

Wideband, Microwave

Monolithic Amplifier

AVA-24+

50Ω

5 to 20 GHz



CASE STYLE: DQ849

The Big Deal

- Surface Mount Amplifier up to 20 GHz
- Integrated matching, DC Blocks and bias circuits
- High Reverse Isolation

Product Overview

The Mini-Circuits AVA-24+ is a surface mount, microwave amplifier fabricated using InGaAs PHEMT technology and fully integrated gain block up to 20 GHz. It is packaged in Mini-Circuits industry standard 3x3 mm MCLP (QFN) package, which provides excellent RF and thermal performance. The AVA-24+ integrates the entire matching network with the majority of the bias circuit inside the package, reducing the need for complicated external circuits. This approach makes the AVA-24+ extremely flexible and enables simple, straightforward use.

NON-CATALOG

Key Features

Feature	Advantages
Wideband, 5 to 20 GHz	Broad frequency range supports a wide array of applications from microwave radio and radar , to military communications and countermeasures.
Excellent Gain Flatness	Typical ± 0.8 dB gain flatness across the entire frequency range minimizes the need for external equalizer networks making it a great fit for instrumentation and EW applications.
High Isolation	With reverse isolation of 37 dB (25 dB directivity), the AVA-24+ is an excellent choice for buffering broadband circuits. It is an ideal LO driver amplifier and provides designers system flexibility and margin when integrating cascaded RF components.
Manufacturability	MSL1 and ESD Class1A (HBM) ratings minimize special handling on production lines.

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



Product Features

- Gain, 12.3 dB typ. & Flatness, ± 0.8 dB
- Output Power, up to +18.3 dBm typ.
- Excellent isolation, 37 dB typ.
- Single Positive Supply Voltage, 5V
- Integrated DC blocks, Bias-Tee & Microwave bypass capacitor
- Unconditionally Stable
- Aqueous washable; 3mm x 3mm SMT package

**AVA-24+**

CASE STYLE: DQ849

PRICE: Contact Sales Dept.

+RoHS Compliant

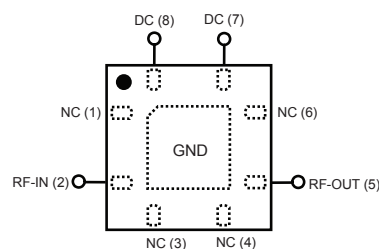
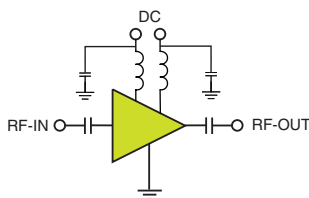
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Typical Applications

- Military EW and Radar
- DBS
- Wideband Isolation amplifier
- Microwave point-to-point radios
- Satellite systems

General Description

AVA-24+ is a wideband medium power monolithic amplifier fabricated using InGaAs PHEMT technology with outstanding gain flatness up to 20 GHz. It is manufactured using PHEMT* technology and is unconditionally stable. Its outstanding isolation enables it to be used as a wideband isolation amplifier or buffer amplifier in a variety of microwave systems.

simplified schematic and pad description

Function	Pad Number	Description (See Application Circuit, Fig. 2)
RF-IN	2	RF input pad
RF-OUT	5	RF output pad
DC	8(V_{D1}), 7(V_{D2})	DC power supply
GND	paddle in center of bottom	Connected to ground
NOT USED	1,3,4,6	No internal connection; recommended use: per PCB Layout PL-328

*Pseudomorphic High Electron Mobility Transistor.

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

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		5.0		20.0	GHz
DC Voltage (V _{D1} , V _{D2})			5.0		V
DC Current (I _{D1} +I _{D2})			134	145	mA
Gain	5.0		12.4		dB
	8.0	10.0	12.7		
	10.0	10.0	12.4		
	12.0		12.0		
	14.0		11.7		
	16.0		12.6		
	18.0	10.0	12.6		
Input Return Loss	20.0	9.0	11.5		dB
	5.0		12.7		
	8.0	10.0	25.7		
	10.0	10.0	17.9		
	12.0		12.4		
	14.0		11.3		
	16.0	10.0	15.8		
Output Return Loss	18.0		11.7		dB
	20.0		16.9		
	5.0		30.0		
	8.0	10.0	25.0		
	10.0	10.0	18.6		
	12.0		14.3		
	14.0		13.6		
Output IP3	16.0		20.3		dBm
	18.0		19.0		
	20.0		11.5		
	5.0		26.2		
	8.0		26.3		
	10.0		26.5		
	12.0		26.3		
Output Power @ 1 dB compression	14.0		26.0		dBm
	16.0		25.4		
	18.0		24.5		
	20.0		23.8		
	5.0		18.8		
	8.0	16.0	18.7		
	10.0		18.6		
Noise Figure	12.0		18.7		dB
	14.0		18.5		
	16.0		18.0		
	18.0		17.4		
	20.0		18.6		
	5.0		7.0		
	8.0		6.3		
Directivity (Isolation-Gain)	10.0		5.6		dB
	12.0		6.5		
	14.0		6.5		
	16.0		6.1		
	18.0		6.1		
	20.0		6.7		
			25.0		
DC Current Variation vs. Temperature ⁽²⁾			-0.087		mA/°C
Thermal Resistance			47		°C/W

Absolute Maximum Ratings⁽³⁾

Parameter	Ratings
Operating Temperature ⁽⁴⁾	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Channel Temperature	160°C
DC Voltage (Pad 7,8)	5.5V
Voltage (Pads 2, 5)	10V
Power Dissipation	860 mW
DC Current (Pad 7+8)	160mA
Input Power	20 dBm

⁽¹⁾ Measured on Mini-Circuits Characterization test fixture TB-547-1+
See Characterization Test Circuit (Fig. 1)

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

⁽³⁾ Permanent damage may occur if any of these limits are exceeded.

These maximum ratings are not intended for continuous normal operation.

⁽⁴⁾ Defined with reference to ground pad temperature.

Notes

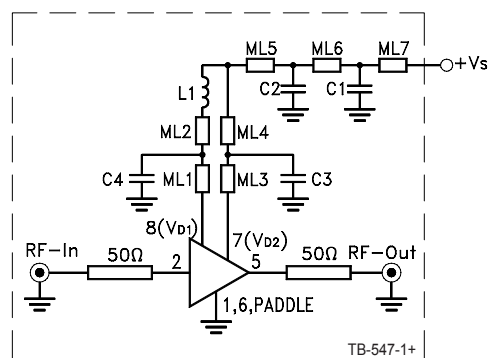
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Characterization Test Circuit



C1=5.6pF, 0402 (NPO) ML1-ML7 are short microstrip lines
 C2=18pF, 0402 (NPO) Refer to 98-PL-328
 C3=0.001μF, 0402 (NPO)
 C4=0.1 μF, 0402 (X7R)
 L1=3.3nH, 0805 (wire wound)

Recommended Application Circuit

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

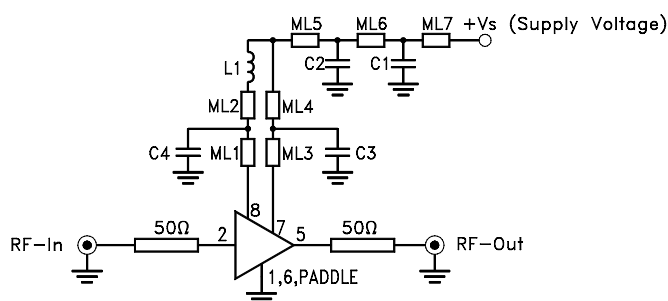


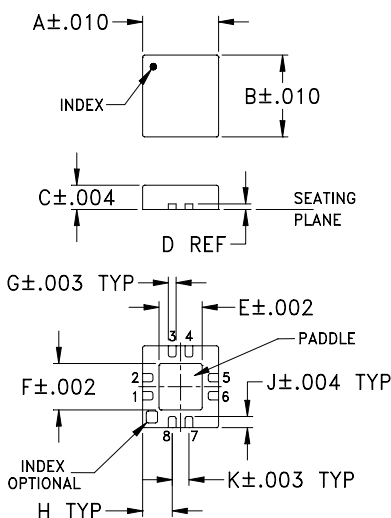
Fig 2. Recommended Application Circuit

Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization Test Board TB-547-1+) Gain, Output power at 1dB compression (P1dB), Noise Figure, Output IP3 (OIP3) are measured using Agilent's N5242A PNA-X microwave network analyzer.

