

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, 20 dB typ.
- Low noise figure
- Output power, up to +19 dBm typ.
- Excellent repeatability
- Low cost
- Aqueous washable



MNA-4+

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

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

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-4+ 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-4+ is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 40,000 years at 2.8V; 9,000 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	—	15.6	14.3	—	dB
	f=1.0 GHz	—	16.6	14.6	—	
	f=1.5 GHz	—	16.4	14.5	—	
	f=2.0 GHz	14.0	15.8	14.1	—	
	f=2.5 GHz	—	13.3	11.7	—	
Input Return Loss	f=0.75-2.5 GHz		14	14		dB
Output Return Loss	f=0.75-2.5 GHz		11.5	11.5		dB
Output Power @ 1 dB compression	f=0.5 GHz		19.0	13.7		dBm
	f=2.5GHz		17.0	13.7		
Output IP3	f=1 GHz		28.4	23.9		dBm
	f=2 GHz		29.0	24.9		
Noise Figure	f=1 GHz		4.8			dB
Directivity (Isolation - Gain)	f=0.5-2.5 GHz		20			
DC Current			75	67	90	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	13dBm (continuous operation)
	23dBm (5 minutes max)

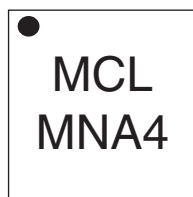
Note: Permanent damage may occur if any of these limits are exceeded.
These ratings are not intended for continuous normal operation.

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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-4+: Plastic package, exposed paddle, lead finish: tin-silver over nickel

Tape & Reel: F104

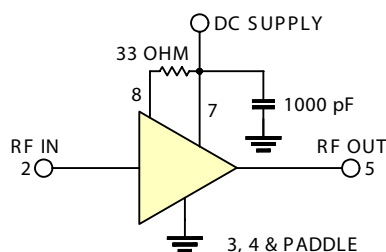
Standard quantities available on reel: 7" reels with 20, 50, 100, 200, 500, 1K, or 2K devices.

Suggested Layout for PCB Design: PL-078

Evaluation Board: TB-186+

Environmental Ratings: ENV08T1

Recommended Application Circuit



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ESD Rating

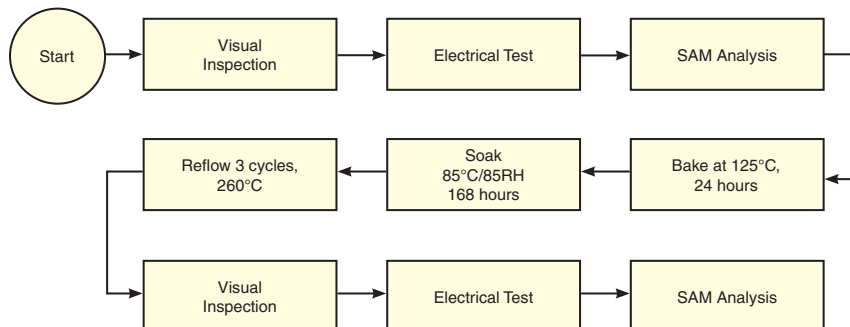
Human Body Model (HBM): Class 1A (250v to < 500v) in accordance with ANSI/ESD STM 5.1 - 2001

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 = 74mA, Vd = 3.9V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.15	56.70	0.38	0.58	3.22	0.89	500	28.42	16.90	4.79
250	3.41	53.52	0.66	1.05	4.13	0.82	550	28.72	17.43	4.85
300	6.93	50.24	1.12	1.68	4.67	0.72	600	28.87	17.61	4.82
350	9.59	46.39	1.77	2.48	4.48	0.60	650	28.95	17.64	4.69
400	11.51	44.01	2.66	3.41	4.76	0.47	700	29.02	17.77	4.64
450	12.90	41.74	3.69	4.38	4.66	0.36	750	29.02	17.76	4.67
500	13.83	40.48	4.87	5.40	4.88	0.26	800	29.06	17.82	4.77
550	14.47	39.72	6.16	6.44	5.17	0.19	850	29.09	17.92	4.76
600	14.89	39.05	7.52	7.47	5.33	0.13	900	29.16	17.63	4.69
650	15.20	38.31	8.95	8.46	5.29	0.10	940	29.02	17.66	4.70
700	15.38	37.79	10.42	9.47	5.30	0.08	1000	28.92	17.46	4.76
750	15.50	37.25	11.92	10.40	5.21	0.08	1050	28.72	17.44	4.78
800	15.58	37.05	13.35	11.37	5.27	0.09	1100	28.75	17.34	4.78
900	15.65	36.20	15.78	13.07	4.99	0.11	1150	28.64	17.17	4.79
1000	15.68	35.62	16.92	14.60	4.77	0.12	1200	28.72	17.20	4.78
1100	15.69	34.94	16.65	15.91	4.45	0.13	1250	28.71	17.00	4.76
1200	15.69	34.42	15.79	16.93	4.20	0.14	1300	28.53	16.97	4.82
1300	15.68	33.86	14.97	17.34	3.93	0.14	1350	28.41	16.88	4.83
1400	15.68	33.34	14.36	17.33	3.70	0.15	1400	28.50	16.91	4.83
1500	15.66	32.86	13.99	16.91	3.49	0.15	1450	28.61	16.74	4.95
1600	15.64	32.50	13.88	16.27	3.34	0.15	1500	28.56	16.66	4.92
1700	15.59	32.03	13.97	15.43	3.17	0.16	1550	28.82	16.61	4.90
1800	15.50	31.68	14.33	14.48	3.07	0.16	1600	28.79	16.38	4.81
1900	15.38	31.48	14.82	13.54	3.03	0.16	1650	28.70	16.36	4.79
2000	15.18	31.26	15.36	12.64	3.00	0.16	1700	28.48	16.15	4.79
2100	14.93	31.10	15.72	11.80	3.01	0.17	1750	28.33	16.08	4.85
2200	14.59	31.08	15.70	11.08	3.08	0.17	1800	28.22	15.95	4.86
2300	14.21	31.12	15.19	10.46	3.19	0.18	1850	28.06	15.94	4.86
2400	13.75	31.28	14.29	9.98	3.37	0.18	1900	28.01	15.81	4.90
2500	13.22	31.50	13.15	9.59	3.59	0.18	1950	27.90	15.78	4.95
2600	12.65	31.64	12.00	9.30	3.81	0.19	2000	27.95	15.70	4.89
2800	11.39	32.21	9.99	8.92	4.46	0.20	2050	27.90	15.59	4.85
3000	10.01	32.90	8.41	8.72	5.33	0.21	2100	27.85	15.50	4.90
3200	8.59	33.62	7.23	8.69	6.43	0.21	2150	27.85	15.49	5.00
3400	7.19	34.20	6.32	8.72	7.63	0.22	2200	27.82	15.42	4.94
3600	5.78	34.79	5.60	8.80	9.07	0.22	2250	27.82	15.54	4.95
3800	4.42	35.34	4.99	8.94	10.68	0.23	2300	27.86	15.44	5.07
4000	3.09	35.89	4.48	9.04	12.51	0.23	2350	27.92	15.42	5.10
4200	1.78	36.53	4.04	9.16	14.73	0.24	2400	27.94	15.42	5.09
4600	-0.75	37.44	3.35	9.37	19.52	0.24	2500	28.00	15.28	5.01

