

# Coaxial High Power Amplifier

## ZHL-100W-251+

50Ω 100W 50 to 250 MHz

### The Big Deal

- Output Power at Saturation 100W typ.
- Wide bandwidth, 50 to 250 MHz
- High gain, 46 dB typ.
- Good gain flatness,  $\pm 0.7$  dB typ.
- Unconditionally stable
- Self protected against high case temperature and shorting/unshorting of the DC supply
- Can withstand short and open circuit at output while delivering 100 watts



ZHL-100W-251-S+



ZHL-100W-251XS+

### Product Overview

The ZHL-100W-251+ is a Class A, high-power amplifier providing 100W saturated power over the 50 to 250 MHz band, ideal for a variety of high-power test setups as well as applications including communications, HAM bands and more. The ruggedly-designed amplifier provides unconditional stability and built-in self-protection against overheating. It is capable of withstanding short and open circuits at output while continuously delivering 100W of power. Housed in a rugged aluminum alloy case measuring 3.25 x 6.0 x 1.13", the unit features SMA connectors and an optional heat sink and fan attachment for cooling.

### Key Features

Feature	Advantages
Wideband, usable from 20 to 450 MHz	Suitable for a broad range of high-power, wideband applications, including test setups, HAM communication and defense applications.
High gain, 46 dB	Enables signal amplification to 100W output without the need for multiple gain stages.
Good gain flatness, $\pm 0.7$ dB	Provides consistent performance across frequency without the need for gain flattening using external components.
Built-in self-protection	In instances of potentially-damaging heat buildup within the housing, unshorting of DC supply, and short or open loads at the output, an automatic sensing feature signals the unit to power down.
Unconditional stability	Provides reliable performance independent of input and load conditions.

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## ZHL-100W-251+

50Ω 100W 50 to 250 MHz

### Features

- High power, 100 Watt at saturation
- Usable over 20 to 450 MHz
- High gain, 46 dB typ.
- Excellent gain flatness,  $\pm 0.7$  dB typ.
- Excellent IP3, +58 dBm typ.
- Class A amplifier, usable up to 100W
- No damage with an open or short output load under full CW output power<sup>1</sup>
- Shuts off when base plate temperature exceeds +100°C
- Internal power regulator (current remains constant over 22 to 28V)
- Over voltage protection, shut off above 29V

### Applications

- VHF/UHF transmitters
- Defense
- Amateur radio, FM, TV
- Laboratory use



Model No.	ZHL-100W-251-S+   ZHL-100W-251XS+ <sup>▲</sup>
Case Style	BT1165
Connectors	SMA

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

### Electrical Specifications at 25°C

Parameter	ZHL-100W-251+			ZHL-100W-251X+ <sup>▲</sup>			Units
	Min.	Typ.	Max.	Min	Typ.	Max.	
Frequency Range	50		250	50		250	MHz
Gain	42	46	51	42	46	51	dB
Gain Flatness	—	$\pm 0.7$	$\pm 1.5$	—	$\pm 0.7$	$\pm 1.5$	dB
Output Power at 1dB compression	—	+48	—	—	+48	—	dBm
Output Power at 3dB compression	—	+50	—	—	+50	—	dBm
Noise Figure	—	4.5	—	—	4.5	—	dB
Output third order intercept point	—	+58	—	—	+58	—	dBm
Input VSWR	—	1.4	—	—	1.4	—	:1
Output VSWR	—	2.5	—	—	2.5	—	:1
DC Supply Voltage	—	24	25	—	24	25	V
Supply Current	—	—	10.5	—	—	10.2	A

1. At constant open or short load 24V nominal supply voltage.

<sup>▲</sup> Heat sink and fan 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 0.08°C/W max.

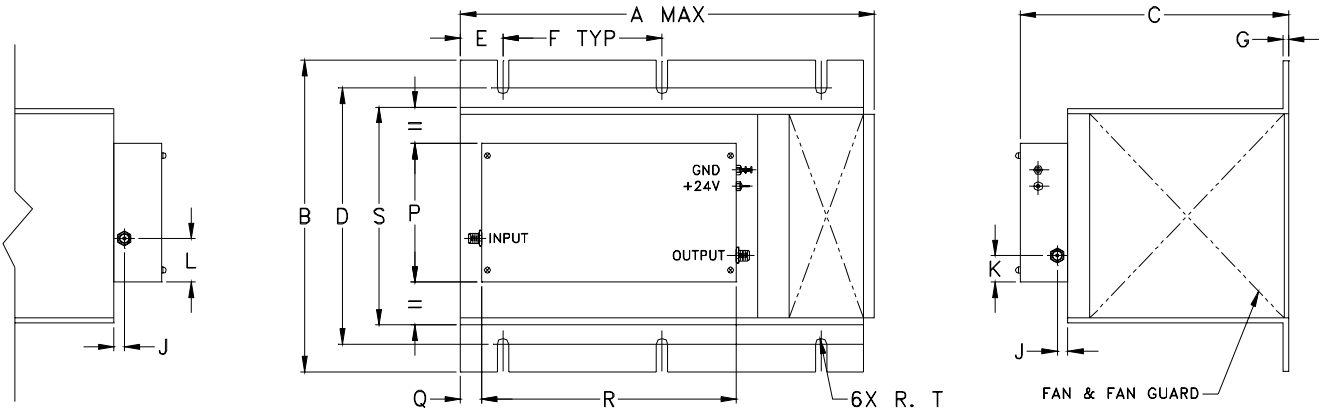
### Maximum Ratings

Parameter	Ratings
Operating Temperature (with Mini-Circuits' heatsink and fan)	-20°C to 65°C
Storage Temperature	-55°C to 100°C
Base Plate Temperature (with alternative heatsink)	85°C
Input RF Power (no damage) <sup>2</sup>	+9 dBm

