High Directivity

Monolithic Amplifier

0.5-2.5 GHz

Product Features

- 3V & 5V operation
- no external biasing circuit required
- internal DC blocking at RF input and output
- high directivity, 20 dB typ.
- wide bandwidth, 0.5 to 2.5 GHz
- low noise figure, 5.5 dB typ.
- output power, up to +18.2 dBm typ.
- low cost

Generic photo used for illustration purposes only

VNA-25+

CASE STYLE: XX211-1

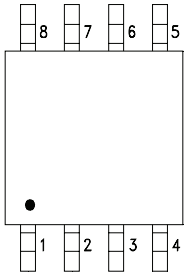
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Typical Applications

- buffer amplifier
- cellular
- PCN

General Description

VNA-25+ is a wideband amplifier offering high dynamic range. It has repeatable performance from lot to lot. It is enclosed in an 8-lead SOIC package. VNA-25+ is fabricated using GaAs MESFET technology. Expected MTBF at 85°C case temperature is 40,000 years at 2.8V, 2,000 at 5V.



Pin Description

Function	Pin Number	Description
RF IN	3	RF input pin.
RF OUT	6	RF output pin.
DC	1	Bias pin
GND	2,4,5,7,8	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

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

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	—	15.5	14.5		dB
	f=1.0 GHz	—	18.0	16.7		
	f=1.5 GHz	—	18.6	17.4		
	f=2.0 GHz	16	17.8	17		
	f=2.5 GHz	—	16	15.5		
Input Return Loss	f=0.75 to 2.5 GHz		14	14		dB
Output Return Loss	f=0.75 to 2.5 GHz		12.5	12.5		dB
Output Power @ 1 dB compression	f=0.5 to 2.5 GHz		18.2	12		dBm
Output IP3	f=0.5 to 2.5 GHz		29	24		dBm
Noise Figure	f=0.5 to 2.5 GHz		5.5	5.5		dB
Directivity (Isolation-Gain)	f=0.5 to 2.5 GHz		18-24	16-25		dB
DC Current			85	80	105	mA
Thermal Resistance, junction-to-case[1]			125			°C/W

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 150°C
DC Voltage	+7V, -1.0V reverse
Power Dissipation	1000mW
Input Power	10dBm

Note: Permanent damage may occur if any of these limits are exceeded.
These ratings are not intended for continuous normal operation.
[1]Case is defined as ground leads.

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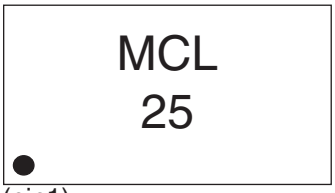
Product Marking



(pin1)

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: XX211-1

VNA-25+: Plastic molded, 8-lead SOIC, lead finish: Tin Plate

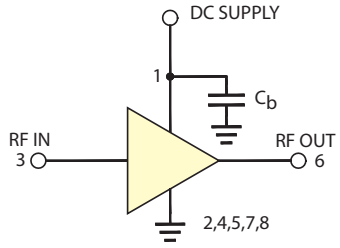
Tape & Reel: F16
7" reels with 20, 50, 100, 200, 500 or 1K devices.
13" reel with 2.5K devices.

Suggested Layout for PCB Design: PL-077

Evaluation Board: TB-01

Environmental Ratings: ENV08T1

Recommended Application Circuit



C_b= 100pF to 10 nF
Test Board includes case, connectors, and components (in bold) soldered to PCB

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ESD Rating

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

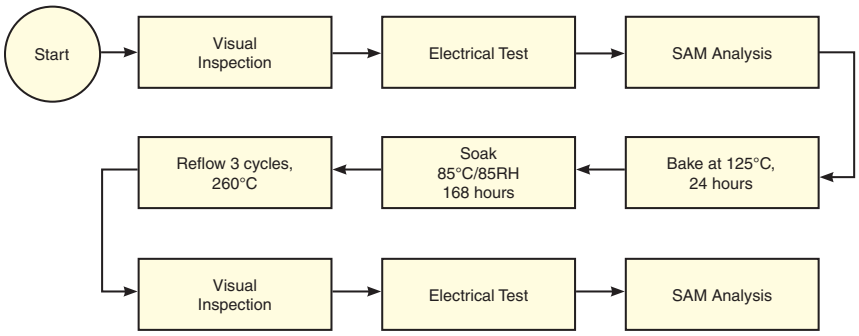
Charged Device Model (CDM): Class III (500 v to 1000v) in accordance with JESD22-C101A

MSL Rating

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

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

MSL Test Flow Chart



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MMIC Amplifier VNA-25+

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 = 68mA, 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	-2.78	47.63	-0.09	1.07	-0.22	0.89	400	26.60	14.17	5.04
300	9.27	39.66	0.38	4.65	0.73	0.55	450	27.49	15.05	4.91
400	13.72	37.71	2.25	10.49	2.71	0.17	500	28.17	15.55	4.89
500	15.44	37.63	4.13	16.00	3.84	0.10	550	28.44	15.98	4.86
600	16.31	38.11	5.79	17.50	4.53	0.14	600	28.73	16.16	4.76
700	16.85	38.47	7.19	16.15	4.86	0.15	650	28.92	16.49	4.71
800	17.25	39.09	8.34	15.02	5.22	0.15	700	29.08	16.56	4.69
900	17.57	39.50	9.24	14.41	5.40	0.14	750	28.95	16.73	4.68
1000	17.81	39.99	9.97	13.99	5.64	0.14	800	29.35	16.51	4.72
1100	18.01	40.53	10.55	13.84	5.93	0.13	850	29.25	16.73	4.62
1200	18.17	40.98	10.99	13.81	6.18	0.12	900	28.80	16.44	4.56
1300	18.26	41.52	11.40	13.82	6.56	0.12	940	28.82	16.63	4.57
1400	18.32	41.63	11.83	14.09	6.66	0.12	1000	28.64	16.57	4.57
1500	18.30	41.70	12.29	14.28	6.78	0.11	1050	28.68	16.58	4.55
1600	18.25	41.35	12.87	14.69	6.62	0.11	1100	28.65	16.56	4.59
1700	18.14	40.61	13.58	15.11	6.24	0.11	1150	28.59	16.46	4.61
1800	17.94	39.89	14.44	15.53	5.93	0.11	1200	28.65	16.48	4.60
1900	17.74	38.74	15.41	16.36	5.39	0.11	1300	28.42	16.37	4.58
2000	17.43	37.75	16.62	16.92	5.03	0.11	1400	28.17	16.32	4.53
2100	17.11	36.74	17.82	17.79	4.69	0.11	1500	27.87	16.22	4.56
2200	16.75	35.91	18.98	18.44	4.47	0.11	1600	27.69	16.09	4.57
2300	16.32	35.08	19.69	18.87	4.28	0.11	1700	27.51	15.92	4.55
2400	15.90	34.46	19.27	19.35	4.18	0.11	1800	27.37	15.83	4.50
2500	15.41	33.55	18.41	19.45	3.98	0.11	1900	27.24	15.69	4.53
2600	14.93	33.07	17.01	19.31	3.96	0.11	2000	27.26	15.52	4.45
2700	14.44	32.57	15.64	18.97	3.92	0.11	2100	27.16	15.50	4.44
2800	13.93	32.20	14.31	18.39	3.93	0.11	2200	27.26	15.40	4.46
2900	13.43	31.77	13.21	18.09	3.92	0.11	2300	27.33	15.57	4.49
3000	12.92	31.39	12.22	17.59	3.91	0.11	2400	27.36	15.65	4.54
3100	12.42	31.06	11.38	17.31	3.93	0.10	2500	27.58	15.67	4.57
3200	11.95	30.75	10.65	16.97	3.94	0.10	2600	27.64	15.78	4.61
3400	10.97	30.23	9.42	16.65	4.01	0.09	2700	27.94	16.05	4.67
3600	10.08	29.64	8.53	16.69	4.02	0.08	2800	28.21	16.16	4.74
3800	9.20	29.13	7.81	16.97	4.06	0.06	2900	28.90	16.22	4.65
4000	8.35	28.76	7.29	17.44	4.18	0.04	3000	29.16	16.48	4.84
4500	6.38	29.41	6.07	20.86	5.30	0.05	3100	29.20	16.36	4.86
5000	4.26	29.33	5.07	16.49	6.10	0.12	3200	29.53	16.48	4.84
5500	2.02	27.75	3.84	12.31	5.52	0.20	3300	29.72	16.78	5.03
6000	-0.92	27.21	3.22	9.39	6.15	0.27	3400	29.69	17.00	5.22
6500	-4.20	27.25	2.82	7.41	7.58	0.33	3500	29.93	17.11	5.18

