



# COAXIAL High Power Amplifier

## ZHL-20W-13+ ZHL-20W-13X+

50Ω 20W 20 to 1000 MHz

### FEATURES

- High Power, 20 Watt
- Protected against overheat -shuts off automatically
- Excellent Gain Flatness,  $\pm 1.2$  dB typ.
- Class A amplifier
- Usable over 15 to 1100 MHz
- Protected by US patent 7,348,854



Generic photo used for illustration purposes only

### APPLICATIONS

- VHF/UHF Transmitters
- Defense
- Amateur Radio, FM, TV

Model No.	ZHL-20W-13+	ZHL-20W-13X+ <sup>▲</sup>
Case Style	CP641	
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	20		1000	MHz
Gain	46	50	55	dB
Gain Flatness			$\pm 1.8$	dB
Output Power at 1dB compression	+39	+41		dBm
Saturated Output Power at 3dB compression	+40	+43		dBm
Noise Figure		3.5		dB
Output third order intercept point		+50		dBm
Input VSWR		1.7		:1
Output VSWR		2.5		:1
DC Supply Voltage		24		V
Supply Current			2.8	A

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

<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 0.38°C/W max.

### ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to +65°C
Storage Temperature	-55°C to +100°C
Base Plate Temperature	+85°C
DC Voltage	+28V
Input RF Power (no damage)	-3 dBm

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

1. At nominal 50 Ohms RF load. Amplifier can withstand a full mismatch (short or open) across all phases at RF output, if the input RF power does not exceed -13dBm. Maximum RF input power is defined as a peak envelope power (PEP). See the application note [AN-60-037](#) for PEP calculation.



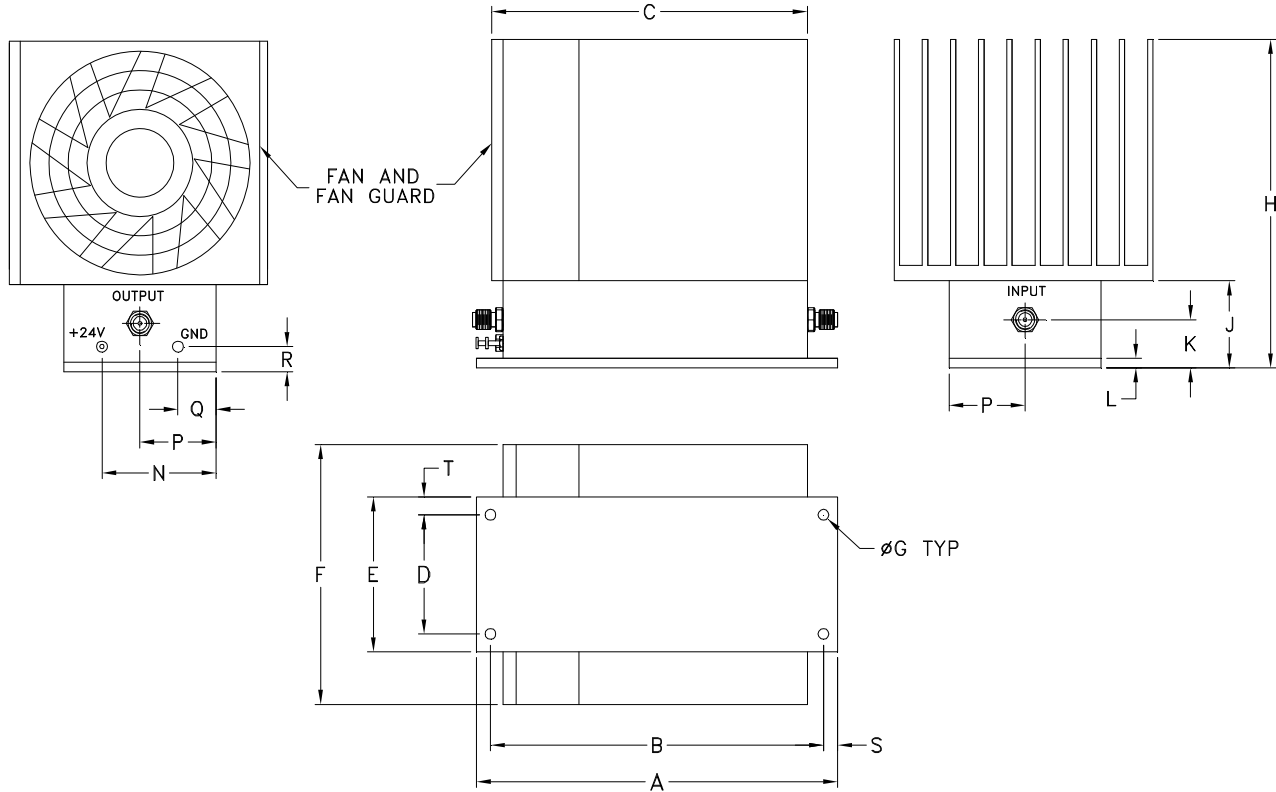


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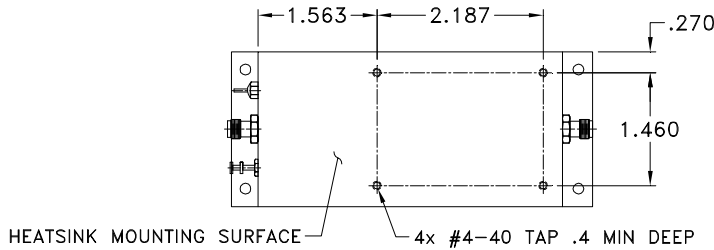
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## OUTLINE DRAWING



