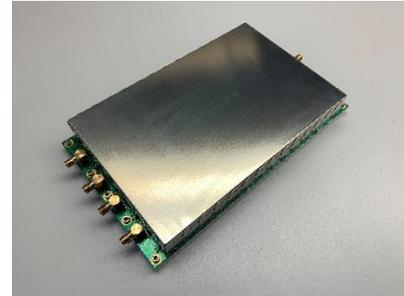


# High Power Solid-State Amplifier ZHL-0027-75X+

50Ω 4X 19W 27MHz

## 1. The Big Deal

- One input, four 19W outputs
- 27MHz ISM band
- Suitable for CW and pulsed signals
- High gain, 16 dB typical at  $P_{3dB}$
- 55% typical efficiency
- Integrated harmonic suppression
- Temperature compensated gate bias



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

## 2. Product Overview

The ZHL-0027-75X+ is a new generation light weight, rugged solid state connectorized power amplifier module. One input signal generates four equal output signals with a typical  $P_{3dB}$  of 19W each. The amplifier is intended as a driver for high power 27MHz amplifiers, such as the ZHL-0027-1K7X+. The ZHL-0027-75X+ can be used in a wide range of industrial, scientific and medical applications in the 27MHz ISM band. The amplifier uses state-of-the-art high ruggedness semiconductor technology. The amplifier is capable of amplifying CW and pulsed signals. A temperature compensated gate bias circuit is provided. Mounting holes for an M3 screw are provided to mount the amplifier to a heatsink or cooling plate in larger systems. Easy screw-on power supply connections are provided outside the shield.

**Typical Electrical Performance of ZHL-0027-75X+**

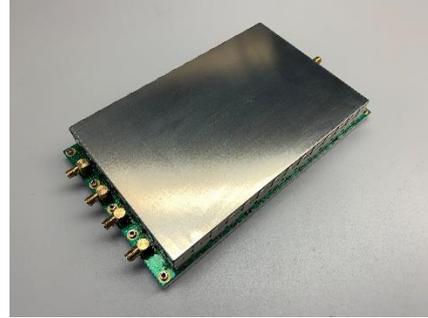
Parameter	Typical Performance ( $T_{MB} = +25^{\circ}C$ )	Unit
Frequency	27	MHz
Supply Voltage	65	V
Total Input Power ( $P_{IN}$ )	27	dBm
CW Output Power ( $P_{OUT}$ @ $P_{IN}$ ) per Channel (4 channels available)	42.8 19	dBm W
Efficiency (@19W per channel)	55	%
Gain (@19W per channel)	16	dB
Current	TBD	A

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## 3. Product Features

- 75W total output power ( $P_{3dB}$ )
- Split over four 19W channels
- 27MHz ISM band
- Suitable for CW and pulsed signals
- High gain, 16dB typical at  $P_{3dB}$
- 55% typical efficiency
- Excellent ruggedness
- Built-in harmonic suppression
- Light weight design



Model No.	Description
ZHL-0027-75X+	75W CW output power 4x 19W 4-Channel High Power Amplifier with SMA input and four SMA output connectors

Feature	Advantages
75W CW Power	Four equal channels with 19W output power ( $P_{3dB}$ ) for a wide range of industrial, scientific and medical applications in the 27MHz ISM band. Designed to drive four ZHL-0027-1K7X+ amplifiers to create a generator with output power >5kW.
High Gain	With only 0.5W of input power and a typical gain of 16 dB at $P_{3dB}$ , only two amplifier stages are needed to generate 5kW.
Harmonic Filtering	Harmonic filtering inside this power amplifier ensures that the final stages receive a clean drive signal.
Temperature Compensated Gate Bias	A temperature compensated gate bias circuit is integrated on the PA.
Easy interfacing	Power supply connections are easily accessible outside the shield.
Small and lightweight	The compact amplifier design (202mm x 118mm x 28mm) is lightweight (0.xxkg) which makes it suitable for integration in high power systems that require multiple amplifiers.
Cooling	The power amplifier can easily be mounted on a heatsink using the provided M3 mounting holes.
Low voltage	The ZHL-0027-75X+ operates over a large 50-65V supply voltage range.

