



COAXIAL

Medium Power Amplifier

ZVA-24443HP+ ZVA-24443HPX+

50Ω 24 to 43.5 GHz P_{SAT} +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_{SAT} +29 dBm Typ.
- Wide DC Operating Voltage, +10 To +15 V
- Over Voltage and Reverse Voltage Protected

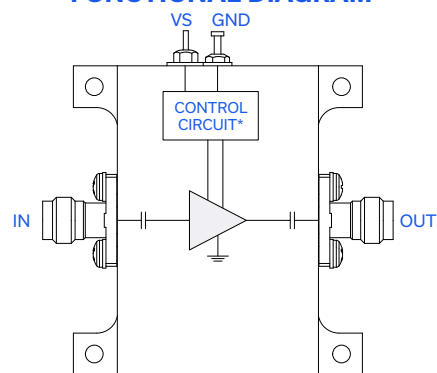


Generic photo used for illustration purposes only

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_s = +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 _{SAT}) ¹	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 _s)		+10	—	+15	V
DC Current ¹ at V _s = +10 V (Without/With Heatsink)		—	700/800	1300/1400 ²	mA

1. At P_{SAT}, P_{out} changes less than 0.1 dB for a 1 dB change in P_{in}.

2. Typical current measured under small signal conditions. Max DC current measured at P_{SAT}. DC current increases as amplifier is driven into compression.





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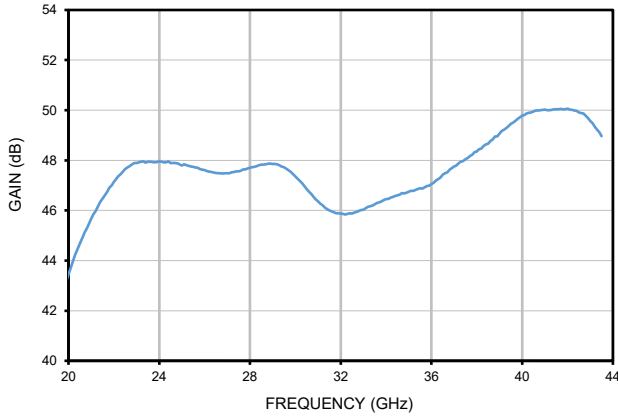
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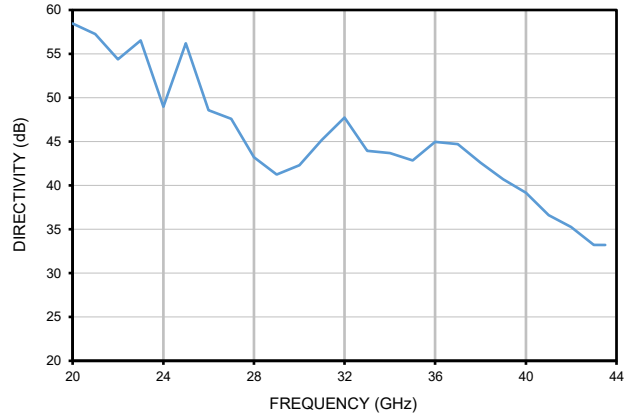
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TYPICAL PERFORMANCE GRAPHS

