



Mini-Circuits

LOW NOISE, HIGH IP3

Monolithic Amplifier

PSA-5453+

50Ω 0.05 to 4 GHz

THE BIG DEAL

- Single Positive Supply Voltage, +3 V, $I_D = 60$ mA
- Ultra Low Noise Figure, 0.7 dB Typ. at 0.5 GHz
- High IP3, +35 dBm Typ. 1 GHz
- Gain, 19.6 dB Typ. at 1 GHz
- Output Power, Up to +19.5 dBm Typ.
- Micro-Miniature Size SOT-363 Package
- Aqueous Washable



Generic photo used for illustration purposes only

CASE STYLE: CA1389

+RoHS Compliant

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

APPLICATIONS

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

PRODUCT OVERVIEW

Mini-Circuits PSA-5453+ 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 +3 V supply at only 60 mA and is internally matched to 50Ω.

KEY FEATURES

Feature	Advantages
Ultra Low Noise, 0.7 dB	Outstanding Noise Figure, measured in a 50Ω environment without any external matching.
High IP3, +35 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.
Low Current, 60 mA	At only 60 mA, the PSA-5453+ is ideal for remote applications with limited available power or densely packed applications where thermal management is critical.
Broadband	Operating over a broadband, the PSA-5453+ 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, +15 dBm	Ruggedized design operates up to input powers of +15 dBm without the need of an external limiter.
High Reliability	Low, small signal operating current of 30 mA nominal maintains junction temperatures typically below +115°C at +85°C ground lead temperature.

* Enhancement mode pseudomorphic High Electron Mobility Transistor.

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PAGE 1 OF 6



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50Ω 0.05 to 4 GHz

ELECTRICAL SPECIFICATIONS¹ AT +25°C, Z₀ = 50Ω, (REFER TO CHARACTERIZATION CIRCUIT, FIG. 1)

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		0.05		4.0	GHz
DC Voltage (V _D)			+3.0		V
DC Current (I _D) ²		40	60	71	mA
DC Current (I _{Rbias})			4.0		mA
Noise Figure	0.05		2.0	1.3	dB
	0.5		0.7		
	1.0		0.8		
	2.0		1.0		
	3.0		1.3		
	4.0		1.6		
Gain	0.05	13.2	24.4	16.2	dB
	0.5		23.3		
	1.0		19.6		
	2.0		14.7		
	3.0		11.9		
	4.0		10.2		
Input Return Loss	0.05-0.5		10.0		dB
	0.5-4.0		7.0		
Output Return Loss	0.05-0.5		10.0		dB
	0.5-4.0		20.0		
Output IP3	0.05		+32.1		dBm
	0.5		+33.8		
	1.0		+35.2		
	2.0		+36.8		
	3.0		+37.1		
	4.0		+37.3		
Output Power @ 1 dB Compression (P1dB) ³	0.05		+19.0		dBm
	0.5		+19.3		
	1.0		+19.4		
	2.0		+19.8		
	3.0		+19.9		
	4.0		+20.1		
DC Current Variation vs. Temperature ⁴			-0.066		mA/°C
Thermal Resistance			165		°C/W

ABSOLUTE MAXIMUM RATINGS⁵

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

1. Measured on Mini-Circuits Characterization test board TB-534-3+. See Characterization Test Circuit (Fig. 1).
2. 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 V_D line.
3. Specified with external current limiting of 70 mA. Capable of higher P1dB at higher currents (see Fig. 2).
4. Current at +85°C - Current at -45°C/130.
5. Permanent damage may occur if any of these limits are exceeded. These maximum ratings are not intended for continuous normal operation.
6. Defined with reference to ground pad temperature.
7. Maximum input power is specified based upon external V_D current limiting of 80 mA. Maximum input power will degrade without external current limiting.

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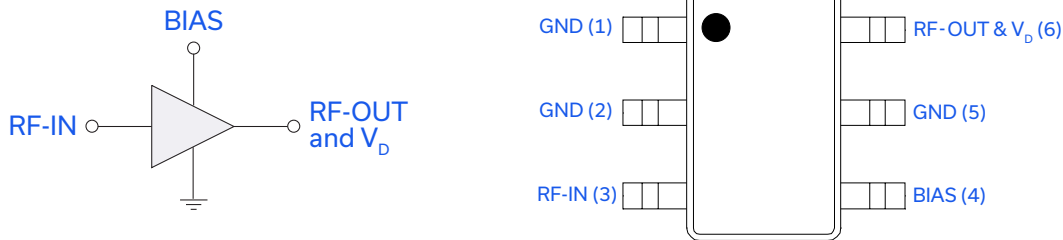
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SIMPLIFIED SCHEMATIC AND PIN DESCRIPTION



Function	Pin Number	Description (See Application Circuit, Fig. 3)
RF-IN	3	RF input pin (connect to RF-IN via blocking cap C1 and Pin 4 via L2)
RF-OUT & V_D	6	RF output pin (connected to RF-out via blocking cap C2 and supply voltage V_D via RF Choke L1)
BIAS	4	Connected to V_S via Rbias. (Connect to ground via C4 & R1)
GND	1,2,5	Connections to ground.



