



COAXIAL

Low Noise Amplifier ZX60-P105LN+

Mini-Circuits

50Ω 40 to 2600 MHz SMA-Female

THE BIG DEAL

- Flat Gain, ±0.25 dB typ.
- Low Noise Figure, 1.9 dB typ. at 2 GHz
- High Dynamic Range
- Gain, 15 dB typ. at 2 GHz
- High IP3, +39 dBm typ. at 0.9 GHz
- Unconditionally stable
- Protected by US patent 6,790,049



Generic photo used for illustration purposes only

Model No.	ZX60-P105LN+
Case Style	GC957
Connectors	SMA-Female

+RoHS Compliant

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

APPLICATIONS

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

PRODUCT OVERVIEW

The ZX60-P105LN+ (RoHS compliant) uses Mini-Circuits' E-PHEMT technology and offers ultra low Gain Flatness over a broad frequency range and high dynamic range. Housed in a rugged, cost effective unibody chassis. The ZX60-P105LN+ is unconditionally stable and has good input and output return loss over a broad frequency range without the need for external matching components.

KEY FEATURES

Feature	Advantages
Ultra Low Noise Figure, 1.9 dB at 2GHz	Outstanding world class noise figure performance.
High IP3 vs. DC Power consumption +37 dBm typical at 1 GHz	Combining Low Noise and High IP3 makes this model ideal for use in Low Noise Receiver Front End (RFE)
Max. Input Power, +23 dBm	Ruggedized design operates to high input powers often seen at receiver inputs.
Very Small Size, 0.75" x 0.75"	The unique unibody size and construction enable the ZX60-P105LN+ to be used in extremely compact connectorized applications.





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ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Units
Frequency Range		40		2600	MHz
Noise Figure	40		2.3		dB
	500		2.0		
	900		1.9		
	2000		1.9	2.7	
	2600		2.0		
Gain	40		14.4		dB
	500		14.5		
	900		14.4		
	2000	13.8	15.5	16.8	
	2600		15.1		
Gain Flatness	1000 - 2000		±0.25		dB
Output Power @ 1 dB compression	40		19.5		dBm
	500		21.0		
	900		21.0		
	2000		18.9		
	2600		19.4		
Output IP3	40		34.6		dBm
	500		38.7		
	900		37.4		
	2000		33.6		
	2600		33.2		
Input VSWR	40		2.2		dB
	500		1.2		
	900		1.2		
	2000		1.3		
	2600		1.8		
Output VSWR	40		1.1		dB
	500		1.2		
	900		1.1		
	2000		2.4		
	2600		2.2		
Active Directivity (Isolation-Gain)	40		6.3		dB
	500		4.5		
	900		5.1		
	2000		8.1		
	2600		13.5		
DC Supply Voltage		4.8	5.0	5.2	V
Supply Current		—	63	77	mA





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Low Noise Amplifier ZX60-P105LN+

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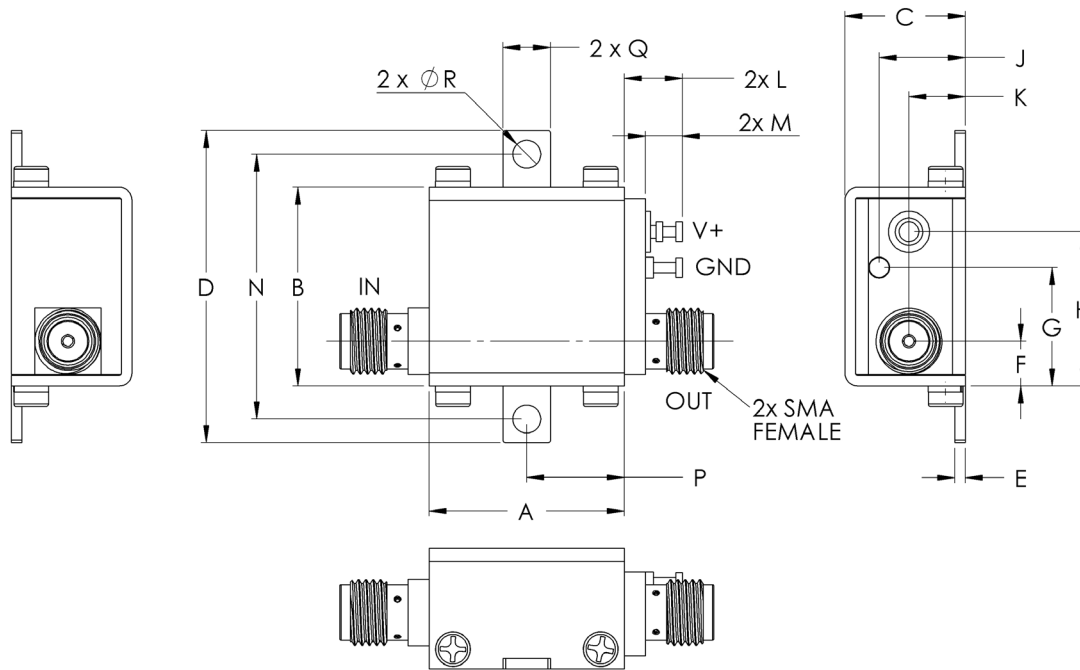
50Ω 40 to 2600 MHz SMA-Female


MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C Case
Storage Temperature	-55°C to 100°C
DC Voltage	+5.5 V
Input RF Power (no damage)	+23 dBm (5 minutes max., +17dBm continous)
Power Consumption	0.47 W

Permanent damage may occur if any of these limits are exceeded.

OUTLINE DRAWING



 NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note. [AN-40-010](#).

OUTLINE DIMENSIONS (Inches mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	wt
.74	.75	.46	1.18	.04	.17	.45	.59	.33	.21	.22	.14	1.00	.37	.18	.106	grams
18.80	19.1	11.68	30.0	1.02	4.32	11.4	14.99	8.38	5.33	5.59	3.56	25.40	9.40	4.57	2.69	23.0

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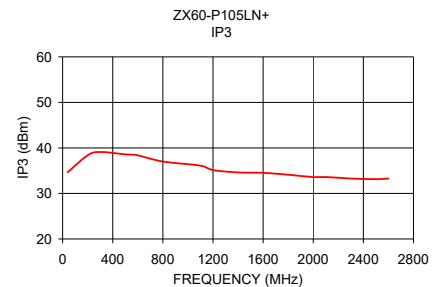
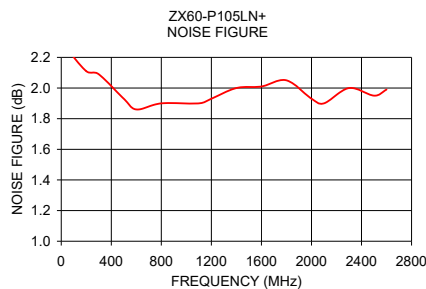
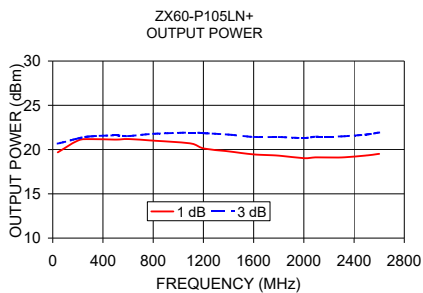
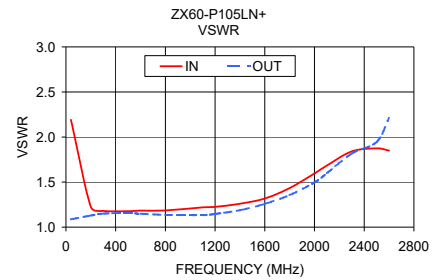
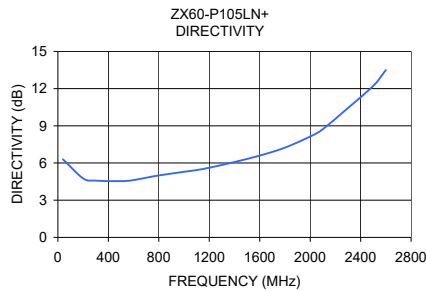
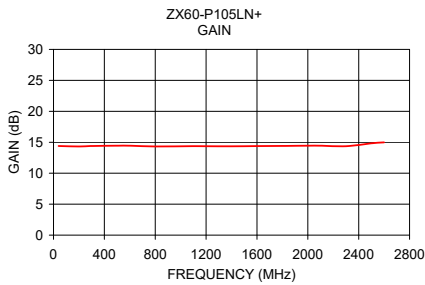
Low Noise Amplifier ZX60-P105LN+

