



Mini-Circuits

COAXIAL

High Power Amplifier

ZHL-0G72G7100+
ZHL-0G72G7100X+

50Ω 700 to 2700 MHz 100 W SMA Female

THE BIG DEAL

- Broadband Operation, 700 to 2700 MHz
- High Gain, 51 dB Typ.
- High P1dB, +50 dBm Typ.
- High OIP3, +55 dBm Typ.
- Thermally Self-Protected

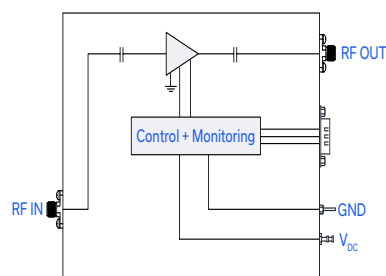


Generic photo used for illustration purposes only

APPLICATIONS

- Communication Systems
- R&D, Production, and OTA Test Systems
- Test & Measurement Equipment
- General Laboratory Applications

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

The ZHL-0G72G7100(X)+ is a high-power broadband amplifier operating over the 700 to 2700 MHz frequency band providing more than 100 W of output power with a typical small signal gain of 51 dB.

The amplifier uses state-of-the-art semiconductor technology and can be used in a wide range of applications. A single supply voltage ensures ease of operation. The amplifier is made with a rugged aluminum housing, has a compact size (230.00 × 152.40 × 30.00 mm), and can be supplied with or without a heatsink.

KEY FEATURES

Features	Advantages
Broadband, Useable from 700 to 2700 MHz	Suitable for a broad range of high-power broadband applications, including test setups, communications and production applications.
High Gain, 51 dB Typ.	Enables signal amplification to 100 W (Typ) output without the need for multiple gain stages.
Thermally Self-Protected	A built-in sensing feature signals the unit to power off when the amplifier reaches its maximum rated operating temperature, preventing damage to the equipment and providing added reliability.
Small and Lightweight	Sports a small footprint (230.00 mm × 152.40 mm × 30.00 mm) and lightweight (1820 grams) modular design.
Low Voltage	Powered by a low voltage of +30 V supply.



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ELECTRICAL SPECIFICATIONS, +25°C, $V_{DC} = +30$ V

Parameter	Symbol	Condition (MHz)		Min.	Typ.	Max.	Units
Frequency Range	f	-		700	-	2700	MHz
Gain	G_{SS}	$P_{IN} = -15$ dBm	700 - 2700	45	51	53	dB
Gain Flatness	$G_{SS-FLAT}$	$P_{IN} = -15$ dBm	700 - 2700	-	±1.5	±2.0	dB
Output Power at 1 dB Compression	P_{1dB}	700 - 2700		+48.5	+50	-	dBm
Output Power at Saturation	P_{SAT}	700 - 2700		+49.5	+51	-	dBm
Noise Figure	NF	$P_{IN} = -15$ dBm	700 - 2700	-	7	10	dB
Output 2 nd Order Intercept Point	OIP2	$P_{OUT} = +37$ dBm/tone	700 - 2700	+55	+60	-	dBm
Output 3 rd Order Intercept Point	OIP3	$P_{OUT} = +37$ dBm/tone	700 - 2700	+50	+55	-	dBm
2 nd Harmonics	F2	$P_{OUT} = +50$ dBm	700 - 2700	-	-29	-10	dBc
3 rd Harmonics	F3	$P_{OUT} = +50$ dBm	700 - 2700	-	-46	-10	dBc
Input Return Loss	I-RL	$P_{IN} = -15$ dBm	700 - 2700	9.5	21	-	dB
Output Return Loss	O-RL	$P_{IN} = -15$ dBm	700 - 2700	9.5	21	-	dB
DC Supply Voltage	V_{SUPPLY}	700 - 2700		+28	+30	+31	V
DC Supply Current	I_{SUPPLY}	$P_{IN} = -15$ dBm	Without Fan	-	13	15	A
			With Fan	-	13.4	15	

