



COAXIAL

# Medium High Power Amplifier

# ZHL-2-S+ ZHL-2X-S+

50Ω 10 to 1000 MHz

## FEATURES

- Wideband, 10 to 1000 MHz
- High IP3, +42 dBm typ.
- Medium High Power, 28 dB min.



Generic photo used for illustration purposes only

## APPLICATIONS

- VHF/UHF
- Cellular
- Instrumentation
- Laboratory

Model No.	ZHL-2-S+	ZHL-2X-S+ <sup>▲</sup>
Case Style	T34	
Connectors	SMA	

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

## ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	ZHL-2-S+ ZHL-2X-S+ <sup>▲</sup>			Units
		Min.	Typ.	Max.	
Frequency Range		10	—	1000	MHz
Gain	10-1000	16	20	24	dB
Gain Flatness	10-1000	—	±0.9	±1.4	dB
Output Power at 1dB compression	10-1000	+28	+29	—	dBm
Output Power at 3dB compression	10-1000	+29	+30	—	dBm
Noise Figure	10-1000	—	9.0	—	dB
Output third order intercept point	10-1000	—	+42	—	dBm
Input VSWR	10-1000	—	—	2.0	:1
Output VSWR	10-1000	—	—	2.1	:1
DC Supply Voltage		—	24	—	V
Supply Current		—	—	0.6	A

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

<sup>▲</sup> 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 1.35°C/W max.

## ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to +65°C
Storage Temperature	-55°C to +100°C
DC Voltage	+25V
Input RF Power (no damage)	+15 dBm

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





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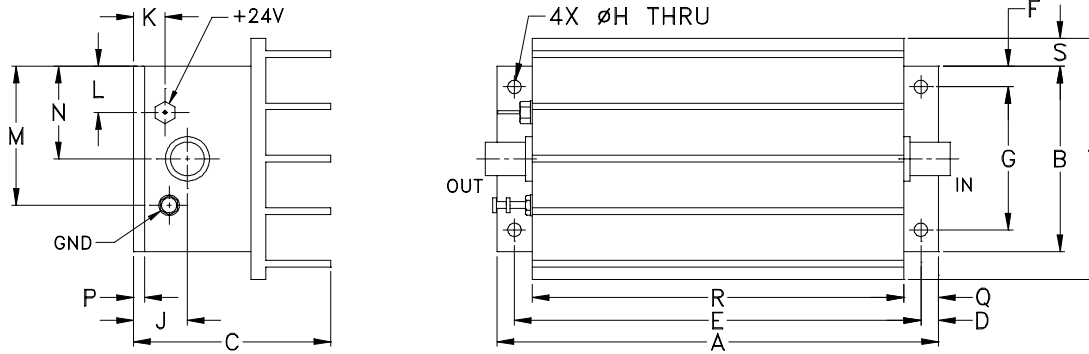
# Medium High Power Amplifier

## ZHL-2-S+ ZHL-2X-S+

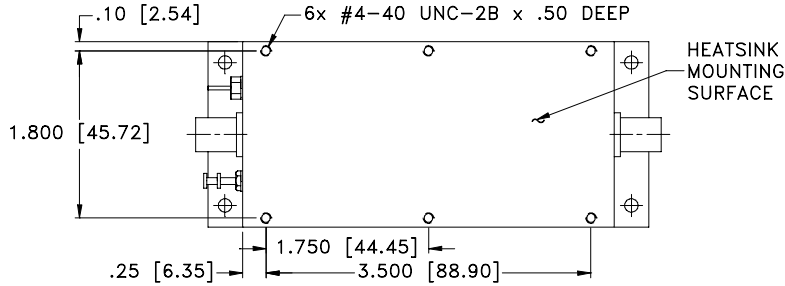
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50Ω 10 to 1000 MHz

### 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	wt
4.75	2.00	2.12	.19	4.375	.23	1.540	.144	.58	.34	.50	1.50	1.00	.12	.38	4.00	.30	2.60	grams*
120.65	50.80	53.85	4.83	111.13	5.84	39.12	3.66	14.73	8.64	12.70	38.10	25.40	3.05	9.65	101.60	7.62	66.04	440.0
																		*325 grams without heatsink



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# Medium High Power Amplifier

