COAXIAL

Pulse Amplifier

ZHL-72A+

50Ω Inverting 0.0025 to 700 MHz

FEATURES

- Wideband, 2.5 kHz - 700 MHz
- High Gain, 25 dB typ. with Excellent Flatness, ±0.6 dB typ.
- Can handle wide pulses width (15μs typ.) with excellent rise/fall time (1.1 ns typ.)
- Delay time, 1.5 ns typ.
- Protected by US Patent, 6,943,629

Generic photo used for illustration purposes only

Model No.	ZHL-72A+
Case Style	S32
Connectors	BNC

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

APPLICATIONS

- Computers
- Digital communication
- Medical Test Setups

PRODUCT OVERVIEW

Mini-Circuits' ZHL-72A+ utilizes high power LDMOS transistor output stage. Class A operation accept any kind of modulation. The frequency range is so wide (280,000:1) that the amplifier may handle long pulses, 15μsec typ. with very short rise and fall duration 1.1 nsec. typ. Of course it may work as an ordinary RF amplifier within its very wide frequency range.

KEY FEATURES

Feature	Advantages
Current stabilization circuits.	The design utilizes a patented technology to set and maintain the constant current consumption.
Rugged Design	Extreme load mismatch such as open/short at output are tolerated without damaging the amplifier.
Range of Protections	Reverse polarity protection.

REV. A
ECO-018348
ZHL-72A+
MCL NY
230626

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ELECTRICAL SPECIFICATIONS

Parameter	Min.	Typ.	Max.	Units
Frequency Range	0.0025		700	MHz
Gain	21	25	—	dB
Gain Flatness	—	—	±1.0	dB
Output Power at 1dB compression	+22	—	—	dBm
Output Third Order Intersept Point (OIP3)	—	+34	—	dBm
Noise Figure**	—	7.7	—	dB
Rise/Fall Time	—	—	1.5	ns
Pulse Width*	6	15	—	µs
Input VSWR	—	2.0	—	:1
Output VSWR	—	2.0	—	:1
DC Supply Voltage	—	+24	—	V
Supply Current	—	—	350	mA

Caution! Transient voltage occurring at RF output upon turn-on is approximately 50% of the applied DC power supply voltage. User should protect equipment fed by this amplifier.

* Pulse width for less than 10% droop.

** Tested above 10 MHz.

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-20°C to +65°C
Storage Temperature	-55°C to +100°C
DC Voltage	+24.5V
Input Power (no damage)	+10 dBm

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

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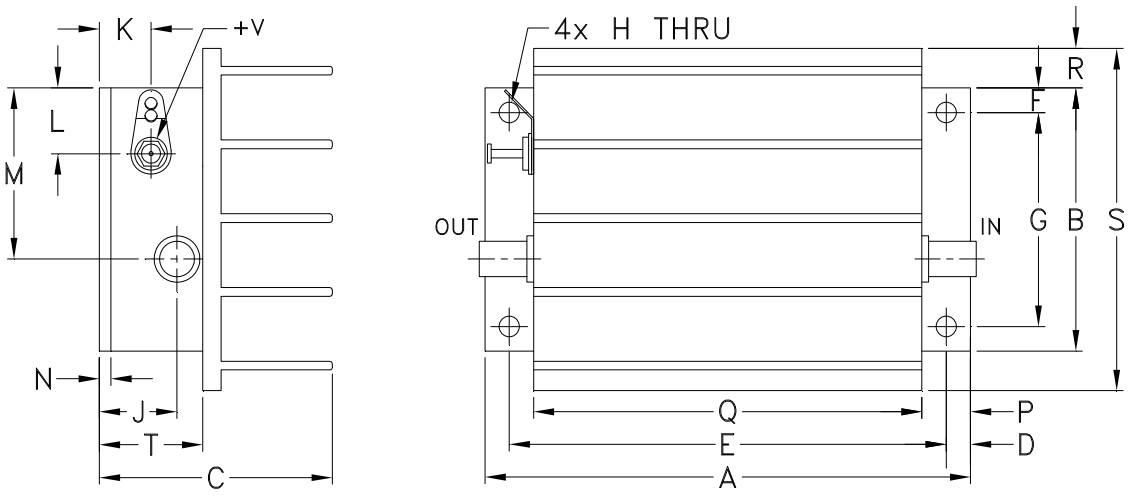
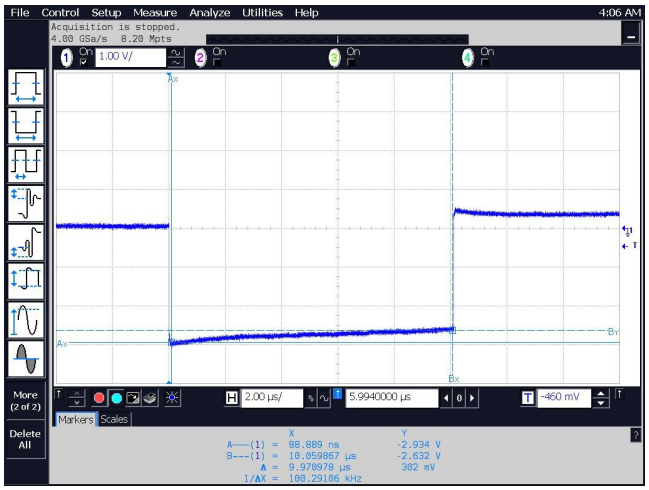
OUTLINE DRAWING