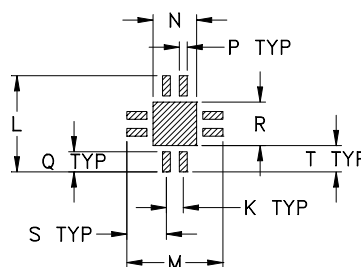
Conditions:

1. Gain: Pin=-25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, -10 dBm/tone at output.
3. Vs adjusted for 5V at device (V_{D1} and V_{D2}), compensating loss of bias lines.

Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

Outline Dimensions (inch mm)

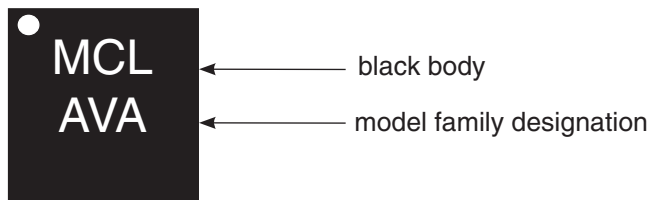
A	B	C	D	E	F	G	H	J
.118	.118	.035	.008	.067	.067	.012	.046	.016
3.00	3.00	0.89	0.20	1.70	1.70	0.30	1.17	0.41
K	L	M	N	P	Q	R	S	T
.026	.148	.148	.067	.012	.031	.067	.061	.041
0.66	3.76	3.76	1.70	0.30	0.79	1.70	1.55	1.04
								grams
								0.02

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Product Marking



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: DQ849

Plastic package, exposed paddle, lead finish: tin silver nickel

Tape & Reel: F104

Standard quantities available on reel: 7" reels with 10, 20, 50, 100, 200, 500, 1K, 2K

Suggested Layout for PCB Design: PL-328

Evaluation Board: TB-547-1+

Environmental Ratings: ENV08T1

ESD Rating

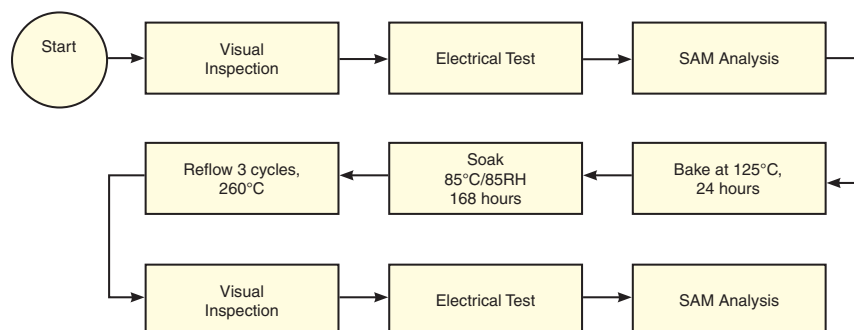
Human Body Model (HBM): 1A (250 to <500V) in accordance with ANSI/ESD STM 5.1 - 2001

Machine Model (MM): M1 (<100V) in accordance with ANSI/ESD STM5.2-1999; passes 25V

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 = 5.00V, Id=118.92mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	12.63	43.14	9.75	20.85	14.74	1.09	26.06	17.72	8.07
4600.0	13.11	41.28	11.16	26.55	12.15	1.07	27.89	18.12	7.68
4800.0	13.28	40.72	12.53	35.65	11.63	1.05	26.75	18.42	7.36
5000.0	13.41	39.32	13.74	44.54	9.80	1.04	28.42	18.64	7.07
5200.0	13.42	39.03	14.93	34.43	9.52	1.03	27.50	18.50	6.92
5400.0	13.41	38.65	15.80	30.36	8.95	1.02	27.75	18.65	6.78
5600.0	13.41	38.60	16.74	28.79	8.94	1.02	28.15	18.69	6.65
5800.0	13.39	38.36	17.42	28.00	9.01	1.01	27.82	18.72	6.52
6000.0	13.39	38.15	18.30	27.14	8.61	1.01	27.96	18.85	6.35
6500.0	13.40	37.85	20.89	28.01	8.44	1.00	28.08	18.68	6.18
7000.0	13.44	37.39	24.39	31.49	8.16	1.00	27.98	18.75	6.03
7500.0	13.46	37.53	33.61	32.08	8.19	1.00	27.24	18.95	5.89
8000.0	13.47	37.26	30.05	25.42	8.15	0.99	28.38	18.65	5.84
8500.0	13.29	36.56	23.78	22.05	7.70	0.99	27.58	18.57	5.87
9000.0	13.23	37.24	18.98	19.10	8.41	1.00	27.52	18.92	5.91
9500.0	13.10	37.55	17.49	17.47	8.41	0.99	27.68	18.72	5.54
10000.0	12.96	37.40	15.69	16.35	8.43	1.00	27.78	18.72	5.16
10500.0	12.79	37.80	14.06	15.99	8.54	1.00	28.16	18.65	5.61
11500.0	12.57	37.99	12.81	15.13	9.73	1.01	26.71	18.62	6.08
12000.0	12.47	38.14	12.77	14.62	9.64	1.01	28.44	18.85	6.08
12500.0	12.30	38.64	11.13	13.90	9.60	1.02	26.69	18.58	6.02
13000.0	12.23	38.70	10.74	13.71	9.85	1.03	26.85	18.76	6.06
13500.0	12.22	38.45	11.00	13.43	9.30	1.02	26.74	18.66	6.00
14000.0	12.15	38.39	11.25	15.32	9.59	1.03	27.14	18.70	6.00
14500.0	12.48	37.06	11.66	15.42	7.89	1.03	26.47	18.60	5.99
15000.0	12.65	38.03	14.03	16.52	9.12	1.01	27.49	18.77	5.92
15500.0	12.77	38.05	13.65	19.59	8.88	1.03	26.80	18.79	5.91
16000.0	12.90	37.44	14.35	22.84	8.43	1.03	26.95	18.40	5.89
16500.0	12.94	36.73	14.77	29.04	8.36	1.03	26.55	18.12	6.55
17000.0	12.91	36.53	12.95	35.59	7.66	1.04	25.27	17.87	6.92
17500.0	12.92	35.73	13.58	29.50	6.88	1.03	25.21	17.72	6.20
18000.0	12.93	34.18	14.10	27.93	6.01	1.03	25.39	17.97	5.77
18500.0	12.87	33.00	17.52	23.21	5.31	1.00	25.00	17.72	5.85
19000.0	12.50	31.32	17.32	19.46	4.70	0.99	23.88	17.13	6.05
19500.0	11.67	30.71	15.98	17.27	4.58	0.99	25.65	17.56	6.31
20000.0	10.22	29.77	13.30	14.55	4.92	0.99	24.72	17.64	6.93

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 = 4.75V, Id=117.48mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	12.69	42.84	9.65	20.84	15.27	1.10	25.47	17.40	7.86
4600.0	13.17	41.18	11.06	26.22	11.81	1.07	26.97	17.78	7.53
4800.0	13.34	40.39	12.37	33.55	11.53	1.05	26.96	18.10	7.16
5000.0	13.46	39.48	13.62	46.57	9.94	1.04	26.95	18.31	6.94
5200.0	13.47	39.04	14.79	39.07	9.51	1.03	27.01	18.11	6.76
5400.0	13.46	38.55	15.65	33.43	9.07	1.02	27.19	18.26	6.58
5600.0	13.45	38.46	16.60	31.47	8.87	1.02	26.75	18.30	6.45
5800.0	13.43	38.32	17.27	30.64	8.90	1.01	26.83	18.34	6.31
6000.0	13.43	38.16	18.13	29.66	8.68	1.01	28.58	18.49	6.17
6500.0	13.44	37.77	20.63	31.02	8.49	1.00	27.17	18.27	6.00
7000.0	13.48	37.58	24.02	36.18	8.40	1.00	27.77	18.36	5.83
7500.0	13.50	37.39	32.47	32.31	8.18	1.00	27.96	18.59	5.70
8000.0	13.51	36.98	30.96	25.23	7.86	0.99	27.65	18.23	5.65
8500.0	13.34	36.40	24.10	22.10	7.35	0.99	27.98	18.16	5.66
9000.0	13.28	37.41	19.21	19.21	8.40	1.00	27.43	18.60	5.73
9500.0	13.16	37.83	17.63	17.62	8.38	0.99	26.80	18.36	5.34
10000.0	13.02	37.31	15.88	16.51	8.41	1.00	25.67	18.39	4.98
10500.0	12.87	37.81	14.27	16.29	8.63	1.00	26.01	18.30	5.45
11500.0	12.65	38.14	12.94	15.29	9.02	1.01	27.39	18.26	5.85
12000.0	12.55	38.30	12.84	14.78	8.82	1.01	26.74	18.61	5.86
12500.0	12.39	38.27	11.20	14.02	9.43	1.02	26.97	18.25	5.82
13000.0	12.32	38.38	10.75	13.79	9.73	1.03	27.64	18.56	5.87
13500.0	12.30	38.12	10.97	13.71	9.53	1.02	28.87	18.44	5.77
14000.0	12.25	37.92	11.24	15.56	9.45	1.03	27.88	18.52	5.82
14500.0	12.59	37.09	11.50	15.78	7.89	1.03	26.39	18.42	5.77
15000.0	12.76	37.35	13.86	17.09	8.79	1.02	26.64	18.49	5.69
15500.0	12.88	37.73	13.61	20.36	9.16	1.03	26.29	18.48	5.70
16000.0	13.03	36.95	14.30	23.77	8.02	1.03	25.82	18.00	5.69
16500.0	13.07	36.74	14.78	29.71	8.05	1.03	26.98	17.74	6.31
17000.0	13.04	36.34	12.91	33.40	7.25	1.04	24.67	17.46	6.69
17500.0	13.04	35.33	13.30	28.05	6.62	1.03	25.54	17.30	5.97
18000.0	13.06	34.16	13.83	27.71	5.83	1.03	25.19	17.59	5.62
18500.0	13.02	32.81	17.23	23.27	5.24	1.00	25.26	17.32	5.71
19000.0	12.70	31.29	17.21	20.06	4.45	0.99	23.91	16.76	5.86
19500.0	11.93	30.36	16.54	17.41	4.50	0.99	24.53	17.17	6.16
20000.0	10.47	29.62	13.46	14.47	4.56	0.99	23.98	17.34	6.67

