



COAXIAL

Low Noise Amplifier

ZX60-05113LN+

Mini-Circuits

50Ω 5 to 11 GHz SMA Female

THE BIG DEAL

- Ultra low noise figure, 1.7 dB typ @ 8.5 GHz
- Low current consumption, 36 mA typ.
- High gain broadband performance
- Voltage regulated internally and reverse voltage protected
- Excellent Gain flatness, ± 0.7 dB over 5 to 11 GHz
- Protected by US patent 6,790,049



Generic photo used for illustration purposes only

Model No.	ZX60-05113LN+
Case Style	GC957
Connectors	SMA

APPLICATIONS

- Microwave radios
- C-band application
- X-band application
- Instrumentation and lab use

+RoHS Compliant

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

PRODUCT OVERVIEW

Mini-Circuits' ZX60-05113LN+ is a wideband low noise connectorized amplifier providing a unique combination of low noise figure, high IP3 and flat gain over a very wide frequency range, supporting a wide range of sensitive, high-dynamic range receiver applications and many systems where high performance over wideband is needed. This design operates on a single 5 V supply and comes in a rugged, compact unibody case (0.74 x 0.75 x 0.46") with SMA connectors, making it an excellent candidate for tough operating conditions and crowded system layouts.

KEY FEATURES

Feature	Advantages
Ultra-wideband with excellent gain flatness, ± 0.7 dB typ. for 5 - 11 GHz	Enables a single amplifier to be used in a wide range of applications including microwave radios and C and X-band applications, instrumentation and more.
Low noise over the whole band	Enables lower system noise figure performance.
High gain, 22 dB typ.	Reduces the number of gain stages, lowering component count and overall system cost.
Low operating voltage, +5V	The amplifier features low operating voltage and low current consumption.
Rugged, unibody construction	Mini-Circuits unibody construction integrates the RF connector into the case body, providing high reliability and excellent survivability in critical applications.

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ZX60-05113LN+
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ELECTRICAL SPECIFICATIONS AT 25°C AND +5V, UNLESS NOTED

Parameter	Condition (GHz)	V _{DD} =5.0			Units
		Min.	Typ.	Max.	
Frequency Range		5		11.0	GHz
Noise Figure	5 - 7		2.0		dB
	7 - 9		1.7		
	9 - 11		1.6		
Gain	5 - 7	17.5	22	-	dB
	7 - 9		22		
	9 - 11		22		
Input Return Loss	5 - 7		7		dB
	7 - 9		13		
	9 - 11		9		
Output Return Loss	5 - 7		13		dB
	7 - 9		17		
	9 - 11		11.5		
Output Power at 1dB Compression ¹	5 - 7		10		dBm
	7 - 9		10		
	9 - 11		10.5		
Output IP3	5 - 7		21		dBm
	7 - 9		21		
	9 - 11		21.5		
Device Operating Voltage (V _{DD})	-	4.9	5.0	9.0	V
Device Operating Current (I _{DD})	-	-	36	53	mA

1. Current increases at P1dB

2. OIP3 measured with 0 dBm tones and 1 MHz spacing.

ABSOLUTE MAXIMUM RATINGS⁴

Parameter	Ratings
Operating Temperature (ground lead)	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Total Power Dissipation	0.6 W
Input Power (CW), V _d =5V	17 dBm
DC Voltage	9V

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





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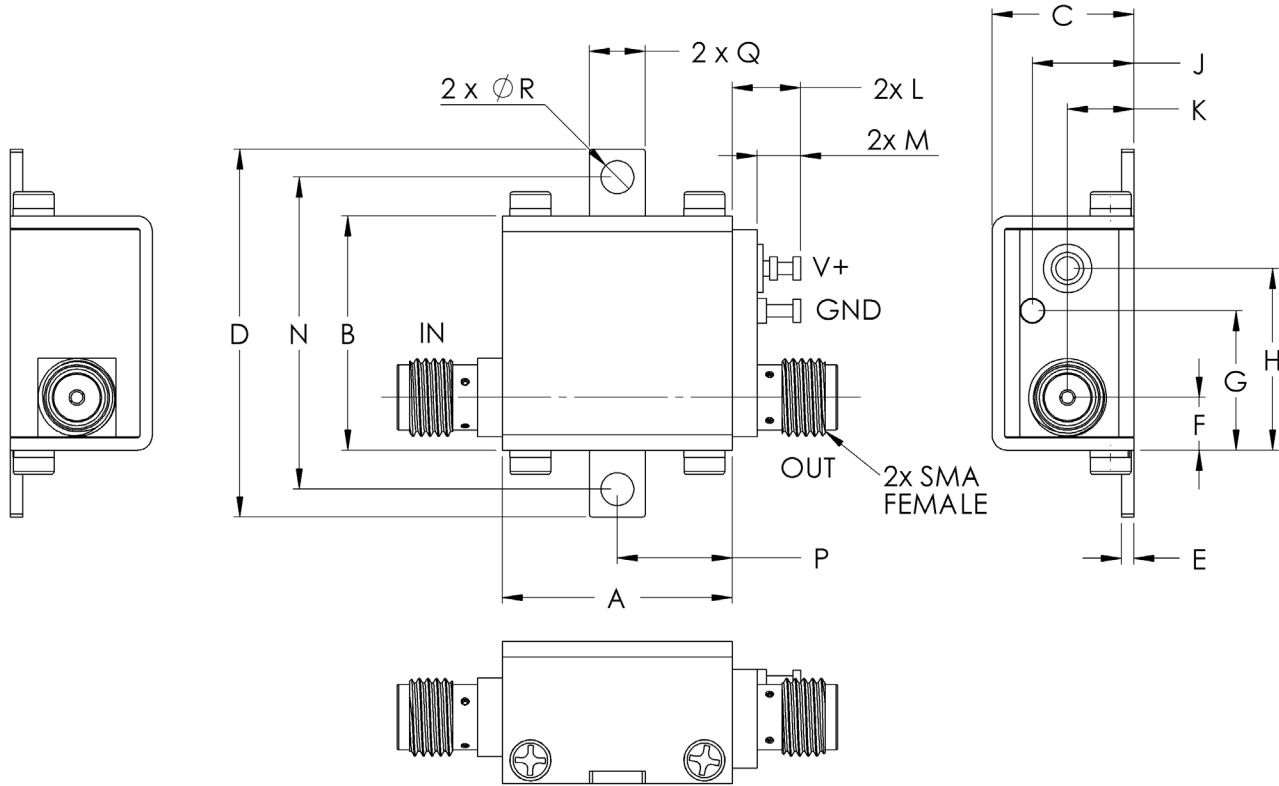
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OUTLINE DRAWING