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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 = +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	-2.73	48.96	-0.09	1.13	-0.42	0.89	400	23.01	10.51	5.06
300	8.98	40.47	0.46	4.66	0.94	0.54	450	23.48	11.23	4.90
400	13.11	39.00	2.35	9.66	3.45	0.20	500	24.09	11.61	4.90
500	14.69	38.92	4.22	13.34	4.82	0.13	550	24.18	12.08	4.90
600	15.48	39.65	5.81	14.23	5.82	0.14	600	24.49	12.21	4.76
700	15.99	39.74	7.12	13.61	6.04	0.15	650	24.57	12.64	4.77
800	16.38	40.10	8.17	12.96	6.29	0.15	700	24.80	12.69	4.69
900	16.69	40.34	8.97	12.50	6.39	0.15	750	24.73	12.97	4.70
1000	16.93	40.42	9.64	12.08	6.36	0.15	800	25.06	12.73	4.72
1100	17.14	40.25	10.19	11.83	6.16	0.15	850	24.97	13.07	4.65
1200	17.31	40.21	10.64	11.57	6.05	0.15	900	24.88	12.73	4.57
1300	17.41	40.10	11.06	11.37	5.94	0.15	940	25.00	13.02	4.59
1400	17.49	39.56	11.51	11.30	5.58	0.15	1000	24.81	13.02	4.58
1500	17.50	39.14	11.99	11.18	5.34	0.15	1050	25.00	13.02	4.55
1600	17.47	38.53	12.57	11.20	5.04	0.15	1100	24.95	13.07	4.61
1700	17.39	37.60	13.26	11.24	4.61	0.15	1150	25.11	12.95	4.62
1800	17.24	36.85	14.09	11.31	4.35	0.15	1200	25.08	13.03	4.56
1900	17.07	36.02	15.00	11.60	4.09	0.15	1300	25.01	13.11	4.59
2000	16.81	35.22	16.15	11.81	3.88	0.15	1400	25.01	13.08	4.54
2100	16.52	34.37	17.29	12.21	3.68	0.15	1500	24.92	13.09	4.57
2200	16.19	33.71	18.42	12.59	3.57	0.14	1600	24.89	13.06	4.55
2300	15.79	33.01	19.17	12.98	3.47	0.14	1700	24.82	13.11	4.54
2400	15.40	32.48	18.99	13.46	3.43	0.13	1800	24.76	13.27	4.53
2500	14.93	31.77	18.33	14.00	3.34	0.13	1900	24.61	13.26	4.52
2600	14.47	31.39	17.07	14.42	3.36	0.12	2000	24.64	13.29	4.43
2700	13.99	30.85	15.77	14.90	3.33	0.12	2100	24.59	13.34	4.45
2800	13.47	30.57	14.47	15.22	3.39	0.11	2200	24.79	13.31	4.51
2900	12.98	30.19	13.38	15.55	3.40	0.10	2300	24.97	13.36	4.49
3000	12.46	29.89	12.36	15.76	3.44	0.10	2400	24.99	13.44	4.54
3100	11.94	29.63	11.50	15.94	3.49	0.09	2500	25.24	13.35	4.55
3200	11.44	29.33	10.74	16.08	3.52	0.08	2600	25.19	13.44	4.56
3400	10.41	28.91	9.46	16.07	3.64	0.07	2700	25.29	13.75	4.65
3600	9.42	28.44	8.48	15.91	3.74	0.06	2800	25.73	13.86	4.69
3800	8.43	28.00	7.67	15.42	3.83	0.06	2900	25.88	13.93	4.63
4000	7.45	27.71	7.05	14.88	4.01	0.08	3000	26.07	14.17	4.83
4500	5.04	28.30	5.70	12.76	5.10	0.15	3100	26.12	14.09	4.87
5000	2.47	29.03	4.69	9.61	6.41	0.23	3200	26.41	14.04	4.86
5500	0.01	27.80	3.65	7.77	6.07	0.31	3300	26.51	14.18	5.06
6000	-2.87	27.48	3.19	6.55	7.00	0.36	3400	26.17	14.29	5.29
6500	-5.87	27.69	2.87	5.64	8.77	0.40	3500	25.92	14.21	5.21

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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 = 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	-3.09	47.57	-0.07	1.03	0.05	0.90	400	27.55	15.87	5.09
300	9.13	39.19	0.37	4.61	0.73	0.56	450	28.68	16.95	4.93
400	13.80	36.90	2.20	11.02	2.43	0.15	500	29.31	17.51	4.97
500	15.62	36.58	4.08	18.33	3.36	0.08	550	29.72	17.84	4.94
600	16.52	37.19	5.77	20.38	4.02	0.13	600	29.96	18.07	4.80
700	17.07	37.48	7.23	17.88	4.28	0.15	650	30.23	18.24	4.81
800	17.48	38.07	8.45	16.32	4.58	0.15	700	30.30	18.35	4.77
900	17.78	38.72	9.41	15.65	4.88	0.14	750	30.17	18.39	4.73
1000	18.02	39.35	10.17	15.33	5.18	0.12	800	30.58	18.16	4.78
1100	18.20	40.22	10.75	15.37	5.67	0.11	850	30.46	18.27	4.66
1200	18.33	40.81	11.17	15.66	6.03	0.10	900	29.86	17.94	4.65
1300	18.40	41.89	11.54	16.04	6.83	0.09	940	29.85	18.08	4.63
1400	18.43	42.71	11.91	16.87	7.55	0.08	1000	29.68	17.91	4.64
1500	18.38	43.72	12.33	17.69	8.60	0.08	1050	29.59	17.84	4.62
1600	18.30	44.16	12.84	18.90	9.23	0.07	1100	29.59	17.69	4.66
1700	18.15	43.83	13.51	20.41	9.15	0.07	1150	29.42	17.58	4.70
1800	17.92	43.03	14.34	21.99	8.66	0.07	1200	29.52	17.38	4.65
1900	17.68	41.65	15.29	24.86	7.68	0.07	1300	29.18	17.17	4.65
2000	17.35	40.40	16.50	26.98	6.97	0.07	1400	28.84	17.04	4.61
2100	17.00	39.03	17.72	29.17	6.24	0.08	1500	28.44	16.89	4.65
2200	16.62	37.93	18.92	27.20	5.77	0.08	1600	28.22	16.66	4.63
2300	16.17	36.96	19.71	24.40	5.44	0.09	1700	28.00	16.41	4.64
2400	15.74	36.08	19.38	22.25	5.15	0.09	1800	27.88	16.24	4.57
2500	15.24	35.12	18.54	20.09	4.86	0.10	1900	27.76	16.00	4.58
2600	14.75	34.46	17.10	18.77	4.73	0.10	2000	27.78	15.81	4.49
2700	14.26	33.84	15.71	17.47	4.60	0.11	2100	27.66	15.73	4.54
2800	13.75	33.28	14.35	16.44	4.51	0.11	2200	27.71	15.64	4.59
2900	13.27	32.83	13.23	15.78	4.46	0.12	2300	27.78	15.77	4.58
3000	12.77	32.40	12.22	15.15	4.42	0.12	2400	27.74	15.92	4.63
3100	12.29	32.01	11.36	14.73	4.40	0.12	2500	27.98	15.91	4.60
3200	11.83	31.69	10.63	14.31	4.38	0.12	2600	28.10	16.03	4.68
3400	10.90	31.08	9.41	13.90	4.38	0.12	2700	28.52	16.38	4.74
3600	10.07	30.41	8.52	13.84	4.33	0.12	2800	28.89	16.44	4.77
3800	9.27	29.78	7.84	14.11	4.28	0.10	2900	29.50	16.57	4.72
4000	8.51	29.43	7.36	14.50	4.38	0.09	3000	29.67	16.86	4.88
4500	6.83	30.14	6.25	18.52	5.49	0.04	3100	29.70	16.73	4.96
5000	5.02	29.39	5.26	38.52	5.84	0.06	3200	29.96	16.95	4.96
5500	2.94	27.57	3.89	17.34	5.07	0.15	3300	30.37	17.42	5.10
6000	-0.13	26.88	3.16	11.33	5.54	0.23	3400	30.30	17.81	5.26
6500	-3.71	26.77	2.72	8.20	6.80	0.30	3500	31.16	18.07	5.24

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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 = 62mA, Vd = 3.9V @Temperature = -45degC