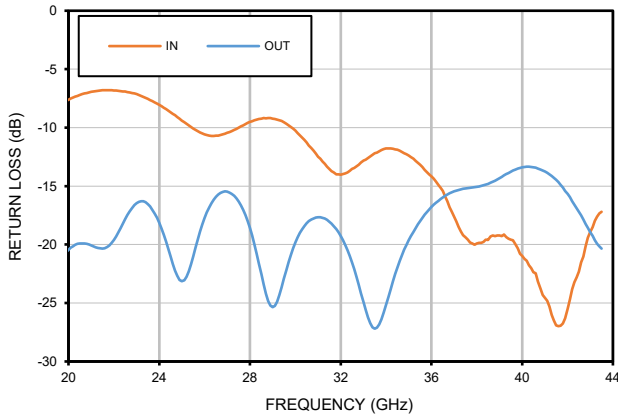
GAIN



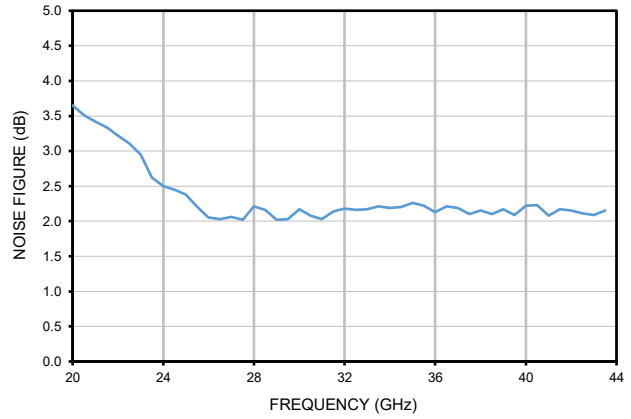
DIRECTIVITY



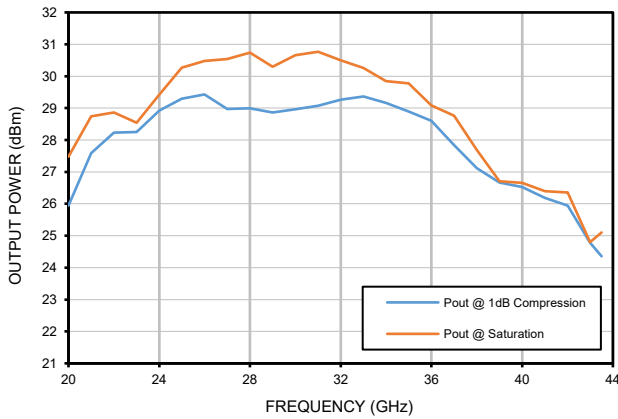
RETURN LOSS



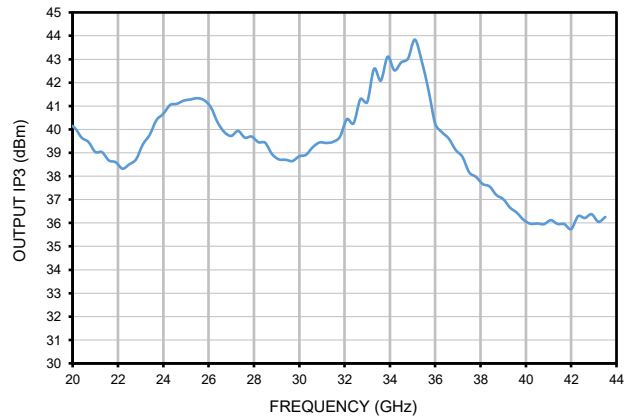
NOISE FIGURE



OUTPUT POWER



OIP3





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ABSOLUTE MAXIMUM RATINGS³

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 ⁴ (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