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50Ω 40 to 2600 MHz SMA-Female

TYPICAL PERFORMANCE DATA/CURVES

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1)		Power Out @1 dB Compr. (dBm)	Noise Figure (dB)	OUTPUT IP3 (dBm)
			IN	OUT			
40.00	14.40	6.30	2.19	1.09	19.7	2.3	34.7
200.00	14.32	4.76	1.23	1.13	21.0	2.1	38.4
300.00	14.39	4.58	1.18	1.15	21.2	2.1	39.1
500.00	14.45	4.54	1.18	1.16	21.1	1.9	38.6
600.00	14.45	4.62	1.18	1.15	21.2	1.9	38.4
800.00	14.32	5.00	1.18	1.14	21.0	1.9	37.0
1100.00	14.37	5.43	1.22	1.13	20.7	1.9	36.1
1200.00	14.36	5.62	1.22	1.15	20.1	1.9	35.1
1400.00	14.35	6.08	1.26	1.19	19.8	2.0	34.6
1600.00	14.38	6.60	1.32	1.26	19.5	2.0	34.5
1800.00	14.41	7.24	1.43	1.36	19.3	2.1	34.1
2000.00	14.44	8.14	1.60	1.50	19.0	1.9	33.6
2100.00	14.45	8.73	1.68	1.60	19.1	1.9	33.6
2300.00	14.36	10.44	1.84	1.82	19.1	2.0	33.3
2500.00	14.83	12.22	1.87	1.95	19.3	2.0	33.1
2600.00	14.98	13.50	1.85	2.21	19.5	2.0	33.3



- 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 = 5.00V, Id = 64.67mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.45	20.75	8.51	26.88	1.13	0.90	34.92	19.19	2.10
50.0	14.41	20.18	9.91	27.65	1.13	0.83	35.50	19.55	2.29
60.0	14.35	19.90	11.20	26.65	1.14	0.79	35.71	20.08	2.33
70.0	14.32	19.73	12.29	26.16	1.14	0.77	34.81	20.46	2.49
80.0	14.29	19.59	13.27	25.76	1.15	0.75	36.91	20.55	2.38
90.0	14.28	19.50	14.18	25.41	1.15	0.73	41.68	20.76	2.38
100.0	14.28	19.42	14.96	25.30	1.15	0.72	37.29	20.86	2.34
150.0	14.28	19.22	17.87	24.25	1.15	0.69	36.75	20.93	2.33
200.0	14.32	19.13	19.92	23.39	1.15	0.67	37.15	20.93	2.24
250.0	14.36	19.06	21.14	22.87	1.14	0.66	39.48	21.02	2.22
300.0	14.40	19.02	22.05	22.51	1.14	0.65	43.51	20.95	2.15
350.0	14.43	19.01	22.68	22.20	1.13	0.65	41.98	21.14	2.16
400.0	14.44	19.01	22.82	21.82	1.13	0.65	38.81	21.14	2.33
450.0	14.43	19.02	22.78	21.69	1.13	0.65	37.80	21.14	2.04
500.0	14.44	19.06	22.76	21.64	1.14	0.65	38.40	21.18	2.05
600.0	14.42	19.13	22.87	21.94	1.14	0.66	40.05	21.08	2.02
700.0	14.39	19.25	23.08	22.24	1.15	0.67	37.37	20.92	2.07
800.0	14.28	19.44	23.58	23.31	1.17	0.69	36.12	20.82	2.13
900.0	14.32	19.51	22.15	24.45	1.18	0.70	36.70	20.91	2.05
1000.0	14.32	19.65	21.68	24.37	1.19	0.71	35.35	20.04	2.03
1100.0	14.30	19.82	21.18	24.31	1.20	0.72	36.14	20.53	2.06
1200.0	14.28	20.01	20.19	23.81	1.21	0.74	34.36	19.76	2.07
1250.0	14.26	20.12	19.67	23.54	1.22	0.74	34.23	19.47	2.12
1300.0	14.26	20.23	19.09	22.46	1.23	0.75	34.30	19.27	2.11
1450.0	14.22	20.60	17.43	20.14	1.26	0.78	34.51	19.05	2.14
1600.0	14.18	21.03	15.92	18.01	1.28	0.80	32.88	18.30	2.09
1700.0	14.16	21.35	14.96	16.95	1.30	0.82	34.28	18.14	2.07
1800.0	14.13	21.73	13.89	15.74	1.32	0.85	34.10	17.75	2.09
1900.0	14.08	22.21	12.92	14.17	1.34	0.87	34.25	17.83	2.39
2000.0	14.03	22.75	12.16	12.80	1.37	0.89	33.54	17.54	2.10
2100.0	13.98	23.37	11.45	11.69	1.40	0.92	33.84	17.76	2.07
2200.0	13.94	24.16	10.74	10.71	1.44	0.94	33.73	18.18	2.12
2300.0	13.79	25.15	10.21	9.62	1.54	0.95	33.90	18.46	1.98
2400.0	13.56	26.44	9.59	9.05	1.73	0.97	33.49	18.57	2.10
2500.0	13.92	27.59	9.49	8.03	1.78	0.95	33.99	18.98	2.19
2600.0	14.18	29.38	9.68	7.09	2.01	0.91	34.57	19.43	2.11
2700.0	14.32	31.78	9.88	6.33	2.49	0.87	34.29	19.74	2.16
2800.0	14.39	35.83	10.45	5.62	3.80	0.81	34.48	19.94	2.13
2900.0	14.43	39.77	11.25	5.12	5.94	0.74	35.32	20.34	2.02
3000.0	14.39	36.45	12.37	4.99	4.24	0.70	35.50	21.07	2.06

