



COAXIAL PUSH-PULL

# Wideband Amplifier

## ZHL-122LM-S+

50Ω 40 to 1200 MHz SMA Female

### THE BIG DEAL

- Ultra Low Second Harmonic, -75 dBc Typ. at +5 dBm Output
- Very High Output IP2, +76 dBm Typ.
- Excellent Output IP3, +42 dBm Typ.
- Output Power, +23 dBm



Generic photo used for illustration purposes only

### APPLICATIONS

- Instrumentation
- Base Stations
- Cellular
- FTTH

<b>Model No.</b>	ZHL-122LM-S+
<b>Case Style</b>	S860
<b>Connectors</b>	SMA female

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

### PRODUCT OVERVIEW

Mini-Circuits' ZHL-122LM-S+ is a high-performance, push-pull amplifier featuring very low second- and third-order distortion products across its 40 to 1200 MHz bandwidth. Designed for a +6 V/260 mA typ. power supply, with SMA connectors in/out, it's a high-value, low-cost solution providing a 12 dB gain for instrumentation, cellular, ISM, and UHF applications. The rugged, aluminum alloy case measures 3.75x2.0x0.80" high.

### KEY FEATURES

Feature	Advantages
Ultra Low Second Harmonic, -75 dBc Typ. at +5 dBm Output	Exceptionally low second order harmonic distortion.
Very High Output IP2, +76 dBm Typ.	Very high linearity across entire 40 to 1200 MHz bandwidth.
Excellent Output IP3, +42 dBm Typ.	Excellent suppression of unwanted intermods in the presence of multi carriers.
Output Power +23 dBm Typ.	Appropriate signal strength for the coaxial portions of hybrid and FTTH systems, as well as many TETRA and LTE applications.
Flat Gain, 12.6±1.5 dB	Ideal for applications requiring consistent, repeatable amplification across a wide range of frequencies.

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 ZHL-122LM-S+  
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### ELECTRICAL SPECIFICATIONS AT +25 °C

Parameter	Condition (MHz)	Min	Typ.	Max.	Units
Frequency Range		40		1200	MHz
Gain	40	12.7	14.2		dB
	700	10.8	12.3		
	1000	10.4	11.9		
	1200	9.5	11.0		
Output Power at 1 dB Compression	40	+22.5	+24		dBm
	700	+21.5	+23		
	1000	+21.0	+23		
	1200	+19.5	+21.5		
Output Third Order Intercept Point IP3 <sup>1</sup>	40		+42		dBm
	700		+40		
	1000		+40		
	1200		+37		
Output Second Order Intercept Point IP2 <sup>1</sup>	40		+81		dBm
	700		+70		
	1000		+66		
	1200		+61		
Noise Figure	40-1200		3.9	5.0	dB
Input VSWR	40-1200		1.5		:1
Output VSWR	40-1200		1.5		:1
DC Supply Voltage	40-1200		+6.0	+6.5	V
Supply Current	40-1200	200	260	360	mA

1. Two tones, spaced 1 MHz apart, +5 dBm/tone at output.

### ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40 °C to +65 °C Case
Storage Temperature	-55 °C to +100 °C
Case Temperature	+65 °C
DC Voltage	+7 V
Input RF Power (No Damage)	+24 dBm

