FLAT GAIN, HIGH IP3

Monolithic Amplifier

CMA-62+

50Ω 0.01 to 6 GHz

THE BIG DEAL

- Ceramic, Hermetic, Nitrogen Filled
- Flat Gain, ±0.7 dB Over 50 to 4000 MHz
- Gain, 15.4 dB Typ. at 2 GHz
- High P1dB, +19 dBm Typ. at 2 GHz
- High IP3, +39.0 dBm Typ. at 50 MHz; +33.0 dBm at 2 GHz
- Excellent ESD Protection, Class 1C for HBM
- Small Size, 3x3x1.14 mm
- No External Matching Components Required

Generic photo used for illustration purposes only

CASE STYLE: DL1721

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

MIL SCREENING AVAILABLE
PLEASE CONSULT APPLICATIONS DEPT.

APPLICATIONS

- Base Station Infrastructure
- Portable Wireless
- CATV & DBS
- MMDS & Wireless LAN
- LTE

PRODUCT OVERVIEW

CMA-62+ (RoHS compliant) is a wideband amplifier fabricated using HBT technology and offers ultra-flat gain over a broad frequency range and with high IP3. In addition, the CMA-62+, has good input and output return loss over a broad frequency range without the need for external matching components and has demonstrated excellent reliability. The MMIC amplifier is bonded to a multilayer integrated LTCC substrate, and then hermetically sealed under a controlled nitrogen atmosphere with gold-plated covers and eutectic AuSn solder. These amplifiers are capable of meeting MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL. The testing can be done if requested.

KEY FEATURES

Feature	Advantages
Broad Band: 0.01 to 6.0 GHz	Broadband covering primary wireless communications bands: Cellular, PCS, LTE, WiMAX, SATELLITE IF
Ultra-Flat Gain	±0.6 dB over 50 to 3000 MHz; ±0.10 dB over 700 to 2700 MHz eliminates need for gain flattening for most applications.
High IP3 vs. DC Power Consumption +39 dBm Typical at 0.05 GHz +37 dBm Typical at 0.8 GHz	The CMA-62+ matches industry leading IP3 performance relative to device size and power consumption. The combination of the design and HBT Structure provides enhanced linearity over a broad frequency range as evidence in the IP3 being typically 20 dB above the P1dB point to 0.8 GHz. This feature makes this amplifier ideal for use in: • Driver amplifiers for complex waveform up converter paths • Drivers in linearized transmit systems
No External Matching Components Required	CMA-62+ provides Input and Output Return Loss of 10-23 dB up to 7 GHz without the need for any external matching components.
Ceramic Hermetic Package	Low Inductance, repeatable performance, excellent reliability.

Monolithic Amplifier

CMA-62+

50Ω 0.01 to 6 GHz

ELECTRICAL SPECIFICATIONS[1,2] AT +25°C, UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range[2]		0.01		6	GHz
Gain	0.05	15.5	16.6	18.0	dB
	0.8	14.5	15.6	16.5	
	2.0	–	15.4	–	
	3.0	–	15.4	–	
	4.0	14.0	15.2	16.0	
	6.0	–	13.7	–	
Gain Flatness	0.05-3.0	–	±0.6	–	dB
	0.7-2.6	–	±0.1	–	
Input Return Loss	0.05	–	16.5	–	dB
	0.8	10.0	13.6	–	
	2.0	–	14.7	–	
	3.0	–	22.7	–	
	4.0	–	25.9	–	
	6.0	–	13.9	–	
Output Return Loss	0.05	–	14.1	–	dB
	0.8	12.0	14.3	–	
	2.0	–	14.0	–	
	3.0	–	10.9	–	
	4.0	–	10.0	–	
	6.0	–	14.0	–	
Reverse Isolation	2.0	–	21.9	–	dB
Output Power @ 1 dB Compression	0.05	+17.5	+19.9	–	dBm
	0.8	+17.5	+19.6	–	
	2.0	+17.2	+19.2	–	
	3.0	–	+17.6	–	
	4.0	–	+15.4	–	
	6.0	–	+11.8	–	
Noise Figure	0.05	–	4.8	6.2	dB
	1.0	–	5.2	–	
	2.0	–	5.4	6.6	
	3.0	–	5.3	–	
	4.0	–	5.6	–	
	6.0	–	5.7	–	
Output IP3	0.05	–	+39.0	–	dBm
	0.8	–	+36.5	–	
	2.0	+31.5	+33.4	–	
	3.0	–	+29.6	–	
	4.0	–	+27.3	–	
	6.0	–	+23.2	–	
Device Operating Voltage		+4.8	+5.0	+5.2	V
Device Operating Current		72	82	92	mA
DC Current Variation vs. Temperature[3]		–	62	–	µA/°C
DC Current Variation vs. Voltage		–	0.035	–	mA/mV
Thermal Resistance, Junction-to-Ground Lead		–	64	–	°C/W

1. Measured on Mini-Circuits Characterization test board TB-656-62+. See Characterization Test Circuit (Fig. 1).
2. Low Frequency cut-off determined by external coupling capacitors and external bias choke.
3. (Current at +85°C - Current at -45°C)/130

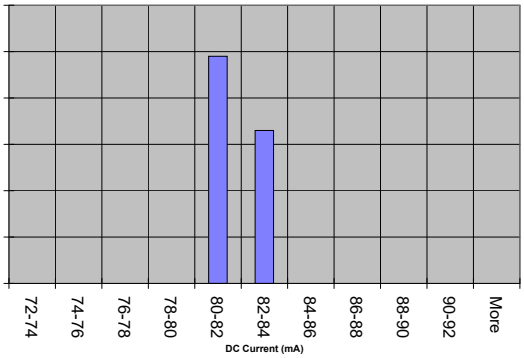
Monolithic Amplifier CMA-62+

50Ω 0.01 to 6 GHz

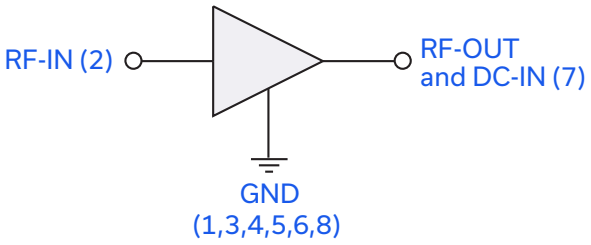
ABSOLUTE MAXIMUM RATINGS

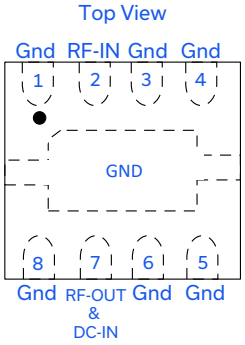
Parameter	Ratings
Operating Temperature (Ground Lead)	-55°C to +105°C
Storage Temperature	-65°C to +125°C
Operating Current at +5 V	120 mA
Power Dissipation	0.725 W
Input Power (CW)	+24 dBm
DC Voltage on Pin 3	+6 V

Permanent damage may occur if any of these limits are exceeded. These ratings are not intended for continuous normal operation.
For continuous operation, do not exceed +5.2 V device voltage.



SIMPLIFIED SCHEMATIC AND PAD DESCRIPTION





Function	Pin Number	Description
RF-IN	2	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
RF-OUT and DC-IN	7	RF output and bias pin. DC voltage is present on this pin; therefore a DC blocking capacitor is necessary for proper operation. An RF choke is needed to feed DC bias without loss of RF signal due to the bias connection, as shown in "Recommended Application Circuit", Fig. 2.
GND	1,3,4,5,6,8, Bottom Center Paddle	Connections to ground. Use via holes as shown in "Suggested Layout for PCB Design" to reduce ground path inductance for best performance.

Monolithic Amplifier CMA-62+

50Ω 0.01 to 6 GHz

CHARACTERIZATION TEST CIRCUIT

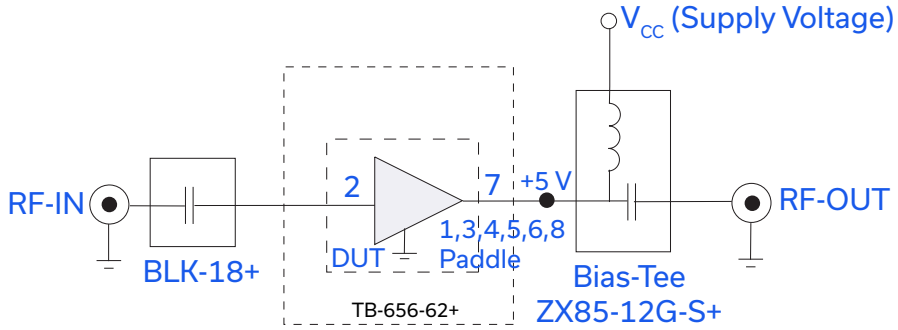


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Characterization test board TB-656-62+) Gain, Return Loss, Output Power at 1 dB Compression (P1dB), Output IP3 (OIP3) and Noise Figure measured using Agilent's N5242A PNA-X microwave network analyzer.

