Low Noise, High IP3

Monolithic Amplifier

PSA-545+

50Ω 0.05 to 4 GHz

CASE STYLE: CA1389

The Big Deal

- Ultra Low Noise Figure, 0.8 dB
- High IP3
- Wideband, up to 4 GHz
- Low Additive Phase Noise
- Suitable for Low Phase Noise Applications

Product Overview

Mini-Circuits PSA-545+ is a E-PHEMT based Ultra-Low Noise MMIC Amplifier operating from 50 MHz to 4 GHz with a unique combination of low noise and high IP3 making this amplifier ideal for sensitive receiver applications. This design operates on a single 3V supply at only 80mA and is internally matched to 50 ohms.

Key Features

Feature	Advantages
Ultra Low Noise, 0.8 dB	Outstanding Noise Figure, measured in a 50 Ohm environment without any external matching
High IP3, 36 dBm	Combining Low Noise and High IP3 makes this MMIC amplifier ideal for Low Noise Receiver Front End (RFE) because it gives the user advantages at both ends of the dynamic range: sensitivity & two-tone spur-free dynamic range
High Output Power, +20 dBm	The PSA-545+ provides up to +20dBm output power at 1dB compression enabling this amplifier to support high linear dynamic range requirements.-
Broad Band	Operating over a broadband the PSA-545+ covers the primary wireless communications bands: Cellular, PCS, LTE, WiMAX
Internally Matched	No external matching elements required to achieve the advertised noise and output power over the full band
SOT-363 Package	Small size, industry standard package
Max Input Power, +15dBm	Ruggedized design operates up to input powers of +15dBm without the need of an external limiter
High Reliability	Low, small signal operating current of 80mA nominal maintains junction temperatures typically below 125°C at 85°C ground lead temperature
Low Additive Phase Noise, Typically -164.5dBc/Hz at 10kHz Offset	Ideal for low phase noise synthesizer applications

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PSA-545+

50Ω 0.05 to 4 GHz

Product Features

- Single Positive Supply Voltage, +3V, Id=80mA
- Ultra Low Noise Figure, 0.8 dB typ. at 1 GHz
- High IP3, up to 35 dBm typ. at 1 GHz
- Output Power at 1dB comp., up to +20 dBm typ.
- Gain, 20 dB typ. at 1GHz
- Micro-miniature size SOT-363 package
- Aqueous washable
- Low additive phase noise

Generic photo used for illustration purposes only

CASE STYLE: CA1389

+RoHS Compliant

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

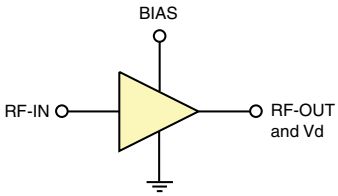
Typical Applications

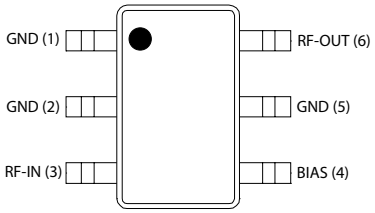
- Cellular
- ISM
- GSM
- WCDMA
- LTE
- WiMax
- WLAN
- UNII and HIPERLAN

General Description

PSA-545+ is an advanced wide band, high dynamic range, low noise, high IP3, high output power, monolithic amplifier. Manufactured using E-PHEMT* technology enables it to work with a single positive supply voltage.

simplified schematic and pin description





Function	Pin Number	Description *(See Application Circuit, Fig. 2)*
RF IN	3	RF input pin (connect to pin 4 via L2)
RF-OUT & Vd	6	RF output pin (connected to RF-out via blocking cap C2 and supply voltage Vd via RF Choke L1)
BIAS	4	Connected to Vs via Rbias. (Connect to ground via C4 & R1)
GND	1,2,5	Connections to ground

* Enhancement mode pseudomorphic High Electron Mobility Transistor.

Electrical Specifications[1] at 25°C, Zo=50Ω, *(refer to characterization circuit, Fig. 1)*

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.05		4.0	GHz
at DC Volts (Vd)			3.0		V
DC Current (Id)[6]		60	80	100	mA
Bias Current (I_{Rbias})			5.6		mA
Noise Figure	0.05 0.5 1.0 2.0 3.0 4.0		2.1 0.7 0.8 1.0 1.3 1.7	— — 1.3 — — —	dB
Additive Phase Noise 2.0GHz, 10kHz offset	2.0	—	-164.5	—	kHz
Gain	0.05 0.5 1.0 2.0 3.0 4.0	— — 17.8 — — —	24.8 23.5 19.8 14.9 12.1 10.4	— — 21.8 — — —	dB
Input Return Loss	0.05-0.5 0.5-4.0		8 6		dB
Output Return Loss	0.05-0.2 0.2-4.0		12 18		dB
Output IP3	0.05 0.5 1.0 2.0 3.0 4.0		34.4 34.9 35.4 36.2 36.3 35.4		dBm
Output Power @1dB compression[2]	0.05 0.5 1.0 2.0 3.0 4.0		19.6 19.6 19.5 20.2 20.5 20.5		dBm
DC Current Variation Vs. Temperature[3]			-0.064		mA/°C
Thermal Resistance[5]			165		°C/W

Absolute Maximum Ratings[4]

Parameter	Ratings
Operating Temperature[5]	-40°C to 85°C
Storage Temperature	-65°C to 150°C
Channel Temperature	150°C
DC Voltage (Pin 6)	5V
Device Current (Pin 6)	130 mA
Power Dissipation	390 mW
Bias Reference Current (Pin 4)	10 mA
Input Power (CW) (Pin 3) [7]	15 dBm

[1] Measured on Mini-Circuits Characterization test board TB-533+. See Characterization Test Circuit (Fig. 1)
[2] Current increases at P1dB
[3] (Current at 85°C - Current at -45°C)/130
[4] Permanent damage may occur if any of these limits are exceeded. These maximum ratings are not intended for continuous normal operation.
[5] Defined with reference to ground pad temperature.
[6] Specified DC current consumption is under small signal conditions. Current will increase with input RF Power. To maintain maximum current consumption, external DC current limiting circuits are required on Vd line.
[7] Maximum input power is specified based upon external Vd current limiting of 100 mA. Maximum input power will degrade without external current limiting.

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

Characterization Test Circuit

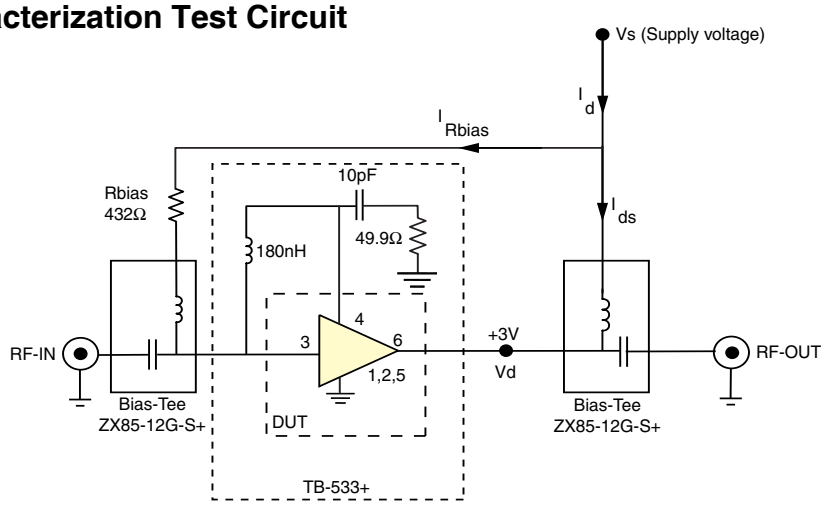


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization Test Board TB-533+) Gain, Return loss, Output power at 1dB compression (P1 dB), Output IP3 (OIP3) and Noise Figure measured using Agilent's N5242A PNA-X microwave network analyzer.