OUTLINE DIMENSIONS (Inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	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

TYPICAL AMPLIFIER RESPONSE TO A PULSE INPUT



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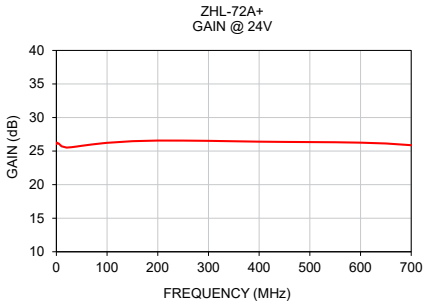
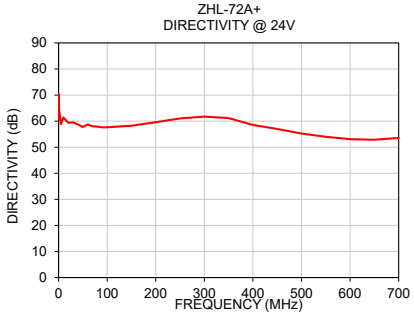
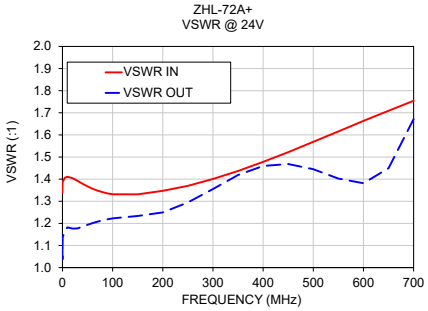
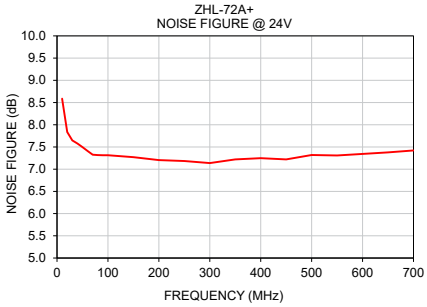
TYPICAL PERFORMANCE DATA/CURVES

