



Product Selection & Comparison

August, 2018
Page 1

ABSTRACT

Wavelength Electronics offers a wide variety of laser diode drivers, quantum cascade laser (QCL) drivers, and temperature controllers. Depending on the parameters of your application, there may be several options that fit your needs. This document will simplify product selection, and answer frequently asked questions.

INTRODUCTION

Wavelength offers a variety of products that are designed to fit a multitude of applications. Our product lines are broken up into four basic categories:

1. Laser Diode Drivers
2. Quantum Cascade Laser Drivers
3. Temperature Controllers
4. Combined Laser Drivers/Temperature Controllers

APPLICATION REQUIREMENTS

The first step in product selection is to narrow down your needs.

- What are your current/voltage requirements to the load? (See **Table 1** below.)
- What packaging requirements do you have?
- What amount of heat can you dissipate safely?
- Do you need a laser driver?
- Is the laser a diode laser, or a quantum cascade laser with higher compliance voltage requirements?
- Do you need a laser driver with temperature control?
- Do you need only temperature control?

If you need both a laser driver and temperature control, Wavelength has products that combine both into one unit.

PARAMETER	LD	QCL	TC	LDTC		Units
				to LD	to TC	
I_{max}	15	2	10	2.2	2.2	Amps
V_{max}	87	20	30	12	27.9	Volts

Table 1. Shows maximum current and voltage ratings for standard products. Product variations are used to achieve 87 V LD output.

PACKAGING REQUIREMENTS

Next, decide what kind of packaging works best in your application. Wavelength offers three basic styles:

1. Components¹
2. Modules¹
3. Instruments

For systems where the controllers are being designed in, *components* or *modules* are chosen.

Components are small (on average 2.0" × 1.5") and provide lower current. They generally have no moving parts, and connect to already existing electronics via pins that mount onto a circuit board. Heat sinks and evaluation boards are usually available as accessories. Components require you to provide a power supply and voltmeter to monitor settings.

Modules are larger than components (on average 3.9" × 3.2") and are more of a standalone unit than components. They may have moving parts such as trimpots, switches, or jumpers. They require you to provide a power supply, and a voltmeter for measuring voltage and/or current. Additionally, modules do not come with integrated heat sinking. Modules can be mounted either inside a chassis, or placed on the benchtop. If placed on the benchtop, heatsinking must be added. A major difference between modules and components is that modules connect via cables, not pins. Thus, there are cables, not evaluation boards as accessories for modules.

¹ OEM product

Instruments are designed for researchers that need flexibility and ease of use. They are the largest of the three categories (2U half rack in size). Instruments come with a fully functioning user interface (touch screen capability on the TC LAB and QCL LAB instruments). They have a built-in power supply, which needs to be plugged into AC wall power. Instruments can either be set on the benchtop, or in a rack (see Rack Mount Solutions accessories). Instruments provide the greatest ease of use and versatility, while maintaining high performance.

See pages 3 & 4 for to-scale drawings of temperature controller and laser driver components and modules.

SAFE OPERATING AREA (SOA)

Any component or module that is chosen has a Safe Operating Area (SOA). It is imperative that you first determine what the SOA is for your application, and that you select a product that will not exceed the SOA during operation. Operating any product outside of the SOA may cause damage to the product itself, and/or other products within your setup. Operating outside of the SOA will void the warranty.

It is recommended that you use the SOA calculators on our website. There are SOA calculators for both [laser diode drivers](#) and [temperature controllers](#). Simply choose your product from the dropdown menu, select any applicable options, and click "Draw SOA Curve" to generate a graph of the SOA for your product.

Additionally, within the SOA calculator, you can simulate how the device works in your application. Enter any device specific parameters, then click "Find SOA Compliance."