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

Recommended Application Circuit

(refer to evaluation board for PCB Layout and component values)

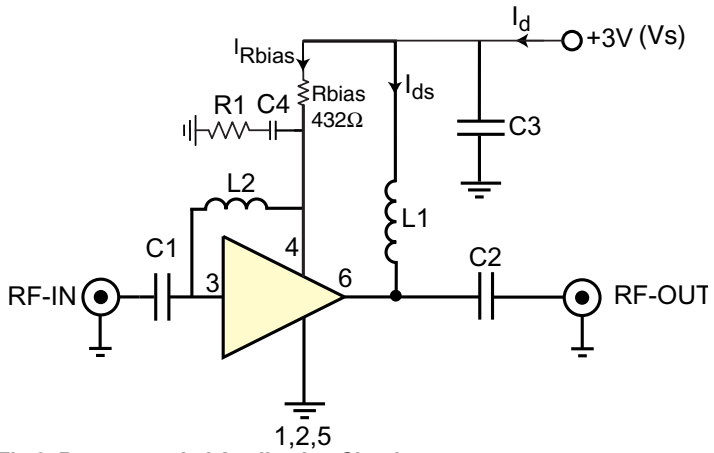
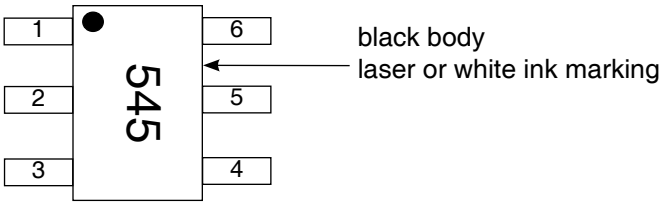


Fig 2. Recommended Application Circuit
Note: Resistance of L1, 0.1-0.2Ω typically

Product Marking



Marking may contain other features or characters for internal lot control

Additional Detailed Technical Information

Additional information is available on our web site www.minicircuits.com. To access this information enter the model number on our web site home page.

Performance data, graphs, s-parameter data set (.zip file)

Case Style: CA1389
Plastic molded SOT-363 package, lead finish: matte tin

Tape & Reel: F101
Standard quantities availabe on reel: *7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices.*

Suggested Layout for PCB Design: PL-311

Evaluation Board: TB-534+

Environmental Ratings: ENV08T2

ESD Rating

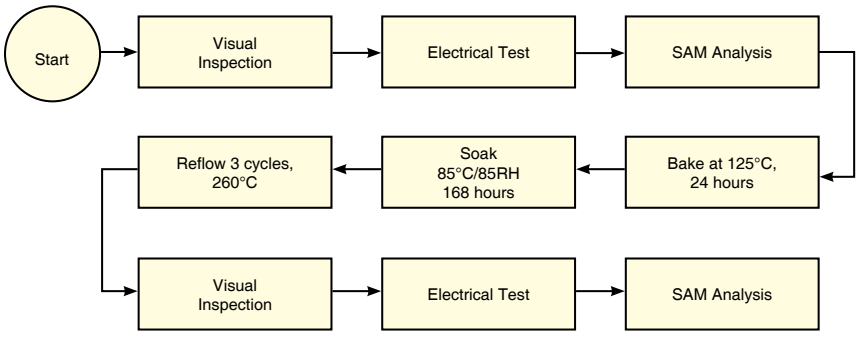
Human Body Model (HBM): Class 1A (250 to <500V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): Class M1 (<100V) in accordance with ANSI/ESD STM5.2-1999; passes 40V

MSL Rating

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

MSL Test Flow Chart



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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 = 3V, Rbias=432 ohms, Id=80 mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(1)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	24.88	32.57	11.26	10.64	1.30	0.76	34.01	19.38	2.05
100.0	25.87	31.46	12.62	14.29	1.13	0.74	33.94	19.42	1.23
200.0	25.79	30.60	11.64	17.95	1.05	0.75	33.98	19.61	0.82
300.0	25.18	30.14	10.09	19.34	1.04	0.80	34.15	19.47	0.72
400.0	24.42	29.69	8.86	19.83	1.03	0.86	34.13	19.44	0.76
500.0	23.59	29.16	8.00	19.90	1.03	0.90	34.45	19.67	0.70
600.0	22.77	28.69	7.39	19.92	1.03	0.94	34.60	19.65	0.77
700.0	21.96	28.16	6.99	19.94	1.04	0.97	34.57	19.53	0.80
800.0	21.19	27.66	6.72	19.93	1.04	0.99	34.34	19.55	0.78
900.0	20.47	27.13	6.51	20.11	1.05	1.01	34.49	19.52	0.80
1000.0	19.79	26.65	6.37	20.13	1.06	1.02	35.28	19.76	0.88
1100.0	19.14	26.17	6.25	20.19	1.07	1.03	34.77	19.52	0.84
1200.0	18.53	25.77	6.18	20.36	1.08	1.04	34.84	19.97	0.94
1300.0	17.97	25.29	6.13	20.65	1.09	1.05	35.19	19.87	0.89
1400.0	17.44	24.82	6.12	20.87	1.09	1.05	35.00	19.87	0.93
1500.0	16.95	24.37	6.14	21.22	1.09	1.05	35.15	19.79	0.96
1600.0	16.49	23.93	6.18	21.42	1.10	1.05	35.08	19.90	1.09
1700.0	16.05	23.51	6.23	21.65	1.10	1.05	34.91	19.95	0.95
1800.0	15.64	23.11	6.27	21.96	1.11	1.05	34.85	20.00	1.03
1900.0	15.25	22.75	6.34	22.24	1.11	1.05	35.49	20.01	1.02
2000.0	14.88	22.37	6.41	22.52	1.11	1.05	35.62	20.06	1.06
2100.0	14.53	21.95	6.48	22.81	1.11	1.04	35.21	20.10	1.02
2200.0	14.20	21.61	6.59	23.07	1.11	1.04	35.38	20.14	1.07
2300.0	13.89	21.21	6.69	23.26	1.11	1.03	35.40	20.31	1.09
2400.0	13.60	20.89	6.78	23.37	1.11	1.03	35.44	20.32	1.11
2500.0	13.31	20.55	6.89	23.44	1.11	1.02	35.47	20.36	1.17
2600.0	13.05	20.22	6.98	23.51	1.11	1.02	35.97	20.58	1.31
2700.0	12.79	19.89	7.12	23.42	1.11	1.01	35.44	20.53	1.28
2800.0	12.55	19.56	7.26	23.51	1.11	1.00	35.53	20.45	1.39
2900.0	12.30	19.29	7.42	23.36	1.11	0.99	35.62	20.52	1.36
3000.0	12.00	19.08	7.52	23.65	1.13	0.99	35.88	20.73	1.38
3100.0	11.86	18.72	7.50	23.69	1.11	0.99	36.35	20.75	1.31
3200.0	11.66	18.43	7.60	23.50	1.10	0.98	35.57	20.63	1.35
3300.0	11.47	18.16	7.66	23.80	1.10	0.97	35.82	20.58	1.38
3400.0	11.29	17.90	7.71	23.96	1.10	0.97	36.12	20.71	1.40
3500.0	11.10	17.70	7.77	24.32	1.10	0.96	35.12	20.60	1.39
3600.0	10.94	17.47	7.78	24.71	1.10	0.96	35.81	20.67	1.52
3700.0	10.78	17.30	7.76	25.26	1.10	0.96	35.44	20.63	1.45
3800.0	10.63	17.10	7.68	25.67	1.10	0.95	35.64	20.73	1.58
3900.0	10.48	16.94	7.61	26.25	1.10	0.95	35.60	20.60	1.52
4000.0	10.33	16.81	7.55	26.42	1.10	0.95	34.82	20.64	1.60
4200.0	9.95	16.56	7.67	25.78	1.13	0.94	34.75	20.29	1.80
4400.0	8.75	16.65	7.62	21.91	1.24	0.99	34.70	20.39	2.08
4600.0	8.97	16.38	6.19	20.13	1.14	1.01	34.28	20.34	2.39
4800.0	8.66	16.20	5.67	17.84	1.13	1.02	34.04	20.29	2.03
5000.0	8.23	16.09	5.21	15.89	1.13	1.03	35.11	20.44	2.03
5200.0	7.83	15.96	4.85	14.52	1.13	1.04	34.10	19.88	1.90
5400.0	7.37	15.84	4.47	13.15	1.13	1.05	33.39	19.46	2.17
5600.0	6.90	15.75	4.13	12.06	1.13	1.06	33.14	19.80	2.02
5800.0	6.43	15.68	3.85	11.07	1.14	1.06	33.45	19.57	2.37
6000.0	6.00	15.59	3.60	10.33	1.14	1.06	33.68	19.47	2.44
6200.0	5.52	15.53	3.37	9.57	1.14	1.06	32.86	19.24	2.66
6400.0	5.09	15.52	3.17	9.01	1.15	1.06	32.40	18.83	2.68
6600.0	4.61	15.51	3.01	8.43	1.16	1.05	32.98	18.79	2.74
6800.0	4.19	15.45	2.87	7.95	1.16	1.04	33.21	18.98	3.04
7000.0	3.79	15.41	2.77	7.55	1.17	1.03	32.94	18.74	3.45

