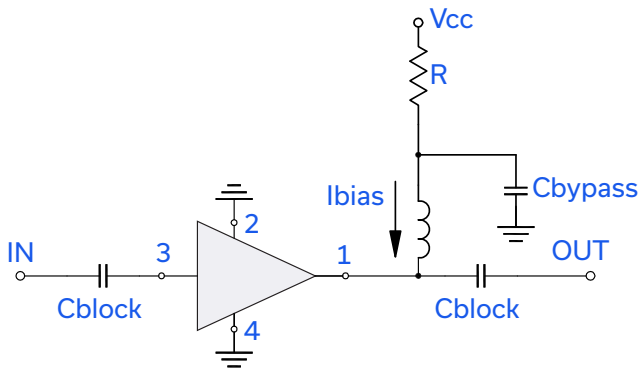
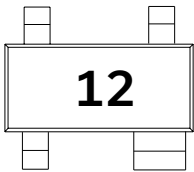


Fig 2. Test Board includes case, connectors, and components soldered to PCB (Cblock=0.001 μF, Cbypass=0.1 μF, R=16.5Ω)

PRODUCT MARKING



Marking may contain other features or characters for internal lot control



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

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MMM1362 (SOT 343) Plastic package, exposed paddle Lead finish: Matte-Tin
Tape & Reel Standard quantities available on reel	F90 7" reels with 20, 50, 100, 200, 500,1K,2K or 3K devices
Suggested Layout for PCB Design	PL-684
Evaluation Board	TB-PSA-14+
Environmental Ratings	ENV08T1

ESD RATING

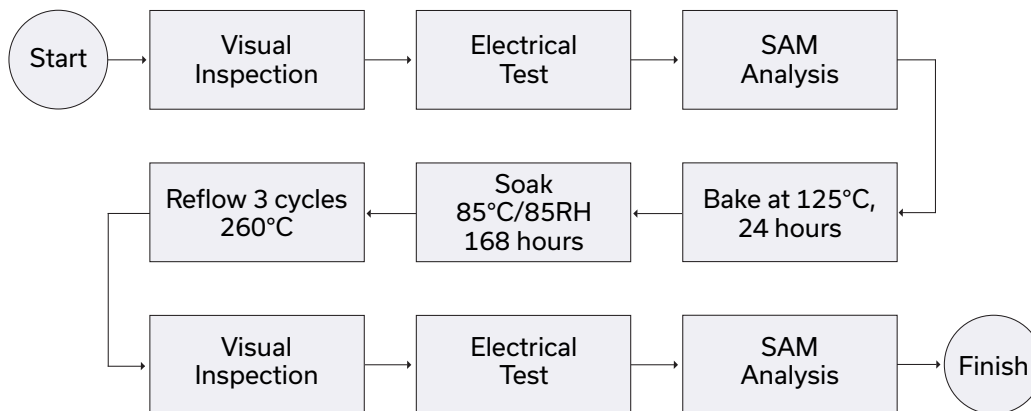
Human Body Model (HBM): Class 1C (1000 to <2000V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M2 (100 to <200V) in accordance with ANSI/ESD STM5.2-1999

MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

MSL TEST FLOW CHART



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

Typical Performance Data

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
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	14.82	22.66	11.41	11.26	1.20	0.88	16.90	15.40	7.26
50	16.43	20.67	13.86	14.06	1.08	0.60	20.92	16.18	5.47
100	17.46	19.67	17.71	18.98	1.03	0.38	29.54	14.93	4.33
150	17.67	19.51	22.12	23.76	1.02	0.34	29.43	15.07	3.96
200	17.67	19.54	26.10	27.28	1.02	0.35	29.17	15.23	3.87
250	17.64	19.61	29.32	29.24	1.03	0.36	29.74	15.76	3.75
300	17.60	19.66	31.05	29.60	1.03	0.38	28.77	15.48	3.79
350	17.57	19.71	31.50	29.64	1.03	0.39	29.55	15.86	3.80
400	17.53	19.75	31.19	29.29	1.03	0.40	29.39	15.87	3.71
450	17.50	19.78	30.31	28.99	1.03	0.41	29.98	15.85	3.73
500	17.48	19.80	29.21	28.90	1.03	0.41	29.83	15.98	3.82
550	17.45	19.81	28.33	28.86	1.03	0.42	29.19	15.95	3.74
600	17.43	19.83	27.40	28.86	1.04	0.43	29.94	15.97	3.74
650	17.41	19.84	26.57	29.01	1.04	0.43	29.77	15.91	3.82
700	17.39	19.85	25.84	29.05	1.04	0.43	29.89	15.88	3.75
750	17.38	19.85	25.19	29.27	1.04	0.44	29.46	16.05	3.75
800	17.36	19.86	24.61	29.40	1.04	0.44	29.67	16.03	3.85
850	17.35	19.87	24.04	29.52	1.04	0.44	30.61	16.15	3.79
900	17.33	19.87	23.55	29.65	1.04	0.45	30.16	16.00	3.73
950	17.30	19.88	23.16	29.75	1.04	0.45	29.68	15.77	3.89
1000	17.28	19.88	22.65	30.03	1.04	0.46	29.71	15.94	3.75
1500	17.07	19.91	19.85	31.96	1.04	0.49	29.64	15.74	3.84
2000	16.83	19.93	17.99	32.51	1.05	0.53	29.18	15.80	3.75
2500	16.53	19.98	16.76	30.88	1.06	0.57	28.55	15.59	3.76
3000	16.21	20.03	15.83	29.42	1.08	0.61	28.39	15.64	3.86
3500	15.88	20.12	15.38	29.35	1.09	0.65	28.12	15.43	3.82
4000	15.57	20.22	15.54	29.35	1.12	0.69	26.58	15.12	3.82
4500	15.29	20.34	16.05	25.13	1.14	0.72	26.33	14.62	3.83
5000	15.04	20.49	16.81	21.15	1.17	0.73	24.86	13.96	3.89
5500	14.87	20.71	18.19	18.92	1.21	0.74	24.43	13.63	3.94
6000	14.72	20.98	20.60	17.92	1.25	0.75	23.96	13.02	4.00
6500	14.61	21.34	25.03	17.91	1.30	0.77	24.18	12.66	4.11
7000	14.53	21.78	31.51	18.43	1.35	0.80	23.58	12.00	4.20
7500	14.43	22.40	23.53	18.65	1.42	0.84	23.27	10.94	4.37
8000	14.31	23.14	17.68	17.51	1.50	0.88	21.06	9.49	4.42
9000	13.97	24.73	10.69	12.18	1.55	0.98	19.49	8.49	4.63
10000	13.35	24.40	6.44	7.35	1.07	1.03	18.14	7.06	4.92
11000	12.39	21.60	3.80	4.54	0.39	1.03	14.52	5.51	5.19
12000	10.49	19.40	2.12	2.81	0.04	0.92	11.70	4.83	5.71

