

Coaxial

Low Noise Amplifier

ZHL-1724MLN+

50Ω

1700 to 2400 MHz

The Big Deal

- Low noise figure, 1.5 dB max.
- High IP3, +32 dBm typ.
- High gain, 28 dB min.
- Good gain flatness, ±1.0 dB



CASE STYLE: S32

Product Overview

ZHL-1724MLN+ is a coaxial, low-noise amplifier supporting a wide range of applications from 1700 to 2400 MHz. This model provides a combination of low noise, high IP3 and high gain with excellent gain flatness. The amplifier operates on a single 15V supply and comes housed in an aluminum alloy case (3.75 x 2.0 x 1.8") with SMA connectors and heat sink for efficient cooling.

Key Features

Feature	Advantages
Low noise, 1.5 dB	Excellent noise figure performance increases system signal to noise ratio
High OIP3, +32 dBm	Highly linear performance with excellent sensitivity and two-tone spur-free dynamic range.
High Gain, 28 dB	Reduces the number of gain stages, lowering component count and overall system cost.
Good gain flatness, ±1.0 dB	Provides consistent performance across its operating frequency, minimizing the need for external equalizing networks in wideband applications.

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/MCLStore/terms.jsp



Low Noise Amplifier

ZHL-1724MLN+

50Ω 1700 to 2400 MHz

Features

- Low noise, 1.1 dB typ.
- High dynamic range, +32 dBm IP3 typ.
- High gain
- Gain flatness, ±1.0 dB

Applications

- Laboratory test / automated test system
- Communications band systems



Generic photo used for illustration purposes only
CASE STYLE: S32

Connectors	Model
SMA	ZHL-1724MLN+

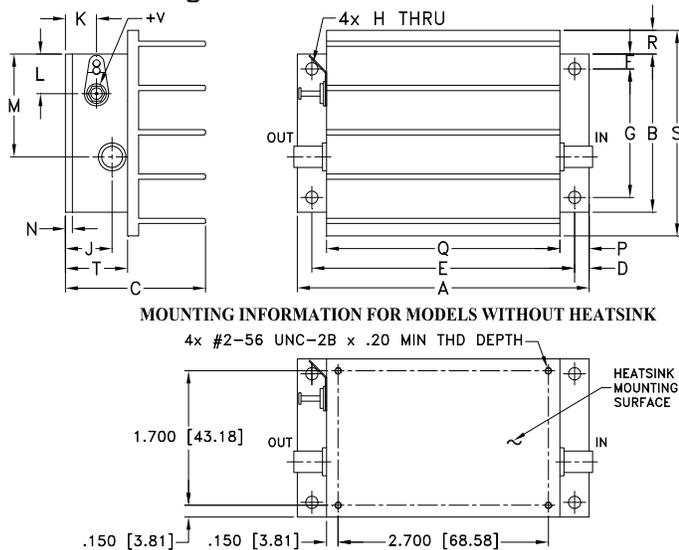
+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Electrical Specifications @ 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		1700		2400	MHz
Noise Figure ⁽¹⁾	1700 - 2400	—	1.1	1.5	dB
Gain	1700 - 2400	28	—	—	dB
Gain Flatness	1700 - 2400	—	—	±1.0	dB
Output Power at 1dB compression	1700 - 2400	—	+20	—	dBm
Output third order intercept point	1700 - 2400	—	+32	—	dBm
Input VSWR	1700 - 2400	—	—	1.8	:1
Output VSWR	1700 - 2400	—	—	1.8	:1
DC Supply Voltage ⁽²⁾		8	15	—	V
Supply Current		—	355	380	mA

(1) Noise Figure specified at room temperature, increases to 2.3 dB max. at +65°C
(2) The performance between +8V to +15V is consistent with no significant changes.

Outline Drawing



Maximum Ratings

Parameter	Ratings
Operating Temperature	-20°C to 65°C
Storage Temperature	-55°C to 100°C
DC Voltage	17V
Input RF Power (no damage)	0 dBm

Open load is not recommended, potentially can cause damage.
With no load derate max input power by 20 dB
Permanent damage may occur if any of these limits are exceeded.