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=120.41mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	12.61	42.59	9.83	20.82	15.73	1.09	26.40	17.97	8.16
4600.0	13.09	41.29	11.23	26.60	11.80	1.07	28.05	18.40	7.80
4800.0	13.27	40.71	12.61	35.55	11.42	1.05	27.68	18.70	7.45
5000.0	13.39	39.35	13.84	37.21	9.93	1.04	29.21	18.95	7.19
5200.0	13.40	38.86	15.04	31.35	9.45	1.03	28.47	18.84	7.01
5400.0	13.40	38.59	15.90	28.35	8.97	1.02	28.58	18.98	6.86
5600.0	13.39	38.49	16.85	26.94	9.08	1.02	29.16	19.04	6.72
5800.0	13.38	38.22	17.60	26.30	9.05	1.01	28.66	19.09	6.58
6000.0	13.38	38.11	18.49	25.60	8.95	1.01	28.92	19.20	6.46
6500.0	13.39	37.71	21.15	26.19	8.34	1.00	28.91	19.05	6.29
7000.0	13.42	37.51	24.80	28.90	8.31	1.00	28.72	19.10	6.10
7500.0	13.44	37.48	34.45	30.65	7.99	1.00	27.13	19.27	6.01
8000.0	13.45	37.23	28.96	25.20	8.07	0.99	28.03	19.00	5.92
8500.0	13.26	36.38	23.31	21.83	7.46	0.99	28.55	18.96	5.95
9000.0	13.20	37.61	18.74	18.96	8.45	1.00	27.78	19.21	5.98
9500.0	13.07	37.64	17.29	17.27	8.63	0.99	28.86	19.06	5.62
10000.0	12.92	37.64	15.53	16.19	8.52	1.00	28.08	19.05	5.23
10500.0	12.76	37.74	13.99	15.85	8.64	1.00	29.99	19.01	5.73
11500.0	12.52	38.36	12.78	15.05	9.51	1.01	27.52	18.95	6.18
12000.0	12.41	38.50	12.67	14.53	9.85	1.01	26.35	19.09	6.15
12500.0	12.24	38.60	11.09	13.79	9.85	1.02	28.27	18.90	6.06
13000.0	12.17	38.40	10.70	13.59	9.88	1.03	27.48	18.96	6.15
13500.0	12.15	38.98	10.98	13.20	9.78	1.02	28.81	18.87	6.09
14000.0	12.08	38.37	11.23	15.01	10.09	1.03	27.93	18.91	6.11
14500.0	12.41	36.81	11.67	15.06	7.98	1.03	27.54	18.80	6.04
15000.0	12.58	37.94	14.08	16.00	9.46	1.01	28.13	19.01	5.97
15500.0	12.69	38.04	13.70	18.85	9.58	1.02	27.91	19.08	5.96
16000.0	12.83	37.46	14.44	22.02	8.56	1.03	27.40	18.78	5.95
16500.0	12.86	37.04	14.84	27.60	8.60	1.03	27.99	18.49	6.63
17000.0	12.82	36.27	13.04	36.29	7.73	1.04	26.31	18.26	7.01
17500.0	12.84	35.59	13.68	29.85	7.01	1.03	26.90	18.12	6.31
18000.0	12.82	34.24	14.06	27.92	6.08	1.03	26.79	18.36	5.86
18500.0	12.74	33.01	17.50	22.61	5.48	1.00	25.93	18.09	5.91
19000.0	12.34	31.60	16.98	19.03	4.91	0.99	24.94	17.52	6.13
19500.0	11.49	30.67	15.91	17.11	4.80	0.99	27.06	17.91	6.38
20000.0	10.02	30.32	12.99	14.25	5.24	0.99	25.50	18.01	7.04

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=121.73mA @ Temperature = -45degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	14.76	42.64	8.77	20.61	11.09	1.12	26.86	18.23	6.47
4600.0	15.11	41.27	10.36	23.83	9.22	1.09	27.30	18.63	6.15
4800.0	15.18	40.50	11.97	25.88	8.65	1.06	27.74	18.92	5.84
5000.0	15.19	39.43	13.53	27.61	7.90	1.04	30.05	19.20	5.62
5200.0	15.14	39.02	15.03	29.66	7.74	1.03	29.03	18.97	5.46
5400.0	15.08	38.67	16.24	31.05	7.52	1.02	27.81	19.10	5.31
5600.0	15.03	38.54	17.66	33.20	7.60	1.01	28.50	19.18	5.20
5800.0	14.98	38.43	18.56	34.11	7.47	1.01	28.70	19.27	5.07
6000.0	14.96	38.05	19.70	37.44	7.41	1.01	28.85	19.39	4.94
6500.0	14.94	37.93	22.44	35.76	7.34	1.00	28.22	19.14	4.78
7000.0	14.95	37.73	25.31	29.94	7.04	1.00	31.36	19.26	4.59
7500.0	14.97	37.39	30.12	25.16	6.90	0.99	28.03	19.54	4.50
8000.0	14.99	37.22	28.29	22.57	6.86	0.99	26.74	19.13	4.42
8500.0	14.81	36.43	22.01	21.51	6.15	0.99	27.95	19.17	4.42
9000.0	14.80	37.55	19.94	19.24	7.00	0.99	28.27	19.60	4.47
9500.0	14.70	37.62	18.10	17.82	6.89	0.99	28.40	19.42	4.06
10000.0	14.57	37.34	15.65	17.44	7.12	1.00	26.15	19.59	3.68
10500.0	14.46	37.39	14.50	16.76	7.05	1.01	28.38	19.48	4.12
11500.0	14.30	37.86	13.75	15.50	7.27	1.01	26.70	19.48	4.52
12000.0	14.16	37.83	12.06	15.04	6.96	1.02	27.63	19.71	4.54
12500.0	13.99	37.78	10.54	14.12	7.30	1.03	29.44	19.28	4.47
13000.0	13.96	38.14	10.54	13.96	7.54	1.03	29.19	19.59	4.49
13500.0	13.96	37.79	10.44	14.74	7.14	1.04	26.71	19.51	4.42
14000.0	13.89	37.86	11.00	16.51	7.79	1.04	27.95	19.55	4.46
14500.0	14.29	36.00	11.97	16.96	6.10	1.03	27.26	19.47	4.37
15000.0	14.46	37.46	13.92	20.00	7.25	1.02	28.82	19.55	4.34
15500.0	14.52	37.18	13.08	23.59	6.85	1.04	26.93	19.43	4.33
16000.0	14.72	36.55	14.69	25.08	6.36	1.02	27.31	18.84	4.29
16500.0	14.74	36.35	13.34	25.85	6.09	1.03	28.03	18.74	4.92
17000.0	14.73	35.51	12.44	25.19	5.59	1.04	26.95	18.37	5.38
17500.0	14.78	34.63	12.19	26.86	5.00	1.04	25.85	18.28	4.61
18000.0	14.84	33.34	12.35	30.83	4.37	1.04	26.14	18.67	4.17
18500.0	14.87	32.01	16.47	27.40	3.92	1.00	25.44	18.35	4.18
19000.0	14.63	30.54	16.95	25.71	3.39	0.99	25.92	18.04	4.34
19500.0	14.01	29.51	17.19	20.99	3.28	0.98	25.50	18.39	4.47
20000.0	12.40	28.86	10.37	16.37	3.28	1.02	26.24	18.94	5.13