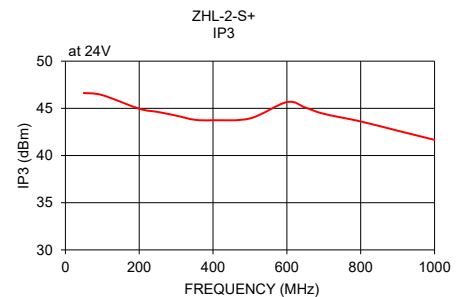
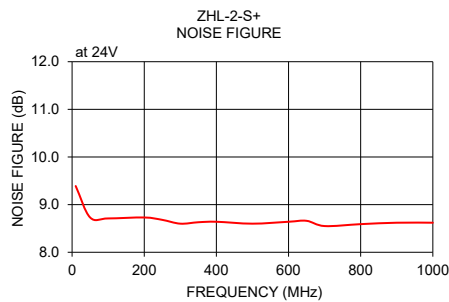
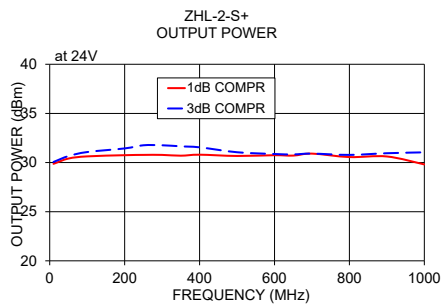
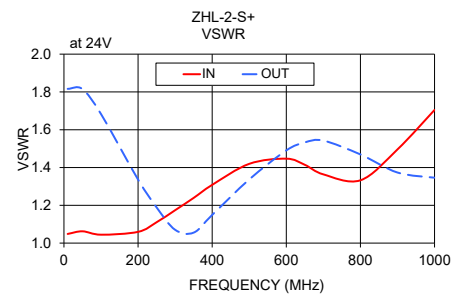
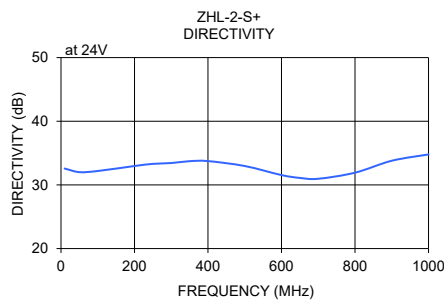
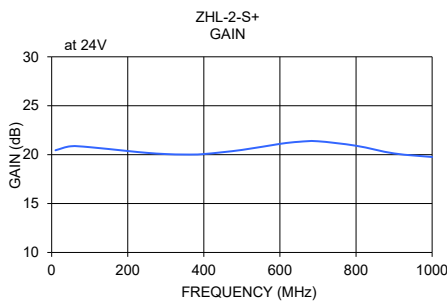
# ZHL-2-S+ ZHL-2X-S+

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### TYPICAL PERFORMANCE DATA/CURVES

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		POUT at 1 dB COMPR. (dBm)	NOISE FIGURE (dB)	IP3 (dBm)
	24V	24V	IN	OUT	24V	24V	24V
10.00	20.45	32.57	1.05	1.82	29.87	9.39	45.49
50.00	20.85	32.00	1.06	1.82	30.41	8.73	46.62
100.00	20.76	32.18	1.04	1.68	30.63	8.71	46.40
200.00	20.37	32.96	1.06	1.34	30.75	8.73	44.96
250.00	20.18	33.30	1.11	1.19	30.78	8.68	44.62
300.00	20.06	33.43	1.17	1.07	30.78	8.60	44.23
350.00	20.01	33.72	1.24	1.06	30.70	8.63	43.79
400.00	20.06	33.73	1.31	1.15	30.80	8.64	43.74
500.00	20.48	32.96	1.42	1.34	30.67	8.60	43.93
600.00	21.10	31.54	1.45	1.49	30.75	8.64	45.66
650.00	21.31	31.09	1.41	1.53	30.71	8.66	45.08
700.00	21.37	30.96	1.36	1.54	30.91	8.55	44.42
800.00	20.91	31.92	1.33	1.47	30.56	8.59	43.61
900.00	20.12	33.79	1.50	1.37	30.62	8.62	42.63
1000.00	19.76	34.78	1.70	1.35	29.81	8.62	41.66