Conditions:
1. Gain and Return Loss: P_{IN}= -25 dBm
2. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.

RECOMMENDED APPLICATION CIRCUIT

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

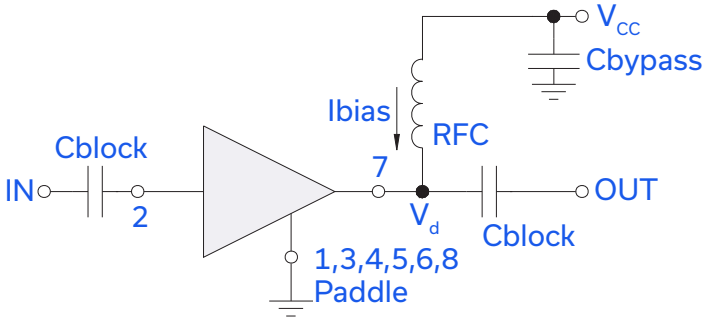
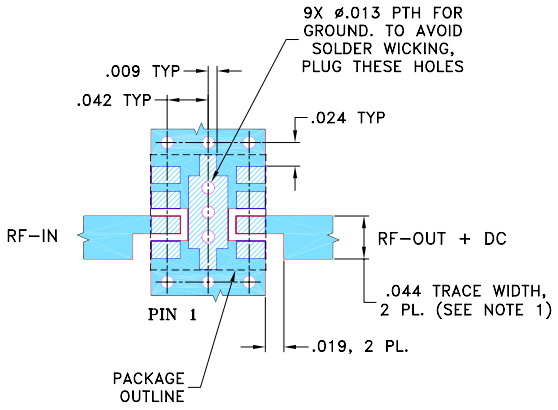


Fig 2. Test Board includes case, connectors, and components soldered to PCB for component values, please see evaluation board drawing.

SUGGESTED PCB LAYOUT (PL-366)

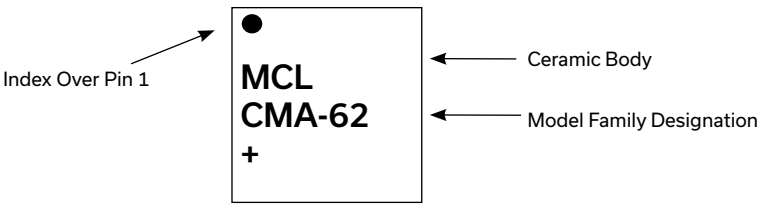


NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

PRODUCT MARKING



Markings in addition to model number designation may appear for internal quality control purposes.

Monolithic Amplifier CMA-62+

50Ω 0.01 to 6 GHz

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. CLICK HERE

Performance Data & Graphs	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	DL1721 Ceramic package, exposed paddle, Terminal Finish: Ni,Pd,Au
Tape & Reel **Standard Quantities Available on Reel**	F66-1 7" Reels with 20, 50, 100, 200, 500, 1000 & 2000 devices
Suggested Layout for PCB Design	PL-366
Evaluation Board	TB-656-62+
Environmental Ratings	ENV68

ESD RATING

Human Body Model (HBM): Class 1C (1000 V to < 2000 V) in accordance with ANSI/ESD STM 5.1 - 2001
Machine Model (MM): Class M2 (100 V to < 200 V) in accordance with ANSI/ESD STM5.2-1999

MSL RATING

Moisture Sensitivity: MSL1 (these parts are hermetic, air cavity and therefore, MSL ratings do not strictly apply. For handling purpose, use MSL1)

QUALIFICATION TESTING

The table below shows the initial qualification testing performed. If required, parts can be subjected to 100% screening and qualifications testing per MIL standard requirement.

	Test Description	Test Method/Process	Results
1	Hermeticity (fine and gross leak)	MIL-STD-202 Method 112, Cond. C & D	Pass
2	Acceleration, 30Kg, Y1 Direction	MIL-STD-883 Method 2001 Cond. E	Pass
3	Vibration , 10-2000Hz sine, 20g, 3 axis	MIL-STD-202 Method 204, Cond. D	Pass
4	Mechanical shock	MIL-STD-202 Method 213, Cond . A	Pass
5	PIND 20G's @130 Hz	MIL-STD-750 Method 2052.2	Pass
6	Temp Cycle -55C/+125C, 1000 Cycles	MIL-STD-202 Method 107	Pass
7	Autoclave, 121C, RH 100%, 15 Psig, 96 hrs	JESD22-A102C	Pass
8	HTOL, 1000hrs, 105C at rated Voltage condition	MIL-STD-202 Method 108, Cond . D	Pass
9	Bend Test	JESD22-B113	Pass
10	Resistance to soldering heat, 3x reflow, 260C peak	JESD22-B102	Pass
11	Drop Test	JESD22-B111	Pass
12	Adhesion Strength	Push Test>10 lb	Pass

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-Circuits' 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 = 5V, Id = 84.86 mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10.0	16.99	23.03	14.35	13.65	1.15	0.76	--	19.17	4.88
50.0	16.64	22.18	15.63	14.57	1.12	0.75	39.52	20.04	4.81
100.0	16.21	21.72	14.36	16.59	1.13	0.76	38.33	20.00	4.92
200.0	15.90	21.47	13.70	18.77	1.15	0.77	39.05	20.00	4.87
300.0	15.81	21.44	13.56	19.63	1.16	0.77	39.60	19.97	5.02
400.0	15.76	21.42	13.36	20.21	1.17	0.76	39.89	19.92	5.08
500.0	15.71	21.44	13.37	20.62	1.18	0.76	38.54	19.97	5.16
600.0	15.72	21.43	13.11	20.76	1.18	0.76	37.96	19.90	5.12
700.0	15.71	21.46	12.91	20.90	1.19	0.76	38.79	19.80	5.15
800.0	15.66	21.49	12.74	20.84	1.19	0.76	37.64	19.78	5.11
1000.0	15.68	21.50	12.50	20.50	1.18	0.77	36.94	19.87	5.19
1250.0	15.67	21.59	12.24	19.70	1.16	0.80	37.20	19.82	5.24
1500.0	15.67	21.60	12.16	18.43	1.14	0.82	35.77	19.68	5.19
1750.0	15.67	21.67	12.29	17.06	1.14	0.82	35.59	19.61	5.27
2000.0	15.65	21.72	12.56	15.64	1.17	0.79	34.41	19.36	5.25
2250.0	15.66	21.76	13.01	14.64	1.20	0.75	33.25	18.99	5.34
2500.0	15.69	21.80	13.79	13.78	1.22	0.71	32.21	18.94	5.31
2750.0	15.69	21.83	14.71	13.02	1.21	0.70	31.63	18.36	5.39
3000.0	15.71	21.82	15.81	12.37	1.19	0.71	30.87	17.89	5.28
3250.0	15.70	21.78	17.23	11.88	1.16	0.72	30.01	17.39	5.47
3500.0	15.68	21.79	18.98	11.53	1.15	0.72	29.52	16.82	5.36
3750.0	15.62	21.68	21.20	11.11	1.14	0.71	28.62	16.09	5.41
4000.0	15.52	21.67	23.81	10.87	1.16	0.69	28.24	15.59	5.46
4250.0	15.39	21.58	25.88	10.58	1.17	0.68	27.83	15.33	5.47
4500.0	15.21	21.44	26.11	10.48	1.17	0.68	27.25	14.71	5.49
4750.0	14.97	21.23	24.23	10.51	1.18	0.68	26.72	14.07	5.48
5000.0	14.81	21.11	21.89	10.48	1.19	0.67	26.44	13.68	5.48
5250.0	14.54	20.91	20.05	10.68	1.21	0.67	26.02	13.17	5.55
5500.0	14.30	20.76	18.35	10.91	1.22	0.68	25.30	12.77	5.60
5750.0	13.98	20.57	17.30	11.43	1.21	0.72	25.27	12.30	5.60
6000.0	13.59	20.39	16.56	11.99	1.21	0.77	24.79	12.09	5.57
6250.0	13.12	20.31	15.89	12.52	1.23	0.81	24.37	11.73	5.74
6500.0	12.56	20.22	15.27	13.02	1.31	0.82	23.93	11.28	5.75
6750.0	11.84	20.26	14.59	13.43	1.43	0.82	23.50	10.74	5.82
7000.0	11.26	20.06	13.60	12.97	1.48	0.83	23.11	10.55	5.89