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 = 4.80V, Id = 62.01mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.43	20.76	8.53	27.07	1.14	0.90	34.96	18.87	2.08
50.0	14.41	20.18	9.88	27.98	1.13	0.83	34.71	19.13	2.33
60.0	14.34	19.91	11.14	27.18	1.14	0.79	35.75	19.74	2.30
70.0	14.31	19.74	12.30	26.71	1.15	0.77	35.20	20.10	2.48
80.0	14.29	19.61	13.32	26.33	1.15	0.75	36.46	20.17	2.38
90.0	14.28	19.51	14.21	25.98	1.15	0.73	38.92	20.37	2.39
100.0	14.28	19.43	15.00	25.86	1.15	0.72	36.92	20.51	2.32
150.0	14.29	19.24	17.86	24.79	1.15	0.69	36.83	20.60	2.34
200.0	14.33	19.14	20.02	23.87	1.15	0.67	36.82	20.57	2.26
250.0	14.36	19.07	21.23	23.32	1.14	0.66	39.38	20.68	2.21
300.0	14.40	19.03	22.09	22.97	1.14	0.65	40.57	20.58	2.23
350.0	14.43	19.02	22.78	22.63	1.14	0.65	42.46	20.81	2.11
400.0	14.44	19.02	22.88	22.23	1.13	0.65	39.02	20.78	2.30
450.0	14.44	19.04	22.76	22.09	1.14	0.65	37.45	20.80	2.06
500.0	14.43	19.06	22.68	22.03	1.14	0.65	37.71	20.82	2.04
600.0	14.42	19.14	22.66	22.36	1.14	0.66	38.29	20.72	2.01
700.0	14.38	19.26	22.76	22.69	1.15	0.67	36.82	20.55	2.07
800.0	14.28	19.45	23.03	23.79	1.18	0.69	35.54	20.43	2.15
900.0	14.32	19.53	21.67	24.97	1.18	0.70	35.98	20.50	2.06
1000.0	14.30	19.66	21.21	24.89	1.19	0.71	34.66	19.72	2.05
1100.0	14.28	19.83	20.75	24.79	1.20	0.72	35.83	20.18	2.07
1200.0	14.25	20.02	19.83	24.12	1.22	0.74	33.84	19.38	2.12
1250.0	14.24	20.13	19.39	23.86	1.23	0.75	33.75	19.16	2.10
1300.0	14.23	20.25	18.85	22.68	1.23	0.75	33.73	18.93	2.12
1450.0	14.19	20.61	17.33	20.26	1.26	0.78	33.97	18.70	2.14
1600.0	14.14	21.04	15.90	18.14	1.29	0.80	32.35	17.94	2.14
1700.0	14.12	21.37	14.96	17.08	1.31	0.83	33.70	17.78	2.04
1800.0	14.08	21.74	13.95	15.88	1.33	0.85	33.59	17.37	2.11
1900.0	14.04	22.22	12.97	14.30	1.35	0.87	33.63	17.47	2.04
2000.0	13.98	22.75	12.22	12.93	1.38	0.90	33.09	17.18	2.10
2100.0	13.94	23.39	11.53	11.80	1.41	0.92	33.32	17.40	2.09
2200.0	13.89	24.18	10.82	10.84	1.46	0.94	33.20	17.83	2.13
2300.0	13.74	25.19	10.27	9.76	1.56	0.95	33.56	18.14	1.98
2400.0	13.52	26.48	9.67	9.17	1.76	0.97	33.11	18.24	2.14
2500.0	13.88	27.64	9.58	8.13	1.82	0.95	33.59	18.67	2.22
2600.0	14.14	29.46	9.76	7.20	2.06	0.91	34.20	19.07	2.10
2700.0	14.27	31.90	9.98	6.45	2.56	0.87	33.85	19.43	2.18
2800.0	14.35	36.16	10.55	5.73	4.02	0.81	34.07	19.65	2.11
2900.0	14.38	40.32	11.38	5.20	6.43	0.75	34.99	20.02	2.03
3000.0	14.35	36.55	12.48	5.08	4.36	0.70	35.21	20.76	2.07

Amplifier

ZX60-P105LN+

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 = 5.20V, Id = 67.82mA @ Temperature = +25°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.48	20.80	8.54	26.99	1.14	0.90	36.09	19.48	2.11
50.0	14.46	20.28	9.76	27.94	1.13	0.84	35.62	19.79	2.31
60.0	14.39	19.98	11.19	27.09	1.14	0.80	37.02	20.35	2.31
70.0	14.36	19.77	12.33	26.63	1.15	0.77	36.01	20.73	2.42
80.0	14.35	19.64	13.32	26.28	1.15	0.75	37.12	20.85	2.35
90.0	14.34	19.53	14.22	25.93	1.15	0.73	40.24	21.02	2.38
100.0	14.34	19.46	15.01	25.83	1.15	0.72	38.62	21.14	2.33
150.0	14.35	19.28	17.86	24.77	1.15	0.69	38.04	21.21	2.33
200.0	14.38	19.17	20.02	23.86	1.15	0.67	38.65	21.20	2.27
250.0	14.42	19.11	21.23	23.31	1.14	0.66	40.82	21.30	2.20
300.0	14.45	19.07	22.11	22.96	1.14	0.65	43.90	21.20	2.15
350.0	14.49	19.05	22.71	22.60	1.13	0.65	43.38	21.42	2.12
400.0	14.50	19.05	22.87	22.18	1.13	0.65	40.19	21.41	2.20
450.0	14.49	19.07	22.79	22.01	1.13	0.65	39.45	21.41	2.00
500.0	14.50	19.10	22.73	21.91	1.14	0.65	39.59	21.46	2.07
600.0	14.48	19.17	22.78	22.18	1.14	0.66	40.42	21.35	2.04
700.0	14.44	19.29	22.87	22.42	1.15	0.67	38.13	21.16	2.06
800.0	14.34	19.49	23.24	23.29	1.17	0.69	37.06	21.07	2.11
900.0	14.38	19.56	21.82	24.20	1.18	0.70	37.33	21.16	2.07
1000.0	14.37	19.70	21.39	24.01	1.19	0.71	35.96	20.33	2.05
1100.0	14.35	19.87	20.89	23.78	1.20	0.72	37.09	20.78	2.07
1200.0	14.32	20.06	19.95	23.08	1.21	0.74	35.02	20.01	2.11
1250.0	14.30	20.17	19.48	22.81	1.22	0.74	34.76	19.76	2.14
1300.0	14.29	20.28	18.97	21.74	1.23	0.75	34.84	19.55	2.11
1450.0	14.25	20.65	17.38	19.50	1.26	0.77	35.06	19.36	2.17
1600.0	14.20	21.08	15.94	17.49	1.28	0.80	33.40	18.61	2.18
1700.0	14.18	21.39	15.01	16.47	1.30	0.82	34.83	18.47	2.04
1800.0	14.15	21.76	13.94	15.34	1.32	0.85	34.61	18.06	2.12
1900.0	14.09	22.24	13.00	13.83	1.34	0.87	34.74	18.15	2.08
2000.0	14.03	22.77	12.23	12.49	1.36	0.89	33.94	17.87	2.10
2100.0	13.98	23.38	11.53	11.38	1.39	0.91	34.26	18.07	2.09
2200.0	13.93	24.16	10.80	10.45	1.44	0.93	34.23	18.47	2.15
2300.0	13.78	25.13	10.24	9.40	1.52	0.95	34.31	18.77	1.98
2400.0	13.55	26.39	9.61	8.84	1.70	0.96	33.88	18.87	2.11
2500.0	13.92	27.47	9.50	7.78	1.73	0.94	34.37	19.28	2.23
2600.0	14.17	29.13	9.68	6.85	1.92	0.90	34.91	19.71	2.13
2700.0	14.29	31.32	9.88	6.10	2.32	0.86	34.69	20.04	2.18
2800.0	14.37	34.82	10.41	5.39	3.32	0.79	34.76	20.19	2.16
2900.0	14.40	37.93	11.21	4.86	4.69	0.72	35.45	20.59	2.06
3000.0	14.38	35.84	12.27	4.73	3.85	0.68	35.53	21.34	2.07