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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 = 71mA, Vd = 2.8V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.54	65.01	0.39	0.59	10.69	0.89	500	25.09	13.95	4.83
250	2.95	58.38	0.67	1.05	8.37	0.82	550	25.34	14.45	4.90
300	6.38	50.95	1.12	1.68	5.51	0.72	600	25.54	14.76	4.84
350	8.97	47.61	1.78	2.45	5.62	0.60	650	25.65	14.73	4.73
400	10.81	44.44	2.65	3.34	5.40	0.48	700	25.73	15.02	4.68
450	12.14	42.37	3.70	4.26	5.44	0.37	750	25.80	15.00	4.72
500	13.02	40.95	4.87	5.19	5.58	0.28	800	25.90	15.17	4.79
550	13.62	39.88	6.15	6.12	5.69	0.20	850	25.94	15.32	4.80
600	14.01	39.24	7.52	7.04	5.90	0.15	900	26.08	15.15	4.72
650	14.28	38.29	8.94	7.87	5.72	0.11	940	25.95	15.29	4.73
700	14.44	37.73	10.39	8.71	5.72	0.09	1000	25.93	15.04	4.78
750	14.53	37.25	11.84	9.44	5.67	0.09	1050	25.79	15.23	4.79
800	14.60	36.81	13.25	10.17	5.58	0.09	1100	25.86	15.06	4.80
900	14.65	35.92	15.59	11.37	5.28	0.11	1150	25.82	15.06	4.82
1000	14.67	35.11	16.71	12.36	4.92	0.12	1200	26.01	15.10	4.82
1100	14.66	34.44	16.58	13.15	4.62	0.13	1250	26.04	14.98	4.81
1200	14.66	33.84	15.83	13.72	4.33	0.14	1300	25.93	15.05	4.86
1300	14.66	33.23	15.06	13.94	4.04	0.15	1350	25.89	14.89	4.85
1400	14.66	32.65	14.49	13.97	3.76	0.15	1400	26.01	15.12	4.87
1500	14.65	32.02	14.13	13.75	3.49	0.16	1450	26.26	14.88	4.98
1600	14.64	31.58	14.00	13.41	3.31	0.16	1500	26.24	14.94	4.95
1700	14.62	31.11	14.05	12.87	3.13	0.17	1550	26.52	14.78	4.92
1800	14.55	30.71	14.31	12.21	3.00	0.17	1600	26.52	14.68	4.81
1900	14.45	30.43	14.68	11.47	2.92	0.18	1650	26.46	14.73	4.82
2000	14.28	30.10	15.00	10.72	2.83	0.18	1700	26.25	14.47	4.81
2100	14.03	29.92	15.08	9.97	2.82	0.19	1750	26.10	14.51	4.89
2200	13.70	29.81	14.75	9.29	2.83	0.20	1800	26.03	14.34	4.89
2300	13.32	29.91	14.06	8.70	2.93	0.20	1850	25.90	14.39	4.90
2400	12.84	30.02	13.10	8.23	3.05	0.21	1900	25.87	14.22	4.90
2500	12.29	30.22	12.01	7.84	3.23	0.22	1950	25.74	14.28	4.99
2600	11.69	30.49	10.94	7.55	3.46	0.22	2000	25.83	14.21	4.89
2800	10.33	31.03	9.13	7.14	4.02	0.24	2050	25.80	14.06	4.86
3000	8.86	31.64	7.74	6.94	4.76	0.25	2100	25.77	14.04	4.92
3200	7.35	32.43	6.70	6.92	5.83	0.26	2150	25.72	14.00	5.02
3400	5.86	33.13	5.91	6.94	7.07	0.27	2200	25.69	13.98	4.95
3600	4.39	33.89	5.27	7.00	8.64	0.27	2250	25.74	14.04	4.96
3800	2.95	34.47	4.74	7.13	10.33	0.28	2300	25.75	14.02	5.09
4000	1.57	34.97	4.28	7.23	12.14	0.28	2350	25.78	13.97	5.14
4200	0.21	35.68	3.88	7.33	14.54	0.29	2400	25.75	13.95	5.09
4600	-2.39	36.71	3.26	7.54	19.85	0.30	2500	25.78	13.78	5.01

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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 = 77mA, Vd = 5V @Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-0.96	63.56	0.38	0.58	8.01	0.89	500	30.49	18.50	4.76
250	3.65	55.71	0.67	1.05	5.44	0.82	550	30.85	19.06	4.83
300	7.22	48.65	1.12	1.68	3.65	0.72	600	31.02	19.20	4.78
350	9.93	45.84	1.78	2.49	4.00	0.60	650	31.09	19.23	4.68
400	11.89	43.49	2.66	3.46	4.30	0.47	700	31.07	19.29	4.61
450	13.31	41.78	3.70	4.46	4.51	0.35	750	31.17	19.30	4.66
500	14.28	40.31	4.88	5.55	4.60	0.25	800	31.14	19.22	4.76
550	14.96	39.43	6.16	6.65	4.79	0.17	850	31.14	19.31	4.75
600	15.41	38.64	7.52	7.78	4.86	0.12	900	31.18	18.90	4.67
650	15.73	38.11	8.94	8.89	4.94	0.08	940	31.03	18.81	4.69
700	15.93	37.83	10.43	10.04	5.08	0.07	1000	30.87	18.69	4.74
750	16.06	37.36	11.92	11.15	5.02	0.08	1050	30.66	18.56	4.76
800	16.16	37.03	13.37	12.30	4.99	0.09	1100	30.63	18.53	4.76
900	16.24	36.34	15.82	14.49	4.80	0.11	1150	30.50	18.28	4.79
1000	16.28	35.89	16.95	16.67	4.65	0.12	1200	30.51	18.28	4.78
1100	16.29	35.30	16.63	18.80	4.38	0.13	1250	30.42	18.06	4.76
1200	16.30	34.87	15.71	20.76	4.17	0.13	1300	30.19	18.02	4.83
1300	16.28	34.39	14.85	21.68	3.94	0.14	1350	30.08	17.91	4.82
1400	16.27	33.81	14.25	21.57	3.67	0.14	1400	30.06	17.90	4.84
1500	16.25	33.42	13.88	20.59	3.50	0.14	1450	30.14	17.81	4.92
1600	16.21	33.13	13.79	19.44	3.39	0.14	1500	30.04	17.65	4.91
1700	16.15	32.77	13.92	18.07	3.27	0.15	1550	30.24	17.65	4.89
1800	16.05	32.54	14.32	16.76	3.21	0.15	1600	30.22	17.39	4.81
1900	15.90	32.31	14.90	15.58	3.18	0.15	1650	30.12	17.33	4.79
2000	15.69	32.23	15.56	14.56	3.22	0.15	1700	29.92	17.14	4.80
2100	15.42	32.12	16.10	13.62	3.27	0.15	1750	29.72	17.02	4.86
2200	15.07	32.16	16.27	12.85	3.39	0.15	1800	29.63	16.98	4.87
2300	14.68	32.26	15.93	12.22	3.55	0.15	1850	29.47	16.86	4.87
2400	14.22	32.31	15.07	11.77	3.72	0.16	1900	29.40	16.81	4.89
2500	13.70	32.57	13.92	11.38	4.00	0.16	1950	29.29	16.72	4.94
2600	13.14	32.92	12.70	11.12	4.36	0.16	2000	29.29	16.69	4.89
2800	11.92	33.41	10.58	10.78	5.08	0.16	2050	29.29	16.49	4.85
3000	10.61	34.02	8.90	10.61	6.02	0.17	2100	29.18	16.45	4.92
3200	9.25	34.72	7.62	10.60	7.23	0.17	2150	29.23	16.47	4.98
3400	7.91	35.32	6.64	10.66	8.55	0.18	2200	29.16	16.33	4.94
3600	6.57	35.80	5.85	10.76	9.96	0.18	2250	29.19	16.47	4.95
3800	5.27	36.31	5.19	10.92	11.59	0.18	2300	29.16	16.38	5.08
4000	3.98	36.71	4.64	11.02	13.27	0.19	2350	29.29	16.38	5.09
4200	2.71	37.24	4.16	11.13	15.32	0.19	2400	29.28	16.29	5.09
4600	0.27	38.02	3.43	11.35	19.69	0.19	2500	29.41	16.27	5.02