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## Electrical Performance

### Electrical Specifications at $T_{\text{MOUNTING BASE}} = +25^{\circ}\text{C}$ , $V_{\text{DS}}=65\text{V}$ , 50Ω System

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Frequency Range	f		24.12	27.12	30.12	MHz
Operating Voltage	$V_{\text{DS}}$		50	65	66	V
Input Power	$P_{\text{IN}}$		-	0.5 27	1.3 31	Watts dBm
$P_{1\text{dB}}$ Compression	$P_{1\text{dB}}$		13.8 41.4	16.5 42.2	- -	Watts dBm
$P_{3\text{dB}}$ Compression	$P_{3\text{dB}}$		16 42.0	19 42.8	- -	Watts dBm
Power Gain	$G_{\text{P}}$	@ $P_{3\text{dB}}$	13	16	19	dB
Efficiency	$\eta$	@ $P_{3\text{dB}}$	48	53	-	%
Input return Loss	IRL	@ $P_{3\text{dB}}$	-	-15	-10	dB
Harmonics (H2 and H3)	H2, H3	@ $P_{3\text{dB}}$	-	TBD	-15	dBc
Mounting Base Temperature	$T_{\text{MB}}$		0	25	65	$^{\circ}\text{C}$
Dimensions			202 x 118 x 28 (LxWxH) 7.97 x 4.66 x 1.11			mm inches
Test conditions: $V_{\text{DS}}=65\text{V}$ , $I_{\text{DQ}}=0.04\text{A}$ , $f=27.12\text{MHz}$ , $T_{\text{MB}}=25^{\circ}\text{C}$ , unless otherwise noted						
Note 2: All power measurements are performed while using a Mini-Circuits NLP-30+ Low Pass Filter in front of the power sensors.						

### Maximum Ratings<sup>1</sup>

Parameter	Ratings
Mounting Base Temperature <sup>2</sup>	0°C to +65°C
Storage Temperature	-20°C to +85°C
DC Voltage	66V
Input RF Power (no damage)	+33 dBm

1. Specifications apply to CW signals only. Permanent damage may occur if any of these limits are exceeded.
2. Mounting Base Temperature is the Temperature of the Aluminum Base Plate.

# High Power Solid-State Amplifier ZHL-0027-75X+

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## 4. Application

The ZHL-0027-75X+ amplifier module can be used as a building block in any single or multi-channel system for high power RF Energy applications such as:

- Industrial heating
- Materials processing
- Food processing (heating, tempering, and pasteurization)
- Microwave-assisted chemistry
- Plasma generation
- Plasma surface treatment
- Disinfection
- Chemistry
- RF-excited lasers
- Medical (heating, hyperthermia, and ablation)
- Semiconductor RF generators