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	-2.14	48.48	-0.19	1.01	-0.95	0.91	400	26.97	14.26	4.11
300	10.23	39.71	0.19	4.65	0.27	0.56	450	27.94	15.06	3.99
400	14.67	37.58	2.10	10.38	2.24	0.17	500	28.63	15.58	4.01
500	16.38	37.72	4.05	15.84	3.44	0.09	550	28.93	16.04	4.00
600	17.26	38.33	5.72	17.59	4.15	0.14	600	29.16	16.26	3.92
700	17.82	38.82	7.15	16.15	4.53	0.16	650	29.32	16.56	3.84
800	18.26	39.55	8.31	14.84	4.90	0.16	700	29.47	16.61	3.82
900	18.61	39.97	9.26	14.08	5.06	0.15	750	29.34	16.76	3.80
1000	18.91	40.58	10.07	13.52	5.33	0.15	800	29.69	16.53	3.82
1100	19.14	41.13	10.69	13.29	5.58	0.14	850	29.52	16.74	3.74
1200	19.35	41.38	11.17	13.22	5.65	0.14	900	29.07	16.46	3.70
1300	19.48	41.70	11.61	13.15	5.81	0.13	940	29.10	16.63	3.70
1400	19.58	41.67	12.05	13.24	5.77	0.13	1000	28.89	16.54	3.71
1500	19.60	41.58	12.50	13.33	5.74	0.13	1050	28.88	16.55	3.66
1600	19.59	41.15	13.08	13.56	5.52	0.13	1100	28.85	16.52	3.74
1700	19.50	40.12	13.88	13.82	5.02	0.13	1150	28.74	16.45	3.78
1800	19.32	39.24	14.81	14.07	4.68	0.13	1200	28.80	16.42	3.73
1900	19.13	37.94	15.80	14.63	4.17	0.13	1300	28.52	16.28	3.75
2000	18.81	37.08	17.09	14.87	3.95	0.13	1400	28.25	16.19	3.70
2100	18.47	36.17	18.03	15.39	3.73	0.13	1500	27.93	16.08	3.72
2200	18.09	35.32	18.57	15.78	3.55	0.13	1600	27.73	15.94	3.74
2300	17.63	34.55	18.53	16.09	3.43	0.13	1700	27.52	15.74	3.68
2400	17.19	33.93	17.65	16.59	3.36	0.13	1800	27.44	15.64	3.67
2500	16.66	33.19	16.68	16.83	3.27	0.13	1900	27.36	15.43	3.67
2600	16.15	32.73	15.36	16.81	3.26	0.13	2000	27.37	15.24	3.60
2700	15.62	32.25	14.19	16.64	3.24	0.13	2100	27.28	15.23	3.63
2800	15.07	31.92	13.09	16.26	3.28	0.12	2200	27.39	15.15	3.65
2900	14.55	31.53	12.23	16.07	3.29	0.12	2300	27.51	15.29	3.61
3000	14.03	31.28	11.44	15.76	3.34	0.12	2400	27.49	15.41	3.68
3100	13.50	30.96	10.73	15.53	3.36	0.11	2500	27.72	15.45	3.69
3200	13.00	30.68	10.11	15.36	3.39	0.11	2600	27.79	15.65	3.71
3400	12.00	30.26	9.05	15.30	3.50	0.10	2700	28.41	15.93	3.77
3600	11.10	29.75	8.29	15.45	3.56	0.09	2800	28.57	16.07	3.84
3800	10.21	29.19	7.70	15.56	3.59	0.07	2900	29.03	16.17	3.80
4000	9.34	28.78	7.32	15.85	3.71	0.05	3000	29.31	16.45	3.96
4500	7.46	29.39	6.03	19.01	4.62	0.04	3100	29.41	16.44	3.95
5000	5.36	29.39	5.16	16.84	5.46	0.11	3200	29.78	16.56	3.98
5500	3.31	27.61	3.69	12.68	4.61	0.21	3300	30.13	16.86	4.14
6000	0.53	27.09	3.04	9.62	5.03	0.28	3400	29.96	17.15	4.32
6500	-2.65	26.89	2.62	7.46	5.86	0.34	3500	30.39	17.25	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 = 58mA, Vd = 2.8V @Temperature = -45degC

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	-2.05	48.23	0.20	1.08	-1.12	0.91	400	23.47	10.80	4.11
300	9.97	40.17	0.26	4.66	0.35	0.55	450	23.99	11.29	3.98
400	14.08	38.90	2.21	9.60	2.87	0.20	500	24.63	11.75	4.01
500	15.63	39.22	4.14	13.28	4.41	0.13	550	24.72	12.28	3.99
600	16.44	39.90	5.76	14.27	5.34	0.14	600	25.03	12.48	3.91
700	16.97	40.29	7.10	13.58	5.74	0.15	650	25.10	12.91	3.85
800	17.39	40.67	8.15	12.78	5.97	0.16	700	25.35	13.07	3.84
900	17.74	40.84	9.02	12.20	5.99	0.16	750	25.27	13.49	3.77
1000	18.04	40.89	9.76	11.68	5.91	0.16	800	25.58	13.32	3.84
1100	18.28	40.80	10.34	11.38	5.74	0.16	850	25.46	13.73	3.75
1200	18.50	40.50	10.81	11.10	5.45	0.16	900	25.37	13.44	3.68
1300	18.64	40.08	11.26	10.82	5.13	0.16	940	25.51	13.76	3.70
1400	18.76	39.50	11.71	10.62	4.76	0.17	1000	25.30	13.72	3.72
1500	18.80	38.91	12.18	10.46	4.44	0.17	1050	25.48	13.76	3.71
1600	18.82	38.21	12.76	10.37	4.12	0.17	1100	25.42	13.78	3.75
1700	18.76	37.22	13.53	10.33	3.73	0.17	1150	25.54	13.72	3.77
1800	18.63	36.41	14.43	10.32	3.49	0.17	1200	25.49	13.78	3.72
1900	18.47	35.37	15.38	10.53	3.19	0.17	1300	25.40	13.81	3.72
2000	18.21	34.68	16.61	10.63	3.07	0.17	1400	25.39	13.81	3.71
2100	17.91	33.87	17.55	10.92	2.92	0.17	1500	25.29	13.80	3.72
2200	17.56	33.23	18.16	11.26	2.84	0.16	1600	25.22	13.78	3.72
2300	17.13	32.49	18.28	11.60	2.75	0.16	1700	25.15	13.75	3.67
2400	16.72	32.08	17.60	12.10	2.76	0.15	1800	25.01	13.82	3.66
2500	16.22	31.39	16.78	12.70	2.71	0.15	1900	24.90	13.81	3.67
2600	15.72	31.01	15.53	13.14	2.74	0.14	2000	24.90	13.73	3.59
2700	15.20	30.58	14.40	13.61	2.75	0.13	2100	24.91	13.72	3.56
2800	14.66	30.28	13.30	13.92	2.80	0.12	2200	25.13	13.66	3.63
2900	14.13	29.97	12.43	14.25	2.84	0.12	2300	25.32	13.75	3.61
3000	13.60	29.70	11.63	14.44	2.89	0.11	2400	25.35	13.80	3.68
3100	13.06	29.44	10.91	14.62	2.95	0.10	2500	25.61	13.72	3.68
3200	12.53	29.24	10.25	14.79	3.01	0.09	2600	25.55	13.83	3.71
3400	11.47	28.80	9.14	15.06	3.13	0.07	2700	25.99	14.06	3.80
3600	10.48	28.38	8.28	15.20	3.24	0.06	2800	26.01	14.23	3.82
3800	9.48	27.95	7.59	14.93	3.34	0.06	2900	26.32	14.27	3.76
4000	8.48	27.62	7.09	14.46	3.51	0.08	3000	26.48	14.52	3.96
4500	6.16	28.10	5.64	12.70	4.35	0.15	3100	26.65	14.46	3.95
5000	3.58	29.04	4.71	9.64	5.66	0.23	3200	26.88	14.48	3.98
5500	1.22	27.63	3.45	7.70	5.02	0.32	3300	27.08	14.63	4.13
6000	-1.53	27.31	2.98	6.43	5.66	0.37	3400	26.82	14.74	4.32
6500	-4.45	27.29	2.66	5.51	6.75	0.42	3500	26.65	14.70	4.22

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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 = 65mA, Vd = 5V @Temperature = -45degC

