

High Directivity

Monolithic Amplifier

0.5-2.5 GHz

Product Features

- 2.8V & 5V operation
- Micro-miniature size .120"X.120"
- Internal DC blocking at RF input and output
- High directivity, 17 dB typ.
- Low noise figure, 2.9 dB typ.
- Output power, up to +18 dBm typ.
- Excellent repeatability
- Low cost
- Aqueous washable

Typical Applications

- Buffer amplifier
- Cellular
- PCN
- Communications satellite
- Defense



MNA-6+

CASE STYLE: DQ849
PRICE: Contact Sales Dept.

+RoHS Compliant

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

Not Recommended for New Designs

please refer to PCN# 15-054 and
recommended replacement at :
http://www.minicircuits.com/support/product_change.html
or PCN History on Dash Board

General Description

MNA-6+ is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in a 3x3 mm MCLP plastic package. MNA-6+ is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 45,000 years at 2.8V; 7,000 years at 5V.

Function	Pin Number	Description
RF IN	2	RF input pin
RF-OUT	5	RF output pin
DC	7, with 1000 pF bypass to ground; connect pin 8 via 33 ohms to pin 7 externally	Bias pins
GND	3,4 and paddle in center of bottom	Connections to ground
OPTIONAL	1,6	No internal connection; recommended use: per PCB Layout PL-078

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



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Electrical Specifications at 25°C

Parameter		Min.	Typ.		Max.	Units
Frequency Range		0.5			2.5	GHz
at DC Volts		5.0	5.0	2.8	5.0	V
Gain	f=0.5 GHz	—	19.4	18.6	—	dB
	f=1.0 GHz	—	23.5	21.5	—	
	f=1.5 GHz	—	23.6	21.2	—	
	f=2.0 GHz	21.5	23.0	21.0	—	
	f=2.5 GHz	—	20.2	19.0	—	
Input Return Loss	f=0.75-2.5 GHz		14	14		dB
Output Return Loss	f=0.75-2.5 GHz		12.5	10		dB
Output Power @ 1 dB compression	f=0.5 GHz		18.0	14.1		dBm
	f=2.5GHz		15.8	13.2		
Output IP3	f=1 GHz		27.1	23.4		dBm
	f=2 GHz		28.0	25.0		
Noise Figure	f=1 GHz		2.9			dB
Directivity (Isolation - Gain)			17			
DC Current			81	65	95	mA
Thermal Resistance, junction-to-case			78			°C/W

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
DC Voltage	7V at pin 7 10V at pins 2 & 5
Power Dissipation	500mW
Input Power	10dBm (continuous operation)
	26dBm (5 minutes max)

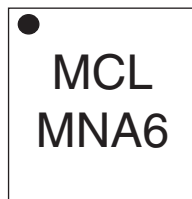
Note: Permanent damage may occur if any of these limits are exceeded.
These ratings are not intended for continuous normal operation.

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Product Marking



Additional Detailed Technical Information

Additional information is available on our web site. 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

MNA-6+: Plastic package, exposed paddle, lead finish: tin-silver over nickel

Tape & Reel: F104

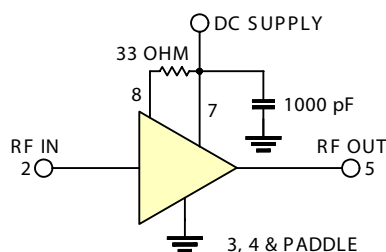
Standard quantities available on reel: 7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices.

Suggested Layout for PCB Design: PL-078

Evaluation Board: TB-186+

Environmental Ratings: ENV08T1

Recommended Application Circuit



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ESD Rating

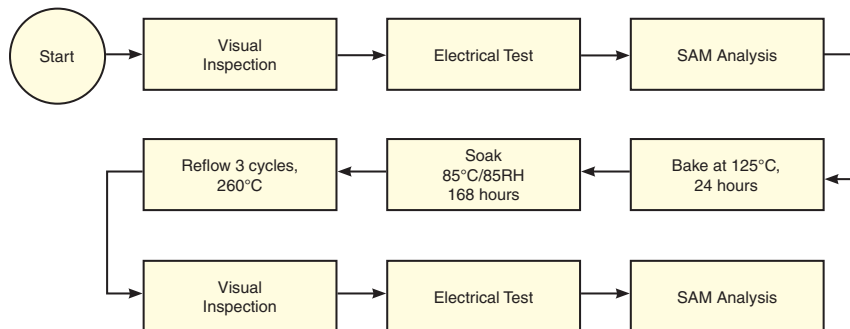
Human Body Model (HBM): Class 1A (250v to < 500v) in accordance with ANSI/ESD STM 5.1 - 2001

Charged Device Model (CDM): Class III (500 to 1000v) in accordance with JESD22-C101A

MSL Rating

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

No.	Test Required	Condition	Standard	Quantity
1	Visual Inspection	Low Power Microscope Magnification 40x	MIP-IN-0003 (MCT spec)	45 units
2	Electrical Test	Room Temperature	SCD (MCL spec)	45 units
3	SAM Analysis	Less than 10% growth in term of delamination	J-Std-020C (Jedec Standard)	45 units
4	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-020C (Jedec Standard)	45 units

MSL Test Flow Chart**Notes**

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Typical Performance Data

**NOTE: Use PDF Bookmarks to view DATA at required conditions
or to view GRAPHS.**

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 72mA, Vd = 3.9V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.50	43.77	7.64	8.93	6.50	0.09	29.86	16.81	3.01
550	19.31	43.25	8.69	10.63	6.14	0.05	30.14	17.79	3.16
600	19.94	43.23	9.86	12.26	6.12	0.02	30.22	16.56	3.38
650	20.40	43.09	11.13	13.99	6.02	0.02	30.00	16.84	3.14
700	20.73	42.99	12.61	15.91	5.97	0.04	29.95	17.82	2.93
750	21.00	41.78	14.13	17.78	5.19	0.07	29.90	17.20	3.10
800	21.22	42.64	15.79	19.74	5.70	0.07	29.71	16.44	3.23
850	21.41	41.21	17.39	21.33	4.81	0.09	29.62	17.33	3.07
900	21.55	41.95	19.35	22.47	5.19	0.09	29.54	17.10	2.82
940	21.68	40.95	20.78	22.81	4.59	0.11	29.48	16.56	2.88
1000	21.81	40.65	23.24	22.48	4.39	0.12	29.41	16.97	2.95
1050	21.88	41.22	24.69	21.71	4.64	0.11	29.33	16.92	2.97
1100	21.99	40.96	25.87	20.81	4.45	0.12	29.26	16.38	2.88
1150	22.06	40.14	26.48	19.66	4.02	0.13	29.22	16.51	2.81
1200	22.14	40.13	25.94	18.55	3.97	0.13	29.12	16.57	2.89
1250	22.18	39.89	25.71	17.88	3.84	0.14	29.05	16.15	2.89
1300	22.27	40.75	25.02	17.11	4.17	0.12	28.93	16.42	2.75
1350	22.29	39.60	24.59	16.23	3.64	0.14	28.91	16.66	2.83
1400	22.36	39.56	24.13	15.54	3.59	0.14	28.88	16.33	2.77
1450	22.40	39.60	24.25	15.01	3.57	0.14	28.86	16.21	3.04
1500	22.40	39.58	24.50	14.40	3.54	0.14	28.81	16.26	2.89
1550	22.45	39.48	24.81	13.88	3.47	0.15	28.82	16.08	2.92
1600	22.48	39.66	25.01	13.35	3.51	0.14	28.71	15.79	2.86
1650	22.44	39.90	25.60	13.03	3.61	0.14	28.55	15.85	2.75
1700	22.46	39.48	26.54	12.55	3.42	0.15	28.39	15.98	2.89
1750	22.43	39.03	27.39	12.27	3.25	0.15	28.37	15.79	2.87
1800	22.40	38.78	28.61	11.87	3.16	0.16	28.28	15.87	2.87
1850	22.36	39.51	29.89	11.60	3.43	0.15	28.19	15.91	2.90
1900	22.32	39.53	30.44	11.42	3.44	0.15	28.20	15.92	2.89
1950	22.21	38.87	29.46	11.15	3.22	0.16	28.10	15.74	2.90
2000	22.12	38.95	27.90	10.86	3.26	0.15	28.09	15.73	2.92
2050	22.06	38.74	25.62	10.74	3.20	0.16	28.08	16.00	2.79
2100	21.91	38.85	23.99	10.59	3.28	0.16	28.02	16.02	2.96
2150	21.76	39.20	22.37	10.35	3.44	0.15	27.97	15.58	3.01
2200	21.56	38.85	20.59	10.24	3.37	0.15	27.91	15.62	2.91
2250	21.42	38.79	19.41	10.13	3.38	0.16	27.94	16.02	2.83
2300	21.24	38.56	18.19	10.01	3.34	0.16	27.94	15.50	3.06
2350	21.06	39.03	17.14	9.93	3.57	0.15	27.95	15.09	3.19
2400	20.87	38.32	16.15	9.81	3.35	0.16	27.94	15.88	3.08
2500	20.37	37.90	14.49	9.77	3.34	0.17	27.89	15.43	2.99

