

Coaxial

Low Noise Amplifier

ZKL-33ULN-S+

50Ω

0.4 to 3.0 GHz



CASE STYLE: BY493

The Big Deal

- Ultra Low Noise Figure, 0.36 dB typ. at 0.9 GHz
- High Dynamic Range
- Small connectorized package

Product Overview

The ZKL-33ULN-S+ (RoHS compliant) uses Mini-Circuits' E-PHEMT technology to offer very high gain with a combination of ultra low noise figure over a broad frequency range and high OIP3. Housed in a rugged shielded package with class 3A ESD rating and internal voltage regulator, this amplifier supports a wide variety of applications requiring moderate power output, low distortion and 50 ohm matched input/output ports.

Key Features

| Feature | Advantages |
|---|---|
| Ultra Low Noise Figure, 0.36 dB at 0.9 GHz | Outstanding world class noise figure performance. |
| High OIP3 vs. DC power consumption +36 dBm typical at 0.9 GHz | Combination of Low Noise and High OIP3 make this model ideal for use in a Low Noise Receiver Front End (RFE) |
| Small Size, 1.38" x 1.5" | The small size and construction enable the ZKL-33ULN-S+ to be used in extremely compact connectorized applications. |



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Features

- Low Noise Figure, 0.36 dB typ. at 0.9 GHz
- High OIP3, +36 dBm at 0.9 GHz typ.
- High Pout, P1dB, +18 dBm typ. at 0.9 GHz typ.
- High Gain, 35.0 dB at 0.9 GHz typ.

Applications

- Base station infrastructure
- Portable Wireless
- LTE
- GPS
- GSM
- Airborne radar



Generic photo used for illustration purposes only

CASE STYLE: BY493

| | |
|------------|--------------|
| Connectors | Model |
| SMA | ZKL-33ULN-S+ |

+RoHS Compliant

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

Electrical Specifications at 25°C and 5.0 V unless noted

| Parameter | Condition (GHz) | Min. | Typ. | Max. | Units |
|-------------------------------------|-----------------|------|------|------|-------|
| Frequency Range | | 0.4 | | 3.0 | GHz |
| Noise Figure | 0.4 | | 0.29 | 0.70 | dB |
| | 0.9 | | 0.36 | | |
| | 1.5 | | 0.50 | | |
| | 2.0 | | 0.68 | | |
| | 3.0 | | 1.44 | | |
| Gain | 0.4 | 33 | 47 | 37 | dB |
| | 0.9 | | 35 | | |
| | 1.5 | | 27 | | |
| | 2.0 | | 22 | | |
| | 3.0 | | 15 | | |
| Output Power @ 1 dB compression | 0.4 | 17 | 18.0 | | dBm |
| | 0.9 | | 18.0 | | |
| | 1.5 | | 18.0 | | |
| | 2.0 | | 18.0 | | |
| | 3.0 | | 13.5 | | |
| Output IP3 | 0.4 | 34 | 34 | | dBm |
| | 0.9 | | 36 | | |
| | 1.5 | | 37 | | |
| | 2.0 | | 38 | | |
| | 3.0 | | 36 | | |
| Input VSWR | 0.4 | | 1.28 | | :1 |
| | 0.9 | | 1.25 | | |
| | 1.5 | | 1.41 | | |
| | 2.0 | | 1.33 | | |
| | 3.0 | | 1.34 | | |
| Output VSWR | 0.4 | | 1.65 | | :1 |
| | 0.9 | | 1.29 | | |
| | 1.5 | | 1.12 | | |
| | 2.0 | | 1.05 | | |
| | 3.0 | | 1.25 | | |
| Active Directivity (Isolation-Gain) | 0.4-3.0 | | 8 | | dB |
| DC Supply Voltage | | — | 5.0 | — | V |
| Supply Current | | — | 100 | 150 | mA |

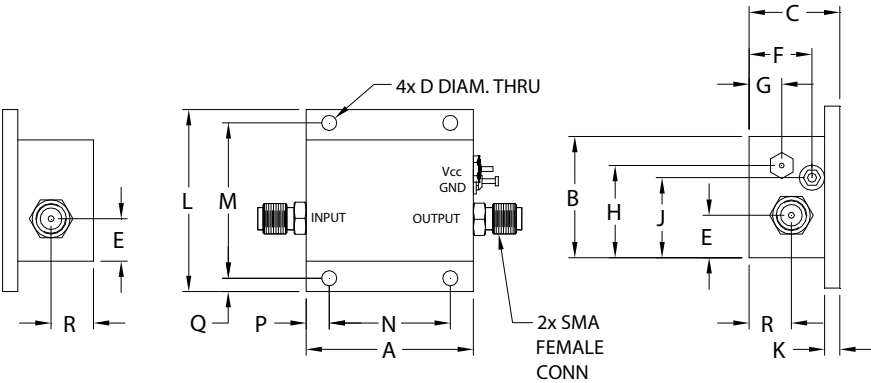


Maximum Ratings

| 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) | -10 dBm |
| Power Consumption | 0.75 W |

