



COAXIAL High Power Amplifier

ZHL-5W-1+ ZHL-5W-1X+

50Ω 5W 5 to 500 MHz

FEATURES

- High Power, 5 Watt
- Wideband, 5 to 500 MHz
- High Power Output, +37dBm Min.
- High Gain, 40 dB typ.
- Low Noise Figure, 4 dB typ.
- High IP3, +49 dBm typ.

APPLICATIONS

- VHF
- Instrumentation
- Laboratory



Generic photo used for illustration purposes only

Model No.	ZHL-5W-1+	ZHL-5W-1X+ [▲]
Case Style	DDD131	
Connectors	SMA	

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

ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Units
Frequency Range	5	—	500	MHz
Gain	40	—	—	dB
Gain Flatness	—	—	±1.7	dB
Output Power at 1dB compression	+37	—	—	dBm
Noise Figure	—	4.0	—	dB
Output third order intercept point	—	+49	—	dBm
Input VSWR	—	2.0	—	:1
Output VSWR	—	2.5	—	:1
DC Supply Voltage	—	24	25	V
Supply Current	—	—	3.3	A

Open load is not recommended potentially can cause damage
With no load derate max. Input power by 20 dB

[▲] Heat sink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 65°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 0.3°C/W max.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to +65°C
Storage Temperature	-55°C to +100°C
Input RF Power (no damage)	0 dBm

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



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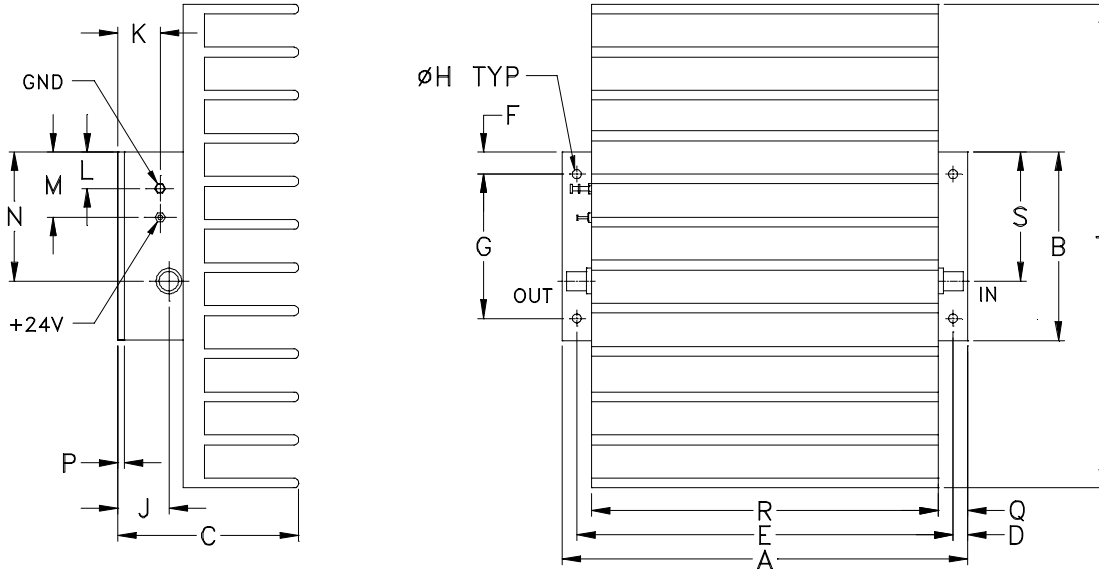
High Power Amplifier