Amplifier

ZX60-P105LN+

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 = 5.00V, Id = 57.56mA @ Temperature = -40°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.22	20.14	7.96	25.13	1.08	0.90	34.71	18.14	1.85
50.0	14.07	19.61	9.21	23.63	1.09	0.84	34.66	18.55	1.96
60.0	13.94	19.28	10.55	22.33	1.11	0.79	36.19	19.30	1.99
70.0	13.84	19.09	11.52	21.72	1.12	0.76	34.75	19.76	2.12
80.0	13.77	18.95	12.41	21.21	1.13	0.74	35.63	19.82	2.01
90.0	13.73	18.86	13.24	20.84	1.13	0.73	38.21	20.14	2.10
100.0	13.71	18.79	13.93	20.73	1.14	0.72	38.95	20.33	1.99
150.0	13.66	18.61	16.31	20.06	1.14	0.69	37.77	20.56	2.01
200.0	13.66	18.50	18.02	19.41	1.14	0.67	38.30	20.37	1.91
250.0	13.69	18.44	18.87	18.83	1.14	0.65	38.68	20.66	1.90
300.0	13.73	18.41	19.61	18.45	1.14	0.64	41.10	20.43	1.94
350.0	13.76	18.39	20.26	18.21	1.13	0.64	38.57	20.81	1.85
400.0	13.79	18.38	20.88	18.07	1.13	0.63	37.63	20.86	2.12
450.0	13.79	18.40	21.37	18.05	1.13	0.63	37.66	20.78	1.73
500.0	13.82	18.42	21.95	17.89	1.13	0.63	40.63	20.91	1.75
600.0	13.85	18.48	22.93	17.75	1.14	0.63	40.05	20.71	1.75
700.0	13.87	18.58	24.77	17.91	1.14	0.64	36.54	20.45	1.79
800.0	13.80	18.78	29.23	18.35	1.16	0.66	35.41	20.35	1.83
900.0	13.91	18.83	32.48	18.99	1.15	0.66	36.31	20.53	1.73
1000.0	13.98	18.94	32.81	19.03	1.16	0.67	35.26	19.32	1.71
1100.0	14.03	19.10	28.82	19.13	1.16	0.68	35.42	20.09	1.74
1200.0	14.07	19.27	24.58	19.01	1.17	0.69	33.57	19.05	1.74
1250.0	14.10	19.36	22.81	19.12	1.17	0.70	33.43	18.68	1.76
1300.0	14.12	19.47	21.27	18.61	1.17	0.71	33.69	18.41	1.74
1450.0	14.17	19.83	17.65	17.28	1.17	0.74	33.60	18.25	1.75
1600.0	14.20	20.28	15.33	15.87	1.18	0.77	32.08	17.42	1.74
1700.0	14.29	20.57	13.87	14.84	1.17	0.80	33.67	17.34	1.64
1800.0	14.34	20.95	12.61	13.83	1.17	0.82	33.14	16.98	1.65
1900.0	14.35	21.40	11.65	12.50	1.17	0.85	33.34	17.03	1.75
2000.0	14.35	21.95	10.91	11.15	1.17	0.87	32.65	16.65	1.63
2100.0	14.36	22.55	10.19	10.10	1.16	0.90	32.95	16.86	1.60
2200.0	14.39	23.29	9.56	9.26	1.17	0.92	32.95	17.32	1.64
2300.0	14.35	24.18	9.18	8.16	1.19	0.93	33.11	17.72	1.48
2400.0	14.12	25.43	8.82	7.16	1.27	0.92	32.83	17.86	1.51
2500.0	14.29	26.55	8.07	7.21	1.36	0.96	33.21	18.27	1.79
2600.0	14.77	27.76	8.81	5.86	1.36	0.87	33.97	18.83	1.65
2700.0	14.88	29.55	8.98	5.26	1.56	0.83	33.76	19.20	1.66
2800.0	14.99	32.36	9.48	4.53	2.02	0.75	34.05	19.57	1.63
2900.0	15.06	34.98	10.28	3.94	2.64	0.66	34.79	20.19	1.53
3000.0	15.08	35.53	11.34	3.76	2.94	0.60	35.00	21.26	1.55

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 = 4.80V, Id = 55.36mA @ Temperature = -40°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.19	20.12	7.96	25.27	1.08	0.90	34.10	17.91	1.82
50.0	14.07	19.54	9.21	23.78	1.08	0.84	34.17	18.24	1.99
60.0	13.90	19.27	10.44	22.42	1.11	0.80	35.26	19.01	1.99
70.0	13.81	19.06	11.51	21.79	1.12	0.77	34.02	19.49	2.12
80.0	13.74	18.92	12.41	21.27	1.13	0.74	35.26	19.52	2.01
90.0	13.69	18.83	13.24	20.90	1.13	0.73	38.10	19.88	2.11
100.0	13.67	18.76	13.94	20.79	1.14	0.72	37.48	20.04	2.00
150.0	13.63	18.57	16.33	20.12	1.14	0.69	37.07	20.28	2.03
200.0	13.62	18.47	18.04	19.45	1.14	0.67	37.40	20.15	2.00
250.0	13.66	18.41	18.93	18.88	1.14	0.65	38.65	20.36	1.92
300.0	13.69	18.39	19.64	18.50	1.14	0.65	41.33	20.24	1.87
350.0	13.73	18.36	20.34	18.25	1.14	0.64	39.92	20.55	1.88
400.0	13.75	18.36	20.92	18.11	1.13	0.64	37.55	20.57	2.10
450.0	13.76	18.36	21.43	18.09	1.13	0.63	37.24	20.52	1.81
500.0	13.79	18.40	21.96	17.93	1.13	0.63	39.16	20.60	1.77
600.0	13.81	18.46	23.01	17.78	1.14	0.64	40.18	20.49	1.77
700.0	13.84	18.55	24.88	17.94	1.14	0.64	36.54	20.18	1.75
800.0	13.77	18.76	29.38	18.38	1.16	0.66	35.16	20.23	1.81
900.0	13.88	18.80	32.47	19.00	1.16	0.66	35.77	20.24	1.76
1000.0	13.96	18.91	32.58	19.06	1.16	0.67	34.63	19.12	1.71
1100.0	14.00	19.07	28.52	19.16	1.16	0.68	35.05	19.78	1.74
1200.0	14.04	19.24	24.43	19.03	1.17	0.69	33.00	18.79	1.76
1250.0	14.07	19.34	22.68	19.14	1.17	0.70	32.92	18.45	1.79
1300.0	14.09	19.44	21.17	18.62	1.17	0.71	33.10	18.18	1.76
1450.0	14.14	19.81	17.60	17.27	1.17	0.74	33.16	17.98	1.76
1600.0	14.17	20.26	15.29	15.87	1.18	0.77	31.52	17.18	1.73
1700.0	14.26	20.54	13.85	14.82	1.17	0.80	33.06	17.11	1.62
1800.0	14.30	20.92	12.58	13.81	1.17	0.82	32.68	16.74	1.65
1900.0	14.33	21.38	11.64	12.50	1.17	0.85	32.92	16.81	1.59
2000.0	14.32	21.92	10.91	11.14	1.17	0.87	32.07	16.42	1.61
2100.0	14.35	22.53	10.19	10.09	1.16	0.90	32.38	16.63	1.58
2200.0	14.37	23.27	9.57	9.26	1.17	0.92	32.39	17.08	1.65
2300.0	14.34	24.16	9.20	8.16	1.19	0.93	32.72	17.44	1.42
2400.0	14.11	25.42	8.84	7.15	1.27	0.92	32.30	17.63	1.54
2500.0	14.27	26.55	8.10	7.23	1.36	0.96	32.66	18.04	1.81
2600.0	14.75	27.76	8.84	5.86	1.37	0.87	33.40	18.58	1.67
2700.0	14.87	29.56	9.02	5.26	1.57	0.83	33.06	18.94	1.67
2800.0	14.97	32.35	9.54	4.53	2.02	0.75	33.43	19.29	1.64
2900.0	15.06	35.02	10.33	3.95	2.66	0.66	34.27	19.94	1.52
3000.0	15.07	35.50	11.40	3.76	2.94	0.60	34.53	20.90	1.52