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



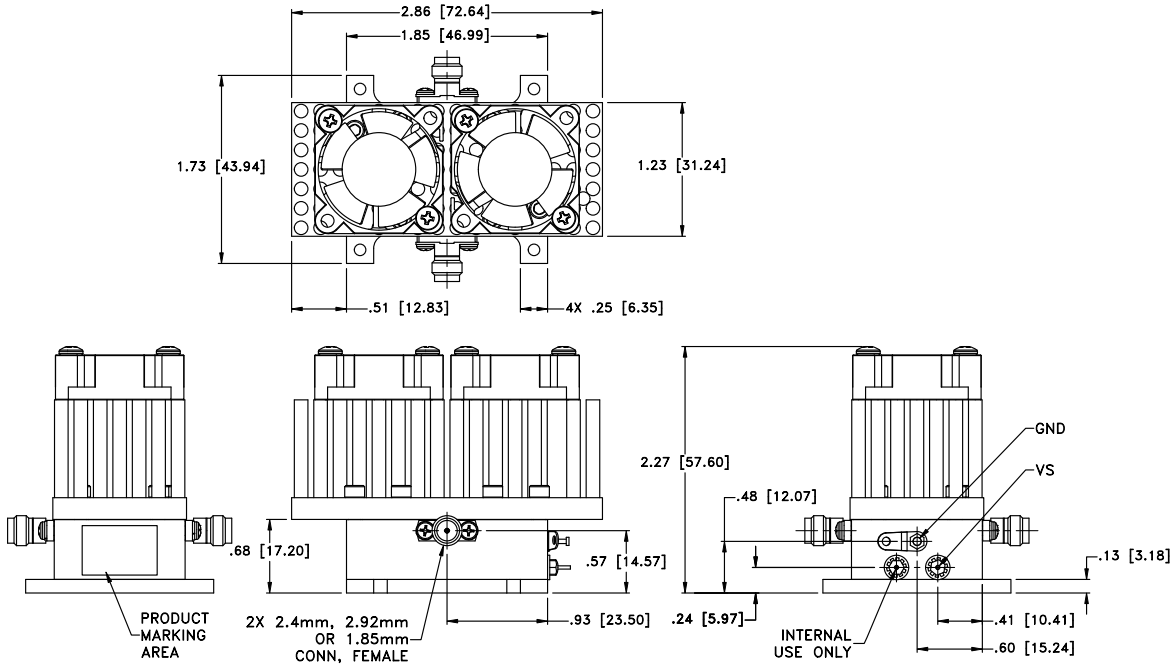
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Medium Power Amplifier

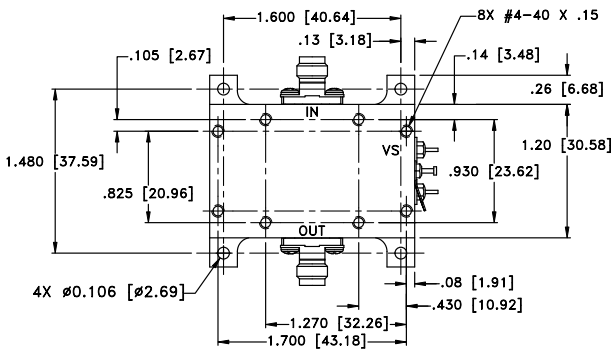
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OUTLINE DRAWING FOR MODELS WITH HEATSINK (ZVA-24443HP+)



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	ZVA-24443HP+	ZVA-24443HPX+
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