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	-2.47	48.09	0.17	0.98	-0.63	0.91	400	27.78	15.97	4.18
300	10.06	39.35	0.18	4.60	0.30	0.57	450	28.92	16.95	4.03
400	14.73	36.86	2.06	10.89	2.04	0.15	500	29.57	17.50	4.04
500	16.54	36.69	3.99	17.96	3.01	0.08	550	29.93	17.84	4.06
600	17.45	37.36	5.70	20.41	3.67	0.14	600	30.10	18.08	3.94
700	18.03	37.78	7.19	17.86	3.97	0.16	650	30.36	18.23	3.92
800	18.46	38.32	8.42	16.12	4.22	0.16	700	30.39	18.32	3.88
900	18.80	39.14	9.44	15.31	4.56	0.15	750	30.26	18.35	3.84
1000	19.08	39.69	10.29	14.83	4.79	0.14	800	30.62	18.13	3.89
1100	19.31	40.49	10.92	14.79	5.17	0.13	850	30.41	18.24	3.80
1200	19.49	41.32	11.36	15.07	5.61	0.12	900	29.85	17.91	3.77
1300	19.59	42.27	11.77	15.39	6.23	0.11	940	29.84	18.03	3.76
1400	19.66	42.95	12.15	16.01	6.75	0.10	1000	29.63	17.84	3.81
1500	19.65	43.79	12.55	16.67	7.50	0.09	1050	29.53	17.79	3.75
1600	19.60	43.86	13.08	17.59	7.69	0.09	1100	29.57	17.64	3.80
1700	19.46	43.06	13.84	18.65	7.21	0.09	1150	29.31	17.54	3.82
1800	19.26	42.12	14.74	19.59	6.70	0.09	1200	29.43	17.35	3.80
1900	19.02	40.59	15.72	21.06	5.84	0.09	1300	29.10	17.13	3.75
2000	18.68	39.40	16.99	21.38	5.33	0.09	1400	28.76	17.00	3.74
2100	18.32	38.27	17.98	21.93	4.91	0.10	1500	28.33	16.82	3.78
2200	17.92	37.29	18.60	21.37	4.60	0.10	1600	28.09	16.57	3.79
2300	17.43	36.21	18.64	20.43	4.29	0.10	1700	27.88	16.35	3.75
2400	16.98	35.55	17.81	19.73	4.18	0.11	1800	27.80	16.14	3.73
2500	16.45	34.61	16.83	18.27	3.95	0.12	1900	27.72	15.93	3.74
2600	15.93	34.07	15.48	17.23	3.90	0.12	2000	27.74	15.73	3.64
2700	15.40	33.48	14.28	16.19	3.83	0.12	2100	27.63	15.66	3.66
2800	14.86	33.05	13.14	15.32	3.81	0.13	2200	27.71	15.59	3.72
2900	14.35	32.65	12.25	14.72	3.80	0.13	2300	27.78	15.72	3.70
3000	13.85	32.31	11.43	14.21	3.80	0.13	2400	27.75	15.90	3.75
3100	13.32	31.95	10.71	13.82	3.80	0.13	2500	27.99	15.92	3.74
3200	12.86	31.68	10.07	13.51	3.82	0.13	2600	28.07	16.13	3.79
3400	11.90	31.11	9.02	13.22	3.85	0.13	2700	28.76	16.46	3.84
3600	11.06	30.52	8.26	13.14	3.85	0.13	2800	29.01	16.55	3.91
3800	10.24	29.93	7.69	13.20	3.84	0.12	2900	29.50	16.69	3.84
4000	9.47	29.47	7.36	13.45	3.90	0.10	3000	29.82	16.93	4.03
4500	7.88	30.22	6.19	16.73	4.85	0.04	3100	29.87	16.95	4.06
5000	6.09	29.52	5.37	31.00	5.29	0.05	3200	30.19	17.14	4.06
5500	4.23	27.46	3.75	19.01	4.25	0.14	3300	30.57	17.54	4.21
6000	1.35	26.75	2.97	11.97	4.50	0.23	3400	30.71	18.00	4.35
6500	-2.13	26.40	2.50	8.34	5.19	0.31	3500	31.23	18.22	4.30

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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 = 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	-3.50	47.40	0.01	1.12	0.63	0.88	400	26.32	13.95	5.86
300	8.28	39.71	0.57	4.63	1.30	0.54	450	27.22	14.90	5.70
400	12.73	37.49	2.34	10.54	3.08	0.17	500	27.91	15.40	5.66
500	14.49	37.25	4.15	16.17	4.13	0.10	550	28.17	15.80	5.69
600	15.34	37.60	5.76	17.45	4.76	0.13	600	28.47	16.02	5.55
700	15.87	38.14	7.11	16.12	5.21	0.15	650	28.67	16.38	5.53
800	16.23	38.51	8.21	15.05	5.45	0.14	700	28.83	16.46	5.47
900	16.51	39.01	9.07	14.57	5.73	0.14	750	28.71	16.65	5.47
1000	16.72	39.47	9.77	14.32	5.99	0.13	800	29.18	16.42	5.49
1100	16.88	39.98	10.33	14.38	6.32	0.12	850	29.09	16.67	5.39
1200	17.00	40.55	10.75	14.50	6.72	0.11	900	28.66	16.36	5.32
1300	17.05	41.18	11.16	14.78	7.24	0.10	940	28.68	16.57	5.34
1400	17.07	41.48	11.57	15.23	7.56	0.10	1000	28.51	16.51	5.40
1500	17.03	41.66	12.02	15.61	7.84	0.10	1050	28.53	16.51	5.35
1600	16.95	41.74	12.56	16.25	8.06	0.09	1100	28.49	16.53	5.42
1700	16.80	41.26	13.21	16.82	7.85	0.09	1150	28.50	16.42	5.44
1800	16.60	40.77	13.98	17.52	7.67	0.09	1200	28.54	16.41	5.42
1900	16.37	39.61	14.86	18.44	6.98	0.09	1300	28.34	16.33	5.40
2000	16.07	38.78	15.98	19.20	6.63	0.09	1400	28.10	16.26	5.34
2100	15.77	37.52	17.18	20.52	6.00	0.09	1500	27.81	16.18	5.38
2200	15.40	36.76	18.50	21.53	5.77	0.09	1600	27.64	16.03	5.35
2300	14.99	35.79	19.64	22.60	5.43	0.09	1700	27.45	15.88	5.35
2400	14.63	35.09	20.03	23.58	5.24	0.09	1800	27.30	15.77	5.36
2500	14.15	34.16	19.72	23.74	4.97	0.09	1900	27.12	15.63	5.31
2600	13.72	33.53	18.46	23.46	4.85	0.09	2000	27.09	15.44	5.22
2700	13.25	32.98	16.97	22.44	4.77	0.10	2100	26.99	15.43	5.25
2800	12.76	32.52	15.42	21.27	4.73	0.09	2200	27.07	15.30	5.31
2900	12.30	32.02	14.16	20.45	4.66	0.10	2300	27.15	15.33	5.32
3000	11.82	31.63	12.99	19.52	4.64	0.09	2400	27.11	15.45	5.35
3100	11.34	31.27	12.00	18.99	4.63	0.09	2500	27.27	15.48	5.36
3200	10.88	30.90	11.16	18.48	4.60	0.09	2600	27.64	15.56	5.38
3400	9.94	30.35	9.74	17.96	4.64	0.08	2700	27.84	15.86	5.49
3600	9.06	29.70	8.70	17.92	4.60	0.07	2800	27.99	15.92	5.49
3800	8.20	29.17	7.89	18.38	4.62	0.06	2900	28.39	16.02	5.48
4000	7.37	28.81	7.31	19.13	4.74	0.04	3000	28.63	16.29	5.69
4500	5.27	29.20	6.30	22.90	6.00	0.06	3100	28.78	16.17	5.66
5000	3.30	28.86	4.87	16.59	6.33	0.12	3200	29.12	16.27	5.70
5500	0.80	27.85	3.97	12.17	6.51	0.20	3300	29.37	16.60	5.88
6000	-2.28	27.43	3.41	9.39	7.60	0.26	3400	29.22	16.83	6.12
6500	-5.67	27.51	3.04	7.49	9.70	0.32	3500	29.18	16.95	6.05

