MEDIUM POWER, HIGH GAIN

Wideband Amplifier

ZVA-543HP+
ZVA-543HPX+

50Ω 18 to 54 GHz 1.85mm Female

THE BIG DEAL

- High gain, 31 dB typ. over the entire operating band
- Good gain flatness, ±2.0 dB typ.
- +29 dBm Psat Typ.
- Adjustable DC voltage, +10 to +15 V
- DC protected against over-voltage, reverse-voltage conditions

Generic photo used for illustration purposes only

Model No.	ZVA-543HP+	ZVA-543HPX+
Option	With heatsink & fan	Without heatsink & fan
Case Style	VN3071-4	
Connector	1.85mm Female	

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

APPLICATIONS

- Wideband Test and Instrumentation
- 5G mmW
- SATCOM
- Wireless Infrastructure

PRODUCT OVERVIEW

Mini-Circuits' ZVA-543HP(X)+ is a coaxial, 1-watt wideband high gain amplifier, operating from 18 to 54 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 wideband operation combined with high output power makes this amplifier an ideal choice for testing and instrumentation applications.

KEY FEATURES

Features	Advantages
Wideband amplifier, 18 to 54 GHz	A single amplifier serves the need for applications including 5G bands (24 to 54 GHz), SATCOM, Test & Instrumentation, etc.
Integrated fan assembly	Model ZVA-543HP+ utilizes two integrated fans, keeping the amplifier cool to the touch during normal operation at room temperature
High gain Low VSWR Medium RF power	The amplifier provides 31 dB (typ.) of gain over the entire operating band, and is capable of delivering over 1 watt of RF power
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

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ELECTRICAL SPECIFICATIONS AT 25 °C BASEPLATE

Parameter	Condition (GHz)	ZVA-543HP+[3] ZVA-543HPX+[4] Min.	Typ.	Max.	Units
Frequency Range	-	18	-	54	GHz
Gain	18-20	-	29.0	-	dB
	20–40	29.0	33.0	-	
	40–54	28.0	31.0	-	
Output Power at 1dB compression	18-20	-	27.0	-	dBm
	20–40	27.0	30.0	-	
	40-54	24.5	27.5	-	
Saturated Output Power	18-20	-	28.0	-	dBm
	20–40	28.0	31.0	-	
	40–54	26.0	28.5	-	
Output IP3 (Output Power = +14 dBm/tone)	18 – 54	-	37.0	-	dBm
Input VSWR	18 – 54	-	1.5	2.0	:1
Output VSWR[1]	18 – 54	-	1.5	2.0	:1
Noise Figure	18 – 50	-	6.5	-	dB
Operating DC Voltage	-	+10	-	+15	V
Device Operating Current at +10 V	-	-	1500[4] / 1650[3]	2400[4] / 2550[3]	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. Device operating power based on current when 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 RATINGS[6]

Parameter	Ratings
Operating Temperature	ZVA-543HP+ -40 °C to +50 °C Ambient ZVA-543HPX+ -40 °C to +60 °C Baseplate
Storage Temperature	-40 °C to +85 °C
Total Power Dissipation	22.5 W
RF Input Power[5] (CW)	+5 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

$$\textit{MAXIMUM THERMAL RESISTANCE} = \frac{\textit{MAXIMUM OPERATING CASE TEMP} - \textit{MAXIMUM USER AMBIENT TEMP}}{\textit{POWER DISSIPATION}}$$