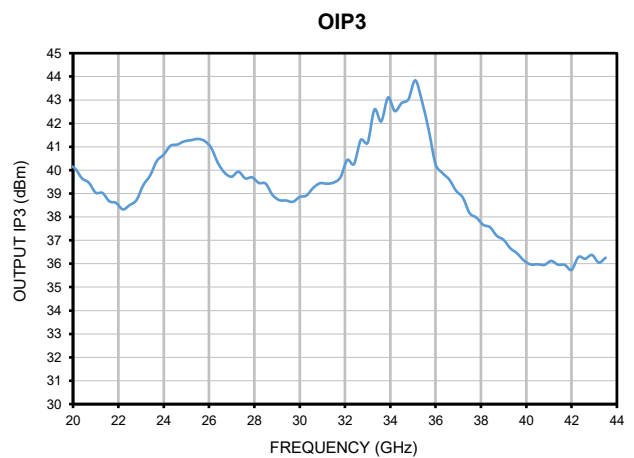
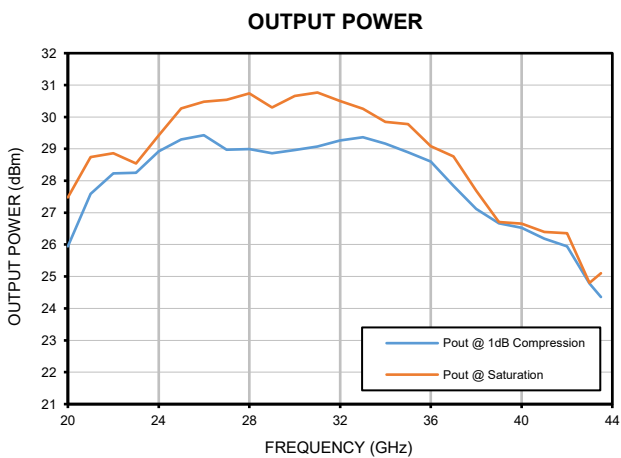
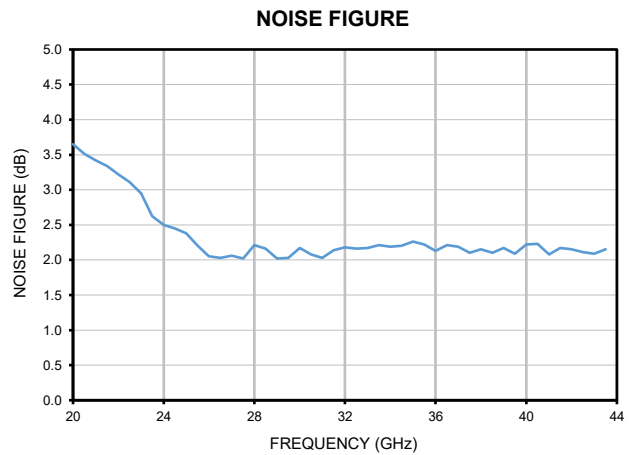
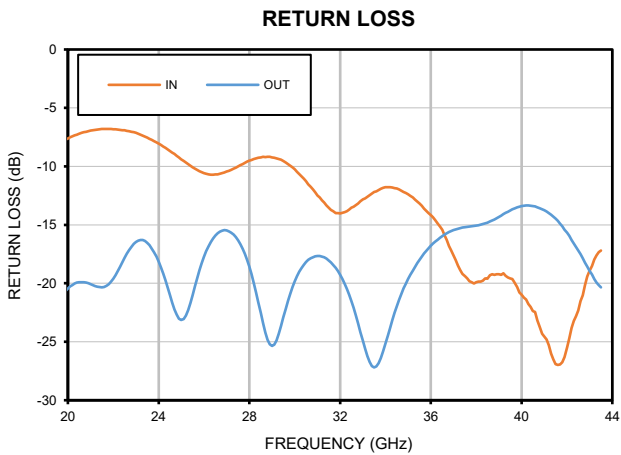
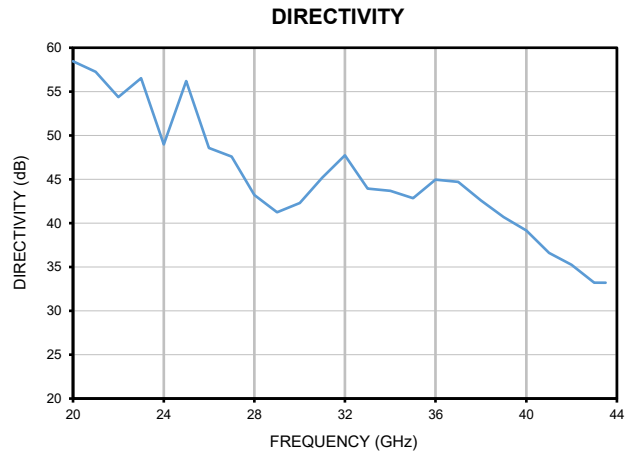
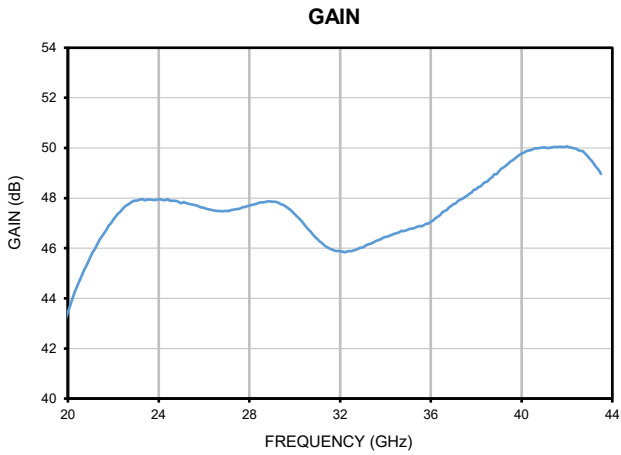
Typical Performance Data

