



COAXIAL

# Wideband Amplifier

## ZHL-2150+

50Ω 950 to 2450 MHz

### THE BIG DEAL

- L-band, 950 to 2450 MHz
- Medium Output Power, +11 dBm typ
- DC Power, from +12V to +18V, feeds the amplifier via RF input or RF output ports. Additionally, the amplifier can pass DC up to 390 mA through the RF ports in any direction
- Along with DC, reference signal 10 MHz, can pass through the amplifier in either direction with minimal loss
- High Gain, 30 dB typ.
- Good Flatness, ±1.0 dB typ.



Generic photo used for illustration purposes only

<b>Model No.</b>	ZHL-2150+
<b>Case Style</b>	S860-1
<b>Connectors</b>	SMA

### +RoHS Compliant

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

### APPLICATIONS

- Satellite Communication Systems
- Tower top amplifiers
- Radar
- Instrumentation
- Laboratory use
- GPS

### PRODUCT OVERVIEW

The ZHL-2150+ is a Class A, L-band amplifier, ideal for a variety of lab applications as well as applications including communications, radar and more. The amplifier provides unconditional stability. Housed in a rugged aluminum alloy case measuring 3.00 x 2.00 x 0.80", the unit features SMA connectors.

### KEY FEATURES

Feature	Advantages
L-band, 950 to 2450 MHz Able to work from 800 to 2600 MHz	Suitable for a broad range of wideband applications, including test setups, satellite communications and defense applications.
Medium P1dB, +11 dBm typ.	Usable for medium power applications, good as buffer amplifier.
Single +12V to +18V supply voltage, applied to either RF input or output	Simplifies the power supply configuration and minimizes the cable needs.
Reference signal 10 MHz can pass through the amplifier	Minimizes needs for Bias Tees and low attenuation of reference signal.
Unconditional stability	Provides reliable performance independent of input and load conditions.

REV. B  
ECO-018348  
ZHL-2150+  
MCL NY  
240117





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### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Min.	Typ.	Max.	Units
Frequency Range	950	–	2450	MHz
Gain	25	30	34	dB
Gain Flatness	–	±1.0	±1.5	dB
Output Power at 1dB compression	–	+11	–	dBm
Noise Figure	–	3.5	–	dB
Output third order intercept point	–	25	–	dBm
Input VSWR	–	1.3	–	:1
Output VSWR	–	1.3	–	:1
Reference Signal IL	–	0.29	0.6	dB
Reference Signal In / Out VSWR	–	1.2	1.4	:1
DC Supply Voltage (from the RF input or output)	–	12	–	V
Supply Current	–	–	110	mA

Open/Short load is not allowed.

### ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
DC Voltage	+19V max.
Input RF Power (no damage)	-5 dBm

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





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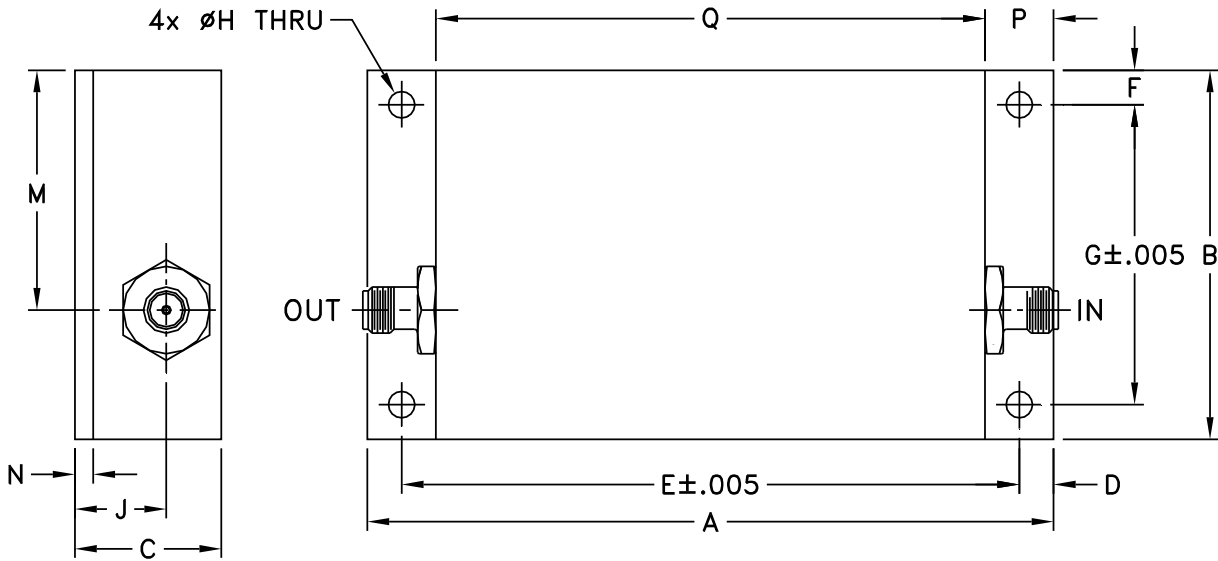
# Wideband Amplifier