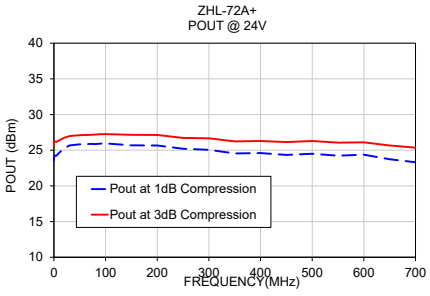
FREQUENCY (MHz)	GAIN (dB)	DIRECTIVITY (dB)	VSWR (:1)		NOISE FIGURE (dB)	POUT at 1 dB COMPR. (dBm)	POUT at 3 dB COMPR. (dBm)	OUTPUT IP3 (dBm)
	24V	24V	IN	OUT	24V			24V
0.0090	26.21	64.42	1.34	1.08	--	23.54	25.74	--
0.01	26.19	69.56	1.34	1.07	--	23.63	25.70	--
0.05	26.03	61.03	1.37	1.04	--	23.74	25.79	--
0.1	26.09	65.10	1.38	1.08	--	23.93	25.96	--
0.5	26.27	70.41	1.39	1.14	--	24.23	26.27	36.67
1	26.25	64.56	1.39	1.14	--	24.22	26.26	36.63
5	26.09	58.85	1.41	1.17	--	24.25	26.17	36.65
10	25.71	61.38	1.41	1.18	8.59	24.64	26.37	36.86
50	25.79	57.75	1.37	1.19	7.50	25.82	27.10	38.03
100	26.23	57.64	1.33	1.22	7.31	25.95	27.26	38.24
200	26.57	59.58	1.35	1.25	7.20	25.66	27.13	37.73
300	26.53	61.75	1.40	1.36	7.14	25.05	26.67	37.07
400	26.41	58.53	1.48	1.46	7.25	24.60	26.29	36.33
500	26.34	55.23	1.57	1.44	7.32	24.51	26.29	36.06
600	26.26	53.08	1.66	1.38	7.34	24.38	26.11	35.55
700	25.87	53.55	1.75	1.67	7.42	23.31	25.36	34.15

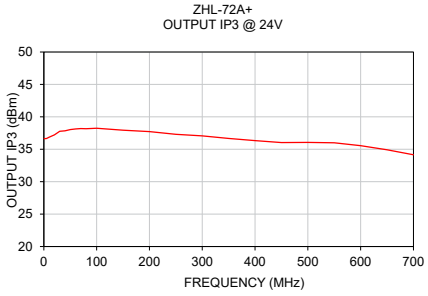












NOTES

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.

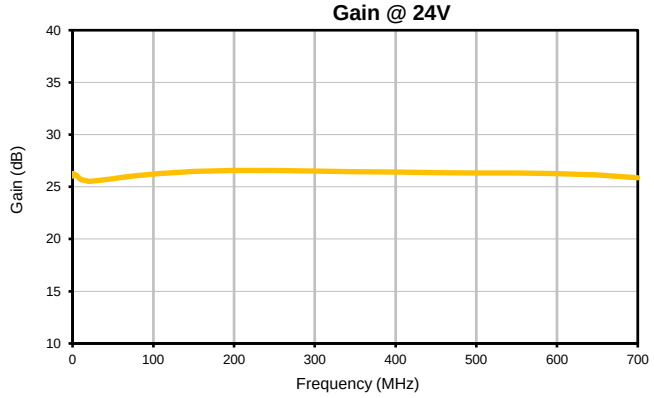
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