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	ZHL-0G72G7100+ $T_{AMBIENT}: -20^{\circ}\text{C}$ to $+60^{\circ}\text{C}$
	ZHL-0G72G7100X+ $T_{MOUNTINGBASE}: \text{Max } +80^{\circ}\text{C}$
Storage Temperature	-55°C to $+100^{\circ}\text{C}$
Max Power Dissipation	380 W
No damage with an open or short at $P_{OUT} = +50$ dBm (100 W) for 2 minutes max	
RF Input Power (no damage)	+7 dBm
DC Operating Voltage	±32 V

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





PROTECTIONS

Parameter	Rating
Shut Down Temperature	85±5°C
Over Voltage (Shut Down)	32±0.5 V
Output Load Mismatch	No damage with an open or short at $P_{OUT}=+50$ dBm (100 W) for 2 minutes max

DETERMINING MAXIMUM THERMAL RESISTANCE OF USERS' EXTERNAL HEAT SINK

$\text{MAXIMUM THERMAL RESISTANCE} = \frac{\text{MAXIMUM OPERATING CASE TEMP} - \text{MAXIMUM USER AMBIENT TEMP}}{\text{POWER DISSIPATION}}$	
Example:	MAXIMUM MOUNTING BASE TEMP = +85 °C (CHECK MAXIMUM RATINGS TABLE FOR THIS VALUE) MAXIMUM USER AMBIENT TEMP = +60 °C (USER DEFINED) POWER DISSIPATION = 46.5 WATTS (EXAMPLE) THEN MAXIMUM ALLOWABLE THERMAL RESISTANCE = 0.54 °C/W

D-SUB9 PINOUT

Pin #	Description
3	Temperature Alarm (4.5 V, TTL high)
4	Ground
8, 9	V_{DC} (+5 V, max 100 mA)
1, 2, 5, 6, 7	No Connection

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IN (RF IN)	SMA Female
OUT (RF OUT)	N-type Female



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High Power Amplifier

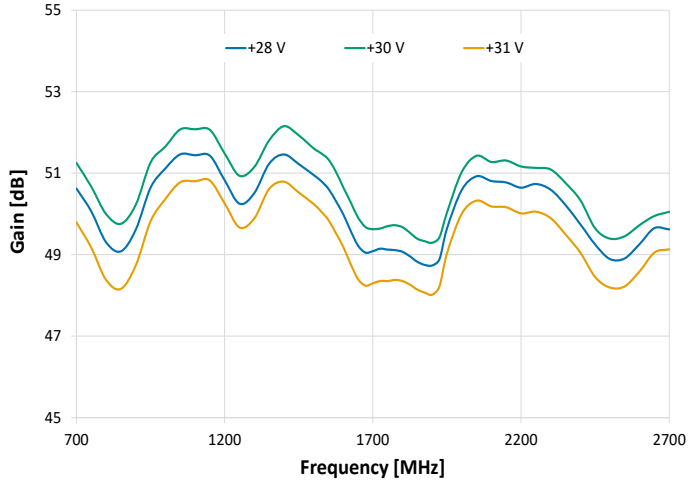
ZHL-0G72G7100+
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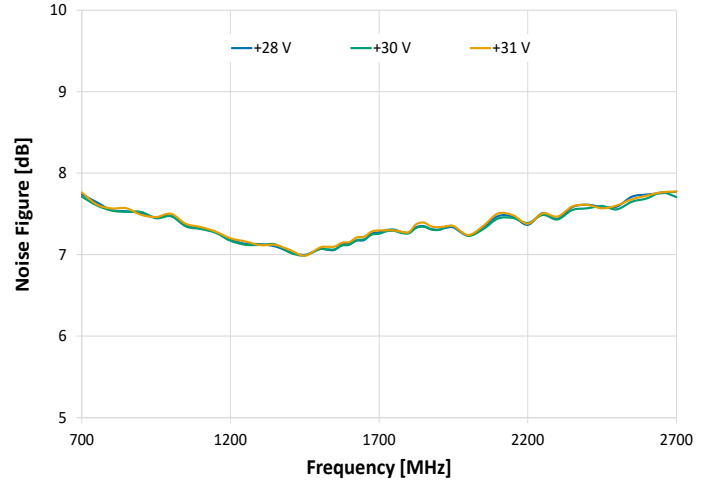
50Ω 700 to 2700 MHz 100 W SMA Female

