COAXIAL

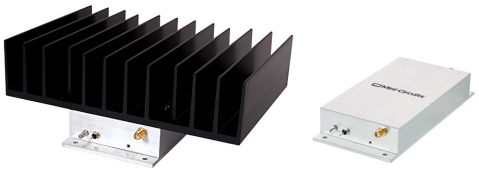
High Power Amplifier

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

50Ω 5 W 5 to 500 MHz SMA Female

FEATURES

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



Generic photo used for illustration purposes only

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

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

APPLICATIONS

- VHF
- Instrumentation
- Laboratory

ELECTRICAL SPECIFICATIONS[1]

Parameter	ZHL-5W-1+ / ZHL-5W-1X+▲ Min.	Typ.	Max.	Units
Frequency Range	5		500	MHz
Gain	40	45		dB
Gain Flatness			±1.7	dB
Output Power at 1 dB 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

1. Specified under matched load to 50Ω.

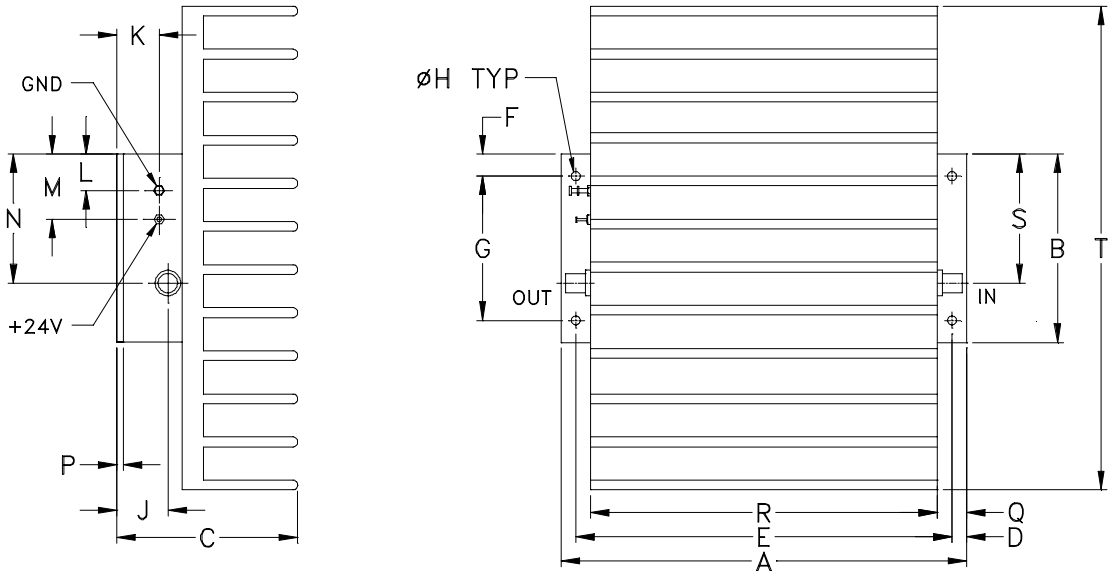
▲ Heatsink not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to +65 °C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heatsink to be 0.3 °C/W max.

ABSOLUTE MAXIMUM RATINGS

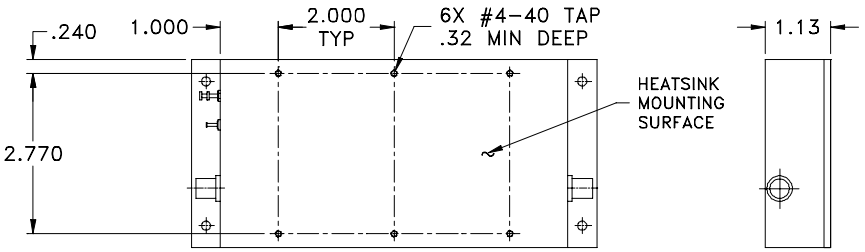
Parameter	Ratings
Operating Temperature	-20 °C to +65 °C
Storage Temperature	-55 °C to +100 °C
Input RF Power (No Damage)[2]	0 dBm

2. Derate maximum input power by 20 dB when load isn't present.
Permanent damage may occur if any of these limits are exceeded.