**MOUNTING INFORMATION OF MODEL 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	4.375	4.18	1.540	2.00	3.36	.144	4.24	1.12	.58	.125	--	1.50	1.00	.50	.34	.19	.23	grams*
120.65	111.13	106.17	39.12	50.80	85.34	3.66	107.70	28.45	14.73	3.18	--	38.10	25.40	12.70	8.64	4.83	5.84	750

\*290 grams without heatsink



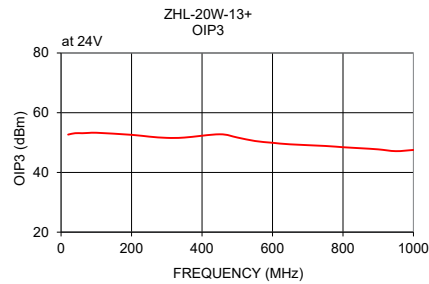
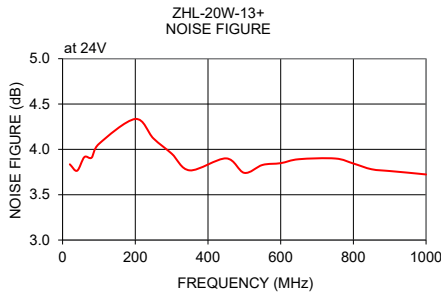
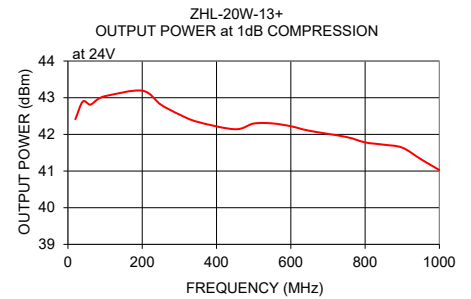
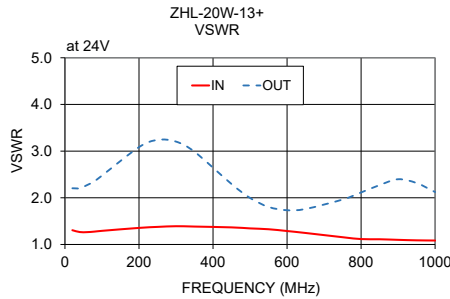
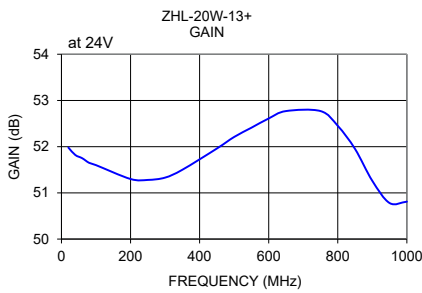
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### TYPICAL PERFORMANCE DATA AND CHARTS

FREQUENCY (MHz)	GAIN (dB)	VSWR (:1)		NOISE FIGURE (dB)	POUT at 1 dB COMPR. (dBm)	OIP3 (dBm)
		IN	OUT			
20	51.98	1.31	2.20	3.84	42.41	52.67
40	51.82	1.27	2.21	3.76	42.89	53.14
60	51.75	1.26	2.27	3.92	42.81	53.13
80	51.65	1.28	2.36	3.91	42.96	53.25
100	51.60	1.29	2.48	4.06	43.04	53.29
200	51.30	1.36	3.09	4.34	43.19	52.59
250	51.28	1.38	3.24	4.12	42.81	51.99
300	51.33	1.39	3.20	3.95	42.54	51.58
350	51.50	1.38	2.99	3.77	42.34	51.68
450	51.96	1.37	2.30	3.90	42.14	52.77
500	52.21	1.34	2.00	3.74	42.30	51.70
550	52.41	1.33	1.80	3.83	42.30	50.53
600	52.61	1.29	1.73	3.85	42.22	49.93
650	52.77	1.25	1.76	3.89	42.10	49.41
750	52.77	1.16	1.96	3.90	41.93	48.86
800	52.45	1.12	2.11	3.84	41.78	48.44
850	51.95	1.11	2.27	3.78	41.72	48.10
900	51.26	1.10	2.40	3.76	41.64	47.73
950	50.78	1.09	2.32	3.74	41.32	47.13
1000	50.81	1.08	2.12	3.72	41.03	47.53



#### 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](http://www.minicircuits.com/terms/viewterm.html)

