

Coaxial

Low Noise Amplifier

ZX60-33LN-S+

50Ω

50 to 3000 MHz

Features

- wide bandwidth, 50 to 3000 MHz
- low noise figure 1.1 dB typ.
- output power, up to 17.5 dBm typ.
- protected by US patent 6,790,049

Applications

- front-end amplifier
- cellular
- GPS
- bluetooth
- lab
- instrumentation
- test equipment



Case Style: GC957	
Connectors	Model
SMA	ZX60-33LN-S+

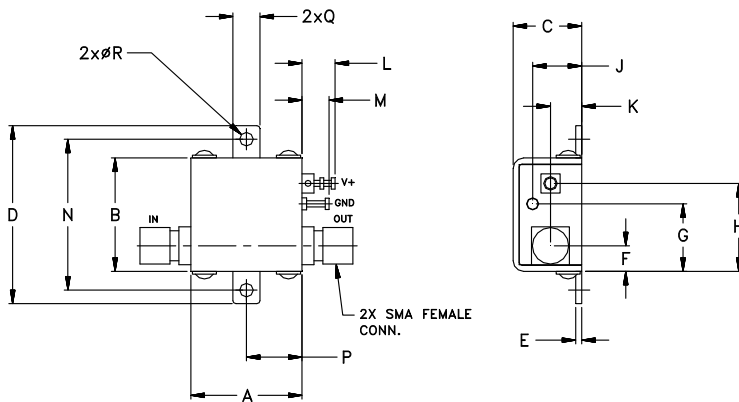
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications at 25°C

Parameter	Condition(MHz)	Min	Typ.	Max.	Units
Frequency	—	50	—	3000	MHz
Noise Figure (Note 1)	—	—	1.1	1.9	dB
Gain	100	—	21.9	—	dB
	1000	—	18.8	—	
	2000	13	14.5	—	
	3000	—	11.9	—	
Gain Flatness	—	—	—	—	dB
Output Power at 1dB compression	—	14.5	16.5	—	dBm
Output third order intercept point	—	—	+32	—	dBm
Input VSWR	—	—	2.0	—	:1
Output VSWR	—	—	1.6	—	:1
Active Directivity	—	—	—	—	dB
DC Supply Voltage	—	—	5	—	V
Supply Current	—	—	70	80	mA

Note 1: 2.3 dB max from 50 to 100 MHz

Outline Drawing



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

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)	+13 dBm
Power Dissipation	0.44W

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

Outline Dimensions (inch/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	.18	1.00	.37	.18	.106	grams
18.80	19.05	11.68	29.97	1.02	4.32	11.43	14.99	8.38	5.33	5.59	4.57	25.40	9.40	4.57	2.69	23.0

Notes

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- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