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 = 5.20V, Id = 60.61mA @ Temperature = -40°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.25	20.15	7.96	24.89	1.08	0.90	35.31	18.65	1.84
50.0	14.11	19.62	9.33	23.40	1.09	0.83	35.04	18.94	1.98
60.0	13.96	19.28	10.52	22.12	1.10	0.79	36.66	19.73	2.01
70.0	13.86	19.09	11.51	21.50	1.12	0.76	35.10	20.19	2.12
80.0	13.79	18.95	12.40	21.00	1.12	0.74	36.14	20.24	2.03
90.0	13.75	18.86	13.22	20.66	1.13	0.73	38.53	20.58	2.13
100.0	13.72	18.80	13.91	20.53	1.14	0.72	40.26	20.79	2.01
150.0	13.67	18.62	16.30	19.86	1.14	0.68	38.76	21.00	2.04
200.0	13.68	18.51	17.90	19.22	1.14	0.66	39.05	20.88	2.05
250.0	13.71	18.45	18.80	18.66	1.14	0.65	39.01	21.08	1.97
300.0	13.73	18.42	19.52	18.30	1.14	0.64	40.26	20.94	1.98
350.0	13.78	18.41	20.13	18.04	1.13	0.64	37.88	21.28	1.90
400.0	13.80	18.40	20.68	17.90	1.13	0.63	37.21	21.35	2.06
450.0	13.81	18.41	21.24	17.88	1.13	0.63	37.83	21.23	1.80
500.0	13.85	18.43	21.71	17.73	1.13	0.63	41.41	21.33	1.75
600.0	13.87	18.50	22.80	17.58	1.14	0.63	40.35	21.22	1.78
700.0	13.89	18.59	24.65	17.73	1.14	0.64	36.95	20.92	1.74
800.0	13.82	18.79	29.04	18.16	1.16	0.66	36.06	20.83	1.85
900.0	13.94	18.84	33.01	18.76	1.15	0.66	36.74	20.96	1.73
1000.0	14.01	18.94	33.96	18.82	1.15	0.67	35.91	19.76	1.72
1100.0	14.05	19.10	29.35	18.91	1.16	0.68	35.88	20.51	1.74
1200.0	14.10	19.28	24.85	18.77	1.16	0.69	33.93	19.46	1.77
1250.0	14.13	19.37	22.89	18.90	1.16	0.70	33.92	19.08	1.77
1300.0	14.16	19.48	21.35	18.39	1.17	0.71	34.20	18.82	1.76
1450.0	14.20	19.84	17.68	17.08	1.17	0.74	34.16	18.64	1.79
1600.0	14.24	20.28	15.32	15.71	1.18	0.77	32.70	17.80	1.78
1700.0	14.32	20.58	13.87	14.69	1.17	0.79	34.35	17.74	1.66
1800.0	14.37	20.94	12.56	13.69	1.16	0.82	33.73	17.38	1.66
1900.0	14.38	21.40	11.62	12.39	1.16	0.85	33.88	17.45	1.60
2000.0	14.37	21.94	10.89	11.03	1.16	0.87	33.08	17.05	1.66
2100.0	14.39	22.54	10.15	9.98	1.15	0.90	33.50	17.25	1.57
2200.0	14.43	23.27	9.51	9.15	1.16	0.92	33.41	17.69	1.66
2300.0	14.40	24.15	9.13	8.06	1.17	0.92	33.65	18.05	1.46
2400.0	14.16	25.40	8.76	7.07	1.25	0.92	33.42	18.26	1.54
2500.0	14.32	26.50	8.02	7.13	1.33	0.96	33.74	18.65	1.80
2600.0	14.79	27.68	8.76	5.76	1.33	0.87	34.53	19.21	1.70
2700.0	14.92	29.42	8.89	5.17	1.51	0.82	34.26	19.56	1.67
2800.0	15.02	32.15	9.41	4.44	1.93	0.74	34.64	19.93	1.66
2900.0	15.10	34.59	10.19	3.85	2.47	0.65	35.52	20.55	1.55
3000.0	15.11	35.21	11.22	3.67	2.78	0.59	35.73	21.60	1.55

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 = 5.00V, Id = 68.95mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.55	21.22	8.73	26.51	1.18	0.90	35.98	18.84	2.25
50.0	14.60	20.66	10.20	28.96	1.17	0.84	35.12	19.12	2.53
60.0	14.60	20.42	11.45	30.00	1.17	0.80	36.52	19.63	2.58
70.0	14.61	20.20	12.57	31.08	1.17	0.77	35.67	19.98	2.57
80.0	14.61	20.05	13.60	32.37	1.17	0.75	37.11	20.07	2.60
90.0	14.63	19.96	14.55	32.68	1.16	0.74	39.07	20.28	2.66
100.0	14.65	19.88	15.33	33.28	1.16	0.73	37.35	20.42	2.61
150.0	14.70	19.67	18.30	33.57	1.16	0.70	37.06	20.55	2.58
200.0	14.75	19.56	20.24	31.66	1.15	0.68	37.48	20.51	2.45
250.0	14.80	19.50	20.96	31.21	1.14	0.67	39.90	20.60	2.41
300.0	14.83	19.46	21.27	31.60	1.14	0.66	40.96	20.48	2.41
350.0	14.86	19.44	21.31	30.71	1.13	0.66	41.64	20.70	2.37
400.0	14.85	19.43	20.95	29.32	1.13	0.66	39.88	20.71	2.24
450.0	14.83	19.45	20.70	28.61	1.14	0.66	38.19	20.66	2.24
500.0	14.82	19.49	20.21	28.14	1.14	0.67	37.92	20.72	2.32
600.0	14.78	19.57	19.47	29.69	1.15	0.68	38.47	20.57	2.29
700.0	14.69	19.70	19.07	29.44	1.16	0.69	37.73	20.35	2.30
800.0	14.57	19.89	18.63	28.42	1.18	0.71	36.44	20.23	2.30
900.0	14.55	19.99	17.57	27.16	1.19	0.72	36.65	20.27	2.32
1000.0	14.49	20.13	17.30	25.84	1.20	0.74	35.23	19.60	2.34
1100.0	14.43	20.31	17.21	24.61	1.22	0.75	36.42	19.94	2.37
1200.0	14.34	20.51	16.79	22.72	1.25	0.76	34.91	19.33	2.39
1250.0	14.30	20.62	16.67	22.32	1.26	0.77	34.61	19.12	2.40
1300.0	14.28	20.74	16.52	21.02	1.27	0.78	34.47	18.98	2.43
1450.0	14.16	21.09	16.19	18.88	1.31	0.80	34.77	18.74	2.46
1600.0	14.05	21.52	15.66	17.14	1.35	0.82	33.17	18.06	2.43
1700.0	13.99	21.83	15.50	16.55	1.38	0.83	34.40	17.89	2.50
1800.0	13.91	22.18	14.76	15.93	1.42	0.86	34.43	17.51	2.45
1900.0	13.81	22.65	13.80	14.38	1.45	0.88	34.56	17.56	2.46
2000.0	13.70	23.18	13.25	12.97	1.50	0.89	33.88	17.35	2.45
2100.0	13.62	23.76	12.64	12.07	1.54	0.91	33.98	17.58	2.49
2200.0	13.53	24.52	11.77	11.32	1.62	0.94	33.81	17.93	2.57
2300.0	13.32	25.55	11.04	10.26	1.76	0.95	33.90	18.17	2.46
2400.0	13.20	26.76	10.47	9.64	1.95	0.96	33.47	18.28	2.59
2500.0	13.53	27.84	10.51	8.31	2.00	0.93	33.80	18.62	2.58
2600.0	13.68	29.65	10.44	7.43	2.29	0.91	34.04	18.96	2.55
2700.0	13.80	32.20	10.67	6.84	2.94	0.88	33.89	19.24	2.59
2800.0	13.86	36.37	11.35	6.09	4.60	0.82	33.87	19.34	2.58
2900.0	13.84	39.01	12.13	5.39	6.10	0.75	34.25	19.69	2.50
3000.0	13.82	35.19	13.13	5.37	4.11	0.72	34.41	20.37	2.52