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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 = 70mA, Vd = 3.9V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.01	62.13	0.32	0.54	5.34	0.91	500	28.45	17.00	4.03
250	3.64	55.98	0.57	0.98	4.50	0.83	550	28.75	17.51	4.08
300	7.24	50.38	1.01	1.59	3.92	0.74	600	28.93	17.70	4.07
350	9.94	46.59	1.65	2.36	3.91	0.62	650	29.01	17.67	3.99
400	11.88	44.07	2.51	3.26	4.22	0.49	700	29.05	17.89	3.88
450	13.30	42.17	3.55	4.20	4.41	0.37	750	29.09	17.84	3.92
500	14.26	41.01	4.72	5.18	4.73	0.27	800	29.12	17.86	4.03
550	14.92	39.92	6.01	6.19	4.86	0.19	850	29.10	17.98	4.02
600	15.37	38.96	7.38	7.18	4.87	0.13	900	29.21	17.70	3.94
650	15.68	38.50	8.80	8.14	5.01	0.10	940	29.04	17.71	3.94
700	15.87	38.04	10.28	9.11	5.07	0.08	1000	28.95	17.50	3.97
750	15.99	37.48	11.78	10.02	4.99	0.08	1050	28.78	17.50	4.00
800	16.09	37.26	13.24	10.96	5.04	0.09	1100	28.78	17.45	4.03
900	16.18	36.46	15.80	12.63	4.81	0.11	1150	28.66	17.27	4.03
1000	16.22	35.79	17.13	14.14	4.55	0.12	1200	28.74	17.30	4.03
1100	16.23	35.21	16.98	15.41	4.31	0.14	1250	28.73	17.09	4.00
1200	16.25	34.63	16.17	16.50	4.04	0.14	1300	28.56	17.07	4.06
1300	16.26	34.09	15.31	17.07	3.79	0.15	1350	28.47	16.92	4.06
1400	16.27	33.61	14.61	17.26	3.57	0.16	1400	28.50	17.02	4.06
1500	16.27	33.10	14.12	17.01	3.36	0.16	1450	28.65	16.85	4.17
1600	16.26	32.74	13.95	16.50	3.21	0.16	1500	28.58	16.78	4.14
1700	16.23	32.33	14.03	15.72	3.07	0.17	1550	28.84	16.71	4.15
1800	16.16	31.94	14.34	14.81	2.95	0.17	1600	28.79	16.52	4.06
1900	16.06	31.57	14.80	13.84	2.85	0.17	1650	28.70	16.47	4.02
2000	15.90	31.41	15.36	12.90	2.84	0.18	1700	28.47	16.21	3.99
2100	15.67	31.28	15.77	12.00	2.84	0.18	1750	28.31	16.20	4.06
2200	15.37	31.30	15.77	11.23	2.91	0.18	1800	28.21	15.98	4.12
2300	15.01	31.24	15.29	10.55	2.97	0.19	1850	28.06	15.97	4.10
2400	14.57	31.41	14.48	10.03	3.13	0.19	1900	28.01	15.83	4.10
2500	14.07	31.51	13.41	9.57	3.28	0.19	1950	27.88	15.82	4.17
2600	13.53	31.63	12.20	9.20	3.46	0.20	2000	27.92	15.77	4.11
2800	12.31	32.19	10.15	8.80	4.02	0.21	2050	27.90	15.63	4.05
3000	10.97	32.80	8.51	8.57	4.74	0.22	2100	27.84	15.54	4.11
3200	9.57	33.56	7.25	8.50	5.70	0.22	2150	27.82	15.53	4.18
3400	8.17	34.14	6.30	8.50	6.73	0.23	2200	27.76	15.42	4.15
3600	6.79	34.58	5.54	8.57	7.81	0.24	2250	27.77	15.55	4.16
3800	5.43	35.20	4.91	8.68	9.23	0.24	2300	27.80	15.48	4.26
4000	4.09	35.55	4.37	8.80	10.51	0.25	2350	27.86	15.48	4.29
4200	2.79	36.06	3.91	8.88	12.13	0.25	2400	27.86	15.50	4.27
4600	0.26	36.86	3.24	9.03	15.78	0.26	2500	27.97	15.36	4.20

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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 = 66mA, Vd = 2.8V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.41	64.07	0.32	0.54	6.99	0.90	500	25.24	14.12	4.09
250	3.17	55.74	0.58	1.00	4.78	0.83	550	25.49	14.47	4.16
300	6.68	51.13	1.01	1.60	4.68	0.73	600	25.67	14.74	4.14
350	9.31	47.11	1.65	2.35	4.55	0.62	650	25.81	14.69	4.03
400	11.19	44.45	2.50	3.22	4.78	0.50	700	25.86	15.00	3.93
450	12.54	42.71	3.54	4.10	5.09	0.38	750	25.94	14.95	3.97
500	13.45	41.12	4.71	5.02	5.19	0.29	800	25.99	15.20	4.06
550	14.07	40.12	6.01	5.93	5.39	0.21	850	26.02	15.35	4.08
600	14.48	39.20	7.37	6.82	5.44	0.15	900	26.15	15.16	3.99
650	14.76	38.49	8.80	7.63	5.44	0.11	940	26.03	15.29	3.99
700	14.92	37.99	10.27	8.44	5.49	0.09	1000	26.00	15.06	4.05
750	15.02	37.41	11.75	9.18	5.40	0.09	1050	25.84	15.20	4.07
800	15.10	37.00	13.17	9.90	5.34	0.09	1100	25.93	15.09	4.08
900	15.15	36.02	15.63	11.09	5.01	0.11	1150	25.86	15.07	4.09
1000	15.18	35.42	16.94	12.09	4.80	0.12	1200	26.01	15.11	4.08
1100	15.19	34.68	16.87	12.87	4.47	0.14	1250	26.04	14.97	4.05
1200	15.20	34.00	16.15	13.46	4.15	0.15	1300	25.91	14.98	4.14
1300	15.20	33.44	15.35	13.75	3.89	0.15	1350	25.88	14.81	4.13
1400	15.21	32.81	14.68	13.86	3.60	0.16	1400	25.99	15.07	4.12
1500	15.22	32.24	14.21	13.74	3.36	0.17	1450	26.22	14.76	4.24
1600	15.22	31.77	14.02	13.46	3.18	0.17	1500	26.18	14.84	4.22
1700	15.21	31.27	14.06	12.97	2.99	0.18	1550	26.46	14.61	4.18
1800	15.16	30.86	14.28	12.36	2.86	0.18	1600	26.43	14.58	4.08
1900	15.08	30.53	14.62	11.64	2.76	0.19	1650	26.34	14.51	4.05
2000	14.94	30.23	14.96	10.88	2.69	0.19	1700	26.13	14.27	4.04
2100	14.72	30.02	15.09	10.10	2.65	0.20	1750	25.99	14.32	4.12
2200	14.42	29.98	14.79	9.39	2.68	0.21	1800	25.91	14.12	4.15
2300	14.07	29.95	14.08	8.77	2.72	0.21	1850	25.75	14.15	4.13
2400	13.62	30.02	13.20	8.25	2.81	0.22	1900	25.74	13.95	4.16
2500	13.10	30.17	12.15	7.80	2.95	0.23	1950	25.60	13.95	4.22
2600	12.53	30.41	11.05	7.43	3.12	0.24	2000	25.69	13.85	4.15
2800	11.22	30.92	9.21	7.00	3.59	0.25	2050	25.65	13.78	4.09
3000	9.80	31.49	7.76	6.79	4.21	0.26	2100	25.60	13.70	4.16
3200	8.30	32.33	6.66	6.71	5.13	0.27	2150	25.55	13.71	4.23
3400	6.83	32.94	5.82	6.70	6.11	0.28	2200	25.52	13.64	4.18
3600	5.36	33.59	5.19	6.77	7.35	0.29	2250	25.56	13.73	4.20
3800	3.93	34.07	4.63	6.87	8.64	0.29	2300	25.56	13.75	4.32
4000	2.54	34.56	4.15	6.96	10.06	0.30	2350	25.61	13.71	4.34
4200	1.18	35.14	3.75	7.04	11.83	0.31	2400	25.58	13.73	4.29
4600	-1.42	36.25	3.13	7.18	16.15	0.32	2500	25.63	13.65	4.26

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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 = 74mA, Vd = 5V @Temperature = -40degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-0.82	60.72	0.32	0.53	4.11	0.91	500	30.62	18.51	3.99
250	3.88	57.45	0.57	0.98	5.12	0.83	550	31.05	19.07	4.07
300	7.52	51.71	1.00	1.59	4.51	0.74	600	31.26	19.17	4.05
350	10.28	46.71	1.65	2.37	3.82	0.62	650	31.29	19.20	3.96
400	12.27	43.85	2.52	3.30	3.95	0.49	700	31.33	19.24	3.87
450	13.72	42.19	3.55	4.27	4.24	0.37	750	31.36	19.28	3.88
500	14.72	40.70	4.73	5.30	4.37	0.27	800	31.35	19.19	3.99
550	15.41	39.76	6.02	6.37	4.56	0.18	850	31.29	19.28	4.00
600	15.88	38.86	7.37	7.44	4.60	0.12	900	31.34	18.89	3.91
650	16.21	38.31	8.80	8.50	4.68	0.09	940	31.19	18.82	3.93
700	16.42	37.98	10.29	9.58	4.79	0.07	1000	31.09	18.66	3.96
750	16.56	37.60	11.79	10.62	4.81	0.08	1050	30.89	18.61	3.99
800	16.66	37.21	13.27	11.74	4.76	0.09	1100	30.85	18.56	4.00
900	16.76	36.50	15.85	13.81	4.58	0.11	1150	30.72	18.32	4.00
1000	16.82	36.06	17.17	15.84	4.44	0.12	1200	30.68	18.35	4.01
1100	16.85	35.48	16.98	17.78	4.19	0.13	1250	30.62	18.14	3.98
1200	16.87	35.09	16.10	19.65	4.01	0.14	1300	30.42	18.11	4.06
1300	16.87	34.61	15.20	20.89	3.79	0.14	1350	30.30	17.99	4.04
1400	16.88	34.10	14.49	21.32	3.56	0.15	1400	30.30	17.98	4.05
1500	16.87	33.71	14.02	20.80	3.39	0.15	1450	30.35	17.91	4.14
1600	16.85	33.29	13.85	19.84	3.23	0.15	1500	30.27	17.77	4.13
1700	16.81	33.06	13.97	18.55	3.15	0.15	1550	30.45	17.75	4.13
1800	16.73	32.74	14.32	17.21	3.06	0.16	1600	30.39	17.51	4.05
1900	16.62	32.52	14.87	15.95	3.02	0.16	1650	30.32	17.51	4.01
2000	16.43	32.29	15.55	14.83	3.00	0.16	1700	30.13	17.30	3.99
2100	16.18	32.26	16.16	13.80	3.06	0.16	1750	29.94	17.22	4.06
2200	15.87	32.25	16.37	12.98	3.14	0.16	1800	29.81	17.11	4.10
2300	15.50	32.32	16.04	12.29	3.27	0.17	1850	29.66	17.04	4.10
2400	15.06	32.49	15.32	11.75	3.46	0.17	1900	29.57	16.93	4.07
2500	14.57	32.69	14.23	11.30	3.69	0.17	1950	29.46	16.87	4.15
2600	14.04	32.90	12.97	10.93	3.94	0.17	2000	29.48	16.82	4.08
2800	12.86	33.38	10.79	10.58	4.57	0.18	2050	29.44	16.67	4.05
3000	11.57	33.84	9.02	10.39	5.30	0.18	2100	29.40	16.59	4.10
3200	10.24	34.60	7.66	10.35	6.36	0.18	2150	29.40	16.61	4.17
3400	8.90	35.10	6.62	10.38	7.41	0.19	2200	29.32	16.46	4.14
3600	7.57	35.72	5.81	10.48	8.75	0.19	2250	29.35	16.60	4.15
3800	6.27	36.00	5.14	10.60	9.89	0.20	2300	29.35	16.50	4.26
4000	4.98	36.47	4.55	10.72	11.32	0.20	2350	29.40	16.45	4.25
4200	3.73	36.90	4.05	10.81	12.85	0.20	2400	29.42	16.42	4.24
4600	1.29	37.59	3.33	10.95	16.27	0.21	2500	29.50	16.37	4.20