TYPICAL PERFORMANCE GRAPHS

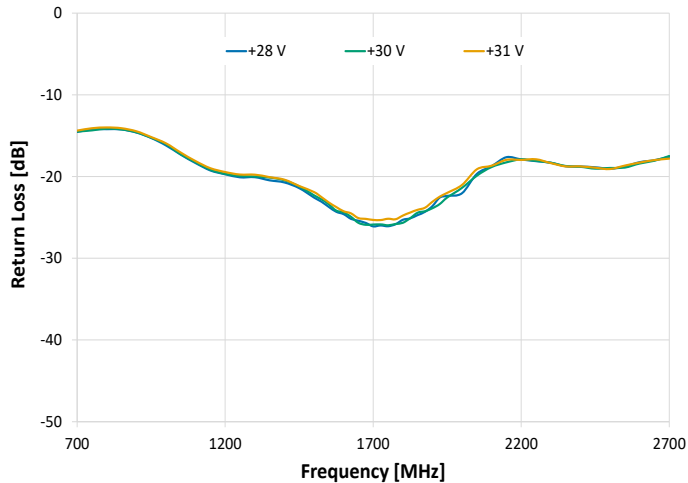
Small Signal Gain vs. Output Frequency



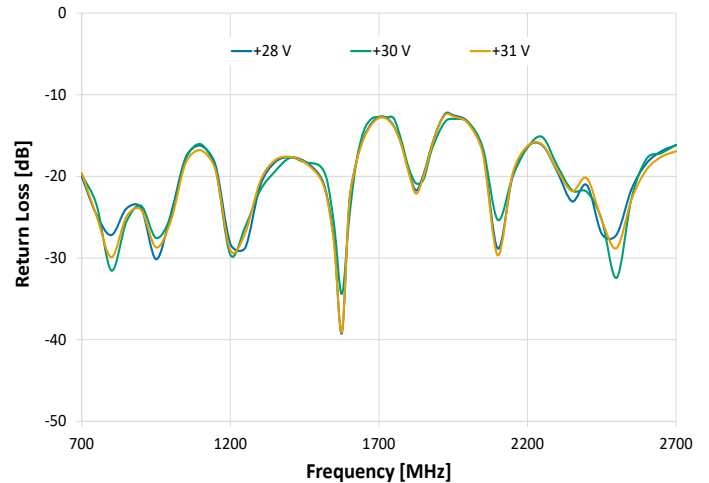
Noise Figure vs. Output Frequency



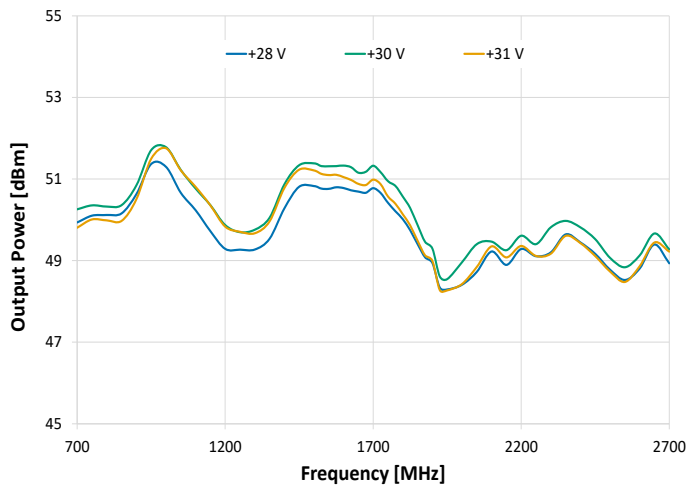
Return Loss In vs. Output Frequency



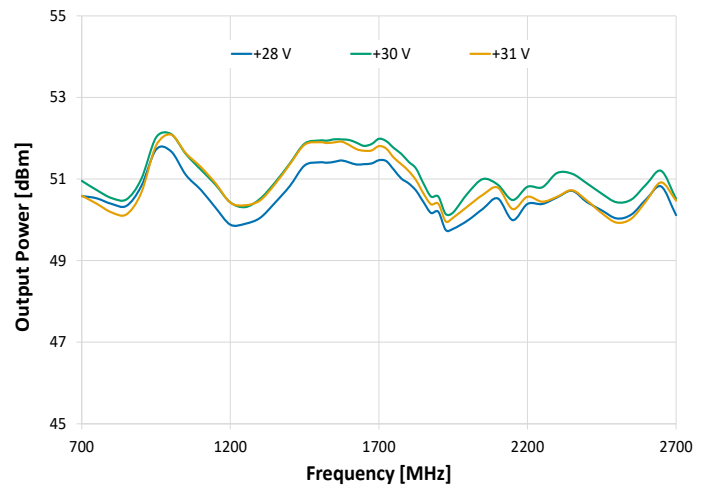
Return Loss Out vs. Output Frequency