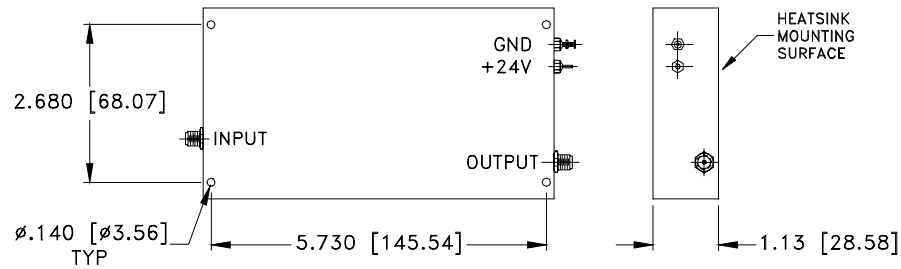
2. At nominal output load, 24V nominal supply voltage. Limiter VLM-52-S+ is recommended to be used at the input of the amplifier.

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

## Outline Drawing for models with heatsink



## MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.

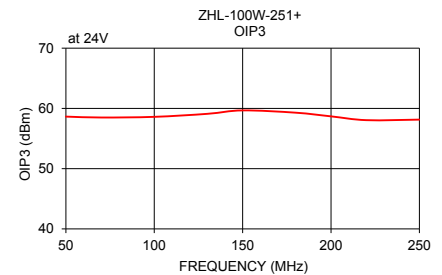
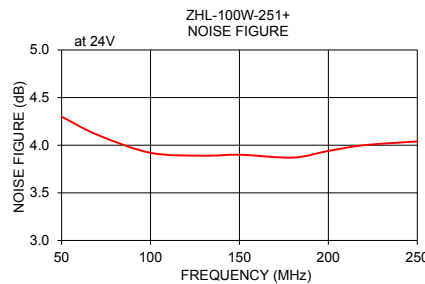
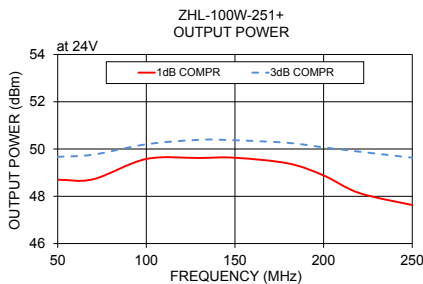
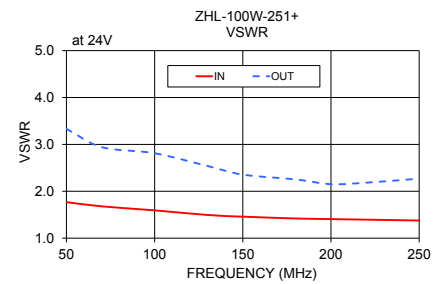
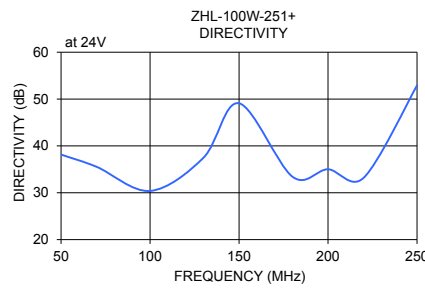
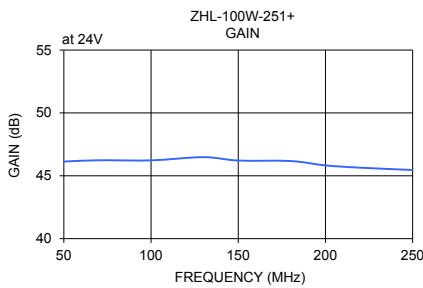


## Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
9.85	7.3	6.3	6.00	1.00	3.75	.13	—	.25	.63	1.03	—	—	3.25	.5	6.00	5.1	.135 gr
250.19	185.42	160.02	152.40	25.40	95.25	3.30	—	6.35	16.00	26.16	—	—	82.55	12.70	152.40	129.54	3.43

\*500 grams without he.

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)
	24V	24V	IN	OUT	24V	24V	24V	24V
50	46.1	38	1.77	3.33	48.7	49.7	4.3	58.6
70	46.2	36	1.68	2.94	48.7	49.8	4.1	58.5
100	46.2	30	1.59	2.81	49.6	50.2	3.9	58.6
130	46.5	37	1.49	2.54	49.6	50.4	3.9	59.1
150	46.2	49	1.46	2.36	49.6	50.4	3.9	59.7
180	46.7	33	1.42	2.25	49.4	50.3	3.9	59.3
200	45.8	35	1.41	2.15	48.9	50.1	3.9	58.7
220	45.6	33	1.40	2.18	48.1	49.9	4.0	58.1
250	45.5	53	1.38	2.27	47.6	49.6	4.0	58.1



### Additional Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)