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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 = 79mA, Vd = 3.9V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.33	60.10	0.43	0.61	6.42	0.89	500	28.41	16.90	5.40
250	3.16	53.77	0.73	1.10	5.16	0.81	550	28.74	17.41	5.47
300	6.61	48.94	1.21	1.75	4.62	0.70	600	28.88	17.63	5.40
350	9.21	46.53	1.87	2.57	5.15	0.59	650	28.93	17.62	5.30
400	11.09	43.64	2.76	3.52	5.06	0.46	700	28.98	17.83	5.25
450	12.45	41.93	3.80	4.51	5.24	0.35	750	29.02	17.80	5.30
500	13.37	40.50	4.97	5.56	5.33	0.26	800	29.04	17.87	5.40
550	14.00	39.55	6.25	6.63	5.48	0.18	850	29.08	18.02	5.38
600	14.41	38.77	7.61	7.69	5.56	0.13	900	29.20	17.75	5.29
650	14.70	38.21	9.03	8.71	5.62	0.10	940	29.06	17.82	5.32
700	14.87	37.69	10.47	9.73	5.61	0.08	1000	28.98	17.61	5.37
750	14.98	37.27	11.91	10.68	5.57	0.08	1050	28.79	17.63	5.36
800	15.06	36.87	13.29	11.65	5.50	0.09	1100	28.79	17.51	5.39
900	15.12	36.03	15.56	13.37	5.20	0.11	1150	28.67	17.41	5.41
1000	15.14	35.36	16.53	14.90	4.92	0.12	1200	28.76	17.38	5.40
1100	15.14	34.79	16.29	16.13	4.65	0.13	1250	28.82	17.18	5.40
1200	15.13	34.25	15.46	17.00	4.38	0.13	1300	28.62	17.21	5.45
1300	15.11	33.67	14.66	17.25	4.09	0.14	1350	28.54	17.07	5.45
1400	15.10	33.08	14.10	17.12	3.81	0.14	1400	28.61	17.13	5.44
1500	15.08	32.68	13.79	16.63	3.63	0.14	1450	28.77	16.95	5.57
1600	15.04	32.19	13.72	15.92	3.43	0.15	1500	28.72	16.90	5.54
1700	14.99	31.84	13.87	15.09	3.31	0.15	1550	29.01	16.85	5.53
1800	14.88	31.51	14.24	14.21	3.21	0.15	1600	29.00	16.64	5.44
1900	14.75	31.19	14.78	13.31	3.13	0.15	1650	28.94	16.60	5.42
2000	14.54	31.07	15.32	12.43	3.14	0.16	1700	28.73	16.38	5.42
2100	14.27	31.02	15.66	11.61	3.20	0.16	1750	28.54	16.30	5.47
2200	13.92	30.93	15.60	10.94	3.25	0.16	1800	28.46	16.16	5.51
2300	13.51	31.06	15.08	10.37	3.41	0.17	1850	28.26	16.17	5.52
2400	13.03	31.07	14.17	9.94	3.55	0.17	1900	28.24	16.07	5.52
2500	12.50	31.36	13.00	9.59	3.82	0.18	1950	28.11	16.03	5.61
2600	11.90	31.61	11.78	9.31	4.11	0.18	2000	28.18	15.99	5.50
2800	10.59	32.26	9.82	9.01	4.89	0.19	2050	28.15	15.85	5.48
3000	9.19	32.90	8.31	8.87	5.84	0.20	2100	28.10	15.75	5.56
3200	7.75	33.62	7.19	8.88	7.09	0.20	2150	28.08	15.82	5.64
3400	6.33	34.40	6.30	8.90	8.62	0.21	2200	28.03	15.68	5.57
3600	4.91	34.95	5.58	8.98	10.22	0.22	2250	28.08	15.81	5.59
3800	3.54	35.54	5.01	9.09	12.13	0.22	2300	28.10	15.80	5.73
4000	2.20	36.17	4.52	9.21	14.41	0.22	2350	28.19	15.70	5.76
4200	0.89	36.56	4.08	9.30	16.53	0.23	2400	28.22	15.65	5.73
4600	-1.65	37.47	3.39	9.57	22.00	0.23	2500	28.23	15.64	5.64

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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 = 76mA, Vd = 2.8V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.78	60.60	0.44	0.62	7.57	0.88	500	24.72	13.46	5.50
250	2.64	54.64	0.74	1.10	6.22	0.81	550	24.97	14.02	5.56
300	6.00	49.95	1.21	1.75	5.69	0.71	600	25.18	14.26	5.50
350	8.52	46.64	1.88	2.53	5.66	0.59	650	25.32	14.32	5.39
400	10.33	43.96	2.76	3.44	5.71	0.47	700	25.40	14.65	5.31
450	11.62	42.12	3.79	4.38	5.83	0.36	750	25.48	14.59	5.37
500	12.49	40.76	4.96	5.33	5.97	0.27	800	25.58	14.83	5.46
550	13.08	39.78	6.23	6.28	6.12	0.20	850	25.65	15.02	5.46
600	13.45	38.93	7.57	7.20	6.16	0.15	900	25.80	14.84	5.36
650	13.72	38.35	8.97	8.06	6.21	0.11	940	25.69	14.97	5.40
700	13.87	37.85	10.38	8.88	6.23	0.10	1000	25.69	14.76	5.45
750	13.96	37.18	11.79	9.63	6.03	0.09	1050	25.56	14.95	5.45
800	14.02	36.78	13.10	10.34	5.96	0.09	1100	25.65	14.82	5.44
900	14.07	35.71	15.29	11.54	5.51	0.11	1150	25.64	14.89	5.46
1000	14.08	34.95	16.31	12.51	5.17	0.12	1200	25.84	14.94	5.47
1100	14.07	34.29	16.20	13.24	4.85	0.13	1250	25.90	14.82	5.45
1200	14.06	33.72	15.50	13.74	4.56	0.14	1300	25.82	14.90	5.51
1300	14.05	33.06	14.77	13.89	4.23	0.14	1350	25.80	14.78	5.51
1400	14.05	32.40	14.24	13.89	3.91	0.15	1400	25.94	15.08	5.51
1500	14.04	31.88	13.94	13.64	3.67	0.15	1450	26.20	14.81	5.64
1600	14.02	31.39	13.86	13.26	3.46	0.16	1500	26.21	14.93	5.60
1700	13.99	30.88	13.94	12.74	3.26	0.16	1550	26.57	14.82	5.58
1800	13.91	30.55	14.25	12.09	3.15	0.16	1600	26.56	14.70	5.49
1900	13.80	30.23	14.64	11.36	3.05	0.17	1650	26.53	14.72	5.45
2000	13.61	29.96	14.98	10.60	2.99	0.17	1700	26.27	14.56	5.49
2100	13.35	29.80	15.05	9.86	2.98	0.18	1750	26.15	14.63	5.54
2200	13.01	29.73	14.68	9.21	3.02	0.19	1800	26.11	14.41	5.55
2300	12.59	29.84	13.98	8.67	3.13	0.19	1850	25.97	14.53	5.55
2400	12.09	29.91	13.01	8.23	3.26	0.20	1900	25.96	14.37	5.57
2500	11.53	30.10	11.89	7.86	3.46	0.21	1950	25.84	14.37	5.63
2600	10.89	30.41	10.80	7.58	3.73	0.21	2000	25.92	14.35	5.54
2800	9.50	31.04	9.03	7.28	4.42	0.23	2050	25.90	14.21	5.53
3000	8.00	31.71	7.70	7.12	5.32	0.24	2100	25.88	14.23	5.60
3200	6.47	32.62	6.70	7.11	6.63	0.25	2150	25.83	14.16	5.70
3400	4.97	33.33	5.92	7.14	8.07	0.26	2200	25.77	14.15	5.63
3600	3.47	34.07	5.29	7.21	9.89	0.26	2250	25.83	14.22	5.63
3800	2.04	34.54	4.79	7.33	11.71	0.27	2300	25.82	14.20	5.75
4000	0.65	35.19	4.34	7.44	14.05	0.27	2350	25.87	14.11	5.83
4200	-0.71	35.78	3.95	7.53	16.65	0.28	2400	25.80	14.08	5.76
4600	-3.32	36.81	3.31	7.79	22.81	0.29	2500	25.75	13.99	5.71

