



COAXIAL HIGH IP3

Low Noise Amplifier

ZHL-2010+

50Ω Medium High Power 50 to 1000 MHz

FEATURES

- Wideband, 50 to 1000 MHz
- Low Noise, 3.7 dB typ.
- High IP3, +46 dBm typ.
- Very High IP2, +68 - +83 dBm typ.



Generic photo used for illustration purposes only

APPLICATIONS

- VHF/UHF
- Cellular
- Test Equipment
- Instrumentation
- Laboratory

| | |
|------------|-----------|
| Model No. | ZHL-2010+ |
| Case Style | S32 |
| Connectors | SMA |

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

ELECTRICAL SPECIFICATIONS

| Parameter | Frequency (MHz) | Min | Typ | Max | Units |
|---------------------------------|-----------------|-----|-----|------|-------|
| Frequency | | 50 | | 1000 | MHz |
| Gain | 50-1000 | 20 | | | dB |
| Gain Flatness | 50-1000 | | | ±0.8 | dB |
| Output Power at 1dB Compression | 50-1000 | +26 | | | dBm |
| Noise Figure | 50-1000 | | 3.7 | | dB |
| Input IP3 | 50-1000 | | +46 | | dBm |
| Input VSWR | 50-1000 | | | 2.0 | :1 |
| Output VSWR | 50-1000 | | | 2.0 | :1 |
| DC Supply Voltage | | | +12 | | V |
| Supply Current | | | | 0.90 | A |

Open load is not recommended, potentially can cause damage.
 With no load derate max input power by 20 dB

ABSOLUTE MAXIMUM RATINGS

| Parameter | Ratings |
|----------------------------|-----------------|
| Operating Temperature | -20°C to +65°C |
| Storage Temperature | -55°C to +100°C |
| DC Voltage | +13V Max. |
| RF Input Power (no damage) | +11 dBm |

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

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COAXIAL HIGH IP3

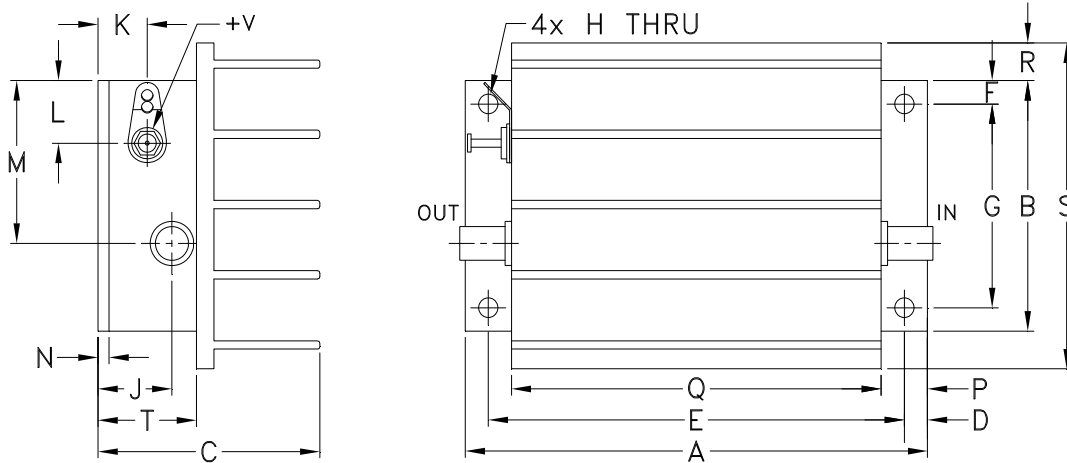
Low Noise Amplifier

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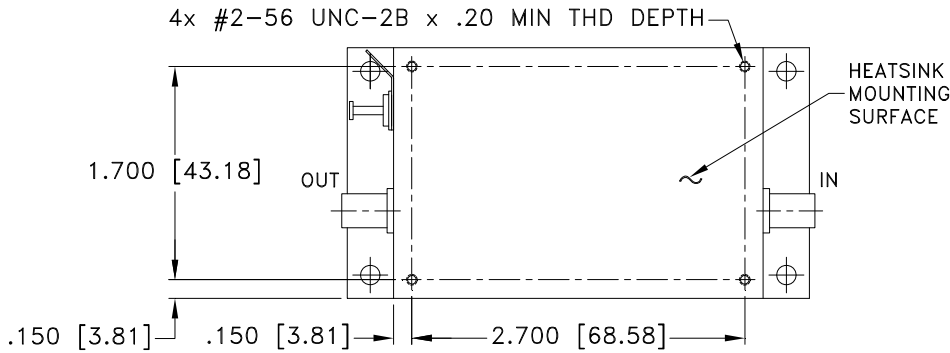
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50Ω Medium High Power 50 to 1000 MHz