Typical Performance Data

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

TEST CONDITIONS: Vd = 4.8V, Id =77.59 mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10.0	16.94	23.61	14.70	13.89	1.21	0.79	--	18.58	4.83
50.0	16.60	22.30	15.87	14.48	1.13	0.75	37.13	19.35	4.77
100.0	16.18	21.72	14.52	16.47	1.13	0.76	36.93	19.33	4.83
200.0	15.87	21.44	13.86	18.56	1.15	0.76	38.25	19.30	4.80
300.0	15.78	21.41	13.71	19.44	1.16	0.76	37.94	19.26	4.97
400.0	15.73	21.35	13.50	19.97	1.17	0.76	37.86	19.24	5.01
500.0	15.68	21.39	13.50	20.37	1.18	0.76	37.27	19.29	5.12
600.0	15.69	21.38	13.24	20.46	1.18	0.75	37.34	19.23	5.05
700.0	15.68	21.42	13.05	20.62	1.19	0.75	37.46	19.15	5.09
800.0	15.64	21.45	12.87	20.57	1.19	0.76	37.21	19.13	5.04
1000.0	15.65	21.45	12.62	20.24	1.18	0.77	35.78	19.18	5.09
1250.0	15.63	21.53	12.36	19.48	1.16	0.80	36.27	19.16	5.17
1500.0	15.63	21.56	12.27	18.21	1.14	0.82	35.43	19.08	5.09
1750.0	15.63	21.60	12.40	16.86	1.14	0.81	34.66	19.03	5.21
2000.0	15.61	21.69	12.68	15.46	1.17	0.79	33.94	18.84	5.21
2250.0	15.63	21.74	13.14	14.47	1.20	0.74	32.90	18.51	5.25
2500.0	15.65	21.73	13.93	13.61	1.21	0.71	31.87	18.49	5.25
2750.0	15.64	21.76	14.85	12.86	1.21	0.70	31.39	17.96	5.33
3000.0	15.65	21.76	15.97	12.23	1.19	0.71	30.60	17.52	5.20
3250.0	15.64	21.72	17.41	11.74	1.16	0.72	29.63	17.04	5.38
3500.0	15.62	21.70	19.20	11.41	1.15	0.72	29.34	16.45	5.31
3750.0	15.55	21.64	21.40	10.99	1.14	0.70	28.36	15.77	5.31
4000.0	15.45	21.63	24.02	10.77	1.16	0.69	27.92	15.26	5.35
4250.0	15.32	21.47	25.93	10.49	1.16	0.68	27.63	15.01	5.38
4500.0	15.13	21.36	26.05	10.41	1.17	0.68	27.06	14.39	5.43
4750.0	14.88	21.15	24.16	10.43	1.18	0.67	26.49	13.78	5.41
5000.0	14.73	21.03	21.83	10.43	1.19	0.67	26.30	13.38	5.37
5250.0	14.45	20.82	20.03	10.62	1.21	0.66	25.79	12.87	5.41
5500.0	14.21	20.67	18.33	10.87	1.22	0.68	25.04	12.44	5.53
5750.0	13.89	20.45	17.33	11.38	1.21	0.72	24.99	11.99	5.51
6000.0	13.50	20.27	16.62	11.93	1.20	0.77	24.54	11.77	5.50
6250.0	13.03	20.19	15.97	12.44	1.23	0.81	24.09	11.43	5.61
6500.0	12.47	20.12	15.33	12.95	1.31	0.82	23.64	10.97	5.63
6750.0	11.75	20.21	14.67	13.33	1.44	0.82	23.23	10.45	5.75
7000.0	11.17	19.99	13.69	12.88	1.48	0.82	22.82	10.28	5.79

Typical Performance Data

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

TEST CONDITIONS: Vd = 5.2V, Id = 92.14 mA @ Temperature = +25degC

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10.0	16.97	23.22	14.87	13.89	1.18	0.77	--	19.59	5.00
50.0	16.66	22.43	15.53	14.68	1.14	0.76	40.16	20.63	4.94
100.0	16.23	21.79	14.22	16.73	1.13	0.76	39.93	20.56	4.96
200.0	15.93	21.55	13.58	18.95	1.15	0.77	39.69	20.60	4.94
300.0	15.83	21.44	13.43	19.82	1.16	0.77	42.37	20.57	5.17
400.0	15.78	21.47	13.25	20.39	1.17	0.76	40.24	20.48	5.15
500.0	15.73	21.45	13.25	20.84	1.18	0.76	38.92	20.51	5.19
600.0	15.75	21.46	13.00	20.95	1.18	0.76	40.00	20.45	5.21
700.0	15.73	21.47	12.81	21.12	1.19	0.76	39.04	20.31	5.25
800.0	15.69	21.51	12.64	21.08	1.19	0.76	39.68	20.29	5.21
1000.0	15.71	21.52	12.40	20.71	1.18	0.77	37.72	20.40	5.29
1250.0	15.69	21.57	12.14	19.93	1.16	0.80	37.30	20.27	5.35
1500.0	15.70	21.62	12.05	18.65	1.14	0.82	36.18	20.05	5.27
1750.0	15.70	21.70	12.19	17.26	1.14	0.82	35.22	19.97	5.38
2000.0	15.68	21.77	12.45	15.82	1.17	0.79	34.41	19.69	5.37
2250.0	15.70	21.80	12.91	14.80	1.20	0.75	33.18	19.29	5.43
2500.0	15.73	21.83	13.68	13.93	1.22	0.72	32.10	19.22	5.44
2750.0	15.73	21.88	14.59	13.17	1.21	0.71	31.66	18.63	5.50
3000.0	15.75	21.85	15.67	12.51	1.19	0.71	30.83	18.14	5.39
3250.0	15.75	21.84	17.08	12.01	1.16	0.72	29.72	17.63	5.58
3500.0	15.73	21.79	18.81	11.64	1.15	0.72	29.43	17.08	5.46
3750.0	15.68	21.74	21.02	11.22	1.15	0.71	28.50	16.38	5.52
4000.0	15.58	21.67	23.59	10.98	1.16	0.69	28.06	15.87	5.58
4250.0	15.46	21.59	25.72	10.67	1.16	0.68	27.62	15.56	5.60
4500.0	15.28	21.50	26.17	10.56	1.17	0.68	27.06	14.97	5.62
4750.0	15.04	21.30	24.24	10.58	1.18	0.68	26.55	14.33	5.63
5000.0	14.89	21.21	21.91	10.55	1.19	0.67	26.23	13.92	5.60
5250.0	14.62	20.95	20.05	10.74	1.21	0.67	25.74	13.40	5.69
5500.0	14.38	20.85	18.35	10.97	1.22	0.68	25.15	12.98	5.70
5750.0	14.06	20.62	17.27	11.48	1.21	0.72	25.03	12.53	5.74
6000.0	13.67	20.48	16.54	12.05	1.21	0.77	24.67	12.33	5.71
6250.0	13.21	20.36	15.84	12.59	1.23	0.81	24.26	11.95	5.86
6500.0	12.65	20.27	15.18	13.13	1.30	0.82	23.86	11.52	5.93
6750.0	11.92	20.36	14.49	13.54	1.43	0.83	23.47	10.99	6.00
7000.0	11.34	20.12	13.53	13.08	1.48	0.83	23.09	10.77	6.08

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 = 5V, Id =78.93 mA @ Temperature = -55degC

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)
10.0	16.92	23.36	13.94	13.51	1.19	0.78		19.15	4.94
50.0	16.70	22.31	15.45	14.50	1.12	0.75	41.23	19.78	3.97
100.0	16.29	21.82	14.64	16.06	1.13	0.76	38.04	19.70	4.04
200.0	16.01	21.55	14.07	18.13	1.14	0.76	39.23	19.66	3.96
300.0	15.90	21.52	13.38	19.92	1.16	0.77	40.02	19.63	4.18
400.0	15.86	21.50	12.98	20.49	1.17	0.76	40.51	19.62	4.17
500.0	15.80	21.53	13.08	20.91	1.18	0.76	39.20	19.60	4.27
600.0	15.83	21.52	12.79	20.92	1.18	0.76	39.07	19.63	4.20
700.0	15.81	21.52	12.73	20.71	1.19	0.75	39.19	19.63	4.20
800.0	15.77	21.54	12.61	20.58	1.19	0.76	39.34	19.58	4.18
1000.0	15.78	21.57	12.45	20.28	1.18	0.77	37.75	19.64	4.24
1250.0	15.76	21.59	11.80	19.83	1.15	0.81	37.26	19.53	4.29
1500.0	15.76	21.65	11.64	18.57	1.13	0.83	37.03	19.58	4.27
1750.0	15.76	21.67	11.78	16.92	1.13	0.81	36.44	19.58	4.37
2000.0	15.72	21.76	11.84	15.41	1.16	0.78	35.51	19.38	4.37
2250.0	15.73	21.77	12.16	14.26	1.19	0.73	34.45	19.29	4.35
2500.0	15.78	21.77	12.94	13.26	1.20	0.70	33.58	19.19	4.36
2750.0	15.78	21.80	13.83	12.53	1.18	0.70	33.17	18.87	4.36
3000.0	15.80	21.78	14.40	12.06	1.15	0.72	32.39	18.41	4.22
3250.0	15.81	21.77	14.94	11.62	1.11	0.74	31.23	18.07	4.43
3500.0	15.81	21.71	16.07	11.08	1.10	0.73	30.85	17.62	4.46
3750.0	15.78	21.69	17.28	10.76	1.11	0.70	29.88	17.10	4.45
4000.0	15.72	21.68	18.58	10.38	1.14	0.67	29.53	16.42	4.39
4250.0	15.60	21.65	20.08	9.98	1.16	0.64	29.36	16.14	4.47
4500.0	15.48	21.59	22.72	9.67	1.17	0.63	29.11	15.67	4.45
4750.0	15.35	21.49	25.22	9.33	1.16	0.63	28.40	14.96	4.48
5000.0	15.22	21.32	26.39	9.32	1.15	0.63	28.31	14.74	4.54
5250.0	15.08	21.15	25.54	9.34	1.14	0.63	27.93	14.12	4.45
5500.0	14.94	20.85	23.57	9.78	1.13	0.65	27.08	13.67	4.51
5750.0	14.73	20.71	21.10	10.11	1.12	0.68	27.08	13.25	4.56
6000.0	14.43	20.49	18.97	10.57	1.12	0.71	26.62	12.99	4.51
6250.0	14.07	20.39	17.96	10.84	1.18	0.70	26.13	12.49	4.62
6500.0	13.57	20.37	16.69	10.98	1.25	0.70	25.89	12.17	4.67
6750.0	12.90	20.45	15.80	11.06	1.32	0.74	25.53	11.60	4.72
7000.0	12.30	20.26	14.95	10.97	1.32	0.78	25.10	11.27	4.85