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=120.13mA @ Temperature = -45degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	14.73	42.61	8.71	20.06	10.97	1.12	25.38	17.85	6.38
4600.0	15.08	41.27	10.28	22.60	9.10	1.09	27.58	18.23	6.07
4800.0	15.15	40.55	11.88	23.92	8.89	1.06	27.13	18.53	5.75
5000.0	15.16	39.32	13.42	25.26	7.88	1.04	27.33	18.78	5.53
5200.0	15.11	38.96	14.88	26.75	8.05	1.03	27.27	18.54	5.38
5400.0	15.05	38.78	16.03	27.78	7.66	1.02	28.12	18.67	5.26
5600.0	15.00	38.47	17.46	29.29	7.83	1.01	27.56	18.74	5.14
5800.0	14.95	38.55	18.32	29.83	7.55	1.01	27.06	18.83	5.00
6000.0	14.93	38.03	19.42	31.60	7.59	1.01	29.02	18.95	4.87
6500.0	14.91	38.01	22.07	30.08	7.36	1.00	27.56	18.68	4.71
7000.0	14.93	37.79	24.85	26.57	7.02	1.00	28.06	18.80	4.58
7500.0	14.95	37.53	29.80	23.12	7.02	0.99	28.03	19.09	4.42
8000.0	14.97	37.23	29.28	21.30	6.56	0.99	28.20	18.67	4.36
8500.0	14.80	36.47	22.40	20.57	6.28	0.99	26.99	18.71	4.35
9000.0	14.78	37.40	20.25	18.78	7.00	0.99	27.03	19.16	4.38
9500.0	14.69	37.57	18.28	17.60	7.04	0.99	26.67	18.98	4.02
10000.0	14.57	37.67	15.78	17.30	7.08	1.00	27.12	19.16	3.60
10500.0	14.47	37.29	14.61	16.65	6.89	1.00	27.41	19.03	4.04
11500.0	14.32	37.72	13.82	15.46	7.22	1.00	27.13	19.05	4.45
12000.0	14.19	37.80	12.13	15.02	7.35	1.02	27.30	19.34	4.48
12500.0	14.02	37.68	10.56	14.16	7.11	1.03	27.31	18.86	4.39
13000.0	14.00	37.74	10.57	14.07	7.47	1.03	27.16	19.27	4.42
13500.0	14.00	37.64	10.45	14.98	7.24	1.04	26.52	19.15	4.34
14000.0	13.93	37.98	10.95	16.84	7.74	1.05	27.33	19.23	4.38
14500.0	14.33	35.98	11.91	17.62	5.94	1.04	27.03	19.12	4.31
15000.0	14.50	37.13	13.89	21.24	6.90	1.03	26.69	19.16	4.24
15500.0	14.56	37.03	13.02	25.36	6.83	1.04	26.11	19.01	4.24
16000.0	14.78	36.12	14.60	25.42	6.19	1.02	26.17	18.40	4.21
16500.0	14.79	36.03	13.41	24.75	6.10	1.03	25.66	18.31	4.87
17000.0	14.79	35.42	12.36	23.42	5.52	1.04	25.44	17.94	5.29
17500.0	14.85	34.55	12.05	25.30	4.97	1.04	25.99	17.84	4.55
18000.0	14.92	33.42	12.28	29.00	4.15	1.04	26.33	18.23	4.11
18500.0	14.99	31.94	16.34	29.29	3.79	1.00	24.44	17.92	4.14
19000.0	14.77	30.37	17.08	27.62	3.28	0.99	24.35	17.61	4.27
19500.0	14.18	29.34	17.88	21.88	3.14	0.98	24.26	17.92	4.39
20000.0	12.62	28.82	10.54	16.41	3.20	1.02	24.81	18.51	5.04

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=123.37mA @ Temperature = -45degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	14.80	42.94	8.81	20.89	10.71	1.12	26.54	18.54	6.51
4600.0	15.15	40.99	10.41	24.76	9.05	1.08	27.37	18.97	6.22
4800.0	15.21	40.55	12.05	27.63	8.70	1.06	27.81	19.27	5.89
5000.0	15.23	39.24	13.64	30.13	7.69	1.04	28.34	19.55	5.68
5200.0	15.17	38.82	15.19	32.86	7.54	1.03	29.99	19.36	5.55
5400.0	15.11	38.48	16.38	34.44	7.55	1.02	29.93	19.46	5.39
5600.0	15.06	38.46	17.88	36.73	7.61	1.01	28.65	19.57	5.25
5800.0	15.01	38.51	18.81	38.39	7.58	1.01	29.76	19.66	5.11
6000.0	14.99	38.30	19.95	42.58	7.27	1.01	29.89	19.78	4.97
6500.0	14.97	37.83	22.78	47.03	7.26	1.00	28.70	19.54	4.82
7000.0	14.98	37.58	25.69	34.07	7.11	1.00	29.49	19.67	4.65
7500.0	15.00	37.52	30.13	27.22	6.93	0.99	30.31	19.92	4.56
8000.0	15.02	37.12	27.71	23.71	6.77	0.99	29.35	19.55	4.49
8500.0	14.83	36.42	21.69	22.34	6.17	1.00	28.31	19.57	4.47
9000.0	14.81	37.69	19.62	19.53	6.96	0.99	28.53	19.95	4.50
9500.0	14.71	37.25	17.82	17.95	6.93	0.99	30.34	19.81	4.16
10000.0	14.57	37.53	15.42	17.44	7.18	1.00	27.34	19.95	3.74
10500.0	14.45	37.56	14.30	16.74	7.16	1.01	28.79	19.87	4.18
11500.0	14.29	37.84	13.58	15.49	7.43	1.00	28.74	19.86	4.59
12000.0	14.15	37.60	11.94	14.94	7.18	1.02	27.25	20.02	4.64
12500.0	13.97	38.01	10.43	14.06	7.54	1.03	27.20	19.65	4.56
13000.0	13.94	37.94	10.51	13.86	7.45	1.03	28.47	19.85	4.57
13500.0	13.93	37.68	10.43	14.54	7.34	1.04	27.60	19.80	4.52
14000.0	13.86	38.02	10.99	16.24	8.13	1.04	29.74	19.81	4.53
14500.0	14.26	36.29	12.01	16.45	5.89	1.03	28.70	19.73	4.45
15000.0	14.42	37.30	14.02	19.16	7.39	1.02	26.99	19.88	4.38
15500.0	14.48	37.08	13.14	22.48	6.95	1.04	28.09	19.80	4.39
16000.0	14.69	36.59	14.75	24.33	6.35	1.02	28.01	19.23	4.36
16500.0	14.68	36.44	13.30	26.71	6.15	1.04	27.68	19.13	4.98
17000.0	14.68	35.56	12.49	26.82	5.64	1.04	27.60	18.77	5.45
17500.0	14.70	34.77	12.24	28.08	5.21	1.04	28.47	18.65	4.71
18000.0	14.76	33.37	12.48	31.83	4.44	1.04	28.46	19.08	4.23
18500.0	14.77	32.26	16.50	25.50	4.01	1.00	28.14	18.77	4.28
19000.0	14.49	30.64	16.80	24.40	3.43	0.99	27.12	18.46	4.39
19500.0	13.83	29.75	16.38	20.46	3.36	0.99	28.51	18.79	4.58
20000.0	12.21	29.10	10.11	16.22	3.48	1.03	27.34	19.37	5.23