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CHARACTERIZATION TEST CIRCUIT

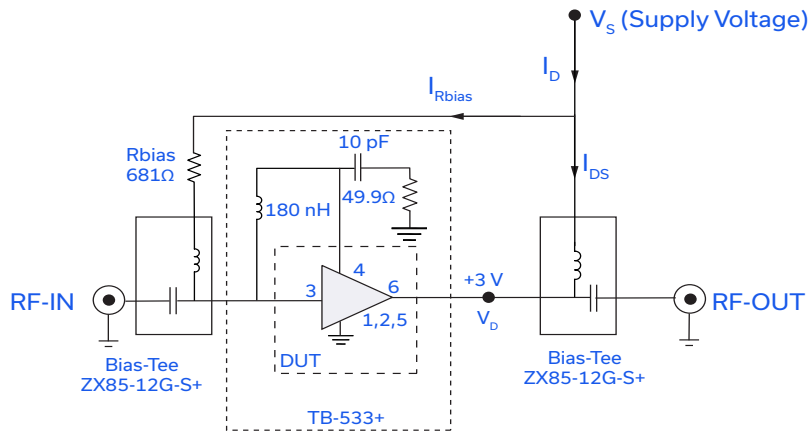


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization Test Board TB-534-3+) Gain, Output Power at 1 dB Compression (P1dB), Output IP3 (OIP3) and Noise Figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:

1. Gain: $P_{IN} = -25$ dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.
3. V_s adjusted for +3 V at device (V_D), compensating loss of bias tee.

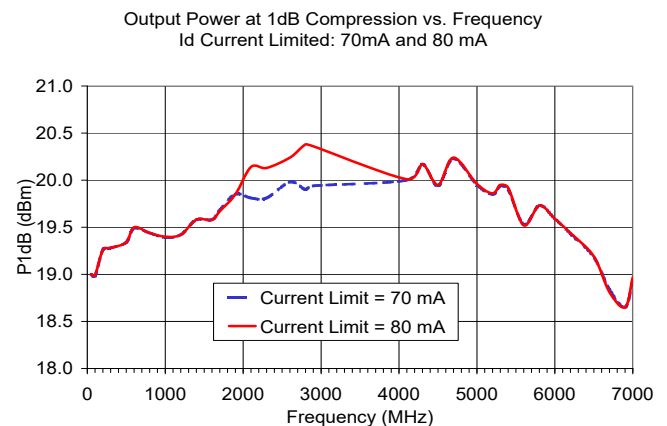
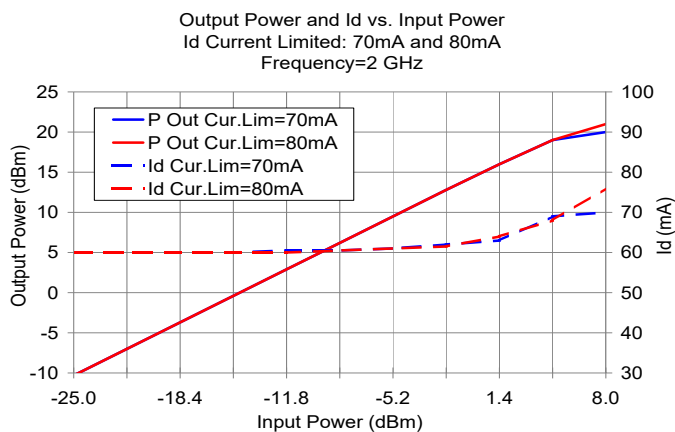


Fig 2. Output Power and I_D vs. Input Power and Frequency.

Performance measured on Mini-Circuits Characterization test board TB-534-3+. See Characterization Test Circuit (Fig. 1). Measurements performed with current (I_D) limited as noted.





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RECOMMENDED APPLICATION CIRCUIT

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

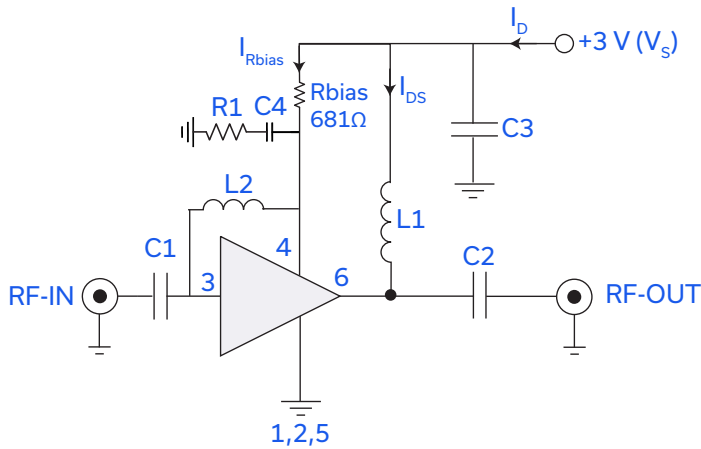


Fig 3. Recommended Application Circuit
Note: Resistance of L1, 0.1-0.2Ω typically