Outline Dimensions (inch/mm)

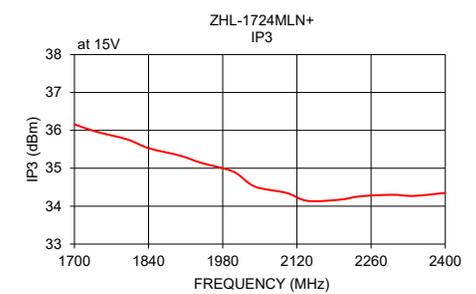
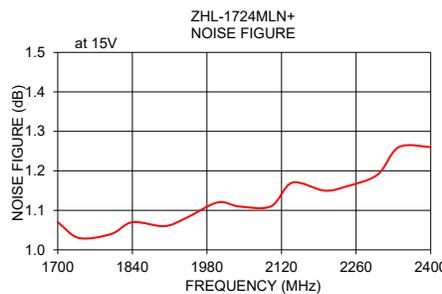
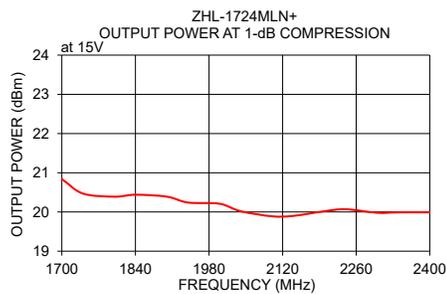
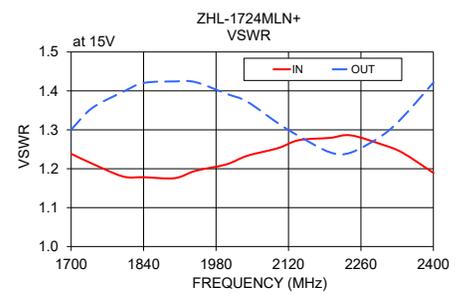
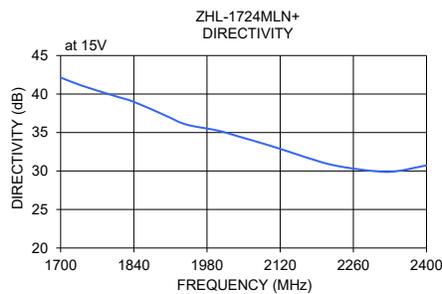
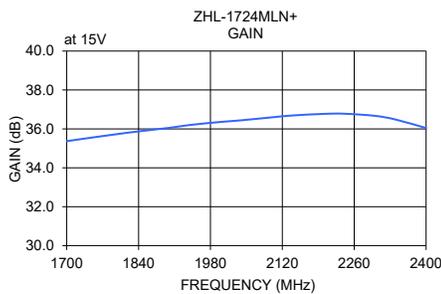
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt	
3.75	2.00	1.80	.19	3.375	.19	1.625	.144	.50	.40	.50	1.30	.10	.38	3.00	.30	2.60	.80	grams	
95.25	50.80	45.72	4.83	85.73	4.83	41.28	3.66	12.70	10.16	12.70	33.02	2.54	9.65	76.20	7.62	66.04	20.32	220.0	
																		wt. w/o heat sink	150

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FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		POUT at 1 dB COMPR. (dBm)	NOISE FIGURE (dB)	OUTPUT IP3 (dBm)
			IN	OUT			
	15V	15V	15V	15V	15V	15V	15V
1700	35.37	42.14	1.24	1.30	20.84	1.07	36.16
1740	35.52	41.10	1.21	1.36	20.47	1.03	35.97
1800	35.74	39.82	1.18	1.40	20.39	1.04	35.76
1840	35.87	38.98	1.18	1.42	20.44	1.07	35.53
1900	36.05	37.22	1.18	1.42	20.39	1.06	35.33
1940	36.20	36.04	1.19	1.42	20.24	1.08	35.14
2000	36.36	35.26	1.21	1.39	20.21	1.12	34.91
2040	36.44	34.49	1.23	1.37	20.02	1.11	34.52
2100	36.59	33.30	1.25	1.32	19.89	1.11	34.35
2140	36.69	32.43	1.27	1.28	19.90	1.17	34.14
2200	36.77	31.13	1.28	1.24	20.02	1.15	34.17
2240	36.78	30.53	1.29	1.24	20.07	1.16	34.26
2300	36.67	29.98	1.26	1.28	19.98	1.19	34.30
2340	36.48	29.95	1.24	1.33	19.99	1.26	34.27
2400	36.04	30.74	1.19	1.42	19.99	1.26	34.35