Typical Performance Data

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

TEST CONDITIONS: Vd = 4.8V, Id =71.11 mA @ Temperature = -55degC

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)
10.0	16.98	23.24	13.93	13.43	1.17	0.77		19.15	4.82
50.0	16.67	22.30	15.67	14.39	1.13	0.75	38.06	19.78	3.91
100.0	16.26	21.79	14.83	15.91	1.13	0.75	36.61	19.70	3.95
200.0	15.97	21.50	14.23	17.94	1.14	0.76	37.95	19.66	3.89
300.0	15.87	21.45	13.54	19.66	1.16	0.76	38.15	19.63	4.07
400.0	15.82	21.41	13.13	20.25	1.16	0.76	37.37	19.62	4.09
500.0	15.76	21.51	13.21	20.61	1.18	0.76	38.48	19.60	4.23
600.0	15.80	21.48	12.92	20.64	1.18	0.75	39.18	19.63	4.12
700.0	15.78	21.44	12.87	20.43	1.18	0.75	37.93	19.63	4.13
800.0	15.74	21.50	12.74	20.33	1.19	0.76	37.68	19.58	4.10
1000.0	15.75	21.51	12.58	20.01	1.18	0.77	36.86	19.64	4.14
1250.0	15.73	21.52	11.91	19.58	1.14	0.80	36.94	19.53	4.20
1500.0	15.72	21.57	11.74	18.32	1.12	0.82	35.88	19.58	4.19
1750.0	15.72	21.62	11.90	16.72	1.13	0.81	35.63	19.58	4.28
2000.0	15.68	21.74	11.97	15.23	1.17	0.78	34.70	19.38	4.27
2250.0	15.69	21.74	12.28	14.05	1.20	0.73	33.87	19.29	4.28
2500.0	15.73	21.73	13.09	13.11	1.20	0.70	32.86	19.19	4.26
2750.0	15.73	21.73	14.00	12.36	1.18	0.70	32.49	18.87	4.29
3000.0	15.75	21.75	14.55	11.91	1.15	0.72	31.71	18.41	4.15
3250.0	15.76	21.70	15.10	11.48	1.11	0.74	30.65	18.07	4.34
3500.0	15.75	21.63	16.23	10.94	1.09	0.73	30.22	17.62	4.34
3750.0	15.71	21.62	17.47	10.63	1.11	0.70	29.36	17.10	4.38
4000.0	15.65	21.57	18.74	10.28	1.14	0.66	29.09	16.42	4.34
4250.0	15.52	21.60	20.26	9.88	1.16	0.64	28.90	16.14	4.39
4500.0	15.39	21.50	22.87	9.59	1.17	0.63	28.49	15.67	4.33
4750.0	15.26	21.41	25.37	9.27	1.16	0.62	27.82	14.96	4.39
5000.0	15.12	21.23	26.31	9.27	1.15	0.63	27.85	14.74	4.42
5250.0	14.98	21.02	25.41	9.31	1.14	0.63	27.40	14.12	4.34
5500.0	14.83	20.73	23.46	9.76	1.13	0.64	26.57	13.67	4.41
5750.0	14.62	20.58	21.05	10.09	1.12	0.68	26.53	13.25	4.43
6000.0	14.32	20.40	18.99	10.54	1.13	0.71	26.07	12.99	4.40
6250.0	13.95	20.28	17.99	10.80	1.18	0.70	25.53	12.49	4.52
6500.0	13.44	20.28	16.72	10.94	1.25	0.70	25.28	12.17	4.55
6750.0	12.77	20.36	15.84	11.01	1.32	0.74	24.94	11.60	4.57
7000.0	12.16	20.18	15.01	10.92	1.32	0.79	24.46	11.27	4.68

Typical Performance Data

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

TEST CONDITIONS: Vd = 5.2V, Id = 85.96 mA @ Temperature = -55degC

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)
10.0	17.03	23.64	13.81	13.71	1.20	0.79		19.80	4.99
50.0	16.74	22.37	15.32	14.59	1.13	0.75	39.52	20.47	4.06
100.0	16.32	21.85	14.51	16.16	1.13	0.76	39.70	20.38	4.07
200.0	16.03	21.58	13.93	18.26	1.14	0.76	39.86	20.37	4.00
300.0	15.92	21.52	13.27	20.10	1.16	0.77	40.57	20.35	4.24
400.0	15.88	21.55	12.88	20.65	1.17	0.77	42.24	20.31	4.25
500.0	15.82	21.56	12.98	21.10	1.18	0.76	39.69	20.31	4.37
600.0	15.85	21.53	12.70	21.13	1.18	0.76	39.97	20.31	4.29
700.0	15.83	21.55	12.65	20.90	1.19	0.76	40.04	20.29	4.29
800.0	15.79	21.57	12.51	20.82	1.19	0.76	40.29	20.26	4.22
1000.0	15.80	21.59	12.35	20.48	1.18	0.77	38.92	20.32	4.30
1250.0	15.78	21.62	11.72	20.05	1.14	0.81	38.82	20.23	4.35
1500.0	15.78	21.66	11.55	18.76	1.13	0.83	38.33	20.24	4.32
1750.0	15.78	21.69	11.70	17.10	1.13	0.82	37.02	20.23	4.45
2000.0	15.75	21.81	11.76	15.55	1.17	0.78	36.51	19.98	4.44
2250.0	15.76	21.82	12.06	14.38	1.20	0.74	35.14	19.83	4.43
2500.0	15.81	21.81	12.86	13.40	1.20	0.70	34.16	19.72	4.45
2750.0	15.83	21.82	13.75	12.63	1.18	0.70	33.43	19.33	4.46
3000.0	15.84	21.83	14.28	12.18	1.15	0.73	32.56	18.79	4.28
3250.0	15.86	21.84	14.82	11.74	1.11	0.75	31.54	18.42	4.53
3500.0	15.86	21.78	15.94	11.19	1.10	0.74	31.21	17.97	4.52
3750.0	15.84	21.68	17.18	10.83	1.11	0.70	30.25	17.43	4.56
4000.0	15.78	21.71	18.42	10.46	1.14	0.67	29.91	16.77	4.51
4250.0	15.67	21.70	19.90	10.06	1.16	0.64	29.76	16.47	4.57
4500.0	15.55	21.61	22.55	9.74	1.17	0.63	29.40	15.98	4.53
4750.0	15.42	21.58	25.06	9.38	1.16	0.63	28.65	15.30	4.57
5000.0	15.30	21.38	26.40	9.36	1.15	0.63	28.58	15.06	4.60
5250.0	15.16	21.21	25.69	9.37	1.14	0.63	28.26	14.46	4.53
5500.0	15.02	20.94	23.66	9.80	1.13	0.65	27.47	14.01	4.65
5750.0	14.82	20.80	21.14	10.12	1.12	0.68	27.41	13.56	4.71
6000.0	14.53	20.58	18.96	10.58	1.12	0.70	26.95	13.30	4.61
6250.0	14.17	20.47	17.91	10.86	1.18	0.70	26.46	12.81	4.72
6500.0	13.67	20.45	16.66	11.02	1.25	0.70	26.23	12.52	4.76
6750.0	13.00	20.51	15.72	11.09	1.31	0.74	25.94	11.91	4.83
7000.0	12.40	20.35	14.88	10.99	1.32	0.78	25.49	11.57	4.90

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 = 5V, Id = 88.52 mA @ Temperature = +105degC