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





COAXIAL PUSH-PULL

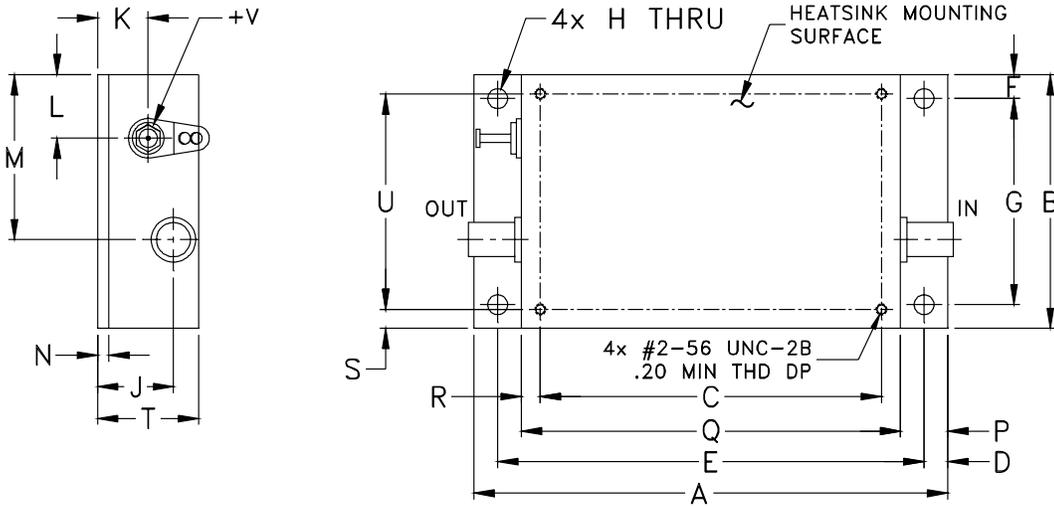
# Wideband Amplifier

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### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	wt
3.75	2.00	2.700	.19	3.375	.19	1.625	.144	.54	.40	.50	1.30	.10	.38	3.00	.15	.15	.84	1.700	grams
95.25	50.80	68.58	4.83	85.73	4.83	41.28	3.66	13.72	10.16	12.70	33.02	2.54	9.65	76.20	3.81	3.81	21.34	43.18	150.0



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# Wideband Amplifier

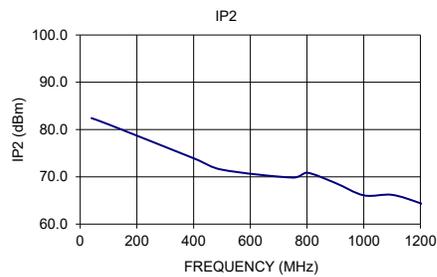
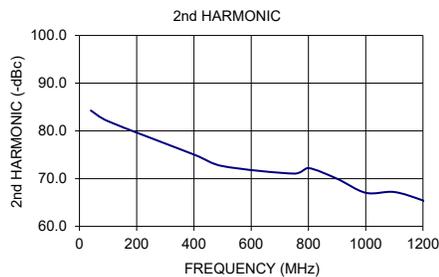
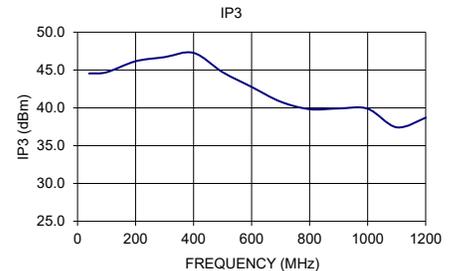
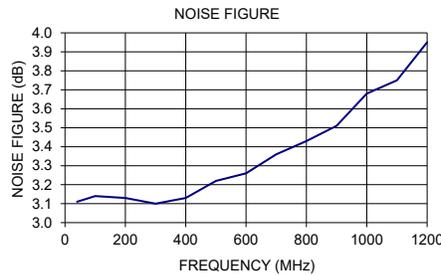
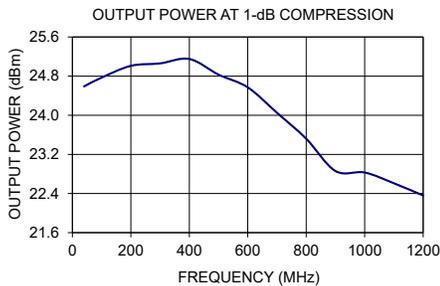
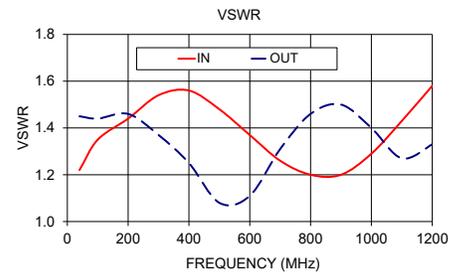
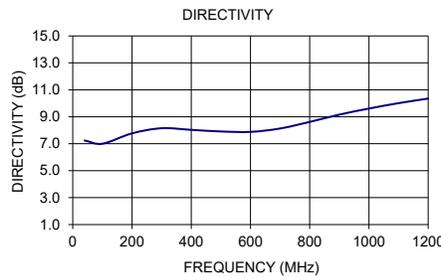
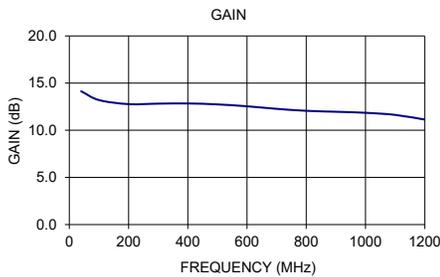
## ZHL-122LM-S+