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Low Noise Amplifier

ZHL-1724MLN+

Typical Performance Data

Frequency (MHz)	Gain (dB) 15V	Directivity (dB) 15V	VSWR In (:1) 15V	VSWR Out (:1) 15V	Noise Figure (dB) 15V	Pout at 1dB Compression (dBm) 15V	Output IP3 (dBm) 15V
1700	35.37	42.14	1.24	1.30	1.07	20.84	36.16
1740	35.52	41.10	1.21	1.36	1.03	20.47	35.97
1800	35.74	39.82	1.18	1.40	1.04	20.39	35.76
1840	35.87	38.98	1.18	1.42	1.07	20.44	35.53
1900	36.05	37.22	1.18	1.42	1.06	20.39	35.33
1940	36.20	36.04	1.19	1.42	1.08	20.24	35.14
2000	36.36	35.26	1.21	1.39	1.12	20.21	34.91
2040	36.44	34.49	1.23	1.37	1.11	20.02	34.52
2100	36.59	33.30	1.25	1.32	1.11	19.89	34.35
2140	36.69	32.43	1.27	1.28	1.17	19.90	34.14
2200	36.77	31.13	1.28	1.24	1.15	20.02	34.17
2240	36.78	30.53	1.29	1.24	1.16	20.07	34.26
2300	36.67	29.98	1.26	1.28	1.19	19.98	34.30
2340	36.48	29.95	1.24	1.33	1.26	19.99	34.27
2400	36.04	30.74	1.19	1.42	1.26	19.99	34.35



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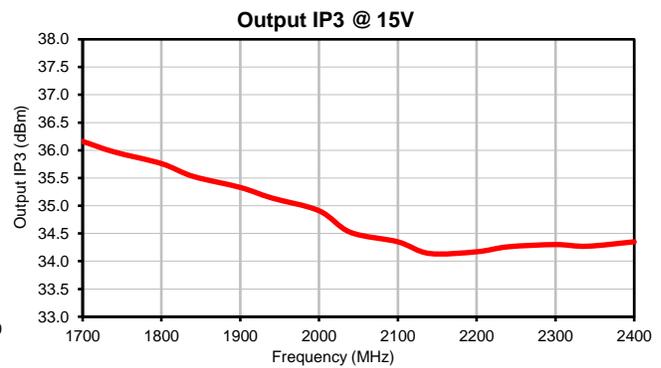
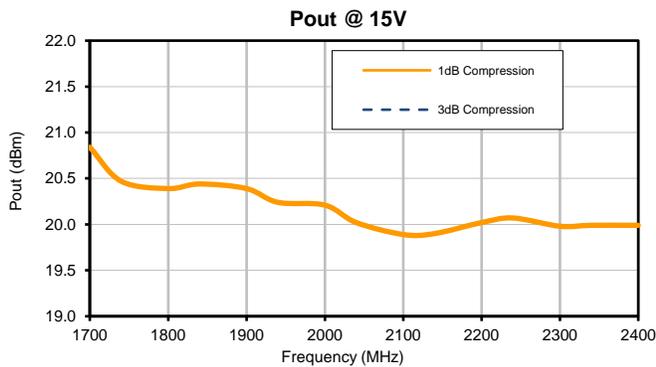
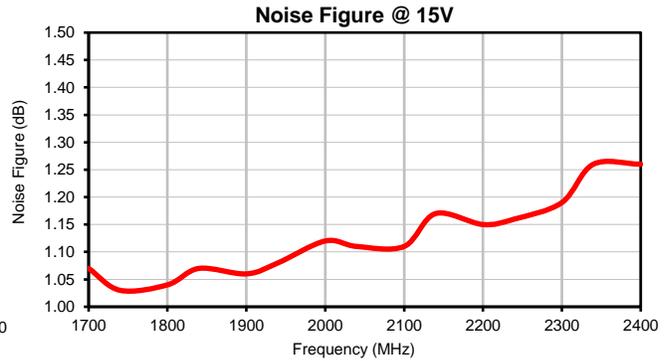
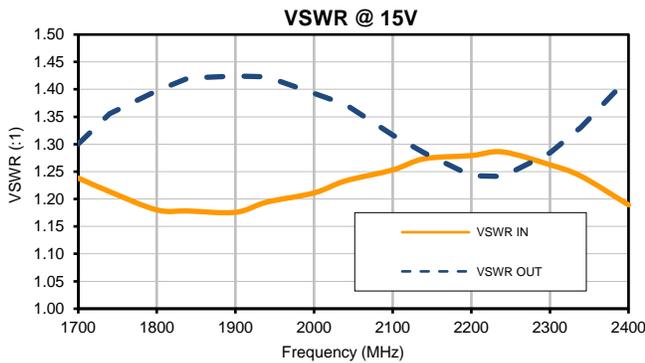
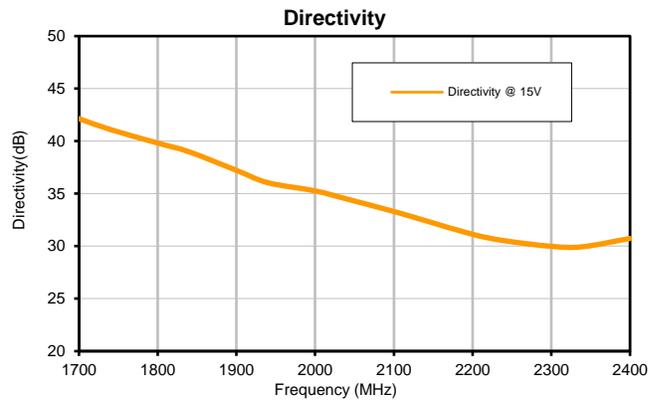
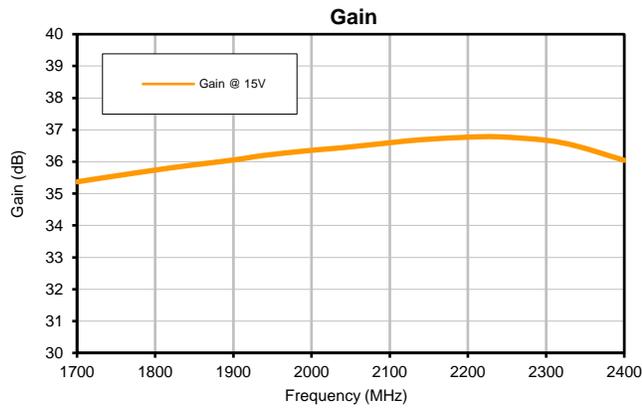
IF/RF MICROWAVE COMPONENTS