(1) Current increases at P1dB

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 = 3V, Rbias=432 ohms, Id=89 mA @ Temperature = -45degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(1)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	25.19	31.88	12.21	10.73	1.21	0.71	35.45	19.40	1.57
100.0	25.94	31.11	15.06	13.85	1.11	0.70	35.88	19.45	1.19
200.0	25.79	30.45	13.55	16.72	1.06	0.72	35.86	19.62	0.64
300.0	25.22	30.11	11.39	17.71	1.06	0.76	35.63	19.48	0.57
400.0	24.52	29.66	9.86	17.95	1.05	0.80	35.57	19.41	0.61
500.0	23.75	29.19	8.78	18.00	1.05	0.84	35.66	19.62	0.57
600.0	22.97	28.76	8.02	18.23	1.06	0.88	35.51	19.60	0.62
700.0	22.20	28.20	7.49	18.39	1.06	0.91	35.33	19.49	0.66
800.0	21.46	27.79	7.14	18.49	1.07	0.94	35.12	19.48	0.62
900.0	20.76	27.29	6.89	18.67	1.08	0.95	34.97	19.44	0.64
1000.0	20.10	26.76	6.69	18.75	1.08	0.97	35.83	19.67	0.70
1100.0	19.47	26.24	6.54	18.89	1.08	0.98	35.23	19.44	0.66
1200.0	18.87	25.74	6.45	19.10	1.09	0.99	35.17	19.86	0.70
1300.0	18.32	25.28	6.36	19.43	1.09	1.00	35.43	19.74	0.71
1400.0	17.80	24.81	6.34	19.65	1.09	1.00	35.36	19.76	0.74
1500.0	17.32	24.37	6.34	19.96	1.10	1.01	35.40	19.68	0.79
1600.0	16.87	23.89	6.37	20.32	1.10	1.01	35.36	19.80	0.85
1700.0	16.43	23.43	6.41	20.70	1.10	1.00	35.03	19.84	0.73
1800.0	16.02	23.02	6.43	21.12	1.10	1.00	35.14	19.88	0.81
1900.0	15.63	22.62	6.49	21.40	1.10	1.00	35.37	19.89	0.77
2000.0	15.27	22.22	6.54	21.91	1.10	1.00	35.77	19.94	0.81
2100.0	14.92	21.86	6.61	22.45	1.10	1.00	35.34	19.98	0.80
2200.0	14.60	21.47	6.72	23.00	1.10	1.00	35.57	20.03	0.81
2300.0	14.30	21.10	6.84	23.53	1.09	0.99	35.84	20.19	0.82
2400.0	14.01	20.74	6.95	23.85	1.09	0.98	35.58	20.22	0.82
2500.0	13.73	20.40	7.07	24.04	1.09	0.98	35.36	20.24	0.85
2600.0	13.46	20.01	7.17	24.35	1.09	0.97	36.21	20.46	0.96
2700.0	13.21	19.71	7.32	24.58	1.09	0.96	35.53	20.46	1.03
2800.0	12.97	19.40	7.47	24.83	1.09	0.96	35.67	20.36	1.08
2900.0	12.73	19.08	7.63	24.78	1.09	0.95	35.81	20.45	0.99
3000.0	12.40	18.93	7.82	24.78	1.11	0.95	35.97	20.64	1.00
3100.0	12.28	18.53	7.70	25.27	1.08	0.94	36.56	20.67	0.99
3200.0	12.09	18.25	7.81	25.20	1.08	0.93	35.72	20.57	1.02
3300.0	11.90	17.98	7.88	25.48	1.08	0.93	36.06	20.55	0.99
3400.0	11.72	17.72	7.93	25.39	1.07	0.92	36.22	20.65	1.12
3500.0	11.54	17.53	7.98	25.60	1.08	0.92	35.23	20.56	1.06
3600.0	11.38	17.26	7.98	25.91	1.07	0.91	35.75	20.65	1.25
3700.0	11.22	17.09	7.96	26.48	1.07	0.91	35.41	20.59	1.07
3800.0	11.08	16.87	7.92	26.72	1.07	0.90	35.89	20.70	1.11
3900.0	10.93	16.72	7.85	26.59	1.07	0.90	35.82	20.56	1.13
4000.0	10.79	16.54	7.76	26.20	1.07	0.90	35.03	20.59	1.35
4200.0	10.45	16.29	7.75	25.16	1.08	0.89	34.85	20.27	1.38
4400.0	8.98	16.41	8.27	20.43	1.23	0.94	34.74	20.33	1.51
4600.0	9.43	16.12	6.24	18.51	1.10	0.96	34.40	20.24	1.38
4800.0	9.12	15.95	5.74	16.63	1.09	0.96	34.12	20.21	1.59
5000.0	8.70	15.82	5.28	14.75	1.09	0.97	34.90	20.34	1.52
5200.0	8.29	15.69	4.89	13.50	1.09	0.98	34.04	19.79	1.59
5400.0	7.82	15.58	4.47	12.17	1.09	0.99	33.50	19.38	1.65
5600.0	7.36	15.50	4.12	11.12	1.09	0.99	33.26	19.63	1.67
5800.0	6.91	15.41	3.85	10.39	1.09	1.00	33.38	19.46	1.88
6000.0	6.45	15.35	3.56	9.58	1.09	1.00	33.65	19.40	1.83
6200.0	5.97	15.29	3.30	8.93	1.09	1.00	32.94	19.15	1.94
6400.0	5.54	15.26	3.12	8.45	1.10	1.00	32.56	18.80	2.08
6600.0	5.07	15.25	2.92	7.88	1.10	0.99	32.81	18.66	2.11
6800.0	4.67	15.17	2.79	7.45	1.11	0.98	33.26	18.91	2.37
7000.0	4.26	15.14	2.66	7.08	1.11	0.97	33.01	18.70	2.75