## 5. Amplifier Interfaces

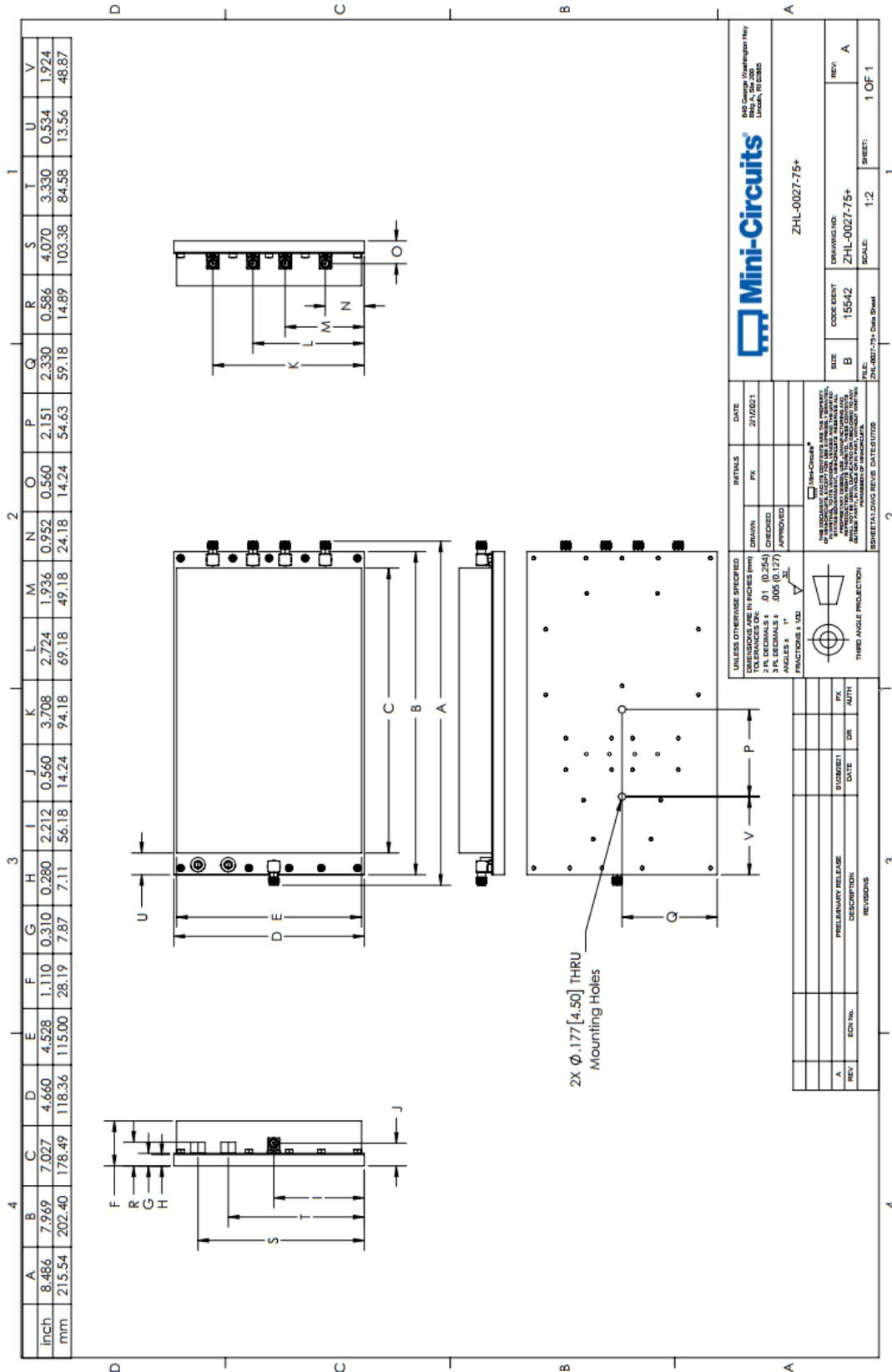
	<p><b>J3 +65V Supply Voltage Connector, M5</b>  <b>J4 -65V Supply Voltage Connector, M5</b></p> <p>Tightening Torque 2.2 N-m (19.5 in-lbs)</p> <p><b>Mating hardware*:</b>  M5 screw (Mcmaster P/N 92095A308)  Belville washer (Mcmaster P/N 90895A027)  Ring Terminal (Mcmaster P/N7113K29)</p>
	<p><b>J1, J2, J6, J7, J8 - SMA Connector Receptacle, Female Socket 50Ohm</b></p> <p>Adam Tech RF2-03E-T-00-50-G</p>

\*Mating hardware not included with amplifier. Similar mating hardware available from other manufactures.

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## 6. Outline/Mechanical Dimensions



# High Power Solid-State Amplifier ZHL-0027-75X+

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## 7. Typical Performance Data (65V, 50Ω System)

<p style="text-align: center; color: red;"><b>All graphs to be done later</b></p> <p style="text-align: center;">Gain &amp; Efficiency as a function of Output Power @ +25°C base temperature</p>	<p style="text-align: center;">Gain &amp; Efficiency as a function of Output Power @ 27MHz for +25°C &amp; +65°C base temperature</p>
<p style="text-align: center;">FWD_AOUT (forward power analog output voltage) as a function of Output Power @ +25°C base temperature</p>	<p style="text-align: center;">FWD_AOUT (forward power analog output voltage) as a function of Output Power @ 2.45GHz for +25°C &amp; +65°C base temp.</p>
<p style="text-align: center;">REFL_AOUT (reflected power analog output voltage) as a function of Power into J5 @ +25°C base temperature</p>	<p style="text-align: center;">REFL_AOUT (refl. power analog output voltage) as a function of Power into J5 @ 2.45GHz for +25°C &amp; +65°C base temperature</p>

# High Power Solid-State Amplifier ZHL-0027-75X+

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50Ω 4x 19W 27MHz

<p>Gain &amp; Input Return Loss as a function of Frequency @ tbd dBm input power &amp; +25°C base temperature</p>	<p>Output Power &amp; Efficiency as a function of Frequency @ tbd dBm input power &amp; +25°C base temperature</p>

# High Power Solid-State Amplifier ZHL-0027-75X+

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50Ω 4x 19W 27MHz

## 8. Additional Notes

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- 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](http://www.minicircuits.com/MCLStore/terms.jsp)