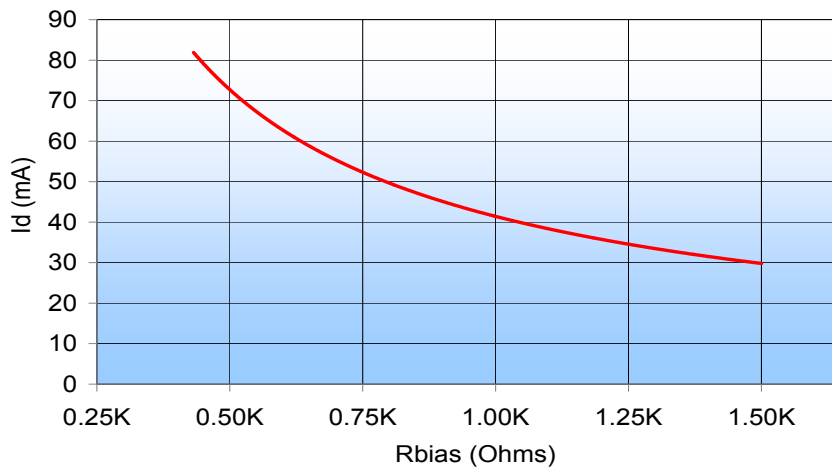
TYPICAL CURRENT (I_D) AS A FUNCTION OF R_{BIAS} ($V_S = +3\text{ V}$)

Fig 4. I_D varies as a function of R_{bias} . The I_D current range is defined based upon the specific R_{bias} value noted in the Application Circuit (Fig 3). R_{bias} may be adjusted to optimize I_D for a customers' application. RF performance will vary accordingly.

PRODUCT MARKING



Marking may contain other features or characters for internal lot control.

Mini-Circuits®

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PAGE 5 OF 6



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

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	CA1389 Plastic molded SOT-363 package, Lead Finish: Matte-Tin
Tape & Reel Standard Quantities Available on Reel	F101 7" Reels with 20, 50, 100, 200, 500, 1000, or 2000 devices
Suggested Layout for PCB Design	PL-311
Evaluation Board	TB-534-3+
Environmental Ratings	ENV08T2

ESD RATING

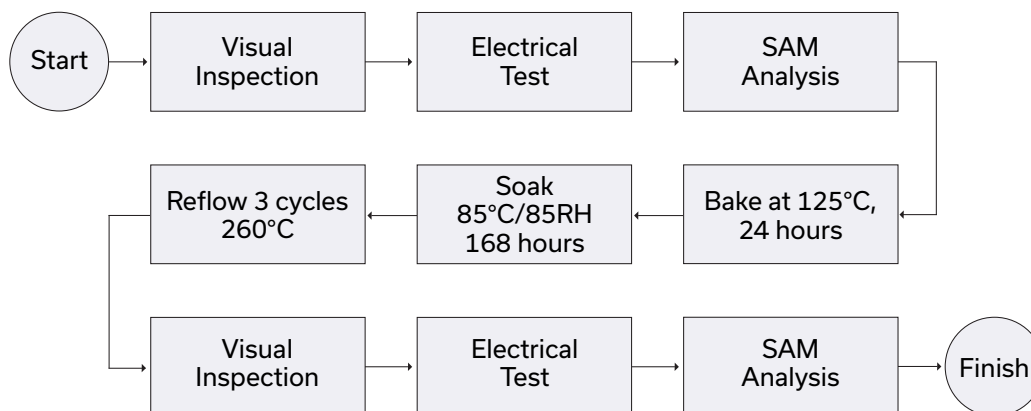
Human Body Model (HBM): Class 1A (250 to <500 V) in accordance with ANSI/ESD STM 5.1 - 2001

