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# Medium Power Amplifier

# ZVA-24443HP+ ZVA-24443HPX+

50Ω 24 to 43.5 GHz P<sub>SAT</sub> +29 dBm 2.92 mm-Female

## THE BIG DEAL

- High Gain, 47 dB Typ. Over The Entire Operating Band
- Low Noise Figure, 2.2 dB Typ.
- High P<sub>SAT</sub> +29 dBm Typ.
- Wide DC Operating Voltage, +10 To +15 V
- Over Voltage and Reverse Voltage Protected

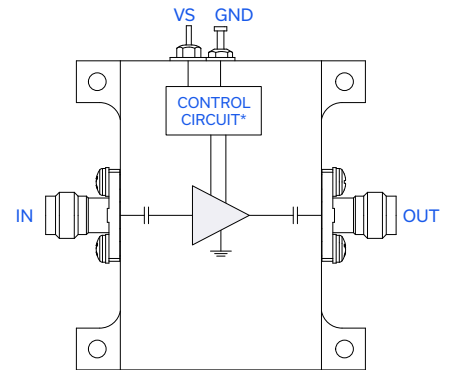


Generic photo used for illustration purposes only

## APPLICATIONS

- Wideband Test and Instrumentation
- Ka-Band SATCOM
- Broadband Telecom
- 5G FR2 Millimeter Wave Testing
- Aerospace and Defense

## FUNCTIONAL DIAGRAM



\*Voltage Regulation, over-voltage, reverse voltage, and in-rush current protection circuit

## PRODUCT OVERVIEW

Mini-Circuits' ZVA-24443HP(X)+ is a wideband low noise, medium power amplifier, operating from 24 to 43.5 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 consistent 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 protects the amplifier from damage if mishandled during operation.

## ELECTRICAL SPECIFICATIONS AT +25 °C BASEPLATE, V<sub>s</sub> = +10 V

Parameter	Condition (GHz)	Min.	Typ.	Max.	Units
Frequency Range		24		43.5	GHz
Gain	24 - 43.5	40	47	—	dB
Output Power at 1dB Compression	24 - 35	26	+28.5	—	dBm
	35 - 43.5	21	+25	—	
Saturated Output Power (P <sub>SAT</sub> ) <sup>1</sup>	24 - 35	—	+30	—	dBm
	35 - 43.5	—	+27	—	
Output IP3	24 - 43.5	—	+40	—	dBm
Input Return Loss	24 - 43.5	—	11	—	dB
Output Return Loss	24 - 43.5	—	13	—	dB
Noise Figure	24 - 43.5	—	2.2	4.0	dB
DC Supply Voltage (V <sub>s</sub> )		+10	—	+15	V
DC Current <sup>1</sup> at V <sub>s</sub> = +10 V (Without/With Heatsink)		—	700/800	1300/1400 <sup>2</sup>	mA

1. At P<sub>SAT</sub>, P<sub>out</sub> changes less than 0.1 dB for a 1 dB change in P<sub>in</sub>.

2. Typical current measured under small signal conditions. Max DC current measured at P<sub>SAT</sub>. DC current increases as amplifier is driven into compression.





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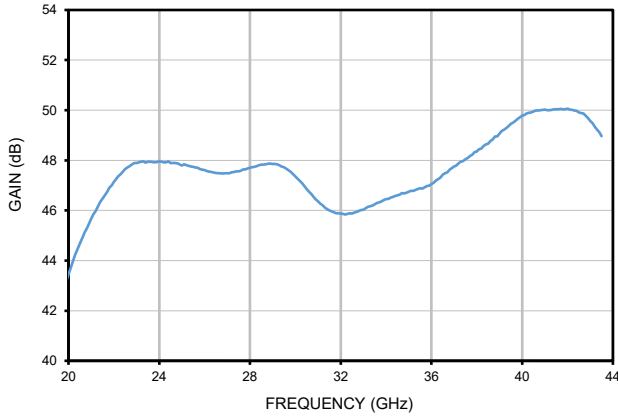
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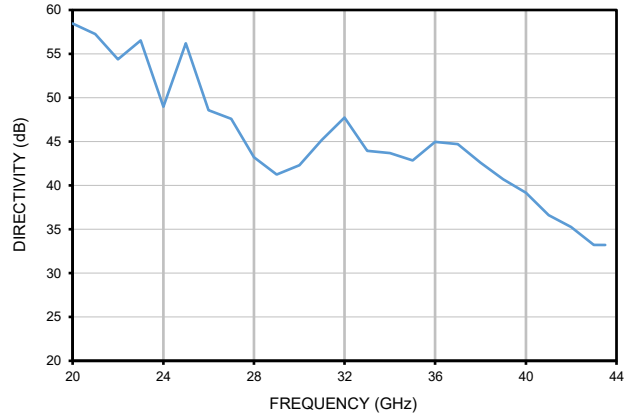
50Ω 24 to 43.5 GHz  $P_{SAT}$  +29 dBm 2.92 mm-Female