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=113.70mA @ Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	9.92	43.07	10.21	19.45	21.20	1.08	25.59	17.10	9.92
4600.0	10.53	41.68	11.34	23.16	16.32	1.07	26.94	17.46	9.53
4800.0	10.84	40.67	12.46	26.21	15.51	1.05	27.63	17.74	9.14
5000.0	11.06	39.31	13.32	25.21	12.71	1.04	27.41	17.91	8.86
5200.0	11.15	38.96	14.17	23.61	12.08	1.03	27.06	17.90	8.63
5400.0	11.21	38.60	14.88	22.46	11.59	1.02	26.74	18.05	8.45
5600.0	11.24	38.25	15.43	21.81	10.93	1.02	27.10	18.05	8.31
5800.0	11.26	38.21	16.08	21.31	10.89	1.02	28.58	18.07	8.19
6000.0	11.28	37.80	16.76	21.01	10.42	1.01	28.60	18.12	8.02
6500.0	11.32	37.32	19.30	21.32	10.30	1.00	26.94	18.04	7.84
7000.0	11.36	37.21	23.28	22.19	10.05	1.00	26.41	18.01	7.66
7500.0	11.38	37.14	33.09	23.32	9.81	0.99	27.30	18.10	7.59
8000.0	11.36	36.99	26.20	21.51	10.14	0.99	26.20	17.95	7.52
8500.0	11.20	36.07	23.87	18.76	9.02	0.99	28.03	17.86	7.54
9000.0	11.09	37.30	17.61	16.88	10.10	0.99	27.49	17.86	7.64
9500.0	10.95	37.21	16.88	15.78	10.52	0.99	27.51	17.77	7.27
10000.0	10.79	37.66	15.86	14.85	10.78	0.99	27.98	17.73	6.91
10500.0	10.62	38.10	14.37	14.82	11.40	1.00	27.28	17.67	7.43
11500.0	10.27	38.66	12.34	14.49	12.56	1.02	27.60	17.56	7.92
12000.0	10.18	38.79	13.41	13.93	13.60	1.00	28.03	17.60	7.89
12500.0	10.00	38.91	11.55	13.48	13.03	1.01	27.97	17.46	7.88
13000.0	9.90	39.24	10.79	13.14	13.93	1.03	27.28	17.46	7.99
13500.0	9.90	39.13	11.56	12.19	14.32	1.00	27.43	17.24	7.90
14000.0	9.86	38.41	11.35	13.86	12.93	1.02	27.58	17.36	7.93
14500.0	10.13	36.98	11.29	14.40	10.77	1.03	27.37	17.23	7.88
15000.0	10.34	38.50	13.85	13.71	12.39	0.99	26.62	17.46	7.79
15500.0	10.51	38.55	14.45	16.79	12.62	1.01	27.07	17.66	7.74
16000.0	10.63	37.98	14.61	19.24	12.16	1.02	25.63	17.66	7.75
16500.0	10.68	37.79	17.25	23.72	11.88	1.01	27.69	17.46	8.37
17000.0	10.63	36.75	14.28	25.86	10.81	1.03	27.28	17.33	8.72
17500.0	10.64	35.83	15.31	28.33	9.70	1.02	27.05	17.14	8.04
18000.0	10.59	34.70	15.32	25.71	8.33	1.02	26.63	17.36	7.63
18500.0	10.45	33.33	17.19	20.04	7.53	1.00	26.99	17.12	7.70
19000.0	10.04	32.24	17.89	16.63	6.75	0.98	26.44	16.62	7.94
19500.0	9.16	31.23	14.64	14.87	6.54	0.99	26.65	17.01	8.19
20000.0	7.79	30.56	16.93	12.59	6.95	0.95	26.49	16.90	8.87

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=112.45mA @ Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	9.87	43.26	10.15	19.60	21.01	1.08	26.58	16.80	9.90
4600.0	10.49	41.38	11.25	23.68	17.21	1.07	26.45	17.15	9.49
4800.0	10.80	40.92	12.36	27.27	15.70	1.05	26.45	17.43	9.09
5000.0	11.02	39.38	13.21	26.36	12.67	1.04	26.81	17.58	8.78
5200.0	11.11	39.08	14.06	24.57	12.32	1.03	27.60	17.53	8.63
5400.0	11.17	38.50	14.74	23.34	11.43	1.03	26.82	17.68	8.42
5600.0	11.20	38.02	15.29	22.59	11.18	1.02	27.57	17.67	8.29
5800.0	11.22	37.93	15.91	22.06	10.93	1.02	26.86	17.68	8.12
6000.0	11.24	37.65	16.59	21.79	10.92	1.01	26.82	17.76	7.98
6500.0	11.28	37.27	19.09	22.12	10.32	1.00	28.28	17.66	7.81
7000.0	11.32	37.08	22.85	23.12	10.00	1.00	28.03	17.65	7.64
7500.0	11.34	37.27	31.88	24.14	10.02	0.99	27.32	17.74	7.51
8000.0	11.33	37.10	26.60	22.09	10.17	0.99	27.74	17.57	7.48
8500.0	11.17	36.10	24.30	19.10	9.13	0.99	26.93	17.48	7.53
9000.0	11.06	37.15	17.78	17.20	10.19	0.99	26.45	17.58	7.60
9500.0	10.93	37.40	17.01	16.04	10.58	0.99	27.84	17.43	7.23
10000.0	10.77	37.30	16.02	15.04	11.06	0.99	27.49	17.38	6.88
10500.0	10.60	37.99	14.40	15.02	11.61	1.00	27.33	17.30	7.38
11500.0	10.26	38.48	12.37	14.64	12.38	1.02	27.23	17.22	7.87
12000.0	10.17	38.74	13.42	14.05	13.07	1.00	27.26	17.35	7.87
12500.0	9.99	38.76	11.59	13.59	12.93	1.01	26.49	17.17	7.84
13000.0	9.90	39.15	10.80	13.23	13.70	1.03	27.05	17.23	7.89
13500.0	9.89	39.27	11.61	12.31	13.64	1.00	26.03	17.02	7.82
14000.0	9.86	38.39	11.34	14.05	12.98	1.02	27.93	17.12	7.83
14500.0	10.13	37.09	11.26	14.64	10.69	1.03	27.60	17.03	7.80
15000.0	10.34	38.52	13.77	13.99	12.21	1.00	26.68	17.20	7.72
15500.0	10.52	38.14	14.37	17.19	12.51	1.01	26.20	17.37	7.64
16000.0	10.64	38.07	14.57	19.82	11.87	1.02	25.85	17.29	7.69
16500.0	10.70	37.55	17.12	24.50	11.43	1.01	25.90	17.03	8.30
17000.0	10.65	36.81	14.29	27.03	10.25	1.03	26.79	16.90	8.64
17500.0	10.67	35.80	15.36	27.47	9.44	1.02	25.98	16.69	7.96
18000.0	10.63	34.48	15.25	25.69	7.99	1.02	25.81	16.90	7.49
18500.0	10.51	33.12	17.09	20.14	7.27	1.00	26.34	16.68	7.60
19000.0	10.13	32.14	18.12	16.66	6.73	0.99	26.30	16.17	7.87
19500.0	9.27	31.05	14.83	15.09	6.29	0.99	26.17	16.58	8.11
20000.0	7.92	30.48	17.20	12.69	6.72	0.96	24.55	16.44	8.78

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

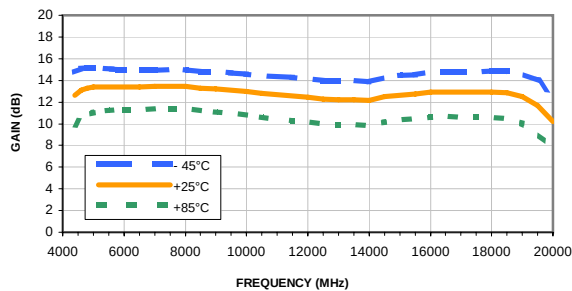
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.25V, Id=115.25mA @ Temperature = +85degC