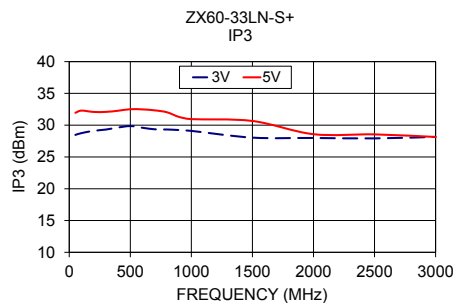
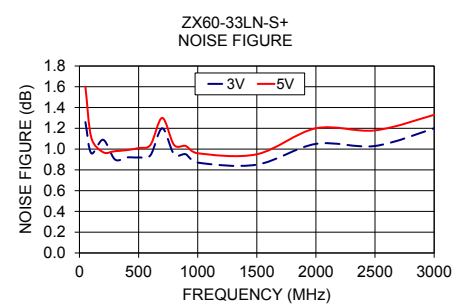
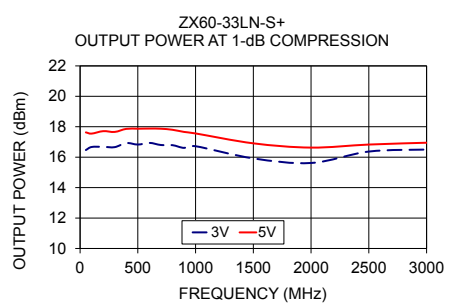
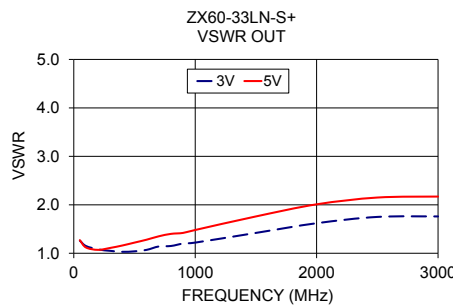
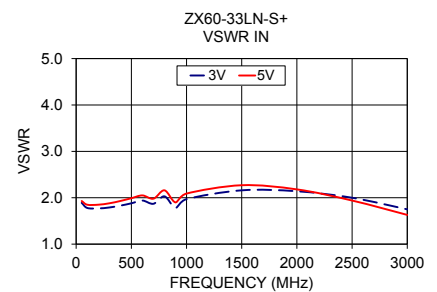
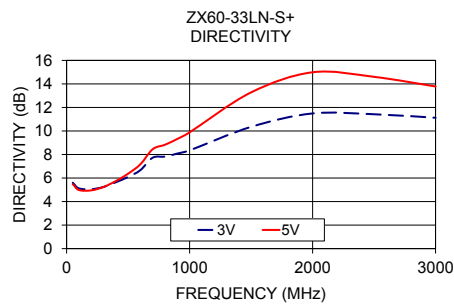
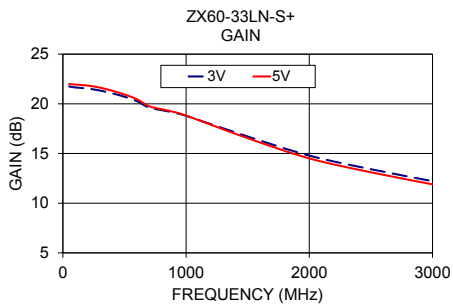


NON-CATALOG

Typical Performance Data/Curves

ZX60-33LN-S+

FREQUENCY (MHz)	GAIN (dB)		DIRECTIVITY (dB)		VSWR IN (:1)		VSWR OUT (:1)		NOISE FIGURE (dB)		POUT at 1dB COMPR. (dBm)		IP3 (dBm)	
	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V
50.00	21.75	21.99	5.60	5.48	1.89	1.93	1.26	1.27	1.26	1.60	16.47	17.63	28.47	31.95
100.00	21.65	21.94	5.12	4.98	1.78	1.85	1.15	1.12	0.96	1.11	16.67	17.55	28.75	32.29
200.00	21.54	21.84	5.05	4.95	1.77	1.85	1.08	1.07	1.09	0.97	16.68	17.71	29.11	32.08
300.00	21.34	21.63	5.24	5.24	1.79	1.88	1.05	1.11	0.90	0.98	16.66	17.66	29.31	32.09
400.00	21.06	21.32	5.64	5.74	1.83	1.93	1.03	1.16	0.92	0.99	16.93	17.86	29.63	32.27
500.00	20.71	20.94	6.09	6.37	1.88	1.99	1.04	1.22	0.92	1.01	16.83	17.87	29.86	32.51
600.00	20.28	20.47	6.67	7.17	1.94	2.05	1.07	1.28	0.94	1.04	16.94	17.88	29.59	32.48
700.00	19.61	19.76	7.73	8.45	1.87	1.98	1.14	1.35	1.20	1.30	16.80	17.87	29.35	32.33
800.00	19.37	19.46	7.82	8.83	2.03	2.16	1.15	1.40	0.95	1.04	16.79	17.80	29.32	32.03
900.00	19.11	19.19	8.08	9.32	1.78	1.90	1.20	1.42	0.95	1.03	16.61	17.66	29.23	31.29
1000.00	18.80	18.82	8.35	9.88	1.97	2.09	1.22	1.48	0.87	0.96	16.72	17.56	29.10	30.95
1500.00	16.71	16.54	10.35	13.28	2.16	2.27	1.42	1.76	0.85	0.95	15.92	16.91	28.04	30.66
2000.00	14.79	14.51	11.49	14.99	2.14	2.18	1.62	2.01	1.05	1.20	15.62	16.63	27.99	28.58
2500.00	13.42	13.11	11.42	14.60	2.00	1.94	1.75	2.15	1.03	1.18	16.37	16.83	27.92	28.55
3000.00	12.22	11.90	11.12	13.78	1.75	1.63	1.76	2.17	1.20	1.33	16.50	16.95	28.16	28.14