(1) Current increases at P1dB

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 = 3V, Rbias=432 ohms,Id=78 mA @ Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(1)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	24.46	32.59	10.52	10.17	1.33	0.76	32.76	19.28	2.67
100.0	25.65	31.61	11.09	13.70	1.14	0.76	32.88	19.30	1.69
200.0	25.64	30.61	10.35	17.31	1.05	0.78	32.91	19.48	0.97
300.0	25.01	30.00	9.17	18.67	1.01	0.83	33.16	19.36	0.90
400.0	24.22	29.49	8.16	19.36	1.00	0.89	33.56	19.35	0.87
500.0	23.37	28.91	7.43	19.83	0.99	0.93	33.70	19.60	0.85
600.0	22.52	28.43	6.93	20.06	0.99	0.97	34.13	19.61	0.94
700.0	21.70	27.92	6.62	20.06	1.00	1.00	34.40	19.48	0.98
800.0	20.92	27.46	6.42	19.92	1.01	1.03	34.31	19.51	0.94
900.0	20.19	26.98	6.26	20.15	1.03	1.04	34.33	19.51	1.00
1000.0	19.50	26.55	6.14	20.29	1.04	1.06	35.07	19.75	0.86
1100.0	18.84	26.02	6.04	20.42	1.05	1.07	34.89	19.53	1.03
1200.0	18.23	25.67	6.01	20.52	1.07	1.08	34.94	19.96	1.01
1300.0	17.66	25.20	5.97	20.73	1.07	1.08	35.22	19.87	1.10
1400.0	17.14	24.73	5.99	20.95	1.08	1.08	35.29	19.90	1.13
1500.0	16.64	24.35	6.02	21.23	1.09	1.09	35.41	19.80	1.22
1600.0	16.18	23.91	6.04	21.34	1.09	1.09	35.36	19.92	1.22
1700.0	15.74	23.57	6.10	21.43	1.11	1.09	35.22	19.97	1.16
1800.0	15.32	23.15	6.14	21.54	1.11	1.09	35.10	20.03	1.29
1900.0	14.93	22.72	6.22	21.73	1.11	1.08	35.70	20.03	1.22
2000.0	14.57	22.39	6.29	22.01	1.12	1.08	36.08	20.09	1.28
2100.0	14.21	22.02	6.36	22.12	1.12	1.08	35.52	20.11	1.32
2200.0	13.88	21.66	6.45	22.23	1.12	1.07	36.04	20.15	1.32
2300.0	13.57	21.33	6.55	22.17	1.13	1.07	36.06	20.29	1.34
2400.0	13.27	21.00	6.65	22.14	1.13	1.06	35.94	20.30	1.37
2500.0	12.98	20.64	6.75	22.18	1.13	1.06	35.75	20.32	1.43
2600.0	12.71	20.33	6.83	22.23	1.13	1.05	36.53	20.52	1.51
2700.0	12.46	19.99	6.96	22.13	1.13	1.04	35.89	20.48	1.58
2800.0	12.21	19.72	7.08	22.19	1.13	1.04	35.90	20.40	1.55
2900.0	11.96	19.39	7.23	22.01	1.13	1.03	36.10	20.44	1.65
3000.0	11.67	19.20	7.33	22.34	1.15	1.03	36.34	20.64	1.60
3100.0	11.51	18.84	7.31	22.24	1.13	1.02	36.87	20.66	1.63
3200.0	11.31	18.56	7.40	22.24	1.13	1.01	36.29	20.54	1.64
3300.0	11.11	18.34	7.45	22.47	1.13	1.01	36.20	20.51	1.67
3400.0	10.93	18.08	7.49	22.75	1.12	1.00	36.51	20.60	1.77
3500.0	10.75	17.85	7.52	23.07	1.12	1.00	35.66	20.52	1.81
3600.0	10.58	17.66	7.53	23.60	1.13	1.00	36.31	20.58	1.90
3700.0	10.41	17.46	7.48	24.13	1.12	0.99	35.93	20.52	1.85
3800.0	10.26	17.27	7.42	24.71	1.12	0.99	36.14	20.64	1.86
3900.0	10.10	17.12	7.36	25.55	1.12	0.99	36.23	20.52	1.94
4000.0	9.95	16.98	7.28	26.04	1.13	0.99	35.51	20.52	1.94
4200.0	9.55	16.74	7.40	25.81	1.15	0.98	35.31	20.25	2.18
4400.0	8.43	16.80	7.52	23.10	1.28	1.02	35.27	20.36	2.50
4600.0	8.57	16.59	6.09	21.30	1.18	1.05	34.95	20.33	2.44
4800.0	8.28	16.42	5.58	18.93	1.16	1.06	34.68	20.28	2.55
5000.0	7.86	16.30	5.16	16.96	1.17	1.08	35.79	20.45	2.40
5200.0	7.47	16.13	4.83	15.53	1.16	1.09	34.63	19.92	2.58
5400.0	7.02	16.03	4.47	14.05	1.17	1.10	34.00	19.51	2.55
5600.0	6.57	15.93	4.15	12.86	1.17	1.10	33.91	19.87	2.82
5800.0	6.11	15.84	3.89	11.86	1.17	1.10	34.25	19.66	2.85
6000.0	5.67	15.76	3.65	10.96	1.18	1.10	34.22	19.52	2.87
6200.0	5.19	15.71	3.42	10.18	1.18	1.10	33.42	19.29	3.10
6400.0	4.74	15.69	3.23	9.56	1.19	1.10	33.07	18.92	3.17
6600.0	4.26	15.67	3.07	8.96	1.20	1.10	33.72	18.91	3.35
6800.0	3.82	15.63	2.93	8.43	1.21	1.09	33.90	19.03	3.73
7000.0	3.41	15.60	2.83	7.98	1.22	1.08	33.39	18.78	4.21

(1) Current increases at P1dB

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 = 3V, Id=80mA @ Temperature = +25degC (1)

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(2)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	24.88	32.57	11.26	10.64	1.30	0.76	34.01	19.38	2.05
100.0	25.87	31.46	12.62	14.29	1.13	0.74	33.94	19.42	1.23
200.0	25.79	30.60	11.64	17.95	1.05	0.75	33.98	19.61	0.82
300.0	25.18	30.14	10.09	19.34	1.04	0.80	34.15	19.47	0.72
400.0	24.42	29.69	8.86	19.83	1.03	0.86	34.13	19.44	0.76
500.0	23.59	29.16	8.00	19.90	1.03	0.90	34.45	19.67	0.70
600.0	22.77	28.69	7.39	19.92	1.03	0.94	34.60	19.65	0.77
700.0	21.96	28.16	6.99	19.94	1.04	0.97	34.57	19.53	0.80
800.0	21.19	27.66	6.72	19.93	1.04	0.99	34.34	19.55	0.78
900.0	20.47	27.13	6.51	20.11	1.05	1.01	34.49	19.52	0.80
1000.0	19.79	26.65	6.37	20.13	1.06	1.02	35.28	19.76	0.88
1100.0	19.14	26.17	6.25	20.19	1.07	1.03	34.77	19.52	0.84
1200.0	18.53	25.77	6.18	20.36	1.08	1.04	34.84	19.97	0.94
1300.0	17.97	25.29	6.13	20.65	1.09	1.05	35.19	19.87	0.89
1400.0	17.44	24.82	6.12	20.87	1.09	1.05	35.00	19.87	0.93
1500.0	16.95	24.37	6.14	21.22	1.09	1.05	35.15	19.79	0.96
1600.0	16.49	23.93	6.18	21.42	1.10	1.05	35.08	19.90	1.09
1700.0	16.05	23.51	6.23	21.65	1.10	1.05	34.91	19.95	0.95
1800.0	15.64	23.11	6.27	21.96	1.11	1.05	34.85	20.00	1.03
1900.0	15.25	22.75	6.34	22.24	1.11	1.05	35.49	20.01	1.02
2000.0	14.88	22.37	6.41	22.52	1.11	1.05	35.62	20.06	1.06
2100.0	14.53	21.95	6.48	22.81	1.11	1.04	35.21	20.10	1.02
2200.0	14.20	21.61	6.59	23.07	1.11	1.04	35.38	20.14	1.07
2300.0	13.89	21.21	6.69	23.26	1.11	1.03	35.40	20.31	1.09
2400.0	13.60	20.89	6.78	23.37	1.11	1.03	35.44	20.32	1.11
2500.0	13.31	20.55	6.89	23.44	1.11	1.02	35.47	20.36	1.17
2600.0	13.05	20.22	6.98	23.51	1.11	1.02	35.97	20.58	1.31
2700.0	12.79	19.89	7.12	23.42	1.11	1.01	35.44	20.53	1.28
2800.0	12.55	19.56	7.26	23.51	1.11	1.00	35.53	20.45	1.39
2900.0	12.30	19.29	7.42	23.36	1.11	0.99	35.62	20.52	1.36
3000.0	12.00	19.08	7.52	23.65	1.13	0.99	35.88	20.73	1.38
3100.0	11.86	18.72	7.50	23.69	1.11	0.99	36.35	20.75	1.31
3200.0	11.66	18.43	7.60	23.50	1.10	0.98	35.57	20.63	1.35
3300.0	11.47	18.16	7.66	23.80	1.10	0.97	35.82	20.58	1.38
3400.0	11.29	17.90	7.71	23.96	1.10	0.97	36.12	20.71	1.40
3500.0	11.10	17.70	7.77	24.32	1.10	0.96	35.12	20.60	1.39
3600.0	10.94	17.47	7.78	24.71	1.10	0.96	35.81	20.67	1.52
3700.0	10.78	17.30	7.76	25.26	1.10	0.96	35.44	20.63	1.45
3800.0	10.63	17.10	7.68	25.67	1.10	0.95	35.64	20.73	1.58
3900.0	10.48	16.94	7.61	26.25	1.10	0.95	35.60	20.60	1.52
4000.0	10.33	16.81	7.55	26.42	1.10	0.95	34.82	20.64	1.60
4200.0	9.95	16.56	7.67	25.78	1.13	0.94	34.75	20.29	1.80
4400.0	8.75	16.65	7.62	21.91	1.24	0.99	34.70	20.39	2.08
4600.0	8.97	16.38	6.19	20.13	1.14	1.01	34.28	20.34	2.39
4800.0	8.66	16.20	5.67	17.84	1.13	1.02	34.04	20.29	2.03
5000.0	8.23	16.09	5.21	15.89	1.13	1.03	35.11	20.44	2.03
5200.0	7.83	15.96	4.85	14.52	1.13	1.04	34.10	19.88	1.90
5400.0	7.37	15.84	4.47	13.15	1.13	1.05	33.39	19.46	2.17
5600.0	6.90	15.75	4.13	12.06	1.13	1.06	33.14	19.80	2.02
5800.0	6.43	15.68	3.85	11.07	1.14	1.06	33.45	19.57	2.37
6000.0	6.00	15.59	3.60	10.33	1.14	1.06	33.68	19.47	2.44
6200.0	5.52	15.53	3.37	9.57	1.14	1.06	32.86	19.24	2.66
6400.0	5.09	15.52	3.17	9.01	1.15	1.06	32.40	18.83	2.68
6600.0	4.61	15.51	3.01	8.43	1.16	1.05	32.98	18.79	2.74
6800.0	4.19	15.45	2.87	7.95	1.16	1.04	33.21	18.98	3.04
7000.0	3.79	15.41	2.77	7.55	1.17	1.03	32.94	18.74	3.45