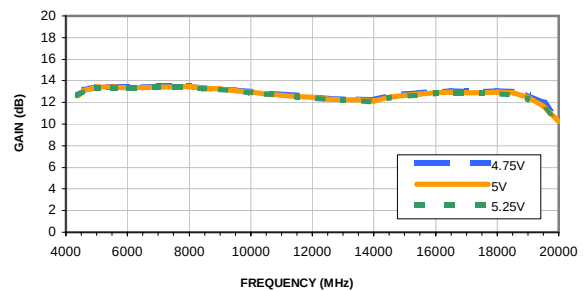
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
4400.0	10.00	43.06	10.26	19.23	20.72	1.08	26.15	17.31	9.96
4600.0	10.61	41.50	11.42	22.71	16.78	1.07	26.34	17.69	9.52
4800.0	10.91	40.90	12.56	25.36	15.15	1.05	26.92	17.96	9.14
5000.0	11.13	39.25	13.43	24.38	12.88	1.04	26.99	18.15	8.86
5200.0	11.22	39.00	14.34	22.94	12.26	1.03	27.36	18.21	8.66
5400.0	11.28	38.38	15.04	21.84	11.45	1.02	27.64	18.35	8.47
5600.0	11.31	38.30	15.63	21.24	10.81	1.02	27.42	18.37	8.32
5800.0	11.32	38.01	16.25	20.77	10.89	1.01	28.56	18.41	8.20
6000.0	11.34	37.59	17.00	20.49	10.71	1.01	27.66	18.41	8.04
6500.0	11.39	37.35	19.61	20.71	10.22	1.00	27.59	18.36	7.86
7000.0	11.43	37.15	23.74	21.56	10.11	0.99	26.77	18.27	7.69
7500.0	11.45	37.13	35.13	22.61	9.89	0.99	28.33	18.33	7.58
8000.0	11.42	37.13	25.94	21.11	9.67	0.99	27.23	18.24	7.53
8500.0	11.25	36.30	23.53	18.50	9.37	0.99	28.21	18.19	7.57
9000.0	11.14	37.51	17.52	16.68	10.28	0.99	26.88	18.09	7.67
9500.0	11.00	37.44	16.81	15.65	10.74	0.99	28.04	18.06	7.31
10000.0	10.83	37.68	15.80	14.70	10.81	0.99	27.10	18.03	6.96
10500.0	10.65	38.24	14.27	14.67	11.48	1.00	27.00	17.97	7.46
11500.0	10.29	38.70	12.33	14.39	13.12	1.01	29.15	17.87	7.94
12000.0	10.20	38.76	13.47	13.87	13.39	1.00	26.90	17.81	7.97
12500.0	10.01	39.31	11.58	13.38	13.28	1.01	27.61	17.70	7.97
13000.0	9.90	39.42	10.83	13.04	13.76	1.02	27.85	17.65	8.01
13500.0	9.89	39.15	11.63	12.10	14.14	1.00	29.51	17.43	7.92
14000.0	9.84	38.57	11.45	13.77	12.95	1.02	26.44	17.54	7.92
14500.0	10.10	37.35	11.47	14.15	10.72	1.03	26.94	17.44	7.90
15000.0	10.30	38.31	14.14	13.43	12.64	0.99	28.20	17.70	7.79
15500.0	10.47	38.60	14.79	16.56	13.09	1.01	28.36	17.87	7.76
16000.0	10.60	38.38	14.90	18.78	12.47	1.02	28.13	17.97	7.79
16500.0	10.65	38.11	17.58	22.91	12.38	1.01	28.99	17.81	8.42
17000.0	10.60	37.00	14.37	25.00	10.73	1.03	27.47	17.71	8.74
17500.0	10.60	35.95	15.43	28.82	9.67	1.02	27.58	17.54	8.08
18000.0	10.54	34.53	15.37	26.10	8.45	1.02	27.01	17.71	7.64
18500.0	10.38	33.59	17.10	20.02	7.61	1.00	27.20	17.53	7.74
19000.0	9.95	32.49	17.48	16.47	6.97	0.99	26.70	17.02	7.96
19500.0	9.04	31.31	14.40	14.70	6.66	0.99	26.87	17.40	8.28
20000.0	7.66	30.79	16.69	12.56	7.12	0.95	28.03	17.18	8.89

Typical Performance Curves

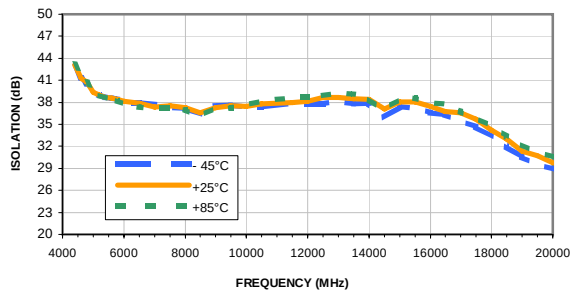
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5.00V



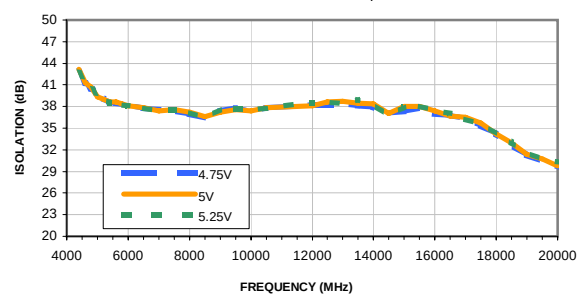
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



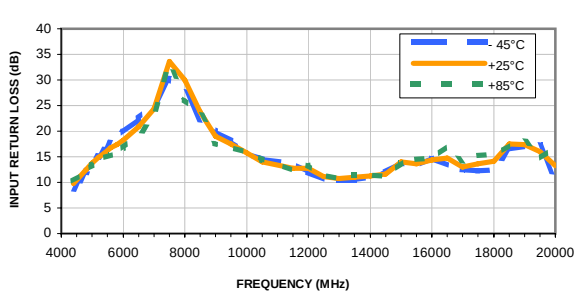
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5.00V



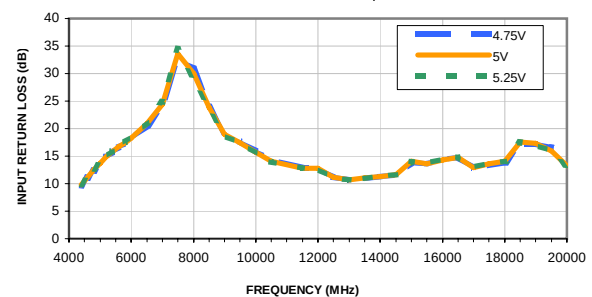
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



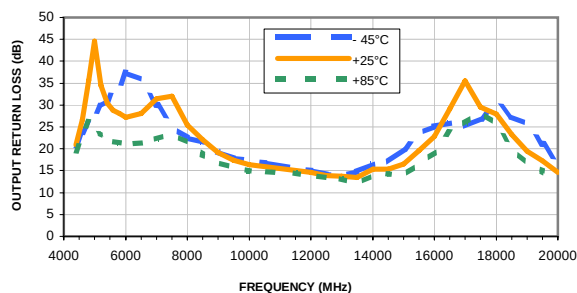
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5.00V



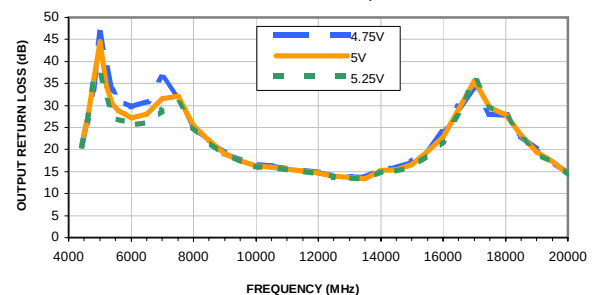
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5.00V

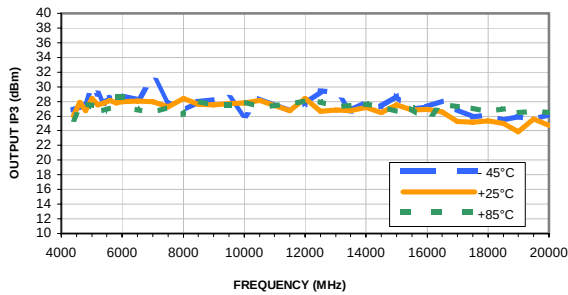


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C

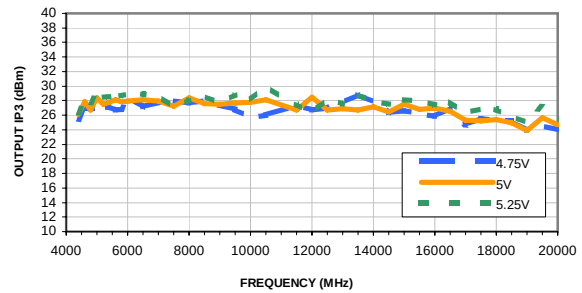


Typical Performance Curves

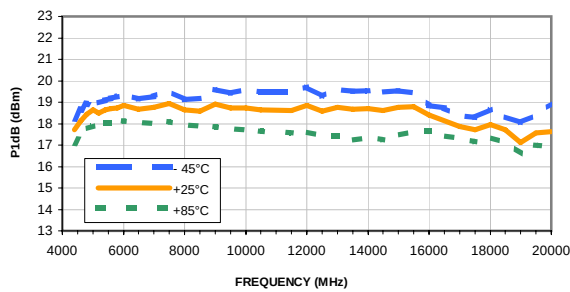
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
Vd = 5.00V



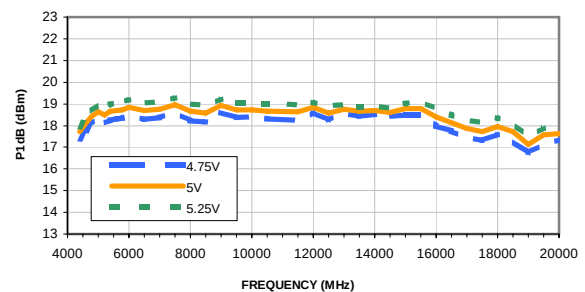
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



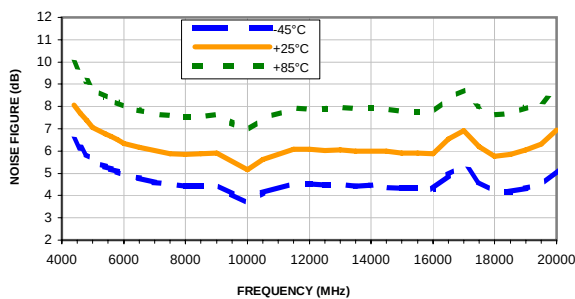
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 5.00V