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

MSL RATING

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

MSL TEST FLOW CHART



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html



Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 3V, Rbias=681 ohms, Id=60 mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	Noise Figure	FREQ	1dB Comp. Output (1)	
										Current Limit 70mA	Current Limit 80mA
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)	(MHz)	(dBm)	
50.0	24.40	33.24	11.30	10.09	1.41	0.79	32.38	1.89	50.0	19.00	19.00
100.0	25.46	30.91	12.06	13.80	1.12	0.72	31.73	1.05	100.0	18.98	18.99
200.0	25.46	30.09	11.05	17.77	1.04	0.75	32.68	0.68	200.0	19.26	19.26
300.0	24.91	29.61	9.60	19.23	1.01	0.80	32.93	0.65	300.0	19.28	19.28
500.0	23.39	28.61	7.67	20.06	0.99	0.90	33.10	0.66	500.0	19.34	19.34
600.0	22.59	28.17	7.09	20.13	0.99	0.94	33.85	0.66	600.0	19.49	19.50
800.0	21.06	27.17	6.38	20.22	0.99	1.00	34.68	0.70	800.0	19.44	19.44
1000.0	19.67	26.31	6.01	20.36	1.01	1.04	34.79	0.72	1000.0	19.39	19.40
1200.0	18.45	25.37	5.82	20.61	1.02	1.06	35.45	0.80	1200.0	19.42	19.42
1400.0	17.38	24.50	5.74	21.03	1.03	1.07	35.61	0.86	1400.0	19.58	19.58
1600.0	16.42	23.68	5.75	21.50	1.05	1.08	35.80	0.93	1600.0	19.58	19.58
1700.0	15.99	23.31	5.77	21.75	1.05	1.08	35.73	0.92	1700.0	19.68	19.67
1900.0	15.19	22.56	5.86	22.34	1.06	1.08	36.45	0.88	1900.0	19.85	19.85
2100.0	14.47	21.84	6.05	22.73	1.07	1.07	36.07	0.92	2100.0	19.81	20.14
2300.0	13.85	21.09	6.21	23.02	1.07	1.06	36.62	1.05	2300.0	19.81	20.13
2500.0	13.28	20.39	6.44	23.02	1.07	1.05	36.65	1.08	2600.0	19.98	20.24
2700.0	12.77	19.76	6.69	22.84	1.07	1.03	36.68	1.21	2800.0	19.90	20.38
2900.0	12.28	19.12	7.02	22.45	1.07	1.01	36.37	1.07	2900.0	19.94	20.36
3000.0	12.00	18.94	7.09	22.73	1.09	1.01	36.77	1.19	4100.0	20.00	20.01
3200.0	11.66	18.29	7.19	22.59	1.07	0.99	36.38	1.23	4300.0	20.17	20.17
3400.0	11.29	17.75	7.30	22.67	1.06	0.98	36.60	1.26	4500.0	19.94	19.95
3600.0	10.96	17.32	7.35	23.30	1.06	0.97	36.61	1.31	4700.0	20.23	20.24
3800.0	10.65	16.94	7.27	24.32	1.06	0.97	36.94	1.51	5000.0	19.95	19.96
4000.0	10.37	16.61	7.10	25.42	1.06	0.96	36.56	1.49	5200.0	19.85	19.86
4100.0	10.22	16.51	7.05	26.00	1.06	0.96	36.64	1.50	5300.0	19.94	19.95
4300.0	9.48	16.36	7.95	24.42	1.16	0.95	36.77	1.85	5400.0	19.90	19.92
4500.0	9.03	16.34	6.02	21.37	1.11	1.03	36.77	1.95	5600.0	19.53	19.52
4700.0	8.88	16.14	5.40	19.21	1.08	1.04	37.56	1.80	5800.0	19.73	19.73
4900.0	8.50	16.01	4.98	17.03	1.08	1.05	38.00	1.77	6000.0	19.59	19.59
5100.0	8.08	15.88	4.63	15.41	1.08	1.06	37.55	1.91	6200.0	19.43	19.44
5300.0	7.64	15.75	4.27	13.94	1.08	1.07	36.79	1.92	6500.0	19.18	19.19
5400.0	7.43	15.68	4.10	13.21	1.08	1.07	37.13	2.05	6700.0	18.84	18.81
5600.0	6.98	15.60	3.81	12.16	1.08	1.08	36.37	2.11	6900.0	18.65	18.65
5800.0	6.57	15.48	3.54	11.23	1.08	1.08	35.79	2.42	7000.0	18.94	18.97
6000.0	6.14	15.36	3.30	10.40	1.08	1.07	35.19	2.45			
6200.0	5.73	15.26	3.09	9.74	1.07	1.07	35.25	2.60			
6400.0	5.32	15.16	2.93	9.12	1.07	1.06	34.91	2.85			
6600.0	4.94	15.08	2.77	8.61	1.07	1.06	35.76	2.86			
6800.0	4.55	14.99	2.62	8.13	1.07	1.05	36.09	3.29			
7000.0	4.17	14.93	2.49	7.65	1.07	1.04	35.59	3.30			

(1) Current is externally limited during P1dB measurements. Unit is capable of higher output power if current is not limited.

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=681 ohms, Id=67 mA @ Temperature = -45degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)
50.0	24.80	33.31	12.29	10.27	1.38	0.77	33.64	1.44
100.0	25.62	30.84	14.33	13.98	1.11	0.70	33.27	0.78
200.0	25.53	30.08	12.90	17.53	1.05	0.72	34.24	0.52
300.0	25.01	29.72	10.91	18.66	1.04	0.76	34.50	0.49
500.0	23.58	28.78	8.41	19.06	1.02	0.85	34.51	0.50
600.0	22.83	28.35	7.68	19.24	1.02	0.89	35.27	0.51
800.0	21.36	27.39	6.80	19.32	1.03	0.95	35.66	0.53
1000.0	20.02	26.41	6.33	19.41	1.03	0.99	35.79	0.54
1200.0	18.82	25.44	6.07	19.83	1.04	1.01	36.23	0.64
1400.0	17.76	24.56	5.94	20.18	1.05	1.02	36.55	0.67
1600.0	16.81	23.64	5.93	20.88	1.05	1.03	36.76	0.71
1700.0	16.38	23.27	5.93	21.24	1.05	1.03	36.54	0.68
1900.0	15.60	22.45	6.00	22.00	1.05	1.03	37.05	0.64
2100.0	14.89	21.67	6.22	22.99	1.06	1.02	37.06	0.72
2300.0	14.27	20.93	6.35	23.89	1.05	1.01	37.05	0.76
2500.0	13.70	20.25	6.58	24.63	1.05	1.00	37.11	0.83
2700.0	13.20	19.55	6.89	24.96	1.05	0.98	37.15	0.91
2900.0	12.73	18.93	7.24	24.48	1.05	0.96	37.49	0.79
3000.0	12.40	18.74	7.45	24.59	1.07	0.96	37.48	0.90
3200.0	12.11	18.06	7.39	24.69	1.04	0.94	37.23	1.00
3400.0	11.75	17.55	7.58	24.05	1.04	0.93	37.27	1.03
3600.0	11.41	17.10	7.59	25.32	1.04	0.92	37.08	1.24
3800.0	11.13	16.68	7.49	26.11	1.03	0.91	36.93	1.00
4000.0	10.84	16.37	7.28	26.01	1.03	0.91	36.79	1.06
4100.0	10.69	16.27	7.17	25.74	1.03	0.91	36.43	1.06
4300.0	10.16	16.03	7.84	23.44	1.09	0.89	36.85	1.29
4500.0	9.42	16.11	6.12	19.38	1.08	0.98	36.42	1.36
4700.0	9.33	15.93	5.44	17.50	1.05	0.98	37.57	1.33
4900.0	8.96	15.75	4.99	15.40	1.05	0.98	37.53	1.31
5100.0	8.52	15.64	4.60	13.98	1.05	1.00	37.09	1.43
5300.0	8.09	15.52	4.26	12.81	1.05	1.00	36.11	1.42
5400.0	7.88	15.45	4.07	12.10	1.04	1.00	36.47	1.57
5600.0	7.44	15.34	3.78	11.22	1.04	1.01	35.63	1.76
5800.0	7.00	15.23	3.48	10.37	1.04	1.01	35.05	1.73
6000.0	6.59	15.12	3.25	9.64	1.04	1.00	34.54	1.97
6200.0	6.19	14.98	3.07	9.16	1.04	1.00	34.74	2.08
6400.0	5.78	14.91	2.86	8.49	1.03	0.99	34.42	2.08
6600.0	5.42	14.80	2.71	8.07	1.03	0.99	35.23	2.32
6800.0	5.05	14.71	2.56	7.66	1.03	0.98	35.34	2.31
7000.0	4.68	14.63	2.41	7.17	1.03	0.96	34.68	2.52