Typical Performance Data

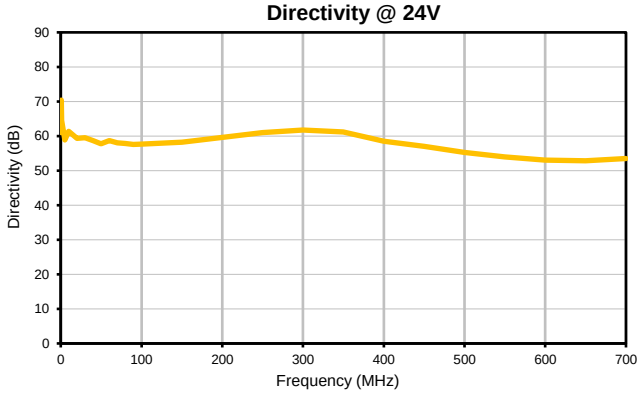
FREQUENCY (MHz)	GAIN (dB) 24V	DIRECTIVITY (dB) 24V	VSWR (:1) IN 24V	VSWR (:1) OUT 24V	NOISE FIGURE (dB) 24V	Pout at 1 dB COMPRESSION (dBm) 24V	Pout at 3 dB COMPRESSION (dBm) 24V	OUTPUT IP3 (dBm) 24V
0.0090	26.21	64.42	1.34	1.08	--	23.54	25.74	--
0.01	26.19	69.56	1.34	1.07	--	23.63	25.70	--
0.05	26.03	61.03	1.37	1.04	--	23.74	25.79	--
0.1	26.09	65.10	1.38	1.08	--	23.93	25.96	--
0.5	26.27	70.41	1.39	1.14	--	24.23	26.27	36.67
1	26.25	64.56	1.39	1.14	--	24.22	26.26	36.63
5	26.09	58.85	1.41	1.17	--	24.25	26.17	36.65
10	25.71	61.38	1.41	1.18	8.59	24.64	26.37	36.86
20	25.52	59.34	1.40	1.18	7.84	25.28	26.76	37.22
30	25.59	59.53	1.39	1.18	7.65	25.66	26.97	37.77
40	25.68	58.72	1.38	1.19	7.58	25.75	27.05	37.85
50	25.79	57.75	1.37	1.19	7.50	25.82	27.10	38.03
60	25.89	58.73	1.36	1.20	7.41	25.82	27.14	38.13
70	25.99	58.01	1.35	1.21	7.33	25.89	27.15	38.19
80	26.08	57.90	1.34	1.21	7.32	25.86	27.20	38.17
90	26.16	57.62	1.34	1.22	7.31	25.92	27.24	38.20
100	26.23	57.64	1.33	1.22	7.31	25.95	27.26	38.24
150	26.48	58.23	1.33	1.23	7.27	25.69	27.16	37.94
200	26.57	59.58	1.35	1.25	7.20	25.66	27.13	37.73
250	26.57	61.02	1.37	1.29	7.18	25.21	26.73	37.30
300	26.53	61.75	1.40	1.36	7.14	25.05	26.67	37.07
350	26.46	61.15	1.44	1.42	7.22	24.54	26.23	36.67
400	26.41	58.53	1.48	1.46	7.25	24.60	26.29	36.33
450	26.37	57.00	1.52	1.47	7.22	24.34	26.14	36.04
500	26.34	55.23	1.57	1.44	7.32	24.51	26.29	36.06
550	26.31	54.00	1.62	1.40	7.31	24.23	26.07	36.00
600	26.26	53.08	1.66	1.38	7.34	24.38	26.11	35.55
650	26.14	52.86	1.71	1.45	7.38	23.74	25.66	34.92
700	25.87	53.55	1.75	1.67	7.42	23.31	25.36	34.15