! 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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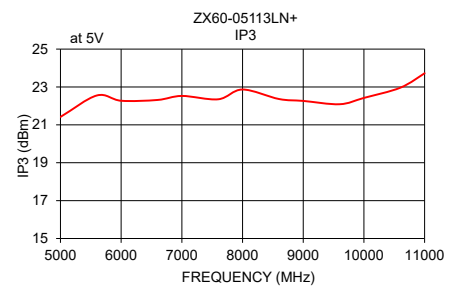
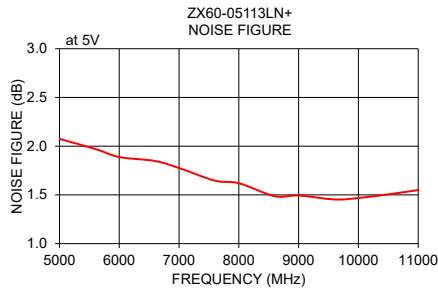
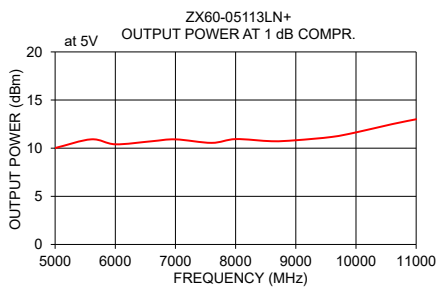
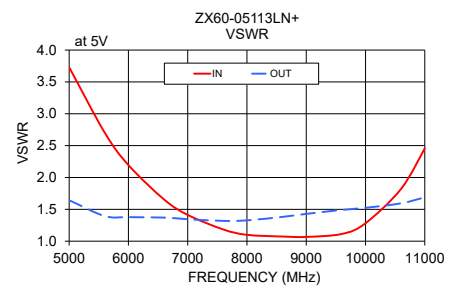
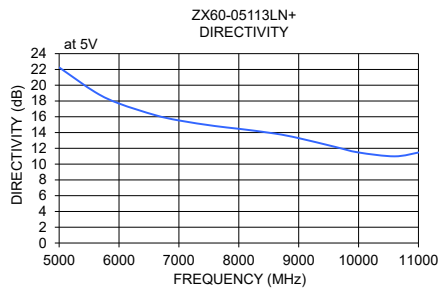
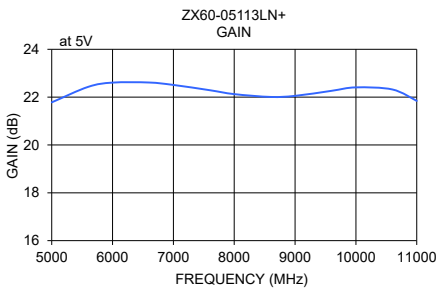
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TYPICAL PERFORMANCE DATA/CURVES

Frequency (MHz)	Gain (dB)	Directivity (dB)	VSWR (:1) 5V		Power Out @ 1 dB COMPR. (dBm)	Noise Figure (dB)	IP3 (dBm)
	5V	5V	IN	OUT	5V	5V	5V
5000	21.78	22.25	3.73	1.64	10.02	2.07	21.42
5600	22.43	19.13	2.70	1.39	10.92	1.97	22.55
6000	22.61	17.68	2.19	1.38	10.40	1.89	22.27
6600	22.61	16.21	1.66	1.37	10.72	1.85	22.31
7000	22.51	15.53	1.41	1.34	10.92	1.78	22.53
7600	22.29	14.83	1.18	1.32	10.55	1.65	22.35
8000	22.13	14.48	1.10	1.33	10.94	1.62	22.87
8600	22.01	13.88	1.07	1.38	10.72	1.49	22.36
9000	22.05	13.29	1.07	1.43	10.82	1.49	22.26
9600	22.26	12.20	1.11	1.49	11.17	1.45	22.09
10000	22.41	11.48	1.28	1.52	11.64	1.47	22.42
10600	22.32	10.99	1.82	1.59	12.50	1.51	22.96
11000	21.84	11.47	2.46	1.69	13.00	1.55	23.72



- 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.
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