



MEDIUM POWER, HIGH GAIN

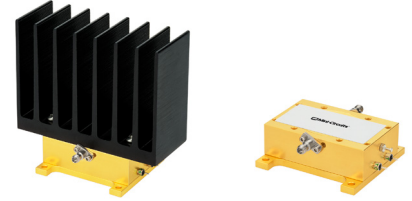
High-Frequency Amplifier

ZVA-71863HP+
ZVA-71863HPX+

50Ω 71 to 86 GHz

THE BIG DEAL

- High gain 38 dB typ. over the entire operating band
- Excellent gain flatness, ±1.5 dB typ.
- High Psat = 24 dBm typ.
- Adjustable DC voltage, +10 to +15 V



Generic photo used for illustration purposes only

APPLICATIONS

- Automotive tests
- Radar/Sensing
- 5G FR2+ bands (E-band)
- SATCOM
- Wireless Infrastructure
- Imaging

| | | |
|------------|--------------|---------------|
| Model No. | ZVA-71863HP+ | ZVA-71863HPX+ |
| Case Style | WC3071-5 | |
| Connectors | 1.0mm Female | |

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

PRODUCT OVERVIEW

Mini-Circuits' ZVA-71863HP+ is a coaxial, medium power high frequency amplifier, operating from 71 to 86 GHz. This model operates over a single positive supply range of +10 to +15 V, allowing users to choose their desired operating voltage. Internal DC-DC conversion circuitry maintains constant efficiency over the full input voltage range. The amplifier incorporates several DC-protection features, such as over-voltage, reverse voltage and in-rush current, that protect the amplifier from damage if mishandled during operation. The high frequency operation combined with high gain and medium output power makes this amplifier an ideal choice for automotive, radar/sensing applications, and 5G testing for E-band.

KEY FEATURES

| Feature | Advantages |
|---|--|
| High Freq amplifier, 71 to 86 GHz | E-band MPA focusing on new 5G, Automotive (77 to 81 GHz) SATCOM, E-bands (71 to 76 GHz, 81 to 86 GHz), Test & Measurement etc. |
| Heatsink option | Model ZVA-71863HP+ comes with a heatsink, keeping the amplifier cool to the touch during normal operation at room temperature |
| High gain Low VSWR Medium output power | The amplifier provides 38 dB (typ.) of gain over the entire operating band, and has high output power at saturation of 24 dBm (typ.) which makes it a good choice for applications that require a medium or high power amplifier at high frequency |
| Adjustable DC supply voltage | The device is capable of operating from +10 to +15 V with consistent DC power consumption |
| DC Protection – Over-voltage Reverse voltage In-rush current | The internal DC circuitry allows the amplifier to be protected from external mishandling, that could lead to catastrophic failures in the field |

REV. OR
ECO-011633
ZVA-71863HP+
MCL NY
220316





MEDIUM POWER, HIGH GAIN

High-Frequency Amplifier

ZVA-71863HP+
ZVA-71863HPX+

Mini-Circuits

ELECTRICAL SPECIFICATIONS AT 25 °C BASEPLATE

| Parameter | Condition (MHz) | ZVA-71863HP+ ³ ZVA-71863HPX+ ⁴ | | | Units |
|--|-----------------|---|------|-------|-------|
| | | Min. | Typ. | Max. | |
| Frequency Range | | 71000 | | 86000 | MHz |
| Gain | 71000 – 86000 | 31.0 | 37.0 | - | dB |
| Output Power at 1dB Compression | 71000 – 86000 | 19.5 | 22.0 | - | dBm |
| Output Power at Saturation | 71000 – 86000 | 21.5 | 24.0 | - | dBm |
| Input VSWR | 71000 – 86000 | - | 1.6 | - | :1 |
| Output VSWR ¹ | 71000 – 86000 | - | 1.6 | - | :1 |
| Operating DC Voltage | | +10 | - | +15 | V |
| Device Operating Current at +10 V ² | | - | 490 | 975 | mA |

1. Open and short-circuit loads are not recommended at the amplifier output. Ensure proper 50 Ohm load before turning the amplifier "ON".
2. Max Device Operating Current is specified when the amplifier is in saturation.
3. For units with heatsink, limit ambient temperature to 50 °C.
4. For units without heatsink, limit the maximum baseplate temperature to 60 °C.