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Low Noise Amplifier

ZX60-33LN-S+

Typical Performance Data

FREQUENCY (MHz)	Gain (dB)		Directivity (dB)		VSWR IN (:1)		VSWR OUT (:1)		Noise Figure (dB)		Pout @ 1dB Compression (dBm)		Output IP3 (dBm)	
	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V	3V	5V
50	21.75	21.99	5.60	5.48	1.89	1.93	1.26	1.27	1.26	1.60	16.47	17.63	28.47	31.95
100	21.65	21.94	5.12	4.98	1.78	1.85	1.15	1.12	0.96	1.11	16.67	17.55	28.75	32.29
200	21.54	21.84	5.05	4.95	1.77	1.85	1.08	1.07	1.09	0.97	16.68	17.71	29.11	32.08
300	21.34	21.63	5.24	5.24	1.79	1.88	1.05	1.11	0.90	0.98	16.66	17.66	29.31	32.09
400	21.06	21.32	5.64	5.74	1.83	1.93	1.03	1.16	0.92	0.99	16.93	17.86	29.63	32.27
500	20.71	20.94	6.09	6.37	1.88	1.99	1.04	1.22	0.92	1.01	16.83	17.87	29.86	32.51
600	20.28	20.47	6.67	7.17	1.94	2.05	1.07	1.28	0.94	1.04	16.94	17.88	29.59	32.48
700	19.61	19.76	7.73	8.45	1.87	1.98	1.14	1.35	1.20	1.30	16.80	17.87	29.35	32.33
800	19.37	19.46	7.82	8.83	2.03	2.16	1.15	1.40	0.95	1.04	16.79	17.80	29.32	32.03
900	19.11	19.19	8.08	9.32	1.78	1.90	1.20	1.42	0.95	1.03	16.61	17.66	29.23	31.29
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3000	12.22	11.90	11.12	13.78	1.75	1.63	1.76	2.17	1.20	1.33	16.50	16.95	28.16	28.14