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

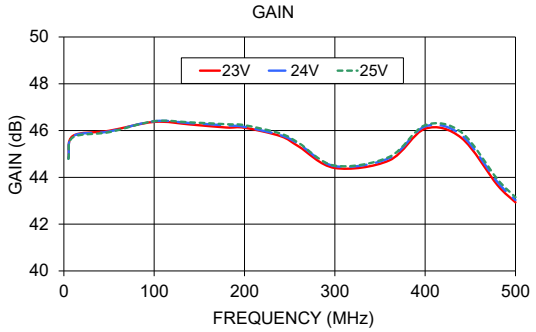
*510 grams without heatsink

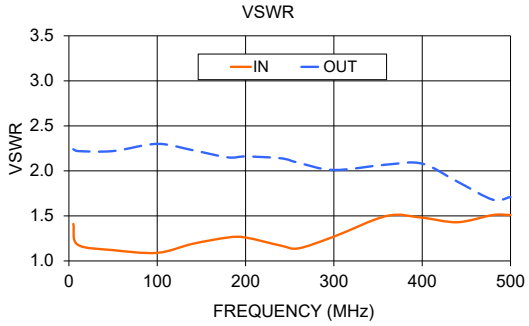
High Power Amplifier

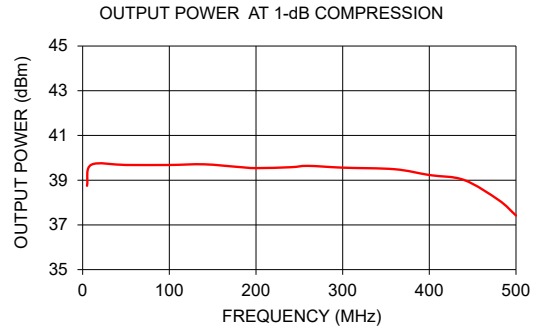
50Ω 5 W 5 to 500 MHz SMA Female

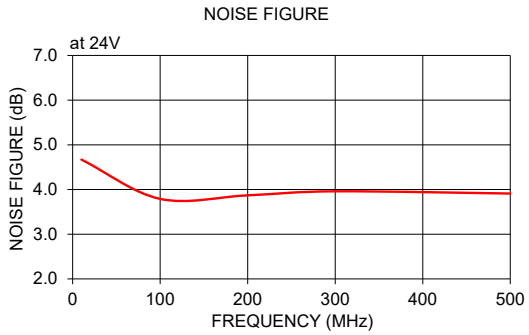
TYPICAL PERFORMANCE DATA AND CHARTS

FREQUENCY (MHz)	GAIN (dB)			VSWR (:1)		P_{OUT} at 1 dB COMPR. (dBm)	FREQUENCY (MHz)	NOISE FIGURE (dB)
	+23 V	+24 V	+25 V	IN	OUT	+24 V		+24 V
5	44.82	44.8	44.79	1.41	2.24	38.75	10	4.67
10	45.77	45.76	45.71	1.18	2.22	39.69	100	3.79
50	45.99	45.96	45.93	1.12	2.22	39.68	200	3.87
100	46.37	46.40	46.40	1.09	2.30	39.68	300	3.96
140	46.26	46.32	46.35	1.19	2.23	39.71	500	3.91
180	46.13	46.22	46.27	1.26	2.15	39.59		
200	46.12	46.16	46.23	1.26	2.16	39.54		
240	45.76	45.80	45.87	1.17	2.14	39.58		
260	45.32	45.43	45.47	1.14	2.09	39.64		
300	44.40	44.48	44.50	1.27	2.01	39.56		
360	44.72	44.82	44.87	1.50	2.07	39.49		
400	46.08	46.18	46.23	1.48	2.08	39.23		
440	45.69	45.81	45.93	1.43	1.88	39.01		
480	43.67	43.80	43.92	1.51	1.68	38.11		
500	42.93	43.03	43.15	1.51	1.71	37.42		









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

Amplifier ZHL-5W-1+

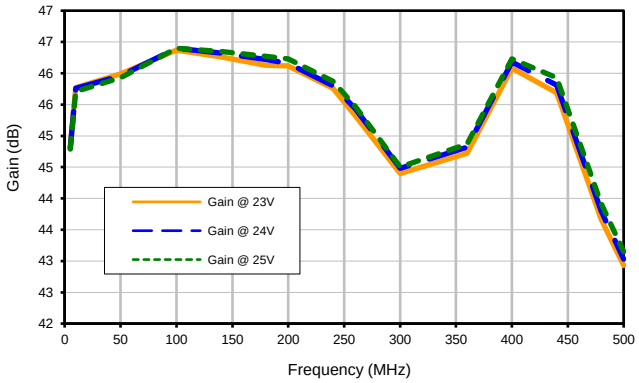
Typical Performance Data

FREQUENCY (MHz)	GAIN 23V	GAIN 24V	GAIN 25V	VSWR IN (:1) 24V	VSWR OUT (:1) 24V	Pout at 1dB Comp. (dBm) 24V
5.0	44.82	44.80	44.79	1.41	2.24	38.75
10.0	45.77	45.76	45.71	1.18	2.22	39.69
50.0	45.99	45.96	45.93	1.12	2.22	39.68
100.0	46.37	46.40	46.40	1.09	2.30	39.68
140.0	46.26	46.32	46.35	1.19	2.23	39.71
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
260.0	45.32	45.43	45.47	1.14	2.09	39.64
300.0	44.40	44.48	44.50	1.27	2.01	39.56
360.0	44.72	44.82	44.87	1.50	2.07	39.49
400.0	46.08	46.18	46.23	1.48	2.08	39.23
440.0	45.69	45.81	45.93	1.43	1.88	39.01
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