REV. OR
ZHL-1724MLN+
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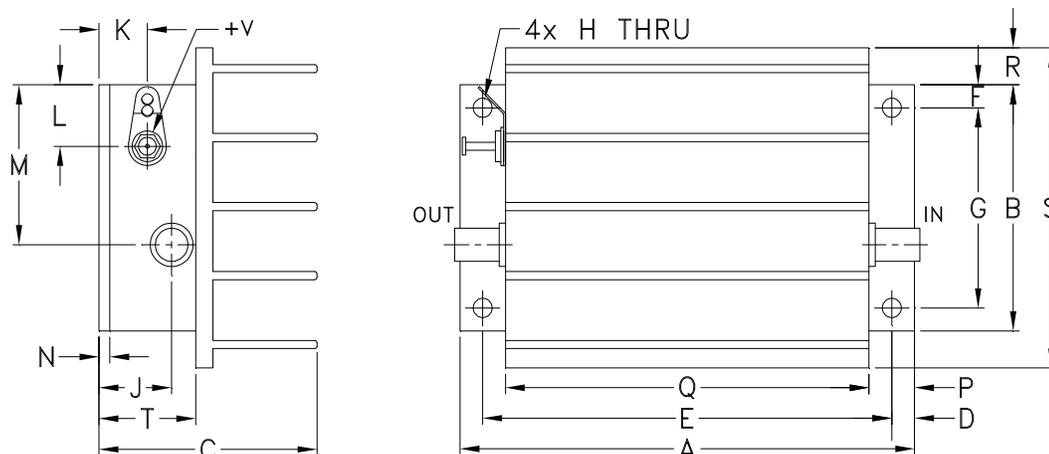
Low Noise Amplifier

Typical Performance Curves

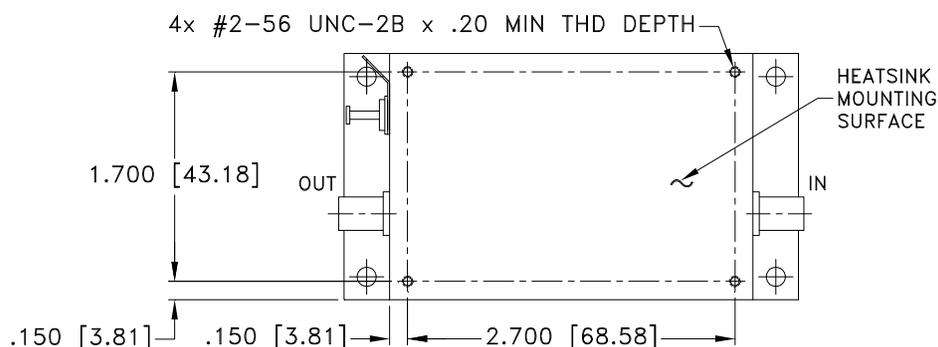
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Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
S32	3.75 (95.25)	2.00 (50.80)	1.80 (45.72)	.19 (4.83)	3.375 (85.73)	.19 (4.83)	1.625 (41.28)	.144 (3.66)	.50 (12.70)	.40 (10.16)	.50 (12.70)	1.30 (33.02)	.10 (2.54)

CASE#	P	Q	R	S	T	WT. GRAMS	WT. WITHOUT HEATSINK GRAMS
S32	.38 (9.65)	3.00 (76.20)	.30 (7.62)	2.60 (66.04)	.80 (20.32)	220.0	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.
- Heat sink finish: Black anodize.



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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