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Typical Performance Data

Definitions:
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Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 68mA, 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	-3.47	47.87	0.01	1.18	0.44	0.87	400	22.61	10.20	5.89
300	7.99	40.47	0.63	4.64	1.54	0.53	450	23.13	10.94	5.70
400	12.12	38.56	2.43	9.71	3.80	0.20	500	23.73	11.27	5.70
500	13.72	38.64	4.22	13.47	5.23	0.13	550	23.86	11.78	5.70
600	14.51	38.99	5.77	14.30	6.01	0.14	600	24.15	11.88	5.59
700	15.02	39.28	7.04	13.72	6.38	0.15	650	24.22	12.27	5.55
800	15.37	39.61	8.03	13.12	6.64	0.15	700	24.49	12.34	5.50
900	15.64	39.80	8.80	12.78	6.75	0.15	750	24.42	12.68	5.47
1000	15.85	39.79	9.45	12.52	6.70	0.14	800	24.71	12.43	5.46
1100	16.03	40.00	9.98	12.43	6.81	0.14	850	24.67	12.76	5.39
1200	16.16	39.94	10.42	12.31	6.72	0.14	900	24.58	12.43	5.38
1300	16.22	39.88	10.84	12.29	6.69	0.13	940	24.73	12.69	5.38
1400	16.27	39.59	11.28	12.32	6.49	0.13	1000	24.51	12.71	5.42
1500	16.25	39.38	11.75	12.31	6.40	0.13	1050	24.73	12.71	5.38
1600	16.19	38.88	12.29	12.43	6.14	0.13	1100	24.69	12.77	5.42
1700	16.08	38.19	12.94	12.49	5.80	0.13	1150	24.85	12.66	5.47
1800	15.92	37.56	13.69	12.66	5.56	0.13	1200	24.83	12.70	5.39
1900	15.72	36.67	14.55	12.90	5.19	0.13	1300	24.83	12.78	5.40
2000	15.46	35.92	15.58	13.13	4.95	0.13	1400	24.86	12.74	5.40
2100	15.19	35.05	16.69	13.61	4.68	0.12	1500	24.76	12.78	5.37
2200	14.85	34.46	17.93	14.00	4.58	0.12	1600	24.73	12.78	5.42
2300	14.47	33.68	19.02	14.48	4.41	0.12	1700	24.69	12.78	5.38
2400	14.13	33.12	19.49	15.09	4.32	0.11	1800	24.55	12.92	5.34
2500	13.68	32.35	19.36	15.72	4.18	0.11	1900	24.37	12.94	5.34
2600	13.26	31.85	18.30	16.29	4.13	0.11	2000	24.37	12.89	5.26
2700	12.80	31.33	16.93	16.81	4.09	0.10	2100	24.35	12.91	5.25
2800	12.31	30.97	15.46	17.15	4.12	0.10	2200	24.50	12.91	5.32
2900	11.85	30.57	14.22	17.50	4.11	0.09	2300	24.68	12.97	5.28
3000	11.36	30.21	13.06	17.64	4.12	0.09	2400	24.68	13.03	5.32
3100	10.86	29.91	12.05	17.69	4.16	0.08	2500	24.86	13.01	5.35
3200	10.39	29.60	11.19	17.73	4.17	0.07	2600	25.08	13.02	5.39
3400	9.38	29.08	9.72	17.41	4.25	0.06	2700	25.10	13.31	5.44
3600	8.42	28.60	8.61	16.96	4.32	0.06	2800	25.08	13.39	5.53
3800	7.44	28.18	7.72	16.26	4.41	0.06	2900	25.41	13.55	5.47
4000	6.49	27.82	7.07	15.59	4.56	0.08	3000	25.54	13.76	5.60
4500	3.97	28.29	5.94	13.20	5.91	0.14	3100	25.63	13.53	5.68
5000	1.58	28.74	4.57	9.91	6.82	0.22	3200	25.87	13.53	5.70
5500	-1.09	27.95	3.82	8.06	7.25	0.29	3300	26.02	13.69	5.89
6000	-4.06	27.72	3.39	6.86	8.68	0.33	3400	25.50	13.81	6.14
6500	-7.16	27.89	3.09	5.94	11.07	0.37	3500	25.52	13.79	6.11

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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 = 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	-3.79	47.40	0.03	1.08	0.87	0.88	400	27.32	15.76	5.96
300	8.15	39.34	0.56	4.58	1.28	0.55	450	28.44	16.92	5.76
400	12.80	36.73	2.30	11.07	2.80	0.15	500	29.11	17.48	5.76
500	14.66	36.39	4.10	18.63	3.69	0.08	550	29.50	17.86	5.71
600	15.55	36.66	5.75	20.25	4.21	0.13	600	29.79	18.09	5.65
700	16.09	37.09	7.16	17.76	4.56	0.15	650	30.07	18.30	5.61
800	16.46	37.51	8.33	16.23	4.79	0.14	700	30.11	18.39	5.60
900	16.72	38.16	9.25	15.68	5.13	0.13	750	30.10	18.47	5.59
1000	16.92	38.71	9.98	15.49	5.43	0.11	800	30.51	18.25	5.58
1100	17.07	39.51	10.53	15.69	5.92	0.10	850	30.34	18.36	5.45
1200	17.16	40.32	10.92	16.12	6.49	0.09	900	29.78	18.05	5.41
1300	17.19	41.37	11.27	16.74	7.36	0.07	940	29.78	18.18	5.44
1400	17.19	42.40	11.62	17.77	8.37	0.07	1000	29.57	18.01	5.44
1500	17.11	43.54	12.01	18.79	9.72	0.06	1050	29.53	17.98	5.43
1600	17.00	44.48	12.50	20.33	11.09	0.05	1100	29.54	17.82	5.47
1700	16.82	44.54	13.10	22.19	11.51	0.05	1150	29.36	17.70	5.49
1800	16.60	44.17	13.85	24.40	11.46	0.05	1200	29.49	17.51	5.48
1900	16.33	42.78	14.72	28.36	10.17	0.05	1300	29.19	17.33	5.46
2000	16.00	41.59	15.82	33.75	9.29	0.06	1400	28.81	17.19	5.44
2100	15.67	40.02	17.02	47.91	8.12	0.06	1500	28.40	17.01	5.44
2200	15.29	38.81	18.36	33.10	7.42	0.06	1600	28.17	16.77	5.45
2300	14.86	37.74	19.56	27.81	6.91	0.07	1700	27.95	16.50	5.45
2400	14.47	36.76	20.02	23.97	6.45	0.07	1800	27.82	16.33	5.42
2500	13.99	35.62	19.80	21.42	5.96	0.08	1900	27.66	16.07	5.41
2600	13.56	34.89	18.55	19.76	5.73	0.09	2000	27.65	15.84	5.29
2700	13.09	34.15	17.04	18.30	5.50	0.09	2100	27.50	15.75	5.36
2800	12.61	33.60	15.48	17.21	5.40	0.10	2200	27.52	15.66	5.39
2900	12.15	33.08	14.20	16.37	5.29	0.10	2300	27.56	15.71	5.38
3000	11.67	32.63	13.01	15.63	5.21	0.11	2400	27.48	15.85	5.43
3100	11.21	32.18	12.00	15.20	5.14	0.11	2500	27.69	15.80	5.43
3200	10.77	31.70	11.15	14.77	5.03	0.11	2600	28.02	15.97	5.44
3400	9.87	31.09	9.75	14.42	5.01	0.11	2700	28.37	16.24	5.57
3600	9.06	30.39	8.72	14.38	4.90	0.11	2800	28.62	16.39	5.56
3800	8.28	29.76	7.94	14.83	4.84	0.10	2900	29.00	16.45	5.56
4000	7.55	29.39	7.40	15.42	4.92	0.08	3000	29.31	16.74	5.76
4500	5.73	29.74	6.48	19.95	6.08	0.04	3100	29.47	16.64	5.78
5000	4.06	28.85	5.01	32.28	5.98	0.07	3200	29.52	16.85	5.81
5500	1.66	27.67	4.00	16.09	5.98	0.15	3300	30.11	17.33	6.01
6000	-1.57	27.11	3.35	10.90	6.88	0.22	3400	30.22	17.77	6.16
6500	-5.27	27.02	2.95	8.09	8.75	0.30	3500	30.25	18.06	6.07

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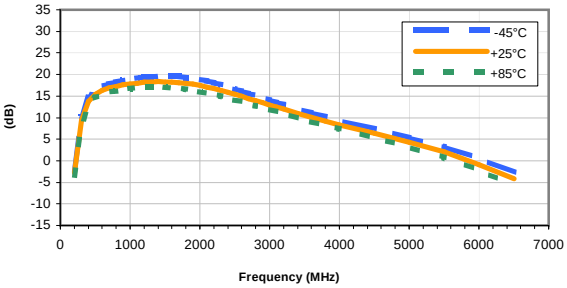
Typical Performance Curves

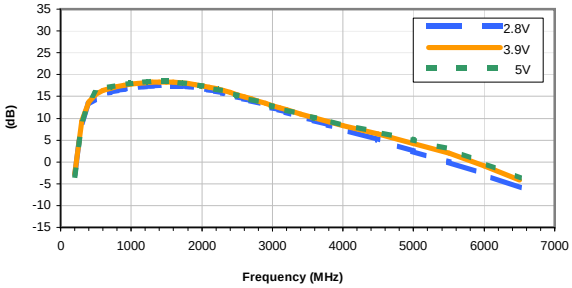
GAIN vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



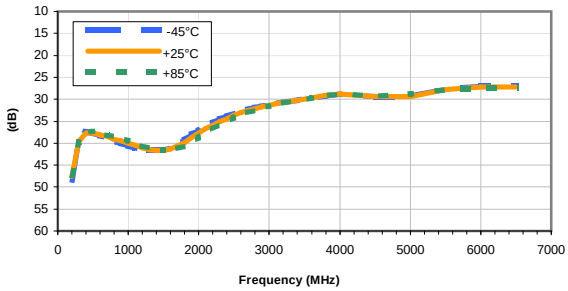
GAIN vs. VOLTAGE

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



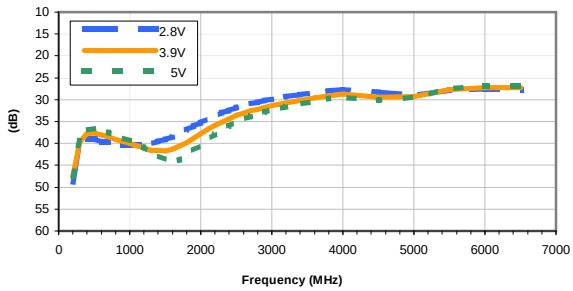
ISOLATION vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