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)
10.0	16.77	22.76	14.66	13.99	1.16	0.76	--	19.36	5.59
50.0	16.51	22.24	15.67	14.80	1.14	0.76	40.88	20.10	5.48
100.0	16.09	21.69	14.20	17.23	1.14	0.77	38.80	19.98	5.56
200.0	15.78	21.40	13.32	19.78	1.15	0.77	39.95	19.98	5.55
300.0	15.67	21.36	13.33	20.11	1.16	0.77	40.48	20.01	5.75
400.0	15.62	21.36	13.49	20.33	1.18	0.77	39.89	19.75	5.78
500.0	15.60	21.32	13.57	20.55	1.18	0.76	39.15	19.81	5.92
600.0	15.60	21.35	13.42	20.54	1.19	0.75	38.56	19.67	5.85
700.0	15.58	21.40	13.29	20.43	1.20	0.76	38.08	19.62	5.90
800.0	15.56	21.39	13.22	20.25	1.20	0.75	37.22	19.57	5.79
1000.0	15.57	21.43	13.09	19.99	1.19	0.76	35.76	19.69	5.82
1250.0	15.57	21.48	12.87	19.50	1.17	0.79	35.73	19.52	5.88
1500.0	15.58	21.56	12.74	18.66	1.16	0.81	33.94	19.28	5.87
1750.0	15.58	21.62	12.75	17.40	1.15	0.81	33.25	19.20	6.02
2000.0	15.57	21.69	13.01	16.10	1.17	0.79	32.55	18.82	6.04
2250.0	15.58	21.75	13.64	15.05	1.20	0.76	31.35	18.39	6.11
2500.0	15.60	21.77	14.76	14.19	1.22	0.72	30.24	18.11	6.14
2750.0	15.59	21.77	16.25	13.46	1.23	0.70	29.65	17.41	6.12
3000.0	15.59	21.73	18.22	12.87	1.21	0.70	28.64	16.91	5.99
3250.0	15.55	21.70	20.94	12.43	1.20	0.71	27.59	16.20	6.23
3500.0	15.49	21.64	24.54	12.04	1.19	0.70	26.89	15.65	6.18
3750.0	15.35	21.55	28.07	11.70	1.19	0.70	25.94	14.92	6.18
4000.0	15.16	21.50	27.90	11.48	1.20	0.70	25.51	14.40	6.19
4250.0	14.91	21.36	24.31	11.37	1.19	0.72	24.99	14.08	6.29
4500.0	14.63	21.20	21.21	11.37	1.19	0.74	24.55	13.45	6.28
4750.0	14.30	21.07	18.70	11.54	1.20	0.75	24.09	12.90	6.24
5000.0	13.96	20.90	16.78	11.76	1.23	0.76	23.68	12.46	6.34
5250.0	13.59	20.73	15.43	12.22	1.28	0.76	23.24	11.98	6.42
5500.0	13.18	20.55	14.34	12.70	1.32	0.76	22.97	11.59	6.35
5750.0	12.77	20.36	13.78	13.50	1.34	0.79	22.58	11.20	6.47
6000.0	12.30	20.24	13.56	14.36	1.36	0.84	22.25	10.91	6.51
6250.0	11.79	20.14	13.58	15.38	1.38	0.88	21.94	10.54	6.55
6500.0	11.18	20.04	13.65	16.06	1.44	0.91	21.49	10.21	6.65
6750.0	10.44	20.02	13.55	16.72	1.57	0.92	21.10	9.72	6.74
7000.0	9.87	19.89	12.60	15.20	1.64	0.91	20.97	9.72	6.86

Typical Performance Data

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

TEST CONDITIONS: Vd = 4.8V, Id = 81.22 mA @ Temperature = +105degC

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)
10.0	16.75	22.46	14.61	13.74	1.14	0.74	--	18.95	5.41
50.0	16.48	22.15	15.81	14.66	1.13	0.75	37.93	19.52	5.40
100.0	16.06	21.68	14.36	17.06	1.14	0.77	37.63	19.46	5.49
200.0	15.75	21.37	13.45	19.58	1.15	0.77	38.65	19.43	5.41
300.0	15.64	21.28	13.46	19.88	1.16	0.77	38.59	19.46	5.68
400.0	15.59	21.32	13.61	20.08	1.18	0.76	39.50	19.24	5.66
500.0	15.57	21.31	13.70	20.28	1.19	0.76	37.56	19.31	5.77
600.0	15.57	21.31	13.54	20.25	1.19	0.75	37.89	19.19	5.76
700.0	15.55	21.33	13.43	20.17	1.20	0.75	37.53	19.16	5.79
800.0	15.53	21.38	13.36	19.95	1.20	0.75	36.98	19.09	5.69
1000.0	15.53	21.41	13.23	19.70	1.20	0.76	35.66	19.20	5.74
1250.0	15.54	21.43	12.98	19.19	1.17	0.78	35.43	19.09	5.76
1500.0	15.55	21.50	12.85	18.35	1.15	0.81	34.48	18.90	5.78
1750.0	15.54	21.57	12.85	17.11	1.15	0.81	33.62	18.86	5.90
2000.0	15.53	21.63	13.11	15.86	1.17	0.79	32.82	18.52	5.91
2250.0	15.53	21.70	13.75	14.80	1.20	0.75	31.65	18.14	5.99
2500.0	15.55	21.72	14.84	13.94	1.22	0.72	30.59	17.87	6.01
2750.0	15.55	21.74	16.33	13.21	1.23	0.70	29.84	17.20	6.03
3000.0	15.54	21.70	18.28	12.63	1.21	0.70	28.81	16.72	5.90
3250.0	15.50	21.67	20.95	12.19	1.20	0.70	27.89	16.01	6.11
3500.0	15.44	21.62	24.51	11.80	1.19	0.70	27.18	15.44	6.05
3750.0	15.30	21.48	28.05	11.46	1.18	0.70	26.15	14.72	6.09
4000.0	15.12	21.45	28.08	11.25	1.19	0.70	25.66	14.21	6.09
4250.0	14.88	21.31	24.56	11.14	1.19	0.71	25.14	13.85	6.16
4500.0	14.60	21.16	21.36	11.15	1.19	0.73	24.61	13.24	6.16
4750.0	14.28	21.03	18.86	11.31	1.20	0.75	24.13	12.67	6.11
5000.0	13.94	20.83	16.93	11.54	1.23	0.75	23.75	12.22	6.22
5250.0	13.57	20.62	15.57	12.00	1.27	0.75	23.24	11.82	6.27
5500.0	13.17	20.46	14.47	12.46	1.31	0.75	22.89	11.35	6.21
5750.0	12.77	20.30	13.94	13.24	1.34	0.78	22.54	11.01	6.32
6000.0	12.31	20.14	13.69	14.08	1.35	0.83	22.15	10.71	6.37
6250.0	11.80	20.01	13.70	15.04	1.36	0.88	21.81	10.29	6.43
6500.0	11.20	19.95	13.80	15.67	1.43	0.90	21.33	9.99	6.54
6750.0	10.45	19.95	13.72	16.24	1.55	0.91	20.94	9.48	6.59
7000.0	9.88	19.80	12.72	14.81	1.62	0.90	20.80	9.50	6.68

Typical Performance Data

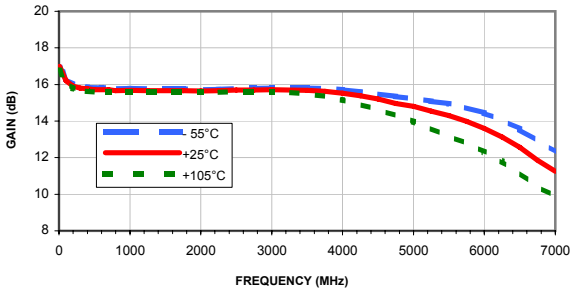
Definitions:
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 5.2V, Id = 96.07 mA @ Temperature = +105degC