## ZHL-2150+

Mini-Circuits

50Ω 950 to 2450 MHz

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inch/mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	wt
3.75	2.00	.84	.19	3.375	.19	1.625	.144	.54	--	--	1.30	.10	.38	3.00	grams
95.25	50.80	21.34	4.83	85.73	4.83	41.28	3.66	13.72	--	--	33.02	2.54	9.65	76.20	150.0



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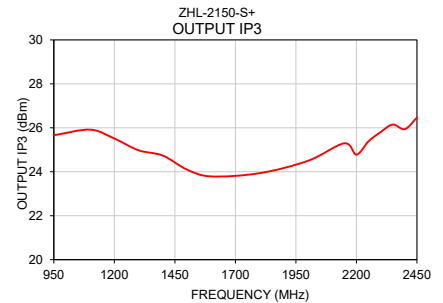
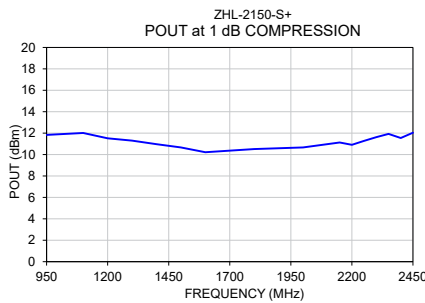
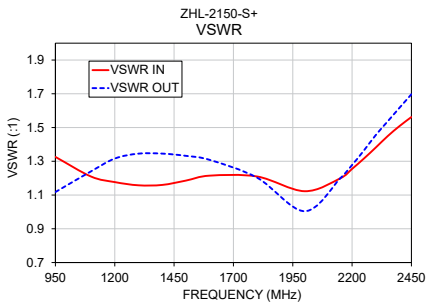
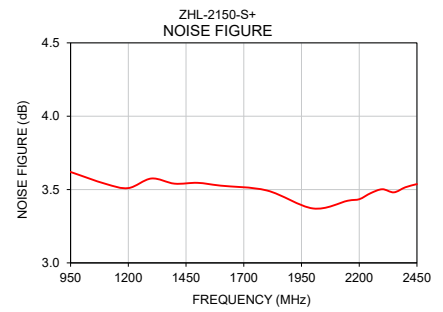
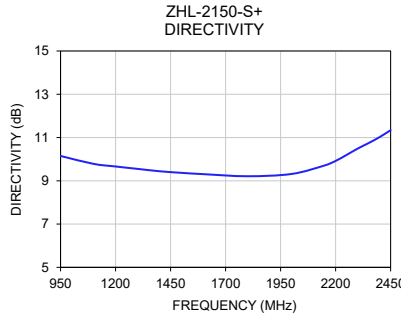
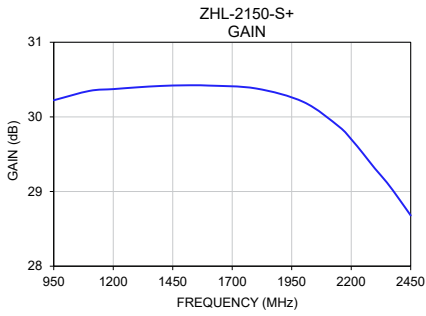
# Wideband Amplifier