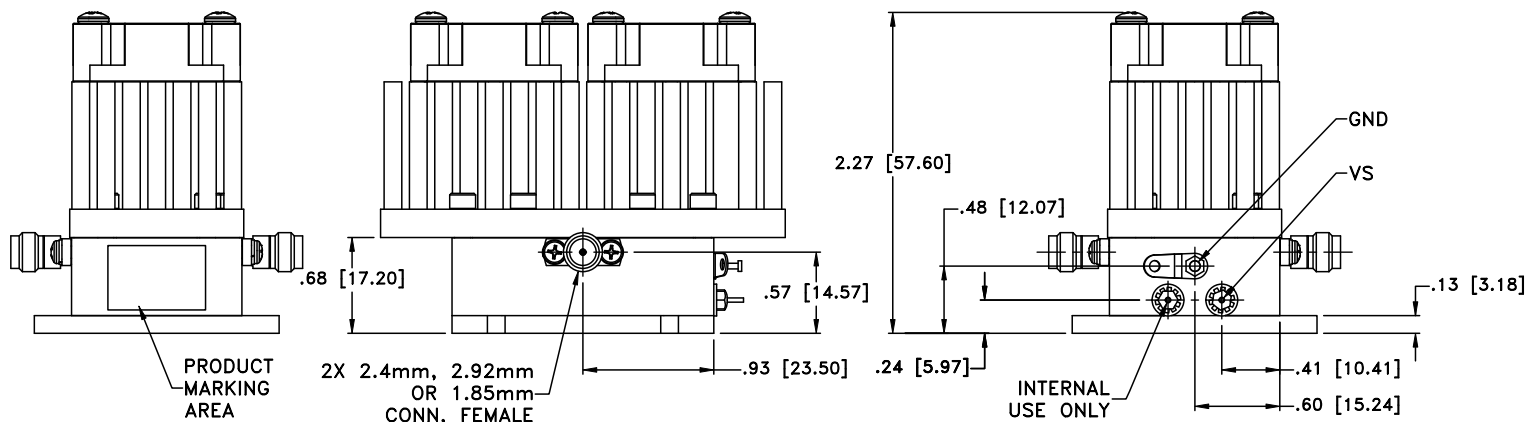
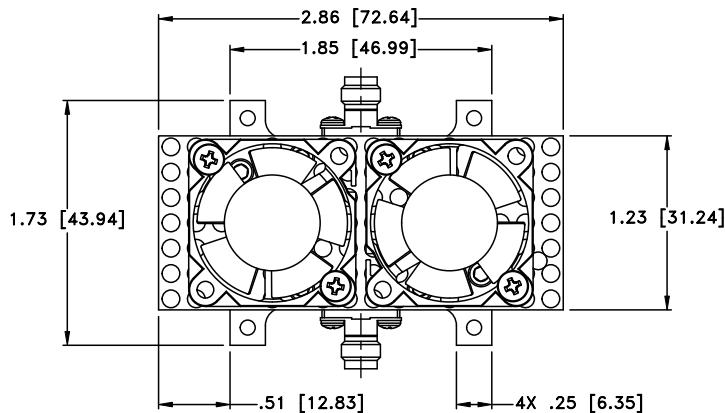
FREQUENCY (GHz)	GAIN (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		Pout @ 1 dB COMPRESSION (dBm)	Pout at SATURATION (dBm)	NOISE FIGURE (dB)	OIP3 (dBm)
			IN	OUT				
20.0	43.5	58.5	7.6	20.4	25.9	27.5	3.7	40.2
21.0	45.7	57.3	6.9	20.1	27.6	28.7	3.4	39.0
22.0	47.1	54.4	6.8	19.6	28.2	28.9	3.2	38.6
23.0	47.9	56.5	7.1	16.4	28.3	28.5	3.0	38.7
24.0	48.0	49.0	8.1	18.2	28.9	29.4	2.5	40.7
25.0	47.8	56.2	9.4	23.1	29.3	30.3	2.4	41.2
26.0	47.6	48.6	10.6	17.7	29.4	30.5	2.1	41.2
27.0	47.5	47.6	10.4	15.5	29.0	30.5	2.1	39.7
28.0	47.7	43.2	9.5	18.6	29.0	30.7	2.2	39.7
29.0	47.9	41.2	9.2	25.4	28.9	30.3	2.0	38.9
30.0	47.4	42.3	10.3	19.8	29.0	30.7	2.2	38.9
31.0	46.4	45.2	12.5	17.7	29.1	30.8	2.0	39.4
32.0	45.9	47.7	14.0	19.3	29.3	30.5	2.2	39.7
33.0	46.0	44.0	12.8	24.9	29.4	30.3	2.2	41.2
34.0	46.5	43.7	11.8	25.2	29.2	29.8	2.2	43.1
35.0	46.7	42.8	12.4	19.6	28.9	29.8	2.3	43.0
36.0	47.0	45.0	14.2	16.8	28.6	29.1	2.1	40.2
37.0	47.8	44.7	17.6	15.4	27.8	28.8	2.2	39.1
38.0	48.4	42.6	19.9	15.1	27.1	27.7	2.2	38.0
39.0	49.1	40.7	19.2	14.3	26.7	26.7	2.2	37.0
40.0	49.8	39.2	21.0	13.4	26.5	26.7	2.2	36.1
41.0	50.0	36.6	24.6	13.7	26.2	26.4	2.1	36.0
42.0	50.1	35.2	25.5	15.7	25.9	26.4	2.2	35.7
43.0	49.6	33.2	18.9	18.9	24.8	24.8	2.1	36.4
43.5	49.0	33.2	17.2	20.3	24.4	25.1	2.2	36.3