ZHL-5W-1+ ZHL-5W-1X+

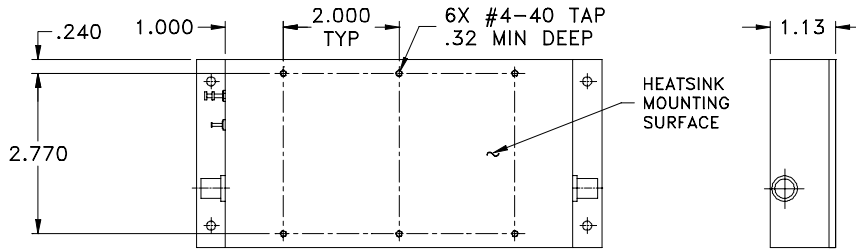
Mini-Circuits

50Ω 5W 5 to 500 MHz

OUTLINE DRAWING



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	wt
7.00	3.25	3.13	.25	6.500	.38	2.500	.156	.88	.43	.62	1.00	2.63	.125	.50	6.00	2.23	8.35	grams*
177.80	82.55	79.50	6.35	165.10	9.65	63.50	3.96	22.35	10.92	15.75	25.40	66.80	3.18	12.70	152.40	56.64	212.09	1780
																		*510 grams without heatsink





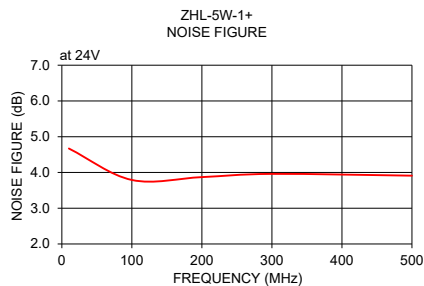
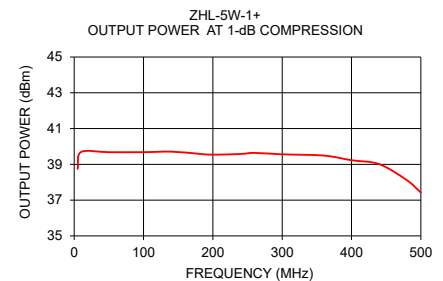
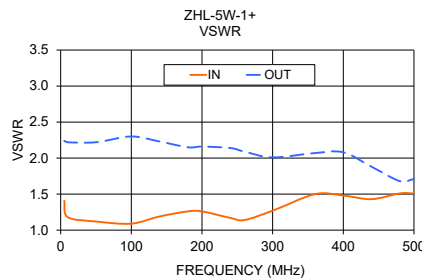
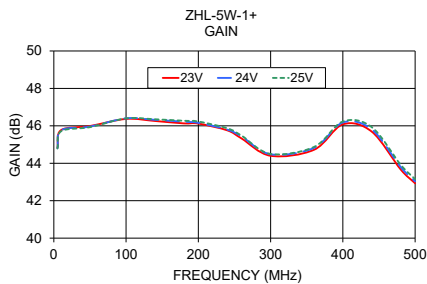
COAXIAL High Power Amplifier

ZHL-5W-1+ ZHL-5W-1X+

50Ω 5W 5 to 500 MHz

TYPICAL PERFORMANCE DATA AND CHARTS

FREQUENCY (MHz)	GAIN (dB)			VSWR (:1)		POUT at 1 dB COMPR. (dBm) 24V	FREQUENCY (MHz)	NOISE FIGURE (dB) 24V
	23V	24V	25V	IN	OUT			
5.00	44.82	44.8	44.79	1.41	2.24	38.75	10.00	4.67
10.00	45.77	45.76	45.71	1.18	2.22	39.69	100.00	3.79
50.00	45.99	45.96	45.93	1.12	2.22	39.68	200.00	3.87
100.00	46.37	46.40	46.40	1.09	2.30	39.68	300.00	3.96
140.00	46.26	46.32	46.35	1.19	2.23	39.71	500.00	3.91
180.00	46.13	46.22	46.27	1.26	2.15	39.59		
200.00	46.12	46.16	46.23	1.26	2.16	39.54		
240.00	45.76	45.80	45.87	1.17	2.14	39.58		
260.00	45.32	45.43	45.47	1.14	2.09	39.64		
300.00	44.40	44.48	44.50	1.27	2.01	39.56		
360.00	44.72	44.82	44.87	1.50	2.07	39.49		
400.00	46.08	46.18	46.23	1.48	2.08	39.23		
440.00	45.69	45.81	45.93	1.43	1.88	39.01		
480.00	43.67	43.80	43.92	1.51	1.68	38.11		
500.00	42.93	43.03	43.15	1.51	1.71	37.42		