Output Power at 1dB Compression vs. Output Frequency



Output Power Saturation vs. Output Frequency





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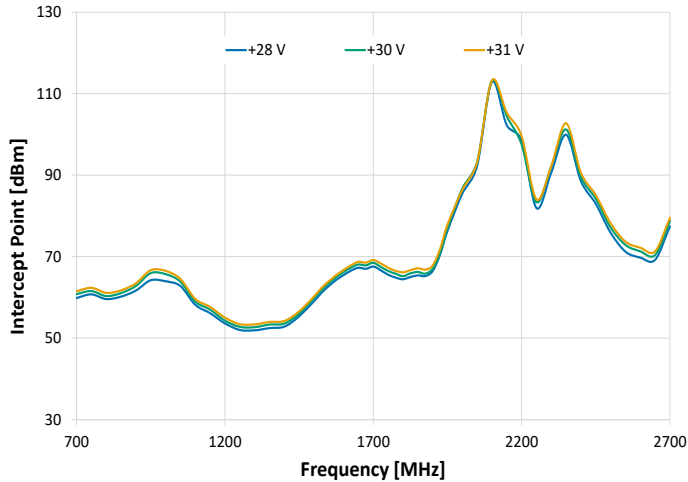
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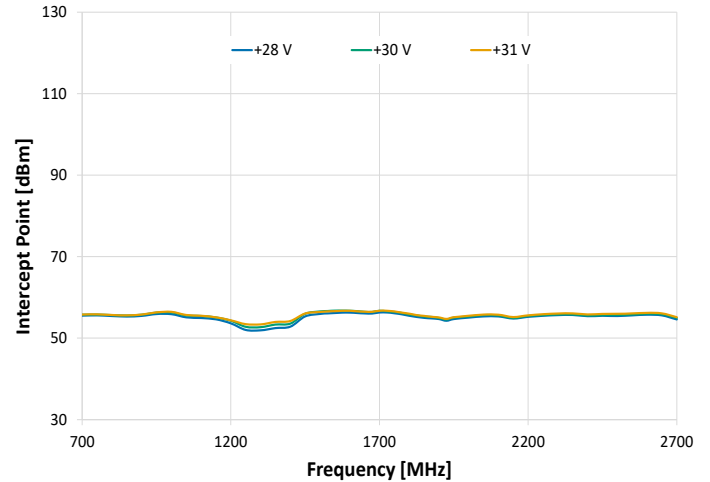
50 Ω 700 to 2700 MHz 100 W SMA Female