OUTLINE DRAWING



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



OUTLINE DIMENSIONS (Inch/mm)

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | wt | |
|-------|-------|-------|------|-------|------|-------|------|-------|-------|-------|-------|------|------|-------|------|-------|-------|-------------------|-----|
| 3.75 | 2.00 | 1.80 | .19 | 3.375 | .19 | 1.625 | .144 | .50 | .40 | .50 | 1.30 | .10 | .38 | 3.00 | .30 | 2.60 | .80 | grams | |
| 95.25 | 50.80 | 45.72 | 4.83 | 85.73 | 4.83 | 41.28 | 3.66 | 12.70 | 10.16 | 12.70 | 33.02 | 2.54 | 9.65 | 76.20 | 7.62 | 66.04 | 20.32 | 220.0 | |
| | | | | | | | | | | | | | | | | | | wt. w/o heat sink | 150 |

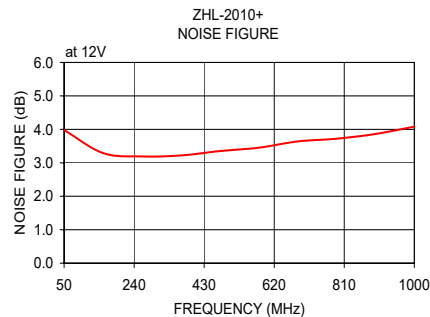
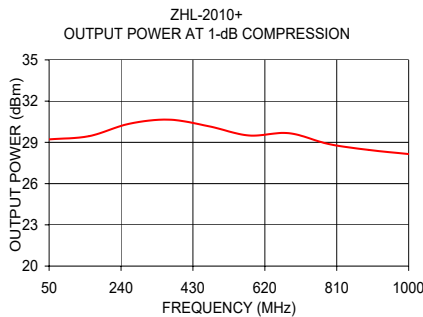
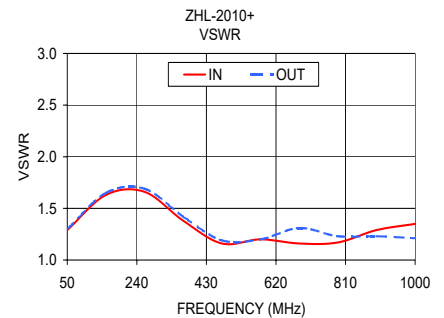
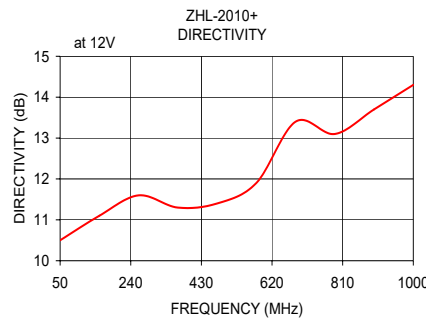
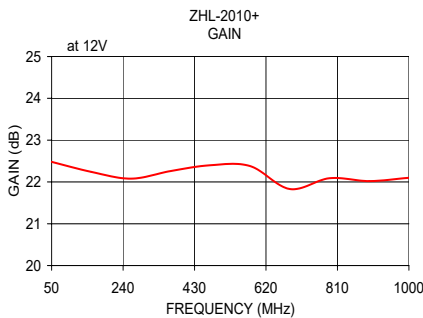


Low Noise Amplifier

50Ω Medium High Power 50 to 1000 MHz

TYPICAL PERFORMANCE DATA/CURVES

| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR (:1) | | NOISE FIGURE (dB) | POUT at 1 dB COMPR. (dBm) |
|-----------------|-----------|------------------|-----------|------|-------------------|---------------------------|
| | 12V | 12V | IN | OUT | 12V | 12V |
| 50.00 | 22.48 | 10.50 | 1.29 | 1.30 | 3.98 | 29.22 |
| 155.60 | 22.24 | 11.10 | 1.63 | 1.65 | 3.29 | 29.45 |
| 261.10 | 22.08 | 11.60 | 1.66 | 1.69 | 3.19 | 30.35 |
| 366.70 | 22.26 | 11.30 | 1.38 | 1.42 | 3.22 | 30.65 |
| 472.20 | 22.40 | 11.40 | 1.16 | 1.19 | 3.35 | 30.17 |
| 577.80 | 22.38 | 11.90 | 1.20 | 1.20 | 3.45 | 29.50 |
| 683.30 | 21.83 | 13.40 | 1.16 | 1.31 | 3.64 | 29.67 |
| 788.90 | 22.09 | 13.10 | 1.17 | 1.23 | 3.72 | 28.88 |
| 894.40 | 22.02 | 13.70 | 1.29 | 1.23 | 3.86 | 28.45 |
| 1000.00 | 22.10 | 14.30 | 1.35 | 1.21 | 4.08 | 28.15 |