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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: I = 69mA, Vd = 2.8V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	17.65	44.61	7.42	9.13	7.88	0.10	26.44	14.35	3.07
550	18.40	43.81	8.45	10.76	7.24	0.06	26.55	15.26	3.19
600	18.95	44.16	9.51	12.39	7.58	0.03	26.63	14.10	3.43
650	19.36	42.98	10.71	13.98	6.64	0.01	26.56	14.41	3.19
700	19.64	42.71	11.95	15.42	6.47	0.04	26.49	15.41	2.95
750	19.87	41.38	13.23	16.70	5.56	0.06	26.46	14.82	3.10
800	20.03	41.19	14.65	17.54	5.45	0.08	26.36	14.24	3.25
850	20.20	42.18	15.90	17.90	6.05	0.07	26.37	15.11	3.10
900	20.30	41.09	17.26	17.94	5.33	0.09	26.34	14.98	2.84
940	20.40	40.13	18.40	17.73	4.75	0.10	26.22	14.37	2.90
1000	20.48	40.29	20.06	17.18	4.80	0.11	26.21	14.85	2.97
1050	20.53	40.31	21.23	16.72	4.79	0.11	26.14	15.01	3.04
1100	20.61	39.58	22.63	16.21	4.38	0.12	26.15	14.47	2.93
1150	20.65	38.94	23.62	15.49	4.05	0.13	26.15	14.52	2.82
1200	20.70	40.09	24.55	14.91	4.56	0.12	26.20	14.85	2.93
1250	20.72	39.16	25.39	14.56	4.09	0.13	26.12	14.51	2.91
1300	20.77	39.55	25.76	14.07	4.23	0.13	26.06	14.62	2.79
1350	20.77	39.14	26.50	13.47	4.02	0.13	26.07	14.97	2.83
1400	20.82	38.83	26.75	13.05	3.84	0.14	26.17	14.80	2.79
1450	20.83	39.25	27.30	12.75	4.01	0.13	26.28	14.56	3.08
1500	20.84	38.99	28.39	12.34	3.87	0.13	26.26	14.61	2.94
1550	20.86	38.64	28.99	11.94	3.69	0.14	26.42	14.61	2.93
1600	20.87	38.15	29.63	11.63	3.48	0.14	26.38	14.37	2.88
1650	20.85	38.07	31.37	11.34	3.44	0.14	26.32	14.27	2.79
1700	20.88	38.46	31.74	11.02	3.55	0.14	26.11	14.45	2.93
1750	20.83	38.40	32.54	10.80	3.53	0.14	26.11	14.44	2.86
1800	20.81	38.00	31.99	10.53	3.37	0.15	26.02	14.40	2.89
1850	20.78	38.38	31.54	10.30	3.51	0.14	25.97	14.34	2.96
1900	20.75	37.66	29.47	10.09	3.23	0.15	25.97	14.49	2.97
1950	20.66	37.44	27.18	9.87	3.17	0.15	25.94	14.41	2.91
2000	20.59	37.96	25.70	9.68	3.36	0.14	25.92	14.24	2.93
2050	20.55	37.67	23.88	9.56	3.26	0.15	25.93	14.49	2.81
2100	20.43	37.56	22.52	9.45	3.25	0.15	25.91	14.64	3.02
2150	20.31	37.57	21.13	9.20	3.26	0.15	25.83	14.14	3.05
2200	20.15	37.07	19.68	9.07	3.12	0.16	25.84	14.13	2.94
2250	20.04	36.84	18.73	8.91	3.06	0.16	25.83	14.62	2.88
2300	19.89	36.88	17.66	8.83	3.11	0.16	25.85	14.19	3.11
2350	19.77	36.81	16.75	8.68	3.10	0.17	25.80	13.59	3.23
2400	19.61	36.96	15.80	8.60	3.18	0.17	25.82	14.45	3.11
2500	19.19	36.37	14.34	8.43	3.08	0.18	25.77	14.00	3.02

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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: I = 75mA, Vd = 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.95	46.37	7.73	8.71	8.32	0.11	31.55	18.12	3.03
550	19.79	44.26	8.81	10.27	6.51	0.06	31.92	19.45	3.18
600	20.45	44.64	10.02	11.94	6.78	0.02	32.07	17.81	3.39
650	20.94	43.79	11.40	13.70	6.15	0.02	31.82	17.96	3.13
700	21.30	42.69	12.96	15.47	5.41	0.05	31.77	19.29	2.93
750	21.62	43.40	14.60	17.50	5.83	0.06	31.84	18.49	3.12
800	21.86	42.98	16.55	19.75	5.53	0.07	31.63	17.63	3.25
850	22.10	42.96	18.40	21.96	5.44	0.08	31.49	18.50	3.06
900	22.26	41.88	20.67	25.22	4.78	0.10	31.47	18.21	2.81
940	22.43	41.67	22.64	27.46	4.60	0.11	31.40	17.67	2.89
1000	22.56	42.05	25.43	29.99	4.75	0.11	31.30	18.00	2.97
1050	22.66	41.44	26.89	29.78	4.39	0.12	31.20	17.86	2.98
1100	22.79	41.98	26.93	27.63	4.60	0.11	31.06	17.29	2.90
1150	22.89	41.47	26.25	25.06	4.28	0.12	31.03	17.46	2.83
1200	22.99	40.63	24.66	22.99	3.85	0.13	30.79	17.39	2.92
1250	23.03	40.97	23.91	21.58	3.97	0.13	30.76	16.98	2.86
1300	23.15	40.68	22.89	20.33	3.78	0.13	30.59	17.32	2.77
1350	23.19	40.46	22.23	18.96	3.65	0.14	30.56	17.51	2.86
1400	23.27	40.49	21.90	17.93	3.62	0.14	30.42	17.06	2.78
1450	23.32	41.23	21.54	17.18	3.89	0.13	30.33	16.98	3.03
1500	23.35	40.82	21.75	16.34	3.69	0.13	30.22	17.09	2.90
1550	23.39	40.36	21.77	15.68	3.48	0.14	30.20	16.83	2.95
1600	23.45	39.79	21.89	15.02	3.24	0.16	30.04	16.54	2.89
1650	23.41	40.54	22.54	14.56	3.52	0.14	29.85	16.62	2.74
1700	23.43	39.30	23.06	14.07	3.06	0.16	29.74	16.83	2.88
1750	23.38	40.40	23.85	13.60	3.45	0.15	29.71	16.57	2.87
1800	23.34	39.82	24.69	13.14	3.24	0.16	29.63	16.63	2.89
1850	23.30	41.43	25.70	12.83	3.88	0.13	29.54	16.78	2.90
1900	23.23	40.49	26.02	12.63	3.52	0.15	29.58	16.72	2.91
1950	23.11	40.15	26.16	12.33	3.42	0.15	29.44	16.49	2.91
2000	22.99	40.05	25.61	12.08	3.42	0.15	29.40	16.56	2.92
2050	22.92	40.74	24.04	11.95	3.71	0.14	29.39	16.88	2.78
2100	22.71	39.07	22.90	11.77	3.15	0.17	29.35	16.83	2.95
2150	22.56	40.09	21.41	11.58	3.56	0.15	29.34	16.46	3.03
2200	22.31	40.50	19.93	11.48	3.81	0.14	29.25	16.54	2.92
2250	22.14	40.63	18.82	11.37	3.92	0.14	29.29	16.92	2.85
2300	21.91	40.57	17.60	11.30	3.98	0.14	29.28	16.40	3.05
2350	21.71	39.88	16.59	11.26	3.75	0.15	29.33	15.95	3.21
2400	21.49	40.25	15.59	11.17	3.98	0.14	29.33	16.78	3.10
2500	20.92	38.91	14.04	11.17	3.61	0.16	29.29	16.31	2.99