Typical Performance Curves

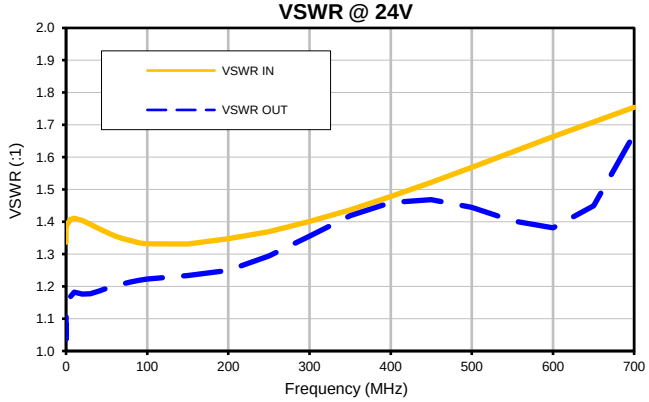
Gain @ 24V



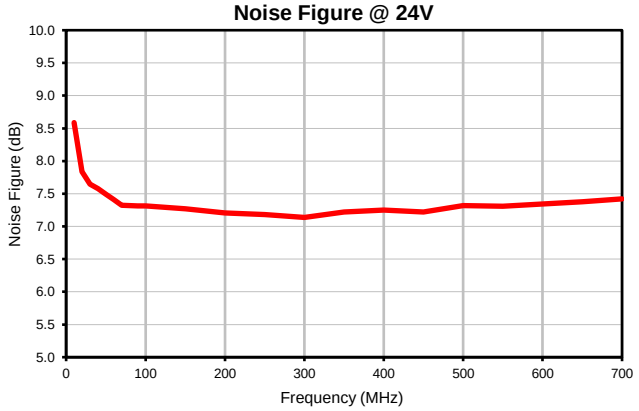
Directivity @ 24V



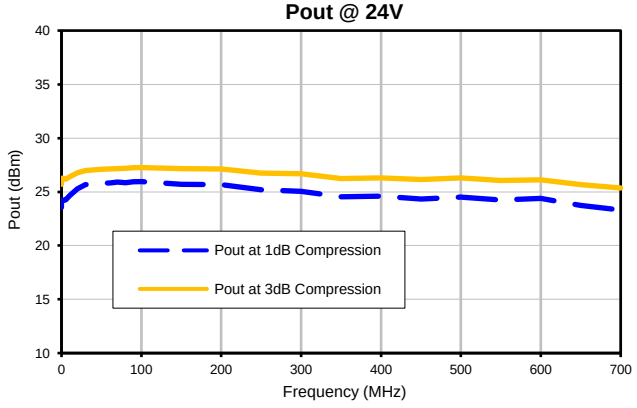
VSWR @ 24V



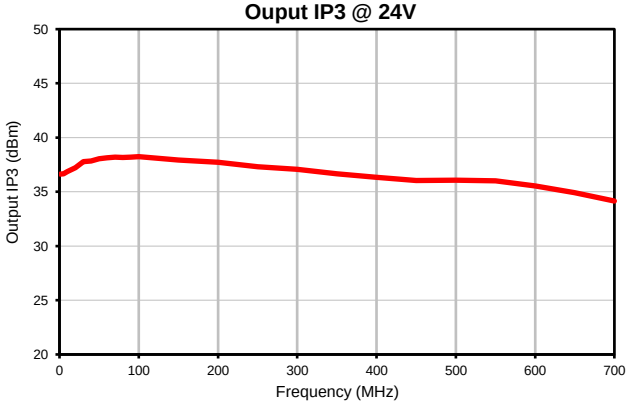
Noise Figure @ 24V



Pout @ 24V



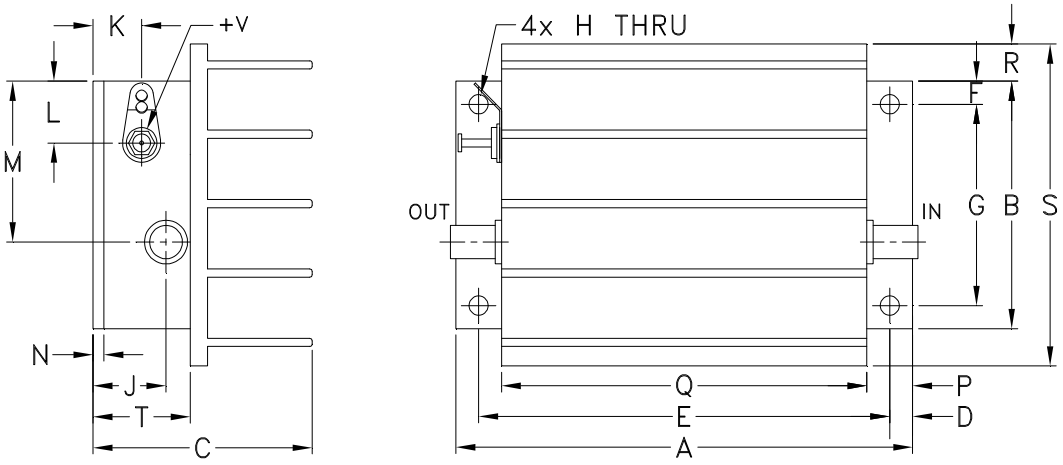
Ouput IP3 @ 24V



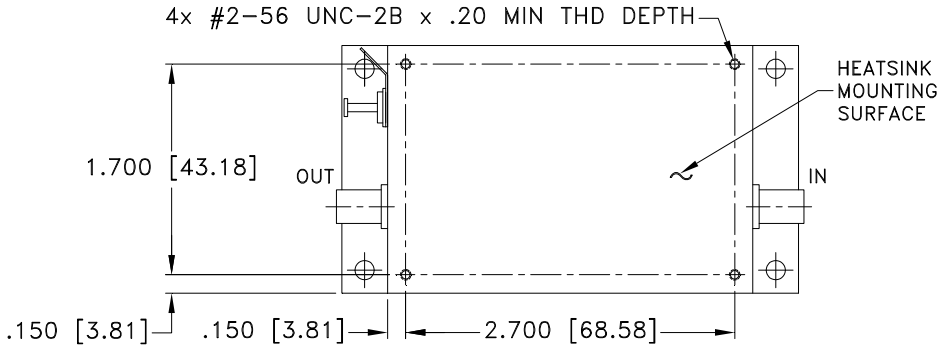
Case Style S

S32

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. ± .03; 3 Pl. ± .015

Notes:

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

Mini-Circuits

Environmental Specifications ENV23T3

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