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
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)			(dBm)	(dBm)	(dB)
10	14.42	22.55	10.90	11.20	1.21	0.90	18.99	14.45	7.13
50	16.30	20.58	13.40	13.92	1.08	0.60	26.06	14.12	5.37
100	17.33	19.60	17.73	18.78	1.03	0.39	27.79	13.22	4.25
150	17.54	19.44	21.79	23.24	1.02	0.35	27.60	13.75	3.92
200	17.55	19.48	25.34	26.08	1.02	0.35	27.88	14.09	3.82
250	17.52	19.54	28.37	27.42	1.03	0.37	28.13	14.66	3.72
300	17.47	19.60	30.21	27.53	1.03	0.38	26.99	14.22	3.76
350	17.45	19.64	31.44	27.57	1.03	0.40	27.97	14.76	3.78
400	17.41	19.68	31.69	27.31	1.03	0.40	28.27	14.92	3.68
450	17.38	19.71	31.15	27.12	1.03	0.41	28.49	14.75	3.70
500	17.36	19.72	30.20	27.10	1.04	0.42	28.09	15.04	3.77
550	17.34	19.74	29.30	27.09	1.04	0.42	27.58	15.01	3.70
600	17.32	19.76	28.37	27.14	1.04	0.43	29.20	15.04	3.70
650	17.30	19.77	27.50	27.29	1.04	0.43	28.16	14.83	3.78
700	17.28	19.78	26.69	27.36	1.04	0.44	28.36	14.80	3.73
750	17.26	19.79	26.02	27.59	1.04	0.44	28.21	15.12	3.70
800	17.25	19.79	25.39	27.74	1.04	0.45	27.90	14.96	3.79
850	17.24	19.79	24.76	27.89	1.04	0.45	28.70	15.11	3.72
900	17.22	19.80	24.23	28.03	1.04	0.45	28.15	15.08	3.69
950	17.19	19.81	23.81	28.18	1.04	0.46	28.59	14.68	3.75
1000	17.17	19.81	23.27	28.44	1.04	0.46	28.62	15.02	3.71
1500	16.97	19.84	20.30	30.48	1.05	0.49	27.88	14.80	3.79
2000	16.72	19.87	18.32	31.14	1.06	0.53	28.13	14.74	3.69
2500	16.43	19.91	17.02	29.72	1.07	0.57	27.26	14.66	3.75
3000	16.11	19.98	16.06	28.96	1.08	0.61	27.25	14.75	3.80
3500	15.79	20.06	15.61	30.17	1.10	0.65	27.58	14.72	3.75
4000	15.48	20.15	15.81	32.45	1.12	0.69	26.44	14.43	3.78
4500	15.20	20.26	16.38	26.36	1.15	0.71	25.72	14.09	3.80
5000	14.95	20.42	17.19	21.39	1.18	0.73	24.50	13.45	3.80
5500	14.76	20.62	18.61	18.83	1.21	0.74	23.99	13.11	3.96
6000	14.60	20.89	21.01	17.57	1.25	0.75	23.63	12.62	3.98
6500	14.48	21.24	25.27	17.29	1.30	0.77	23.90	12.16	4.03
7000	14.38	21.66	29.77	17.52	1.35	0.79	23.25	11.50	4.12
7500	14.27	22.24	22.92	17.56	1.42	0.83	22.73	10.58	4.26
8000	14.14	22.95	17.53	16.60	1.49	0.88	20.49	9.26	4.40
9000	13.78	24.44	10.76	11.99	1.54	0.97	18.83	8.24	4.57
10000	13.17	24.27	6.56	7.42	1.09	1.03	17.48	6.81	4.81
11000	12.22	21.69	3.92	4.68	0.43	1.03	13.87	5.27	5.09
12000	10.37	19.53	2.21	2.92	0.07	0.93	11.10	4.59	5.56

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 = 5.25, Id = 48mA @ 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)
10	15.39	22.77	12.62	11.38	1.18	0.84	17.38	16.17	7.13
50	16.63	20.73	15.16	14.25	1.07	0.58	19.19	17.12	5.51
100	17.49	19.74	18.26	19.14	1.03	0.39	24.49	16.38	4.38
150	17.76	19.57	22.39	24.11	1.02	0.33	30.08	16.33	4.01
200	17.77	19.60	26.51	28.18	1.02	0.34	30.99	16.31	3.91
250	17.74	19.67	29.64	30.92	1.02	0.36	31.26	16.51	3.83
300	17.69	19.73	30.94	31.66	1.03	0.37	30.00	16.37	3.85
350	17.66	19.77	30.74	31.78	1.03	0.39	30.49	16.58	3.88
400	17.62	19.80	30.16	31.28	1.03	0.40	31.47	16.72	3.77
450	17.59	19.83	29.24	30.83	1.03	0.40	30.80	16.70	4.05
500	17.57	19.85	28.16	30.68	1.03	0.41	31.16	16.81	3.87
550	17.54	19.87	27.36	30.55	1.03	0.42	30.73	16.78	3.77
600	17.52	19.88	26.50	30.47	1.03	0.42	31.05	16.80	3.79
650	17.50	19.89	25.74	30.57	1.03	0.43	31.83	16.75	3.85
700	17.48	19.90	25.08	30.57	1.04	0.43	31.31	16.73	3.83
750	17.46	19.91	24.50	30.75	1.04	0.44	31.51	16.86	3.78
800	17.45	19.92	23.94	30.81	1.04	0.44	30.56	16.74	3.87
850	17.44	19.92	23.42	30.90	1.04	0.44	31.49	16.84	3.80
900	17.42	19.93	22.96	31.01	1.04	0.45	30.58	16.82	3.81
950	17.39	19.93	22.60	31.03	1.04	0.45	30.58	16.48	3.87
1000	17.37	19.94	22.14	31.26	1.04	0.45	31.32	16.75	3.84
1500	17.16	19.96	19.49	32.60	1.04	0.49	30.57	16.58	3.91
2000	16.91	19.98	17.72	32.89	1.05	0.53	30.30	16.50	3.80
2500	16.62	20.02	16.55	31.20	1.06	0.57	29.36	16.28	3.83
3000	16.29	20.08	15.64	29.18	1.07	0.61	29.17	16.30	3.90
3500	15.96	20.16	15.19	28.20	1.09	0.65	28.54	16.06	3.85
4000	15.66	20.26	15.32	27.32	1.11	0.69	27.20	15.60	3.87
4500	15.37	20.39	15.78	24.06	1.14	0.72	26.67	15.08	3.87
5000	15.13	20.55	16.49	20.80	1.17	0.73	25.36	14.42	3.95
5500	14.97	20.77	17.79	18.91	1.20	0.74	24.52	14.09	4.03
6000	14.83	21.05	20.13	18.13	1.25	0.75	24.30	13.47	4.09
6500	14.74	21.42	24.54	18.39	1.30	0.77	24.48	12.98	4.19
7000	14.67	21.88	33.05	19.25	1.35	0.80	23.93	12.18	4.29
7500	14.58	22.52	24.21	19.75	1.42	0.84	23.52	11.12	4.42
8000	14.48	23.31	17.89	18.44	1.51	0.88	21.51	9.80	4.55
9000	14.17	24.98	10.68	12.38	1.57	0.98	19.90	8.69	4.78
10000	13.57	24.53	6.35	7.29	1.04	1.04	18.71	7.40	5.06
11000	12.59	21.51	3.69	4.42	0.35	1.03	15.10	5.85	5.33
12000	10.66	19.27	2.03	2.70	0.01	0.92	12.10	5.27	5.93