### TYPICAL PERFORMANCE GRAPHS

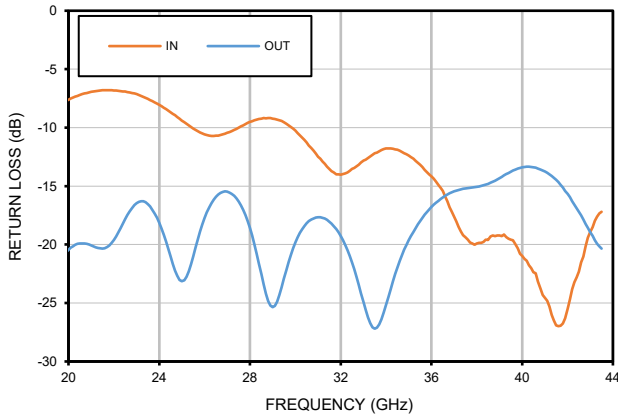
**GAIN**



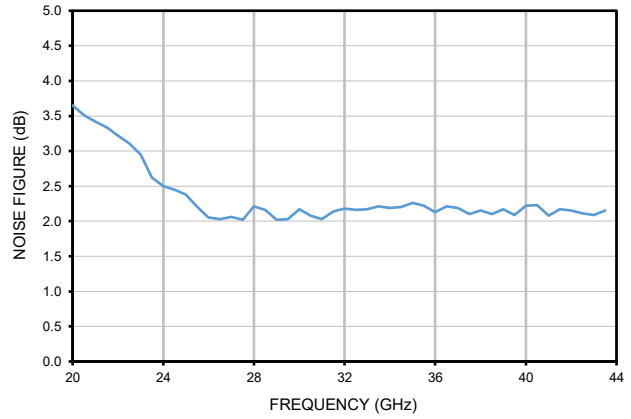
**DIRECTIVITY**



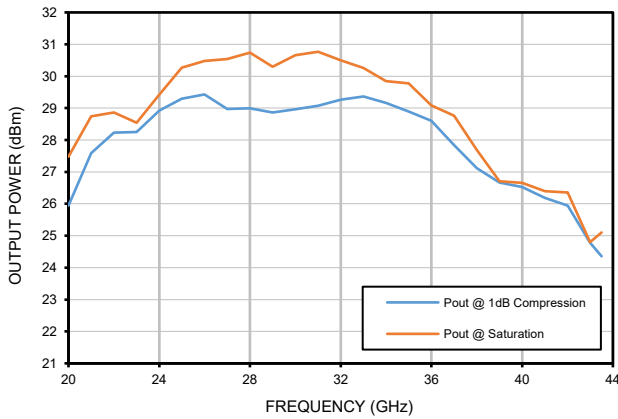
**RETURN LOSS**



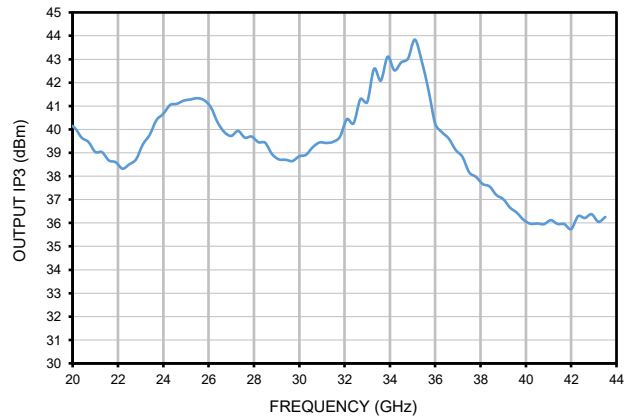
**NOISE FIGURE**



**OUTPUT POWER**



**OIP3**





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### ABSOLUTE MAXIMUM RATINGS<sup>3</sup>

Parameter	Ratings		
Operating Temperature	ZVA-24443HP+	-40 °C to +50°C	Ambient
	ZVA-24443HPX+	-40 °C to +60°C	Baseplate
Storage Temperature	-40 °C to +85°C		
Total Power Dissipation	14 W		
RF Input Power <sup>4</sup> (CW)	+5 dBm		
DC Operating Voltage	+16 V		

3. Continuous operation is not recommended at these extremes. Permanent damage may occur if any of these limits are exceeded.

