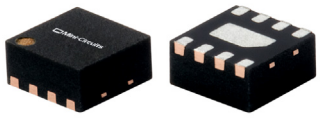
WIDEBAND

Monolithic Amplifier TSY-172LNB+

50Ω 0.03 to 1.7 GHz

THE BIG DEAL

- Very wideband, 30 MHz to 1.7 GHz
- Low NF over entire frequency band, 1.4 dB
- Low current and low voltage (2.7V and 7.7 mA)
- Internal bypass switching
- Suitable for low phase noise applications
- P1dB: +17.5 dBm typ.



Generic photo used for illustration purposes only

CASE STYLE: MC1631-1

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

APPLICATIONS

- Wireless Base Station Systems
- Test and Measurement Systems
- Multi-Band Receivers

PRODUCT OVERVIEW

TSY-172LNB+(RoHS compliant) is an advanced Low Voltage, Low Current, Low Noise wideband Bypass amplifier fabricated using GaAs E-PHEMT technology offering extremely high dynamic range over a broad frequency range. It has integrated switches enabling users to bypass the amplifier. TSY-172LNB+ is enclosed in a 8-lead 2 x 2 mm MCLP package for good thermal performance.

KEY FEATURES

Feature	Advantages
Ultra-wideband: 30 MHz to 1.7 GHz	Ideal for a wide range of receiver applications including military, commercial wireless, and instrumentation.
Low Voltage & Low Current +2.7V & 7.7 mA	Ideal for Battery operates systems
High IP3 +24.7 dBm typ at 1 GHz	Provides enhanced linearity over broad frequency range under high signal conditions.
Bypass feature Low insertion loss	Unlike other amplifiers, insertion loss is low in Bypass mode. (For Bypass, both V_{DD} and Ve are set to 0V.)
Compact size: 2 x 2 x 1 mm	Saves space in dense system layouts. Low inductance, repeatable transitions, and excellent thermal contact.
Low additive phase noise, typically -155 dBc/Hz @10 KHz offset	Ideal for low phase noise synthesizer applications

ELECTRICAL SPECIFICATIONS[1] AT 25°C, Z_O=50Ω & V_{DD}=+2.7V UNLESS OTHERWISE NOTED

Parameter	Condition (GHz)	Amplifier - ON			Amplifier - Bypass	Units
		Min.	Typ.	Max.	Typ.	
Frequency Range		0.03		1.7	0.03 - 1.7	GHz
Noise Figure	0.03		1.3		0.5	dB
	0.5		1.2		0.8	
	1.0		1.4		1.8	
	1.5		1.8		3.2	
	1.7		1.9		3.7	
Additive Phase Noise 2.0 GHz, 10KHz offset			-155		—	dBc/Hz
Gain	0.03	—	15.3	—	-0.5	dB
	0.5	—	14.7	—	-0.8	
	1.0	11.8	13.1	14.4	-1.8	
	1.5	—	11.0	—	-3.2	
	1.7	—	10.1	—	-3.7	
Input Return Loss	0.03		13		19	dB
	0.5		14		14	
	1.0		10		8	
	1.5		6		6	
	1.7		6		5	
Output Return Loss	0.03		16		18	dB
	0.5		18		13	
	1.0		14		7	
	1.5		11		5	
	1.7		10		6	
Output Power at 1dB Compression, AMP-ON[2]	0.03		15.8		1.2	dBm
	0.5		17.1		2.7	
	1.0		17.5		3.1	
	1.5		17.8		2.6	
	1.7		17.4		1.4	
Output IP3[3]	0.03		25.6		24.9	dBm
	0.5		26.4		28.4	
	1.0		24.7		30.4	
	1.5		24.0		23.5	
	1.7		22.4		19.5	
Device Operating Voltage (V_{DD})[5]		2.5	2.7	2.9	0	V
Device Operating Current ($I_{D+}I_e$)		—	7.7	10.6	0	mA
Enable Voltage (V_e)[5]		+2.5	+2.7	+2.9	0	V
Device Current Variation vs. Temperature[4]			1.5		—	µA/°C
Device Current Variation vs. Voltage			0.0067		—	mA/mV
Thermal Resistance, junction-to-ground lead			229		—	°C/W

1. Measured on Mini-Circuits Characterization Test Board TB-943+. See Characterization Test Circuit (Fig. 1)
2. Current increases to 28-54 mA typ. at P1dB
3. Tested at Pout=+6 dBm/tone
4. ((Current at 85°C - Current at -45°C)/130)
5. V_{DD} is always connected to Ve

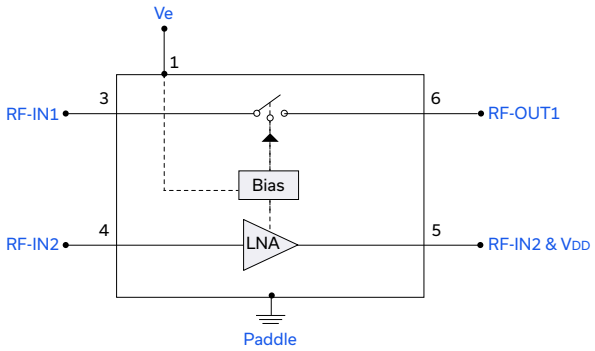
MAXIMUM RATINGS[6]

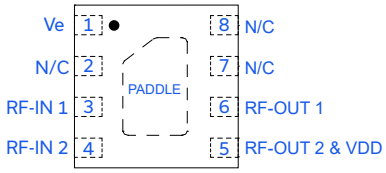
Parameter		Ratings
Operating Temperature (ground lead)		-40°C to 85°C
Storage Temperature		-65°C to 150°C
Total Power Dissipation		0.2W
Input Power	Amplifier - ON	10 dBm (continuous), +23 dBm (5 min. max)
	Amplifier Bypass	15 dBm (continuous), +22 dBm (5 min. max)
DC Voltage V_{DD} (Pad 5)		6V
DC Voltage Ve (Pad 1)		6V

	Min.	Typ.	Max.	Units
Amplifier-ON (V_{DD}, V_e)	2.5	2.7	2.9	V
Amplifier-Bypass (V_{DD}, V_e)	—	—	0.3	

6. Permanent damage may occur if any of these limits are exceeded.
Electrical maximum ratings are not intended for continuous normal operation.

SIMPLIFIED SCHEMATIC & PAD DESCRIPTION





Function	Pad Number	Description (See Figure 1)
RF-IN 1 & RF-IN 2	3,4	RF-Input pads. Pad 4 is connected to Pad 3 via two 0.1µF Capacitors
RF-OUT 1 & RF-OUT2 & VDD	5,6	RF-Output pads. Pad 6 is connected to Pad 5 via 0.1µF Capacitor.
Voltage Enable (Ve)	1	Enable Voltage pad. Ve is always connected to V_{DD}. For amplifier bypass, V_{DD} & Ve should be turned OFF simultaneously.
Ground	Paddle	Connect to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.
N/C	2,7,8	No connection

SWITCHING SPECIFICATIONS

Parameter		Min.	Typ.	Max.	Units
Amplifier ON to Bypass	OFF TIME (50% Control to 10% RF)	—	6	—	µS
	FALL TIME (90 TO 10% RF)	—	7	—	
Amplifier Bypass to ON	ON TIME (50% Control to 90% RF)	—	59	—	µS
	RISE TIME (10% to 90% RF)	—	20	—	
Control Voltage Leakage		—	443	—	mV

CHARACTERIZATION TEST CIRCUIT

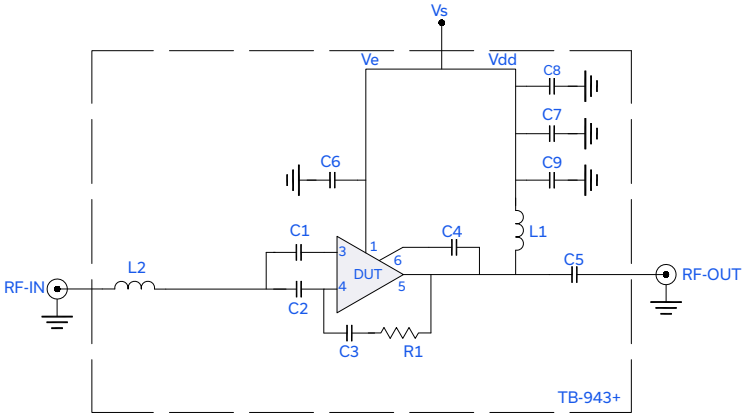


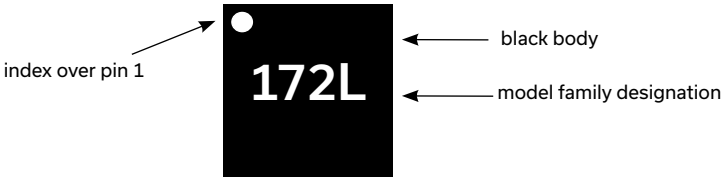
Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-943+)

Gain, Return loss, Output power at 1dB compression (P1dB), output IP3 (OIP3) and noise figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain and Return loss: Pin= -25dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, +6 dBm/tone at output.
3. Switching Time RF Signal: Pin=-10 dBm at 500 MHz.
   VDD=Ve=0 to 2.5. / 2.7 / 2.9V, Pulse Signal=500 Hz, 50% duty cycle.