MAXIMUM RATINGS⁶

| Parameter | Rating |
|----------------------------------|--|
| Operating temperature | ZVA-71863HP+ -40 °C to +50 °C Ambient ZVA-71863HPX+ -40 °C to + 60 °C Baseplate |
| Storage temperature | -40 °C to +85 °C |
| Total Power Dissipation | 9.6 W |
| RF Input Power ⁵ (CW) | 0 dBm |
| DC Operating Voltage | +16 V |

5. Specified under matched load to 50 ohms.
6. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.

DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

| | |
|--|---|
| $\text{MAXIMUM THERMAL RESISTANCE} = \frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$ | |
| Example: | MAXIMUM OPERATING CASE TEMP = 50 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) MAXIMUM USER AMBIENT TEMP = 30 °C (USER DEFINED) POWER DISSIPATION = 10 WATTS (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 2 °C/W |





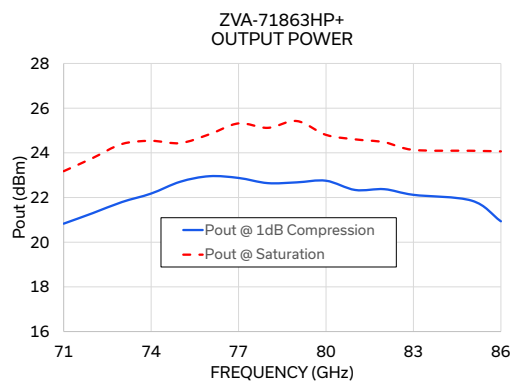
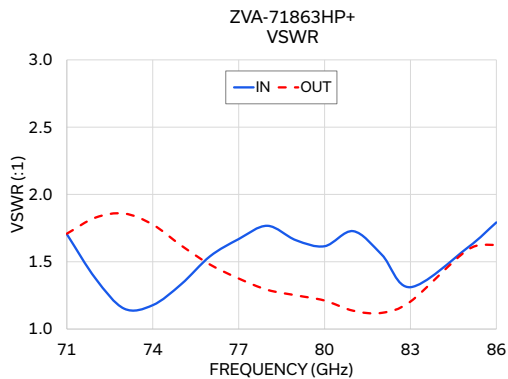
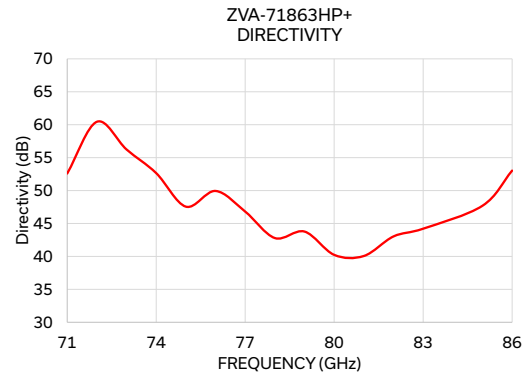
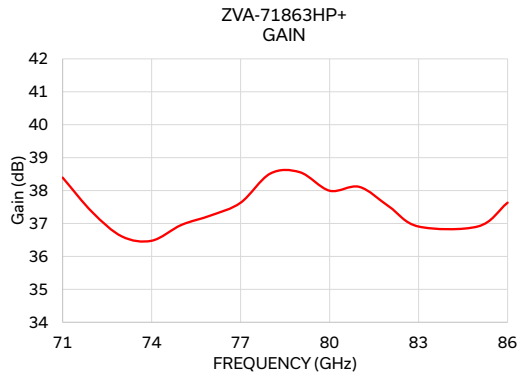
MEDIUM POWER, HIGH GAIN

High-Frequency Amplifier

ZVA-71863HP+
ZVA-71863HPX+

TYPICAL PERFORMANCE DATA

| Frequency (GHz) | Gain (dB) | Directivity (dB) | VSWR (:1) | | Pout at 1 dB Compr. (dBm) | Pout at Saturation (dBm) |
|-----------------|-----------|------------------|-----------|------|---------------------------|--------------------------|
| | 10V | 10V | IN | OUT | 10V | 10V |
| 71.00 | 38.39 | 52.59 | 1.70 | 1.71 | 20.83 | 23.18 |
| 72.00 | 37.34 | 60.45 | 1.38 | 1.83 | 21.30 | 23.77 |
| 73.00 | 36.61 | 56.24 | 1.15 | 1.86 | 21.80 | 24.40 |
| 74.00 | 36.48 | 52.65 | 1.18 | 1.78 | 22.18 | 24.54 |
| 75.00 | 36.95 | 47.56 | 1.33 | 1.62 | 22.71 | 24.44 |
| 76.00 | 37.25 | 49.94 | 1.54 | 1.48 | 22.95 | 24.83 |
| 77.00 | 37.63 | 46.81 | 1.67 | 1.38 | 22.88 | 25.32 |
| 78.00 | 38.52 | 42.79 | 1.77 | 1.29 | 22.64 | 25.12 |
| 79.00 | 38.56 | 43.77 | 1.66 | 1.25 | 22.68 | 25.42 |
| 80.00 | 37.99 | 40.24 | 1.62 | 1.21 | 22.75 | 24.80 |
| 81.00 | 38.11 | 40.06 | 1.73 | 1.14 | 22.34 | 24.60 |
| 82.00 | 37.52 | 43.04 | 1.55 | 1.12 | 22.37 | 24.48 |
| 83.00 | 36.91 | 44.21 | 1.31 | 1.20 | 22.12 | 24.13 |
| 85.00 | 36.91 | 47.69 | 1.61 | 1.59 | 21.86 | 24.09 |
| 86.00 | 37.63 | 53.03 | 1.79 | 1.63 | 20.93 | 24.07 |