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 = 4.80V, Id = 66.00mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.52	21.22	8.76	26.43	1.18	0.90	35.49	18.59	2.24
50.0	14.58	20.69	9.99	28.90	1.17	0.84	34.79	18.86	2.54
60.0	14.57	20.42	11.40	30.02	1.17	0.80	36.02	19.38	2.60
70.0	14.58	20.19	12.57	31.15	1.17	0.77	34.98	19.72	2.59
80.0	14.60	20.05	13.58	32.49	1.17	0.75	36.77	19.82	2.62
90.0	14.61	19.95	14.54	32.92	1.16	0.74	38.38	20.02	2.66
100.0	14.63	19.88	15.33	33.64	1.16	0.73	36.58	20.15	2.61
150.0	14.69	19.67	18.22	34.07	1.16	0.70	36.60	20.27	2.54
200.0	14.73	19.56	20.19	32.03	1.15	0.68	36.99	20.24	2.43
250.0	14.77	19.49	20.87	31.55	1.14	0.67	38.65	20.33	2.46
300.0	14.80	19.46	21.13	31.93	1.14	0.67	39.59	20.20	2.34
350.0	14.83	19.44	21.18	31.05	1.14	0.66	41.23	20.42	2.35
400.0	14.84	19.43	20.83	29.68	1.13	0.66	39.04	20.41	2.27
450.0	14.83	19.45	20.56	29.02	1.14	0.66	37.63	20.39	2.25
500.0	14.80	19.49	20.09	28.56	1.14	0.67	37.04	20.42	2.30
600.0	14.75	19.56	19.35	30.37	1.15	0.68	37.78	20.30	2.26
700.0	14.68	19.70	18.89	30.26	1.16	0.70	37.19	20.08	2.34
800.0	14.56	19.87	18.45	29.21	1.18	0.72	35.96	19.98	2.28
900.0	14.53	19.99	17.42	27.82	1.19	0.73	36.24	20.01	2.30
1000.0	14.47	20.13	17.12	26.39	1.21	0.74	34.67	19.35	2.29
1100.0	14.40	20.30	17.07	25.09	1.22	0.75	36.01	19.66	2.34
1200.0	14.31	20.50	16.69	23.07	1.25	0.77	34.36	19.09	2.40
1250.0	14.28	20.62	16.55	22.63	1.26	0.77	34.11	18.86	2.40
1300.0	14.25	20.72	16.42	21.34	1.27	0.78	33.96	18.72	2.41
1450.0	14.12	21.08	16.12	19.15	1.31	0.80	34.29	18.48	2.48
1600.0	14.02	21.50	15.59	17.38	1.35	0.82	32.71	17.80	2.46
1700.0	13.95	21.81	15.47	16.82	1.39	0.84	33.97	17.63	2.37
1800.0	13.88	22.17	14.71	16.22	1.42	0.86	34.13	17.25	2.46
1900.0	13.77	22.64	13.81	14.64	1.46	0.88	34.14	17.30	2.47
2000.0	13.66	23.17	13.24	13.20	1.51	0.90	33.52	17.09	2.48
2100.0	13.60	23.76	12.65	12.31	1.56	0.92	33.60	17.32	2.44
2200.0	13.50	24.52	11.78	11.56	1.64	0.94	33.53	17.65	2.53
2300.0	13.29	25.57	11.06	10.47	1.78	0.96	33.55	17.91	2.47
2400.0	13.17	26.80	10.51	9.85	1.98	0.97	33.16	18.04	2.55
2500.0	13.51	27.92	10.53	8.51	2.05	0.94	33.47	18.37	2.56
2600.0	13.66	29.79	10.46	7.63	2.36	0.92	33.84	18.72	2.50
2700.0	13.78	32.51	10.72	7.04	3.10	0.89	33.68	19.00	2.58
2800.0	13.84	37.12	11.42	6.28	5.10	0.83	33.61	19.12	2.58
2900.0	13.82	40.25	12.22	5.57	7.18	0.76	34.17	19.46	2.46
3000.0	13.80	35.38	13.22	5.57	4.29	0.73	34.17	20.14	2.46

Typical Performance Data

Definitions:

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

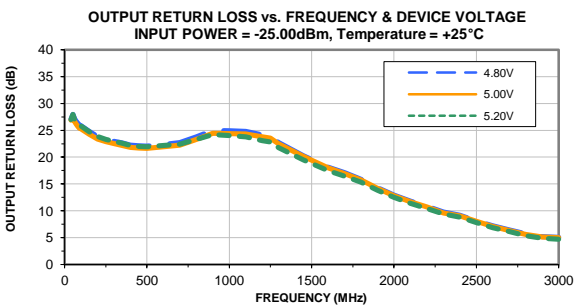
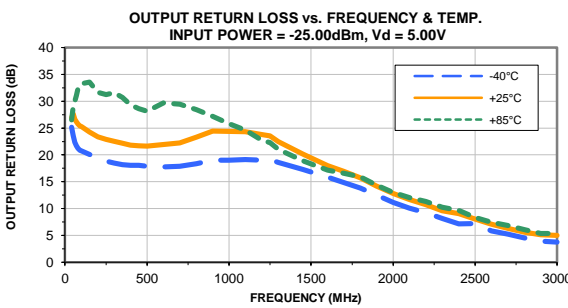
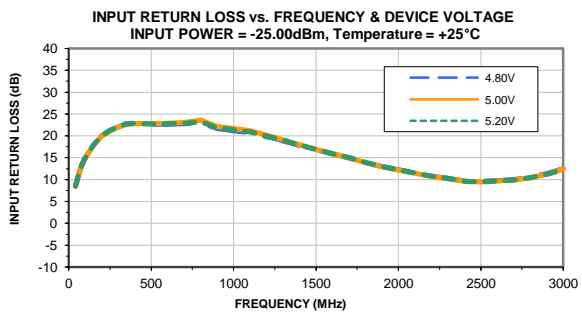
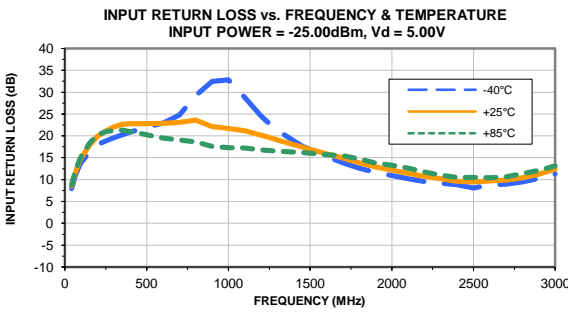
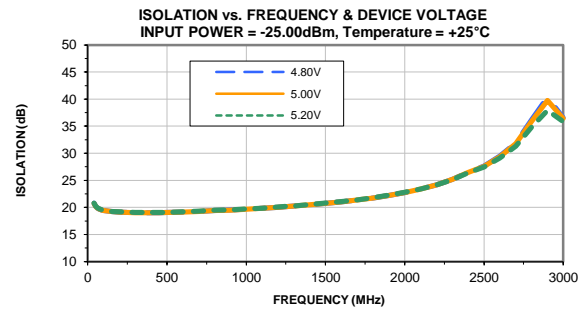
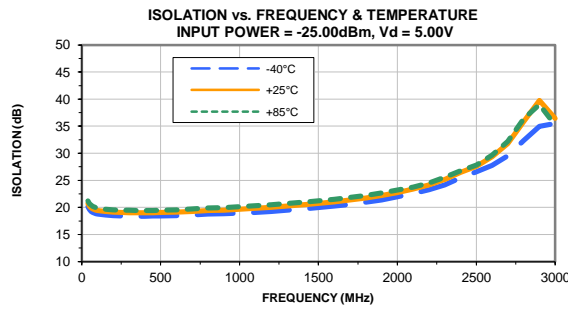
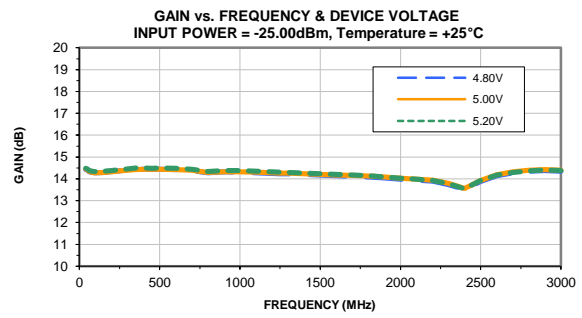
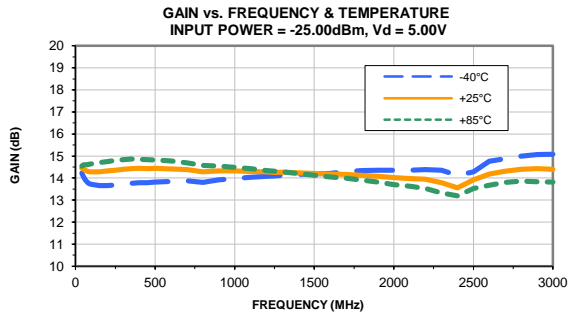
Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

