

Low Noise Amplifier

ZX60-123LN-S+

50Ω

0.5 to 12 GHz



CASE STYLE: GC957

The Big Deal

- Ultra-wideband, 0.5 to 12 GHz
- Flat gain, 17 ±2.4 dB over full band
- Low noise figure, 2.4 dB
- High IP3, +28 dBm

Product Overview

Mini-Circuits' ZX60-123LN-S+ is an ultra-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 12V 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, ±2.4 dB | Enables a single amplifier to be used in a wide range of applications including WiFi, LTE, S-Band radar, C-band and X-band SatCom, defense, instrumentation and more. |
| Low noise over the whole band, 2.4 dB typ. | Enables lower system noise figure performance. |
| High gain, 17 dB typ. | Reduces the number of gain stages, lowering component count and overall system cost. |
| High IP3, +28 dBm typ. | The combination of low noise and high IP3 makes the ZX60-123LN-S+ ideal for use in low noise receiver front end (RFE) as it gives the user the advantages of sensitivity and two-tone IM performance at both ends of the dynamic range. |
| Rugged, unibody construction | Mini-Circuits unibody construction integrates the RF connector into the case body, providing high reliability and excellent survivability in critical applications. |

Coaxial Low Noise Amplifier

ZX60-123LN-S+

50Ω 0.5 to 12 GHz

Features

- Low noise figure, 2.4 dB at 8 GHz
- High IP3, 28 dBm typ. at 8 GHz
- Excellent gain flatness, ± 2.5

Applications

- WiFi
- WLAN
- UMTS
- LTE
- WiMAX
- S-band Radar
- C-band Satcom



Generic photo used for illustration purposes only

CASE STYLE: GC957

| | |
|------------|---------------|
| Connectors | Model |
| SMA | ZX60-123LN-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 (GHz) | Min. | Typ. | Max. | Units |
|---|-----------------|------|--------|------|-------|
| Frequency Range | | 0.5 | | 12 | GHz |
| Noise Figure | 0.5 | | 2.6 | | dB |
| | 2.0 | | 2.1 | | |
| | 8.0 | | 2.4 | | |
| | 10.0 | | 2.7 | | |
| | 12.0 | | 3.1 | | |
| Gain | 0.5 | 15.1 | 18.4 | 18.4 | dB |
| | 2.0 | | 18.9 | | |
| | 8.0 | | 16.2 | | |
| | 10.0 | | 15.4 | | |
| | 12.0 | | 14.4 | | |
| Input VSWR | 0.5 | | 2.5 | | :1 |
| | 2.0 | | 1.7 | | |
| | 8.0 | | 1.9 | | |
| | 10.0 | | 1.7 | | |
| | 12.0 | | 2.3 | | |
| Output VSWR | 0.5 | | 1.5 | | :1 |
| | 2.0 | | 1.5 | | |
| | 8.0 | | 1.4 | | |
| | 10.0 | | 1.5 | | |
| | 12.0 | | 1.6 | | |
| Output Power @ 1 dB compression ¹ | 0.5 | | 15.8 | | dBm |
| | 2.0 | | 16.5 | | |
| | 8.0 | | 16.0 | | |
| | 10.0 | | 14.8 | | |
| | 12.0 | | 13.4 | | |
| Output IP3 | 0.5 | | 29.4 | | dBm |
| | 2.0 | | 31.2 | | |
| | 8.0 | | 28.3 | | |
| | 10.0 | | 27 | | |
| | 12.0 | | 25.1 | | |
| Device Operating Voltage (V _{DD}) | | | 12 | | V |
| Device Operating Current (I _{DD}) | | — | 82 | 94 | mA |
| Device Current Variation vs. Temperature ² | | | -11.7 | | µA/°C |
| Device Current Variation vs. Voltage | | | 0.0187 | | mA/mV |

1. Current increases at P1dB.

2. (Current at 85°C - Current at -45°C)/130

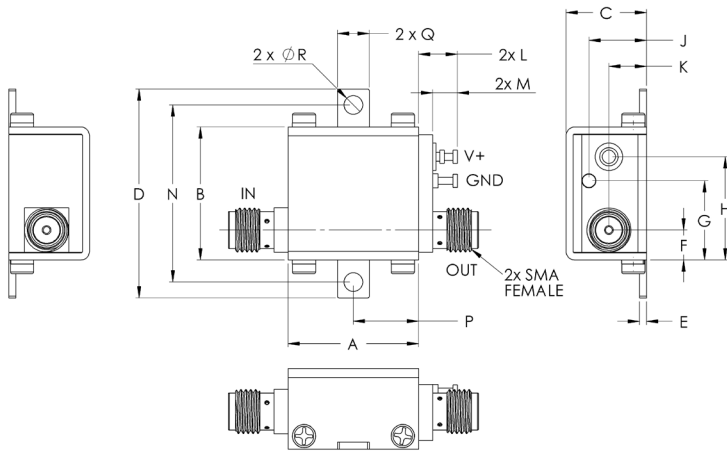


Absolute Maximum Ratings³

| Parameter | Ratings |
|-------------------------------------|---|
| Operating Temperature (ground lead) | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Total Power Dissipation | 1.2W |
| Input Power (CW), Vd=12 | +23 dBm (5 minutes max.) +8 dBm (continuous) |
| DC Voltage | 13V |