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

Outline Drawing

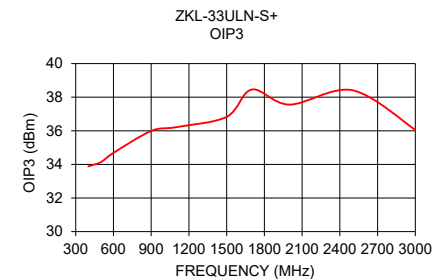
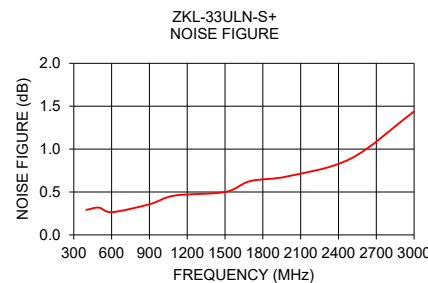
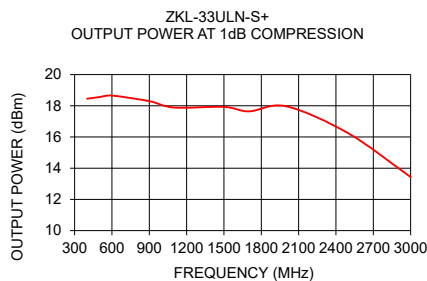
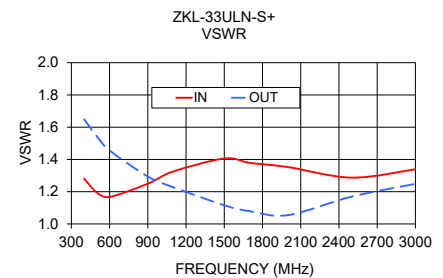
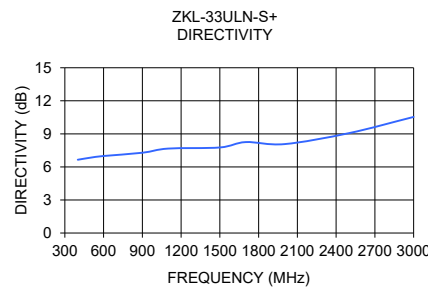
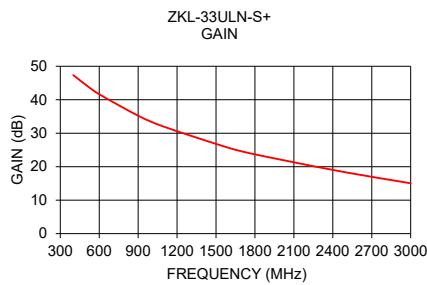


NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminal. See Application Note. [AN-40-010](#).

Outline Dimensions (inch mm)

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | wt |
|-------|-------|-------|------|------|-------|------|-------|-------|------|-------|-------|-------|------|------|------|-------|
| 1.38 | 1.00 | .75 | .125 | .35 | .52 | .27 | .76 | .66 | .125 | 1.50 | 1.281 | 1.000 | .19 | .11 | .35 | grams |
| 35.05 | 25.40 | 19.05 | 3.18 | 8.89 | 13.21 | 6.86 | 19.30 | 16.76 | 3.18 | 38.10 | 32.54 | 25.40 | 4.83 | 2.79 | 8.89 | 40 |

| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR (:1) | | POUT at 1dB COMPR. (dBm) | NOISE FIGURE (dB) | OUTPUT IP3 (dBm) |
|--------------------|--------------|---------------------|--------------|------|-----------------------------------|-------------------------|------------------------|
| | | | IN | OUT | | | |
| 400 | 47.4 | 6.7 | 1.28 | 1.65 | 18.5 | 0.3 | 33.9 |
| 500 | 44.4 | 6.8 | 1.19 | 1.54 | 18.6 | 0.3 | 34.1 |
| 600 | 41.6 | 7.0 | 1.17 | 1.46 | 18.7 | 0.3 | 34.7 |
| 900 | 35.2 | 7.3 | 1.25 | 1.29 | 18.3 | 0.4 | 36.0 |
| 1100 | 31.9 | 7.7 | 1.33 | 1.23 | 17.9 | 0.5 | 36.2 |
| 1500 | 26.8 | 7.8 | 1.41 | 1.12 | 17.9 | 0.5 | 36.8 |
| 1700 | 24.6 | 8.3 | 1.38 | 1.08 | 17.6 | 0.6 | 38.5 |
| 2000 | 22.1 | 8.1 | 1.35 | 1.05 | 18.0 | 0.7 | 37.6 |
| 2500 | 18.3 | 9.1 | 1.29 | 1.17 | 16.2 | 0.9 | 38.4 |
| 3000 | 15.0 | 10.5 | 1.34 | 1.25 | 13.4 | 1.4 | 36.1 |



Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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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