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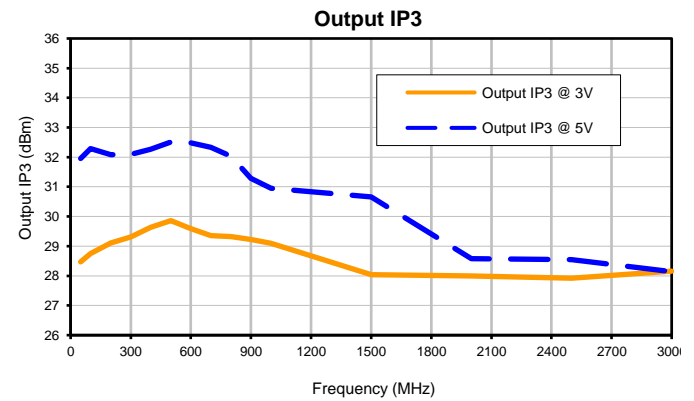
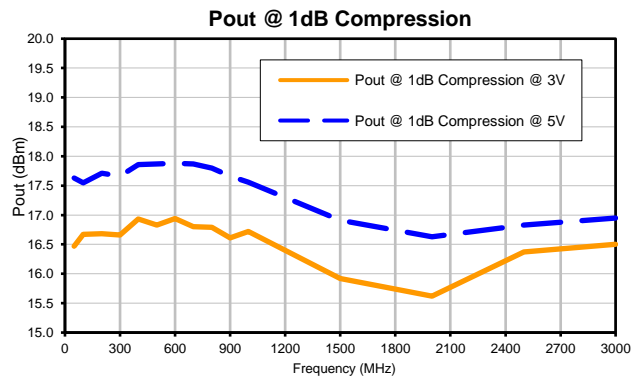
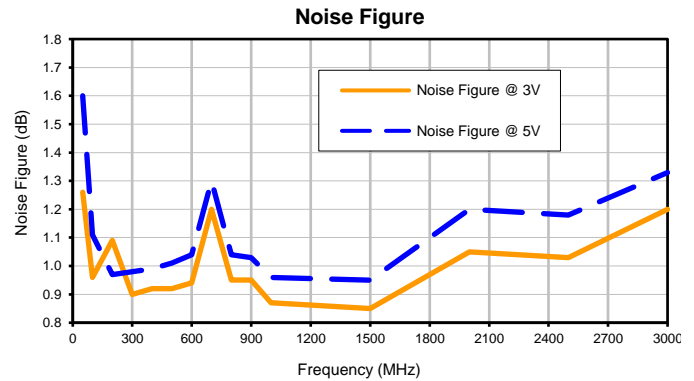
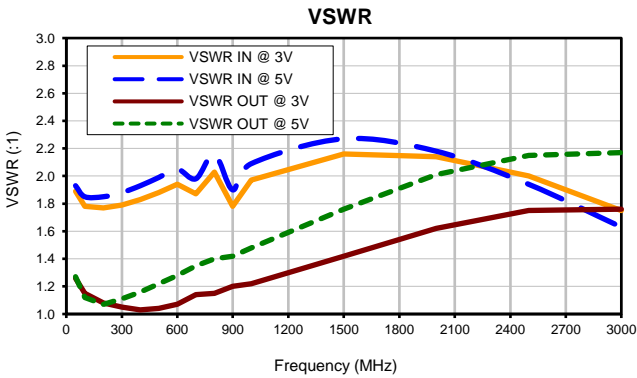
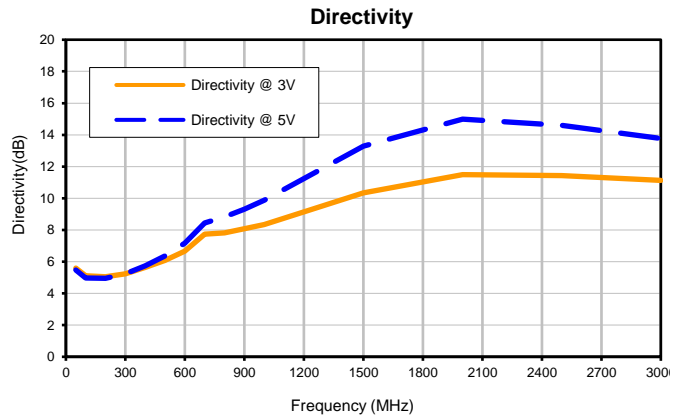
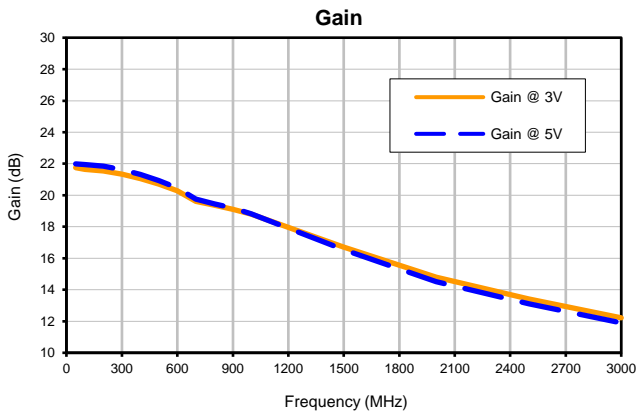
IF/RF MICROWAVE COMPONENTS

