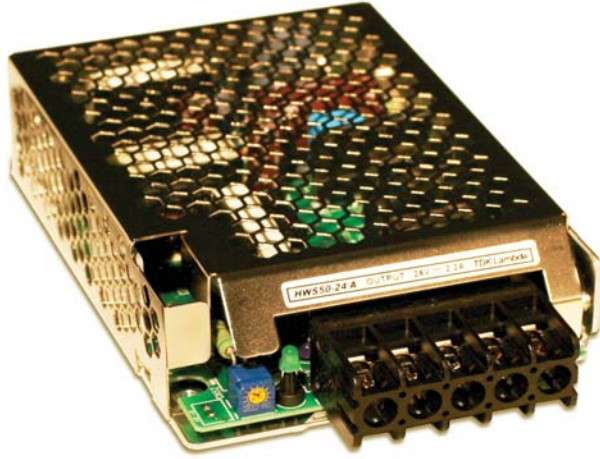


# DATASHEET AND OPERATING GUIDE

# PWRPAK 24 V

## Switched Mode Power Supply



### FEATURES & BENEFITS

- Overload & Overvoltage Protection
- <1% Noise and Ripple
- 85-260 VAC, 47-63 Hz Input Voltage

### SMALL SIZE, EFFICIENT

Wavelength offers the PWRPAK-24V low noise switched power supply for the QCL Series Laser Drivers.

One of the most important components affecting noise performance is the power supply used to power the QCL driver. Wavelength has extensively tested the TDK/ Lambda switching power supply, and recommends this power supply for most QCL applications. A linear supply will offer lower noise, but a much larger size and lower efficiency.

### USED WITH

- QCL Series Quantum Cascade Laser Drivers

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### CONTENTS

	PAGE
QUICK CONNECT GUIDE	2
PERFORMANCE SPECIFICATIONS	3
MECHANICAL SPECIFICATIONS	5
CERTIFICATION AND WARRANTY	6

### ORDERING INFORMATION

PART NO	DESCRIPTION
PWRPAK-24V	24 V Switched Power Supply
WCB312	QCL Power Supply Wiring Kit
WCB313	QCL 3-Pin Power Cable

## QUICK CONNECT GUIDE



TO DETERMINE IF THE PWRPAK-24V POWER SUPPLY IS APPROPRIATE FOR YOUR APPLICATION, IT IS IMPERATIVE THAT YOU VERIFY THE UNIT WILL BE OPERATING WITHIN THE INTERNAL HEAT DISSIPATION SAFE OPERATING AREA (SOA).

Visit the Wavelength Electronics website for the most accurate, up-to-date, and easy to use SOA calculator.

The SOA calculator for Laser Diode Drivers is at this page: <http://www.teamwavelength.com/support/calculator/soa/soald.php>, then choose the appropriate QCL driver.

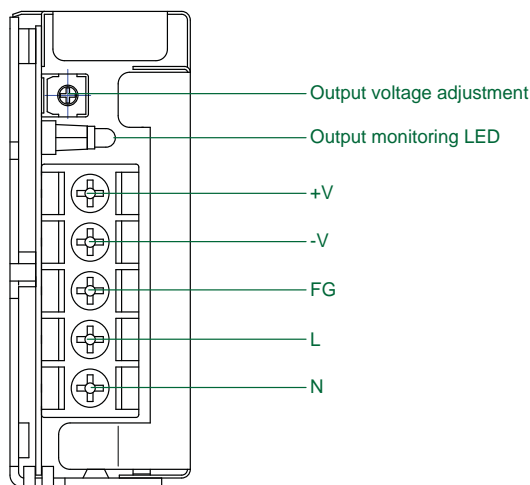
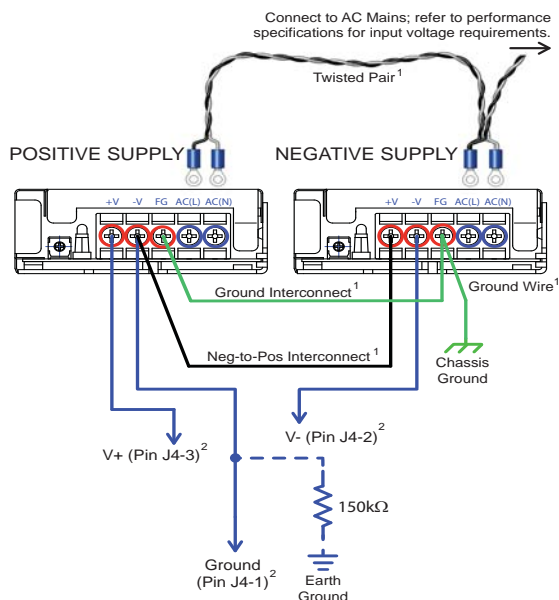


Figure 1. Power Supply Wiring Connections

Figure 2 shows an example of a correctly connected grounded load.