TYPICAL PERFORMANCE GRAPHS (CONTINUED)

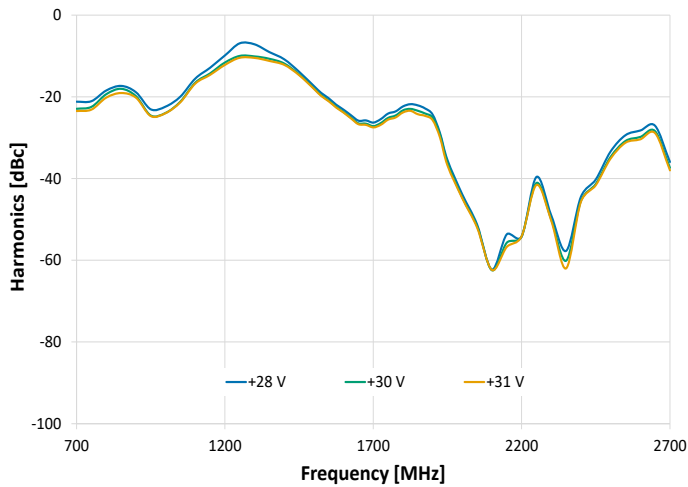
2nd Order Intercept Point vs. Output Frequency



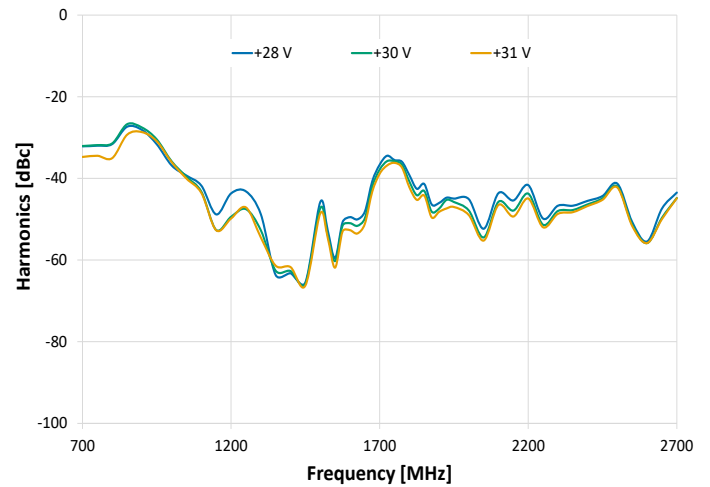
3rd Order Intercept Point vs. Output Frequency