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

Outline Drawing

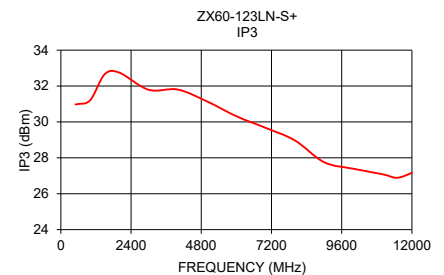
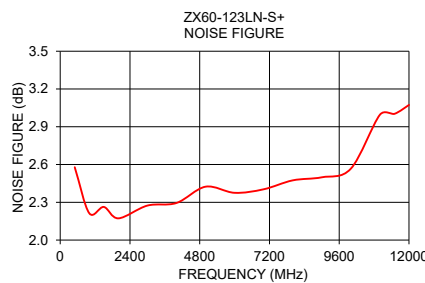
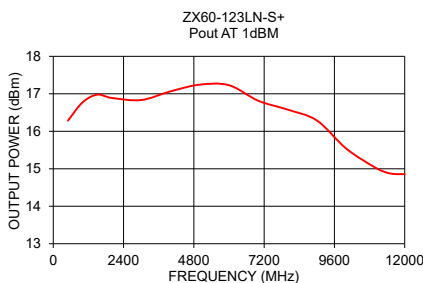
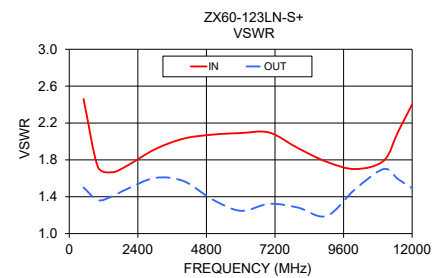
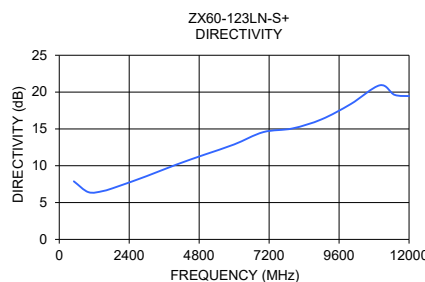
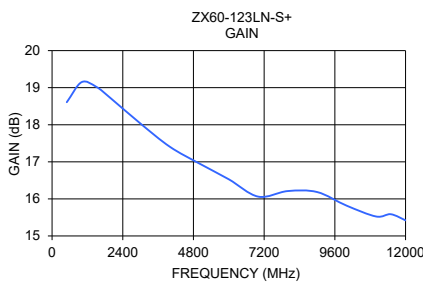


! NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note. [AN-40-010](#).

Outline Dimensions (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 | .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 |

| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR (:1) | | POUT at 1dB COMPR. (dBm) | NOISE FIGURE (dB) | OUTPUT IP3 (dBm) |
|--------------------|--------------|---------------------|--------------|------|-----------------------------------|-------------------------|------------------------|
| | | | IN | OUT | | | |
| 500 | 18.61 | 7.88 | 2.46 | 1.50 | 16.28 | 2.58 | 30.97 |
| 1000 | 19.15 | 6.42 | 1.73 | 1.36 | 16.77 | 2.21 | 31.21 |
| 1500 | 19.02 | 6.56 | 1.67 | 1.40 | 16.98 | 2.26 | 32.66 |
| 2000 | 18.71 | 7.17 | 1.73 | 1.48 | 16.89 | 2.17 | 32.75 |
| 3000 | 18.03 | 8.59 | 1.91 | 1.60 | 16.83 | 2.27 | 31.79 |
| 4000 | 17.41 | 10.13 | 2.03 | 1.57 | 17.06 | 2.29 | 31.80 |
| 5000 | 16.95 | 11.53 | 2.07 | 1.37 | 17.24 | 2.42 | 31.14 |
| 6000 | 16.53 | 12.89 | 2.09 | 1.25 | 17.23 | 2.38 | 30.32 |
| 7000 | 16.06 | 14.57 | 2.10 | 1.32 | 16.81 | 2.40 | 29.67 |
| 8000 | 16.21 | 15.06 | 1.93 | 1.28 | 16.58 | 2.47 | 28.97 |
| 9000 | 16.18 | 16.30 | 1.78 | 1.19 | 16.29 | 2.50 | 27.76 |
| 10000 | 15.82 | 18.37 | 1.70 | 1.48 | 15.54 | 2.57 | 27.39 |
| 11000 | 15.52 | 20.92 | 1.79 | 1.70 | 15.03 | 3.00 | 27.08 |
| 11500 | 15.59 | 19.63 | 2.10 | 1.59 | 14.87 | 3.00 | 26.89 |
| 12000 | 15.42 | 19.46 | 2.40 | 1.49 | 14.86 | 3.07 | 27.16 |



Additional 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/MCLStore/terms.jsp

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