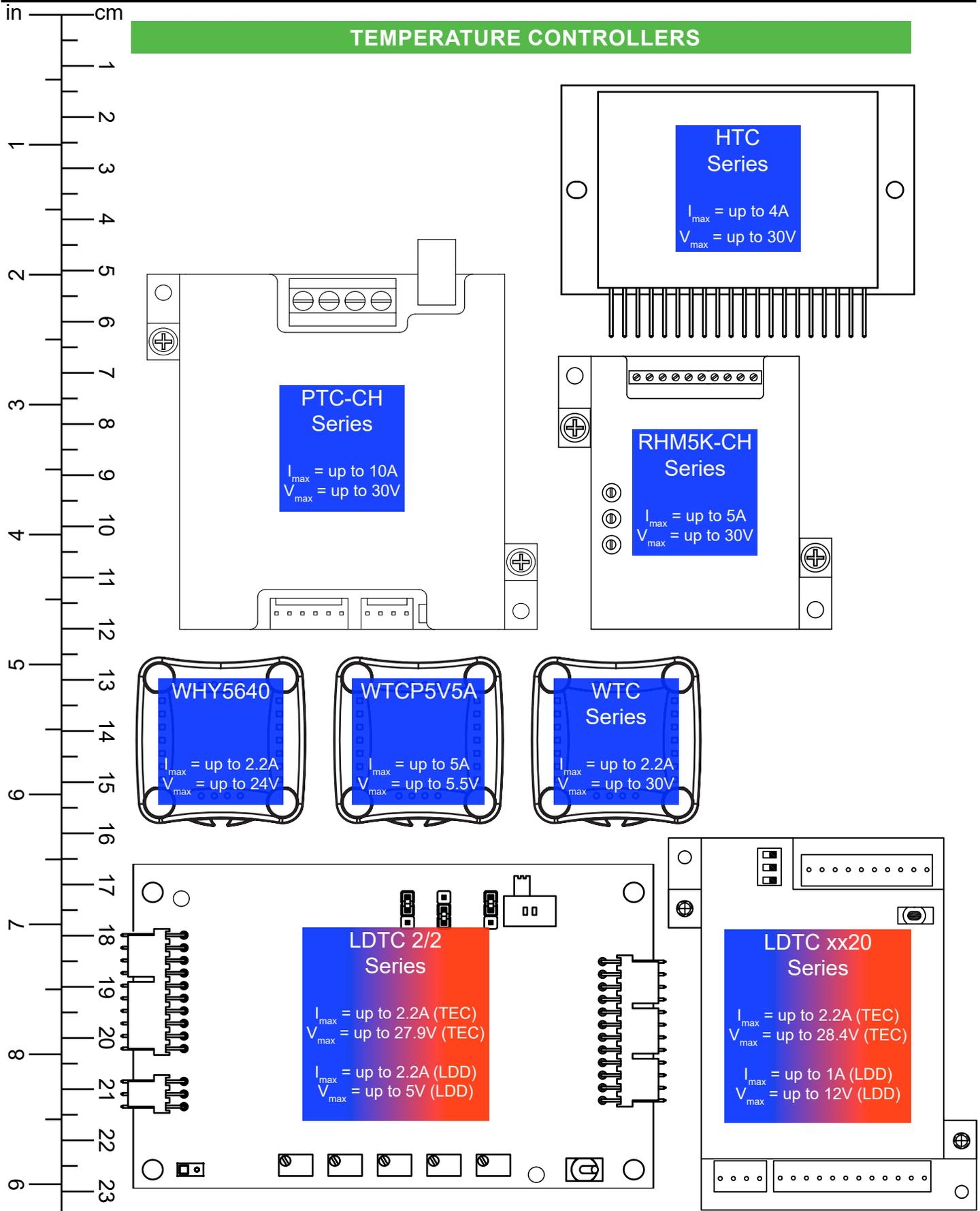
Further SOA resources include an application note [AN-LDTC01: The Principle of the Safe Operating Area](#), and a [Safe Operating Area video](#).

If you have any questions about the Safe Operating Area, or the Safe Operating Area calculator, call the factory for free and prompt technical assistance.