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### TYPICAL PERFORMANCE DATA / GRAPHS

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	P <sub>OUT</sub> at 1 dB COMPR. (dBm)	OUTPUT IP3 (dBm)
	+6 V	+6 V	IN	OUT	+6 V	+6 V	+6 V
40	14.13	7.24	1.22	1.45	3.11	24.59	44.54
100	13.20	7.00	1.35	1.44	3.14	24.77	44.70
200	12.77	7.77	1.44	1.46	3.13	25.01	46.15
300	12.82	8.15	1.54	1.37	3.10	25.06	46.70
400	12.84	8.03	1.56	1.25	3.13	25.15	47.26
500	12.74	7.91	1.48	1.08	3.22	24.83	44.71
600	12.54	7.88	1.37	1.11	3.26	24.57	42.76
700	12.27	8.13	1.26	1.31	3.36	24.05	40.81
800	12.06	8.62	1.20	1.46	3.43	23.52	39.82
900	11.96	9.16	1.20	1.50	3.51	22.86	39.91
1000	11.85	9.61	1.29	1.40	3.68	22.83	39.88
1100	11.63	10.01	1.43	1.27	3.75	22.61	37.42
1200	11.13	10.35	1.58	1.33	3.95	22.36	38.70



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



# Push-Pull

# Wideband Amplifier

# ZHL-122LM+

## Typical Performance Data

FREQ. (MHz)	GAIN (dB) 6V	DIRECTIVITY (dB) 6V	VSWR (:1)		NOISE FIGURE (dB) 6V	POUT @ 1 dB COMPRESSION (dBm) 6V	OUTPUT IP3 (dBm) 6V	FREQ. (MHz)	2nd HARMONIC (-dBc) 6V	OUTPUT IP2 (dBm) 6V
			IN 6V	OUT 6V						
40.0	14.13	7.24	1.22	1.45	3.11	24.59	44.54	40.0	84.27	82.41
100.0	13.20	7.00	1.35	1.44	3.14	24.77	44.70	100.0	82.03	81.09
200.0	12.77	7.77	1.44	1.46	3.13	25.01	46.15	400.0	75.05	73.93
300.0	12.82	8.15	1.54	1.37	3.10	25.06	46.70	500.0	72.63	71.51
400.0	12.84	8.03	1.56	1.25	3.13	25.15	47.26	750.0	71.06	69.84
500.0	12.74	7.91	1.48	1.08	3.22	24.83	44.71	800.0	72.22	70.88
600.0	12.54	7.88	1.37	1.11	3.26	24.57	42.76	900.0	69.98	68.70
700.0	12.27	8.13	1.26	1.31	3.36	24.05	40.81	1000.0	67.04	66.09
800.0	12.06	8.62	1.20	1.46	3.43	23.52	39.82	1100.0	67.20	66.19
900.0	11.96	9.16	1.20	1.50	3.51	22.86	39.91	1200.0	65.43	64.41
1000.0	11.85	9.61	1.29	1.40	3.68	22.83	39.88	1300.0	63.07	62.08
1100.0	11.63	10.01	1.43	1.27	3.75	22.61	37.42	1400.0	60.96	59.93
1200.0	11.13	10.35	1.58	1.33	3.95	22.36	38.70	1500.0	63.37	62.36