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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 = 82mA, Vd = 5V @Temperature = +85degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		FREQ	IP3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Delta	(MHz)	(dBm)	(dBm)	(dB)
200	-1.13	60.27	0.43	0.62	6.49	0.89	500	30.40	18.67	5.38
250	3.42	54.16	0.73	1.09	5.20	0.81	550	30.82	19.23	5.45
300	6.93	49.03	1.21	1.75	4.48	0.70	600	30.94	19.35	5.38
350	9.59	45.73	1.88	2.60	4.50	0.58	650	31.02	19.42	5.28
400	11.51	43.25	2.77	3.58	4.65	0.46	700	31.03	19.49	5.22
450	12.90	41.34	3.80	4.63	4.69	0.34	750	31.09	19.48	5.28
500	13.86	40.35	4.98	5.74	5.03	0.25	800	31.09	19.43	5.37
550	14.51	39.19	6.25	6.88	5.02	0.17	850	31.11	19.54	5.36
600	14.95	38.62	7.62	8.05	5.21	0.12	900	31.14	19.15	5.28
650	15.26	38.07	9.03	9.20	5.26	0.08	940	30.94	19.12	5.30
700	15.45	37.66	10.49	10.39	5.32	0.07	1000	30.83	18.91	5.37
750	15.57	37.16	11.95	11.52	5.23	0.08	1050	30.67	18.84	5.36
800	15.66	36.84	13.35	12.71	5.20	0.09	1100	30.58	18.81	5.37
900	15.74	36.16	15.65	15.00	5.00	0.11	1150	30.46	18.56	5.40
1000	15.77	35.69	16.60	17.28	4.82	0.12	1200	30.49	18.55	5.40
1100	15.77	35.11	16.27	19.40	4.54	0.12	1250	30.45	18.33	5.38
1200	15.76	34.69	15.38	21.09	4.33	0.13	1300	30.24	18.30	5.44
1300	15.74	34.14	14.56	21.58	4.06	0.13	1350	30.11	18.18	5.43
1400	15.72	33.65	13.97	21.11	3.82	0.13	1400	30.13	18.17	5.44
1500	15.69	33.25	13.66	20.02	3.64	0.13	1450	30.20	18.06	5.57
1600	15.63	32.90	13.62	18.77	3.51	0.14	1500	30.11	17.91	5.52
1700	15.57	32.53	13.79	17.51	3.38	0.14	1550	30.35	17.89	5.52
1800	15.44	32.25	14.23	16.34	3.32	0.14	1600	30.33	17.65	5.41
1900	15.29	32.05	14.85	15.25	3.30	0.14	1650	30.31	17.60	5.41
2000	15.07	32.00	15.53	14.25	3.35	0.14	1700	30.05	17.44	5.41
2100	14.78	31.91	16.06	13.36	3.41	0.14	1750	29.85	17.29	5.45
2200	14.42	31.94	16.17	12.67	3.54	0.14	1800	29.74	17.18	5.50
2300	14.01	32.11	15.79	12.11	3.75	0.15	1850	29.57	17.12	5.50
2400	13.52	32.17	14.91	11.70	3.95	0.15	1900	29.52	17.01	5.52
2500	12.99	32.46	13.71	11.36	4.27	0.15	1950	29.42	16.98	5.57
2600	12.41	32.82	12.45	11.10	4.66	0.15	2000	29.41	16.91	5.50
2800	11.15	33.31	10.36	10.85	5.45	0.16	2050	29.37	16.75	5.48
3000	9.81	34.02	8.76	10.75	6.56	0.16	2100	29.37	16.65	5.54
3200	8.44	34.79	7.54	10.78	7.97	0.17	2150	29.36	16.73	5.64
3400	7.08	35.40	6.58	10.83	9.47	0.17	2200	29.30	16.57	5.56
3600	5.73	35.96	5.81	10.92	11.16	0.17	2250	29.36	16.75	5.58
3800	4.42	36.48	5.18	11.03	13.02	0.18	2300	29.34	16.62	5.72
4000	3.11	36.91	4.65	11.13	15.01	0.18	2350	29.43	16.68	5.75
4200	1.85	37.52	4.18	11.22	17.52	0.18	2400	29.40	16.58	5.73
4600	-0.62	38.18	3.46	11.50	22.41	0.19	2500	29.51	16.52	5.65

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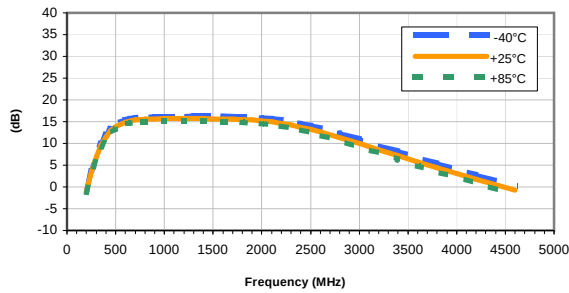
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Typical Performance Curves

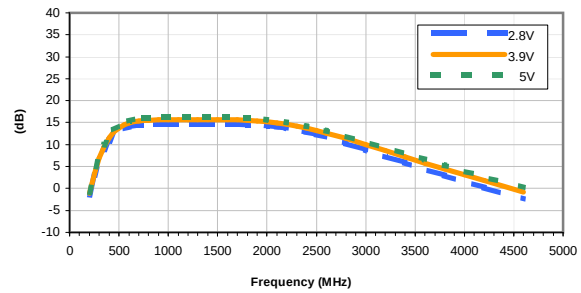
GAIN vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



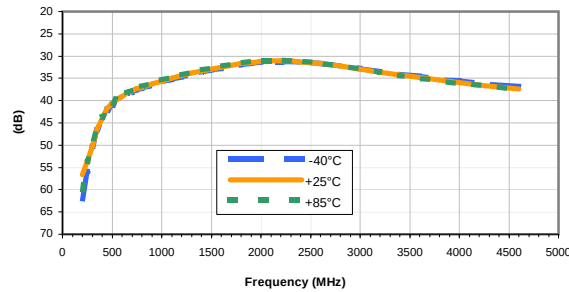
GAIN vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



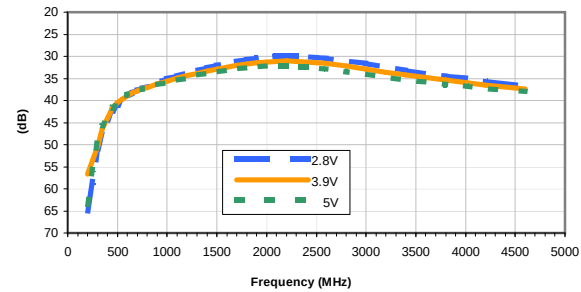
ISOLATION vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



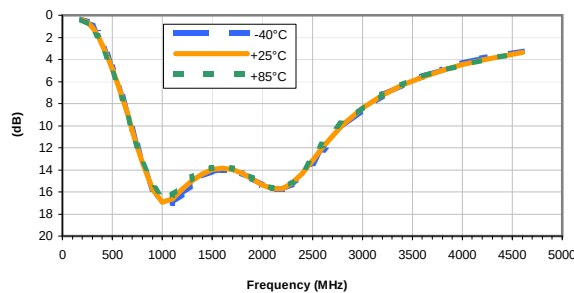
ISOLATION vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