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

Low Noise Amplifier

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Typical Performance Data

| FREQUENCY (MHz) | GAIN (dB) 12V | DIRECTIVITY (dB) 12V | VSWR IN (:1) 12V | VSWR OUT (:1) 12V | NOISE FIGURE (dB) 12V | Pout at 1dB Comp. (dBm) 12V |
|--------------------|---------------------|----------------------------|---------------------------|-------------------------|--------------------------------|--------------------------------------|
| 50.0 | 22.48 | 10.47 | 1.29 | 1.30 | 3.98 | 29.22 |
| 155.6 | 22.24 | 11.05 | 1.63 | 1.65 | 3.29 | 29.45 |
| 261.1 | 22.08 | 11.59 | 1.66 | 1.69 | 3.19 | 30.35 |
| 366.7 | 22.26 | 11.32 | 1.38 | 1.42 | 3.22 | 30.65 |
| 472.2 | 22.40 | 11.38 | 1.16 | 1.19 | 3.35 | 30.17 |
| 577.8 | 22.38 | 11.86 | 1.20 | 1.20 | 3.45 | 29.50 |
| 683.3 | 21.83 | 13.44 | 1.16 | 1.31 | 3.64 | 29.67 |
| 788.9 | 22.09 | 13.09 | 1.17 | 1.23 | 3.72 | 28.88 |
| 894.4 | 22.02 | 13.73 | 1.29 | 1.23 | 3.86 | 28.45 |
| 1000.0 | 22.10 | 14.35 | 1.35 | 1.21 | 4.08 | 28.15 |

REV. X1
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060914
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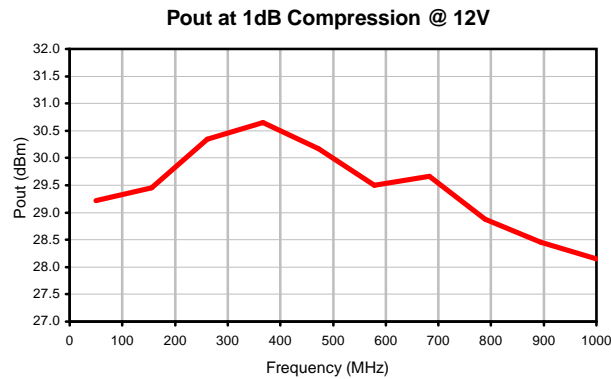
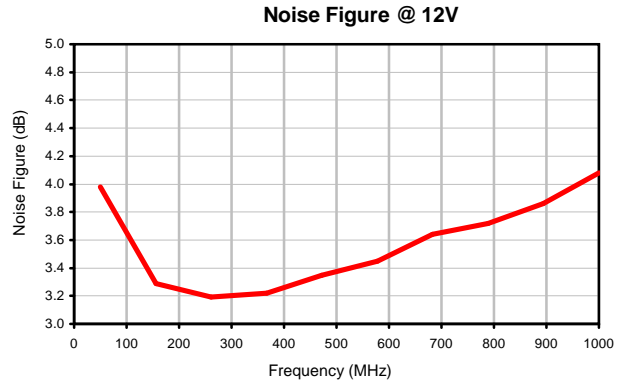
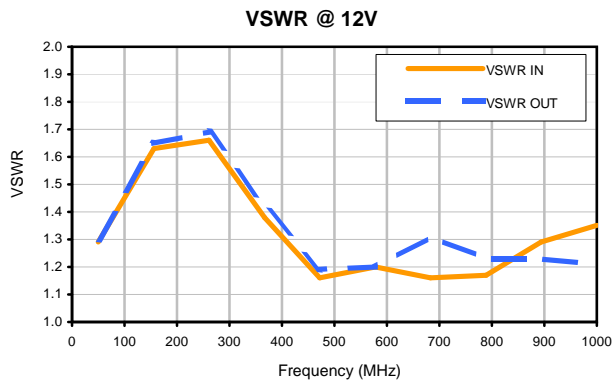
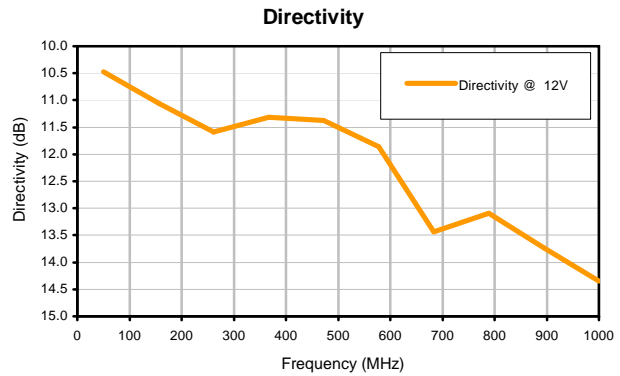
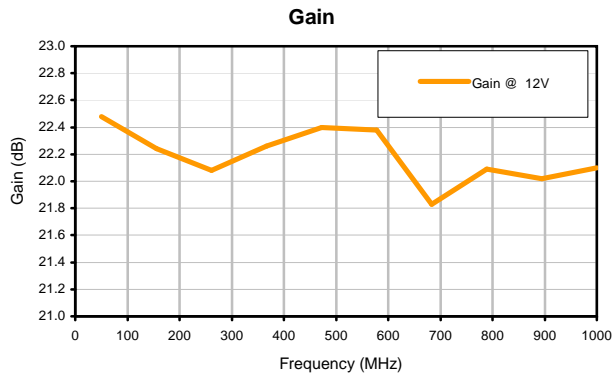
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Low Noise Amplifier