Component	P/N	Supplier	Value	Size
L1	1008CS-102XJLC	Coilcraft	1uH	0.115'' x 0.11''
L2	LQG15HS3N0S02D	Murata	3nH	0402
C1 to C8	GRM155R71C104KA88D	Murata	0.1uF	0402
C9	GRM1555C1H102JA01D	Murata	1000pF	0402
R1	RK73H1ETTP4320F	KOA	432 Ω	0402

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MC1631-1 Plastic package, exposed paddle, lead finish: Matt Tin
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50, 100, 200, 500 or 2K devices
Suggested Layout for PCB Design	PL-536
Evaluation Board	TB-943+
Environmental Ratings	ENV08T1

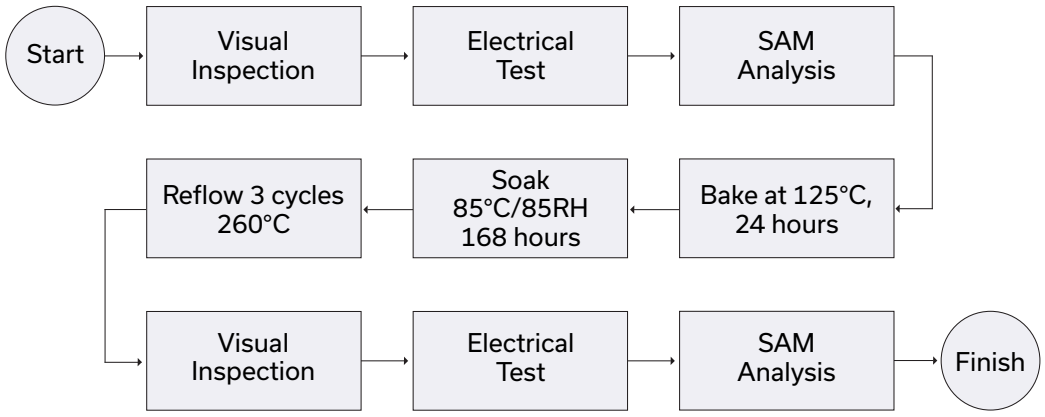
ESD RATING

Human Body Model (HBM): Class 1A (Pass 250) in accordance with ANSI/ESD STM 5.1 - 2001 Machine.

MSL RATING

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

MSL TEST FLOW CHART



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/terms/viewterm.html

Typical Performance Data

NOTE: Use PDF Bookmarks to view DATA at required conditions

Definitions:

Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.70V, Id = 7.97mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	14.51	20.00	8.64	7.65	1.08	0.50	30.75	15.13	1.74
20	15.26	19.32	12.44	12.85	1.08	0.55	27.96	15.68	1.31
30	15.39	19.18	13.59	15.85	1.07	0.56	26.81	16.01	1.27
40	15.45	19.12	14.14	17.82	1.07	0.56	26.60	16.71	1.24
50	15.46	19.11	14.64	19.13	1.07	0.56	25.89	17.01	1.22
60	15.47	19.09	14.85	20.01	1.07	0.57	26.79	16.80	1.17
70	15.47	19.08	14.89	20.58	1.07	0.57	27.29	16.72	1.19
80	15.46	19.07	14.95	20.97	1.07	0.57	28.00	16.77	1.15
90	15.46	19.06	15.08	21.19	1.07	0.57	27.74	16.95	1.15
100	15.46	19.05	15.11	21.34	1.07	0.57	27.91	16.57	1.16
150	15.42	19.06	15.09	21.39	1.07	0.57	31.46	16.75	1.18
200	15.37	19.03	15.09	20.62	1.07	0.58	28.28	16.73	1.14
250	15.31	19.05	15.09	20.11	1.07	0.59	36.03	16.98	1.18
300	15.24	19.02	15.07	19.23	1.07	0.59	28.04	16.94	1.15
350	15.15	19.03	14.97	18.64	1.07	0.60	33.82	16.85	1.20
400	15.05	19.00	14.80	17.95	1.07	0.61	28.48	16.98	1.22
450	14.95	18.98	14.63	17.23	1.06	0.62	27.57	17.21	1.22
500	14.83	18.97	14.36	16.65	1.06	0.64	33.07	17.39	1.22
550	14.70	18.98	14.04	16.17	1.06	0.65	30.16	17.13	1.25
600	14.56	18.97	13.72	15.70	1.06	0.67	28.52	17.17	1.29
650	14.41	18.96	13.31	15.20	1.06	0.69	29.00	17.32	1.30
700	14.23	18.98	12.85	14.75	1.06	0.71	29.57	17.19	1.31
750	14.09	18.96	12.47	14.52	1.06	0.72	29.69	17.57	1.29
800	13.92	18.97	12.02	14.21	1.06	0.74	30.49	17.47	1.36
850	13.74	18.97	11.57	13.86	1.06	0.76	29.93	17.28	1.36
900	13.54	18.99	11.10	13.49	1.05	0.78	28.79	17.37	1.39
950	13.34	19.01	10.64	13.16	1.05	0.81	28.75	17.76	1.40
1000	13.12	19.06	10.20	12.80	1.06	0.83	33.08	17.87	1.40
1100	12.50	19.34	9.11	12.10	1.08	0.90	27.48	17.63	1.48
1200	12.25	19.22	8.32	12.77	1.07	0.94	26.96	17.81	1.56
1300	11.86	19.25	7.76	11.77	1.07	0.96	27.01	17.86	1.65
1400	11.40	19.35	7.13	10.98	1.07	0.99	26.64	17.76	1.69
1500	10.93	19.48	6.54	10.25	1.07	1.01	24.66	18.36	1.75
1600	10.44	19.62	6.02	9.51	1.08	1.03	23.52	18.36	1.80
1700	9.95	19.79	5.56	8.83	1.09	1.04	22.65	17.89	1.93
1800	9.46	19.94	5.14	8.16	1.10	1.04	22.24	17.66	2.05
1900	8.97	20.13	4.76	7.51	1.11	1.03	21.17	17.36	2.15
2000	8.47	20.35	4.42	6.91	1.12	1.02	20.74	17.19	2.21