(1) External Rbias resistor is adjusted to obtain desired current

(2) Current increases at P1dB

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 = 3V, Id=65mA @ Temperature = +25degC (1)

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(2)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	24.62	32.81	11.20	10.44	1.35	0.77	33.09	19.25	2.05
100.0	25.66	31.26	12.39	14.09	1.13	0.74	33.06	19.35	1.12
200.0	25.61	30.38	11.38	17.90	1.05	0.75	33.24	19.55	0.82
300.0	25.02	29.92	9.91	19.40	1.03	0.80	33.78	19.43	0.76
400.0	24.27	29.34	8.75	19.97	1.01	0.85	34.03	19.40	0.73
500.0	23.45	28.92	7.91	20.09	1.01	0.90	34.04	19.63	0.70
600.0	22.64	28.51	7.32	20.10	1.02	0.94	34.47	19.62	0.77
700.0	21.83	27.98	6.94	20.06	1.02	0.97	34.89	19.50	0.81
800.0	21.07	27.54	6.66	20.07	1.04	1.00	34.71	19.52	0.77
900.0	20.35	27.08	6.45	20.23	1.05	1.02	34.88	19.52	0.80
1000.0	19.67	26.56	6.30	20.30	1.05	1.03	35.37	19.73	0.78
1100.0	19.02	26.10	6.19	20.37	1.06	1.04	35.43	19.52	0.84
1200.0	18.42	25.67	6.14	20.49	1.07	1.05	35.63	19.92	0.96
1300.0	17.86	25.13	6.10	20.72	1.07	1.05	35.69	19.83	0.88
1400.0	17.34	24.78	6.10	20.99	1.09	1.06	35.66	19.84	0.98
1500.0	16.84	24.33	6.09	21.28	1.09	1.06	35.72	19.77	0.94
1600.0	16.38	23.95	6.11	21.47	1.10	1.07	35.90	19.87	0.88
1700.0	15.94	23.51	6.17	21.70	1.10	1.06	35.73	19.92	0.96
1800.0	15.54	23.11	6.22	21.98	1.10	1.06	35.60	19.98	1.00
1900.0	15.15	22.72	6.29	22.22	1.11	1.06	36.20	19.97	1.02
2000.0	14.78	22.31	6.35	22.49	1.11	1.06	36.56	20.02	1.05
2100.0	14.43	21.96	6.42	22.69	1.11	1.06	35.89	20.04	1.06
2200.0	14.10	21.61	6.52	22.91	1.11	1.05	36.32	20.08	1.05
2300.0	13.80	21.22	6.62	23.03	1.11	1.04	36.45	20.22	1.10
2400.0	13.50	20.90	6.71	23.05	1.11	1.04	36.40	20.23	1.12
2500.0	13.21	20.57	6.82	23.11	1.11	1.03	36.20	20.26	1.15
2600.0	12.95	20.21	6.92	23.06	1.11	1.03	37.14	20.45	1.23
2700.0	12.69	19.90	7.04	22.99	1.11	1.02	36.65	20.41	1.29
2800.0	12.45	19.62	7.18	23.09	1.11	1.01	36.43	20.34	1.23
2900.0	12.20	19.28	7.32	22.92	1.11	1.00	36.51	20.39	1.27
3000.0	11.90	19.11	7.43	23.26	1.13	1.00	36.78	20.58	1.36
3100.0	11.76	18.75	7.43	23.09	1.11	1.00	37.18	20.58	1.31
3200.0	11.57	18.45	7.51	22.97	1.10	0.99	36.82	20.46	1.32
3300.0	11.38	18.20	7.57	23.10	1.10	0.98	37.00	20.45	1.38
3400.0	11.19	17.94	7.63	23.36	1.10	0.98	37.02	20.53	1.42
3500.0	11.02	17.70	7.66	23.72	1.10	0.97	36.17	20.46	1.47
3600.0	10.85	17.50	7.67	24.05	1.10	0.97	37.11	20.52	1.50
3700.0	10.69	17.32	7.66	24.79	1.10	0.97	36.38	20.46	1.52
3800.0	10.54	17.13	7.62	25.10	1.10	0.96	36.93	20.54	1.56
3900.0	10.39	17.00	7.55	25.85	1.10	0.96	36.60	20.44	1.54
4000.0	10.24	16.83	7.48	26.06	1.10	0.96	35.97	20.47	1.69
4200.0	9.85	16.59	7.61	25.66	1.13	0.95	35.97	20.22	1.78
4400.0	8.67	16.66	7.54	22.21	1.24	1.00	35.83	20.33	2.04
4600.0	8.88	16.42	6.10	20.38	1.14	1.02	35.47	20.29	1.75
4800.0	8.57	16.28	5.62	18.24	1.14	1.04	35.27	20.24	2.09
5000.0	8.16	16.12	5.20	16.31	1.13	1.05	36.33	20.39	1.99
5200.0	7.73	16.00	4.80	14.75	1.14	1.06	35.25	19.87	2.03
5400.0	7.28	15.89	4.44	13.37	1.14	1.06	34.63	19.48	2.11
5600.0	6.84	15.80	4.11	12.31	1.14	1.07	34.37	19.81	2.11
5800.0	6.33	15.72	3.80	11.20	1.14	1.07	34.75	19.64	2.31
6000.0	5.93	15.65	3.60	10.53	1.15	1.07	34.80	19.52	2.45
6200.0	5.44	15.59	3.35	9.68	1.15	1.07	34.07	19.27	2.74
6400.0	4.98	15.55	3.14	9.11	1.15	1.07	33.60	18.90	2.65
6600.0	4.52	15.54	2.99	8.53	1.16	1.06	34.17	18.83	2.72
6800.0	4.10	15.50	2.84	8.03	1.17	1.06	34.50	19.00	2.90
7000.0	3.69	15.48	2.73	7.63	1.18	1.05	34.23	18.79	3.46

(1) External Rbias resistor is adjusted to obtain desired current

(2) Current increases at P1dB

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 = 3V, Id=98mA @ Temperature = +25degC (1)