*Typical Performance Data***Definitions:**

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

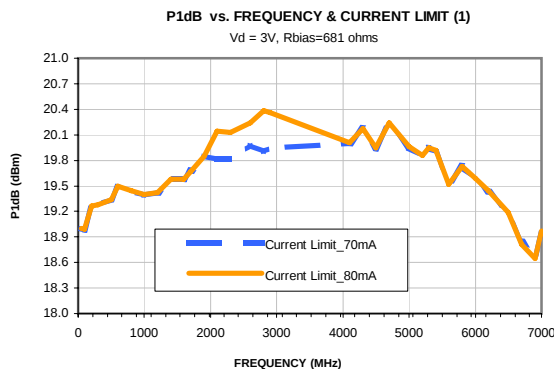
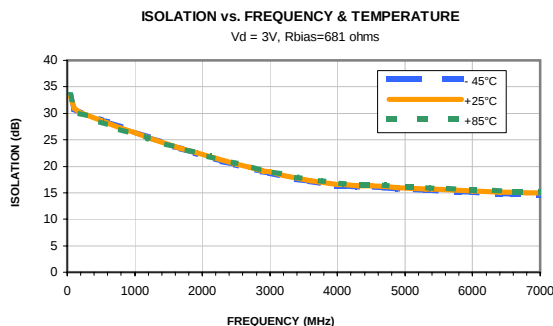
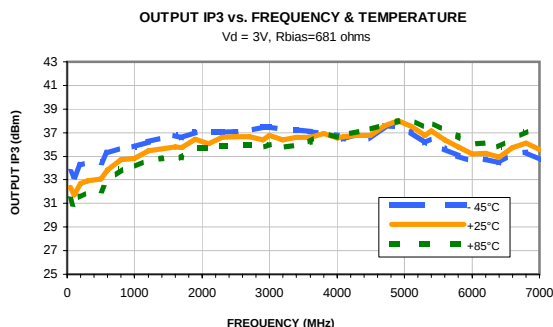
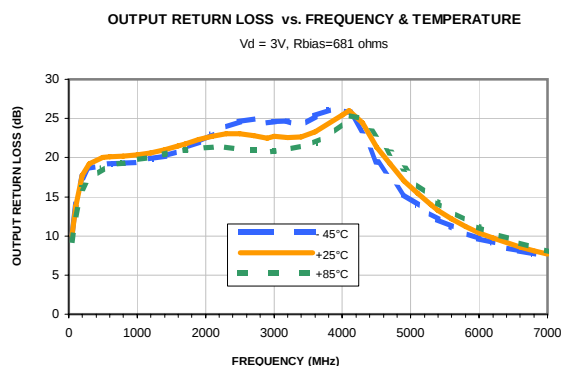
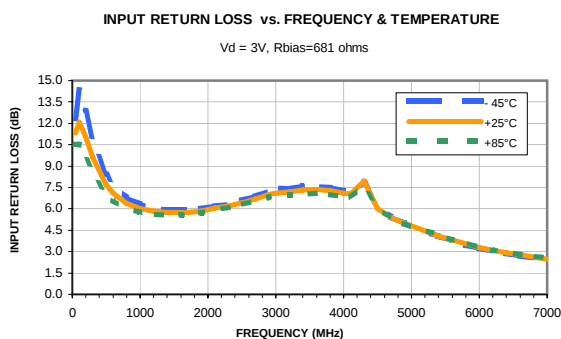
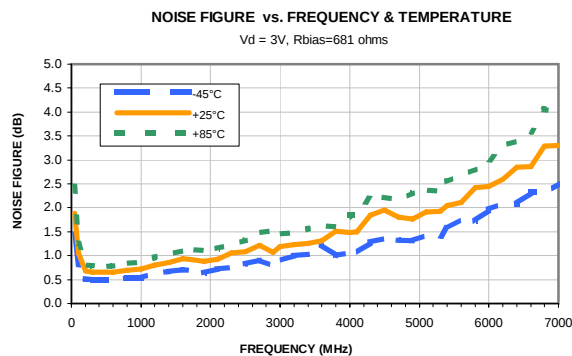
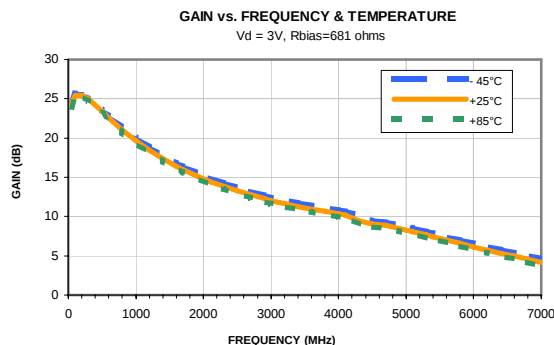
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 3V, Rbias=681 ohms, Id=57 mA @ Temperature = +85degC