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 = 41mA @ Temperature = -45°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)
10	14.53	22.82	10.30	11.28	1.21	0.92	20.05	15.08	6.65
50	16.51	20.79	12.84	13.91	1.08	0.60	28.13	14.69	4.81
100	17.58	19.76	17.51	18.79	1.03	0.37	28.19	13.66	3.72
150	17.80	19.59	22.11	23.66	1.02	0.33	29.36	14.18	3.42
200	17.81	19.63	26.39	27.61	1.02	0.34	28.93	14.38	3.29
250	17.78	19.70	29.97	30.14	1.02	0.36	28.99	15.10	3.18
300	17.73	19.76	31.97	30.99	1.03	0.37	28.01	14.64	3.17
350	17.70	19.81	32.17	31.36	1.03	0.38	28.70	15.04	3.27
400	17.67	19.84	31.50	31.27	1.03	0.39	29.25	15.21	3.14
450	17.64	19.88	30.33	31.16	1.03	0.40	28.99	15.18	3.14
500	17.62	19.89	29.07	31.16	1.03	0.41	28.80	15.34	3.21
550	17.59	19.91	28.19	31.13	1.03	0.41	28.48	15.45	3.16
600	17.58	19.92	27.33	31.14	1.03	0.42	29.87	15.49	3.18
650	17.55	19.93	26.59	31.34	1.03	0.42	28.97	15.41	3.22
700	17.54	19.94	25.87	31.51	1.04	0.43	29.49	15.22	3.17
750	17.52	19.95	25.15	31.97	1.04	0.43	28.71	15.59	3.15
800	17.50	19.96	24.47	32.36	1.04	0.44	28.52	15.41	3.21
850	17.50	19.96	23.80	32.68	1.04	0.44	29.84	15.73	3.19
900	17.48	19.97	23.27	33.01	1.04	0.44	29.12	15.69	3.14
950	17.45	19.97	22.91	33.23	1.04	0.45	29.00	14.96	3.26
1000	17.43	19.98	22.43	33.67	1.04	0.45	29.15	15.50	3.15
1500	17.23	20.00	19.77	38.03	1.04	0.48	29.16	15.25	3.24
2000	17.00	20.01	18.08	38.89	1.05	0.52	29.29	15.21	3.14
2500	16.71	20.05	16.94	35.11	1.06	0.56	28.42	15.14	3.17
3000	16.39	20.09	16.17	32.46	1.07	0.60	28.29	15.40	3.19
3500	16.06	20.16	15.58	33.45	1.09	0.64	28.86	15.40	3.14
4000	15.76	20.25	15.50	30.71	1.11	0.68	27.92	15.29	3.18
4500	15.47	20.35	15.65	24.09	1.13	0.71	26.80	14.82	3.12
5000	15.21	20.48	15.78	19.77	1.15	0.72	25.59	14.32	3.21
5500	15.03	20.65	16.24	17.50	1.18	0.73	24.80	13.81	3.33
6000	14.88	20.86	17.32	16.22	1.21	0.73	24.18	13.55	3.27
6500	14.79	21.14	19.26	15.79	1.25	0.74	24.64	13.41	3.38
7000	14.74	21.47	22.52	15.96	1.29	0.76	24.30	12.97	3.42
7500	14.71	21.94	28.57	16.50	1.34	0.79	24.21	11.98	3.62
8000	14.69	22.55	24.52	16.86	1.40	0.82	22.14	10.62	3.65
9000	14.67	24.17	13.95	14.09	1.50	0.91	20.81	9.54	3.78
10000	14.55	25.06	8.41	8.91	1.26	0.99	19.51	8.04	4.02
11000	14.08	22.52	4.67	5.19	0.51	1.01	15.43	6.10	4.27
12000	12.69	19.46	2.00	2.51	-0.02	0.89	12.40	5.44	4.76

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4.75, Id = 37mA @ Temperature = -45°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)
10	14.42	22.71	10.46	11.18	1.22	0.91	27.29	14.05	6.57
50	16.40	20.71	13.09	13.82	1.08	0.60	25.90	12.56	4.81
100	17.46	19.69	17.58	18.66	1.03	0.38	27.30	12.35	3.70
150	17.67	19.53	21.85	23.32	1.02	0.34	27.55	12.91	3.41
200	17.68	19.57	25.71	26.65	1.02	0.35	27.15	13.24	3.32
250	17.66	19.64	29.15	28.43	1.03	0.36	27.64	13.83	3.21
300	17.61	19.70	31.31	28.85	1.03	0.38	26.31	13.37	3.22
350	17.59	19.74	32.63	29.12	1.03	0.39	26.82	13.92	3.24
400	17.55	19.78	32.60	29.06	1.03	0.40	27.51	14.10	3.16
450	17.53	19.81	31.67	29.04	1.03	0.41	27.07	14.07	3.20
500	17.51	19.83	30.47	29.09	1.03	0.41	26.99	14.23	3.24
550	17.48	19.84	29.51	29.11	1.04	0.42	26.53	14.20	3.16
600	17.47	19.86	28.55	29.17	1.04	0.42	27.91	14.39	3.18
650	17.45	19.87	27.73	29.38	1.04	0.43	27.33	14.16	3.24
700	17.43	19.88	26.92	29.50	1.04	0.43	27.79	14.12	3.21
750	17.42	19.89	26.11	29.94	1.04	0.44	27.35	14.50	3.16
800	17.40	19.89	25.36	30.30	1.04	0.44	27.13	14.30	3.22
850	17.40	19.90	24.61	30.64	1.04	0.44	28.00	14.65	3.20
900	17.38	19.90	24.04	31.00	1.04	0.45	27.48	14.62	3.17
950	17.34	19.90	23.65	31.32	1.04	0.45	27.62	13.85	3.17
1000	17.33	19.91	23.10	31.78	1.04	0.45	27.96	14.56	3.17
1500	17.13	19.93	20.26	36.42	1.04	0.48	27.44	14.00	3.28
2000	16.90	19.95	18.44	36.45	1.05	0.52	27.51	14.12	3.14
2500	16.61	19.98	17.23	32.98	1.06	0.56	26.62	14.05	3.16
3000	16.30	20.04	16.42	31.56	1.08	0.60	27.06	14.34	3.20
3500	15.98	20.10	15.83	34.43	1.09	0.64	27.59	14.52	3.13
4000	15.68	20.18	15.77	33.80	1.11	0.67	26.73	14.44	3.13
4500	15.39	20.27	15.95	24.81	1.13	0.70	26.00	14.29	3.14
5000	15.13	20.39	16.08	19.90	1.16	0.72	25.07	13.81	3.22
5500	14.94	20.56	16.53	17.43	1.18	0.72	24.25	13.29	3.33
6000	14.79	20.76	17.57	16.01	1.22	0.73	23.67	13.04	3.32
6500	14.68	21.04	19.40	15.43	1.25	0.74	24.19	12.89	3.38
7000	14.62	21.35	22.44	15.44	1.29	0.75	23.76	12.47	3.43
7500	14.58	21.80	27.27	15.79	1.34	0.78	23.75	11.62	3.59
8000	14.55	22.37	23.84	16.01	1.39	0.82	21.60	10.27	3.65
9000	14.51	23.90	13.99	13.70	1.48	0.91	20.16	9.16	3.75
10000	14.38	24.85	8.56	8.96	1.27	0.98	18.83	7.78	4.00
11000	13.92	22.61	4.82	5.36	0.55	1.01	14.80	5.85	4.24
12000	12.58	19.62	2.11	2.64	0.01	0.90	11.85	5.18	4.67