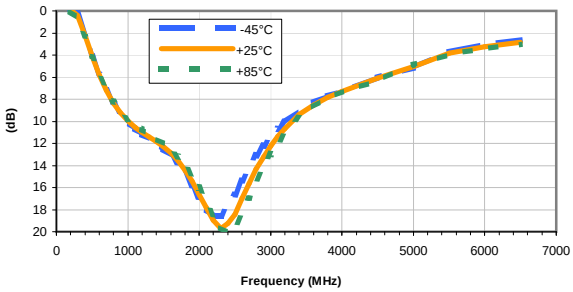
ISOLATION vs. VOLTAGE

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



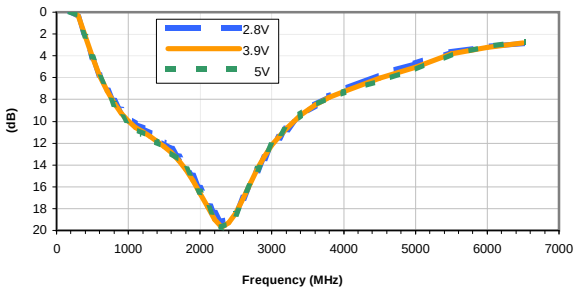
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



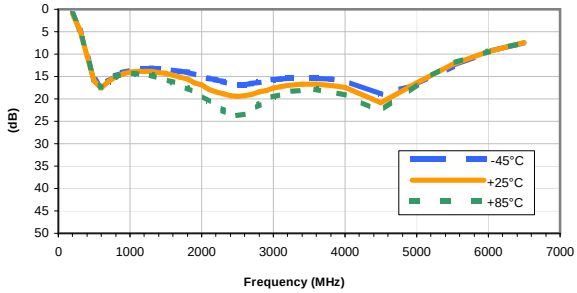
INPUT RETURN LOSS vs. VOLTAGE

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



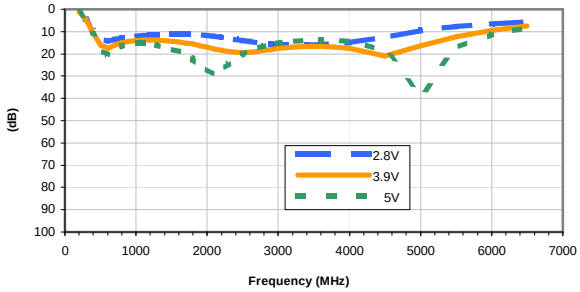
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

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



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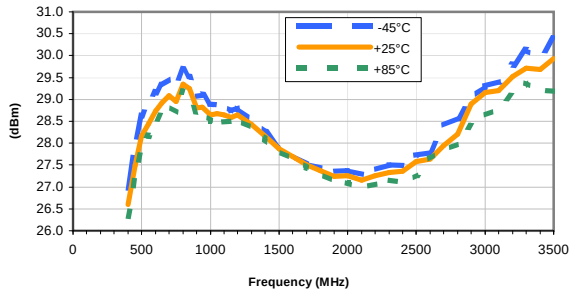
Typical Performance Curves

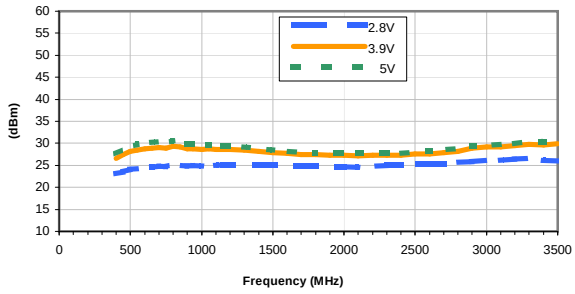
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



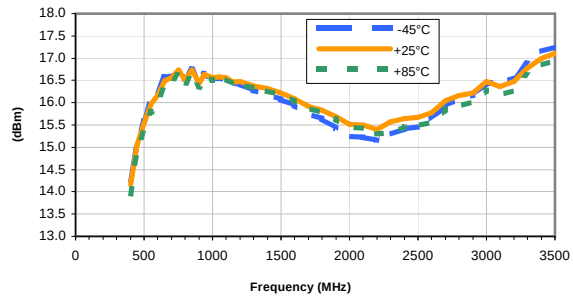
OUTPUT IP-3 vs. VOLTAGE

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



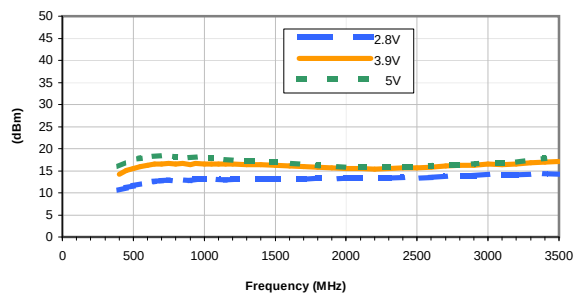
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



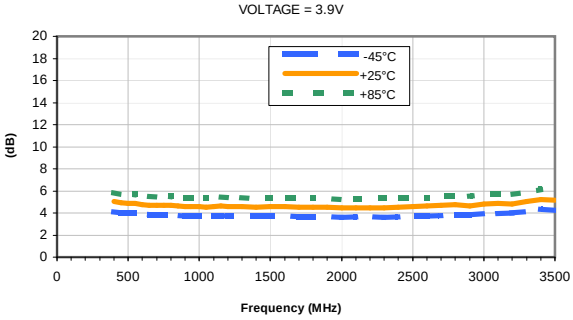
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



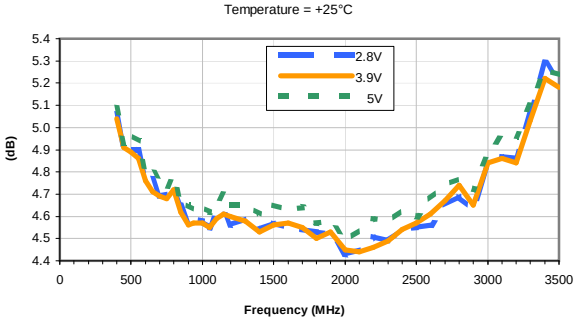
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V



Noise Figure vs. VOLTAGE

Temperature = +25°C



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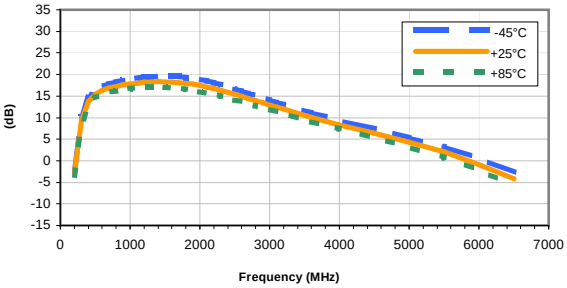
Typical Performance Curves

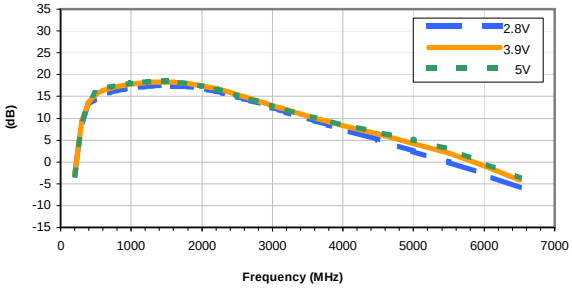
GAIN vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



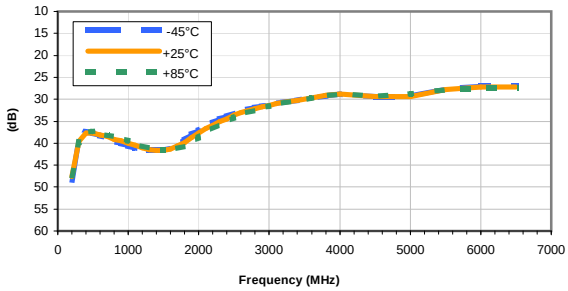
GAIN vs. VOLTAGE

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



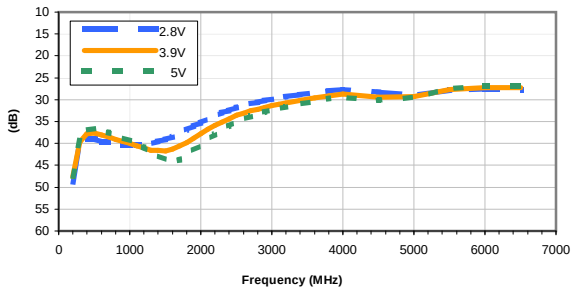
ISOLATION vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