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.50V, Id = 6.69mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	13.81	19.70	8.06	7.17	1.09	0.51	25.08	14.59	1.83
20	14.59	18.95	11.17	11.88	1.08	0.56	24.80	15.14	1.38
30	14.74	18.81	12.11	14.29	1.08	0.57	24.43	15.44	1.34
40	14.79	18.74	12.53	15.66	1.08	0.58	23.87	16.15	1.27
50	14.81	18.73	12.87	16.45	1.08	0.58	23.33	16.48	1.29
60	14.82	18.71	13.02	16.91	1.08	0.58	23.98	16.27	1.24
70	14.82	18.69	13.07	17.17	1.08	0.58	25.14	16.19	1.28
80	14.82	18.69	13.09	17.34	1.08	0.58	26.18	16.24	1.23
90	14.82	18.67	13.17	17.41	1.08	0.58	26.97	16.44	1.21
100	14.81	18.66	13.19	17.45	1.08	0.58	29.32	16.05	1.22
150	14.77	18.67	13.22	17.50	1.08	0.59	28.57	16.23	1.23
200	14.72	18.64	13.25	17.07	1.08	0.59	29.06	16.22	1.22
250	14.67	18.65	13.28	16.87	1.07	0.60	27.18	16.47	1.26
300	14.60	18.62	13.31	16.33	1.07	0.60	26.77	16.43	1.29
350	14.51	18.62	13.27	15.99	1.07	0.62	27.50	16.34	1.27
400	14.42	18.60	13.18	15.52	1.07	0.62	26.45	16.48	1.28
450	14.31	18.57	13.11	15.02	1.06	0.63	25.99	16.73	1.30
500	14.20	18.56	12.95	14.60	1.06	0.65	27.53	16.90	1.24
550	14.06	18.57	12.75	14.24	1.06	0.66	28.64	16.64	1.29
600	13.93	18.55	12.54	13.87	1.06	0.68	27.77	16.66	1.33
650	13.77	18.55	12.22	13.47	1.05	0.69	27.82	16.86	1.33
700	13.60	18.56	11.88	13.12	1.05	0.71	27.68	16.71	1.38
750	13.46	18.54	11.59	12.93	1.05	0.73	27.01	17.10	1.39
800	13.28	18.55	11.21	12.67	1.05	0.75	26.83	16.98	1.44
850	13.10	18.55	10.84	12.36	1.05	0.77	26.30	16.76	1.42
900	12.90	18.57	10.45	12.06	1.04	0.79	25.92	16.86	1.44
950	12.70	18.60	10.02	11.78	1.04	0.81	25.43	17.24	1.47
1000	12.48	18.65	9.63	11.47	1.04	0.83	26.20	17.35	1.48
1100	11.85	18.95	8.60	10.95	1.06	0.90	24.23	17.09	1.56
1200	11.61	18.82	7.91	11.49	1.05	0.94	24.10	17.24	1.62
1300	11.21	18.87	7.36	10.61	1.05	0.96	24.21	17.29	1.71
1400	10.74	18.99	6.75	9.95	1.05	0.99	23.81	17.14	1.76
1500	10.26	19.14	6.17	9.34	1.05	1.01	22.74	17.93	1.83
1600	9.77	19.31	5.66	8.71	1.06	1.02	22.14	17.95	1.89
1700	9.27	19.50	5.21	8.12	1.07	1.03	21.47	17.57	2.01
1800	8.77	19.68	4.81	7.55	1.08	1.03	21.20	17.20	2.13
1900	8.28	19.90	4.44	6.98	1.09	1.03	20.35	16.84	2.25
2000	7.77	20.15	4.10	6.47	1.10	1.02	19.93	16.70	2.34

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.90V, Id = 9.31mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	15.11	20.25	9.33	7.98	1.08	0.49	28.88	15.61	1.71
20	15.78	19.62	13.40	13.47	1.07	0.53	28.43	16.10	1.28
30	15.91	19.50	14.99	16.93	1.07	0.54	27.55	16.45	1.22
40	15.96	19.44	15.75	19.46	1.07	0.55	28.14	17.15	1.18
50	15.97	19.43	16.34	21.41	1.07	0.55	27.58	17.42	1.17
60	15.98	19.41	16.63	22.89	1.07	0.55	28.02	17.22	1.12
70	15.98	19.40	16.76	24.14	1.07	0.55	26.69	17.14	1.13
80	15.98	19.39	16.84	25.12	1.07	0.55	26.34	17.20	1.11
90	15.97	19.38	16.95	25.82	1.07	0.55	25.77	17.35	1.08
100	15.96	19.38	16.97	26.32	1.07	0.55	25.53	17.00	1.09
150	15.93	19.38	17.00	26.69	1.07	0.56	26.52	17.17	1.10
200	15.88	19.36	16.97	24.96	1.07	0.56	25.58	17.14	1.10
250	15.82	19.38	16.89	23.71	1.07	0.57	27.33	17.39	1.13
300	15.74	19.35	16.80	22.26	1.07	0.58	26.05	17.33	1.17
350	15.66	19.36	16.57	21.23	1.07	0.59	27.37	17.27	1.16
400	15.56	19.34	16.30	20.28	1.07	0.60	26.66	17.38	1.16
450	15.45	19.32	16.00	19.33	1.07	0.61	26.01	17.58	1.16
500	15.33	19.32	15.59	18.58	1.06	0.63	27.13	17.76	1.19
550	15.20	19.33	15.13	17.96	1.06	0.64	26.63	17.51	1.19
600	15.07	19.32	14.70	17.39	1.06	0.66	26.02	17.56	1.20
650	14.92	19.31	14.16	16.81	1.06	0.68	26.20	17.66	1.24
700	14.74	19.33	13.61	16.28	1.06	0.70	26.48	17.58	1.26
750	14.60	19.31	13.14	16.01	1.06	0.72	26.91	17.94	1.30
800	14.43	19.32	12.62	15.65	1.06	0.74	27.34	17.85	1.29
850	14.25	19.32	12.11	15.25	1.06	0.76	27.79	17.70	1.31
900	14.05	19.34	11.61	14.83	1.06	0.78	27.46	17.79	1.34
950	13.85	19.36	11.10	14.45	1.06	0.80	28.01	18.17	1.34
1000	13.64	19.40	10.64	14.02	1.07	0.82	28.09	18.28	1.33
1100	13.02	19.67	9.50	13.13	1.09	0.89	30.59	18.07	1.42
1200	12.76	19.55	8.63	13.93	1.08	0.93	28.90	18.25	1.50
1300	12.38	19.57	8.07	12.78	1.08	0.95	28.43	18.31	1.59
1400	11.93	19.65	7.44	11.84	1.08	0.98	29.34	18.24	1.66
1500	11.46	19.76	6.84	10.98	1.09	1.01	26.30	18.65	1.69
1600	10.98	19.89	6.32	10.12	1.09	1.02	24.68	18.61	1.76
1700	10.50	20.03	5.85	9.34	1.10	1.03	23.72	18.08	1.88
1800	10.01	20.16	5.42	8.58	1.11	1.03	23.19	17.99	1.97
1900	9.52	20.34	5.03	7.86	1.12	1.03	21.93	17.73	2.07
2000	9.02	20.53	4.68	7.19	1.13	1.02	21.47	17.52	2.15

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.70V, Id = 7.01mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	14.56	19.98	8.67	7.48	1.08	0.49	27.62	15.14	1.47
20	15.30	19.30	12.32	12.64	1.07	0.54	27.11	15.53	1.05
30	15.43	19.18	13.44	15.55	1.07	0.55	26.33	15.97	1.01
40	15.48	19.12	13.98	17.39	1.07	0.55	26.05	16.81	0.96
50	15.50	19.10	14.41	18.51	1.07	0.56	25.30	17.17	0.93
60	15.51	19.09	14.58	19.17	1.07	0.56	26.16	16.92	0.93
70	15.50	19.07	14.56	19.51	1.07	0.56	27.25	16.80	0.96
80	15.50	19.07	14.54	19.69	1.07	0.56	28.47	16.91	0.91
90	15.50	19.06	14.59	19.72	1.07	0.56	28.68	17.04	0.88
100	15.49	19.05	14.55	19.72	1.07	0.56	29.10	16.60	0.90
150	15.45	19.06	14.37	19.45	1.07	0.57	33.23	16.83	0.92
200	15.41	19.03	14.43	18.94	1.07	0.57	29.90	16.76	0.89
250	15.37	19.03	14.67	19.07	1.07	0.58	33.19	17.08	0.92
300	15.31	18.99	14.97	18.81	1.07	0.58	29.46	16.94	0.95
350	15.24	19.00	15.11	18.68	1.07	0.59	37.21	16.86	0.90
400	15.15	18.97	15.02	18.17	1.06	0.60	29.82	16.94	0.92
450	15.05	18.96	14.78	17.48	1.06	0.61	28.68	17.23	0.92
500	14.93	18.96	14.44	16.87	1.06	0.63	37.52	17.47	0.90
550	14.80	18.98	14.02	16.34	1.06	0.64	34.05	17.08	0.91
600	14.66	18.97	13.66	15.79	1.06	0.66	30.83	17.20	0.98
650	14.52	18.98	13.22	15.17	1.05	0.68	32.36	17.33	0.99
700	14.35	18.99	12.80	14.61	1.05	0.70	34.07	17.27	1.00
750	14.20	18.99	12.41	14.30	1.05	0.71	32.92	17.69	1.01
800	14.04	19.00	11.96	13.94	1.05	0.73	32.80	17.57	1.03
850	13.87	19.00	11.52	13.61	1.05	0.75	30.55	17.38	1.02
900	13.68	19.02	11.03	13.31	1.05	0.77	29.66	17.47	1.05
950	13.49	19.04	10.53	13.07	1.05	0.79	28.91	18.01	1.06
1000	13.28	19.09	10.08	12.76	1.05	0.82	27.71	18.23	1.07
1100	12.73	19.32	9.09	11.97	1.06	0.88	26.35	18.03	1.12
1200	12.39	19.30	8.11	13.07	1.06	0.94	26.34	18.16	1.22
1300	12.02	19.32	7.60	11.77	1.06	0.96	26.30	18.28	1.28
1400	11.56	19.44	6.96	10.83	1.06	0.98	25.24	18.17	1.30
1500	11.09	19.58	6.39	10.03	1.06	1.01	23.94	19.29	1.35
1600	10.61	19.73	5.88	9.26	1.06	1.02	23.24	19.22	1.39
1700	10.12	19.92	5.43	8.56	1.07	1.03	22.40	18.99	1.53
1800	9.63	20.08	5.02	7.88	1.07	1.03	22.19	18.56	1.58
1900	9.14	20.28	4.63	7.24	1.08	1.02	21.23	18.18	1.67
2000	8.66	20.49	4.28	6.67	1.09	1.01	20.61	18.08	1.73