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/terms/viewterm.html



Amplifier

ZHL-5W-1+

Typical Performance Data

FREQUENCY (MHz)	GAIN			VSWR IN (:1) 24V	VSWR OUT (:1) 24V	Pout at 1dB Comp. (dBm) 24V	FREQUENCY (MHz)	NOISE FIGURE (dB) 24V
	23V	24V	25V					
5.0	44.82	44.80	44.79	1.41	2.24	38.75	10.00	4.67
10.0	45.77	45.76	45.71	1.18	2.22	39.69	100.00	3.79
50.0	45.99	45.96	45.93	1.12	2.22	39.68	200.00	3.87
100.0	46.37	46.40	46.40	1.09	2.30	39.68	300.00	3.96
140.0	46.26	46.32	46.35	1.19	2.23	39.71	500.00	3.91
180.0	46.13	46.22	46.27	1.26	2.15	39.59		
200.0	46.12	46.16	46.23	1.26	2.16	39.54		
240.0	45.76	45.80	45.87	1.17	2.14	39.58		
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480.0	43.67	43.80	43.92	1.51	1.68	38.11		
500.0	42.93	43.03	43.15	1.51	1.71	37.42		



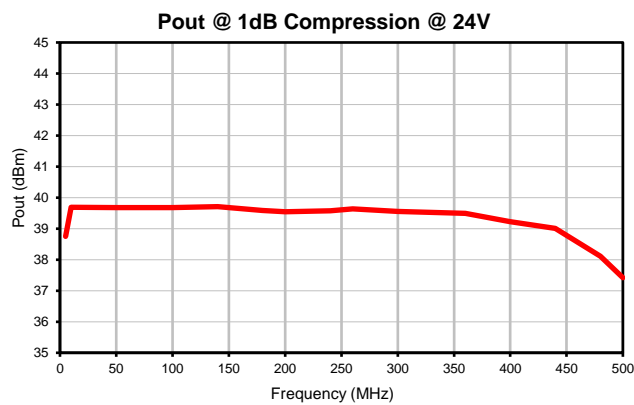
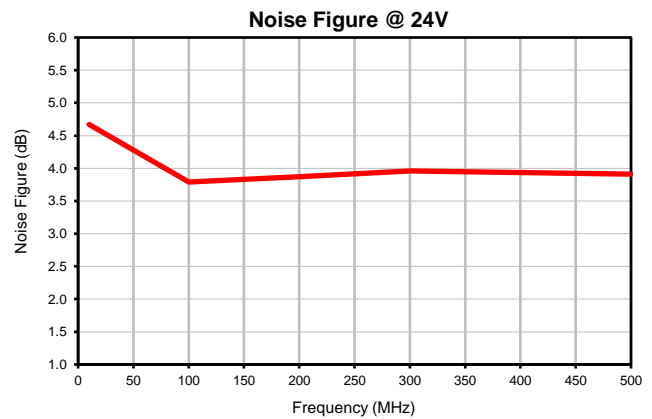
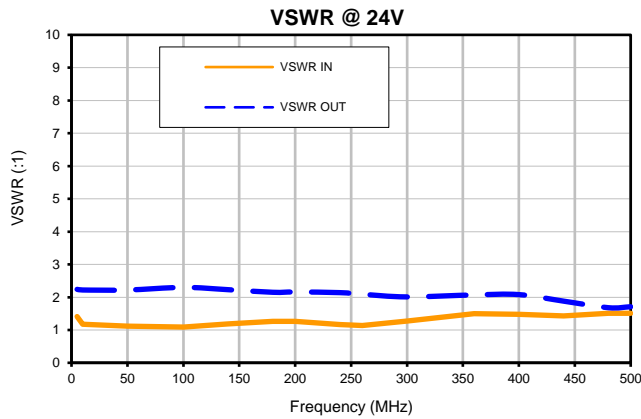
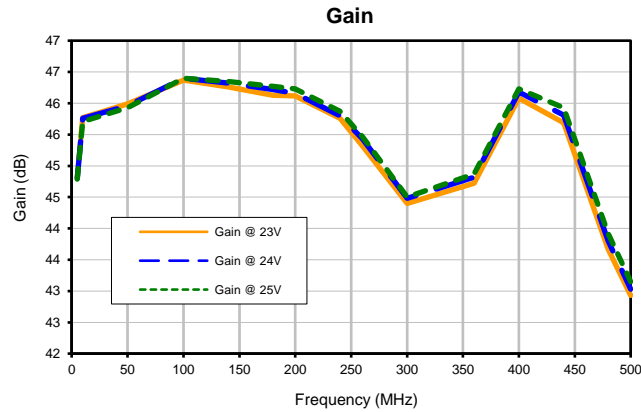
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com