# ZHL-2150+

50Ω 950 to 2450 MHz

## TYPICAL PERFORMANCE DATA/CURVES

FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		POUT at 1 dB COMPR. (dBm)	NOISE FIGURE (dB)	OIP3 (dBm)
	12V	12V	IN	OUT	12V	12V	12V
950	30.22	10.15	1.33	1.12	11.84	3.62	25.66
1100	30.35	9.78	1.21	1.24	12.01	3.54	25.92
1200	30.37	9.66	1.18	1.32	11.52	3.51	25.51
1300	30.40	9.55	1.16	1.35	11.30	3.58	24.98
1400	30.41	9.44	1.16	1.35	10.97	3.54	24.74
1500	30.42	9.37	1.19	1.33	10.67	3.55	24.10
1600	30.42	9.31	1.21	1.31	10.22	3.53	23.79
1800	30.38	9.21	1.21	1.20	10.51	3.49	23.94
2000	30.20	9.32	1.12	1.00	10.67	3.37	24.50
2150	29.87	9.71	1.20	1.20	11.13	3.42	25.29
2200	29.70	9.92	1.26	1.28	10.91	3.43	24.78
2250	29.51	10.20	1.32	1.36	11.28	3.48	25.39
2300	29.31	10.49	1.38	1.46	11.63	3.50	25.81
2350	29.12	10.74	1.45	1.54	11.93	3.48	26.15
2400	28.91	11.02	1.51	1.62	11.55	3.52	25.94
2450	28.68	11.34	1.56	1.70	12.04	3.54	26.47