Typical Performance Curves

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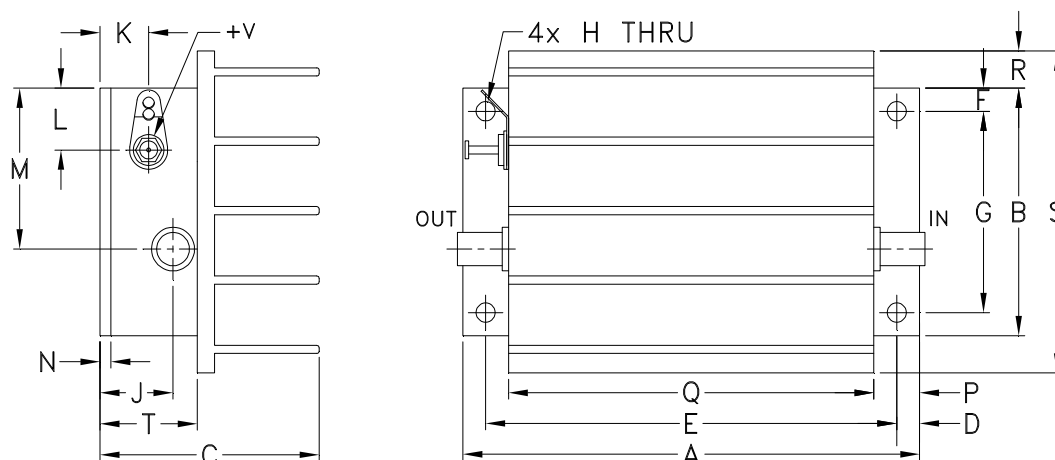
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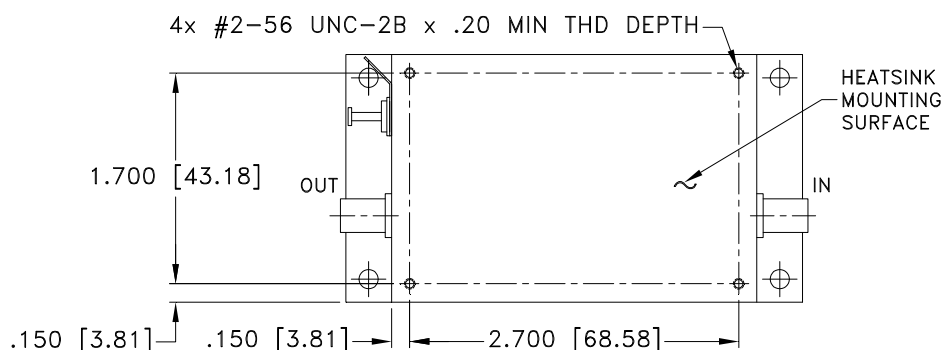
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Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|-------|-----------------|-----------------|-----------------|---------------|------------------|---------------|------------------|----------------|----------------|----------------|----------------|-----------------|---------------|
| S32 | 3.75 (95.25) | 2.00 (50.80) | 1.80 (45.72) | .19 (4.83) | 3.375 (85.73) | .19 (4.83) | 1.625 (41.28) | .144 (3.66) | .50 (12.70) | .40 (10.16) | .50 (12.70) | 1.30 (33.02) | .10 (2.54) |

| CASE# | P | Q | R | S | T | WT. GRAMS | WT. WITHOUT HEATSINK GRAMS |
|-------|---------------|-----------------|---------------|-----------------|----------------|-----------|----------------------------|
| S32 | .38 (9.65) | 3.00 (76.20) | .30 (7.62) | 2.60 (66.04) | .80 (20.32) | 220.0 | 150.0 |

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Heat sink finish: Black anodize.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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RF/IF MICROWAVE COMPONENTS

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 | -20° to 65° C Ambient Environment | 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 |