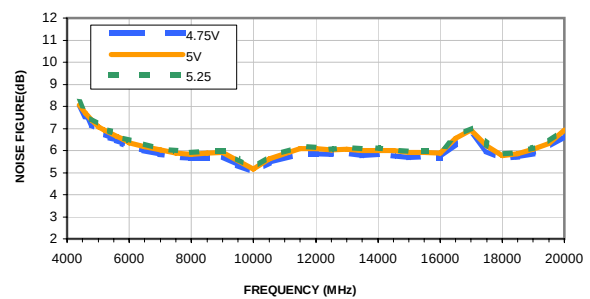
P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



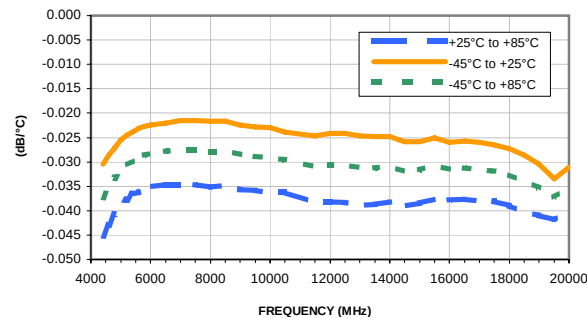
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 5.00V



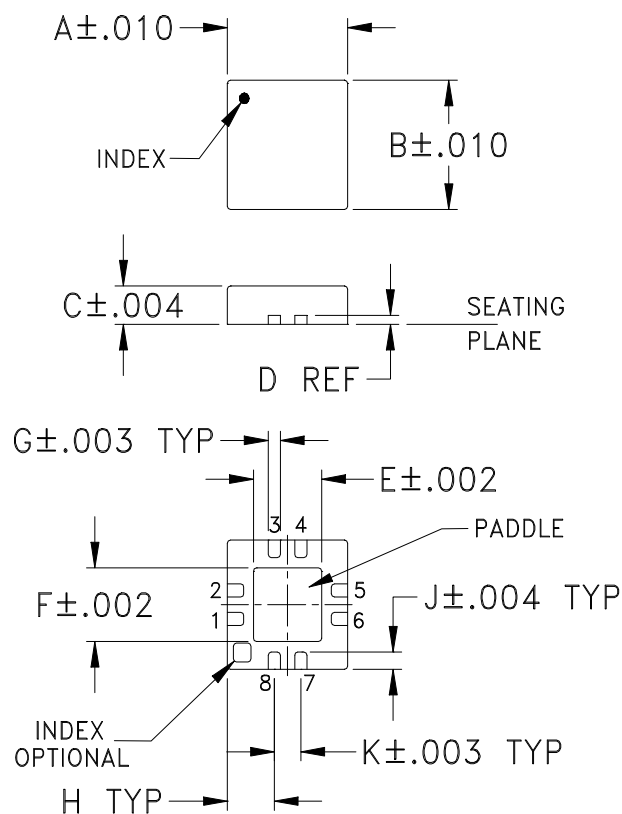
NOISE FIGURE vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



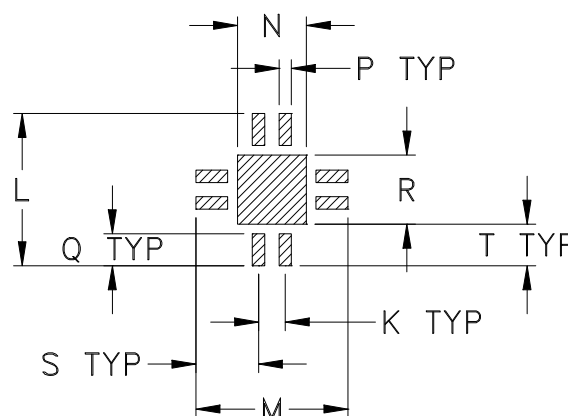
GAIN VARIATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5.00V



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
DQ849	.118 (3.00)	.118 (3.00)	.035 (0.89)	.008 (0.20)	.067 (1.70)	.067 (1.70)	.012 (0.30)	.046 (1.17)	.016 (0.41)	.026 (0.66)	.148 (3.76)	.148 (3.76)	.067 (1.70)

CASE #	P	Q	R	S	T	WT. GRAM
DQ849	.012 (0.30)	.031 (0.79)	.067 (1.70)	.061 (1.55)	.041 (1.04)	.02

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

Notes:

- Case material: Plastic.
- Termination finish:
For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier or Matte-Tin plated. All models, (+) suffix. See Data sheet.
For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.



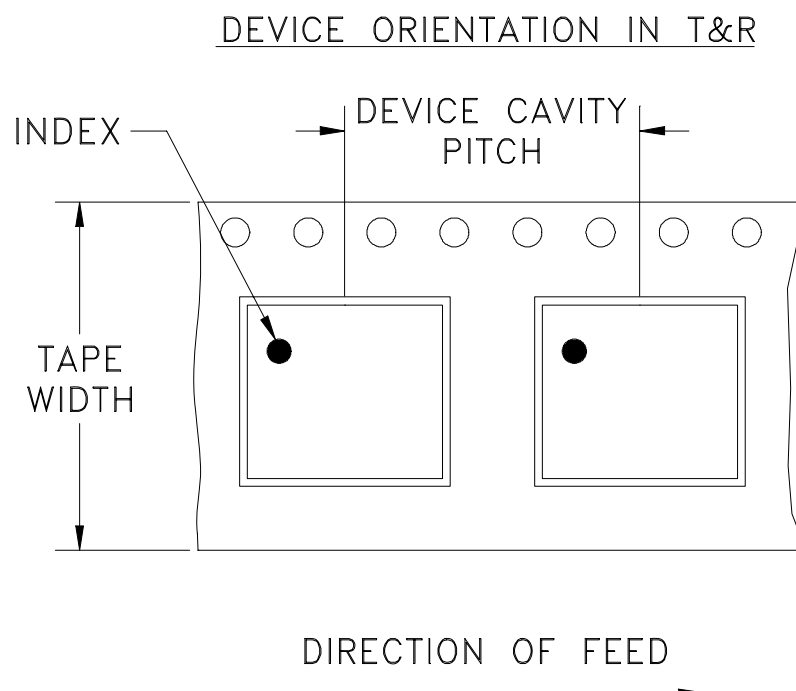
INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

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Mini-Circuits ISO 9001 & ISO 14001 Certified

Tape & Reel Packaging TR-F104



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

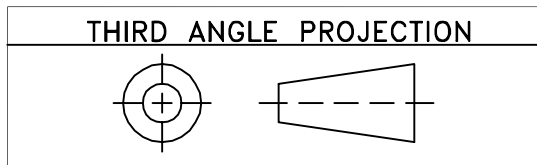
Note: Please Consult individual model data sheet to determine device per reel availability.