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.50V, Id = 5.74mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	13.79	19.67	8.01	7.01	1.09	0.50	23.71	14.81	1.56
20	14.57	18.95	10.95	11.67	1.08	0.56	23.95	15.28	1.12
30	14.72	18.80	11.88	13.99	1.08	0.57	23.71	15.55	1.05
40	14.77	18.74	12.28	15.26	1.08	0.57	23.13	16.38	1.05
50	14.78	18.72	12.55	15.93	1.08	0.58	22.61	16.77	1.00
60	14.80	18.71	12.65	16.28	1.08	0.58	23.20	16.53	0.97
70	14.80	18.69	12.66	16.42	1.08	0.58	24.39	16.41	1.01
80	14.79	18.69	12.66	16.48	1.08	0.58	25.34	16.50	0.97
90	14.78	18.67	12.66	16.45	1.08	0.58	26.10	16.67	0.93
100	14.77	18.67	12.63	16.42	1.08	0.58	28.01	16.22	0.95
150	14.74	18.68	12.51	16.20	1.08	0.58	26.41	16.44	0.96
200	14.70	18.64	12.57	15.88	1.07	0.58	27.56	16.40	0.96
250	14.66	18.64	12.79	16.05	1.07	0.59	25.55	16.70	0.98
300	14.61	18.59	13.06	15.90	1.07	0.60	26.06	16.56	0.99
350	14.54	18.59	13.21	15.91	1.07	0.61	25.95	16.47	0.96
400	14.45	18.56	13.21	15.57	1.07	0.62	25.77	16.57	1.01
450	14.35	18.53	13.11	15.08	1.06	0.63	25.35	16.89	1.00
500	14.23	18.53	12.89	14.65	1.06	0.64	25.95	17.11	0.94
550	14.10	18.55	12.61	14.27	1.06	0.66	27.11	16.71	0.98
600	13.96	18.54	12.36	13.83	1.05	0.67	26.78	16.83	1.02
650	13.82	18.54	12.03	13.34	1.05	0.69	26.63	17.01	1.07
700	13.64	18.55	11.70	12.90	1.05	0.71	26.36	16.96	1.08
750	13.50	18.55	11.41	12.64	1.04	0.72	25.80	17.36	1.10
800	13.33	18.55	11.04	12.35	1.04	0.74	25.52	17.24	1.07
850	13.16	18.55	10.68	12.07	1.04	0.76	25.04	17.01	1.09
900	12.97	18.57	10.27	11.83	1.04	0.78	24.84	17.11	1.09
950	12.78	18.60	9.83	11.63	1.04	0.80	24.33	17.58	1.11
1000	12.57	18.64	9.43	11.39	1.04	0.82	24.15	17.74	1.12
1100	12.00	18.88	8.52	10.77	1.05	0.89	23.15	17.51	1.19
1200	11.68	18.85	7.67	11.72	1.04	0.95	23.20	17.61	1.28
1300	11.30	18.88	7.17	10.62	1.04	0.96	23.17	17.71	1.33
1400	10.83	19.02	6.55	9.85	1.04	0.99	22.54	17.54	1.37
1500	10.35	19.18	5.99	9.18	1.04	1.01	21.78	18.71	1.45
1600	9.85	19.35	5.49	8.54	1.04	1.02	21.45	18.65	1.47
1700	9.35	19.55	5.06	7.94	1.05	1.03	20.96	18.49	1.59
1800	8.86	19.73	4.66	7.35	1.05	1.03	20.91	18.00	1.69
1900	8.36	19.96	4.28	6.79	1.06	1.02	20.25	17.57	1.78
2000	7.87	20.20	3.95	6.29	1.07	1.01	19.76	17.46	1.84

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.90V, Id = 8.38mA @ Temperature = -45°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	15.24	20.27	9.39	7.88	1.07	0.47	33.18	15.40	1.39
20	15.90	19.65	13.44	13.40	1.07	0.52	28.67	15.56	1.02
30	16.02	19.53	15.03	16.83	1.07	0.53	27.46	16.19	0.96
40	16.07	19.48	15.82	19.32	1.07	0.54	28.26	17.04	0.93
50	16.08	19.47	16.29	21.13	1.07	0.54	27.81	17.36	0.87
60	16.09	19.45	16.56	22.41	1.07	0.54	28.26	17.13	0.85
70	16.09	19.44	16.64	23.35	1.07	0.54	26.84	17.02	0.89
80	16.09	19.43	16.65	23.95	1.07	0.54	26.48	17.14	0.81
90	16.08	19.42	16.66	24.30	1.07	0.54	25.95	17.24	0.81
100	16.07	19.41	16.64	24.46	1.07	0.54	25.59	16.84	0.84
150	16.04	19.43	16.42	24.10	1.07	0.55	26.57	17.08	0.84
200	15.99	19.40	16.47	23.14	1.06	0.55	25.68	16.96	0.81
250	15.95	19.40	16.74	23.00	1.06	0.56	27.37	17.31	0.86
300	15.89	19.37	17.02	22.35	1.06	0.56	26.32	17.17	0.86
350	15.81	19.38	17.03	21.78	1.06	0.58	27.51	17.10	0.86
400	15.72	19.36	16.80	20.95	1.06	0.59	27.05	17.19	0.87
450	15.62	19.34	16.40	19.98	1.06	0.60	26.49	17.41	0.88
500	15.50	19.35	15.86	19.15	1.06	0.61	27.41	17.68	0.84
550	15.37	19.36	15.29	18.44	1.06	0.63	26.85	17.29	0.90
600	15.24	19.36	14.81	17.77	1.06	0.65	26.32	17.42	0.91
650	15.09	19.36	14.25	17.02	1.06	0.67	26.66	17.49	0.92
700	14.93	19.38	13.73	16.35	1.06	0.69	27.04	17.45	0.95
750	14.78	19.38	13.25	15.98	1.06	0.70	27.76	17.88	0.94
800	14.62	19.38	12.74	15.56	1.06	0.72	28.20	17.77	0.97
850	14.45	19.38	12.21	15.18	1.06	0.74	28.98	17.66	0.97
900	14.26	19.40	11.67	14.84	1.06	0.76	28.89	17.75	1.00
950	14.07	19.42	11.11	14.54	1.06	0.79	30.33	18.33	0.98
1000	13.87	19.46	10.63	14.18	1.06	0.81	27.59	18.61	1.01
1100	13.32	19.68	9.60	13.17	1.07	0.87	35.42	18.44	1.08
1200	12.97	19.66	8.50	14.45	1.08	0.93	32.88	18.60	1.12
1300	12.62	19.66	7.99	12.93	1.07	0.95	32.52	18.75	1.20
1400	12.17	19.76	7.35	11.82	1.07	0.98	30.42	18.67	1.23
1500	11.71	19.87	6.76	10.87	1.07	1.00	27.05	19.72	1.28
1600	11.23	20.00	6.25	9.97	1.08	1.01	25.26	19.67	1.33
1700	10.75	20.16	5.79	9.16	1.08	1.02	24.00	19.37	1.44
1800	10.27	20.29	5.37	8.38	1.09	1.02	23.56	19.03	1.52
1900	9.78	20.47	4.95	7.66	1.09	1.02	22.20	18.68	1.58
2000	9.29	20.65	4.60	7.00	1.10	1.00	21.51	18.58	1.61