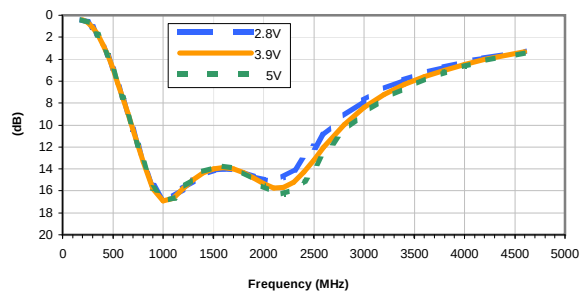
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



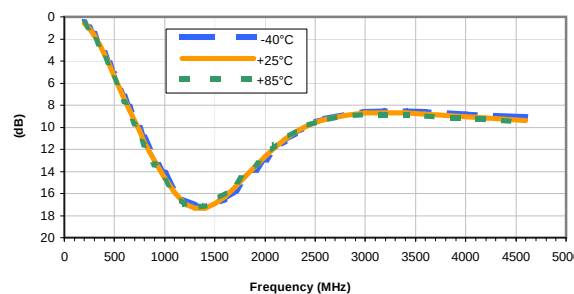
INPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



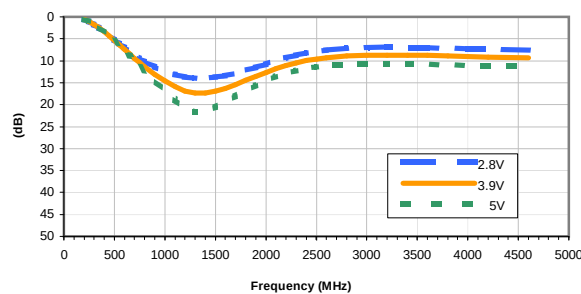
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



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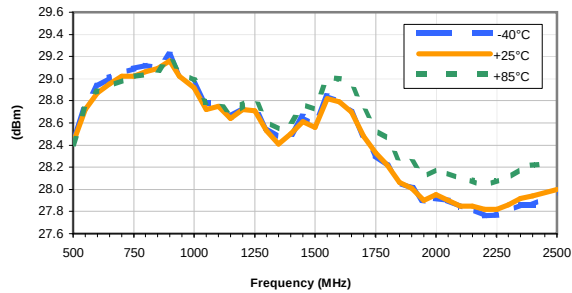
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Typical Performance Curves

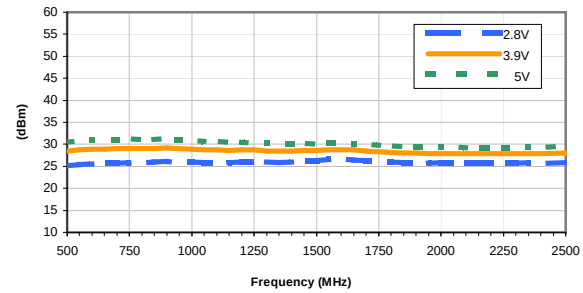
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



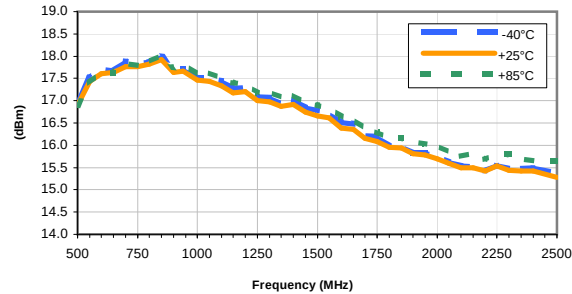
OUTPUT IP-3 vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



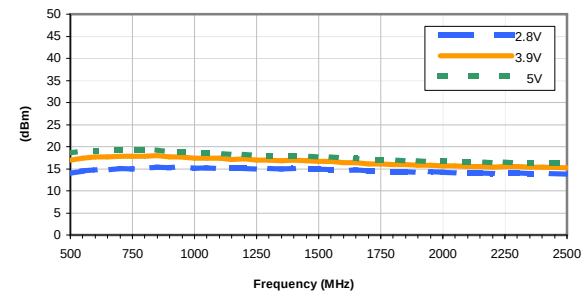
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



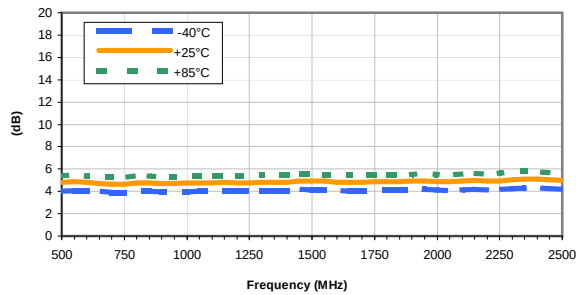
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



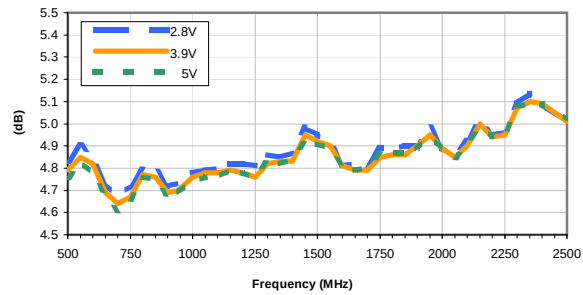
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V



Noise Figure vs. VOLTAGE

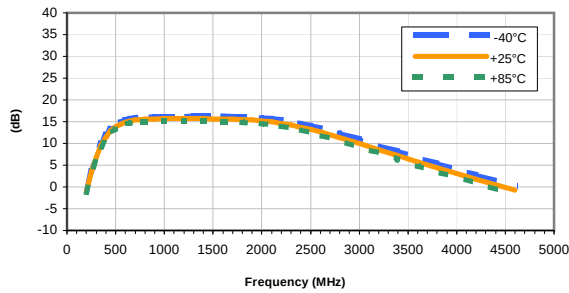
Temperature = +25°C



Typical Performance Curves

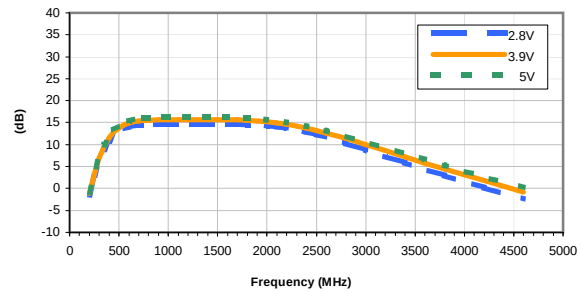
GAIN vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



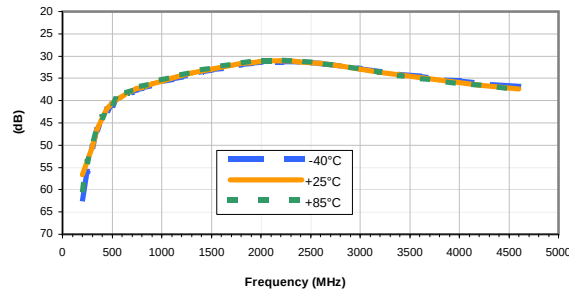
GAIN vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



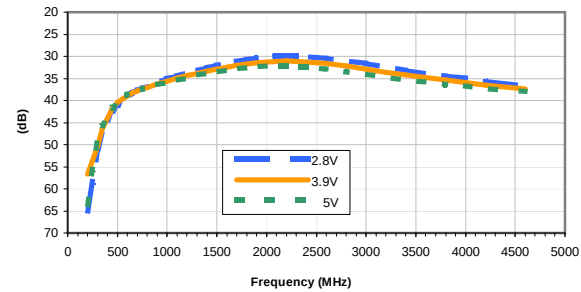
ISOLATION vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



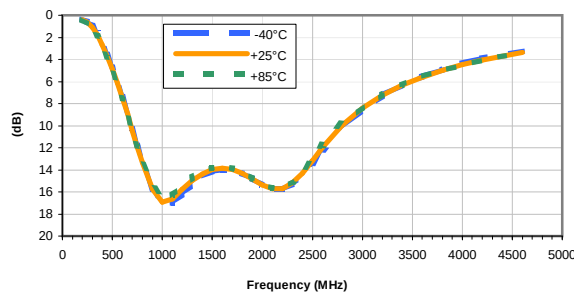
ISOLATION vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



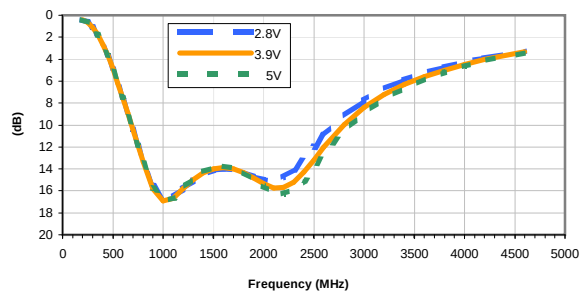
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