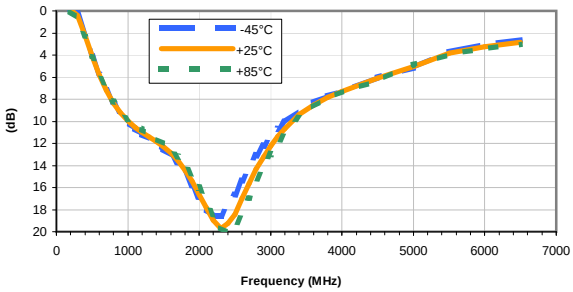
ISOLATION vs. VOLTAGE

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



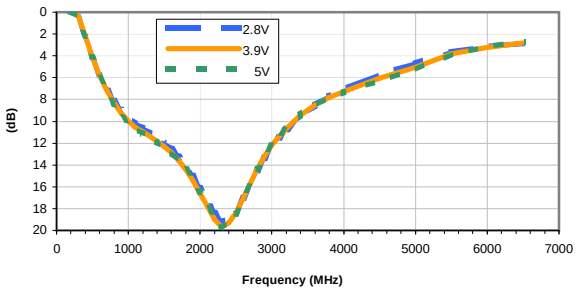
INPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



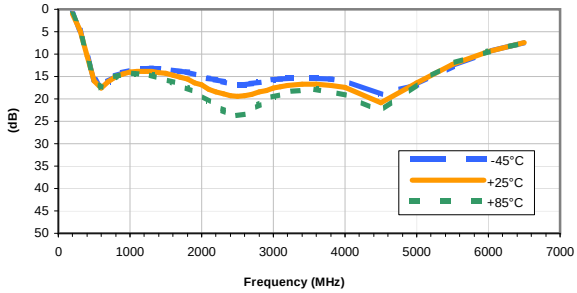
INPUT RETURN LOSS vs. VOLTAGE

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



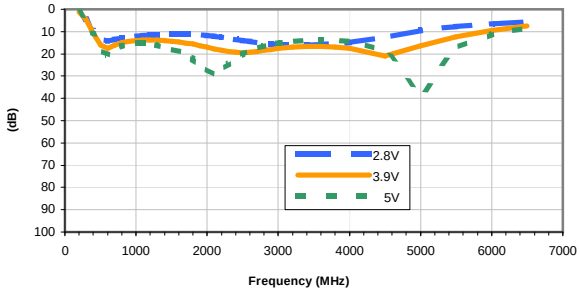
OUTPUT RETURN LOSS vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



OUTPUT RETURN LOSS vs. VOLTAGE

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



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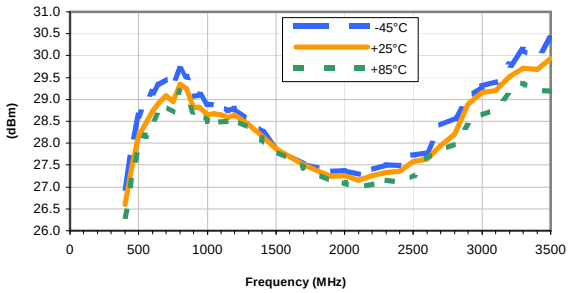
Typical Performance Curves

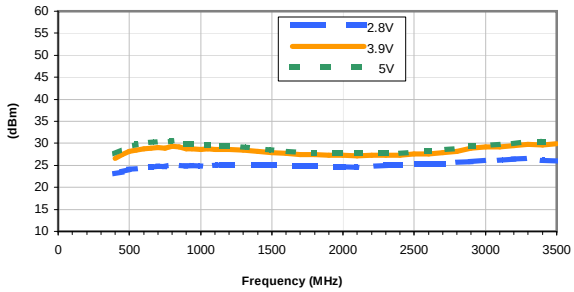
OUTPUT IP3 vs. TEMPERATURE

INPUT POWER = -20, VOLTAGE = 3.9V



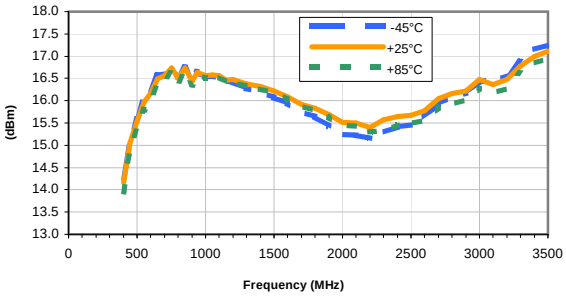
OUTPUT IP-3 vs. VOLTAGE

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



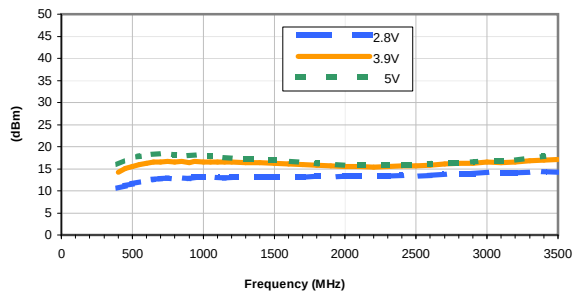
OUTPUT POWER at 1dB Compression vs. TEMPERATURE

VOLTAGE = 3.9V



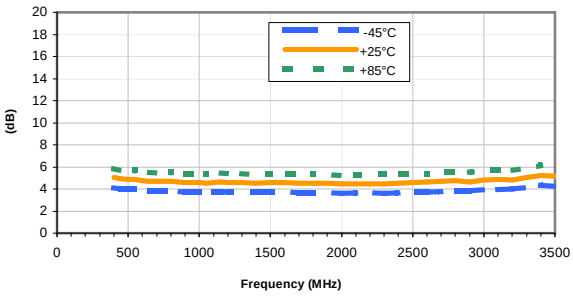
OUTPUT POWER at 1dB Compression vs. VOLTAGE

Temperature = +25°C



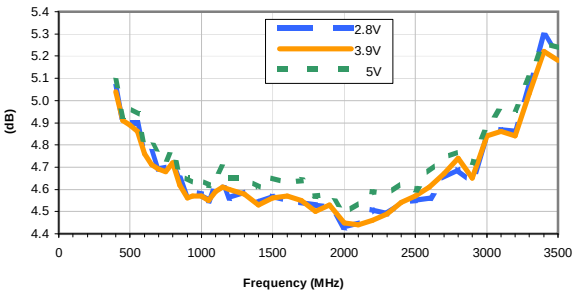
Noise Figure vs. TEMPERATURE

VOLTAGE = 3.9V



Noise Figure vs. VOLTAGE

Temperature = +25°C



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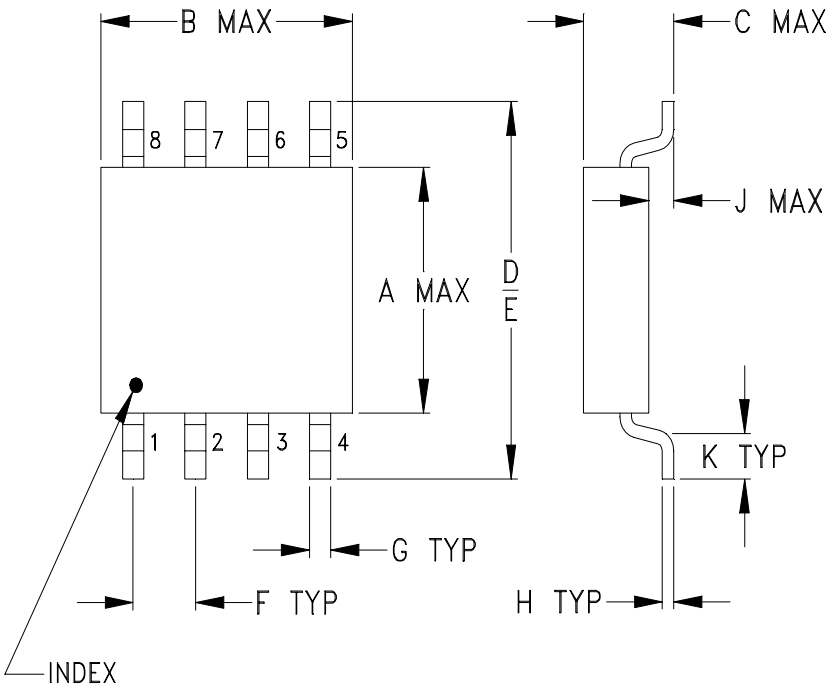
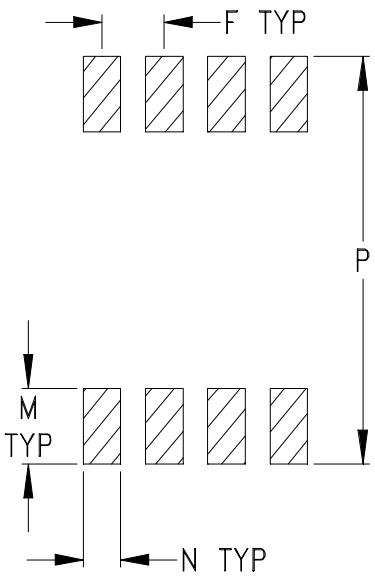
Case Style XX

XX211

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	N	P
XX211	.163 (4.14)	.210 (5.33)	.077 (1.96)	.250 (6.35)	.220 (5.59)	.050 (1.27)	.017 (0.43)	.009 (0.23)	.025 (0.64)	.030 (0.76)	-- --	.050 (1.27)	.030 (0.76)	.270 (6.86)

CASE #	Q	R	S	WT. GRAM
XX211	-- --	-- --	-- --	.10

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver alloy plate over Nickel barrier. All models, (+) suffix. ⊗
   For RoHS-5 Case Styles: Tin-Lead plate. All models, No (+) suffix.
3. Special Tolerances: Termination width ± .005 inch, termination thickness ± .003 inch.