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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: I = 68mA, Vd = 3.9V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.94	46.09	7.57	8.75	8.02	0.11	29.86	16.75	2.44
550	19.74	44.79	8.59	10.35	6.91	0.06	30.10	17.85	2.56
600	20.36	44.33	9.75	12.03	6.57	0.03	30.21	16.39	2.81
650	20.83	42.99	11.05	13.80	5.64	0.02	30.04	16.53	2.56
700	21.17	42.80	12.48	15.56	5.53	0.04	29.93	17.77	2.37
750	21.44	42.42	13.98	17.44	5.30	0.06	29.87	17.07	2.51
800	21.67	42.30	15.67	19.31	5.20	0.08	29.70	16.24	2.66
850	21.90	42.74	17.33	20.87	5.39	0.08	29.62	17.18	2.52
900	22.04	41.67	19.23	22.15	4.75	0.10	29.56	16.97	2.24
940	22.16	42.37	20.83	22.53	5.10	0.09	29.46	16.32	2.32
1000	22.30	42.89	23.52	22.26	5.34	0.09	29.40	16.74	2.40
1050	22.42	41.06	25.37	21.78	4.30	0.12	29.30	16.78	2.42
1100	22.50	41.20	27.29	20.77	4.32	0.12	29.23	16.14	2.34
1150	22.61	40.88	28.65	19.65	4.11	0.13	29.19	16.22	2.26
1200	22.69	40.42	28.22	18.65	3.86	0.13	29.06	16.33	2.35
1250	22.77	40.66	27.83	18.04	3.92	0.13	28.99	15.94	2.33
1300	22.85	40.79	26.65	17.11	3.92	0.13	28.86	16.24	2.20
1350	22.91	40.08	26.28	16.28	3.59	0.14	28.86	16.44	2.27
1400	23.00	40.03	26.01	15.57	3.52	0.15	28.78	16.13	2.22
1450	23.05	39.85	25.45	14.98	3.42	0.15	28.78	16.01	2.47
1500	23.06	40.67	25.80	14.33	3.71	0.14	28.71	16.09	2.33
1550	23.14	39.84	25.95	13.80	3.34	0.15	28.69	15.88	2.36
1600	23.19	39.33	26.13	13.36	3.13	0.16	28.60	15.62	2.31
1650	23.16	40.06	27.02	12.88	3.39	0.15	28.42	15.65	2.19
1700	23.22	39.58	27.82	12.44	3.18	0.16	28.28	15.75	2.34
1750	23.21	39.05	29.19	12.14	2.99	0.17	28.26	15.61	2.28
1800	23.20	39.28	30.49	11.72	3.05	0.16	28.17	15.69	2.31
1850	23.19	39.17	32.28	11.38	3.00	0.16	28.07	15.69	2.34
1900	23.16	39.00	33.65	11.21	2.95	0.17	28.10	15.66	2.31
1950	23.07	39.19	32.73	10.86	3.02	0.16	27.99	15.59	2.31
2000	22.99	39.42	30.42	10.66	3.11	0.16	27.93	15.60	2.34
2050	22.97	39.84	28.14	10.51	3.25	0.15	27.94	15.79	2.21
2100	22.84	39.64	25.71	10.36	3.21	0.15	27.90	15.88	2.38
2150	22.69	39.34	23.49	10.15	3.14	0.16	27.85	15.45	2.41
2200	22.52	39.38	21.51	10.04	3.20	0.16	27.78	15.38	2.33
2250	22.40	38.32	20.15	9.89	2.87	0.17	27.79	15.81	2.26
2300	22.24	39.40	18.74	9.78	3.27	0.16	27.79	15.35	2.45
2350	22.08	38.40	17.75	9.70	2.96	0.17	27.79	14.77	2.57
2400	21.89	38.60	16.66	9.60	3.07	0.17	27.79	15.66	2.45
2500	21.40	38.49	14.90	9.55	3.16	0.17	27.73	15.27	2.39

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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: I = 64mA, Vd = 2.8V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.11	44.31	7.38	9.03	7.17	0.10	26.58	14.38	2.47
550	18.85	45.70	8.38	10.58	8.49	0.07	26.70	15.38	2.59
600	19.41	44.13	9.44	12.22	7.12	0.03	26.80	13.71	2.85
650	19.83	43.98	10.67	13.83	7.04	0.01	26.67	14.20	2.63
700	20.11	42.17	12.01	15.25	5.76	0.04	26.60	15.45	2.41
750	20.35	42.71	13.26	16.54	6.13	0.05	26.57	14.73	2.55
800	20.53	42.42	14.67	17.41	5.91	0.07	26.45	13.72	2.69
850	20.71	41.50	16.03	17.85	5.28	0.08	26.44	15.04	2.58
900	20.82	41.71	17.53	17.95	5.39	0.09	26.40	14.90	2.26
940	20.93	41.51	18.63	17.67	5.22	0.09	26.29	14.03	2.34
1000	21.02	41.63	20.39	17.13	5.26	0.10	26.23	14.69	2.40
1050	21.07	40.94	21.94	16.67	4.84	0.11	26.16	14.93	2.47
1100	21.17	40.98	23.37	16.16	4.81	0.11	26.18	14.30	2.37
1150	21.22	39.49	24.95	15.54	4.04	0.13	26.15	14.29	2.27
1200	21.28	40.54	25.94	14.88	4.49	0.12	26.18	14.67	2.36
1250	21.32	39.92	27.10	14.55	4.16	0.13	26.10	14.33	2.38
1300	21.38	39.64	27.80	14.06	4.00	0.13	26.03	14.44	2.25
1350	21.41	39.64	28.65	13.45	3.96	0.13	26.05	14.82	2.28
1400	21.47	38.61	28.84	13.04	3.49	0.15	26.11	14.65	2.24
1450	21.50	38.84	29.35	12.67	3.55	0.14	26.23	14.37	2.51
1500	21.51	38.99	30.71	12.18	3.59	0.14	26.19	14.43	2.37
1550	21.54	38.72	31.38	11.86	3.45	0.14	26.30	14.38	2.36
1600	21.58	38.81	32.26	11.53	3.45	0.14	26.28	14.11	2.32
1650	21.54	38.14	34.19	11.26	3.20	0.15	26.20	14.04	2.24
1700	21.60	38.28	35.41	10.90	3.21	0.15	26.01	14.20	2.37
1750	21.56	38.34	36.29	10.68	3.23	0.15	25.98	14.21	2.30
1800	21.57	38.71	36.06	10.34	3.34	0.14	25.88	14.19	2.33
1850	21.55	38.21	34.97	10.11	3.15	0.15	25.81	14.12	2.39
1900	21.52	38.57	32.80	9.96	3.27	0.14	25.80	14.20	2.35
1950	21.46	38.28	29.39	9.76	3.17	0.15	25.76	14.15	2.33
2000	21.41	38.07	27.61	9.52	3.10	0.15	25.72	13.95	2.35
2050	21.41	37.40	25.58	9.38	2.86	0.16	25.72	14.25	2.25
2100	21.27	37.58	23.74	9.26	2.95	0.16	25.70	14.42	2.42
2150	21.19	37.75	22.25	9.09	3.01	0.16	25.61	13.84	2.45
2200	21.04	37.38	20.53	8.92	2.92	0.16	25.59	13.75	2.35
2250	20.94	38.13	19.37	8.80	3.18	0.15	25.57	14.29	2.29
2300	20.81	36.89	18.27	8.70	2.80	0.17	25.61	13.78	2.48
2350	20.70	36.53	17.33	8.61	2.71	0.18	25.56	13.09	2.59
2400	20.56	36.71	16.32	8.43	2.78	0.18	25.54	14.10	2.47
2500	20.17	36.49	14.84	8.33	2.80	0.18	25.51	13.52	2.42