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 = 45mA @ Temperature = -45°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)			(dBm)	(dBm)	(dB)
10	14.94	22.92	10.88	11.33	1.20	0.90	16.38	15.95	6.84
50	16.63	20.85	13.31	14.02	1.07	0.60	22.15	16.62	4.96
100	17.69	19.82	17.42	18.88	1.03	0.37	30.27	15.32	3.82
150	17.91	19.65	22.23	23.85	1.02	0.32	29.55	15.46	3.46
200	17.92	19.69	26.70	28.27	1.02	0.33	30.65	15.61	3.33
250	17.88	19.76	30.06	31.73	1.02	0.35	30.32	16.18	3.24
300	17.83	19.82	31.44	33.40	1.03	0.37	29.58	15.73	3.30
350	17.80	19.87	30.89	34.09	1.03	0.38	30.22	16.12	3.30
400	17.77	19.90	29.98	34.01	1.03	0.39	30.14	16.29	3.21
450	17.74	19.93	28.86	33.74	1.03	0.40	31.24	16.26	3.24
500	17.72	19.95	27.73	33.61	1.03	0.40	30.73	16.41	3.29
550	17.69	19.97	26.96	33.47	1.03	0.41	30.34	16.37	3.21
600	17.67	19.98	26.20	33.33	1.03	0.42	30.81	16.41	3.24
650	17.65	19.99	25.56	33.50	1.03	0.42	30.64	16.33	3.29
700	17.63	20.00	24.94	33.56	1.03	0.42	30.74	16.29	3.21
750	17.62	20.01	24.30	34.02	1.03	0.43	31.14	16.49	3.23
800	17.60	20.01	23.69	34.27	1.03	0.43	29.98	16.46	3.25
850	17.59	20.02	23.09	34.53	1.03	0.43	31.54	16.61	3.22
900	17.57	20.03	22.59	34.72	1.04	0.44	31.17	16.58	3.23
950	17.54	20.03	22.24	34.75	1.04	0.44	30.61	16.03	3.29
1000	17.52	20.03	21.80	35.02	1.04	0.45	30.78	16.52	3.22
1500	17.32	20.05	19.32	36.82	1.04	0.48	30.86	16.17	3.30
2000	17.09	20.06	17.75	38.10	1.05	0.51	31.10	16.26	3.16
2500	16.80	20.09	16.68	35.74	1.06	0.55	29.73	16.04	3.22
3000	16.48	20.14	15.95	32.22	1.07	0.60	29.81	16.13	3.25
3500	16.15	20.21	15.36	31.52	1.08	0.64	29.66	16.09	3.22
4000	15.84	20.30	15.25	28.44	1.10	0.68	28.31	15.81	3.20
4500	15.55	20.40	15.37	23.31	1.12	0.71	27.62	15.32	3.21
5000	15.30	20.53	15.47	19.55	1.15	0.72	26.26	14.79	3.30
5500	15.13	20.71	15.92	17.48	1.17	0.73	25.17	14.30	3.38
6000	15.00	20.93	17.01	16.36	1.21	0.73	24.40	14.03	3.39
6500	14.91	21.22	18.94	16.08	1.25	0.74	24.99	13.77	3.48
7000	14.88	21.55	22.30	16.44	1.29	0.76	24.69	13.32	3.53
7500	14.87	22.04	29.44	17.22	1.34	0.79	24.58	12.31	3.63
8000	14.87	22.68	25.37	17.79	1.40	0.82	22.63	10.94	3.76
9000	14.88	24.41	13.94	14.54	1.52	0.92	21.35	9.75	3.94
10000	14.79	25.29	8.28	8.89	1.25	0.99	20.00	8.26	4.14
11000	14.32	22.43	4.51	5.03	0.46	1.01	16.02	6.45	4.45
12000	12.91	19.26	1.85	2.34	-0.06	0.89	12.98	5.77	4.89

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.00V, Id = 46mA @ Temperature = +85°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)
10	15.24	22.54	13.17	11.33	1.19	0.83	17.34	15.69	7.55
50	16.45	20.57	15.61	14.23	1.08	0.59	19.54	16.72	5.92
100	17.29	19.62	18.46	19.11	1.03	0.40	24.73	16.00	4.77
150	17.54	19.45	22.16	23.79	1.02	0.35	29.12	15.94	4.45
200	17.55	19.48	25.77	26.90	1.02	0.36	29.69	15.92	4.35
250	17.51	19.54	28.72	28.30	1.03	0.37	29.85	16.10	4.22
300	17.47	19.60	30.37	28.31	1.03	0.39	29.53	15.99	4.27
350	17.43	19.64	30.96	28.15	1.03	0.40	29.28	16.19	4.27
400	17.39	19.68	30.85	27.72	1.03	0.41	30.14	16.31	4.19
450	17.37	19.71	30.12	27.36	1.03	0.42	30.23	16.29	4.20
500	17.34	19.73	29.16	27.20	1.04	0.42	30.36	16.28	4.26
550	17.31	19.75	28.33	27.09	1.04	0.43	29.79	16.37	4.22
600	17.29	19.76	27.46	27.01	1.04	0.43	30.61	16.26	4.17
650	17.27	19.77	26.65	27.06	1.04	0.44	30.23	16.34	4.29
700	17.25	19.78	25.92	27.03	1.04	0.44	30.12	16.19	4.22
750	17.23	19.79	25.30	27.12	1.04	0.45	30.22	16.32	4.19
800	17.21	19.80	24.72	27.16	1.04	0.45	30.07	16.32	4.32
850	17.20	19.80	24.15	27.20	1.04	0.45	31.00	16.29	4.29
900	17.18	19.81	23.66	27.25	1.04	0.46	30.55	16.26	4.21
950	17.15	19.81	23.24	27.28	1.04	0.46	30.53	16.07	4.51
1000	17.13	19.82	22.75	27.42	1.04	0.47	30.36	16.19	4.28
1500	16.90	19.85	19.83	28.21	1.05	0.50	30.16	16.14	4.35
2000	16.64	19.90	17.84	28.57	1.06	0.54	29.80	16.04	4.26
2500	16.33	19.95	16.55	28.01	1.07	0.59	28.01	15.81	4.25
3000	15.99	20.02	15.67	27.23	1.09	0.63	28.06	15.66	4.33
3500	15.66	20.11	15.35	27.04	1.11	0.67	27.67	15.24	4.30
4000	15.34	20.24	15.78	27.32	1.13	0.71	26.42	14.74	4.33
4500	15.05	20.38	16.80	25.67	1.17	0.73	25.76	14.20	4.33
5000	14.81	20.58	18.53	22.99	1.21	0.75	24.79	13.54	4.41
5500	14.62	20.85	21.73	21.44	1.25	0.76	24.38	13.15	4.54
6000	14.44	21.20	28.36	21.08	1.31	0.78	23.58	12.34	4.53
6500	14.28	21.67	36.32	21.47	1.38	0.81	23.73	11.62	4.65
7000	14.11	22.23	23.32	21.46	1.45	0.85	22.63	10.86	4.77
7500	13.91	22.99	17.84	19.77	1.55	0.89	21.88	9.73	4.99
8000	13.64	23.82	14.19	16.79	1.65	0.94	19.25	8.42	5.07
9000	12.86	25.08	8.78	10.63	1.63	1.03	17.51	7.43	5.33
10000	11.78	23.87	5.47	6.34	0.99	1.04	16.49	6.11	5.51
11000	10.56	21.20	3.65	4.28	0.41	1.01	13.41	4.83	5.88
12000	8.38	19.60	2.62	3.24	0.22	0.93	10.80	4.28	6.46