Harmonics (F2) vs. Output Frequency



Harmonics (F3) vs. Output Frequency





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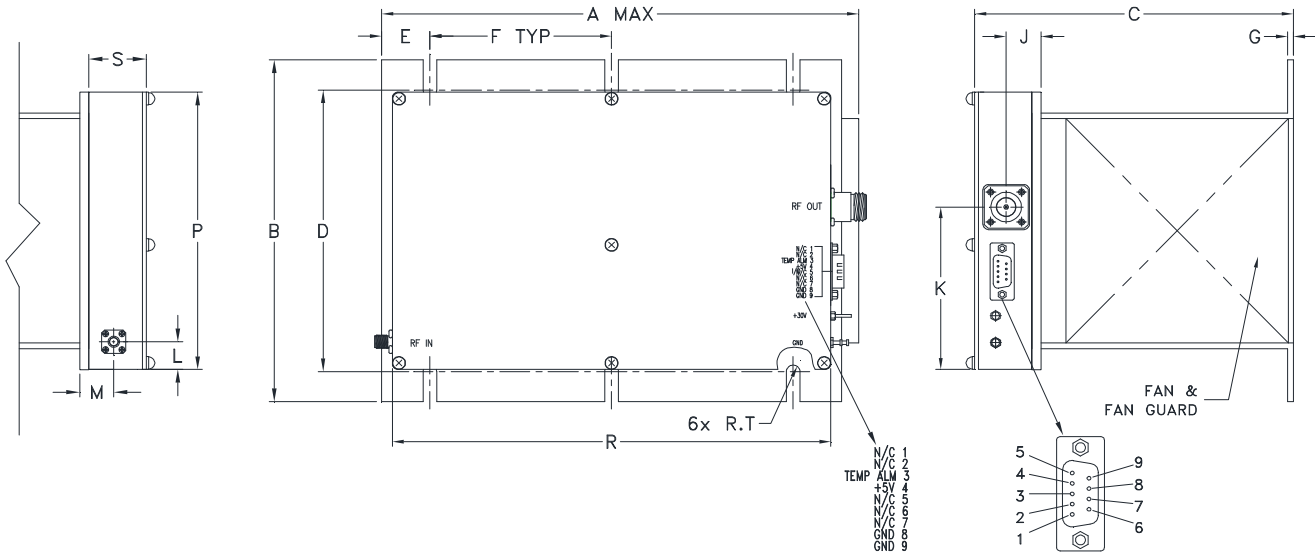
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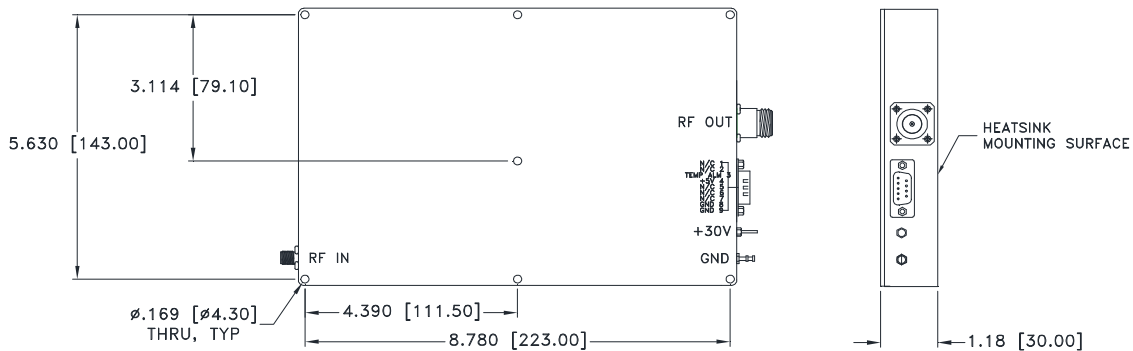
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CASE STYLE DRAWING (BT2247, WITH HEATSINK / WITHOUT HEATSINK)



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
Inch	9.85	7.3	6.6	6.00	.98	3.75	.13	-	.72	3.46	.59	.70	-	5.91	-	9.06	1.18	.135
mm	250.19	185.42	167.64	152.40	24.89	95.25	3.30	-	18.24	88.00	15.00	17.75	-	150.00	-	230.00	30.00	3.43

Notes:

- Case material: Aluminum alloy.
- Case finish: Clear chemical conversion coating, non-chrome or trivalent chrome based.
Heatsink finish: Black anodize.
- Weight: 1820 grams / 5350 grams with heatsink.
- Dimensions: Inches [mm].
Tolerances: 2 Pl. ± 0.03 inch; 3 Pl. ± 0.015 inch.
- Recommended screw for mounting model without heatsink on 3/32" thick sheet: #6-32, 1.50" Length.

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DETAILED MODEL INFORMATION IS AVAILABLE ON OUR WEBSITE

[CLICK HERE](#)

Performance Data	Table
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file)
RoHS Status	Compliant
Environmental Ratings	ENV23T19

ORDERING INFORMATION

Model No. Links	ZHL-0G72G7100+	ZHL-0G72G7100X+
Option	With heatsink	Without heatsink
Case Style	BT2247	
Connector	IN (SMA Female) / OUT (N-type Female)	

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-Circuits' 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