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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: I = 72mA, Vd = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	19.38	44.23	7.63	8.52	6.10	0.10	31.57	18.01	2.44
550	20.20	43.41	8.73	10.04	5.57	0.06	31.97	19.44	2.59
600	20.88	44.17	9.89	11.71	6.07	0.02	32.07	17.76	2.82
650	21.38	43.99	11.29	13.38	5.95	0.02	31.97	17.84	2.56
700	21.73	43.60	12.80	15.12	5.70	0.05	31.95	19.16	2.36
750	22.06	43.27	14.48	17.04	5.45	0.06	31.88	18.45	2.53
800	22.30	43.83	16.28	19.28	5.78	0.07	31.70	17.52	2.67
850	22.57	41.86	18.28	21.37	4.55	0.10	31.60	18.33	2.50
900	22.72	41.95	20.66	24.01	4.57	0.10	31.54	18.17	2.24
940	22.88	42.80	22.53	26.14	4.96	0.10	31.44	17.54	2.36
1000	23.07	42.73	26.07	28.52	4.84	0.10	31.41	17.88	2.38
1050	23.17	42.46	28.48	28.66	4.65	0.11	31.29	17.81	2.39
1100	23.31	41.49	29.52	27.17	4.10	0.12	31.14	17.29	2.35
1150	23.41	41.87	28.53	24.67	4.23	0.12	31.06	17.41	2.28
1200	23.54	41.08	26.65	22.73	3.81	0.13	30.80	17.28	2.37
1250	23.62	41.39	25.37	21.53	3.89	0.13	30.79	16.96	2.30
1300	23.74	40.64	24.19	20.21	3.53	0.14	30.64	17.26	2.21
1350	23.81	40.47	23.45	18.81	3.42	0.15	30.59	17.41	2.29
1400	23.91	41.26	23.06	17.88	3.67	0.14	30.42	16.98	2.23
1450	24.00	40.92	22.53	17.02	3.49	0.14	30.34	17.00	2.47
1500	24.01	40.69	22.73	16.05	3.38	0.15	30.24	17.06	2.33
1550	24.10	40.82	22.73	15.46	3.39	0.15	30.17	16.78	2.37
1600	24.16	40.52	22.86	14.85	3.24	0.15	30.02	16.55	2.34
1650	24.14	40.40	23.58	14.29	3.19	0.16	29.82	16.65	2.18
1700	24.21	40.65	24.10	13.73	3.25	0.15	29.75	16.73	2.31
1750	24.20	40.69	24.80	13.34	3.25	0.15	29.72	16.50	2.30
1800	24.17	40.63	25.93	12.88	3.23	0.16	29.65	16.62	2.34
1850	24.15	40.08	27.06	12.41	3.03	0.17	29.53	16.69	2.33
1900	24.10	40.65	28.16	12.29	3.24	0.16	29.56	16.63	2.31
1950	24.01	41.25	28.44	11.95	3.48	0.15	29.42	16.55	2.32
2000	23.91	40.38	27.85	11.65	3.18	0.16	29.40	16.62	2.36
2050	23.85	40.37	26.28	11.53	3.19	0.16	29.38	16.82	2.22
2100	23.69	39.97	24.93	11.34	3.10	0.16	29.35	16.81	2.38
2150	23.53	41.41	22.88	11.16	3.68	0.14	29.33	16.47	2.40
2200	23.34	40.02	20.88	11.06	3.21	0.16	29.24	16.45	2.32
2250	23.18	40.54	19.55	10.96	3.44	0.15	29.27	16.83	2.24
2300	22.97	40.30	18.21	10.89	3.41	0.16	29.24	16.36	2.45
2350	22.77	39.43	17.11	10.80	3.15	0.16	29.32	15.94	2.59
2400	22.54	39.61	16.14	10.71	3.27	0.16	29.26	16.72	2.46
2500	22.00	39.69	14.49	10.77	3.47	0.16	29.27	16.36	2.40

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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: I = 78mA, Vd = 3.9V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.00	44.96	7.70	9.09	7.99	0.10	29.99	17.19	3.53
550	18.80	43.63	8.72	10.75	6.84	0.05	30.23	18.00	3.66
600	19.42	42.82	9.88	12.51	6.22	0.01	30.22	16.97	3.89
650	19.87	43.43	11.10	14.26	6.67	0.01	30.06	17.20	3.63
700	20.18	42.68	12.51	16.17	6.15	0.04	29.95	18.09	3.42
750	20.46	42.51	13.98	18.04	6.00	0.05	29.97	17.51	3.59
800	20.67	42.19	15.56	20.05	5.76	0.07	29.76	16.89	3.70
850	20.86	41.59	17.12	21.45	5.33	0.08	29.76	17.72	3.53
900	20.98	41.51	18.80	22.72	5.26	0.09	29.69	17.50	3.29
940	21.11	40.46	20.08	22.81	4.62	0.11	29.60	16.97	3.36
1000	21.23	40.96	21.96	22.40	4.84	0.11	29.54	17.36	3.43
1050	21.27	41.06	22.89	21.51	4.88	0.11	29.47	17.32	3.47
1100	21.37	40.60	23.77	20.60	4.58	0.12	29.38	16.68	3.39
1150	21.43	40.33	24.12	19.47	4.40	0.12	29.35	16.87	3.30
1200	21.49	40.23	23.87	18.51	4.31	0.12	29.26	17.03	3.38
1250	21.53	40.17	23.77	17.72	4.25	0.12	29.26	16.51	3.36
1300	21.60	39.69	23.29	16.98	3.98	0.13	29.15	16.81	3.26
1350	21.60	39.55	23.18	16.22	3.91	0.13	29.12	17.11	3.30
1400	21.63	40.12	23.10	15.49	4.13	0.13	29.12	16.76	3.24
1450	21.67	39.56	22.94	14.99	3.85	0.13	29.12	16.52	3.52
1500	21.68	39.24	23.24	14.49	3.70	0.14	29.07	16.69	3.39
1550	21.70	38.78	23.33	13.97	3.49	0.15	29.09	16.53	3.40
1600	21.71	39.45	23.71	13.44	3.74	0.14	29.01	16.16	3.36
1650	21.65	38.49	24.47	13.13	3.37	0.15	28.87	16.18	3.23
1700	21.67	38.73	24.95	12.75	3.44	0.15	28.72	16.44	3.39
1750	21.61	39.27	25.57	12.46	3.66	0.14	28.68	16.27	3.35
1800	21.56	39.15	26.27	12.11	3.62	0.14	28.62	16.28	3.36
1850	21.51	38.78	27.12	11.82	3.48	0.15	28.49	16.34	3.39
1900	21.44	38.96	27.16	11.62	3.57	0.14	28.51	16.40	3.38
1950	21.33	38.49	26.47	11.35	3.41	0.15	28.44	16.17	3.40
2000	21.24	38.94	25.53	11.20	3.62	0.14	28.44	16.18	3.42
2050	21.15	38.57	24.01	11.01	3.49	0.15	28.42	16.50	3.29
2100	20.98	38.32	22.58	10.85	3.45	0.15	28.40	16.50	3.48
2150	20.83	38.69	21.30	10.73	3.63	0.15	28.35	15.99	3.54
2200	20.63	38.48	19.81	10.53	3.61	0.15	28.27	16.10	3.45
2250	20.48	38.44	18.76	10.41	3.63	0.15	28.28	16.55	3.34
2300	20.28	38.17	17.69	10.34	3.58	0.15	28.30	16.01	3.58
2350	20.12	38.79	16.75	10.23	3.89	0.15	28.30	15.53	3.76
2400	19.89	37.69	15.77	10.11	3.50	0.16	28.31	16.38	3.63
2500	19.40	38.53	14.19	10.00	4.00	0.15	28.32	15.88	3.51

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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: I = 75mA, Vd = 2.8V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	17.03	45.65	7.41	9.27	9.60	0.11	25.92	14.23	3.61
550	17.76	46.12	8.37	10.83	10.17	0.07	26.09	15.10	3.70
600	18.29	42.53	9.34	12.49	6.74	0.02	26.17	13.73	3.92
650	18.70	43.30	10.54	14.12	7.42	0.02	26.12	14.26	3.70
700	18.99	42.92	11.71	15.52	7.12	0.04	26.10	15.29	3.47
750	19.23	41.56	12.87	16.69	6.09	0.06	26.10	14.60	3.61
800	19.37	40.65	14.16	17.61	5.50	0.08	26.00	13.89	3.74
850	19.54	40.51	15.33	18.00	5.38	0.09	26.02	15.04	3.61
900	19.62	40.91	16.49	17.92	5.62	0.09	26.03	14.90	3.34
940	19.72	39.84	17.49	17.74	4.95	0.10	25.94	14.16	3.38
1000	19.79	40.53	18.83	17.19	5.32	0.10	25.97	14.76	3.46
1050	19.81	39.51	19.77	16.70	4.74	0.11	25.88	15.00	3.53
1100	19.88	39.68	20.73	16.14	4.79	0.11	25.92	14.24	3.43
1150	19.91	39.76	21.57	15.55	4.81	0.11	25.90	14.39	3.31
1200	19.96	39.49	22.20	15.02	4.62	0.12	25.99	14.84	3.41
1250	19.97	38.95	22.94	14.60	4.34	0.13	25.95	14.45	3.43
1300	20.03	38.68	23.32	14.14	4.17	0.13	25.92	14.53	3.29
1350	20.02	38.65	23.94	13.64	4.14	0.13	25.96	14.99	3.32
1400	20.03	38.72	24.46	13.12	4.15	0.13	26.06	14.90	3.27
1450	20.06	38.89	24.73	12.83	4.20	0.13	26.20	14.53	3.57
1500	20.04	38.62	25.44	12.51	4.07	0.13	26.21	14.69	3.43
1550	20.05	38.27	26.11	12.14	3.89	0.13	26.40	14.69	3.43
1600	20.04	38.48	26.54	11.78	3.96	0.13	26.44	14.40	3.37
1650	20.01	37.86	27.59	11.56	3.70	0.14	26.41	14.33	3.30
1700	20.02	37.88	27.75	11.24	3.68	0.14	26.19	14.56	3.46
1750	19.95	37.46	28.26	11.00	3.53	0.14	26.21	14.66	3.37
1800	19.91	37.50	27.96	10.74	3.54	0.14	26.11	14.52	3.38
1850	19.88	38.20	27.68	10.52	3.82	0.13	26.06	14.48	3.46
1900	19.83	37.10	26.67	10.34	3.38	0.15	26.10	14.73	3.48
1950	19.73	37.19	25.23	10.10	3.44	0.15	26.11	14.56	3.43
2000	19.66	37.31	24.08	9.94	3.49	0.14	26.11	14.40	3.44
2050	19.61	36.34	22.59	9.84	3.15	0.16	26.10	14.79	3.33
2100	19.49	36.54	21.47	9.67	3.24	0.16	26.13	14.95	3.55
2150	19.35	36.80	20.31	9.47	3.36	0.15	26.07	14.29	3.59
2200	19.18	36.84	18.96	9.35	3.42	0.15	26.04	14.39	3.47
2250	19.07	37.45	18.09	9.19	3.67	0.15	26.05	14.93	3.39
2300	18.92	36.73	17.14	9.11	3.43	0.16	26.13	14.44	3.63
2350	18.77	36.11	16.27	8.98	3.23	0.17	26.06	13.74	3.80
2400	18.61	36.62	15.35	8.84	3.45	0.16	26.11	14.78	3.67
2500	18.17	36.40	13.89	8.71	3.48	0.17	26.09	14.17	3.59