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 = 42mA @ Temperature = +85°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)			(dBm)	(dBm)	(dB)
10	14.68	22.42	12.02	11.14	1.20	0.86	16.65	14.87	7.66
50	16.24	20.49	14.35	13.97	1.08	0.60	21.33	15.52	5.85
100	17.22	19.53	17.84	18.84	1.03	0.39	28.11	14.52	4.71
150	17.42	19.38	21.68	23.15	1.02	0.36	28.62	14.65	4.40
200	17.43	19.41	24.98	25.62	1.03	0.36	28.64	14.80	4.28
250	17.39	19.48	27.73	26.57	1.03	0.38	29.66	15.19	4.19
300	17.34	19.53	29.41	26.49	1.03	0.39	28.10	14.93	4.22
350	17.32	19.58	30.55	26.37	1.03	0.40	28.88	15.29	4.24
400	17.28	19.61	30.82	26.05	1.03	0.41	28.51	15.43	4.13
450	17.25	19.64	30.40	25.80	1.04	0.42	28.94	15.41	4.16
500	17.23	19.66	29.70	25.69	1.04	0.43	28.31	15.52	4.24
550	17.20	19.67	28.89	25.63	1.04	0.43	28.09	15.49	4.17
600	17.18	19.69	28.07	25.59	1.04	0.44	29.42	15.39	4.15
650	17.16	19.70	27.29	25.67	1.04	0.44	28.69	15.46	4.24
700	17.14	19.71	26.52	25.67	1.04	0.45	28.65	15.43	4.18
750	17.12	19.72	25.90	25.80	1.04	0.45	28.41	15.45	4.17
800	17.10	19.73	25.30	25.85	1.04	0.46	28.41	15.45	4.24
850	17.09	19.74	24.69	25.91	1.04	0.46	29.45	15.55	4.19
900	17.07	19.74	24.18	25.97	1.04	0.46	28.68	15.52	4.18
950	17.04	19.75	23.73	26.03	1.04	0.47	29.12	15.19	4.43
1000	17.02	19.75	23.22	26.18	1.04	0.47	28.78	15.33	4.20
1500	16.79	19.80	20.18	27.18	1.05	0.51	28.53	15.27	4.29
2000	16.53	19.84	18.12	27.77	1.06	0.55	28.48	15.18	4.22
2500	16.22	19.90	16.78	27.49	1.07	0.59	27.70	15.09	4.26
3000	15.89	19.97	15.88	27.32	1.09	0.63	27.19	14.97	4.29
3500	15.56	20.07	15.58	28.12	1.11	0.67	26.95	14.72	4.25
4000	15.25	20.19	16.05	29.82	1.14	0.71	25.95	14.24	4.26
4500	14.96	20.32	17.14	27.43	1.17	0.73	25.26	13.72	4.31
5000	14.70	20.52	18.99	23.43	1.21	0.75	24.31	13.06	4.32
5500	14.50	20.79	22.36	21.25	1.26	0.76	24.10	12.69	4.47
6000	14.31	21.12	29.45	20.35	1.31	0.78	23.28	12.00	4.49
6500	14.14	21.56	33.53	20.22	1.38	0.81	23.35	11.30	4.57
7000	13.96	22.11	22.84	19.95	1.45	0.85	22.11	10.54	4.68
7500	13.74	22.81	17.68	18.58	1.54	0.89	21.40	9.54	4.95
8000	13.46	23.60	14.16	16.14	1.63	0.94	18.84	8.24	4.98
9000	12.67	24.81	8.85	10.54	1.62	1.02	16.96	7.11	5.18
10000	11.61	23.80	5.56	6.41	1.02	1.04	15.97	5.93	5.47
11000	10.42	21.27	3.74	4.39	0.45	1.01	12.92	4.67	5.80
12000	8.28	19.70	2.68	3.32	0.25	0.94	10.50	3.87	6.39

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

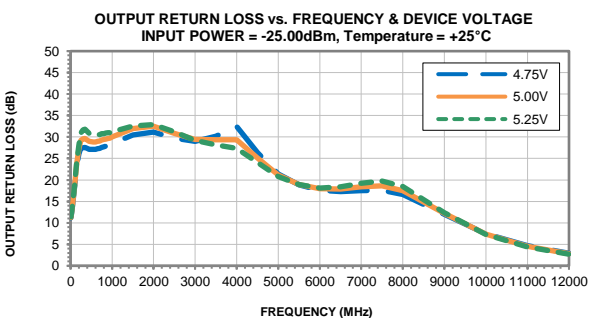
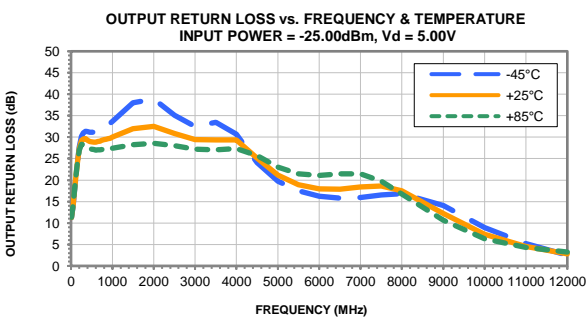
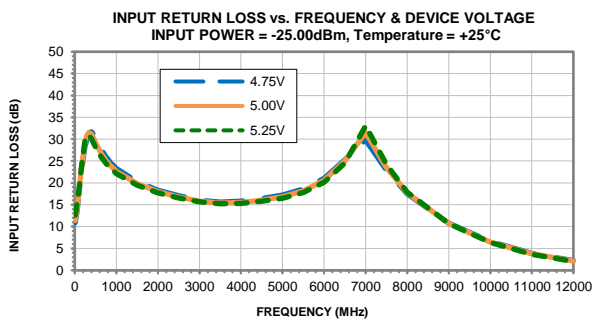
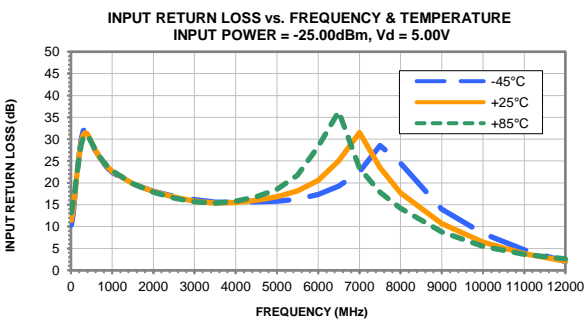
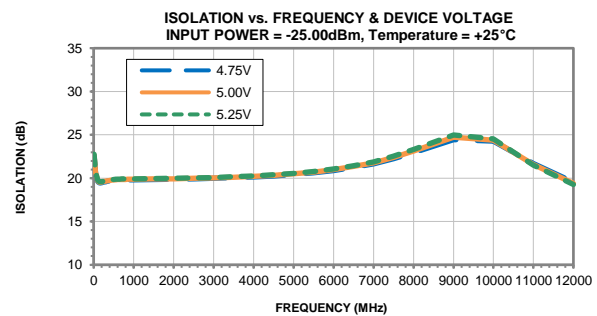
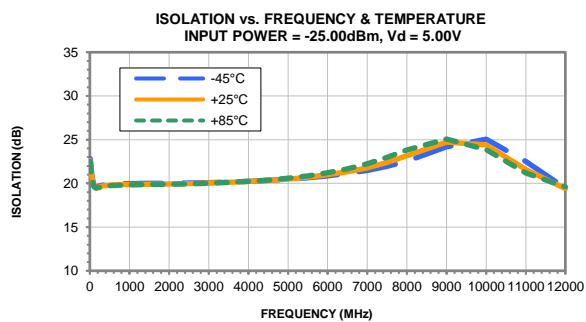
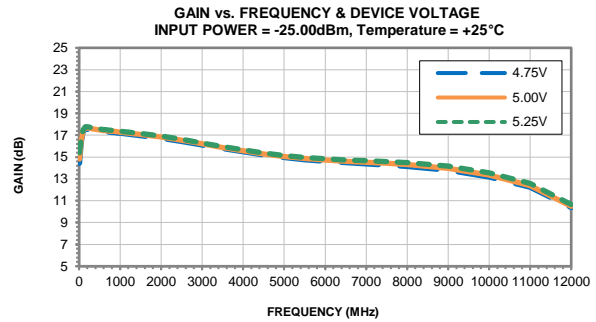
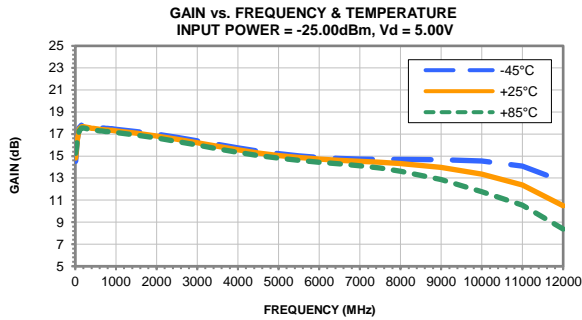
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