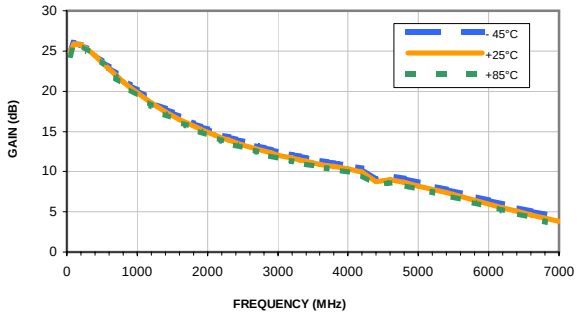
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output(2)	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
50.0	25.15	32.64	10.96	10.91	1.27	0.76	34.90	19.50	2.14
100.0	26.10	31.74	12.84	14.49	1.13	0.75	34.91	19.47	1.31
200.0	25.99	30.88	11.91	17.97	1.06	0.76	34.51	19.65	0.82
300.0	25.36	30.36	10.25	19.23	1.04	0.80	34.37	19.49	0.75
400.0	24.58	30.02	8.98	19.65	1.05	0.86	33.97	19.44	0.78
500.0	23.75	29.41	8.09	19.73	1.04	0.90	34.17	19.69	0.74
600.0	22.92	28.86	7.46	19.79	1.04	0.93	33.95	19.67	0.80
700.0	22.10	28.41	7.06	19.80	1.05	0.96	33.97	19.55	0.85
800.0	21.32	27.89	6.78	19.82	1.06	0.99	33.61	19.54	0.81
900.0	20.60	27.30	6.57	19.99	1.06	1.00	33.55	19.51	0.83
1000.0	19.92	26.77	6.42	20.04	1.07	1.01	34.22	19.76	0.78
1100.0	19.26	26.31	6.31	20.13	1.08	1.02	33.71	19.52	0.87
1200.0	18.65	25.85	6.24	20.29	1.09	1.03	33.77	20.00	0.90
1300.0	18.09	25.37	6.18	20.57	1.09	1.04	33.95	19.88	0.94
1400.0	17.56	24.90	6.18	20.85	1.10	1.04	33.75	19.88	0.84
1500.0	17.07	24.44	6.20	21.19	1.10	1.04	33.86	19.78	1.01
1600.0	16.60	24.01	6.24	21.43	1.10	1.04	33.94	19.92	0.97
1700.0	16.16	23.58	6.29	21.73	1.11	1.04	33.53	19.97	1.07
1800.0	15.75	23.18	6.34	22.06	1.11	1.04	33.71	20.01	1.00
1900.0	15.36	22.77	6.41	22.36	1.11	1.04	33.92	20.03	1.05
2000.0	14.99	22.36	6.47	22.73	1.11	1.04	34.24	20.09	1.10
2100.0	14.64	21.98	6.55	23.03	1.11	1.04	33.96	20.13	1.05
2200.0	14.31	21.62	6.67	23.40	1.11	1.03	34.02	20.16	1.11
2300.0	14.00	21.25	6.77	23.68	1.11	1.03	34.21	20.36	1.15
2400.0	13.70	20.95	6.87	23.76	1.12	1.02	34.14	20.38	1.22
2500.0	13.42	20.56	6.98	23.93	1.11	1.01	34.10	20.41	1.20
2600.0	13.15	20.21	7.08	23.95	1.11	1.01	34.63	20.66	1.29
2700.0	12.90	19.90	7.22	23.93	1.11	1.00	34.15	20.63	1.36
2800.0	12.65	19.60	7.36	24.01	1.11	0.99	34.22	20.51	1.45
2900.0	12.40	19.29	7.52	23.91	1.11	0.98	34.18	20.59	1.30
3000.0	12.11	19.09	7.61	24.20	1.13	0.98	34.41	20.84	1.28
3100.0	11.96	18.72	7.61	24.23	1.11	0.98	34.89	20.89	1.36
3200.0	11.76	18.47	7.70	24.05	1.11	0.97	34.25	20.75	1.37
3300.0	11.56	18.20	7.76	24.31	1.10	0.96	34.29	20.70	1.47
3400.0	11.39	17.93	7.81	24.47	1.10	0.96	34.60	20.84	1.49
3500.0	11.20	17.71	7.86	24.83	1.10	0.95	33.78	20.71	1.55
3600.0	11.04	17.49	7.86	25.23	1.10	0.95	34.25	20.79	1.63
3700.0	10.88	17.29	7.86	25.81	1.10	0.95	33.88	20.74	1.58
3800.0	10.73	17.08	7.77	26.14	1.09	0.94	34.23	20.87	1.64
3900.0	10.57	16.93	7.71	26.73	1.10	0.94	34.28	20.69	1.62
4000.0	10.43	16.79	7.64	26.72	1.10	0.94	33.56	20.72	1.77
4200.0	10.04	16.54	7.75	25.91	1.12	0.93	33.27	20.32	1.81
4400.0	8.85	16.62	7.68	21.79	1.23	0.98	33.34	20.40	2.20
4600.0	9.07	16.36	6.24	19.98	1.13	1.00	32.91	20.35	2.08
4800.0	8.75	16.21	5.73	17.74	1.13	1.01	32.63	20.29	2.15
5000.0	8.32	16.07	5.25	15.78	1.13	1.02	33.52	20.45	2.17
5200.0	7.92	15.92	4.89	14.43	1.12	1.03	32.68	19.85	2.12
5400.0	7.46	15.82	4.50	13.08	1.13	1.04	32.12	19.38	2.28
5600.0	6.99	15.73	4.16	12.00	1.13	1.05	31.98	19.74	2.40
5800.0	6.52	15.64	3.88	11.01	1.13	1.05	32.22	19.52	2.52
6000.0	6.08	15.57	3.64	10.26	1.13	1.05	32.36	19.40	2.62
6200.0	5.61	15.52	3.40	9.52	1.14	1.05	31.64	19.13	2.41
6400.0	5.18	15.48	3.21	8.96	1.14	1.05	31.26	18.77	2.90
6600.0	4.71	15.48	3.04	8.38	1.15	1.04	31.73	18.75	2.93
6800.0	4.29	15.40	2.89	7.93	1.16	1.03	31.91	18.97	3.18
7000.0	3.89	15.38	2.79	7.53	1.16	1.03	31.65	18.69	3.84

(1) External Rbias resistor is adjusted to obtain desired current

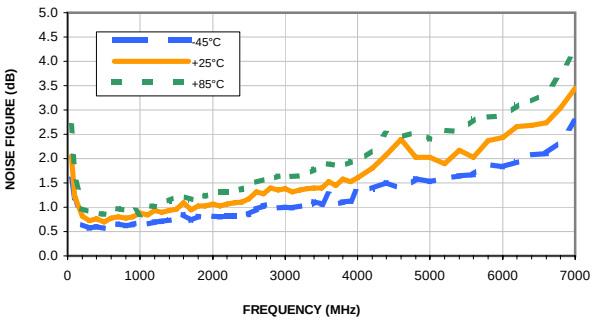
(2) Current increases at P1dB

Typical Performance Curves

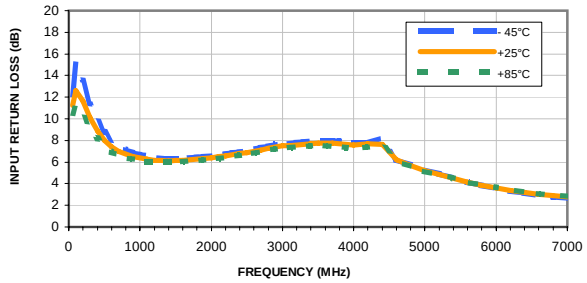
GAIN vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



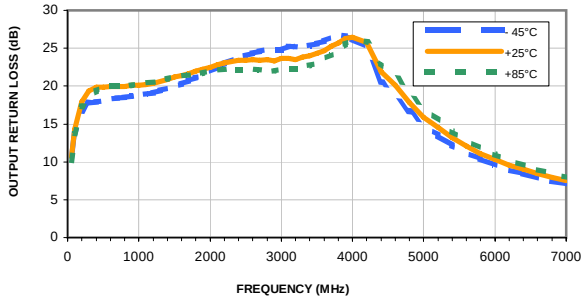
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



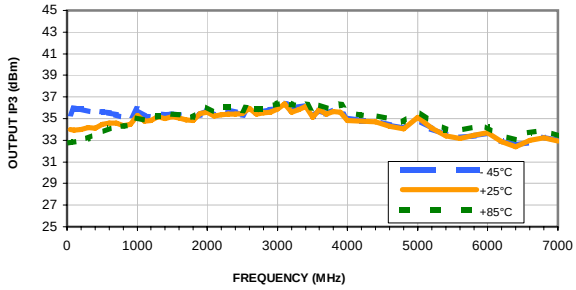
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



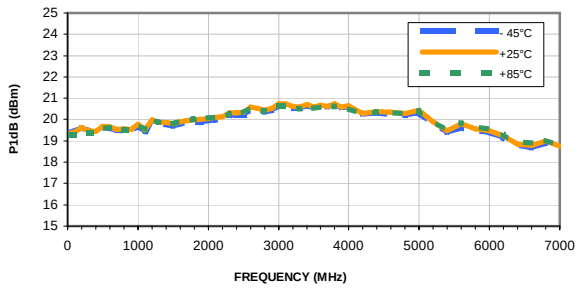
OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



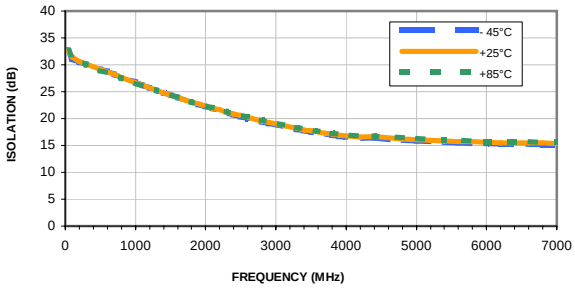
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