IF/RF MICROWAVE COMPONENTS

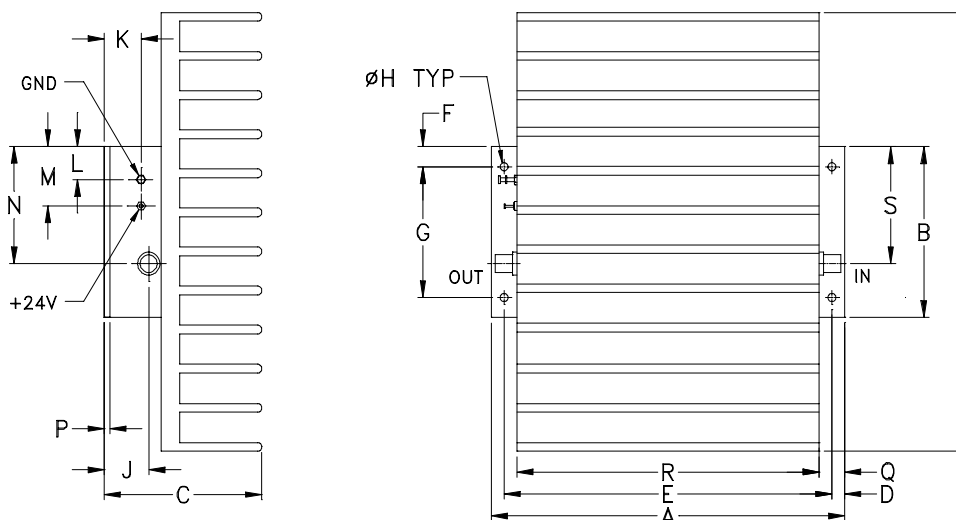
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 ZHL-5W-1+
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Typical Performance Curves

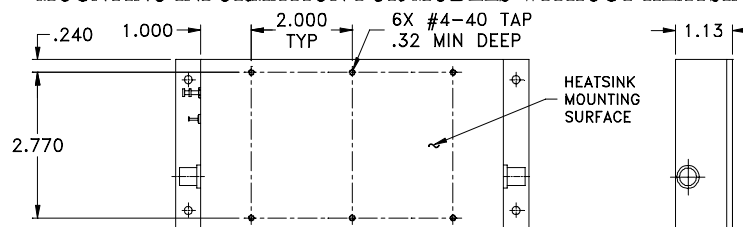


Outline Dimensions

DDD131



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
DDD131	7.00 (177.80)	3.25 (82.55)	3.13 (79.50)	.25 (6.35)	6.500 (165.10)	.38 (9.65)	2.500 (63.50)	.156 (3.96)	.88 (22.35)	.43 (10.92)	.62 (15.75)	1.00 (25.40)	2.63 (66.68)

CASE#	P	Q	R	S	T	WT. GRAMS	WT. WITHOUT HEATSINK GRAMS
DDD131	.125 (3.18)	.50 (12.70)	6.00 (152.40)	2.23 (56.64)	8.35 (212.09)	1780	510

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

- Case material: Aluminum alloy.
- Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Heatsink finish: Black anodize if supplied with heatsink.
- Refer to the individual model data sheet for the type of connectors available.



INTERNET <http://www.minicircuits.com>

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Mini-Circuits ISO 9001 & ISO 14001 Certified

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	-20° to 65° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Stabilization Bake	(non-operating) 125°C, 24 hours	- - -
Burn-in at Elevated Temp.	(DC on) 160 hours at 85° C	MIL-STD-202, Method 108
Thermal Shock	-55° to 100°C, 5 cycles	MIL-STD-202, Method 107, Condition A, except 100°C