- 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



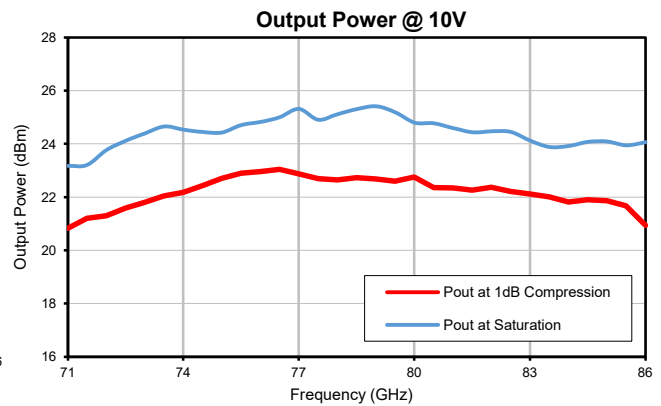
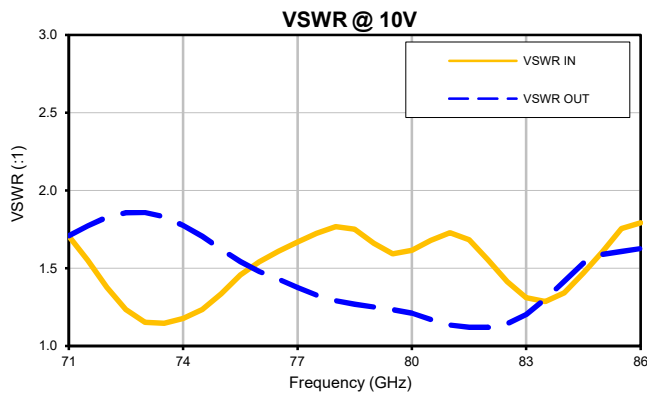
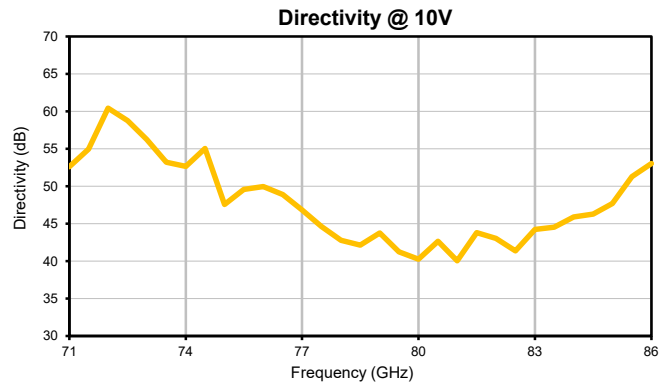
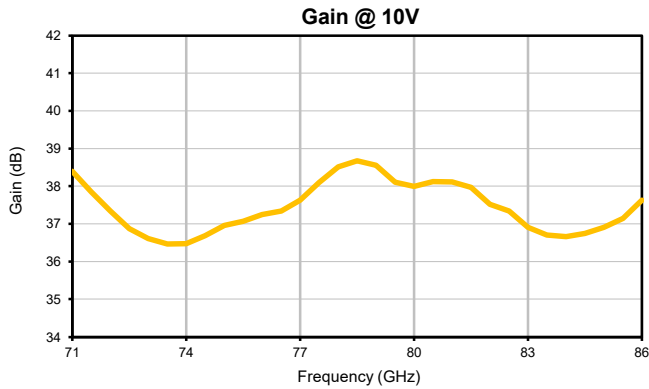
Coaxial Amplifier