1. Cable included as part of the WCB312 Power Supply Wiring Kit  
2. Included with the QCL Driver. (WCB313)

Figure 2. Power Supply Wiring Diagram, Dual Supply Operation

## WIRING THE PWRPAK-24V

Figure 1 illustrates the power supply connections for single supply operation:

- +V — positive output terminal
- V — negative output terminal
- FG — frame ground
- L — live line input terminal (fuse in line)
- N — neutral input terminal
- Output voltage adjustment
- Output monitoring LED

## WIRING POWER SUPPLY TO QCL DRIVER

Follow these instructions to wire the power supplies using the WCB312 Wiring Kit and WCB313 Power Cable. Refer to Figure 2.

- AC Safety Ground #1: 24 AWG green wire, 10" with ring lugs on each end; connect to the Frame Ground terminals on the power supplies.
- AC Safety Ground #2: 24 AWG green wire; 10" with one ring lug; connect to the Frame Ground terminal on one power supply; connect the other end to AC Chassis Ground.
- Common Ground: 24 AWG black wire; 10" with ring lugs on each end; connect between V- of Positive Supply and V+ of Negative Supply.
- Use the remaining ring lugs to connect the power supply cable (WCB313) to the V+, Power Ground, and V- terminals of the power supplies.

Figure 2 indicates a 150 kΩ resistor connecting the power supplies to ground; this resistor is necessary if the electronics ground is tied to earth ground at some point within your system, such as at a DAQ card, computer, or USB cable connection.

This resistor provides a lossy connection from system ground to earth ground, and will prevent the ground potential of isolated power supplies from drifting. Note that if this resistor is used the remote POWER and ENABLE inputs must be optically isolated in order to function properly.

If you are unsure whether to include this resistor in your system, contact Wavelength Electronics for technical assistance.

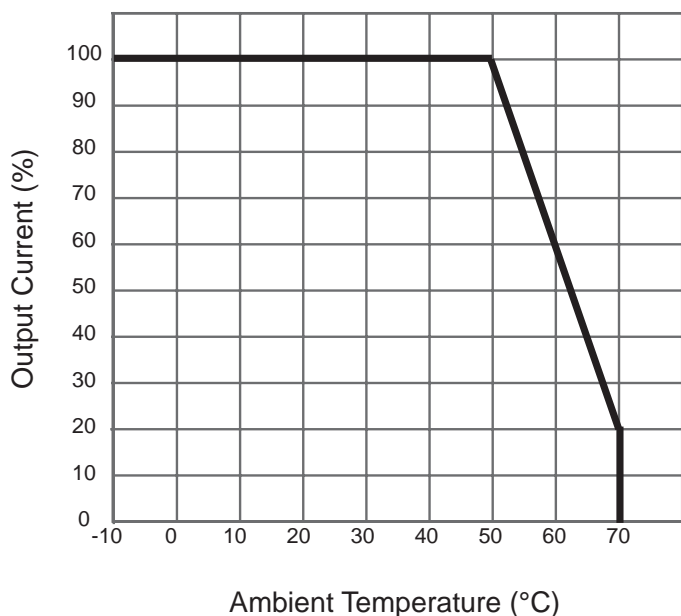
## PERFORMANCE SPECIFICATIONS

PARAMETER DESCRIPTION	PARAMETER VALUE	NOTES
<b>INPUT</b>		
Input Voltage	85 - 265 VAC	
Frequency	47 - 63 Hz	
<b>OUTPUT</b>		
Output Power Maximum	52.8 W	
Output Voltage	24 V	Output voltage is within $\pm 20\%$ of nominal output voltage:
Output Current	2.2 A	
Hold Up Time	20 ms	
Line Regulation	96 mV	
Load Regulation	192 mV	
Ripple & Noise	150 mV	100 MHz bandwidth
Overvoltage Protection	30 - 34.8 V	Inverter shutdown, manual reset. When OVP triggers, the output will be shutdown. Remove the input and re-connect to reset power. The OVP setting is fixed, not user adjustable. In the case of an inductive load, use a decoupling diode at the output terminal.
Overload Protection, hiccup trip & auto restart	>104%	Constant current limiting and hiccup with automatic recovery when overload condition clears.
Temperature Coefficient	< 0.02% / °C	
<b>GENERAL</b>		
Efficiency	82 / 84 %	100 / 200 VAC input. Power Thermistor Protection
Operating Temperature <sup>(1)</sup>	-10 to + 71 °C	See derating chart above 50°C
<b>EMC</b>		
Emissions, FCC B EN55011 / EN55022	Yes	
<b>SAFETY</b>		
UL/cUL, CB, CE Mark Approved	Yes	
Weight	280 g	
Size	1.46 x 3.23 x 6.3 inches	

<sup>(1)</sup> Derating information can be found in **Table 1 on page 4**.