### NOTES

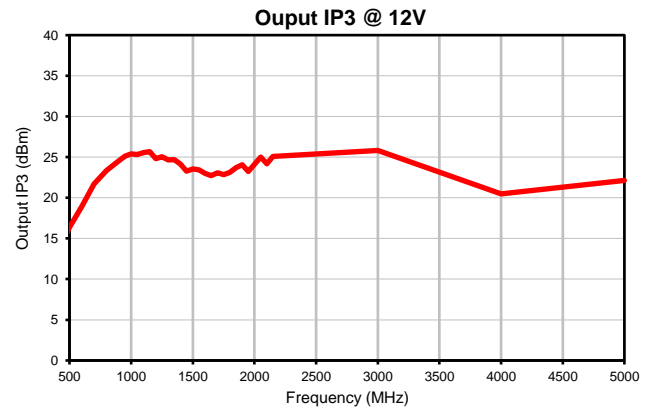
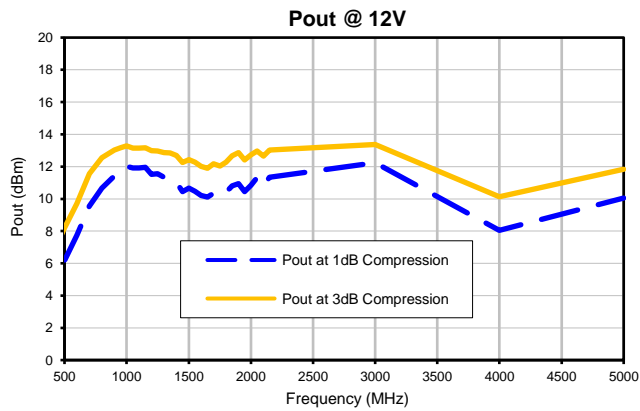
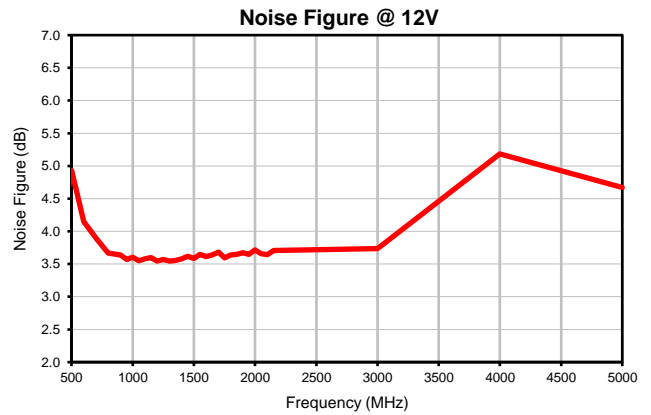
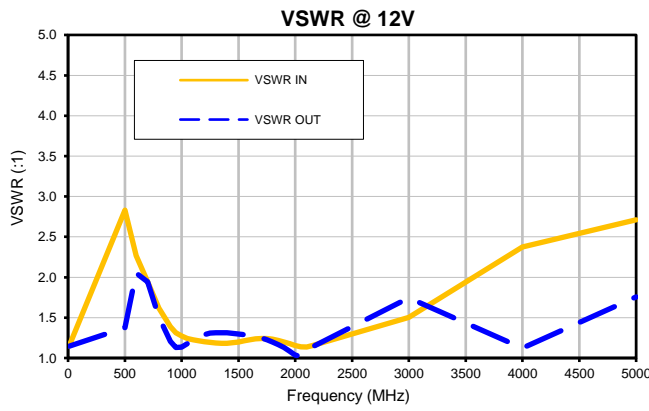
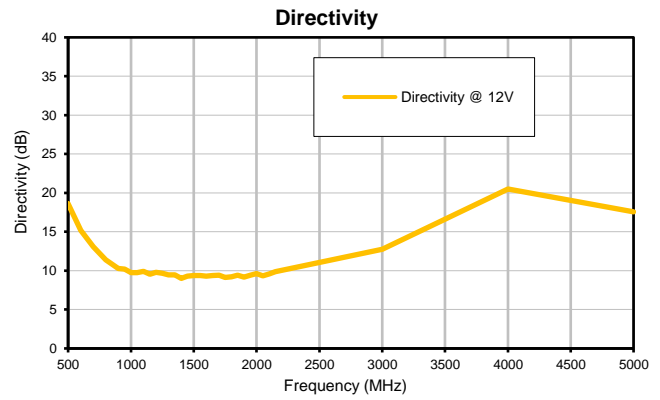
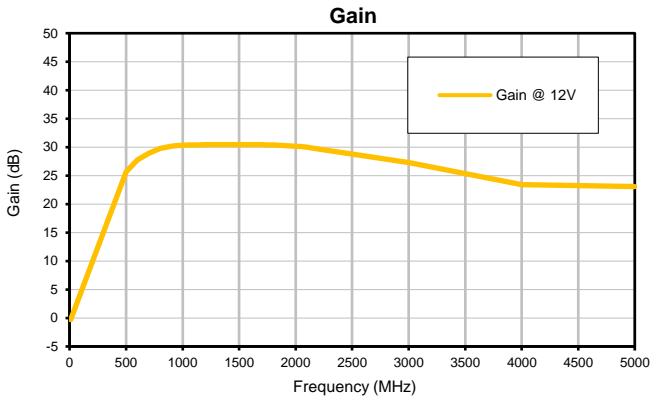
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- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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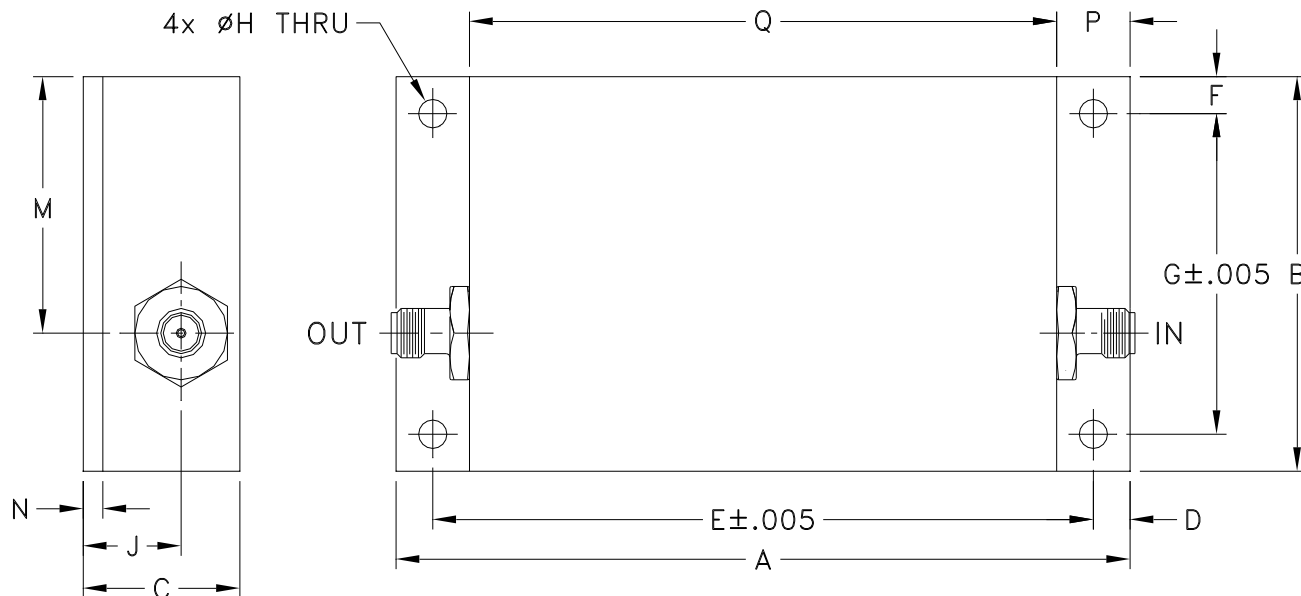
## Typical Performance Data