ZVA-71863HP+

Typical Performance Data

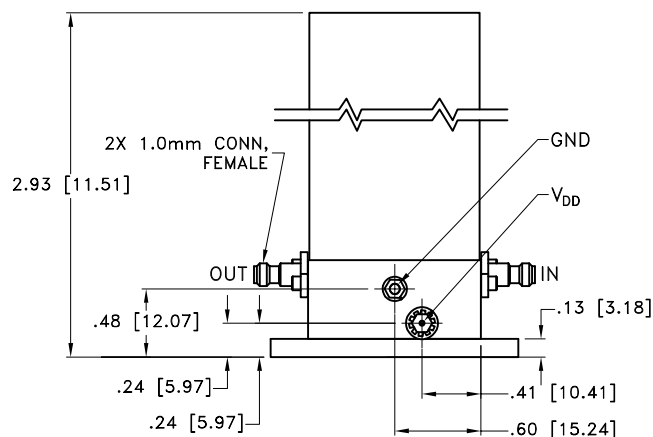
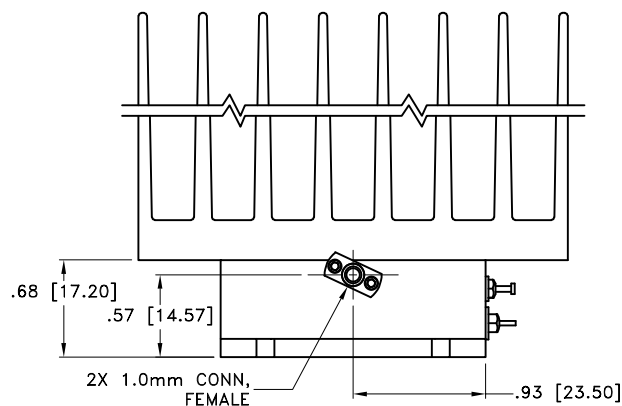
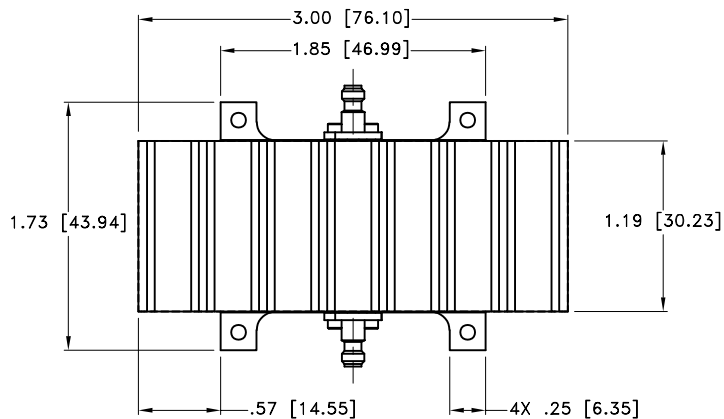
| FREQUENCY (GHz) | GAIN (dB) 10V | DIRECTIVITY (dB) 10V | VSWR (:1) | | Pout @ 1 dB COMPRESSION (dBm) 10V | Pout at SATURATION (dBm) 10V |
|--------------------|---------------------|----------------------------|-----------|------------|--|---------------------------------------|
| | | | IN 10V | OUT 10V | | |
| 71.0 | 38.39 | 52.59 | 1.70 | 1.71 | 20.83 | 23.18 |
| 71.5 | 37.85 | 54.95 | 1.55 | 1.77 | 21.20 | 23.21 |
| 72.0 | 37.34 | 60.45 | 1.38 | 1.83 | 21.30 | 23.77 |
| 72.5 | 36.87 | 58.75 | 1.23 | 1.86 | 21.59 | 24.12 |
| 73.0 | 36.61 | 56.24 | 1.15 | 1.86 | 21.80 | 24.40 |
| 73.5 | 36.47 | 53.18 | 1.15 | 1.83 | 22.05 | 24.66 |
| 74.0 | 36.48 | 52.65 | 1.18 | 1.78 | 22.18 | 24.54 |
| 74.5 | 36.69 | 55.02 | 1.23 | 1.71 | 22.43 | 24.45 |
| 75.0 | 36.95 | 47.56 | 1.33 | 1.62 | 22.71 | 24.44 |
| 75.5 | 37.07 | 49.56 | 1.46 | 1.54 | 22.90 | 24.71 |
| 76.0 | 37.25 | 49.94 | 1.54 | 1.48 | 22.95 | 24.83 |
| 76.5 | 37.34 | 48.86 | 1.61 | 1.43 | 23.05 | 25.01 |
| 77.0 | 37.63 | 46.81 | 1.67 | 1.38 | 22.88 | 25.32 |
| 77.5 | 38.10 | 44.60 | 1.72 | 1.33 | 22.69 | 24.91 |
| 78.0 | 38.52 | 42.79 | 1.77 | 1.29 | 22.64 | 25.12 |
| 78.5 | 38.68 | 42.12 | 1.75 | 1.27 | 22.73 | 25.31 |
| 79.0 | 38.56 | 43.77 | 1.66 | 1.25 | 22.68 | 25.42 |
| 79.5 | 38.10 | 41.23 | 1.59 | 1.23 | 22.59 | 25.19 |
| 80.0 | 37.99 | 40.24 | 1.62 | 1.21 | 22.75 | 24.80 |
| 80.5 | 38.12 | 42.62 | 1.68 | 1.17 | 22.35 | 24.78 |
| 81.0 | 38.11 | 40.06 | 1.73 | 1.14 | 22.34 | 24.60 |
| 81.5 | 37.97 | 43.81 | 1.68 | 1.12 | 22.26 | 24.44 |
| 82.0 | 37.52 | 43.04 | 1.55 | 1.12 | 22.37 | 24.48 |
| 82.5 | 37.34 | 41.34 | 1.41 | 1.14 | 22.21 | 24.45 |
| 83.0 | 36.91 | 44.21 | 1.31 | 1.20 | 22.12 | 24.13 |
| 83.5 | 36.70 | 44.52 | 1.28 | 1.30 | 22.01 | 23.89 |
| 84.0 | 36.66 | 45.91 | 1.34 | 1.42 | 21.82 | 23.92 |
| 84.5 | 36.75 | 46.26 | 1.47 | 1.53 | 21.90 | 24.08 |
| 85.0 | 36.91 | 47.69 | 1.61 | 1.59 | 21.86 | 24.09 |
| 85.5 | 37.14 | 51.26 | 1.75 | 1.61 | 21.67 | 23.96 |
| 86.0 | 37.63 | 53.03 | 1.79 | 1.63 | 20.93 | 24.07 |