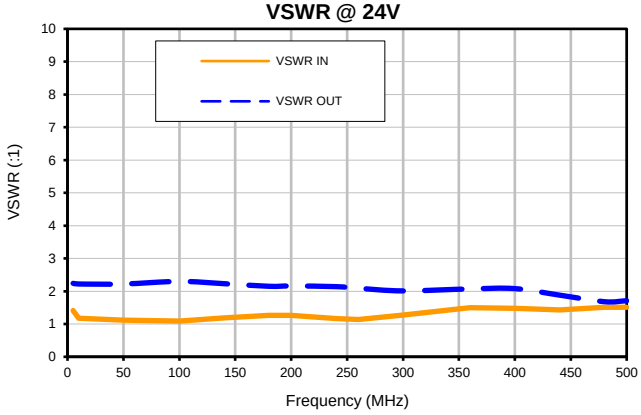
FREQUENCY (MHz)	NOISE FIGURE (dB) 24V
10.00	4.67
100.00	3.79
200.00	3.87
300.00	3.96
500.00	3.91

Typical Performance Curves

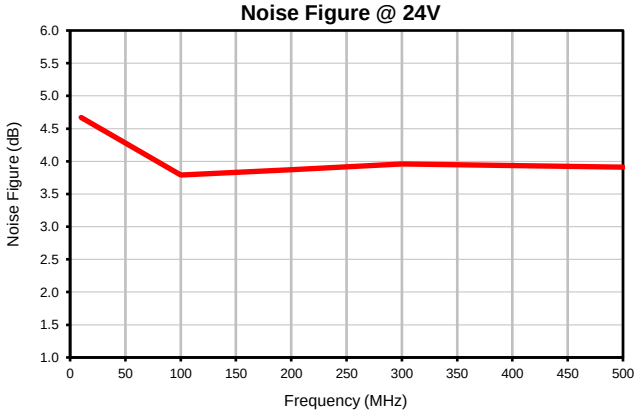
Gain



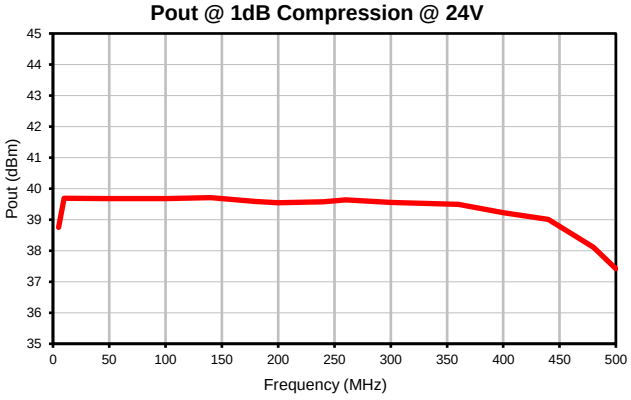
VSWR @ 24V



Noise Figure @ 24V



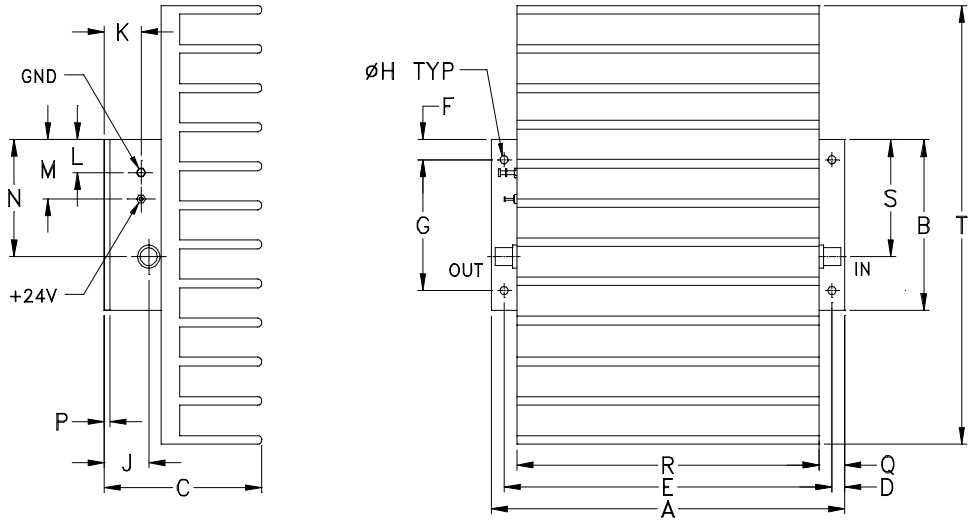
Pout @ 1dB Compression @ 24V



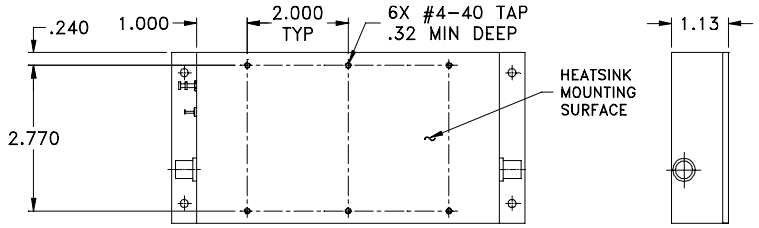
Case Style DDD

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. ± .03; 3 Pl. ± .015

Notes:

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

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Environmental Specifications ENV23T3

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

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