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

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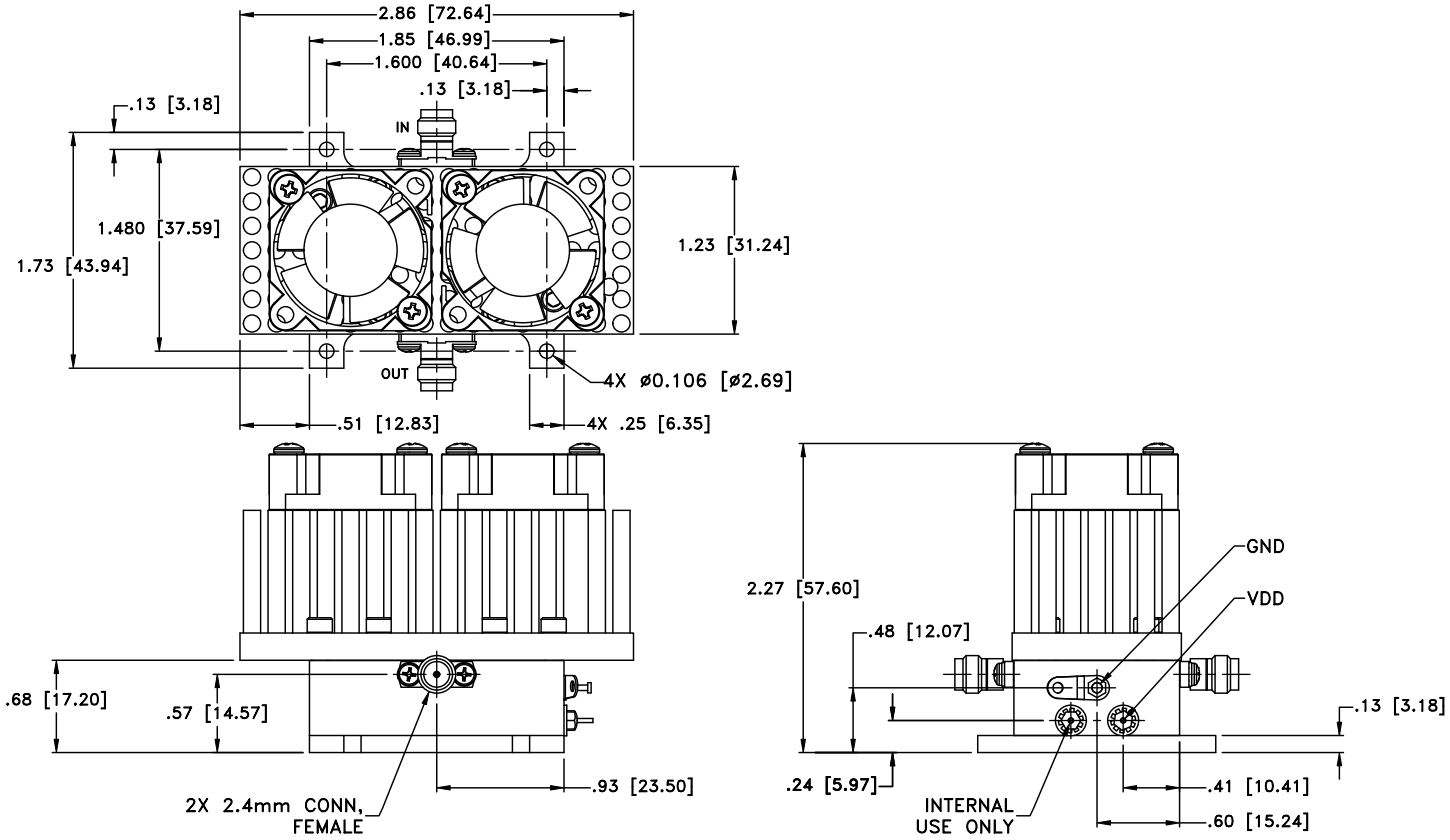
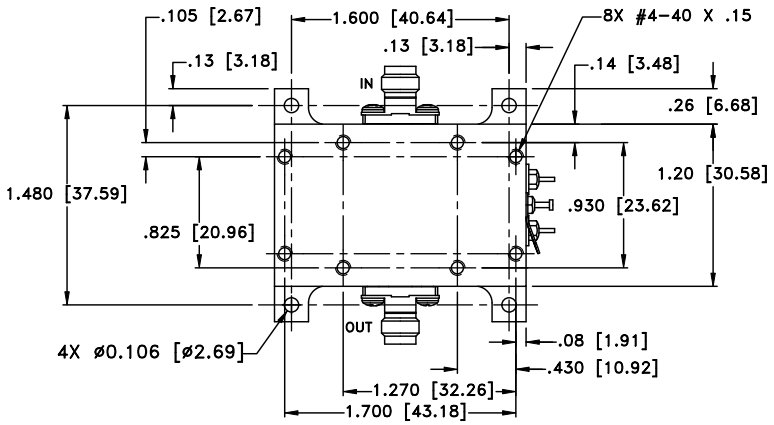
OUTLINE DRAWING FOR MODELS WITH HEATSINK (ZVA-543HP+)



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK (ZVA-543HPX+)



WT. GRAMS 160 grams; WITHOUT HEATSINK GRAMS 60 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl. ±.015

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TYPICAL PERFORMANCE DATA / GRAPHS

Frequency (GHz)	Gain (dB) 10V	Directivity (dB) 10V	VSWR (:1) 10V		Pout @ 1 dB Compression (dBm) 10V	Pout @ Saturation (dBm) 10V	Output IP3 (dBm) 10V	Noise Figure (dB) 10V
			IN	OUT				
18.0	26.7	63.9	1.1	1.4	24.5	25.0	27.4	5.3
20.0	31.7	61.3	1.2	1.1	28.9	29.5	32.2	5.5
22.0	32.8	60.7	1.3	1.2	30.5	30.8	34.6	5.4
24.0	33.2	59.3	1.2	1.1	31.0	31.2	35.6	5.4
26.0	33.5	57.3	1.2	1.1	31.1	31.5	36.0	5.6
28.0	33.0	53.3	1.2	1.2	31.5	31.9	37.2	6.0
30.0	32.5	55.1	1.2	1.1	30.7	31.7	36.0	6.3
32.0	32.7	54.0	1.3	1.1	31.0	31.8	37.0	6.8
34.0	33.3	48.8	1.4	1.2	30.7	31.6	36.9	7.0
36.0	33.7	47.2	1.2	1.5	30.1	30.9	35.7	7.1
38.0	33.8	49.2	1.3	1.9	29.6	30.5	35.9	7.4
40.0	32.8	50.8	1.1	1.9	29.1	29.5	38.2	7.6
42.0	31.1	50.3	1.1	1.8	28.6	29.1	36.4	8.1
44.0	30.3	48.3	1.3	1.5	28.3	28.7	37.7	8.3
46.0	30.2	49.5	1.3	1.1	27.6	28.5	37.1	8.6
48.0	30.3	46.8	1.4	1.3	27.3	28.1	35.2	9.0
50.0	30.3	46.9	1.4	1.7	27.0	27.9	34.1	9.2
52.0	30.9	47.8	1.5	1.8	27.4	27.8	33.8	
54.0	32.4	46.5	1.1	1.6	26.6	27.4	35.1