Typical Performance Curves

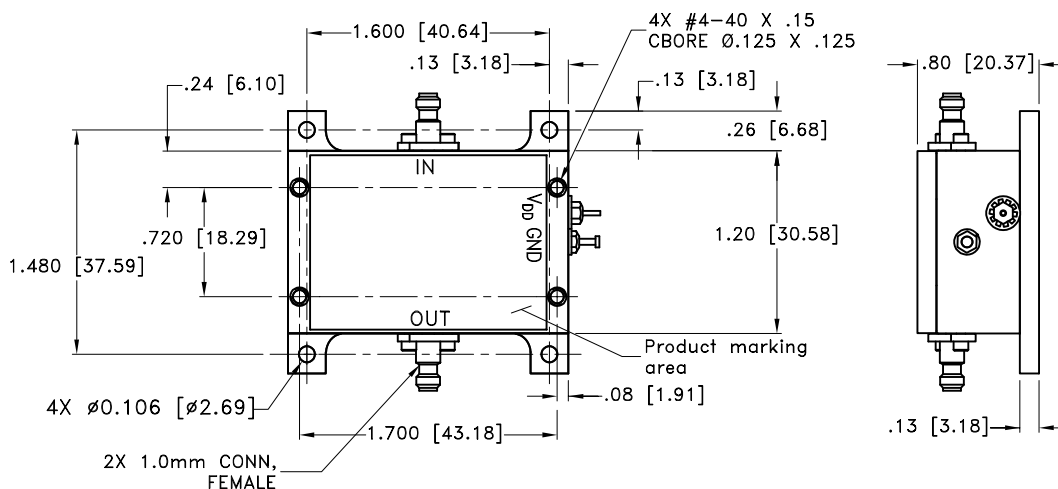


Outline Dimensions

WC3071-5



MOUNTING INFORMATION OF MODEL WITHOUT HEATSINK



WT. WT. GRAMS 160 grams; WITHOUT HEATSINK GRAMS 60 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl. ±.015 Inches

Notes:

1. Case material: Aluminum.
2. Case finish: Gold plating;
3. Heat sink finish: Black anodize.
4. Refer to the individual model data sheet for the type of connectors available.
5. Shape of connector flange may vary.



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



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

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 | -40° to +60° C Baseplate Temp | Individual Model Data Sheet |
| Storage Temperature | -40° to +85° C Ambient Environment | Individual Model Data Sheet |
| Burn-in | (DC on) 72 hours at 25°C | ---- |
| Thermal Shock | -40° C to +85°C, 100 cycles | Transition time = 5 mins, Dwell time = 30 mins |
| Vibration | Random Vibration (non-operating) | MIL-STD-883K, Method 2025, Cond. 1A |