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.70V, Id = 8.93mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	14.43	19.96	8.66	7.65	1.08	0.51	33.40	14.38	2.03
20	15.17	19.28	12.24	12.80	1.08	0.55	28.97	15.03	1.55
30	15.31	19.14	13.42	15.80	1.08	0.56	27.51	15.46	1.53
40	15.36	19.08	13.99	17.76	1.07	0.57	27.46	16.06	1.48
50	15.37	19.06	14.49	19.09	1.08	0.57	26.66	16.27	1.44
60	15.39	19.05	14.75	20.00	1.07	0.57	27.60	16.12	1.41
70	15.39	19.03	14.84	20.68	1.07	0.57	27.57	16.08	1.44
80	15.39	19.02	14.95	21.19	1.07	0.57	27.89	16.10	1.41
90	15.39	19.01	15.12	21.58	1.07	0.57	27.35	16.26	1.37
100	15.38	19.00	15.20	21.90	1.07	0.57	27.18	15.95	1.40
150	15.35	19.00	15.44	22.59	1.07	0.58	29.18	16.09	1.40
200	15.30	18.98	15.51	21.87	1.07	0.58	27.44	16.08	1.40
250	15.23	19.00	15.37	20.88	1.07	0.59	31.32	16.27	1.42
300	15.14	18.98	15.17	19.55	1.07	0.60	27.65	16.26	1.45
350	15.05	18.99	14.88	18.57	1.07	0.61	31.02	16.20	1.45
400	14.94	18.97	14.62	17.67	1.07	0.62	28.18	16.32	1.46
450	14.83	18.95	14.39	16.84	1.07	0.63	27.25	16.44	1.48
500	14.71	18.94	14.15	16.25	1.06	0.65	30.60	16.59	1.43
550	14.57	18.95	13.84	15.74	1.06	0.66	28.77	16.43	1.49
600	14.43	18.93	13.54	15.28	1.06	0.68	27.70	16.44	1.55
650	14.27	18.93	13.13	14.80	1.06	0.69	27.96	16.53	1.55
700	14.09	18.94	12.69	14.37	1.06	0.72	28.40	16.42	1.61
750	13.95	18.92	12.34	14.11	1.06	0.73	28.73	16.75	1.62
800	13.77	18.92	11.90	13.77	1.06	0.75	29.43	16.69	1.65
850	13.59	18.93	11.48	13.41	1.06	0.77	29.50	16.56	1.64
900	13.38	18.94	11.06	13.05	1.06	0.79	28.39	16.61	1.67
950	13.18	18.97	10.61	12.73	1.06	0.81	28.69	16.87	1.71
1000	12.96	19.01	10.19	12.38	1.06	0.83	33.23	16.88	1.69
1100	12.32	19.30	9.05	11.99	1.08	0.91	28.76	16.63	1.78
1200	12.11	19.12	8.43	12.29	1.07	0.93	27.71	16.80	1.86
1300	11.71	19.16	7.85	11.49	1.07	0.95	27.62	16.82	1.95
1400	11.25	19.25	7.22	10.82	1.07	0.98	27.58	16.74	2.01
1500	10.78	19.37	6.63	10.17	1.08	1.01	25.11	16.80	2.07
1600	10.30	19.51	6.10	9.50	1.09	1.02	23.94	16.74	2.19
1700	9.81	19.68	5.63	8.87	1.10	1.04	22.96	16.24	2.25
1800	9.32	19.83	5.20	8.25	1.11	1.04	22.45	16.21	2.44
1900	8.82	20.02	4.80	7.63	1.12	1.04	21.31	15.99	2.51
2000	8.30	20.25	4.45	7.06	1.13	1.03	20.81	15.71	2.64

Typical Performance Data

Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.50V, Id = 7.61mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	13.79	19.67	8.09	7.22	1.09	0.51	26.14	13.92	2.11
20	14.57	18.95	11.12	11.92	1.08	0.56	25.83	14.51	1.64
30	14.71	18.80	12.09	14.36	1.08	0.58	25.33	14.88	1.58
40	14.77	18.74	12.57	15.77	1.08	0.58	24.78	15.54	1.54
50	14.79	18.71	12.91	16.63	1.08	0.58	24.18	15.79	1.50
60	14.80	18.70	13.09	17.16	1.08	0.58	24.95	15.63	1.48
70	14.81	18.68	13.20	17.52	1.08	0.58	26.18	15.58	1.49
80	14.81	18.67	13.29	17.77	1.08	0.58	27.45	15.59	1.48
90	14.81	18.65	13.40	17.96	1.08	0.58	28.20	15.79	1.47
100	14.80	18.64	13.46	18.11	1.08	0.58	30.51	15.45	1.47
150	14.78	18.64	13.69	18.56	1.08	0.59	32.42	15.60	1.49
200	14.72	18.61	13.78	18.20	1.08	0.59	31.11	15.60	1.48
250	14.66	18.63	13.71	17.74	1.08	0.61	29.70	15.81	1.47
300	14.57	18.61	13.58	16.88	1.07	0.61	28.02	15.79	1.50
350	14.47	18.63	13.38	16.24	1.07	0.62	30.06	15.71	1.51
400	14.37	18.61	13.21	15.59	1.07	0.63	27.64	15.85	1.53
450	14.26	18.59	13.07	14.96	1.07	0.64	26.94	16.02	1.56
500	14.14	18.58	12.90	14.50	1.06	0.65	29.93	16.17	1.53
550	14.00	18.58	12.71	14.12	1.06	0.67	30.76	15.99	1.58
600	13.86	18.57	12.50	13.76	1.06	0.68	28.93	15.99	1.59
650	13.71	18.56	12.19	13.35	1.06	0.70	29.14	16.12	1.63
700	13.52	18.58	11.85	13.00	1.06	0.72	29.20	15.98	1.67
750	13.38	18.56	11.56	12.77	1.05	0.73	28.37	16.34	1.68
800	13.20	18.56	11.20	12.47	1.05	0.75	28.32	16.26	1.69
850	13.02	18.57	10.85	12.16	1.05	0.77	27.64	16.10	1.73
900	12.82	18.59	10.46	11.85	1.05	0.79	26.93	16.17	1.74
950	12.62	18.62	10.06	11.56	1.05	0.81	26.43	16.48	1.74
1000	12.39	18.67	9.67	11.25	1.05	0.83	27.95	16.52	1.74
1100	11.75	18.96	8.62	10.98	1.07	0.91	25.28	16.22	1.85
1200	11.55	18.79	8.07	11.18	1.06	0.93	24.99	16.40	1.95
1300	11.14	18.85	7.50	10.47	1.06	0.95	25.18	16.43	2.00
1400	10.68	18.97	6.88	9.88	1.06	0.98	24.83	16.30	2.11
1500	10.20	19.10	6.30	9.32	1.06	1.00	23.38	16.55	2.16
1600	9.71	19.27	5.79	8.74	1.07	1.02	22.66	16.55	2.27
1700	9.21	19.46	5.33	8.19	1.08	1.03	21.87	16.07	2.39
1800	8.71	19.63	4.91	7.65	1.09	1.03	21.52	15.93	2.53
1900	8.20	19.86	4.52	7.11	1.11	1.03	20.56	15.67	2.65
2000	7.69	20.11	4.18	6.61	1.12	1.03	20.09	15.45	2.74

Typical Performance Data

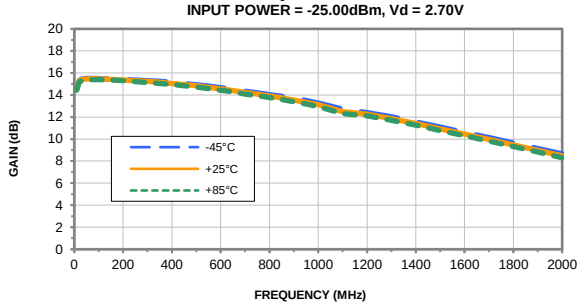
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 2.90V, Id = 10.24mA @ Temperature = +85°C