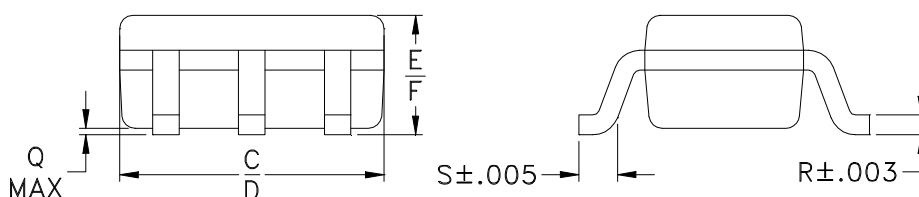
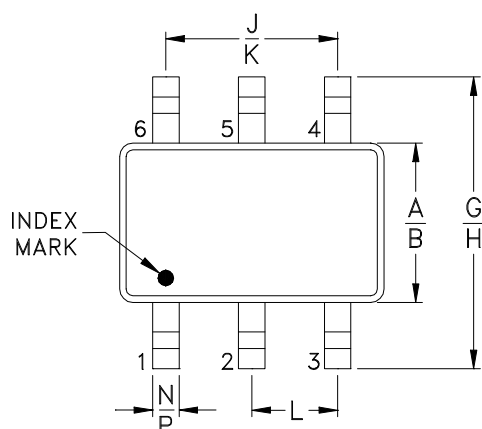
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dB)
50.0	23.90	33.47	10.57	9.44	1.47	0.79	31.37	2.45
100.0	25.17	31.04	10.45	12.70	1.13	0.74	30.56	1.26
200.0	25.27	30.03	9.62	16.08	1.02	0.77	31.48	0.82
300.0	24.70	29.47	8.55	17.37	0.98	0.83	31.92	0.79
500.0	23.13	28.37	7.01	18.64	0.94	0.94	32.09	0.77
600.0	22.32	27.84	6.58	19.01	0.94	0.98	32.94	0.79
800.0	20.76	26.91	6.03	19.27	0.95	1.04	33.91	0.84
1000.0	19.35	26.10	5.73	19.73	0.98	1.08	34.04	0.87
1200.0	18.12	25.27	5.60	20.01	1.00	1.10	34.71	0.96
1400.0	17.04	24.46	5.55	20.44	1.02	1.11	34.83	1.03
1600.0	16.09	23.64	5.59	20.81	1.03	1.12	35.00	1.11
1700.0	15.65	23.33	5.62	20.95	1.05	1.12	34.88	1.13
1900.0	14.85	22.54	5.71	21.26	1.06	1.11	35.71	1.11
2100.0	14.13	21.85	5.91	21.33	1.07	1.11	35.71	1.15
2300.0	13.50	21.17	6.09	21.33	1.08	1.09	35.83	1.23
2500.0	12.93	20.49	6.31	21.10	1.08	1.08	35.90	1.33
2700.0	12.40	19.88	6.51	20.99	1.09	1.07	35.93	1.47
2900.0	11.91	19.26	6.82	20.74	1.09	1.05	35.70	1.53
3000.0	11.64	19.03	6.90	20.81	1.10	1.04	36.01	1.46
3200.0	11.28	18.47	6.95	20.98	1.09	1.03	35.76	1.49
3400.0	10.91	17.94	7.02	21.46	1.08	1.02	35.95	1.56
3600.0	10.56	17.49	7.09	21.91	1.08	1.01	36.21	1.62
3800.0	10.26	17.13	7.02	22.80	1.08	1.01	36.93	1.61
4000.0	9.96	16.84	6.87	24.32	1.08	1.01	36.58	1.85
4100.0	9.80	16.73	6.80	25.40	1.09	1.01	36.74	1.85
4300.0	9.08	16.57	7.62	24.97	1.19	0.99	37.10	2.21
4500.0	8.62	16.58	6.02	23.00	1.15	1.07	37.26	2.22
4700.0	8.47	16.39	5.37	20.59	1.12	1.08	37.66	2.16
4900.0	8.12	16.23	4.97	18.53	1.11	1.10	37.98	2.31
5100.0	7.73	16.06	4.63	16.68	1.11	1.11	38.11	2.37
5300.0	7.29	15.94	4.29	15.04	1.11	1.12	37.42	2.35
5400.0	7.08	15.88	4.11	14.25	1.11	1.12	37.91	2.54
5600.0	6.65	15.78	3.81	13.05	1.11	1.13	37.13	2.67
5800.0	6.23	15.64	3.58	11.99	1.11	1.12	36.72	2.81
6000.0	5.80	15.54	3.34	11.09	1.11	1.12	36.02	3.01
6200.0	5.36	15.45	3.11	10.27	1.10	1.12	36.11	3.30
6400.0	4.95	15.36	2.96	9.70	1.11	1.12	35.79	3.40
6600.0	4.56	15.28	2.80	9.09	1.11	1.11	36.42	3.60
6800.0	4.14	15.23	2.65	8.53	1.11	1.10	37.07	4.05
7000.0	3.74	15.19	2.54	8.04	1.11	1.09	36.56	4.02