#### NOTES

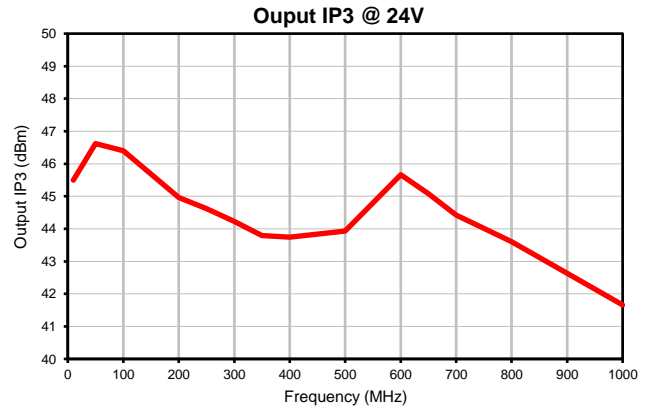
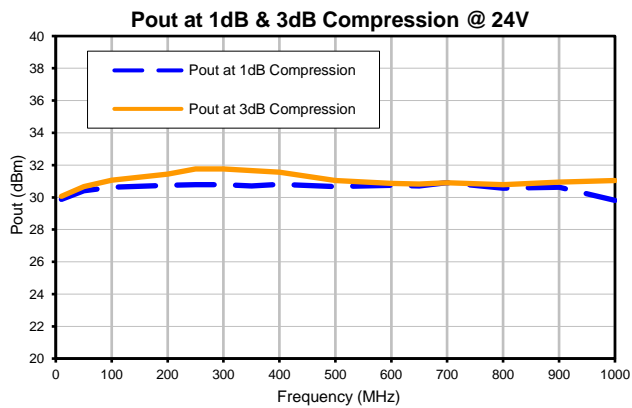
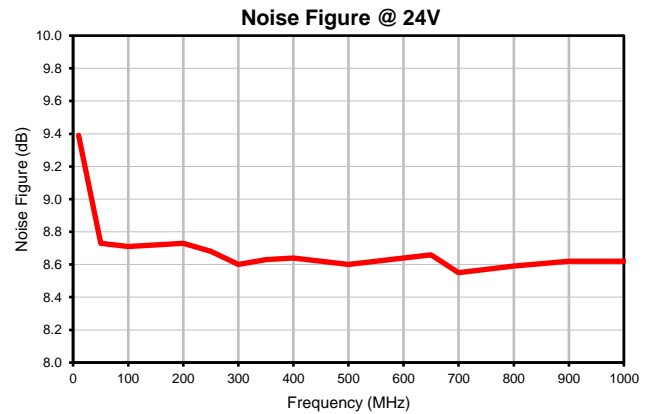
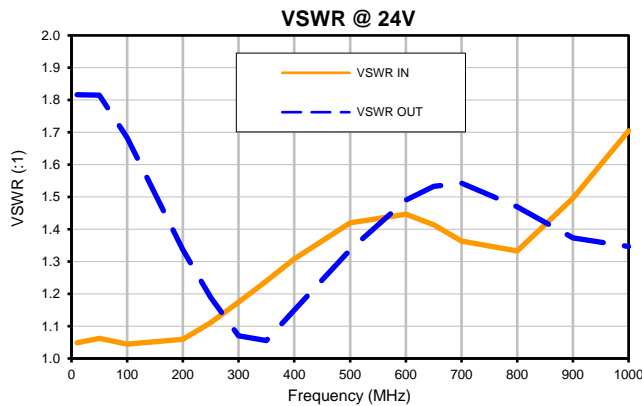
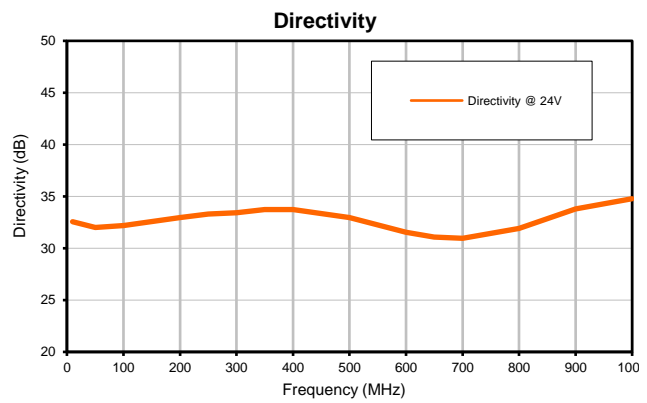
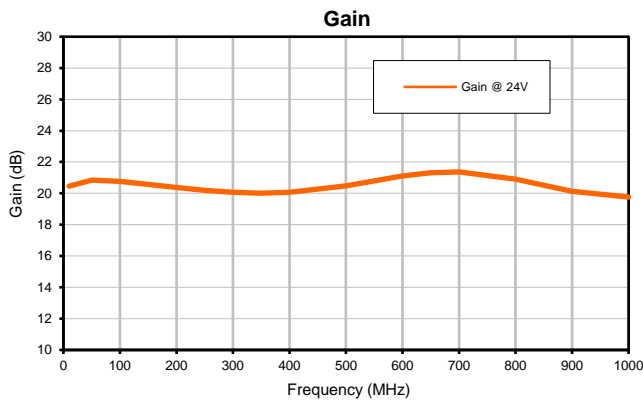
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document 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](http://www.minicircuits.com/terms/viewterm.html)