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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: I = 80mA, Vd = 5V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(dBm)	(dBm)	(dB)
500	18.50	45.77	7.80	8.86	8.26	0.11	31.47	18.63	3.54
550	19.32	44.19	8.87	10.49	6.86	0.05	32.01	19.64	3.67
600	19.96	42.83	10.05	12.18	5.85	0.01	32.05	18.34	3.88
650	20.45	43.10	11.41	13.91	6.02	0.02	31.92	18.55	3.63
700	20.83	41.66	12.96	15.83	5.10	0.05	31.89	19.67	3.41
750	21.11	43.50	14.54	17.91	6.27	0.05	31.95	18.95	3.59
800	21.35	42.78	16.38	20.27	5.73	0.07	31.74	18.19	3.72
850	21.60	42.50	18.27	22.83	5.47	0.08	31.61	19.03	3.54
900	21.74	41.31	20.36	25.91	4.76	0.10	31.58	18.69	3.29
940	21.88	42.11	21.93	28.56	5.14	0.10	31.56	18.13	3.39
1000	22.04	41.90	23.91	31.23	4.95	0.10	31.44	18.53	3.45
1050	22.12	41.38	24.67	29.40	4.63	0.11	31.40	18.37	3.46
1100	22.23	40.71	24.63	27.01	4.24	0.12	31.25	17.71	3.37
1150	22.30	41.14	24.01	24.67	4.40	0.12	31.23	17.97	3.32
1200	22.39	40.27	23.10	22.63	3.94	0.13	31.03	17.96	3.39
1250	22.42	40.14	22.49	21.23	3.86	0.13	30.97	17.45	3.36
1300	22.52	40.33	21.54	20.03	3.89	0.13	30.83	17.82	3.25
1350	22.56	39.90	21.28	18.90	3.68	0.14	30.78	18.05	3.35
1400	22.60	39.68	20.99	17.78	3.55	0.14	30.71	17.61	3.27
1450	22.65	40.25	20.78	17.06	3.75	0.13	30.63	17.48	3.49
1500	22.66	40.55	20.94	16.39	3.86	0.13	30.55	17.66	3.38
1550	22.68	40.22	21.00	15.69	3.71	0.14	30.50	17.45	3.43
1600	22.70	39.55	21.21	15.07	3.42	0.15	30.37	17.07	3.37
1650	22.64	40.28	21.63	14.70	3.73	0.13	30.17	17.20	3.23
1700	22.64	40.76	22.11	14.20	3.92	0.13	30.05	17.43	3.38
1750	22.57	39.43	22.54	13.82	3.40	0.15	30.03	17.15	3.38
1800	22.51	40.46	23.27	13.45	3.83	0.14	29.94	17.17	3.38
1850	22.45	40.06	24.00	13.13	3.67	0.14	29.85	17.35	3.38
1900	22.36	40.06	24.34	12.87	3.70	0.14	29.89	17.31	3.38
1950	22.23	39.83	24.15	12.67	3.65	0.15	29.77	17.08	3.42
2000	22.11	39.76	23.76	12.42	3.66	0.15	29.75	17.15	3.43
2050	21.99	40.78	22.74	12.27	4.15	0.13	29.72	17.48	3.27
2100	21.80	39.36	21.86	12.17	3.61	0.15	29.70	17.45	3.47
2150	21.61	39.96	20.48	12.01	3.92	0.14	29.69	17.01	3.56
2200	21.36	40.56	19.31	11.88	4.29	0.13	29.56	17.10	3.45
2250	21.19	39.90	18.35	11.79	4.05	0.14	29.65	17.57	3.33
2300	20.96	40.44	17.21	11.77	4.39	0.13	29.63	17.01	3.58
2350	20.74	39.30	16.32	11.66	3.94	0.15	29.70	16.64	3.76
2400	20.51	39.25	15.43	11.52	3.99	0.15	29.64	17.42	3.63
2500	19.93	40.02	13.85	11.53	4.58	0.14	29.65	16.92	3.51

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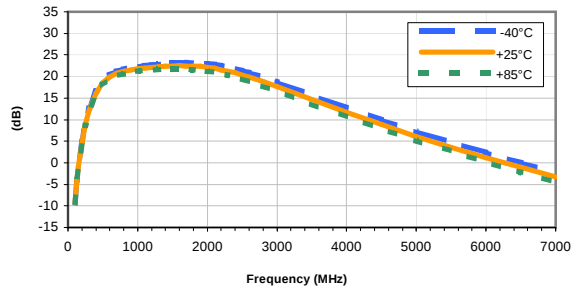
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Typical Performance Curves

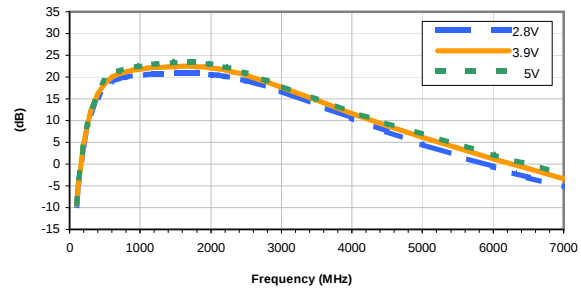
GAIN vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



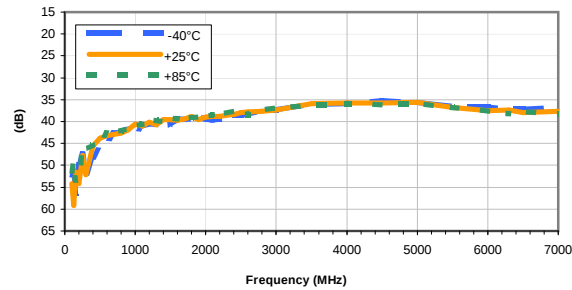
GAIN vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



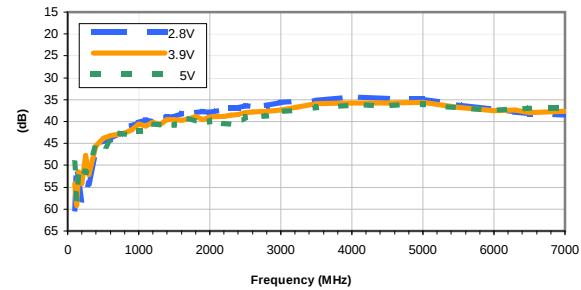
ISOLATION vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



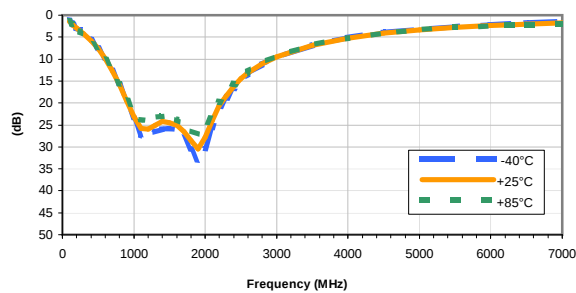
ISOLATION vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



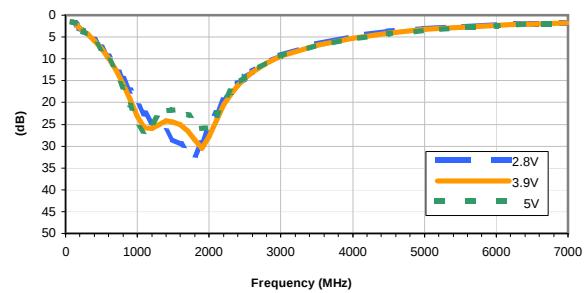
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