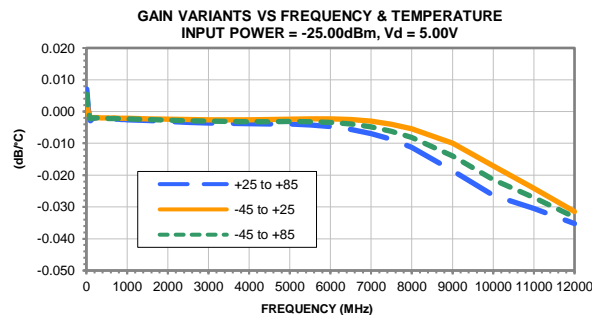
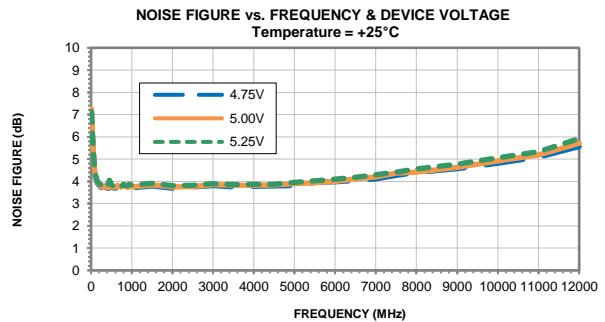
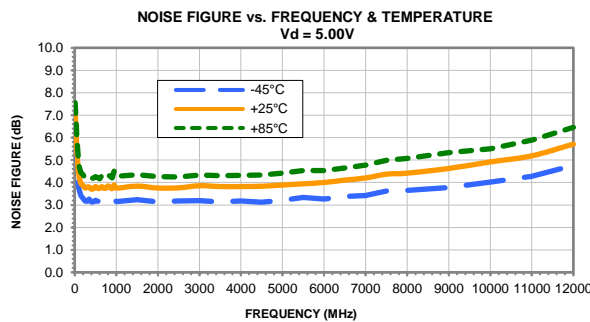
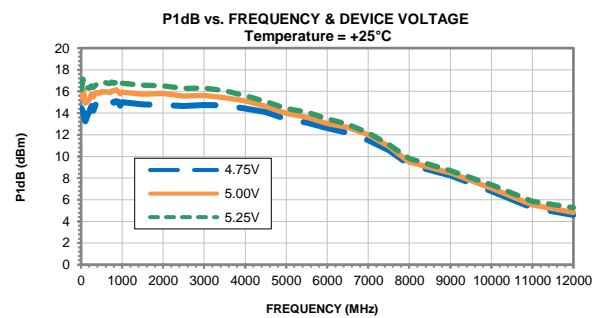
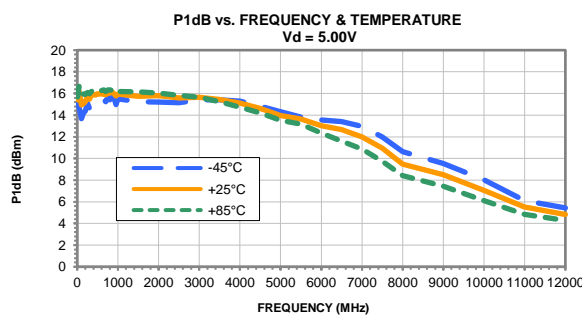
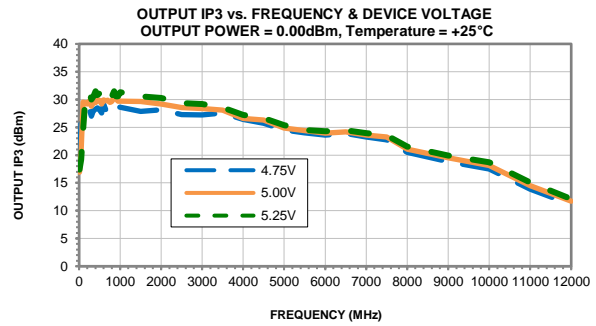
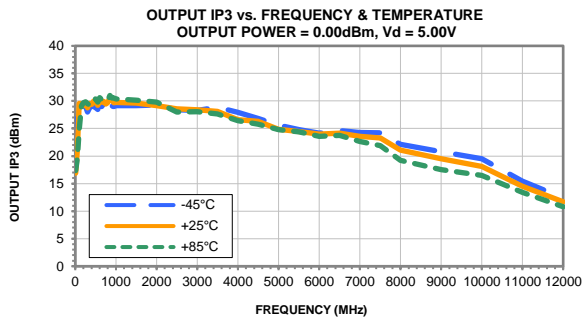
TEST CONDITIONS: Vd = 5.25V, Id = 51mA @ Temperature = +85°C

