

Super Ultra Wideband Amplifier

ZVE-403-K+

50Ω 26 to 40 GHz

The Big Deal

- Extremely wideband, 26 to 40 GHz
- Flat Gain, 22 ±2 dB typ.
- High Output IP3, +28 dBm typ.
- P3dB, +21 dBm typ.



ZVE-403-K+



ZVE-403X-K+

Product Overview

Mini-Circuits' ZVE-403-K+ is a Class-A, four-stage, unconditionally stable amplifier providing flat gain over an extremely wide frequency range from 26 to 40 GHz. This model is capable of delivering up to 0.125W output power at P3dB with high output IP3 supporting a wide range of sensitive, high-dynamic range receiver applications and many systems where high performance over wideband is needed. It operates on a +12V supply and features built-in safety features including protection against reverse bias and immunity to accidental (less than 2 minutes) open or short loads. The amplifier comes in a rugged, compact case (1.2 x 0.46 x 0.45") with K-type (2.92mm) connectors and an optional heat sink for efficient cooling.

Key Features

| Feature | Advantages |
|--|---|
| Ultra-wideband, 26 to 40 GHz Able to work from 25 to 42 GHz | Enables a single amplifier to be used in a wide range of applications. |
| Excellent gain flatness, ±2.0 dB across full frequency range | Provides consistent performance across its operating frequency, minimizing the need for external equalizing networks in wideband applications. |
| High gain, 22 dB typ. | Reduces the number of gain stages, lowering component count and overall system cost. |
| Class A Amplifier | Provides good linearity with low signal distortion. |
| High Output IP3: +28 dBm typ. | The high IP3 results in high SFDR (Spurious Free Dynamic Range) and makes the ZVE-403-K+ ideal for use in high performance receiver front end (RFE) as it gives the user the advantages in a real world of multi-tone interference. |
| Rugged design | Built-in protection against reverse bias and accidental open and short loads provides added reliability for demanding operating conditions. |

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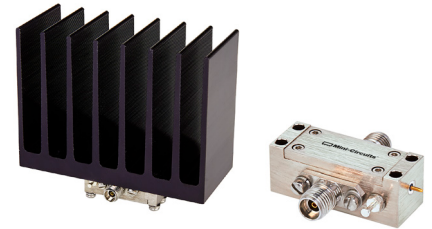
50Ω 26 to 40 GHz

Features

- Wideband, 26 to 40 GHz
- High Output IP3, 28 dBm typ.
- Medium power output, +21 dBm
- High gain, 22±2 dB typ.

Applications

- Radar and military
- Test instrumentation
- Satellite repeaters
- Communication



Generic photo used for illustration purposes only

| | | |
|------------|------------|---------------|
| Model No. | ZVE-403-K+ | ▲ ZVE-403X-K+ |
| Case Style | AV1280-2 | |
| Connectors | 2.92mm | |

+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) | ZVE-403-K+ ▲ ZVE-403X-K+ | | | Units |
|------------------------------------|-----------------|-----------------------------|------|------|-------|
| | | Min. | Typ. | Max. | |
| Frequency Range | | 26 | | 40 | GHz |
| Gain | 26 - 40 | 15.5 | 22 | | dB |
| Gain Flatness | 26 - 40 | | ±2.0 | ±3.0 | dB |
| Output Power at 1dB compression | 26 - 40 | 14.5 | 19 | | dBm |
| Output Power at 3dB compression | 26 - 40 | 16.5 | 21 | | dBm |
| Noise Figure | 26 - 40 | — | 9 | — | dB |
| Output third order intercept point | 26 - 40 | | 28 | | dBm |
| Input VSWR | 26 - 40 | | 2.0 | 3.0 | :1 |
| Output VSWR | 26 - 40 | | 2.0 | 3.0 | :1 |
| DC Supply Voltage | | 11 | 12* | 14 | V |
| Supply Current | | | 300 | 400 | mA |

* Recommended Operating Voltage.