REV. OR
 ZX60-33LN-S+
 12/13/2018
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Typical Performance Curves



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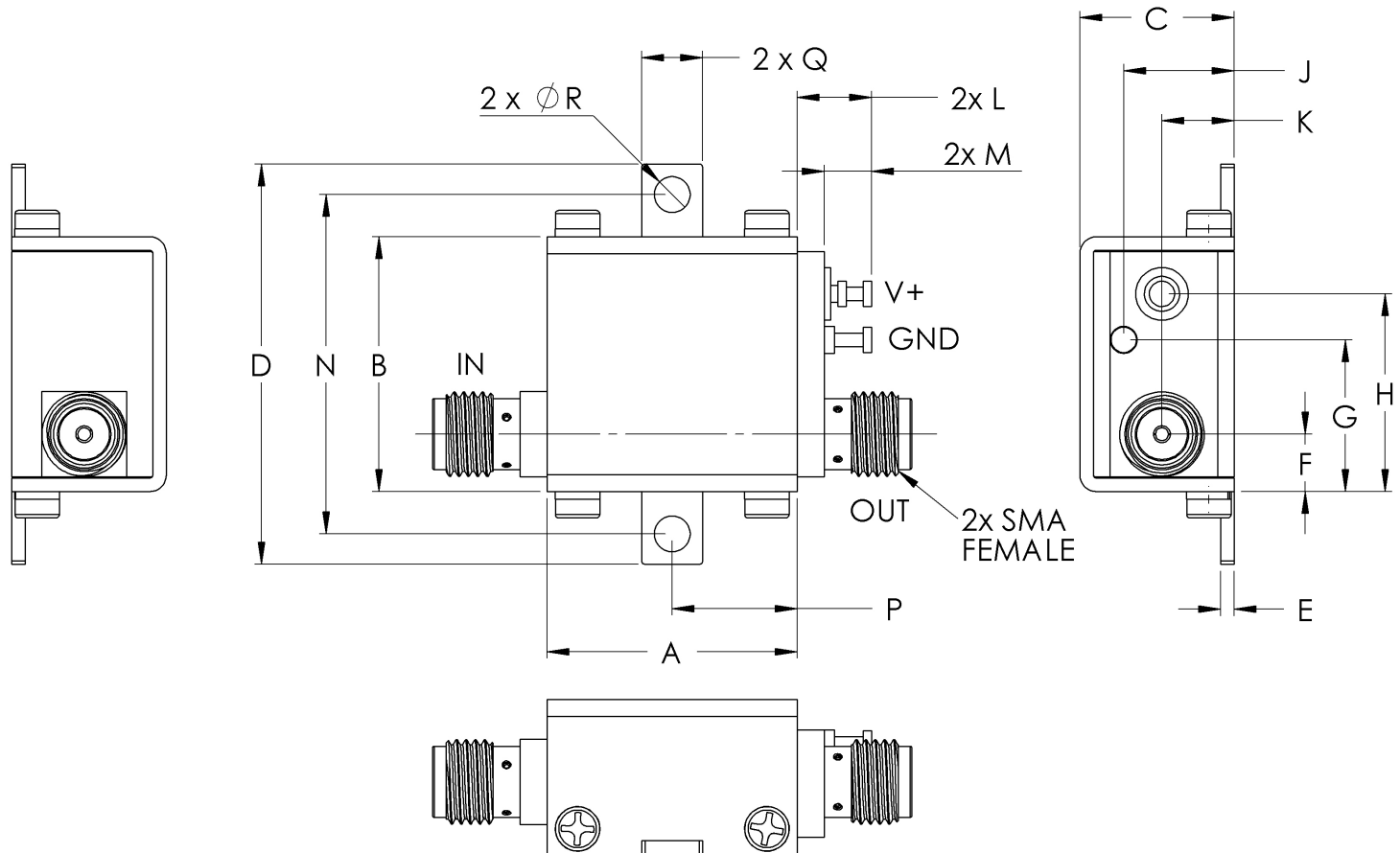
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Case Style

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