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)
10	15.91	21.67	15.36	13.84	1.13	0.75	24.38	16.25	5.47
50	16.70	20.67	17.49	15.92	1.07	0.59	25.42	17.57	5.23
100	17.29	19.83	20.41	19.83	1.04	0.43	26.89	17.17	4.70
150	17.53	19.60	23.75	24.24	1.03	0.37	29.44	17.10	4.48
200	17.59	19.59	27.01	27.63	1.03	0.37	30.16	17.09	4.38
250	17.58	19.63	29.47	29.54	1.03	0.38	29.26	17.11	4.27
300	17.54	19.68	30.59	29.80	1.03	0.39	30.42	17.04	4.30
350	17.52	19.72	30.49	29.67	1.03	0.40	31.33	17.08	4.36
400	17.48	19.75	30.09	29.20	1.03	0.41	30.87	17.07	4.22
450	17.45	19.77	29.27	28.75	1.03	0.41	32.69	17.05	4.26
500	17.43	19.79	28.30	28.54	1.03	0.42	31.91	17.13	4.34
550	17.40	19.81	27.52	28.39	1.04	0.43	30.82	17.11	4.28
600	17.38	19.82	26.71	28.24	1.04	0.43	33.18	17.11	4.25
650	17.36	19.83	25.94	28.27	1.04	0.44	31.54	17.08	4.35
700	17.34	19.84	25.27	28.20	1.04	0.44	32.36	17.06	4.32
750	17.32	19.85	24.69	28.27	1.04	0.45	31.58	17.05	4.27
800	17.30	19.85	24.14	28.26	1.04	0.45	31.31	17.06	4.35
850	17.29	19.86	23.61	28.27	1.04	0.45	32.48	17.12	4.31
900	17.27	19.87	23.15	28.29	1.04	0.46	31.57	17.09	4.32
950	17.24	19.87	22.77	28.28	1.04	0.46	31.71	16.94	4.63
1000	17.22	19.88	22.31	28.38	1.04	0.47	31.00	16.91	4.30
1500	16.99	19.91	19.52	28.79	1.05	0.50	30.98	16.87	4.38
2000	16.72	19.94	17.61	28.80	1.05	0.54	30.23	16.76	4.33
2500	16.41	20.00	16.35	27.99	1.07	0.59	29.48	16.52	4.38
3000	16.08	20.06	15.49	26.73	1.08	0.63	28.58	16.33	4.42
3500	15.74	20.16	15.17	25.89	1.10	0.67	27.85	15.88	4.39
4000	15.43	20.28	15.57	25.51	1.13	0.71	26.83	15.24	4.40
4500	15.14	20.43	16.53	24.22	1.16	0.73	25.99	14.69	4.45
5000	14.89	20.63	18.17	22.38	1.20	0.75	25.09	14.01	4.50
5500	14.72	20.91	21.19	21.43	1.25	0.76	24.56	13.62	4.63
6000	14.55	21.27	27.40	21.61	1.31	0.78	23.88	12.68	4.67
6500	14.40	21.75	40.04	22.71	1.37	0.81	24.03	11.95	4.77
7000	14.25	22.34	23.84	23.18	1.45	0.85	22.89	11.20	4.91
7500	14.06	23.13	18.03	21.06	1.55	0.89	22.01	10.08	5.14
8000	13.80	24.02	14.27	17.45	1.66	0.94	19.51	8.77	5.20
9000	13.04	25.33	8.74	10.72	1.65	1.03	17.81	7.80	5.47
10000	11.94	23.95	5.39	6.28	0.96	1.05	16.84	6.47	5.77
11000	10.71	21.14	3.58	4.19	0.38	1.01	13.80	5.32	6.10
12000	8.50	19.52	2.56	3.17	0.19	0.93	11.23	4.62	6.73

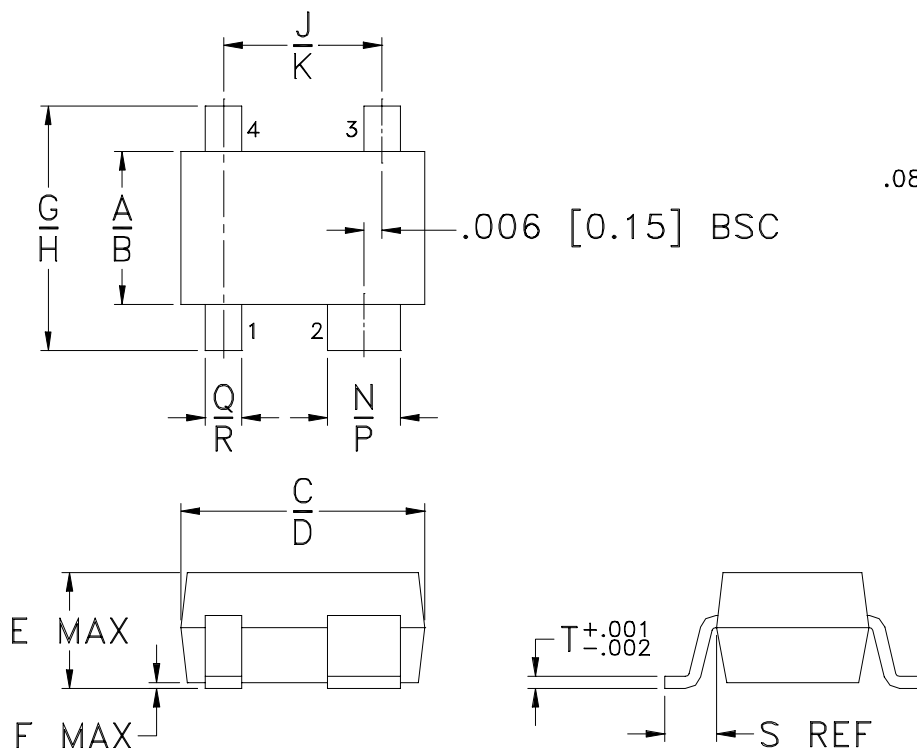
Typical Performance Curves



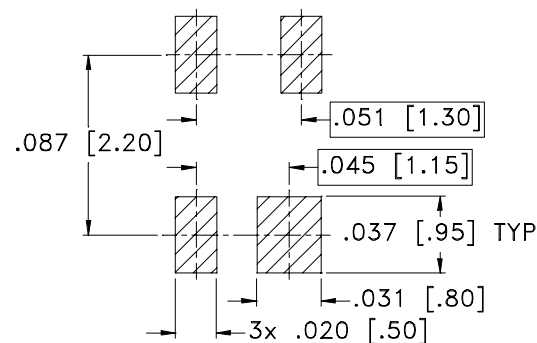
Typical Performance Curves



Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MMM1362	.045 (1.15)	.053 (1.35)	.073 (1.85)	.089 (2.25)	.043 (1.10)	.004 (0.10)	.071 (1.80)	.094 (2.40)	.046 (1.17)	.056 (1.43)	-	-	.022 (0.55)	.028 (0.70)