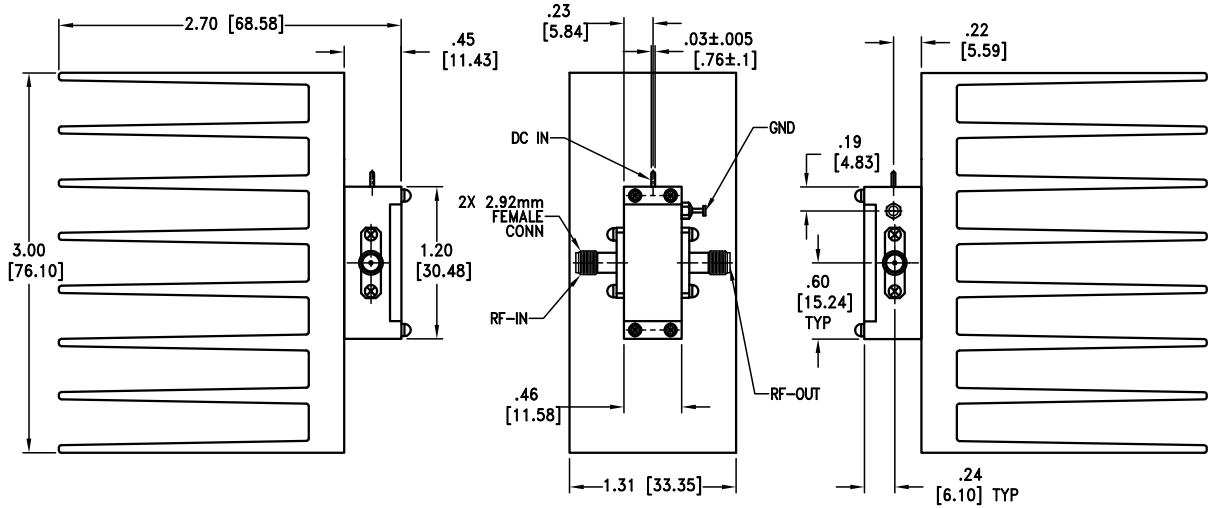
▲ Heat sink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 85°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 5.0°C/W max.

Maximum Ratings

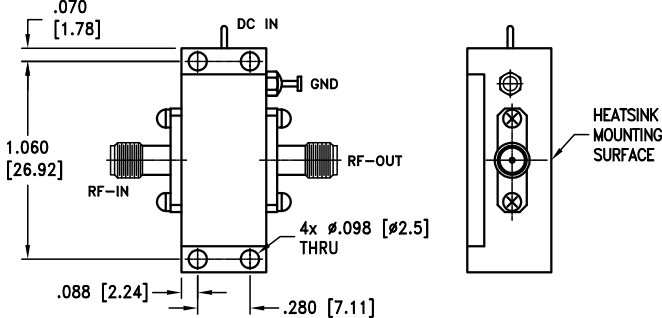
| Parameter | Ratings |
|-------------------------------|--|
| Operating Temperature | ZVE-403-K+ -40°C to 60°C ambient |
| | ZVE-403X-K+ -40°C to 85°C base plate temp. |
| Storage Temperature | -65°C to 150°C |
| DC Voltage | 14V |
| CW Input RF Power (no damage) | +17 dBm |

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

inch
Outline Drawing / Dimensions [mm] for models with heatsink

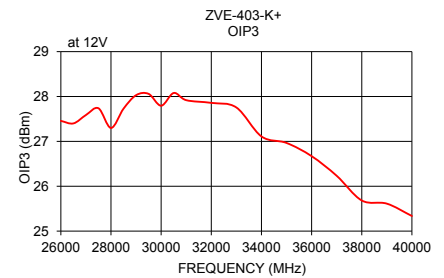
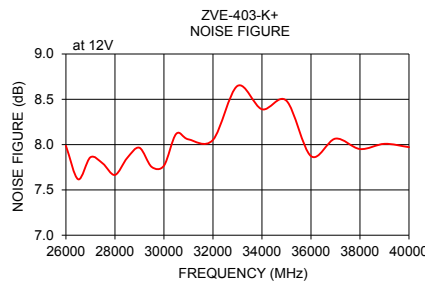
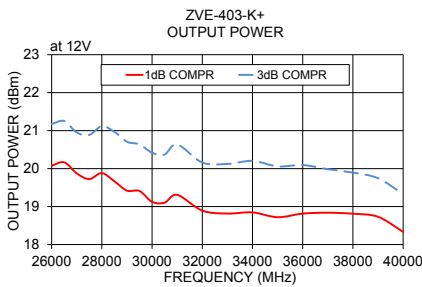
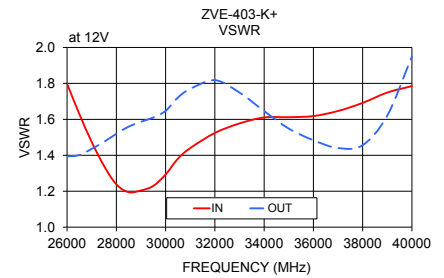
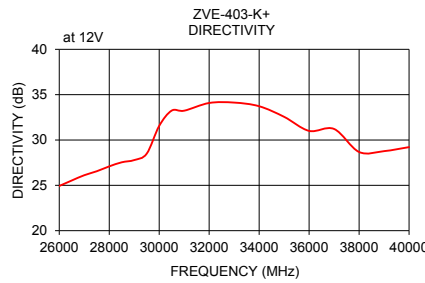
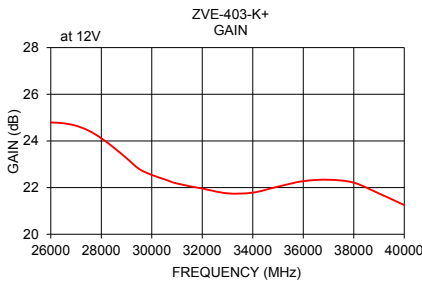


MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



Weight: 150 grams; Weight without heatsink: 17 grams

| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR (:1) | | POUT at 1 dB COMPR. (dBm) | POUT at 3 dB COMPR. (dBm) | NOISE FIGURE (dB) | OIP3 (dBm) |
|-----------------|-----------|------------------|-----------|------|---------------------------|---------------------------|-------------------|------------|
| | 12V | 12V | IN | OUT | 12V | 12V | 12V | 12V |
| 26000 | 24.79 | 24.93 | 1.80 | 1.39 | 20.08 | 21.17 | 7.99 | 27.46 |
| 26500 | 24.76 | 25.53 | 1.63 | 1.40 | 20.17 | 21.25 | 7.62 | 27.40 |
| 27000 | 24.65 | 26.11 | 1.47 | 1.44 | 19.87 | 20.95 | 7.86 | 27.59 |
| 27500 | 24.44 | 26.55 | 1.34 | 1.47 | 19.72 | 20.89 | 7.79 | 27.74 |
| 28000 | 24.12 | 27.09 | 1.24 | 1.52 | 19.88 | 21.12 | 7.67 | 27.30 |
| 28500 | 23.71 | 27.54 | 1.19 | 1.56 | 19.67 | 20.97 | 7.85 | 27.73 |
| 29000 | 23.26 | 27.79 | 1.20 | 1.59 | 19.42 | 20.71 | 7.97 | 28.03 |
| 29500 | 22.80 | 28.49 | 1.23 | 1.61 | 19.41 | 20.64 | 7.75 | 28.06 |
| 30000 | 22.54 | 31.56 | 1.29 | 1.65 | 19.13 | 20.42 | 7.77 | 27.79 |
| 30500 | 22.36 | 33.24 | 1.38 | 1.72 | 19.10 | 20.37 | 8.12 | 28.08 |
| 31000 | 22.17 | 33.23 | 1.44 | 1.77 | 19.31 | 20.64 | 8.06 | 27.92 |
| 32000 | 21.96 | 34.08 | 1.52 | 1.82 | 18.89 | 20.16 | 8.05 | 27.86 |
| 33000 | 21.75 | 34.13 | 1.58 | 1.75 | 18.82 | 20.12 | 8.65 | 27.75 |
| 34000 | 21.78 | 33.72 | 1.61 | 1.65 | 18.85 | 20.20 | 8.39 | 27.11 |
| 35000 | 22.04 | 32.55 | 1.61 | 1.55 | 18.72 | 20.06 | 8.48 | 26.96 |
| 36000 | 22.28 | 31.00 | 1.62 | 1.48 | 18.81 | 20.09 | 7.87 | 26.67 |
| 37000 | 22.34 | 31.22 | 1.65 | 1.44 | 18.84 | 19.98 | 8.07 | 26.23 |
| 38000 | 22.21 | 28.68 | 1.69 | 1.46 | 18.81 | 19.90 | 7.95 | 25.68 |
| 39000 | 21.75 | 28.77 | 1.75 | 1.62 | 18.73 | 19.75 | 8.01 | 25.61 |
| 40000 | 21.25 | 29.21 | 1.79 | 1.95 | 18.34 | 19.33 | 7.97 | 25.34 |



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