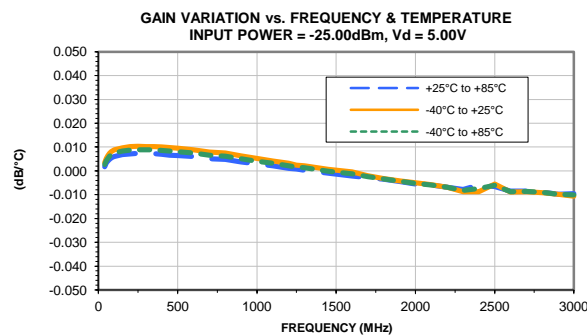
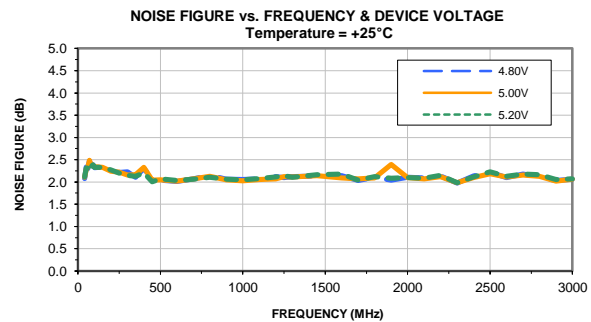
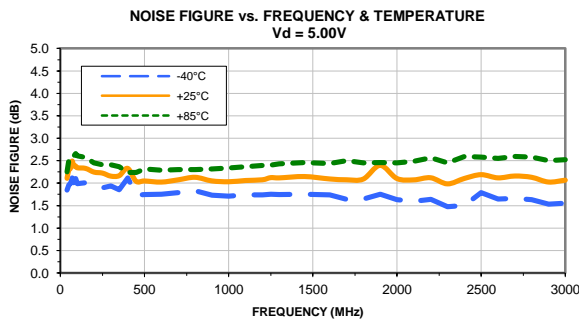
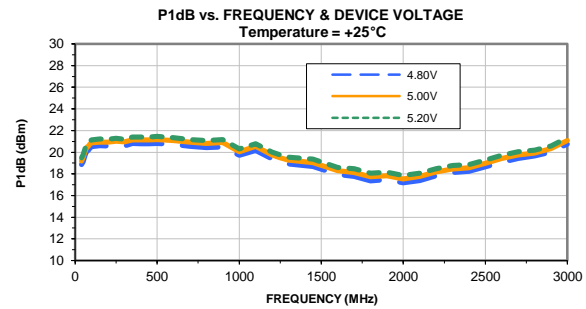
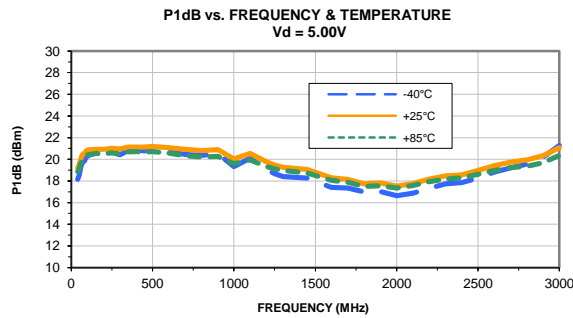
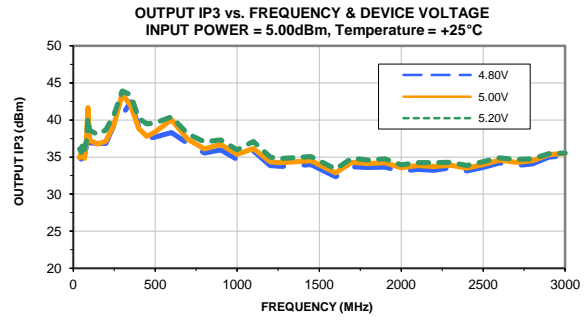
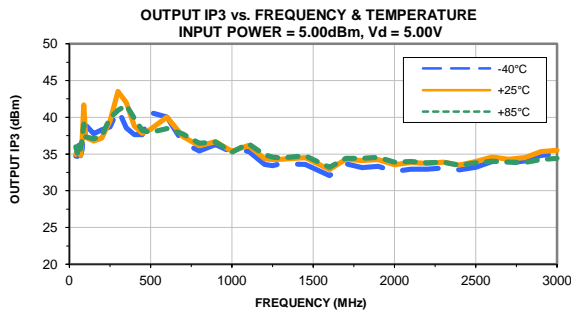
TEST CONDITIONS: Vd = 5.20V, Id = 72.10mA @ Temperature = +85°C