FREQUENCY (MHz)	GAIN (dB) 12V	DIRECTIVITY (dB) 12V	VSWR (:1)		NOISE FIGURE (dB) 12V	POUT @ 1 dB COMPRESSION (dBm) 12V	POUT @ 3 dB COMPRESSION (dBm) 12V	OUTPUT IP3 (dBm) 12V
			IN 12V	OUT 12V				
10	-0.29	0.38	1.15	1.15	--	--	--	--
500	25.64	18.63	2.83	1.37	4.93	6.17	8.18	16.36
600	27.76	15.18	2.27	2.05	4.15	7.74	9.71	18.97
700	28.94	13.10	1.94	1.94	3.90	9.56	11.56	21.72
800	29.74	11.38	1.62	1.51	3.67	10.66	12.55	23.37
900	30.15	10.30	1.39	1.20	3.64	11.42	13.03	24.52
950	30.25	10.18	1.31	1.13	3.57	11.78	13.17	25.12
1000	30.32	9.77	1.27	1.14	3.60	12.02	13.28	25.41
1050	30.36	9.76	1.24	1.18	3.55	11.92	13.14	25.31
1100	30.39	9.92	1.23	1.23	3.58	11.91	13.15	25.55
1150	30.40	9.56	1.21	1.26	3.60	11.96	13.16	25.67
1200	30.41	9.81	1.20	1.29	3.55	11.52	12.98	24.81
1250	30.43	9.68	1.19	1.31	3.57	11.56	12.96	25.06
1300	30.44	9.45	1.18	1.31	3.55	11.34	12.86	24.66
1350	30.45	9.45	1.18	1.31	3.55	11.29	12.85	24.68
1400	30.45	9.02	1.18	1.31	3.58	11.02	12.69	24.13
1450	30.45	9.29	1.19	1.30	3.62	10.44	12.25	23.28
1500	30.46	9.37	1.20	1.30	3.59	10.66	12.42	23.55
1550	30.45	9.38	1.21	1.29	3.65	10.47	12.27	23.45
1600	30.44	9.28	1.23	1.28	3.62	10.21	12.02	22.99
1650	30.42	9.37	1.24	1.27	3.64	10.11	11.89	22.74
1700	30.41	9.44	1.24	1.25	3.68	10.35	12.18	23.10
1750	30.39	9.13	1.24	1.23	3.59	10.19	12.03	22.84
1800	30.36	9.22	1.23	1.20	3.64	10.41	12.27	23.11
1850	30.33	9.40	1.22	1.17	3.65	10.80	12.66	23.72
1900	30.29	9.19	1.20	1.13	3.67	10.95	12.86	24.06
1950	30.23	9.44	1.18	1.08	3.65	10.45	12.40	23.22
2000	30.16	9.64	1.15	1.04	3.71	10.85	12.73	24.08
2050	30.08	9.35	1.14	1.02	3.66	11.32	12.97	25.00
2100	29.97	9.59	1.14	1.07	3.64	10.83	12.65	24.19
2150	29.84	9.86	1.15	1.14	3.71	11.34	13.03	25.10
3000	27.30	12.75	1.50	1.75	3.74	12.24	13.37	25.82
4000	23.39	20.50	2.37	1.12	5.18	8.05	10.13	20.49
5000	23.09	17.57	2.71	1.75	4.67	10.04	11.83	22.13

## Typical Performance Curves



### Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
S860-1	3.75 (95.25)	2.00 (50.80)	.84 [21.34]	.19 (4.83)	3.375 (85.73)	.19 (4.83)	1.625 (41.28)	.144 (3.66)	.54 (13.72)	-	-	1.30 (33.02)	.10 (2.54)

CASE#	P	Q	WT. GRAMS
S860-1	.38 (9.65)	3.00 (76.20)	150.0

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.



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	-40° to 85° C Case Temperature	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