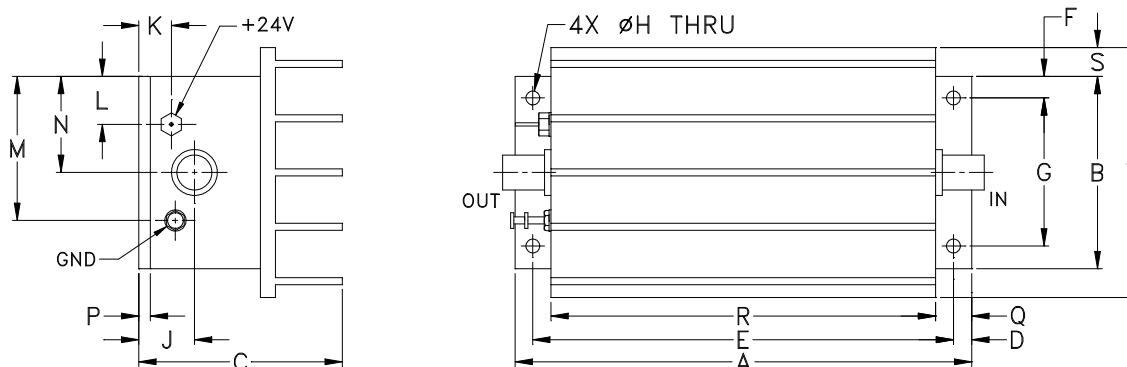
## Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 24V	DIRECTIVITY (dB) 24V	VSWR (:1)		NOISE FIGURE (dB) 24V	POUT @ 1 dB COMPRESSION (dBm) 24V	POUT @ 3 dB COMPRESSION (dBm) 24V	OUTPUT IP3 (dBm) 24V
			IN 24V	OUT 24V				
10	20.45	32.57	1.05	1.82	9.39	29.87	30.06	45.49
50	20.85	32.00	1.06	1.82	8.73	30.41	30.66	46.62
100	20.76	32.18	1.04	1.68	8.71	30.63	31.07	46.40
200	20.37	32.96	1.06	1.34	8.73	30.75	31.44	44.96
250	20.18	33.30	1.11	1.19	8.68	30.78	31.76	44.62
300	20.06	33.43	1.17	1.07	8.60	30.78	31.76	44.23
350	20.01	33.72	1.24	1.06	8.63	30.70	31.65	43.79
400	20.06	33.73	1.31	1.15	8.64	30.80	31.55	43.74
500	20.48	32.96	1.42	1.34	8.60	30.67	31.05	43.93
600	21.10	31.54	1.45	1.49	8.64	30.75	30.87	45.66
650	21.31	31.09	1.41	1.53	8.66	30.71	30.83	45.08
700	21.37	30.96	1.36	1.54	8.55	30.91	30.91	44.42
800	20.91	31.92	1.33	1.47	8.59	30.56	30.78	43.61
900	20.12	33.79	1.50	1.37	8.62	30.62	30.95	42.63
1000	19.76	34.78	1.70	1.35	8.62	29.81	31.04	41.66

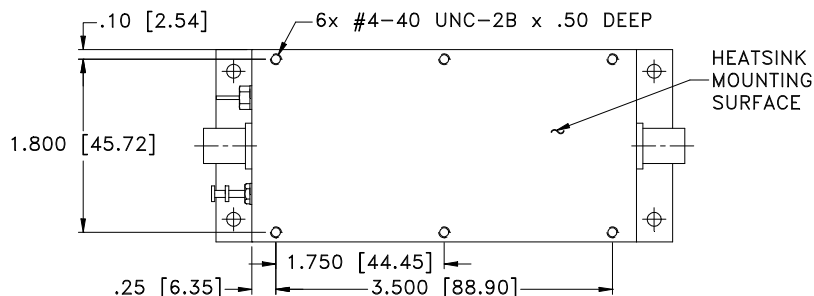
## Typical Performance Curves



### Outline Dimensions



### MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
T34	4.75 (120.65)	2.00 (50.80)	2.12 (53.85)	.19 (4.83)	4.375 (111.13)	.23 (5.84)	1.540 (39.12)	.144 (3.66)	.58 (14.73)	.34 (8.64)	.50 (12.70)	1.50 (38.10)	1.00 (25.40)

CASE#	P	Q	R	S	T	WT. GRAMS	WT. WITHOUT HEATSINK GRAMS
T34	.12 (3.05)	.38 (9.65)	4.00 (101.60)	.30 (7.62)	2.60 (66.04)	440.0	325.0

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

### Notes:

- Case material: Aluminum alloy.
- Case finish and mounting bracket finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Heat sink finish: Black anodize.



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



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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	-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