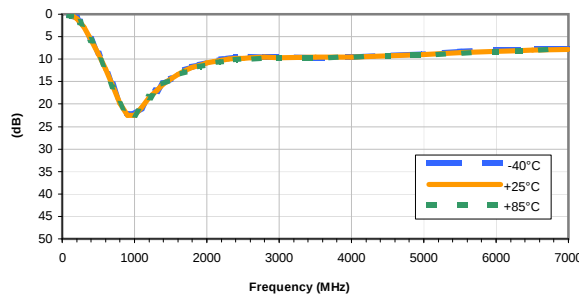
INPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



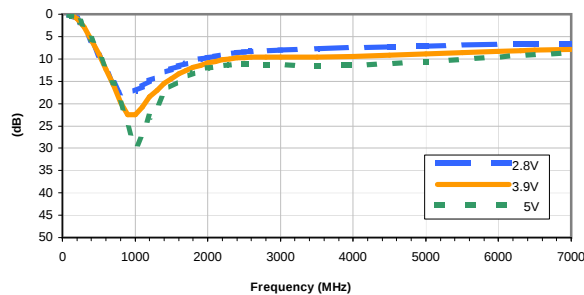
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



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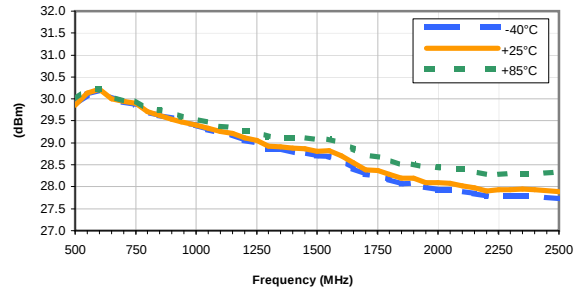
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Typical Performance Curves

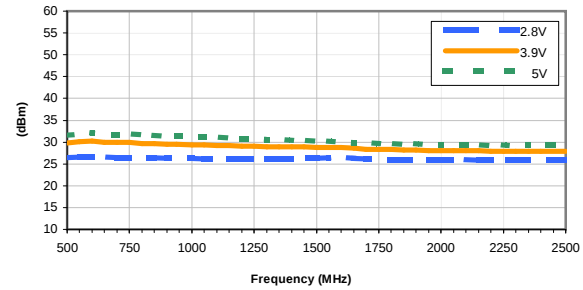
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



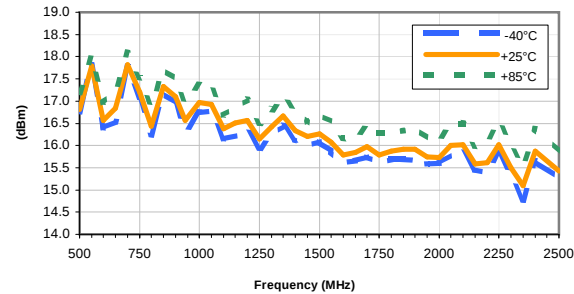
OUTPUT IP-3 vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



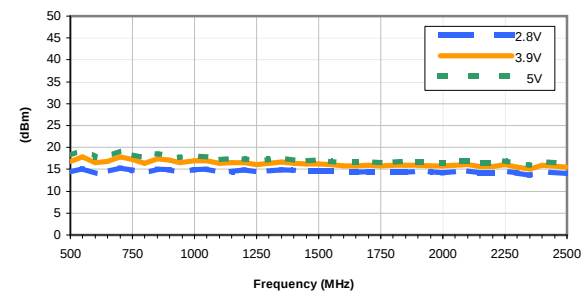
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



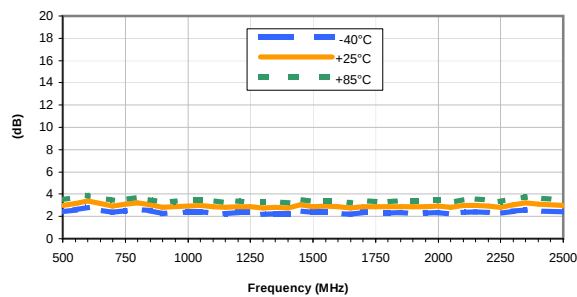
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



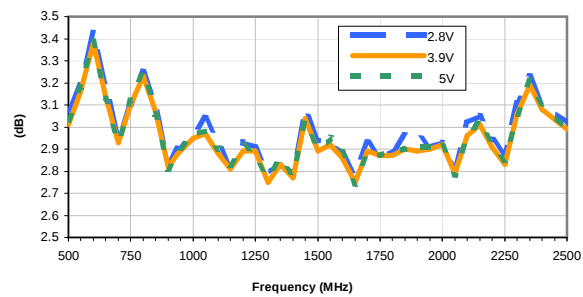
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V



Noise Figure vs. VOLTAGE

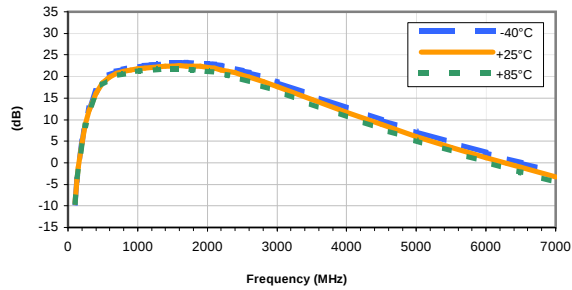
Temperature = +25°C



Typical Performance Curves

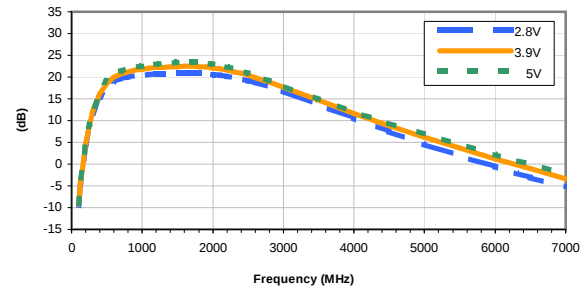
GAIN vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



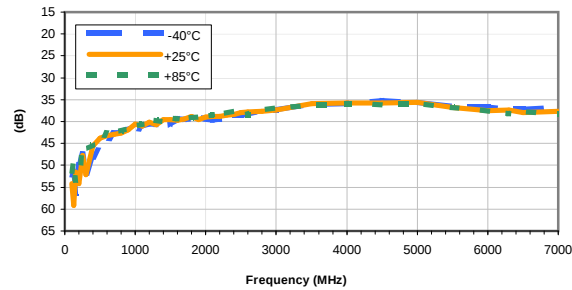
GAIN vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



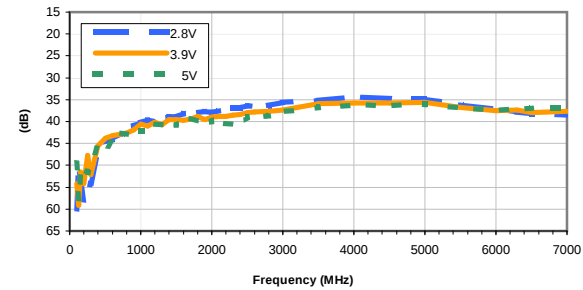
ISOLATION vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



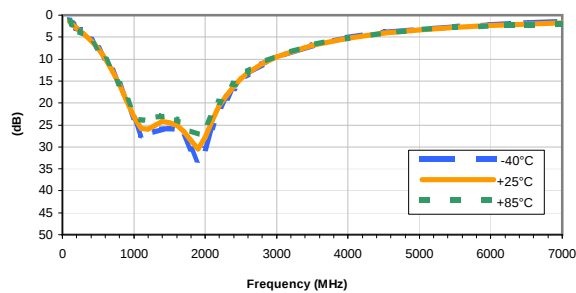
ISOLATION vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



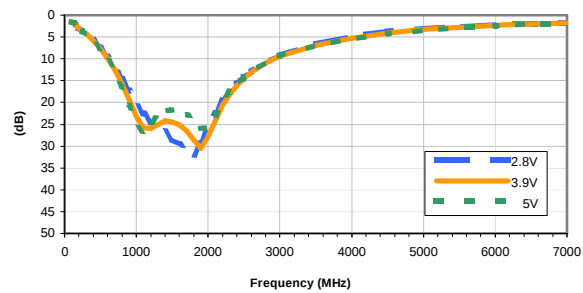
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



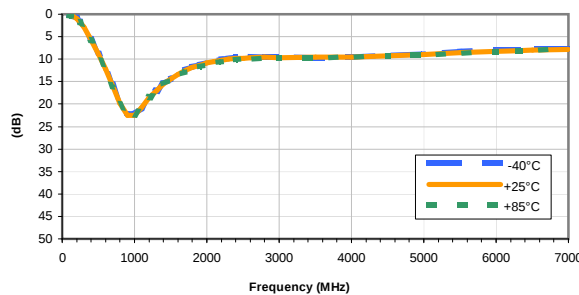
INPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