FREQ	Gain	Isolation	Input Return Loss	Output Return Loss	Stability		IP-3 Output	1dB Comp. Output	Noise Figure
					K	Measure			
(MHz)	(dB)	(dB)	(dB)	(dB)	K	Measure	(dBm)	(dBm)	(dB)
40.0	14.57	21.25	8.76	26.35	1.18	0.90	36.71	18.99	2.27
50.0	14.61	20.73	10.22	28.68	1.17	0.84	35.61	19.28	2.55
60.0	14.62	20.45	11.44	29.93	1.17	0.80	37.28	19.79	2.60
70.0	14.63	20.22	12.57	30.97	1.17	0.77	36.06	20.15	2.66
80.0	14.64	20.08	13.59	32.32	1.17	0.75	37.30	20.24	2.64
90.0	14.66	19.98	14.57	32.81	1.16	0.74	39.70	20.46	2.68
100.0	14.68	19.91	15.35	33.55	1.16	0.73	37.89	20.60	2.61
150.0	14.75	19.70	18.26	34.33	1.15	0.69	37.92	20.74	2.58
200.0	14.78	19.59	20.22	32.34	1.15	0.68	37.90	20.71	2.41
250.0	14.82	19.53	20.95	31.87	1.14	0.67	39.04	20.80	2.45
300.0	14.86	19.49	21.25	32.25	1.14	0.66	41.24	20.64	2.44
350.0	14.90	19.47	21.24	31.22	1.13	0.66	42.42	20.90	2.38
400.0	14.89	19.46	20.87	29.66	1.13	0.66	40.49	20.93	2.17
450.0	14.88	19.48	20.64	28.91	1.14	0.66	38.78	20.85	2.23
500.0	14.86	19.52	20.17	28.30	1.14	0.67	38.63	20.91	2.32
600.0	14.82	19.60	19.40	29.68	1.15	0.68	38.93	20.77	2.26
700.0	14.73	19.74	18.98	29.07	1.16	0.69	38.21	20.54	2.36
800.0	14.61	19.92	18.52	27.77	1.18	0.71	36.86	20.42	2.32
900.0	14.58	20.02	17.46	26.46	1.19	0.72	37.21	20.46	2.33
1000.0	14.53	20.17	17.19	25.19	1.20	0.74	35.66	19.77	2.35
1100.0	14.46	20.35	17.15	24.02	1.22	0.75	36.99	20.07	2.37
1200.0	14.37	20.54	16.72	22.21	1.25	0.76	35.23	19.49	2.42
1250.0	14.33	20.66	16.62	21.84	1.26	0.77	35.01	19.28	2.44
1300.0	14.30	20.77	16.48	20.60	1.27	0.78	34.93	19.14	2.45
1450.0	14.19	21.14	16.16	18.53	1.31	0.79	35.22	18.91	2.49
1600.0	14.07	21.55	15.66	16.84	1.35	0.82	33.60	18.23	2.48
1700.0	14.00	21.86	15.52	16.26	1.38	0.83	34.81	18.07	2.40
1800.0	13.92	22.22	14.78	15.67	1.42	0.86	34.98	17.70	2.50
1900.0	13.82	22.67	13.82	14.16	1.45	0.87	34.99	17.72	2.44
2000.0	13.70	23.21	13.28	12.75	1.50	0.89	34.15	17.51	2.50
2100.0	13.63	23.77	12.67	11.87	1.54	0.91	34.26	17.75	2.46
2200.0	13.53	24.52	11.79	11.14	1.61	0.94	34.19	18.08	2.55
2300.0	13.31	25.55	11.05	10.09	1.75	0.95	34.21	18.33	2.50
2400.0	13.20	26.73	10.47	9.50	1.93	0.96	33.79	18.43	2.58
2500.0	13.53	27.77	10.50	8.15	1.97	0.93	34.02	18.76	2.58
2600.0	13.68	29.50	10.42	7.25	2.23	0.90	34.26	19.12	2.60
2700.0	13.79	31.91	10.65	6.68	2.82	0.87	34.09	19.39	2.63
2800.0	13.85	35.65	11.31	5.94	4.19	0.81	34.09	19.48	2.63
2900.0	13.83	37.89	12.07	5.22	5.29	0.74	34.40	19.82	2.52
3000.0	13.81	34.91	13.07	5.20	3.92	0.70	34.56	20.52	2.53

Typical Performance Curves



Typical Performance Curves

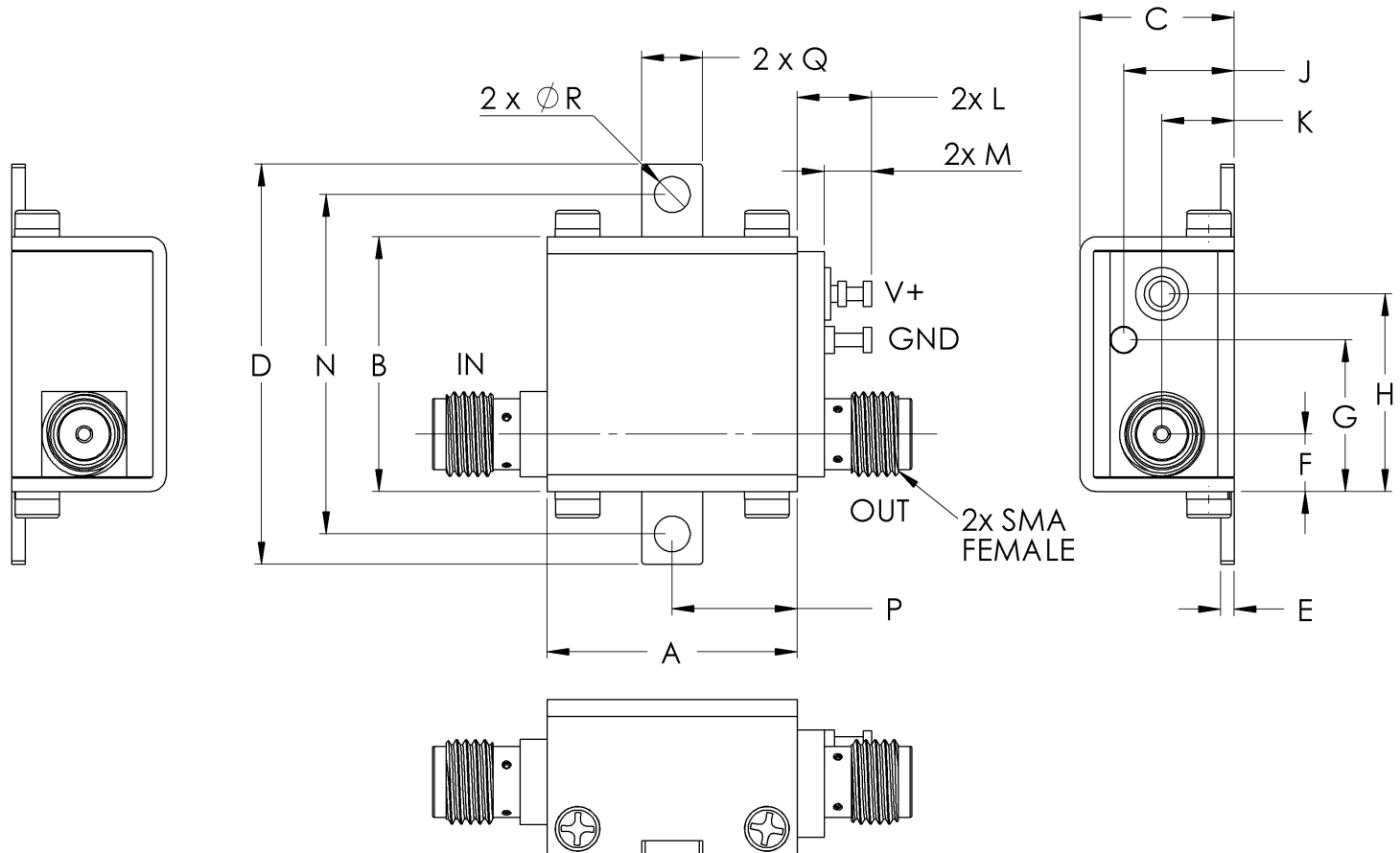


Case Style

GC

Outline Dimensions

GC957



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N
GC957	.74 (18.80)	.75 (19.15)	.46 (11.61)	1.18 (30.07)	.04 (1.02)	.17 (4.32)	.45 (11.40)	.59 (14.86)	.33 (8.31)	.21 (5.44)	.22 (5.59)	.14 (3.56)	1.00 (25.4)

CASE #.	P	Q	R	WT GRAMS
GC957	.37 (9.40)	.18 (4.57)	.106 (2.69)	23.0

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$
Tolerance on hole size and interaxes dimensions to be $\pm .005$.

Note:

1. Case material: Brass
2. Case finish: Nickel plate

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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
Operating Temperature	-40° to 85° C Case Temperature	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Stabilization Bake	(non-operating) 125°C, 24 hours	- - -
Burn-in at Elevated Temp.	(DC on) 160 hours at 85° C	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C