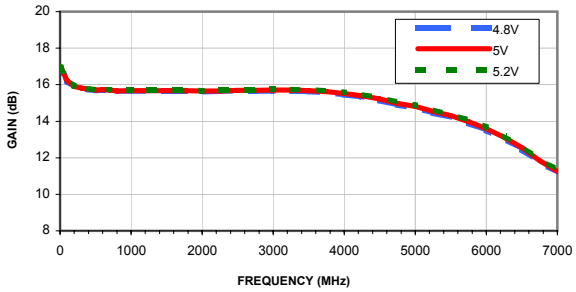
FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
10.0	16.82	22.20	14.35	13.73	1.11	0.72	--	19.60	5.70
50.0	16.54	22.18	15.49	14.87	1.13	0.75	39.47	20.54	5.56
100.0	16.12	21.75	14.09	17.36	1.14	0.77	38.64	20.34	5.66
200.0	15.80	21.45	13.19	20.00	1.15	0.78	39.07	20.39	5.70
300.0	15.69	21.38	13.22	20.31	1.16	0.77	40.42	20.42	5.93
400.0	15.65	21.39	13.35	20.59	1.18	0.77	39.03	20.11	5.87
500.0	15.62	21.39	13.43	20.82	1.19	0.76	37.88	20.17	6.00
600.0	15.62	21.38	13.30	20.79	1.19	0.76	38.06	20.03	5.91
700.0	15.60	21.44	13.18	20.74	1.20	0.76	36.95	19.96	5.98
800.0	15.58	21.43	13.11	20.51	1.20	0.76	37.08	19.88	5.89
1000.0	15.59	21.45	12.98	20.28	1.19	0.77	35.53	20.01	5.94
1250.0	15.60	21.51	12.77	19.81	1.17	0.79	34.68	19.77	5.98
1500.0	15.61	21.56	12.64	18.97	1.15	0.81	33.74	19.51	5.98
1750.0	15.61	21.64	12.68	17.67	1.15	0.81	32.93	19.41	6.11
2000.0	15.61	21.75	12.95	16.42	1.18	0.80	32.18	18.98	6.13
2250.0	15.61	21.73	13.62	15.36	1.20	0.76	31.00	18.57	6.22
2500.0	15.63	21.78	14.74	14.46	1.22	0.72	29.82	18.28	6.24
2750.0	15.63	21.82	16.27	13.74	1.23	0.71	29.27	17.57	6.24
3000.0	15.62	21.77	18.31	13.14	1.22	0.70	28.30	17.04	6.12
3250.0	15.58	21.72	21.06	12.72	1.20	0.71	27.32	16.33	6.33
3500.0	15.52	21.67	24.86	12.31	1.19	0.71	26.68	15.76	6.31
3750.0	15.37	21.58	28.34	11.97	1.20	0.70	25.83	15.05	6.31
4000.0	15.18	21.48	27.56	11.74	1.20	0.71	25.34	14.54	6.32
4250.0	14.92	21.40	23.87	11.65	1.20	0.72	24.85	14.20	6.41
4500.0	14.62	21.26	20.76	11.65	1.20	0.74	24.40	13.59	6.44
4750.0	14.28	21.10	18.37	11.84	1.21	0.76	23.98	13.07	6.38
5000.0	13.93	20.93	16.50	12.06	1.24	0.77	23.55	12.61	6.45
5250.0	13.54	20.74	15.19	12.51	1.28	0.77	23.18	12.24	6.59
5500.0	13.12	20.61	14.14	12.99	1.33	0.77	22.92	11.75	6.52
5750.0	12.71	20.43	13.60	13.81	1.36	0.80	22.58	11.41	6.65
6000.0	12.23	20.30	13.38	14.72	1.38	0.84	22.26	11.09	6.70
6250.0	11.71	20.15	13.39	15.83	1.40	0.89	21.97	10.73	6.71
6500.0	11.11	20.14	13.46	16.65	1.47	0.92	21.56	10.48	6.84
6750.0	10.36	20.10	13.36	17.38	1.59	0.93	21.20	9.94	6.89
7000.0	9.79	19.96	12.41	15.76	1.66	0.92	21.09	9.95	7.06

Typical Performance Curves

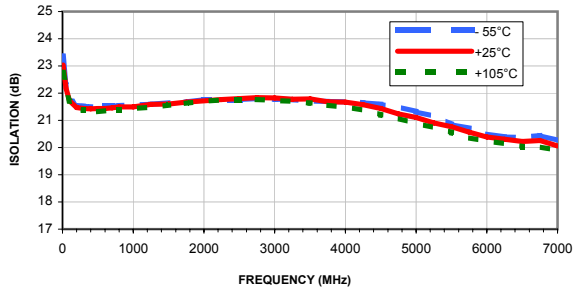
GAIN vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



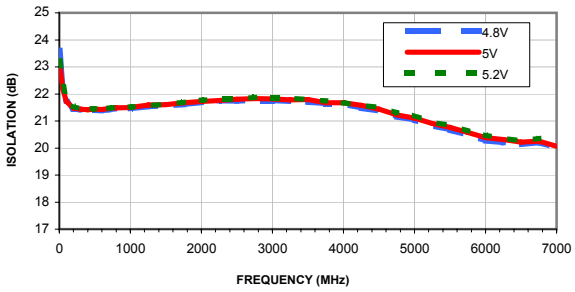
GAIN vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



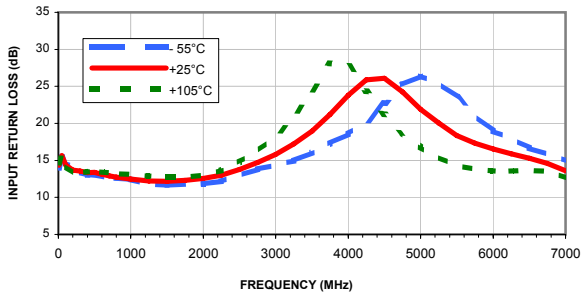
ISOLATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



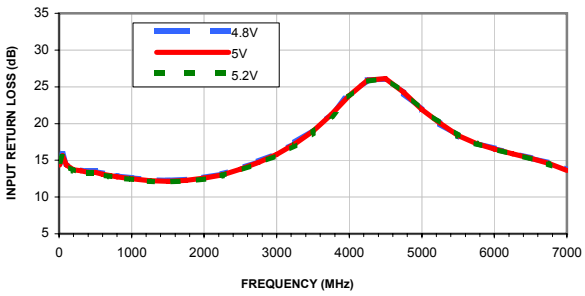
ISOLATION vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



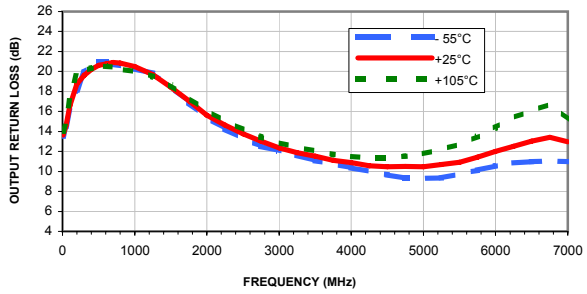
INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V



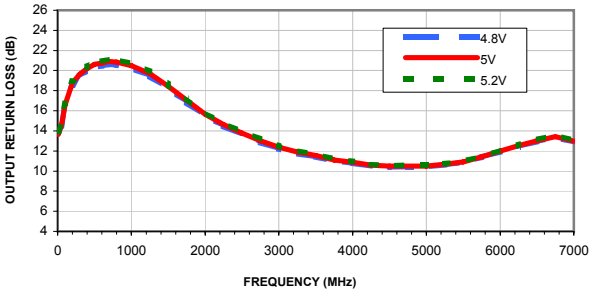
INPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C



OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V

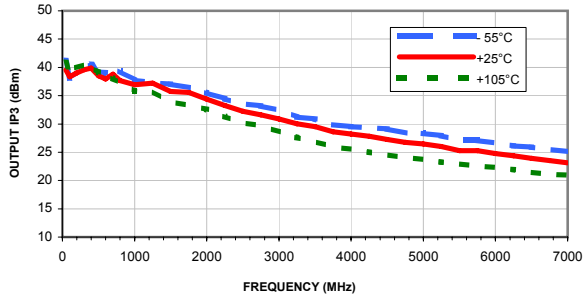


OUTPUT RETURN LOSS vs. FREQUENCY & DEVICE VOLTAGE
INPUT POWER = -25dBm, Temperature = +25°C

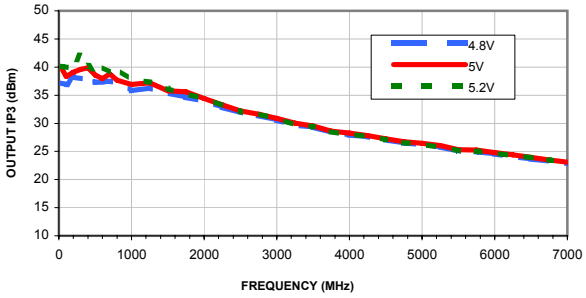


Typical Performance Curves

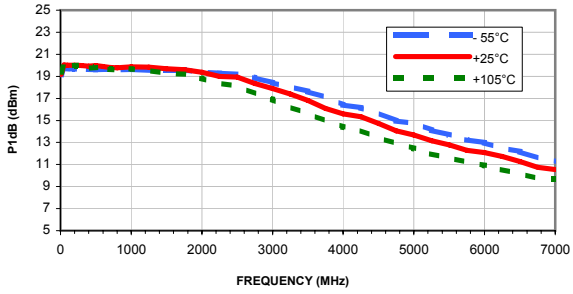
OUTPUT IP3 vs. FREQUENCY & TEMPERATURE
OUTPUT POWER = 0 dBm/tone, Vd = 5V