P1dB vs. FREQUENCY & TEMPERATURE(1)
Vd = 3V, Rbias=432 Ohms



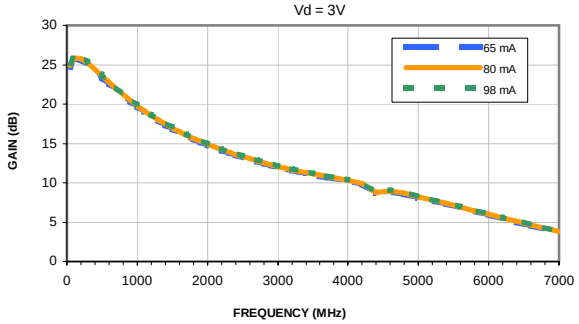
ISOLATION vs. FREQUENCY & TEMPERATURE
Vd = 3V, Rbias=432 Ohms



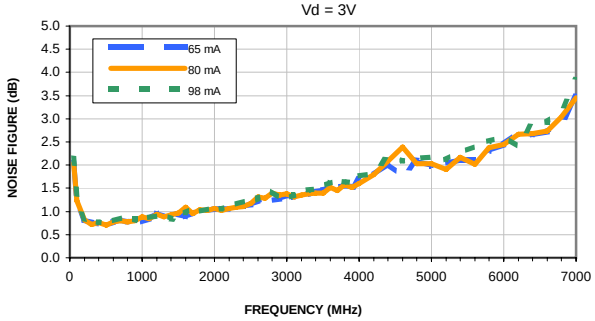
(1) Current increases at P1dB

Typical Performance Curves

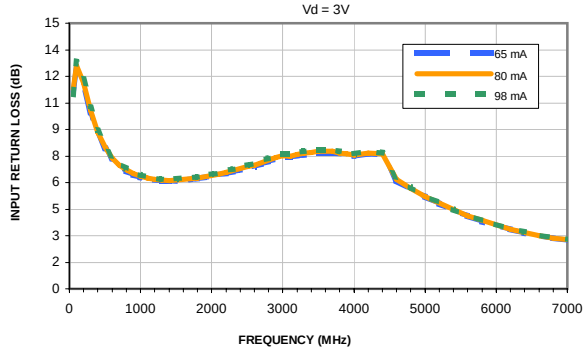
GAIN vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



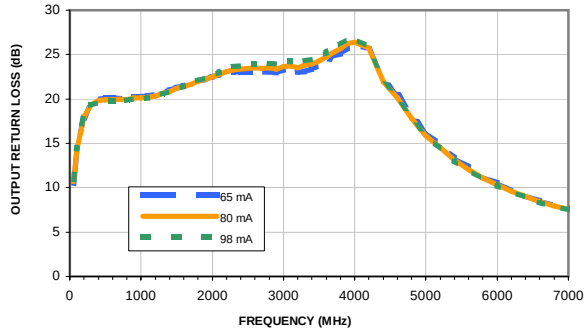
NOISE FIGURE vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



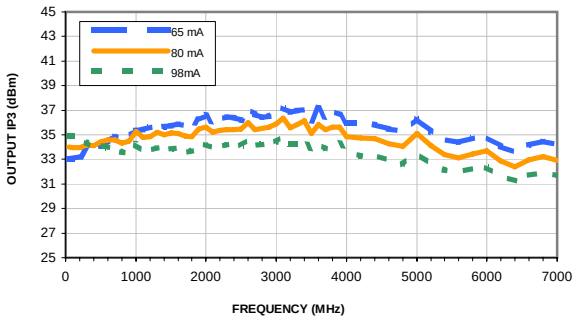
IINPUT RETURN LOSS vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



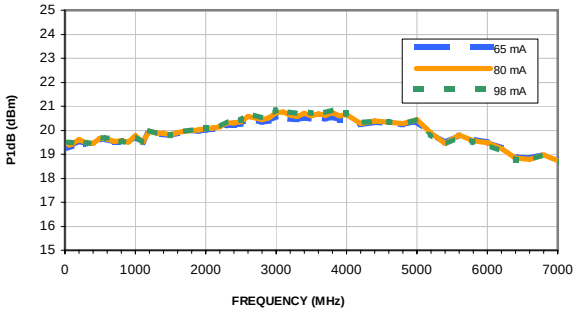
OUTPUT RETURN LOSS vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



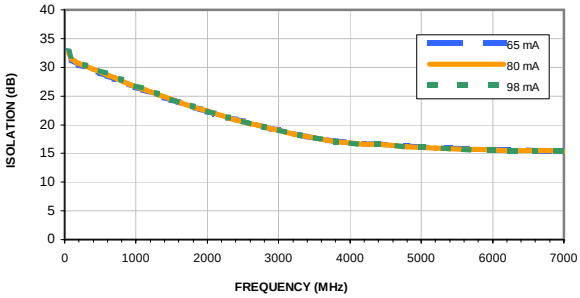
OUTPUT IP3 vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



P1dB vs. FREQUENCY & BIAS CURRENT(2)
Vd = 3V



ISOLATION vs. FREQUENCY & BIAS CURRENT(1)
Vd = 3V



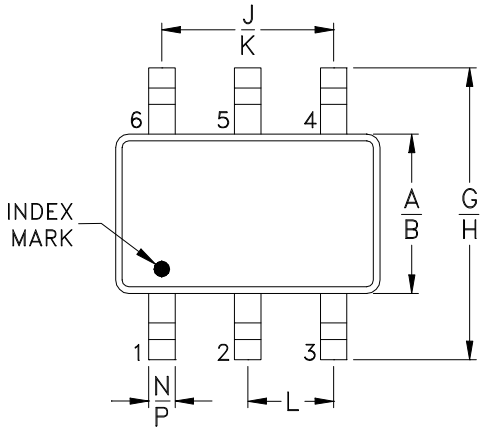
(1) External Rbias resistor is adjusted to obtain desired current
(2) Current increases at P1dB

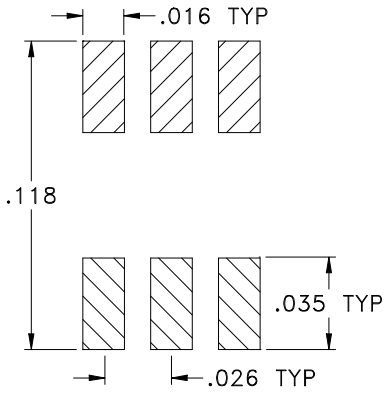
Case Style CA

CA1389

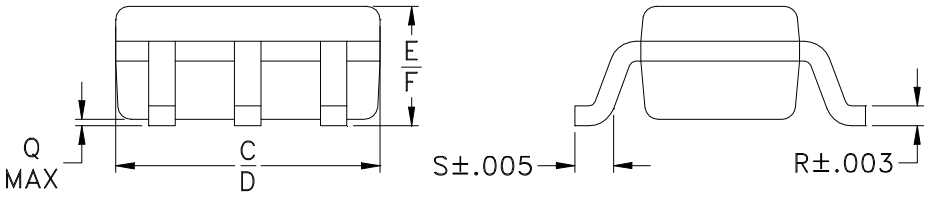
Outline Dimensions

PCB Land Pattern





Suggested Layout,
Tolerance to be within ±.002



CASE #	A	B	C	D	E	F	G	H	J	K
CA1389	.045 (1.15)	.053 (1.35)	.073 (1.85)	.089 (2.25)	.031 (0.80)	.039 (1.00)	.079 (2.00)	.091 (2.30)	.051 (1.30)	.051 (1.30)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CA1389	.026 (0.65)	- -	.006 (0.15)	.012 (0.30)	.004 (0.09)	.007 (0.165)	.012 (0.31)	- -	.010

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

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Matte Tin plate.
3. Primary dimensions are in millimeters.