## OUTPUT DERATING

**Figure 3** illustrates the output derating for the PWRPAK-24V. **Table 1** shows the output available at different ambient temperatures as a percent of full current.



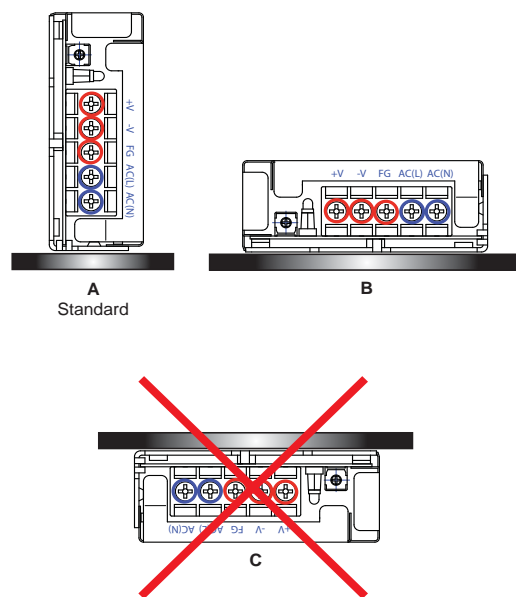
**Figure 3. Output Derating Curve**

**Table 1. Derating Chart**

AMBIENT TEMPERATURE	MOUNTING METHOD	
	A	B
-10 to +30 °C	100	100
40°C	100	100
50°C	60	60
60°C	20	20

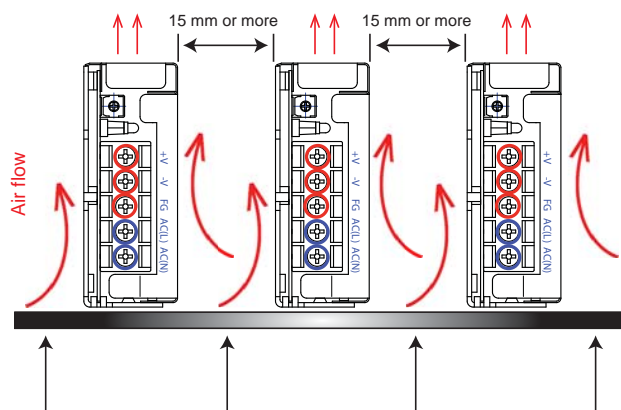
## MOUNTING CONSIDERATIONS

**Figure 4** shows various mounting configurations. The standard method (A) is recommended. Configuration B also works. Do not use configuration C, where the PCB is on the top and heat is trapped within the unit.



**Figure 4. Mounting Options**

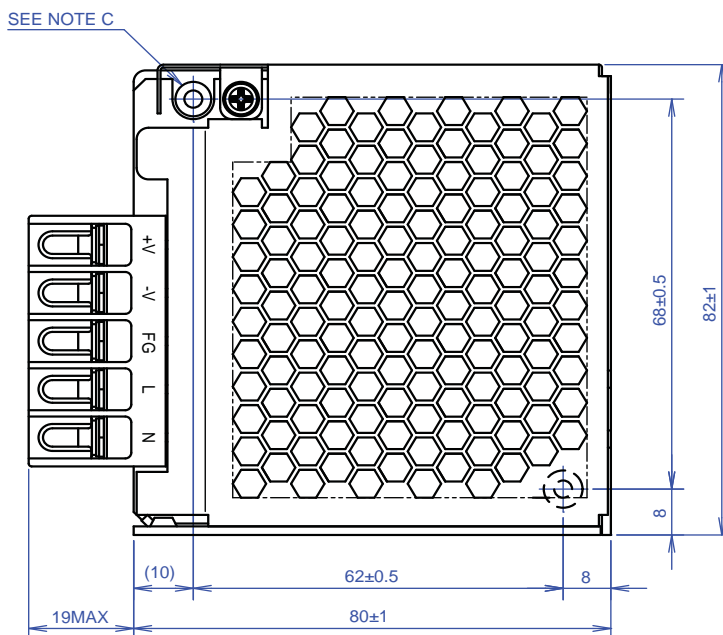
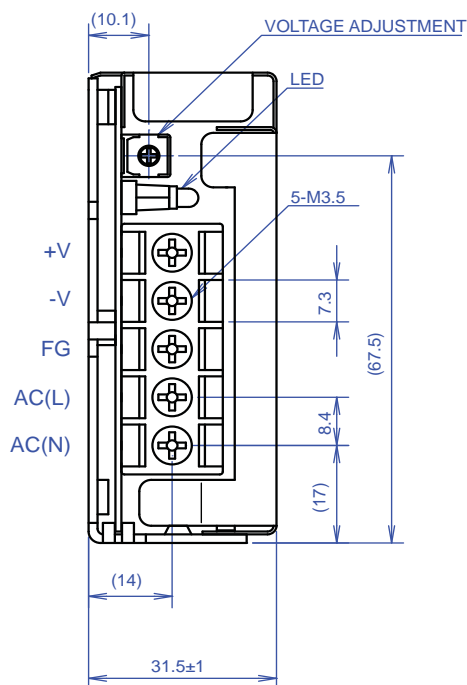
- This is a convection cooling type power supply. To ensure proper heat radiation and safety, allow a distance of more than 15 mm between the power supply and peripheral parts. See **Figure 5**.
- The maximum allowable penetration of mounting screws is 6 mm.
- Recommended torque for the mounting screw is 0.49 N·m (5.0 kgf·cm).