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

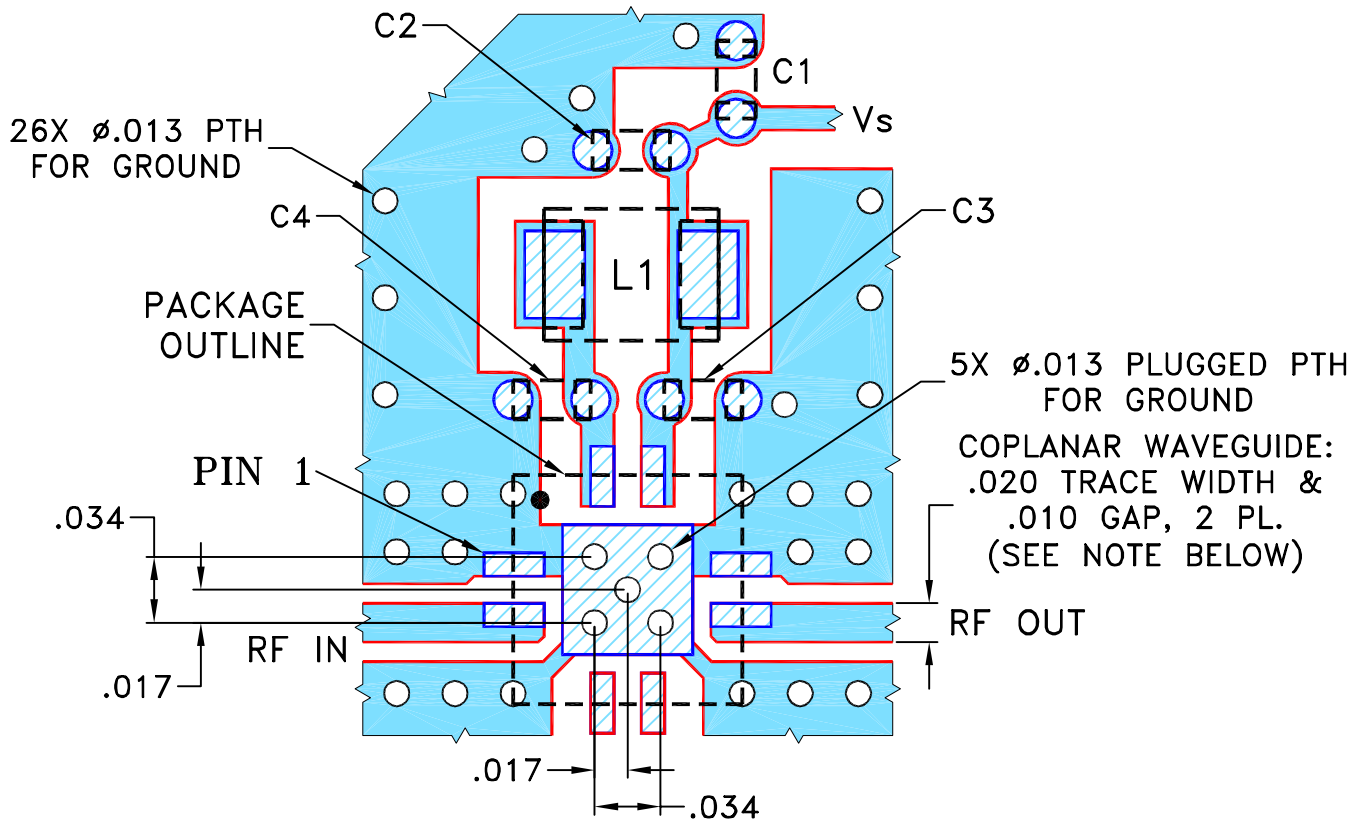


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REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M125952	NEW RELEASE	01/08/10	MMG	RD
A	M132664	UPDATED PATTERN & COMPONENTS	12/16/11	PW	DJ
B	M135298	UPDATED DESCRIPTION & NOTE 2	01/11/12	AV	DJ

**SUGGESTED MOUNTING CONFIGURATION FOR
DQ849 CASE STYLE, "08AM03" PIN CODE**



- NOTES: 1. COPLANAR WAVEGUIDE PARAMETERS ARE 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 0805 CHIP COMPONENTS FOOTPRINTS ARE SHOWN FOR REFERENCE. VALUE OF COMPONENTS AS PER TB-547-X+.
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
TOLERANCES ON:	CHECKED	IL
2 PL DECIMALS $\pm$	APPROVED	RD
3 PL DECIMALS $\pm$.005		
ANGLES $\pm$		
FRACTIONS $\pm$		



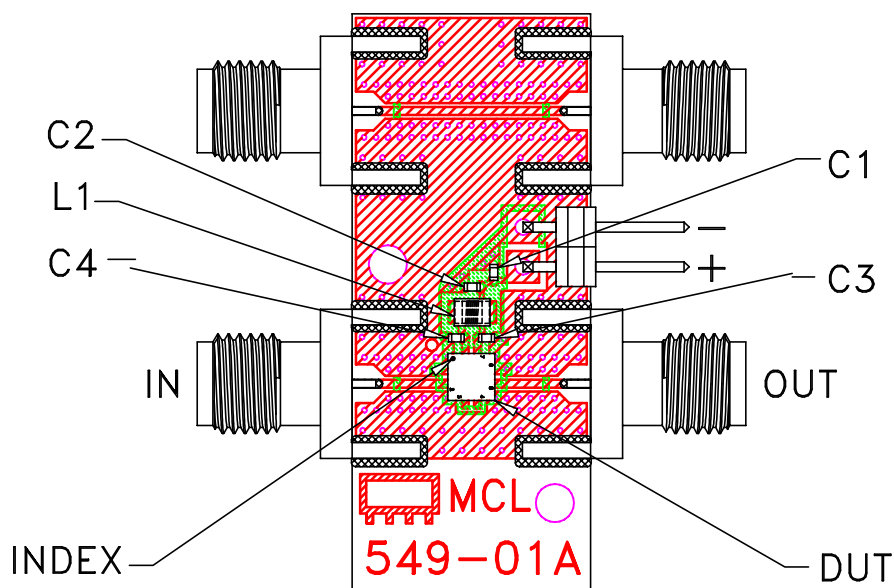
Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, 08AM03, DQ849, TB-547-X+

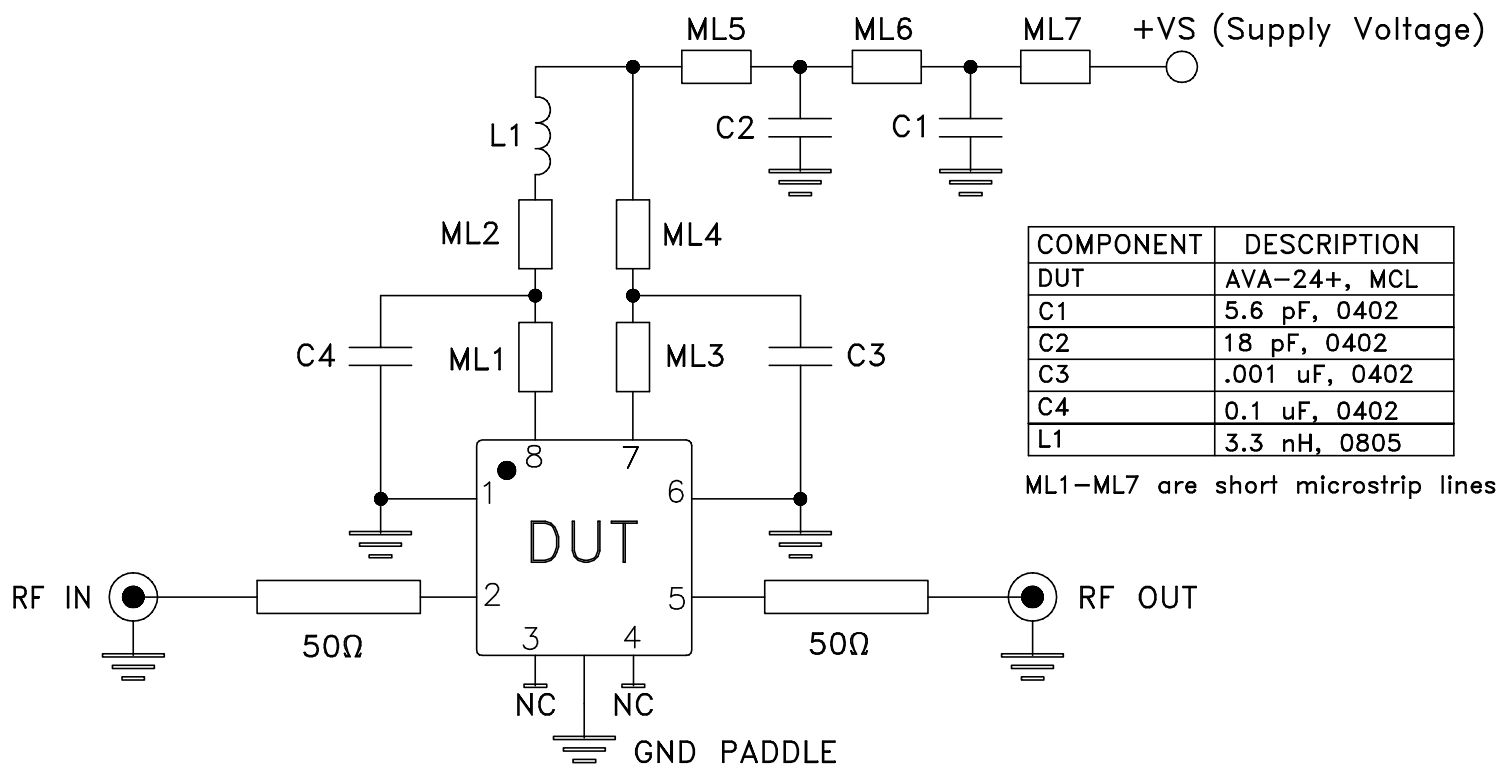
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ASHEETA1.DWG	REV:A	DATE:01/12/95

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-328	B
FILE:	98PL328	SCALE:	10:1
		SHEET:	1 OF 1

Evaluation Board and Circuit



TB-547-1+



Schematic Diagram

NOTES:

1. SMA Female connectors.
2. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric 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	-40° to 85°C or -45° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C or -65° to 150° Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +	MIL-STD-202, Method 215



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	