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INTERNET http://www.minicircuits.com
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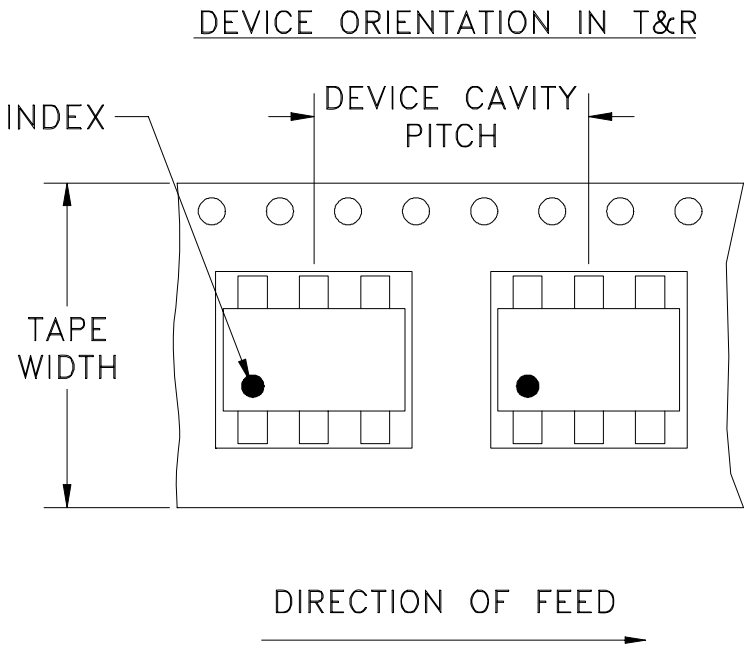
Mini-Circuits ISO 9001 & ISO 14001 Certified

Tape & Reel Packaging TR-F101



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

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

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

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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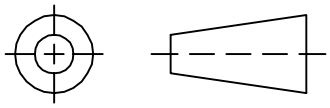
Mini-Circuits ISO 9001 & ISO 14001 Certified

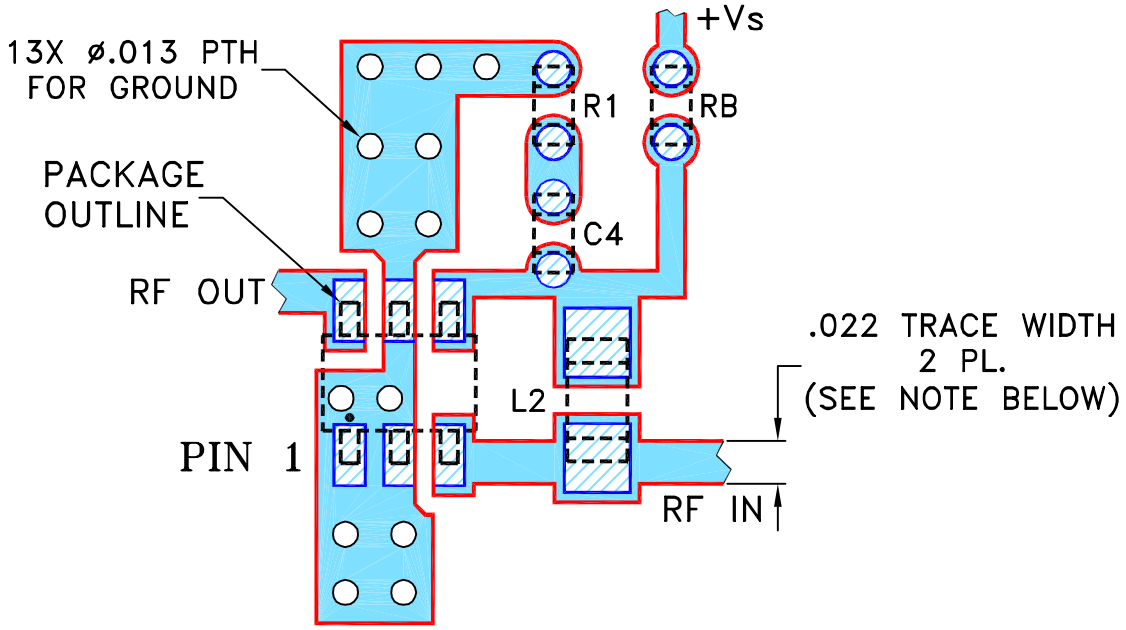
THIRD ANGLE PROJECTION



REVISIONS

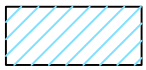
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M123889	NEW RELEASE	08/18/09	MMG	DJ
A	M124525	MODIFIED DRAWING, CHG. TB IN TITLE	09/22/09	MMG	DJ

SUGGESTED MOUNTING CONFIGURATION FOR CA1389 CASE STYLE, "06AM01" PIN CODE



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. 0402 AND 0603 CHIP COMPONENTS FOOTPRINTS ARE SHOWN FOR REFERENCE. VALUES OF COMPONENTS AS PER TB-534+.
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	MMG	08/13/09
TOLERANCES ON:	CHECKED	AV	08/17/09
2 PL DECIMALS ±	APPROVED	DJ	08/18/09
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

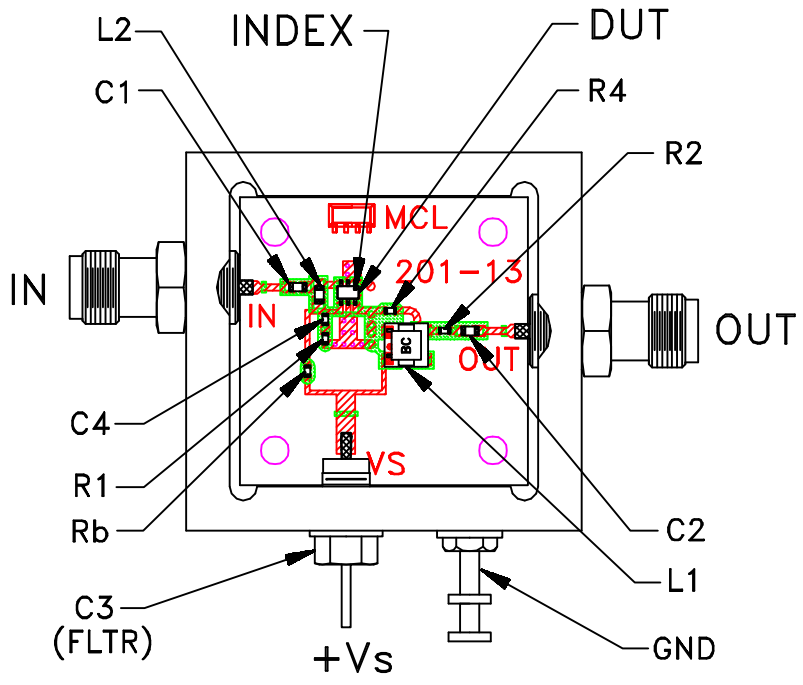
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 06AM01, CA1389, TB-534+

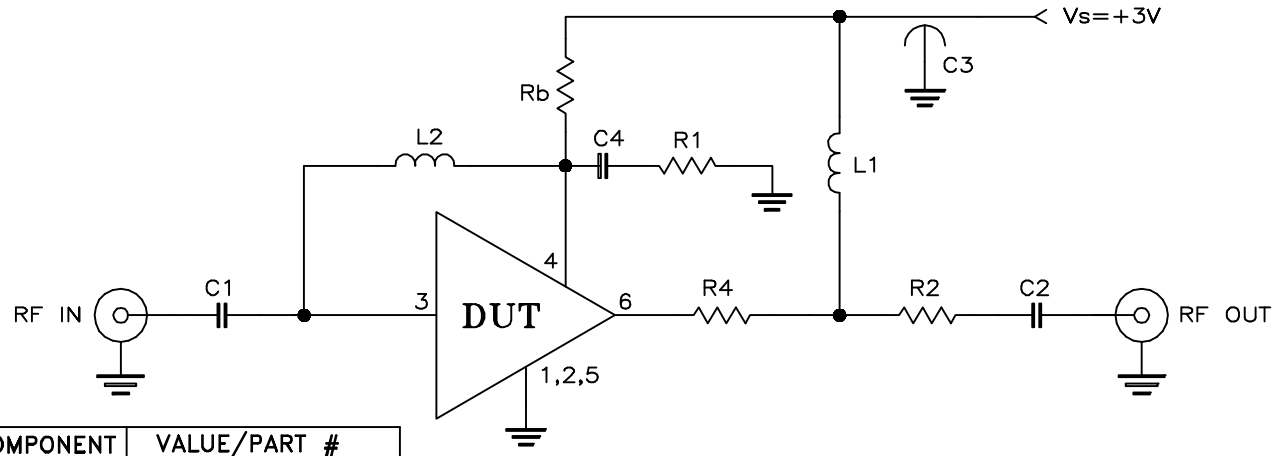
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-311	A

FILE:	SCALE:	SHEET:
98PL311	10:1	1 OF 1

Evaluation Board and Circuit



TB-534+



COMPONENT	VALUE/PART #
R1	49.9 Ω
R2, R4	0 Ω
Rb	432 Ω
C1, C2	1000 pF
C3 (FLTR)	1500 pF
C4	10 pF
L1	TCCH-80+, MCL
L2	180 nH
DUT	PSA-545+, MCL

Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.010 inch.

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Environmental Specifications **ENV08T2**

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	-45° to 85°C or -40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-65° to 150° C 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

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
	monoethanolamine at 63°C to 70°C	