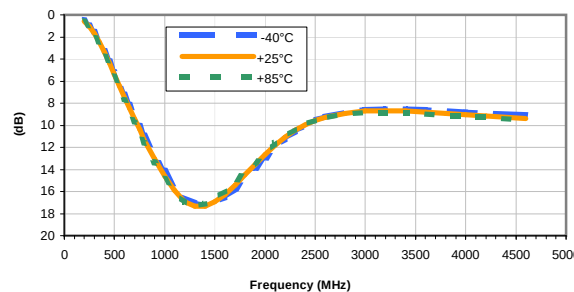
INPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



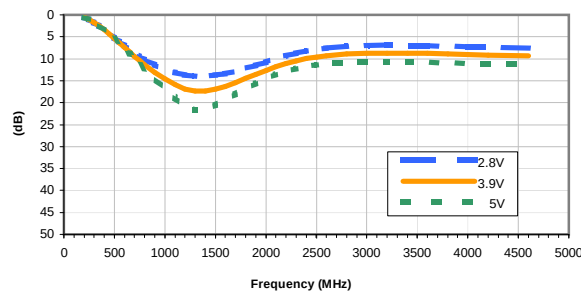
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



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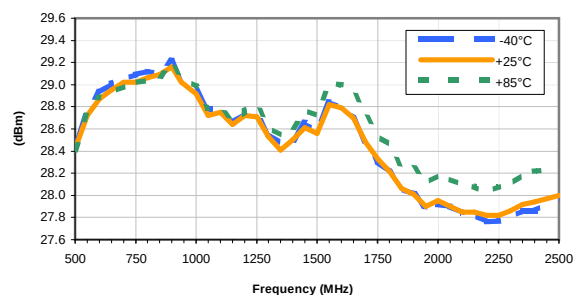
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Typical Performance Curves

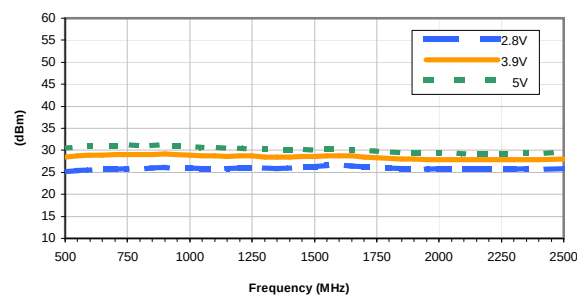
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



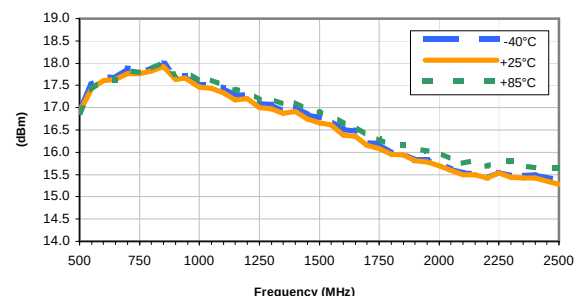
OUTPUT IP-3 vs. VOLTAGE

INPUT POWER = -20, Temperature = +25°C



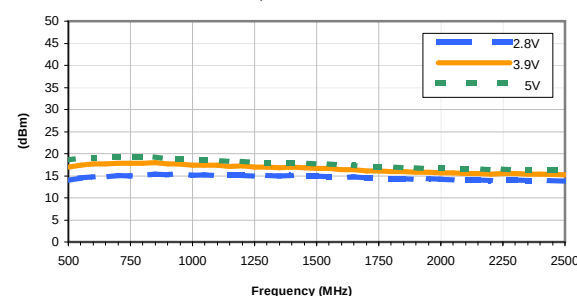
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



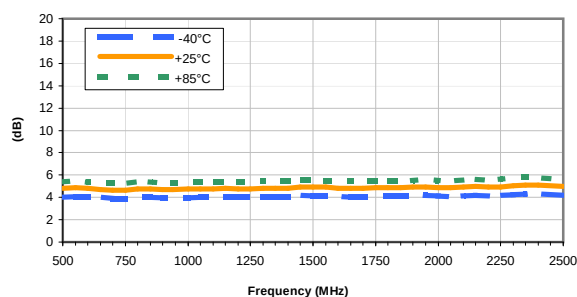
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



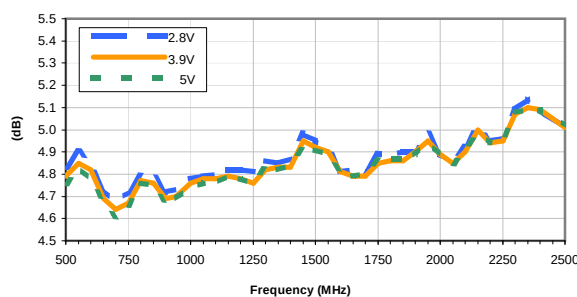
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V

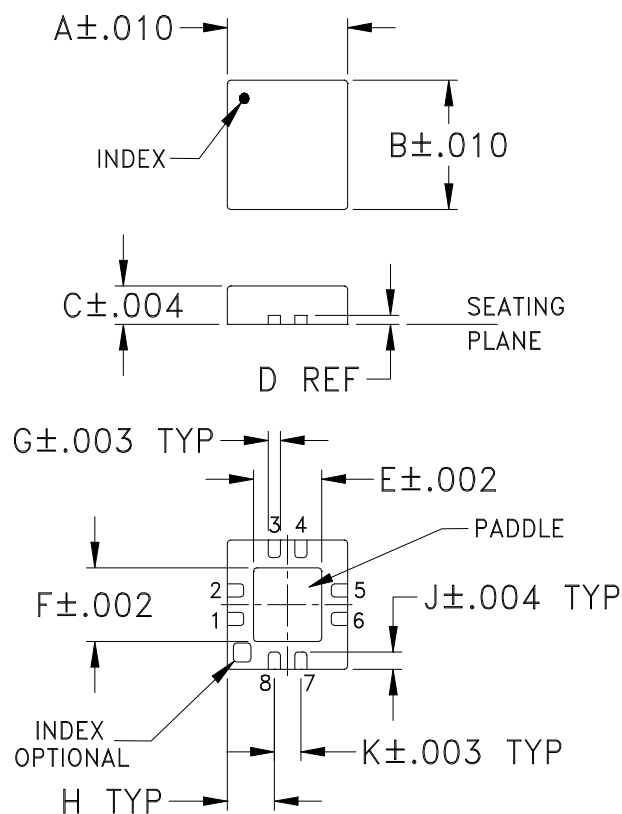


Noise Figure vs. VOLTAGE

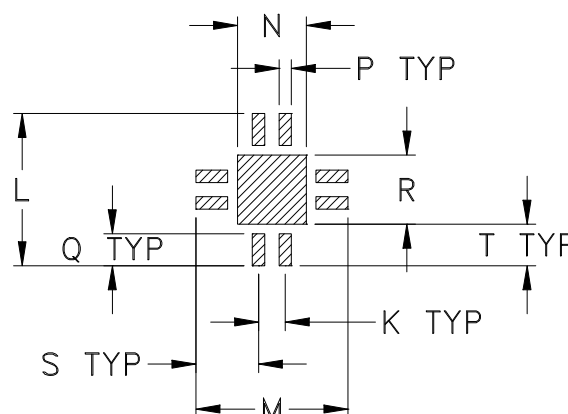
Temperature = +25°C



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.



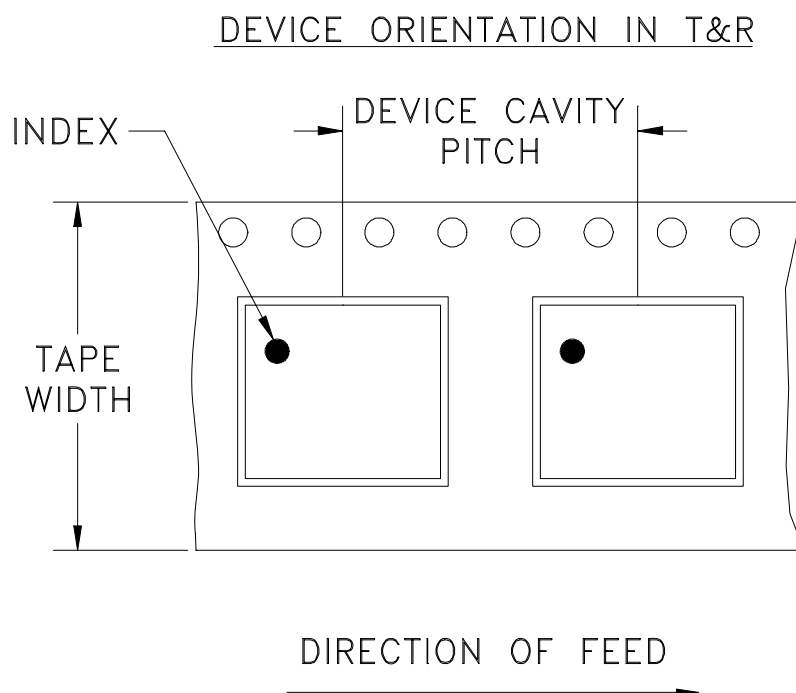
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Tape & Reel Packaging TR-F104