CASE #.	Q	R	S	T	WT, GRAM
MMM1362	.010 (0.25)	.016 (0.40)	.017 (0.43)	.006 (0.15)	.007

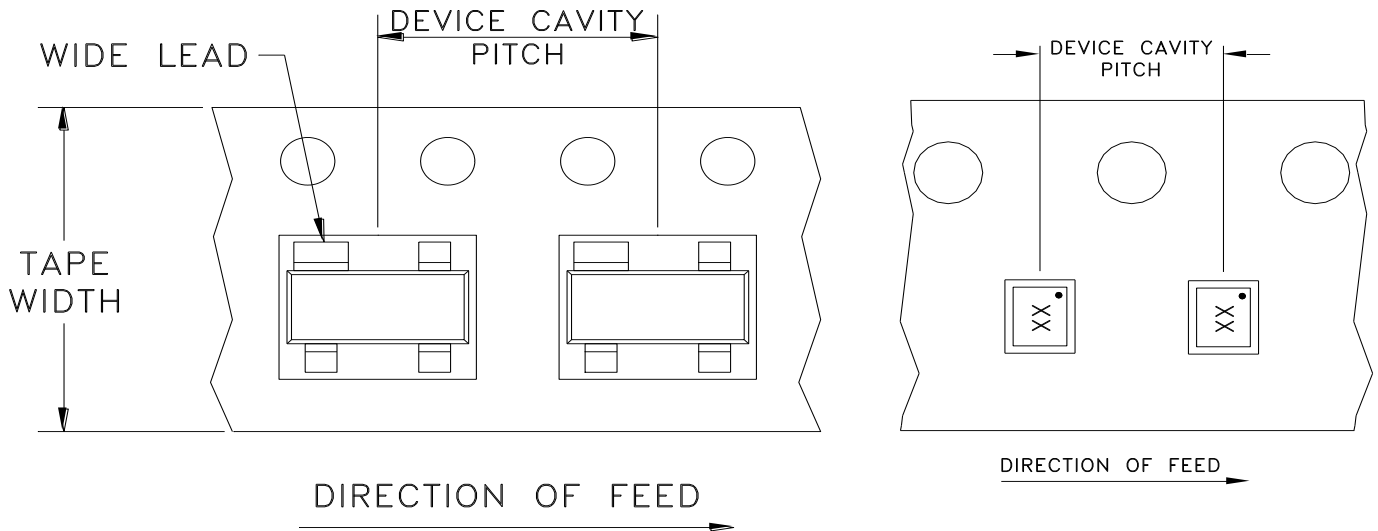
Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

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

Tape & Reel Packaging TR-F90

DEVICE ORIENTATION IN T&R



Applicable Case Style
MMM1362

NONE

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

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

| [Applicable Case Styles](#) |

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

| [MZ4532C](#) |

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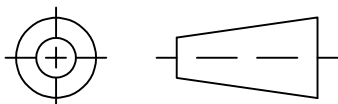
INTERNET <http://www.minicircuits.com>

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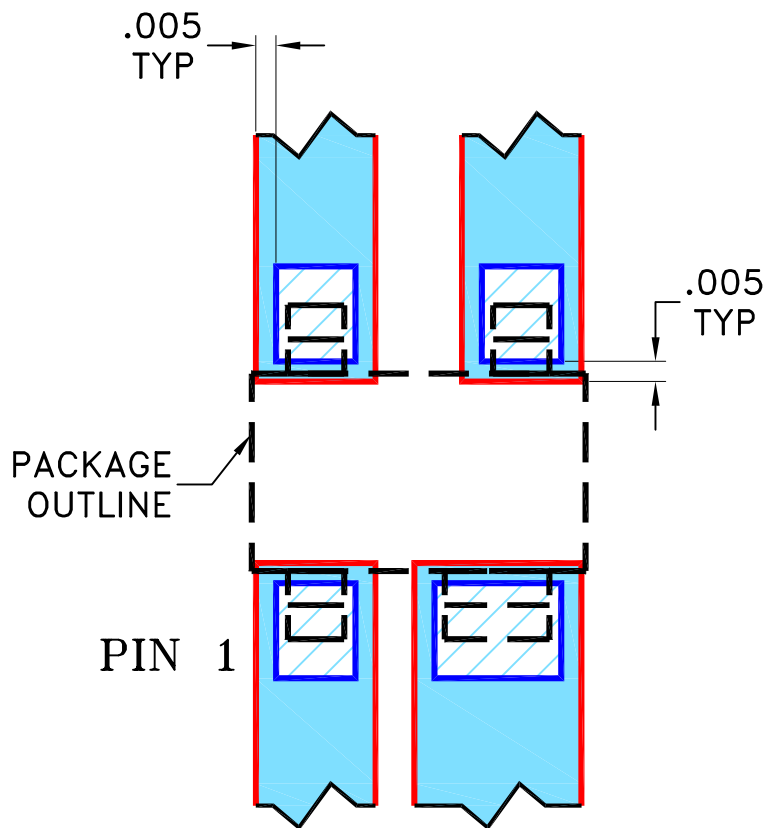
THIRD ANGLE PROJECTION




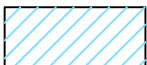
REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-003355	NEW RELEASE	07/22/20	ITG	CM

SUGGESTED MOUNTING CONFIGURATION FOR
MMM1362 CASE STYLE



NOTES:

1. LINE WIDTH IS SHOWN FOR REFERENCE ONLY. ACTUAL LINE WIDTH IS A FUNCTION OF SPECIFIC MATCHING CIRCUIT.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3.  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	07/22/20
TOLERANCES ON:	CHECKED	GF	07/22/20
2 PL DECIMALS ±	APPROVED	CM	07/22/20
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			




Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

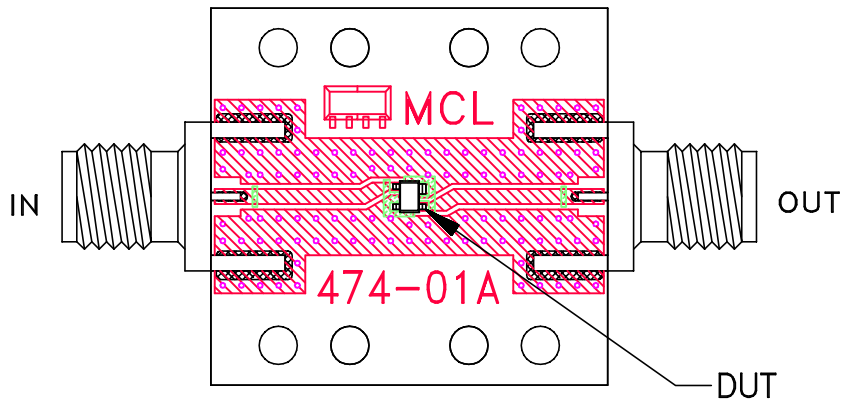
PL, MMM1362, TB-PSA-14+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-684	OR
FILE:	98PL684	SCALE:	SHEET:
		20:1	1 OF 1

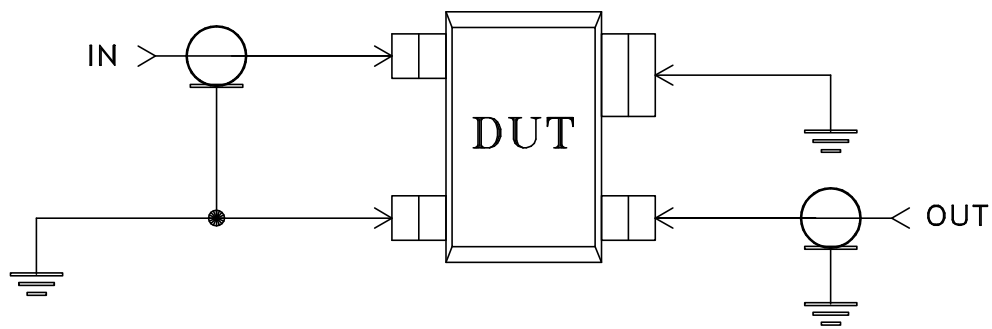
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Characterization Test Board




TB-471+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers RO4350B or its equivalent, Dielectric Constant=3.5, Thickness=.020"

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

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

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