⊗ Model BP4C+ will be supplied with either Tin finish or Tin-Silver-Nickel finish until Tin finish inventory is depleted.

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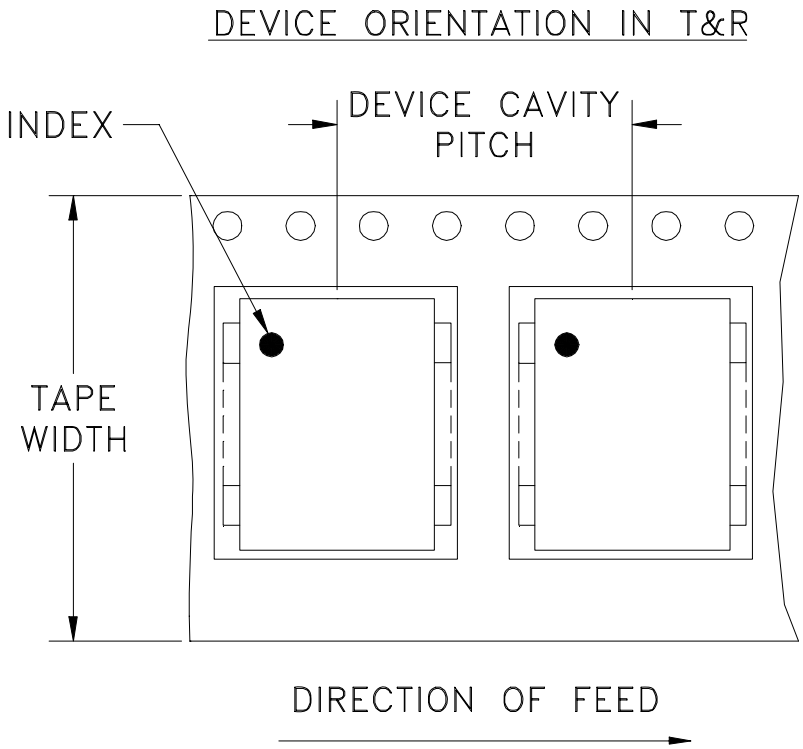
Tape & Reel Packaging TR-F16



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	8	7	Small quantity standards (see note)	20
				50
				100
				200
				500
			Standard	1000*
		13	Standard	2000**

Note : Please Consult individual model data sheet to determine device per reel availability
* BP models only
** MSW and MSWA models

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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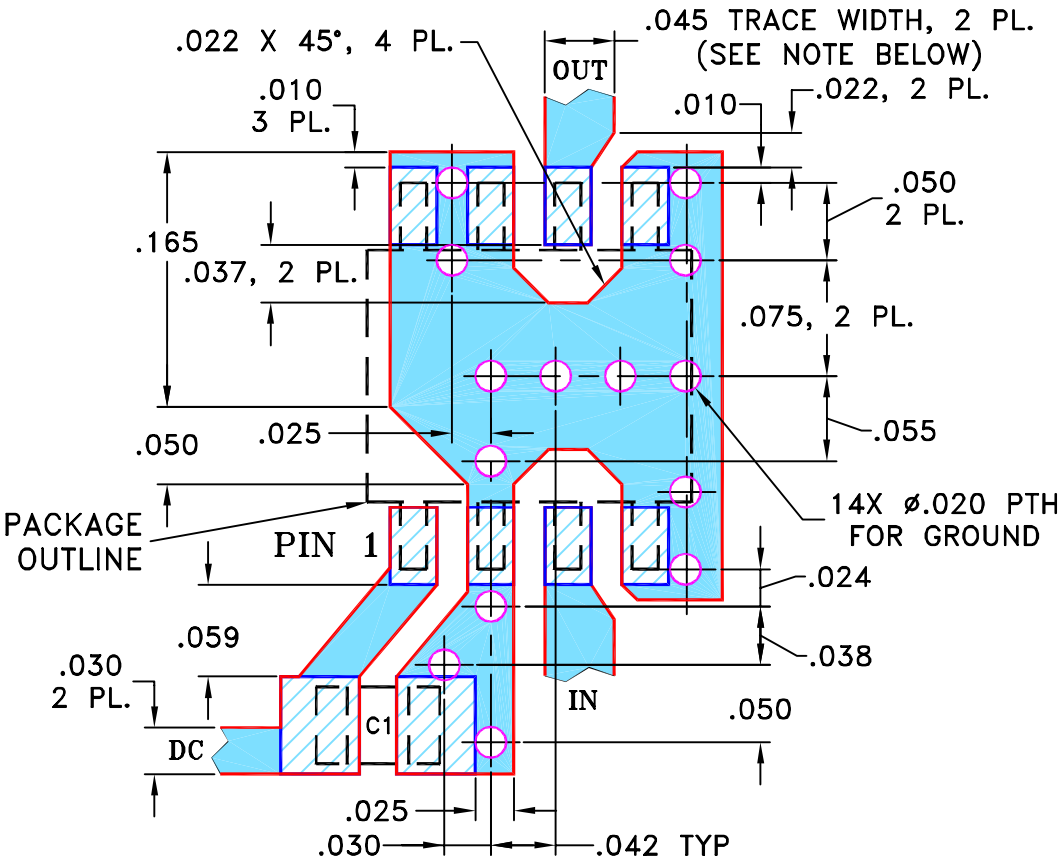
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	GF	DJ
A	M84246	UPDATED DRAWING	11/21/02	AV	LC
B	M91639	REMOVED NOTE 2, UPDATED DIMENSIONS	04/14/04	AV	DJ
C	M102713	UPDATED DWG. & ADDED "...WITH SMOBC"	01/25/06	MMG	DJ

SUGGESTED MOUNTING CONFIGURATION FOR XX211 CASE STYLE, "hj" PIN CONNECTION



CAPACITOR C1: .01 uF, 0805 SIZE

NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. 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 ±	APPROVED	DJ	08/05/02
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

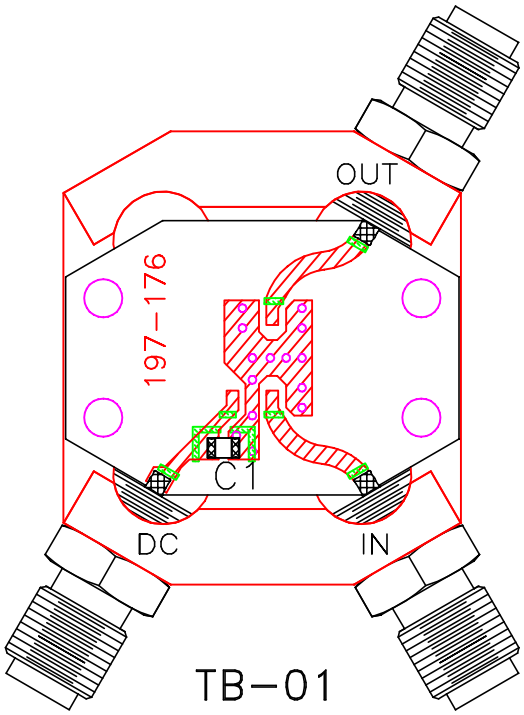
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, hj, XX211, VNA, TB-01

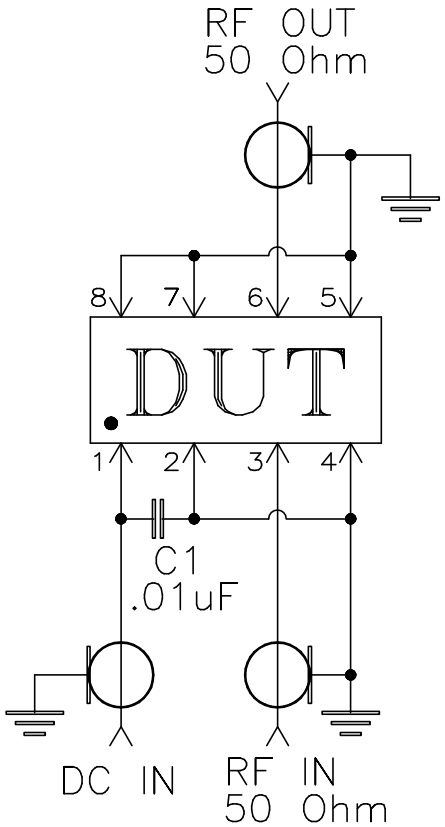
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-077	C

FILE:	SCALE:	SHEET:
98PL077	8:1	1 OF 1

Evaluation Board and Circuit



TB-01



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

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Environmental Specifications ENV08T1

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

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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

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