Typical Performance Curves

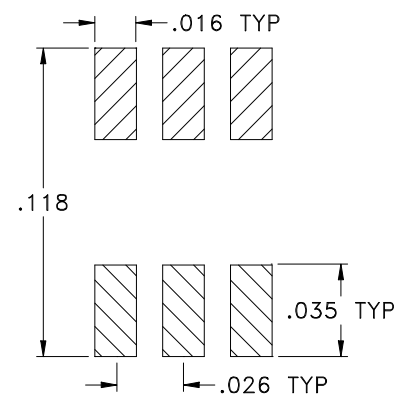


(1) Current is externally limited during P1dB measurements. Unit is capable of higher output power if current is not limited.

Outline Dimensions



PCB Land Pattern



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

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. $\pm .01$; 3Pl. $\pm .005$

Notes:

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



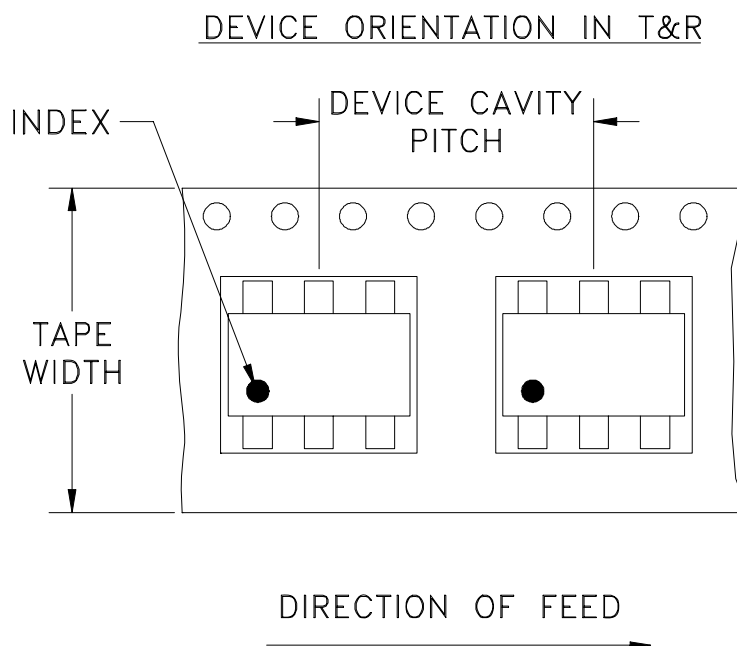
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Tape & Reel Packaging TR-F101



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

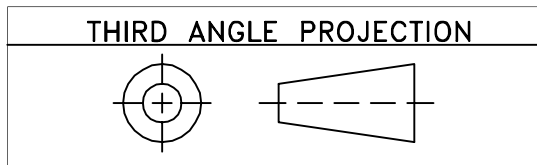
Note: Please Consult individual model data sheet to determine device per reel availability.

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

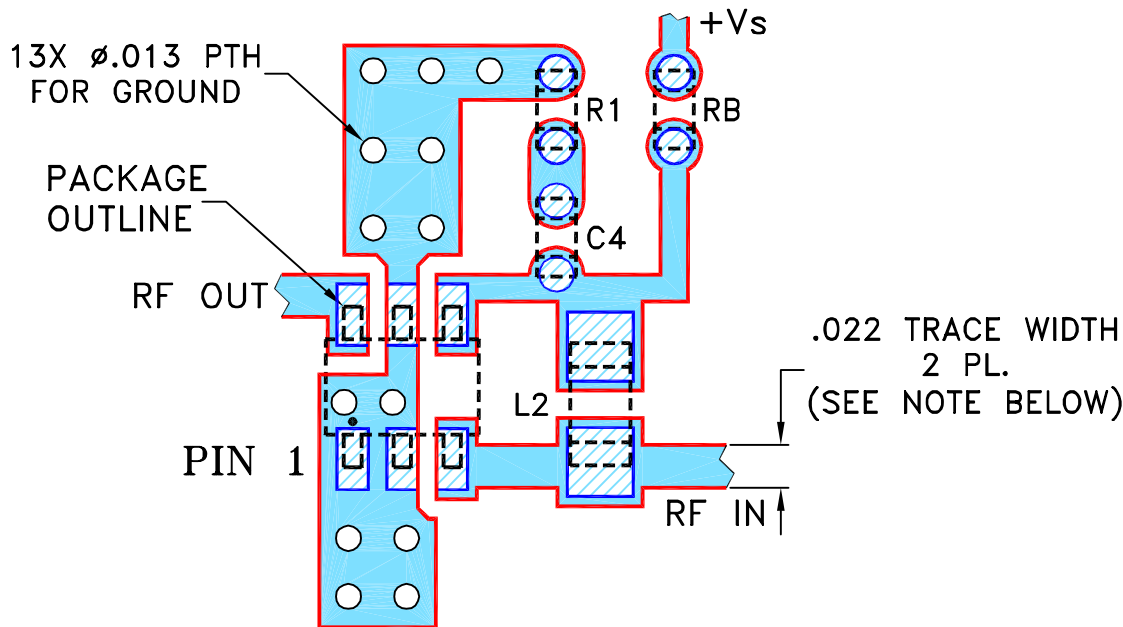


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REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M123889	NEW RELEASE	08/18/09	MMG	DJ
A	M124525	MODIFIED DRAWING, CHG. TB IN TITLE	09/22/09	MMG	DJ