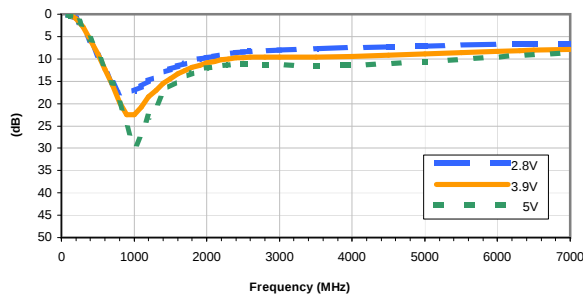
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



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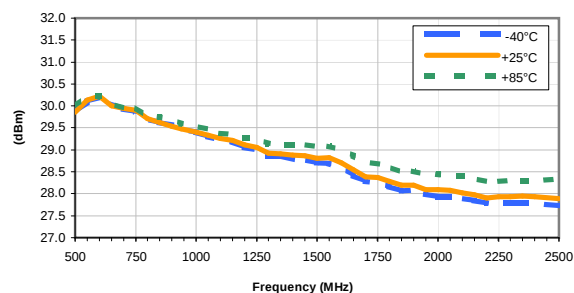
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Typical Performance Curves

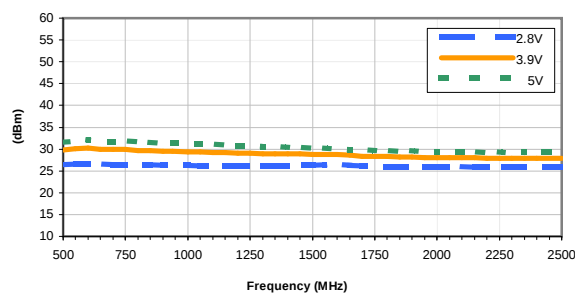
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -25, VOLTAGE = 3.9V



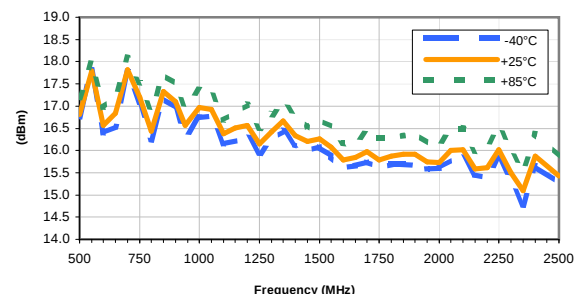
OUTPUT IP-3 vs. VOLTAGE

INPUT POWER = -25, Temperature = +25°C



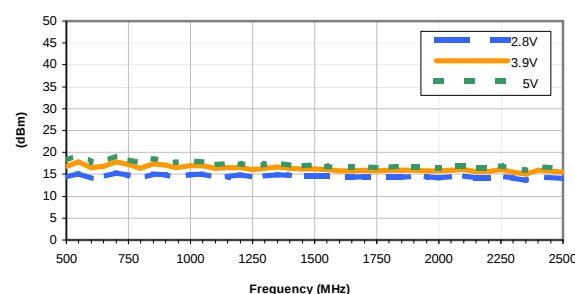
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



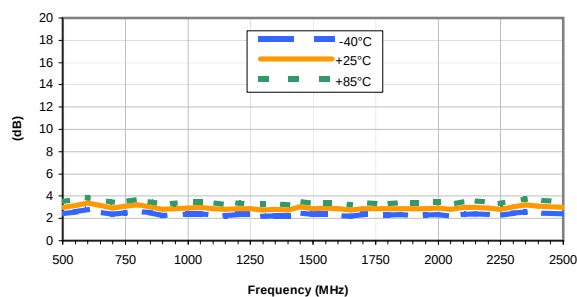
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



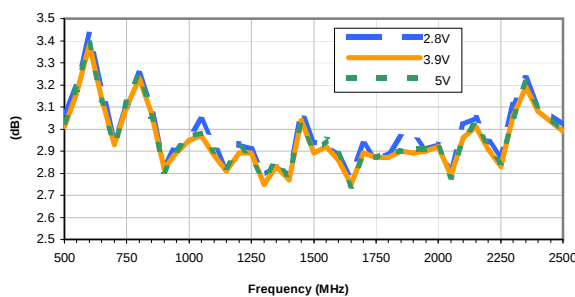
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V

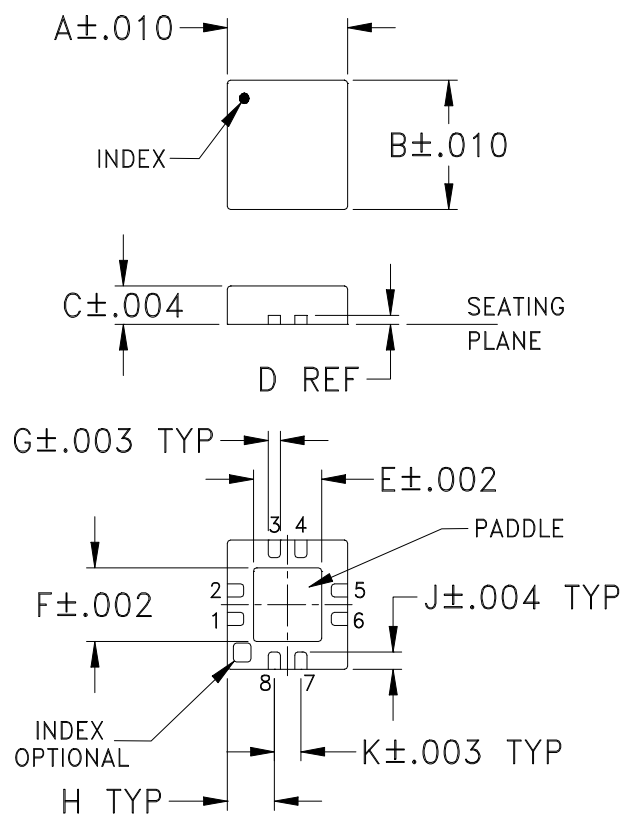


Noise Figure vs. VOLTAGE

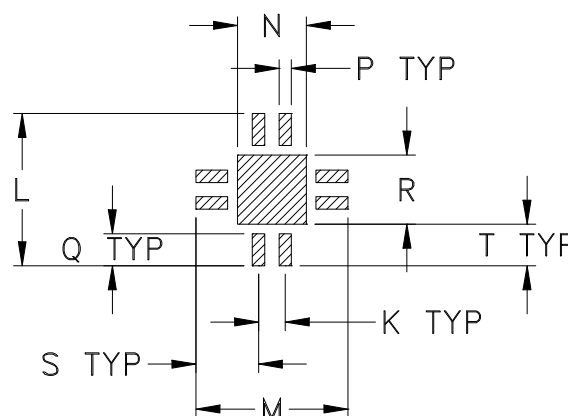
Temperature = +25°C



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.



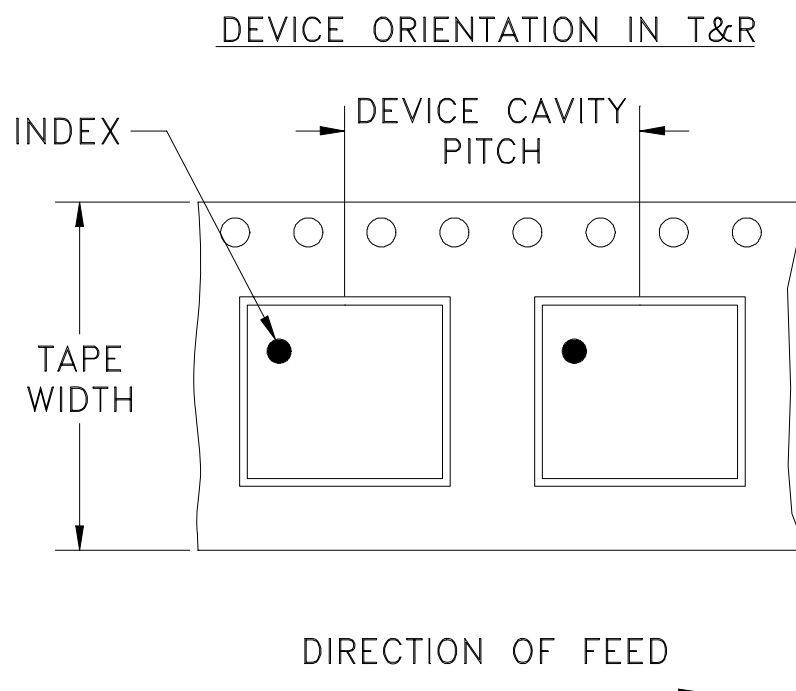
INTERNET <http://www.minicircuits.com>

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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