Coaxial Amplifier

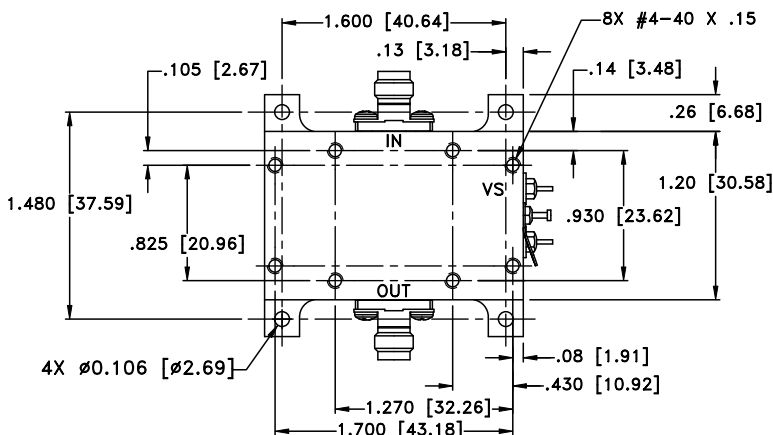
Typical Performance Curves

ZVA-24443HP(X)+





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Flo gpukqpu'ctg'lp'pej gu"o o #0Vqrgtcegu<4'Rr0025="5'Rr000237"

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70 Uj cr g'qh'epppgevqt'hrpi g'o c{ 'xct{0



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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