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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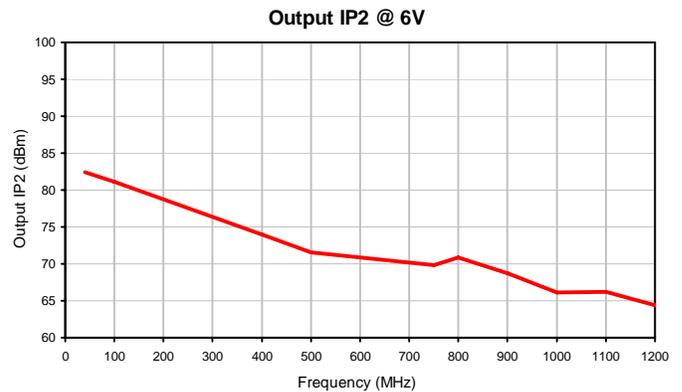
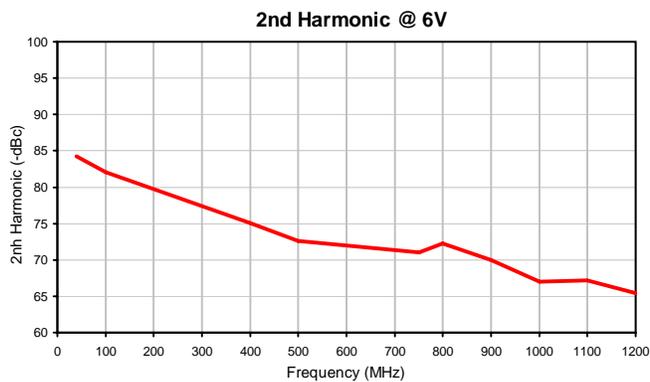
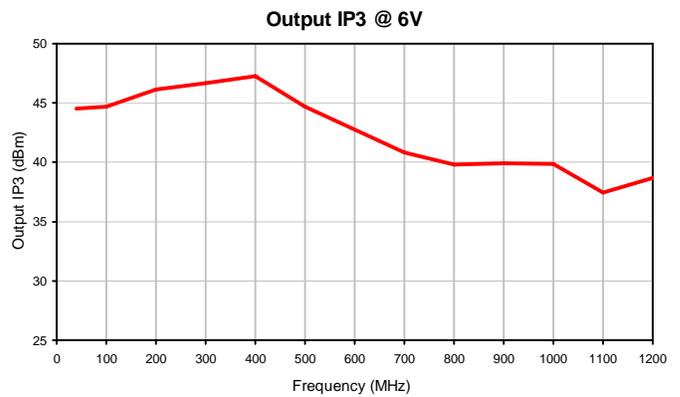
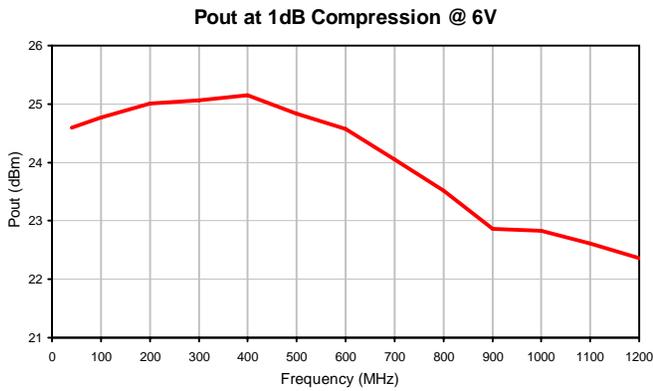
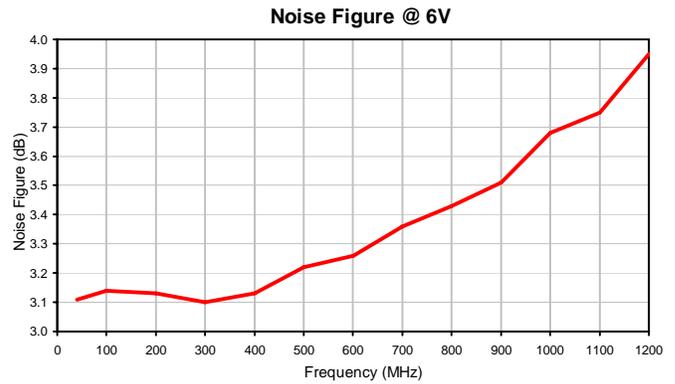
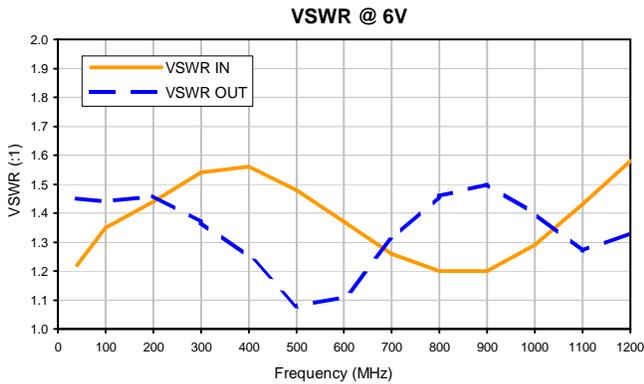
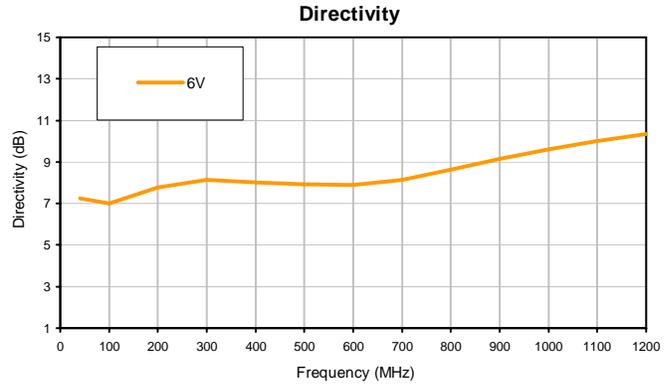
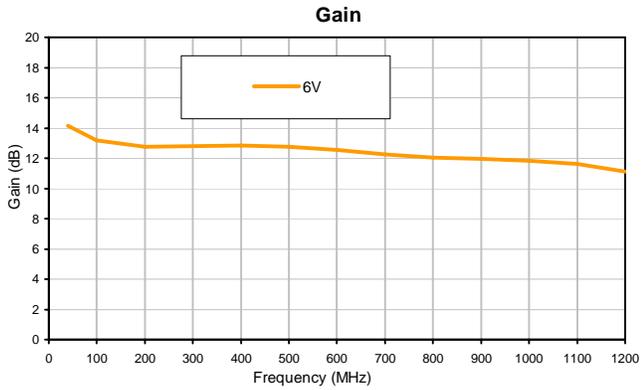
IF/RF MICROWAVE COMPONENTS