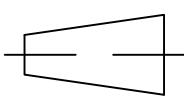
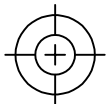
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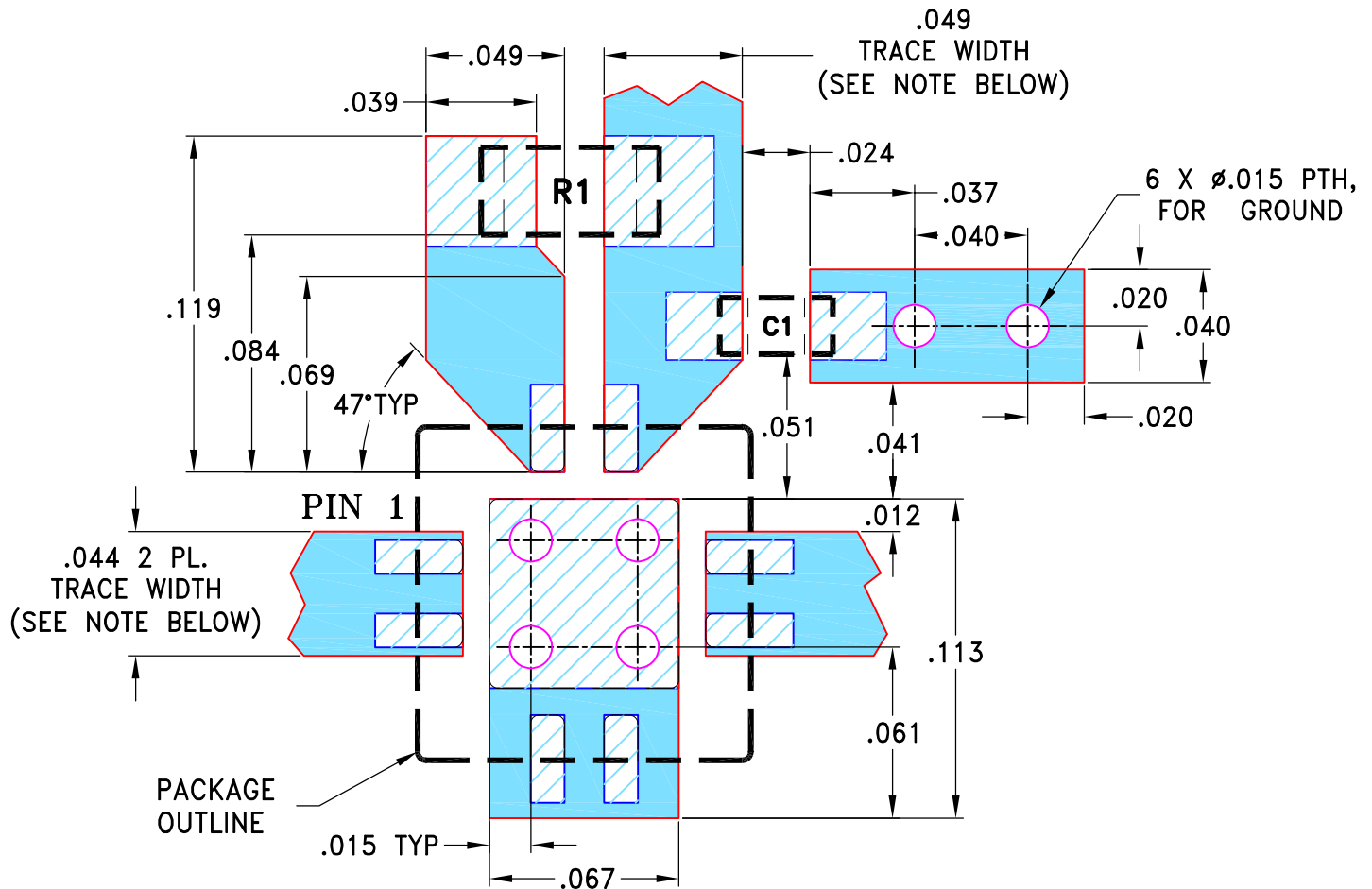
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	GF	DJ
A	M82598	MODIFIED LAYOUT	08/12/02	GF	MM
B	M102713	ADDED "...WITH SMOBC"	01/14/06	GF	IL
C	ECO-003400	REMOVED COMP. VALUE, ADDED NOTE REF. TO EVAL. BOARD	07/23/20	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR DQ849 CASE STYLE

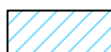


RESISTOR R1: 0603 SIZE
CAPACITOR C1: 0402 SIZE

NOTES:

1. LINE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS $.020 \pm .0015$;
COPPER: 1/2 OZ. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. FOR "R1" & "C1" VALUES REFER TO THE CORRESPONDING EVALUATION BOARD TB-186-XX+.
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 GF	07/19/02
TOLERANCES ON:	CHECKED LC	08/01/02
2 PL DECIMALS $\pm$	APPROVED DJ	08/05/02
3 PL DECIMALS $\pm .005$		
ANGLES $\pm$		
FRACTIONS $\pm$		

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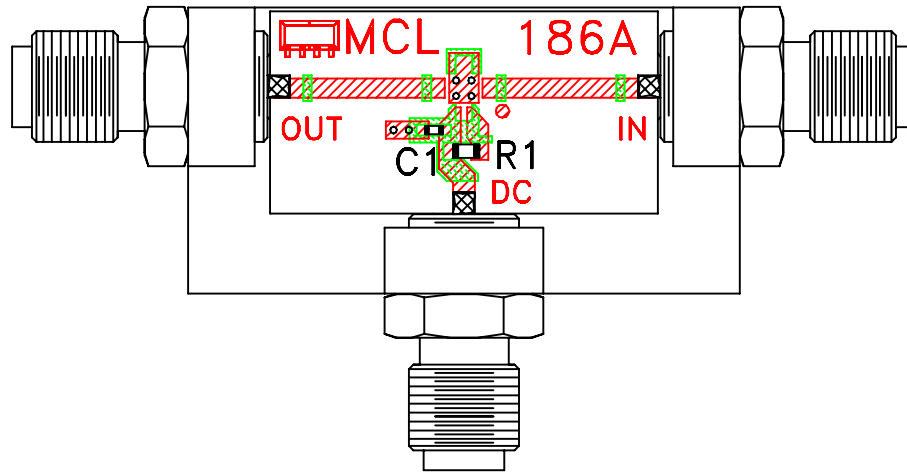


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Brooklyn NY 11235

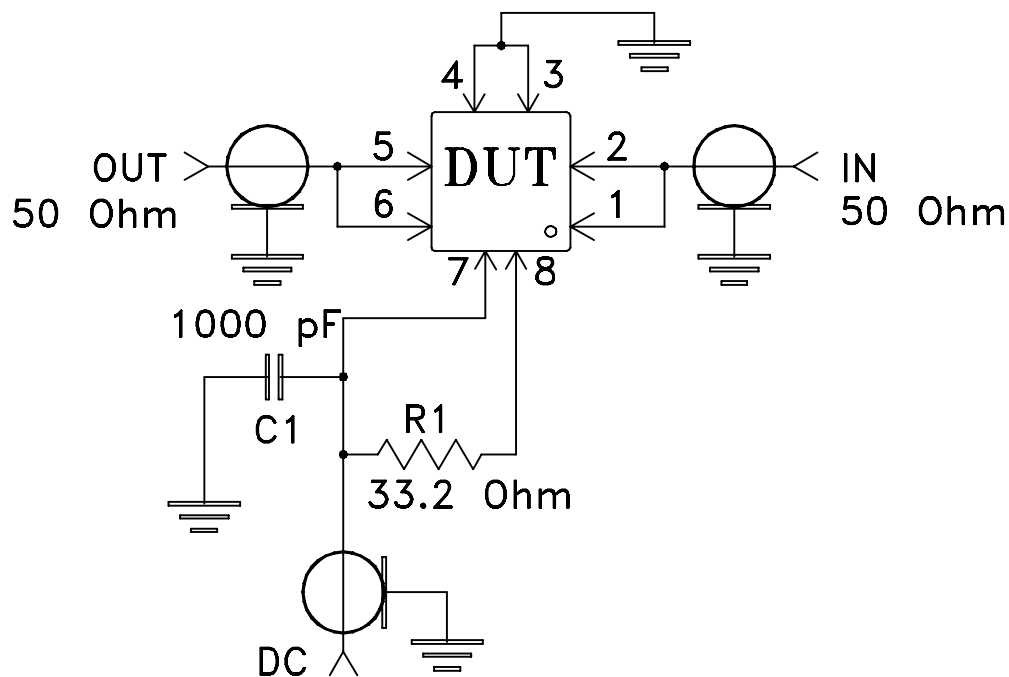
PL, DQ849, TB-186-XX+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-078	C
FILE:	98PL078	SCALE:	15:1
		SHEET:	1 OF 1

Evaluation Board and Circuit



TB-186+



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.
3. Pins 1 and 6 have no internal connecton.
4. Paddle underneath DUT must be grounded.

 **Mini-Circuits®**



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

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



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