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



- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" $\pm$.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 AY	08/17/09
2 PL DECIMALS $\pm$	APPROVED DJ	08/18/09
3 PL DECIMALS $\pm$.005		
ANGLES $\pm$		
FRACTIONS $\pm$		



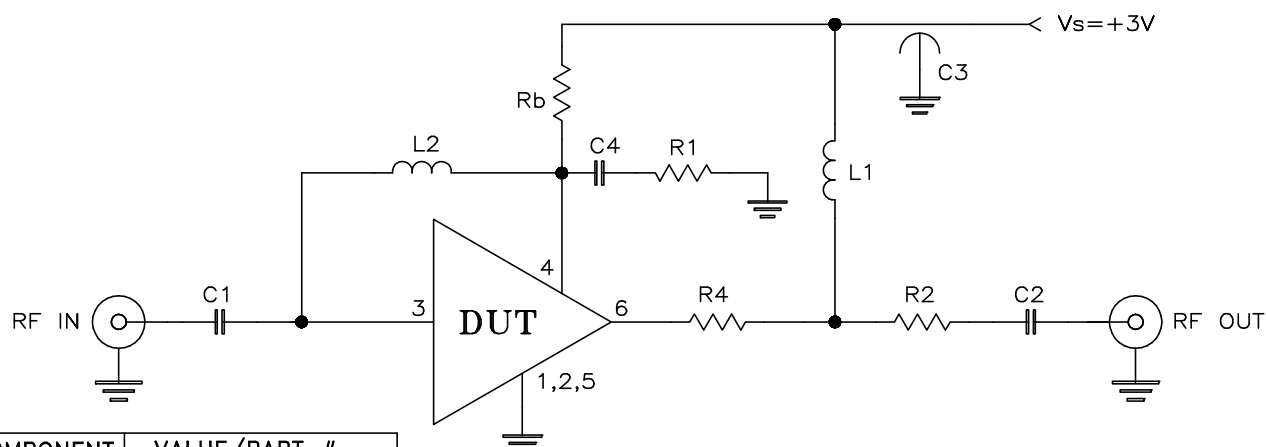
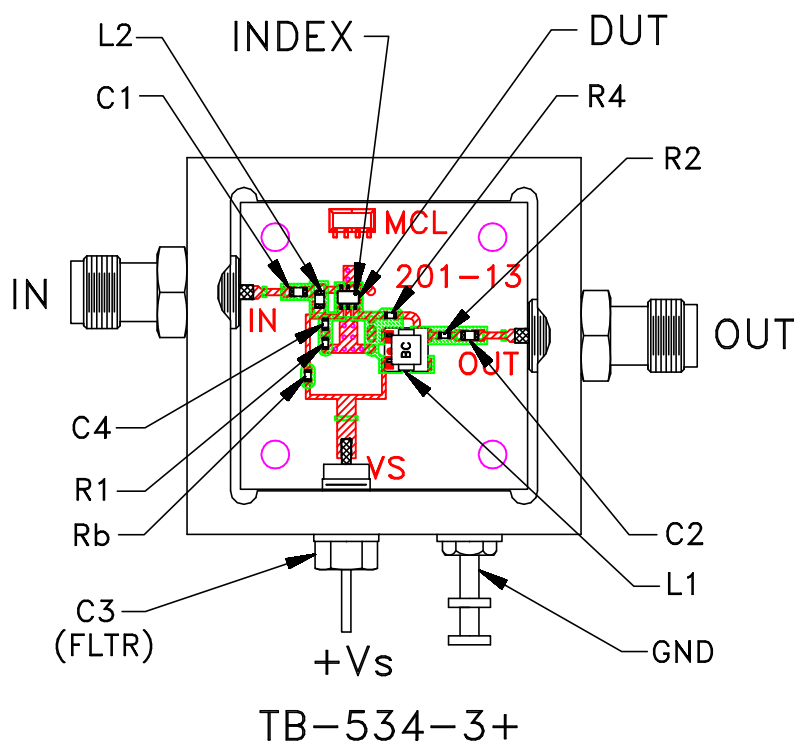
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PL, 06AM01, CA1389, TB-534+

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

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-311	REV: A
FILE: 98PL311	SCALE: 10:1	SHEET: 1 OF 1	

Evaluation Board and Circuit



COMPONENT	VALUE/PART #
R1	49.9 Ω
R2, R4	0 Ω
Rb	681 Ω
C1, C2	1000 pF
C3 (FLTR)	1500 pF
C4	10 pF
L1	TCCH-80+, MCL
L2	180 nH
DUT	PSA-5453+, MCL

Schematic Diagram

Notes:

- 50 Ohm SMA Female connectors.
- PCB Material: R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.010 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	-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	