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



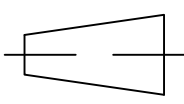
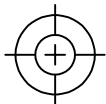
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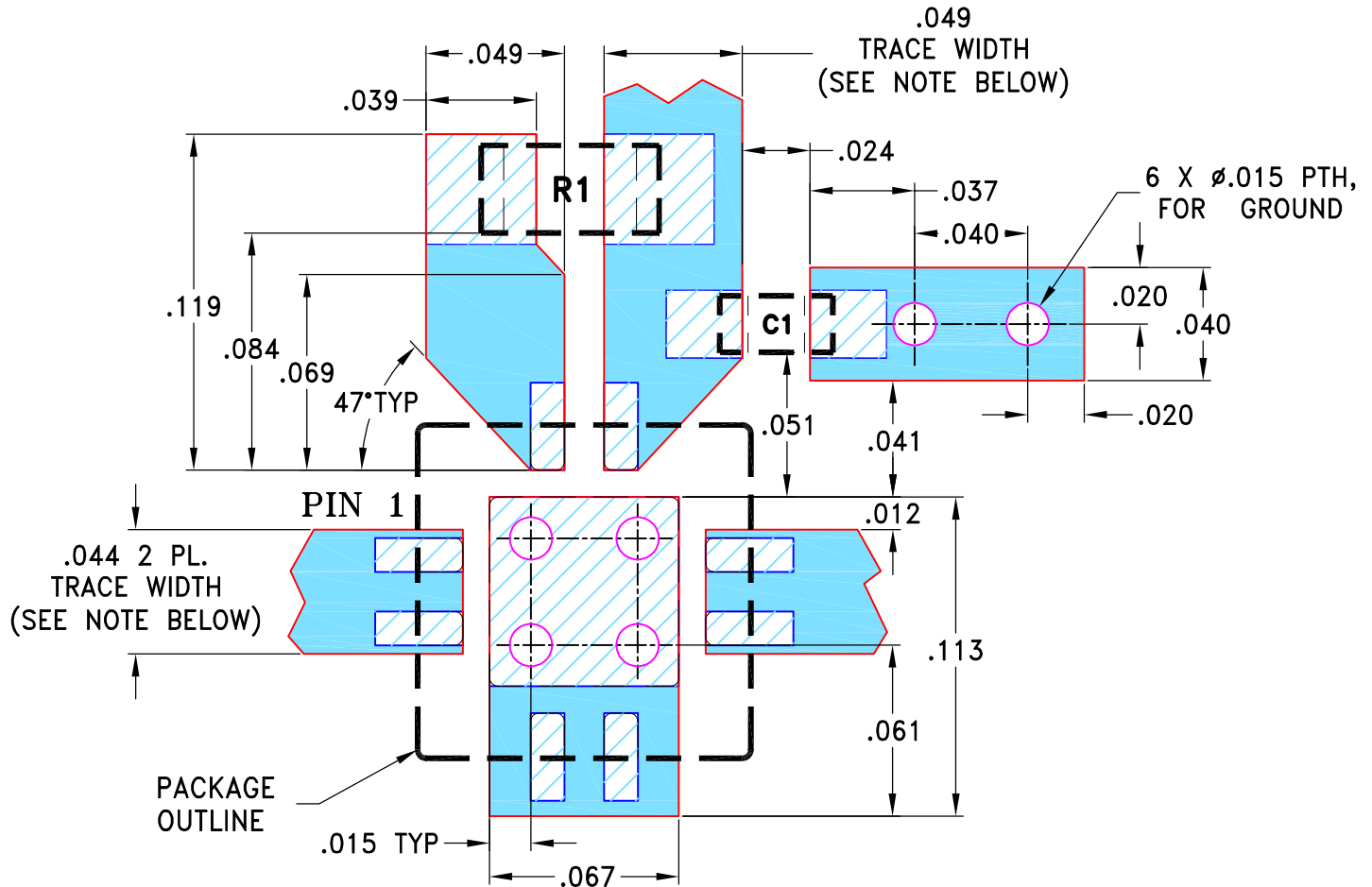
THIRD ANGLE PROJECTION



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

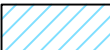


RESISTOR R1: 0603 SIZE
CAPACITOR C1: 0402 SIZE

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

DIMENSIONS ARE IN INCHES

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$
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ASHEETA1.DWG REV:A DATE:01/12/95

INITIALS

DATE

DRAWN

GF

07/19/02

CHECKED

LC

08/01/02

APPROVED

DJ

08/05/02



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, DQ849, TB-186-XX+

SIZE

A

CODE IDENT

15542

DRAWING NO:

98-PL-078

REV:

C

FILE:

98PL078

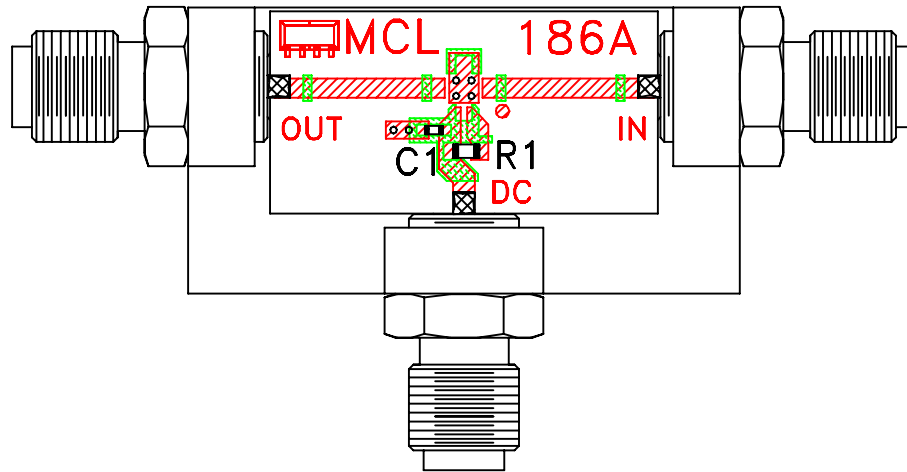
SCALE:

15:1

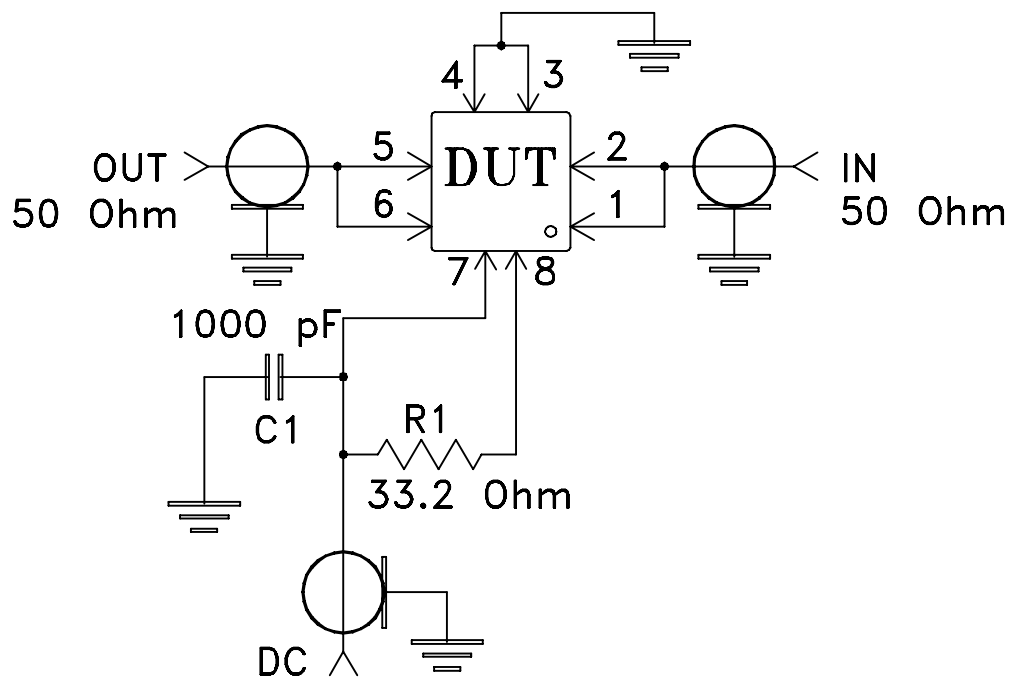
SHEET:

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



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

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