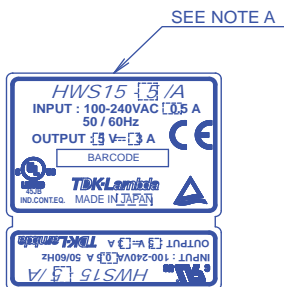
Provide punching, etc. to allow air to pass.

**Figure 5. Airflow Requirements**

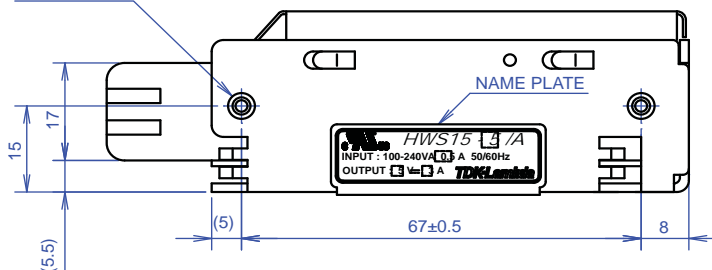
# MECHANICAL SPECIFICATIONS



NAME PLATE



SEE NOTE B



## NOTES

- A : MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B : M3 EMBOSSED, TAPPED AND COUNTERSUNK HOLES (2) FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6m/m.
- C : M3 TAPPED HOLES (2) FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6m/m.

(unit : mm)

MODEL	HWS15/A
<b>DENSEI-LAMBDA</b>	

A224-02-01/A-A

Diagram courtesy of TDK-Lambda. Specifications subject to change.

## CERTIFICATION AND WARRANTY

### CERTIFICATION

Wavelength Electronics, Inc. (Wavelength) certifies that this product met its published specifications at the time of shipment. Wavelength further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by that organization's calibration facilities, and to the calibration facilities of other International Standards Organization members.

### WARRANTY

This Wavelength product is warranted against defects in materials and workmanship for a period of one (1) year from date of shipment. During the warranty period, Wavelength will, at its option, either repair or replace products which prove to be defective.

### WARRANTY SERVICE

For warranty service or repair, this product must be returned to the factory. An RMA is required for products returned to Wavelength for warranty service. The Buyer shall prepay shipping charges to Wavelength and Wavelength shall pay shipping charges to return the product to the Buyer upon determination of defective materials or workmanship. However, the Buyer shall pay all shipping charges, duties, and taxes for products returned to Wavelength from another country.

### LIMITATIONS OF WARRANTY

The warranty shall not apply to defects resulting from improper use or misuse of the product or operation outside published specifications. No other warranty is expressed or implied. Wavelength specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

### EXCLUSIVE REMEDIES

The remedies provided herein are the Buyer's sole and exclusive remedies. Wavelength shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory.

### REVERSE ENGINEERING PROHIBITED

Buyer, End-User, or Third-Party Reseller are expressly prohibited from reverse engineering, decompiling, or disassembling this product.

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## SAFETY

There are no other user-serviceable parts inside this product. Return the product to Wavelength for service and repair to ensure that safety features are maintained.

## LIFE SUPPORT POLICY

This important safety information applies to all Wavelength electrical and electronic products and accessories:

As a general policy, Wavelength Electronics, Inc. does not recommend the use of any of its products in life support applications where the failure or malfunction of the Wavelength product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. Wavelength will not knowingly sell its products for use in such applications unless it receives written assurances satisfactory to Wavelength that the risks of injury or damage have been minimized, the customer assumes all such risks, and there is no product liability for Wavelength. Examples of devices considered to be life support devices are neonatal oxygen analyzers, nerve stimulators (for any use), auto-transfusion devices, blood pumps, defibrillators, arrhythmia detectors and alarms, pacemakers, hemodialysis systems, peritoneal dialysis systems, ventilators of all types, and infusion pumps as well as other devices designated as "critical" by the FDA. The above are representative examples only and are not intended to be conclusive or exclusive of any other life support device.

## REVISION HISTORY

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REV.	DATE	CHANGE
A	December 2013	Release in new format and extend warranty



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