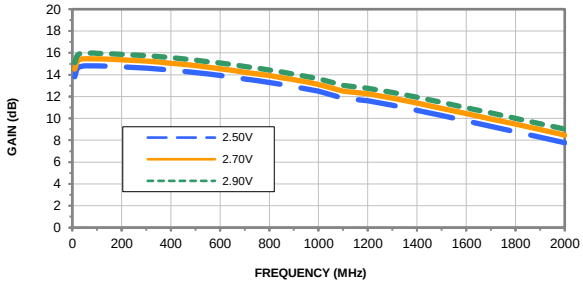
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10	14.95	20.17	9.28	7.95	1.08	0.50	28.32	14.71	1.98
20	15.63	19.54	13.11	13.36	1.07	0.54	28.62	15.43	1.51
30	15.76	19.41	14.62	16.74	1.07	0.55	27.90	15.92	1.45
40	15.82	19.35	15.38	19.18	1.07	0.55	28.49	16.48	1.44
50	15.82	19.34	15.94	21.02	1.07	0.56	27.85	16.63	1.39
60	15.84	19.32	16.27	22.45	1.07	0.56	28.04	16.51	1.38
70	15.84	19.30	16.46	23.68	1.07	0.56	26.58	16.48	1.37
80	15.84	19.30	16.62	24.69	1.07	0.56	26.15	16.51	1.34
90	15.83	19.29	16.77	25.57	1.07	0.56	25.58	16.62	1.32
100	15.83	19.28	16.86	26.26	1.07	0.56	25.33	16.36	1.34
150	15.80	19.28	17.18	27.81	1.07	0.56	26.14	16.49	1.34
200	15.74	19.27	17.22	26.03	1.07	0.57	25.38	16.46	1.34
250	15.67	19.28	16.97	24.02	1.07	0.58	26.87	16.64	1.35
300	15.59	19.27	16.63	22.16	1.07	0.59	25.87	16.63	1.41
350	15.49	19.28	16.25	20.74	1.07	0.60	26.96	16.58	1.40
400	15.39	19.27	15.89	19.64	1.07	0.61	26.44	16.68	1.42
450	15.27	19.25	15.57	18.64	1.07	0.62	25.75	16.74	1.40
500	15.16	19.25	15.21	17.91	1.07	0.64	26.68	16.88	1.44
550	15.02	19.25	14.82	17.30	1.07	0.65	26.23	16.77	1.41
600	14.88	19.25	14.41	16.77	1.07	0.67	25.71	16.80	1.52
650	14.72	19.24	13.91	16.21	1.07	0.69	25.80	16.81	1.50
700	14.54	19.26	13.39	15.70	1.07	0.71	26.02	16.76	1.54
750	14.40	19.25	12.94	15.41	1.06	0.72	26.38	17.02	1.56
800	14.22	19.25	12.47	15.02	1.07	0.74	26.74	17.01	1.59
850	14.04	19.25	11.99	14.61	1.07	0.76	27.18	16.93	1.58
900	13.84	19.27	11.53	14.20	1.07	0.78	26.84	16.94	1.61
950	13.64	19.29	11.04	13.81	1.07	0.80	27.26	17.11	1.62
1000	13.42	19.34	10.59	13.40	1.07	0.83	27.35	17.07	1.64
1100	12.78	19.63	9.40	12.87	1.09	0.90	29.90	16.89	1.71
1200	12.57	19.45	8.72	13.23	1.08	0.92	28.33	17.02	1.80
1300	12.17	19.48	8.13	12.30	1.08	0.95	27.76	17.05	1.86
1400	11.72	19.57	7.49	11.50	1.09	0.98	28.75	17.01	1.92
1500	11.25	19.68	6.88	10.74	1.09	1.00	26.25	16.91	2.00
1600	10.77	19.81	6.35	9.96	1.10	1.02	24.91	16.82	2.06
1700	10.28	19.96	5.87	9.25	1.11	1.03	23.88	16.31	2.22
1800	9.79	20.09	5.43	8.55	1.12	1.03	23.27	16.36	2.34
1900	9.29	20.28	5.03	7.87	1.14	1.03	21.96	16.15	2.43
2000	8.79	20.48	4.67	7.24	1.15	1.02	21.44	15.74	2.55

Typical Performance Curves

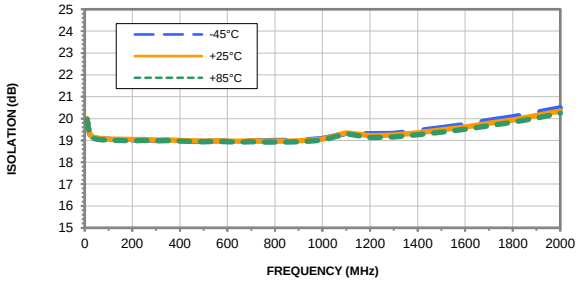
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.70V



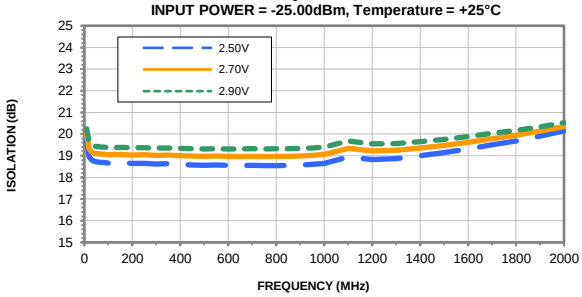
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



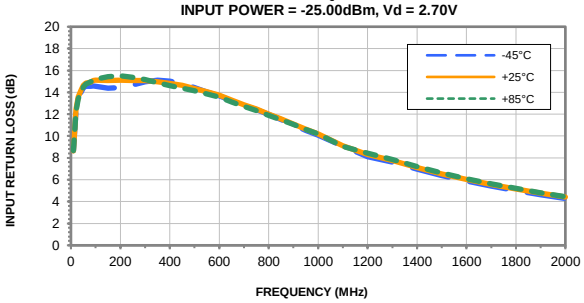
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.70V



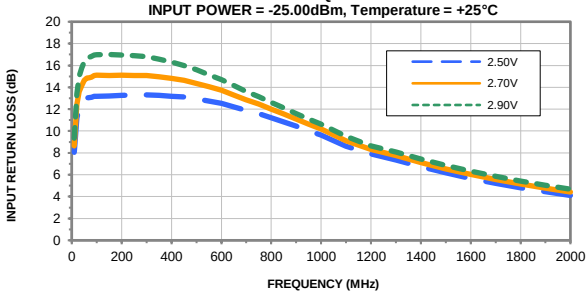
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



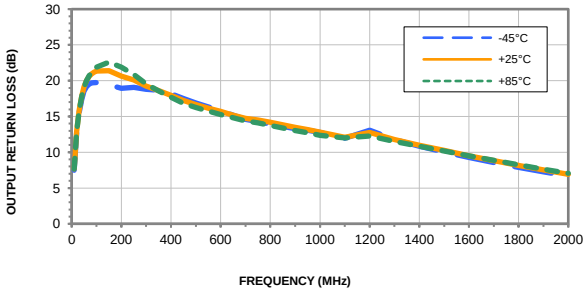
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.70V



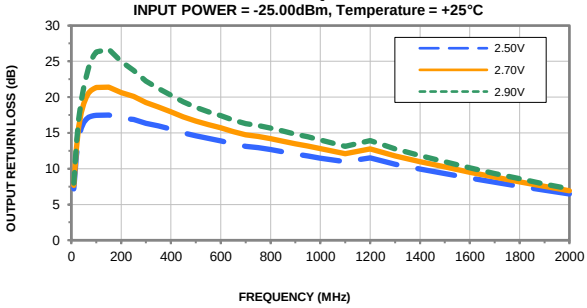
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.70V

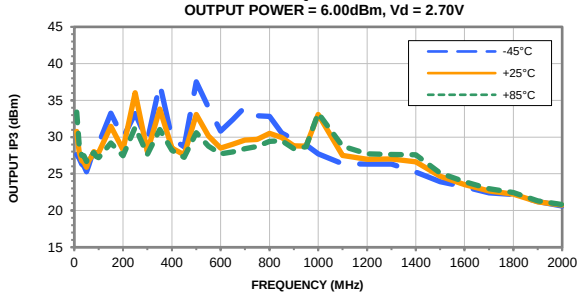


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25.00dBm, Temperature = +25°C

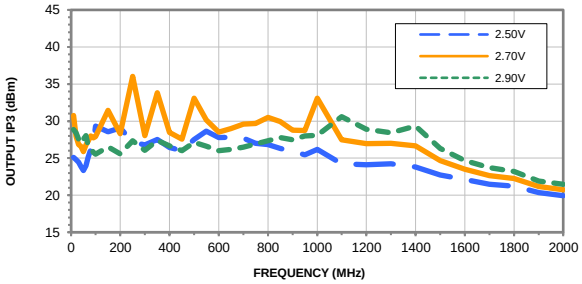


Typical Performance Curves

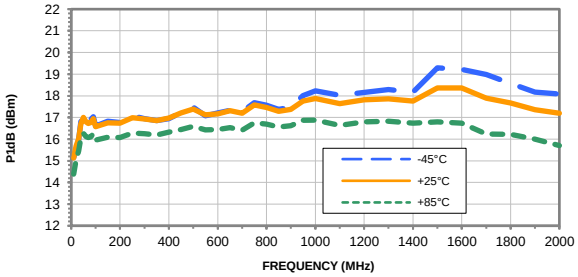
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = 6.00dBm, Vd = 2.70V