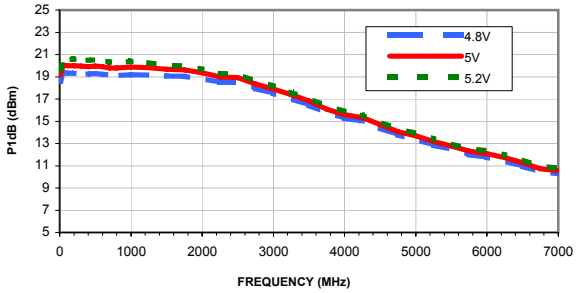
OUTPUT IP3 vs. FREQUENCY & DEVICE VOLTAGE
OUTPUT POWER = 0 dBm/tone, Temperature = +25°C



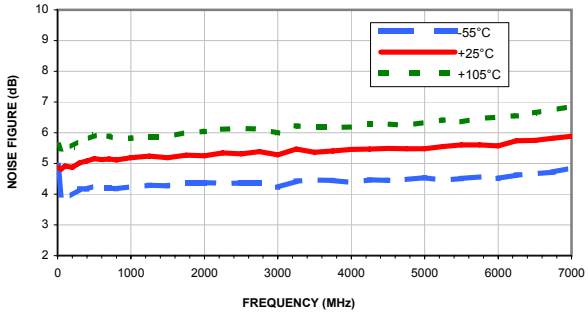
P1dB vs. FREQUENCY & TEMPERATURE
Vd = 5V



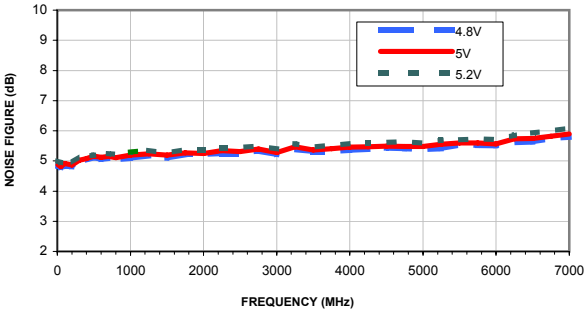
P1dB vs. FREQUENCY & DEVICE VOLTAGE
Temperature = +25°C



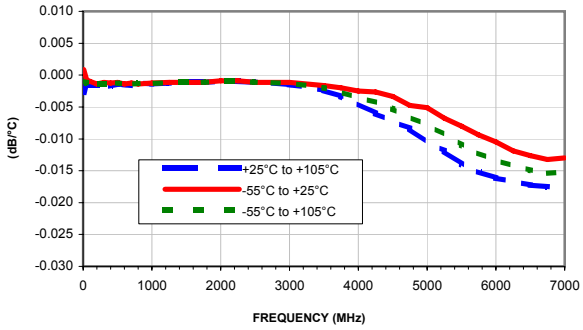
NOISE FIGURE vs. FREQUENCY & TEMPERATURE
Vd = 5V



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

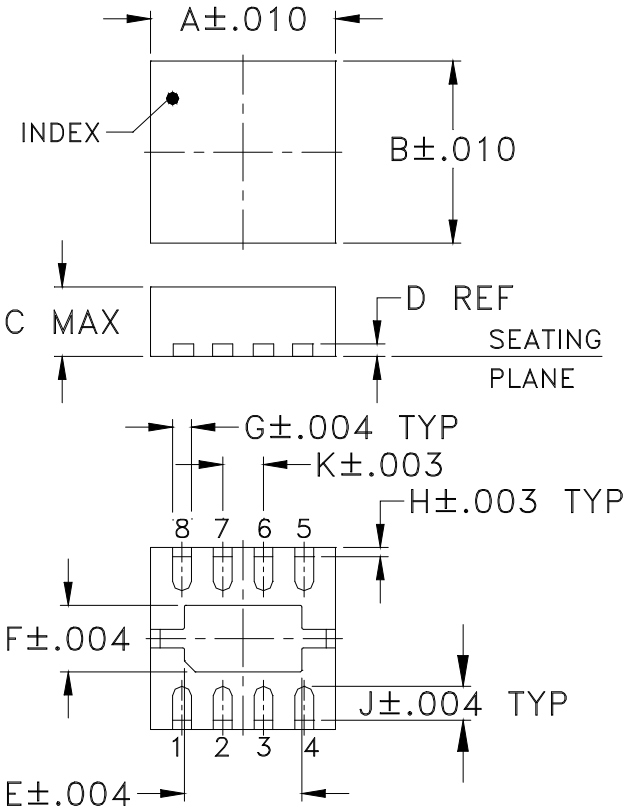


GAIN VARIATION vs. FREQUENCY & TEMPERATURE
INPUT POWER = -25dBm, Vd = 5V

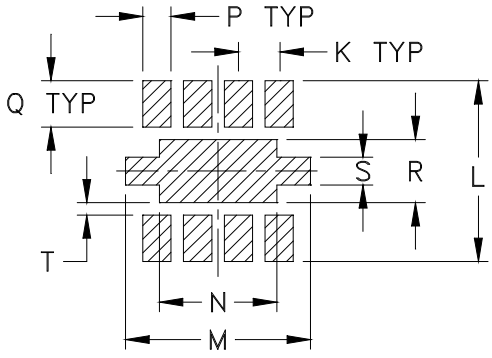


DL1721

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
DL1721	.118 (3.00)	.118 (3.00)	.045 (1.14)	.008 (0.20)	.075 (1.91)	.043 (1.09)	.012 (0.30)	.006 (0.15)	.022 (0.56)	.026 (0.66)	.117 (2.97)	.118 (3.00)	.075 (1.91)

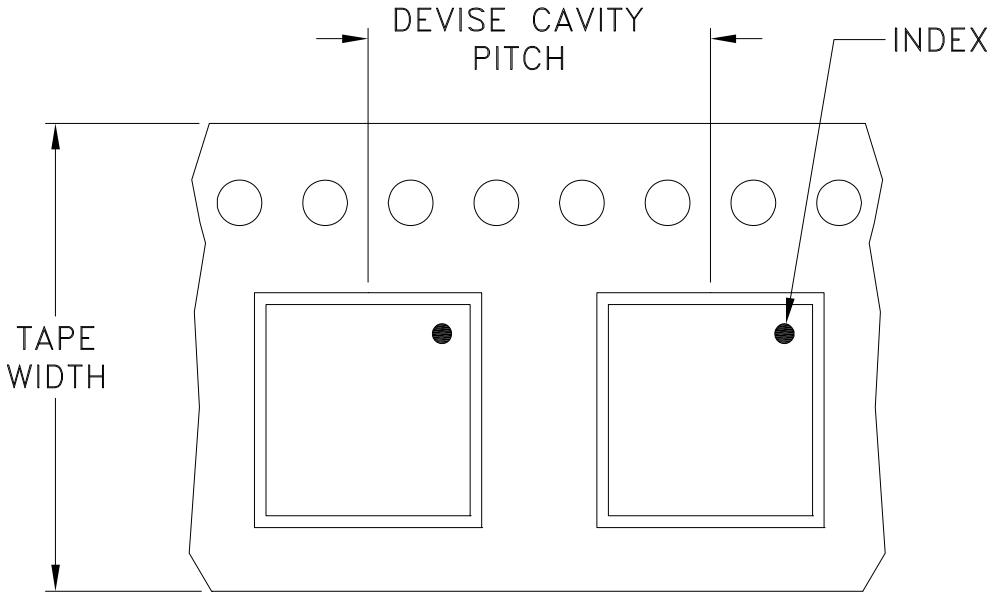
CASE #	P	Q	R	S	T	WT. GRAM
DL1721	.018 (0.46)	.030 (0.76)	.041 (1.04)	.018 (0.46)	.008 (0.20)	.02

Dimensions are in inches (mm). Tolerances: 3Pl. ± .004, unless otherwise specified.

Notes:

1. Case material: LTCC.
2. Termination finish: Nickel-Palladium-Gold plating.

Tape & Reel Packaging TR-F66-1



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

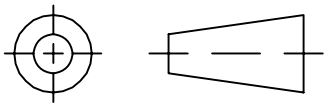
Note: Please consult individual model data sheet to determine device per reel availability.