REV. X1  
ZHL-122LM+  
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Page 1 of 1

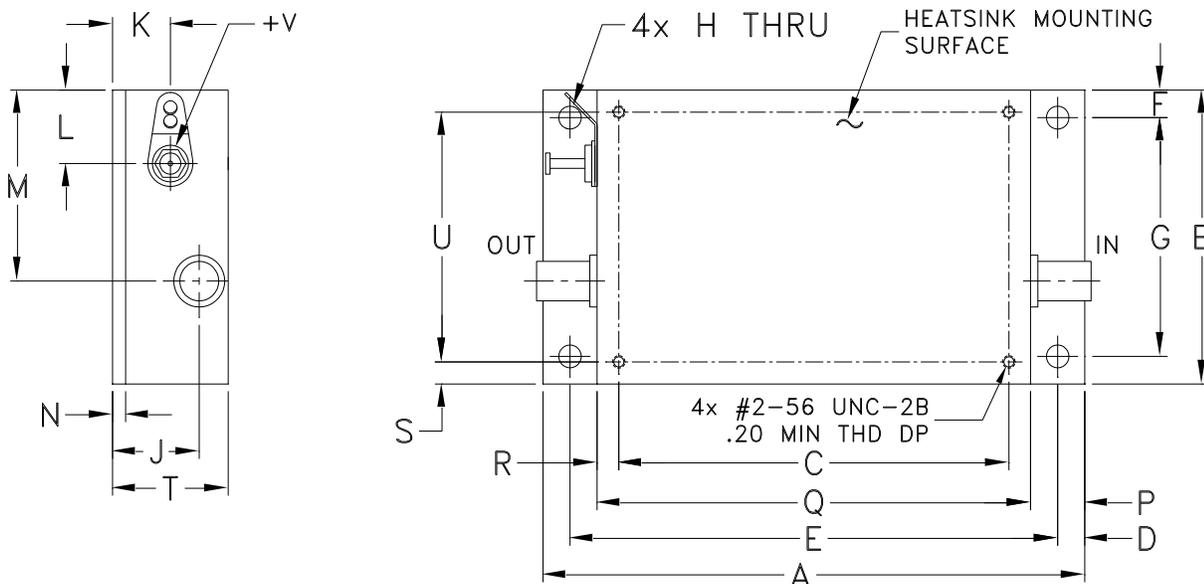
# Push-Pull Wideband Amplifier

# ZHL-122LM+

## Typical Performance Curves



### Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
S860	3.75 (95.25)	2.00 (50.80)	2.700 (68.58)	.19 (4.83)	3.375 (85.73)	.19 (4.83)	1.625 (41.28)	.144 (3.66)	.54 (13.72)	.40 (10.16)	.50 (12.70)	1.30 (33.02)	.10 (2.54)

CASE#	P	Q	R	S	T	U	WT. GRAMS
S860	.38 (9.65)	3.00 (76.20)	.15 (3.81)	.15 (3.81)	.84 (21.34)	1.700 (43.18)	150.0

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

#### Notes:

1. Case material: Aluminum alloy.
2. Case finish:

For RoHS Case Styles:

Clear chemical conversion coating, non-chrome or trivalent chrome based.



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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	-40° 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