4. Specified under matched load to 50 ohms.

### DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

<i>MAXIMUM THERMAL RESISTANCE</i>	= $\frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$
<b>Example:</b>	<p>MAXIMUM OPERATING CASE TEMP = +50 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE)</p> <p>MAXIMUM USER AMBIENT TEMP = +30 °C (USER DEFINED)</p> <p>POWER DISSIPATION = 23.5 WATTS (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE)</p> <p>THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 0.85 °C/W</p>





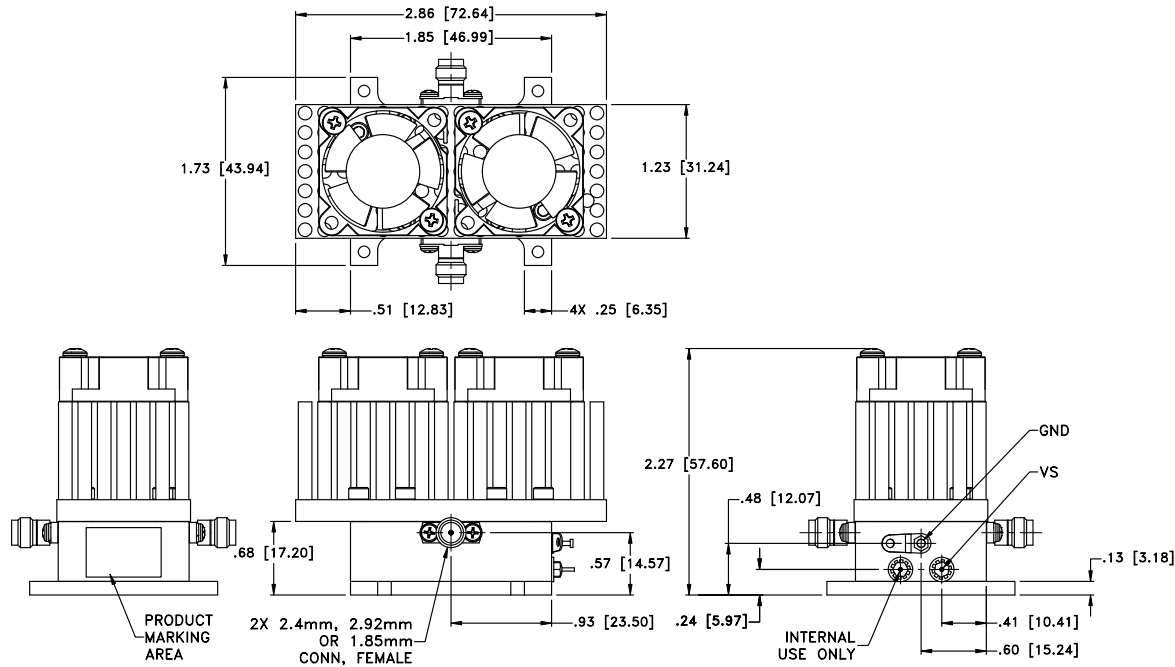
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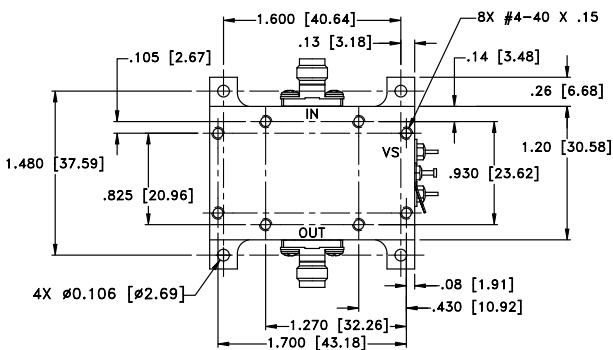
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### OUTLINE DRAWING FOR MODELS WITH HEATSINK (ZVA-24443HP+)



### MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK (ZVA-24443HPX+)



Weight: 160 grams; Without Heatsink: 60 grams  
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3Pl.±.015



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### ADDITIONAL INFORMATION IS AVAILABLE ON OUR DASHBOARD.

Performance Data & Graphs	Data
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
RoHS Status	Compliant
Environmental Ratings	ENV130
Export Information	ECCN # 3A001.B.4 This item will require an export license when shipped to certain countries.

### ORDERING INFORMATION

Model No. Links	<a href="#">ZVA-24443HP+</a>	<a href="#">ZVA-24443HPX+</a>
Option	With heatsink	Without heatsink
Product Marking	ZVA-24443HP+	ZVA-24443HPX+
Case Style	VN3071-4	
Connector	2.92 mm-Female	

- 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](http://www.minicircuits.com/terms/viewterm.html)