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

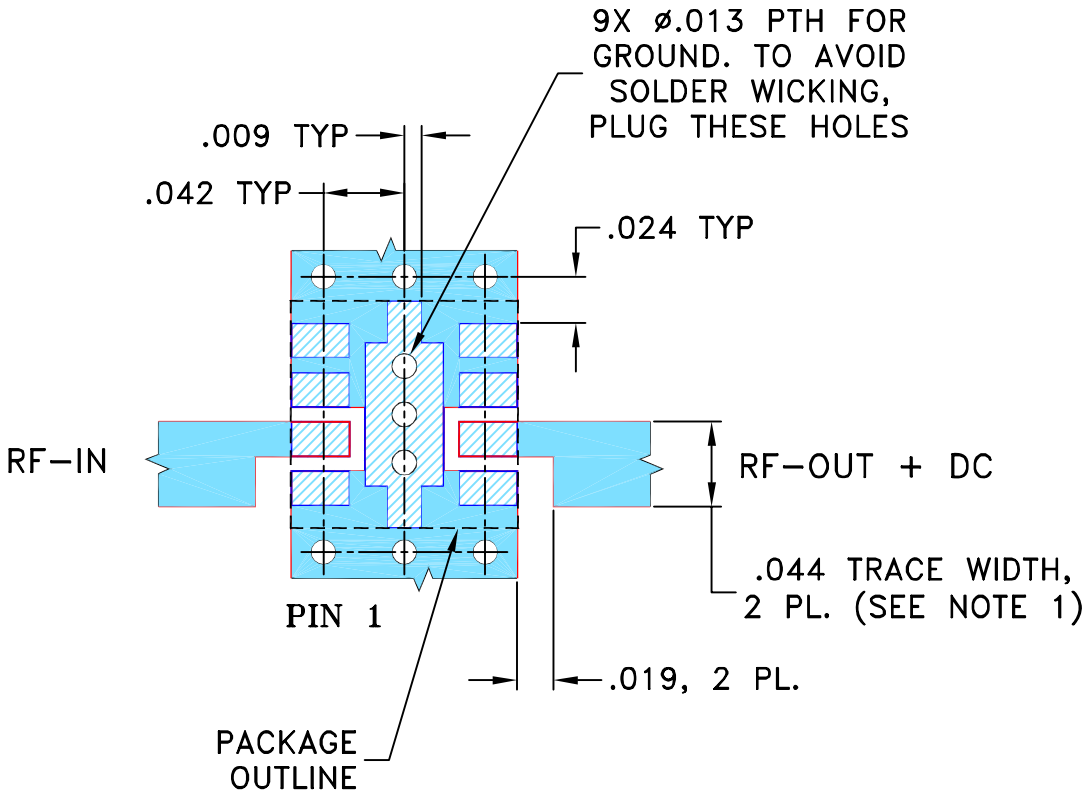
Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M136376	NEW RELEASE	06/12/12	PW	DJ

SUGGESTED MOUNTING CONFIGURATION FOR DL1721 CASE STYLE, "08AM09" PIN CONNECTION



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 AND GAP 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	PW	05/18/12
TOLERANCES ON:	CHECKED	IL	06/05/12
2 PL DECIMALS ±	APPROVED	DJ	06/12/12
3 PL DECIMALS ± .005			
ANGLES ± 1°			
FRACTIONS ±			

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

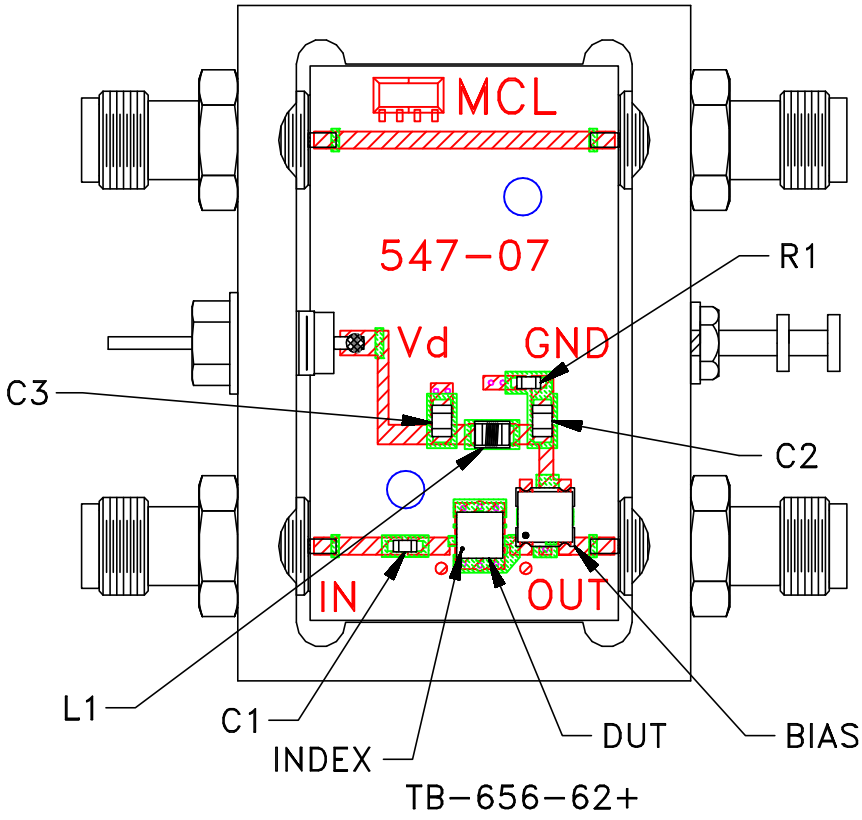
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 08AM09, DL1721, CMA TB-656+

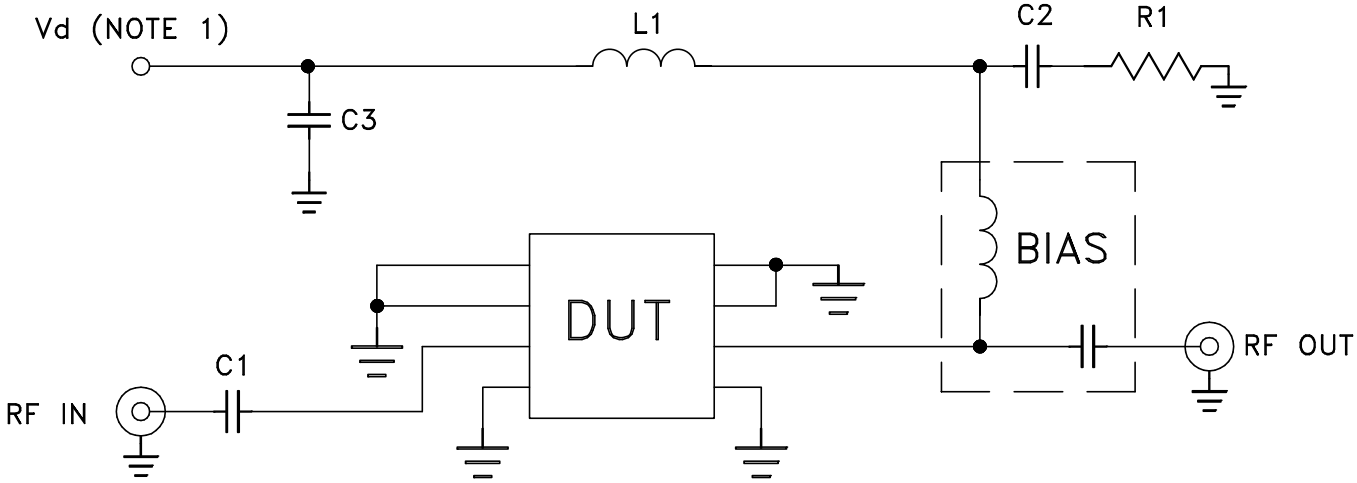
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-366	OR

FILE:	SCALE:	SHEET:
98PL366	10:1	1 OF 1

Evaluation Board and Circuit



TB-656-62+



COMPONENT	DESCRIPTION
DUT	CMA-62+
C1	2.2 nF
C2,C3	.1 uF
L1	15 nH
R1	11.5 Ohm
BIAS TEE	Mini-Circuits TCBT-14+

Schematic Diagram

NOTES:

1. Vd voltage: +5V.
2. SMA Female connectors.
3. PCB material: Rogers RO4350 or equivalent, dielectric constant=3.5, dielectric thickness=.020 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV68

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	-55° to 105°C	Individual Model Data Sheet
Storage Temperature	-65° to 125° C	Individual Model Data Sheet
Thermal Shock (device level)	-55° to 125°C, 100 cycles	MIL-STD-202, Method 107
Thermal Shock (board level)	-55° to 125°C, 1000 cycles	MIL-STD-202, Method 107
Constant Acceleration	Y1 plane only, 30 Kg	MIL-STD-883, Method 2001, Cond. E
Vibration	10-2000MHz sine, 20g, 3 axis	MIL-STD-202, Method 204, Cond. D
Mechanical Shock	Y1 plane, 5 pulses, .5ms, 1.5 Kg	MIL-STD-202, Method 213, Cond. A
PIND	20G's @130 Hz	MIL-STD-750, Method 2052.2
Resistance to Soldering Heat	3X Reflow, Peak Temperature 260°C, electrical End points	JESD22-B102
Resistance to Solvent	15 pieces, 5 pieces each solvent, marking permanency	MIL-STD-202, Method 215
Moisture Sensitivity Level	Hermetic device, MSL-1 by construction	JESD22-A113, MSL1/260
Hermeticity	Fine Leak, Gross Leak	MIL-STD-202, Method 112, Cond. C&D

Environmental Specifications ENV68

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
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JEDEC-STD-22-B, Method A102