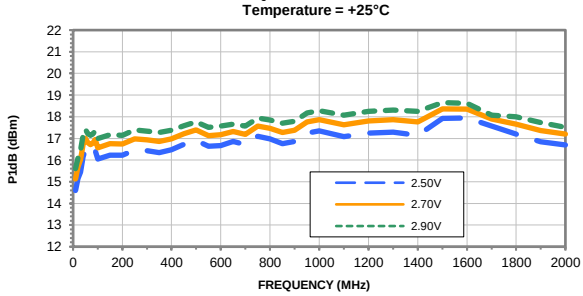
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = 6.00dBm, Temperature = +25°C



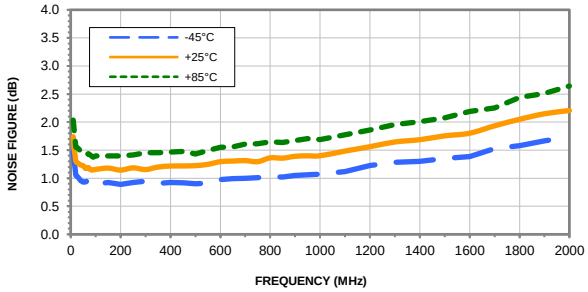
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 2.70V



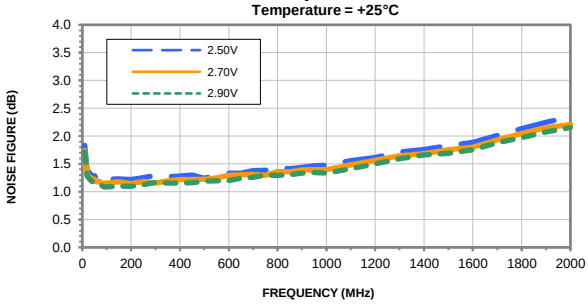
P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



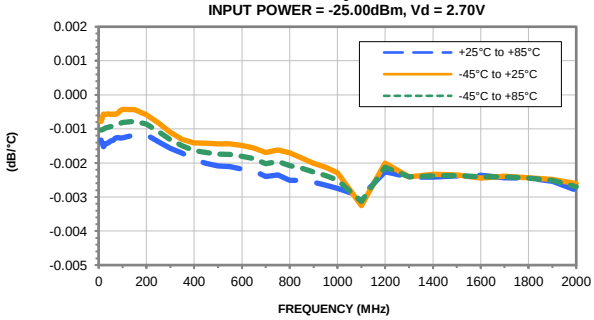
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 2.70V



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



GAIN VARIATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25.00dBm, Vd = 2.70V

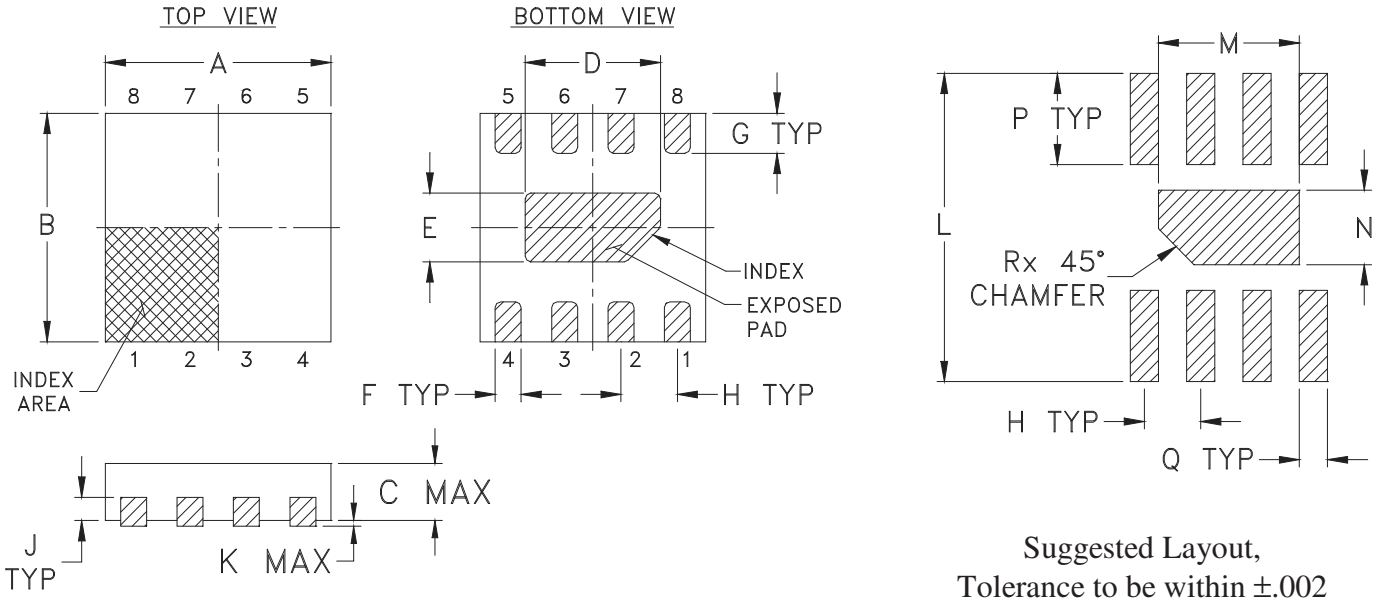


Case Style MC

MC1631-1

Outline Dimensions

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

SE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	P
MC1631-1	.079 (2.00)	.079 (2.00)	.039 (1.00)	.047 (1.20)	.024 (.60)	.009 (.23)	.014 (.35)	.020 (.50)	.008 (.20)	.002 (.05)	.106 (2.70)	.049 (1.25)	.026 (.65)	.031 (.80)

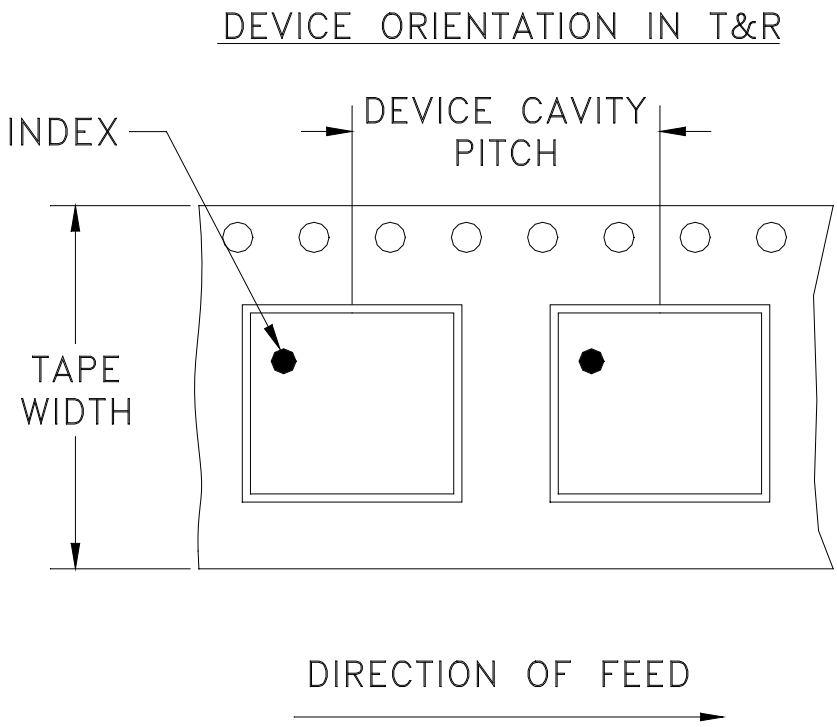
CASE #.	Q	R	WT, GRAM
MC1631-1	.010 (.25)	.012 (.30)	.006

Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish:
   For RoHS Case Styles: Tin-Silver over Nickel plated or Matte-Tin Plated (See Data sheet).
   All models, (+) suffix.
3. Lead #1 identifier shall be located in the cross-hatched area shown.
   Identifier may be either a molded or marked feature.

Tape & Reel Packaging TR-F66



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
8	4	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000, 2000, 3000

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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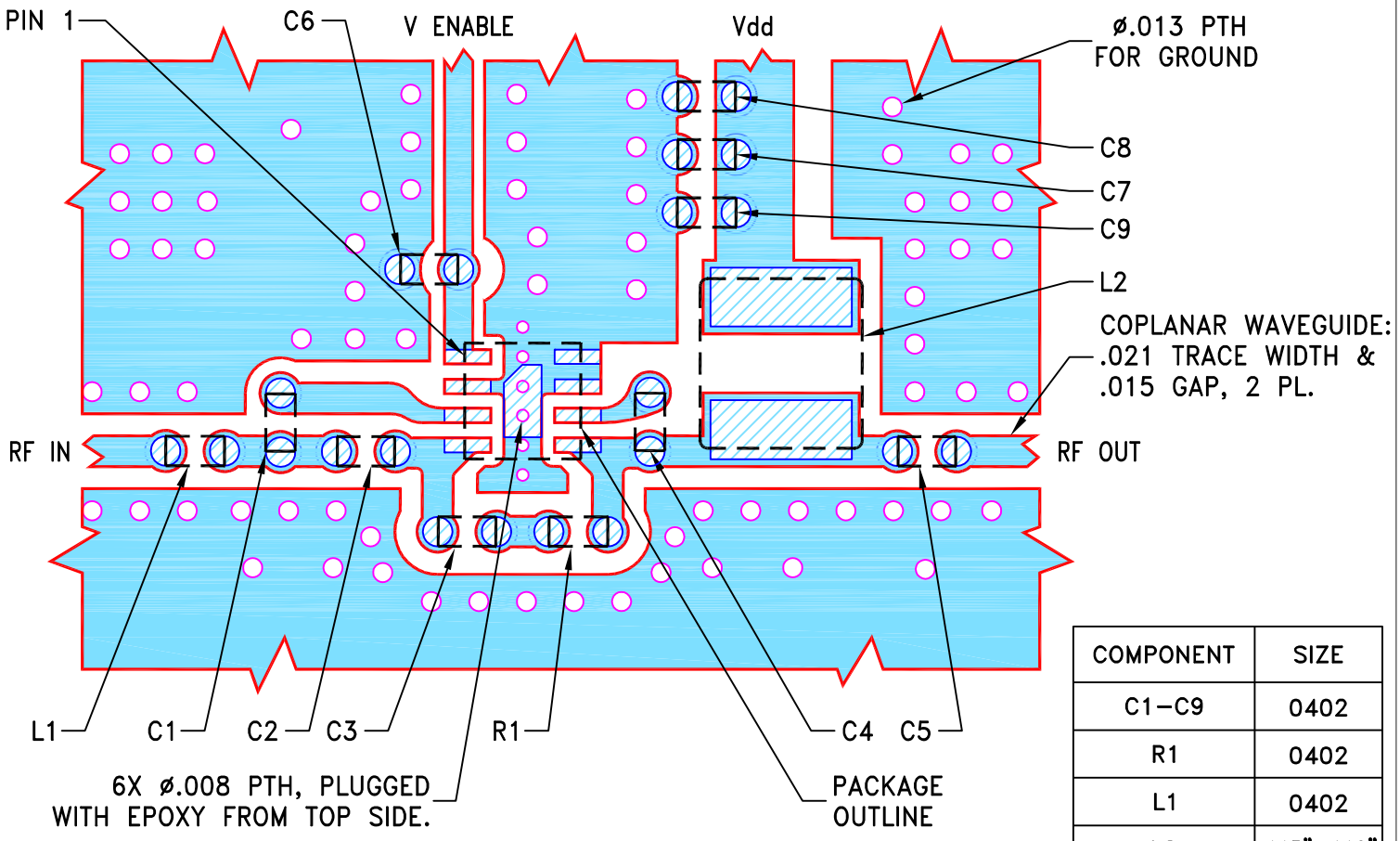
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M165468	NEW RELEASE	01/05/18	ITG	GH

SUGGESTED MOUNTING CONFIGURATION
FOR MC1631-1 CASE STYLE, "08AM17" PIN CODE



COMPONENT	SIZE
C1-C9	0402
R1	0402
L1	0402
L2	.115"x.110"

NOTES:

1. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010"±.001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-943+ & TB-943-13LNB+.
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	ITG	01/03/17
TOLERANCES ON:	CHECKED	IL	01/05/18
2 PL DECIMALS ±	APPROVED	GH	01/05/18
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

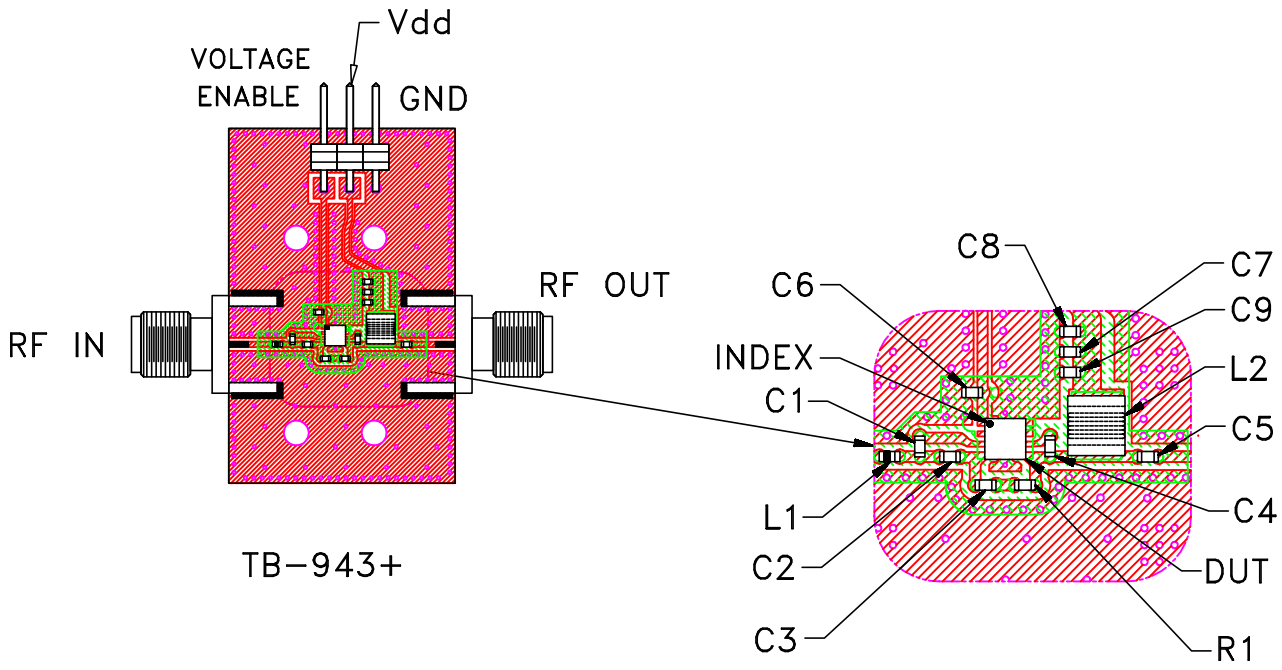
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

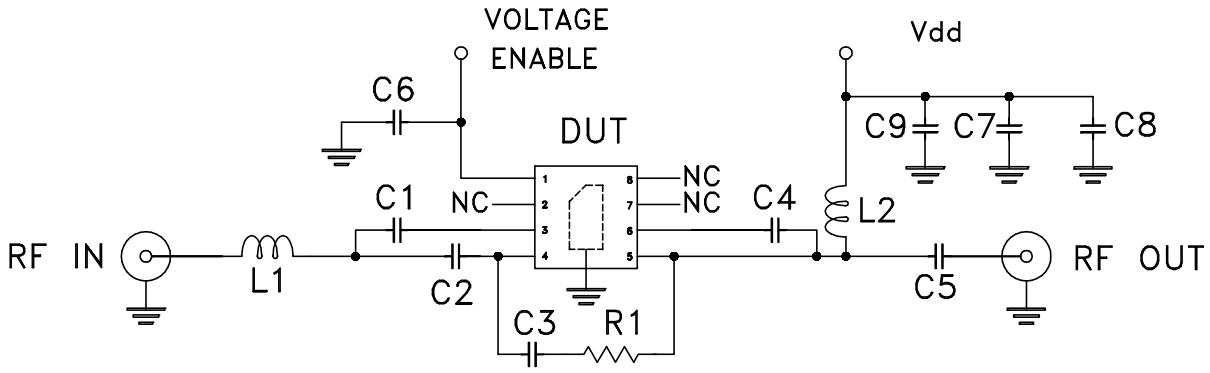
PL, 08AM17, MC1631-1, TB-943+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-536	OR

FILE:	SCALE:	SHEET:
98PL536	8:1	1 OF 1

Evaluation Board and Circuit





ITEM	DESCRIPTION	SIZE
C1-C8	CAP, 0,1 uF	.04"x02"
C9	CAP, 1000 pF	
R1	RES, 432 Ohm	
L1	IND, 3 nH	
L2	IND, 1000 nH	.115"x.110"
DUT	TSY-172LNB+	

Schematic Diagram

NOTES:

1. SMA Female connectors.
2. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric thickness=.010 inch.

Mini-Circuits®

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

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

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