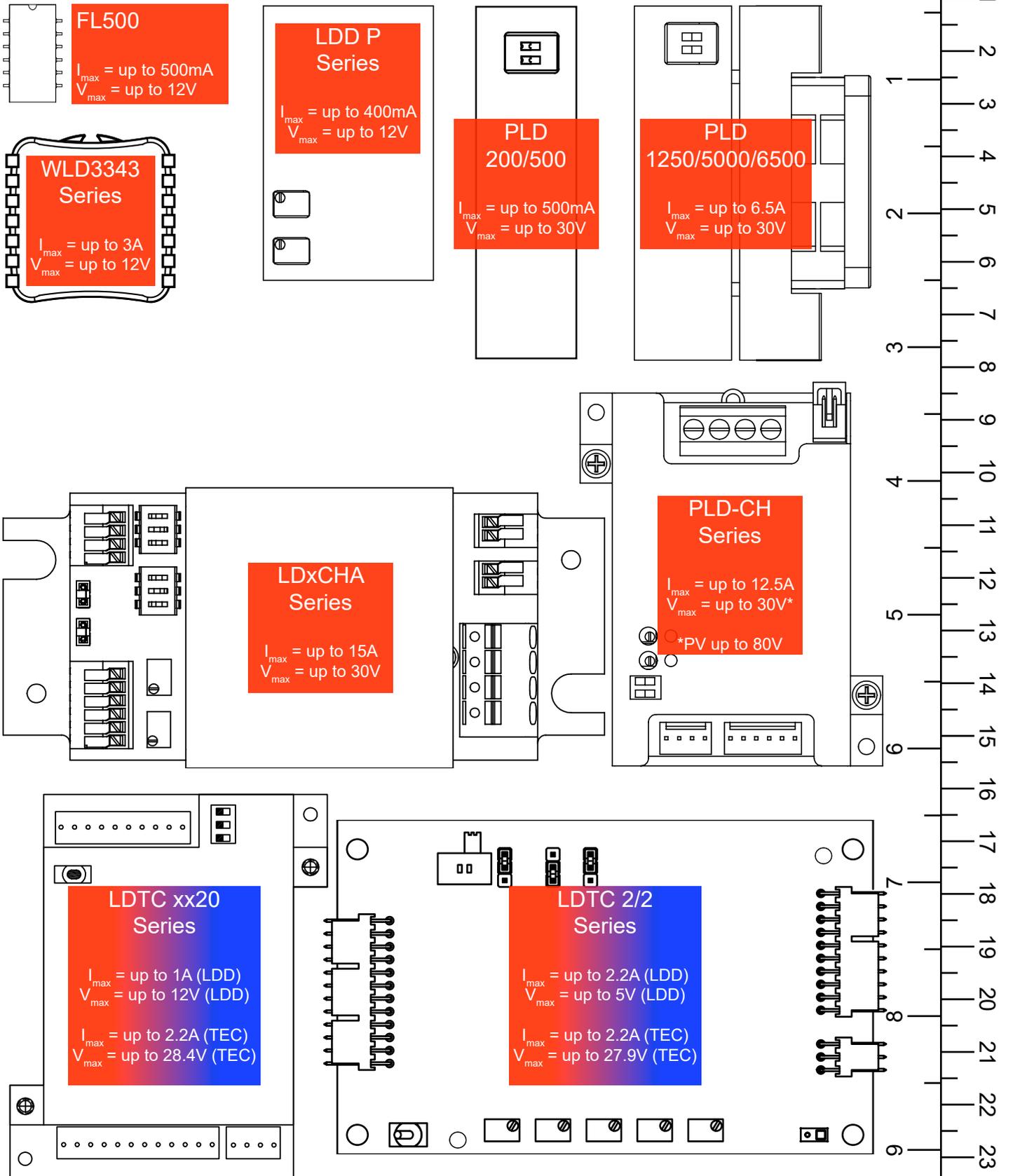
Wavelength Electronics offers many other key features that may influence your product choice.

OTHER KEY FEATURES

- Safety Features (interlock, current limits, temperature limits, etc.)
- Adjustable Compliance Voltage
- Best-in-Class Stability
- Lowest Noise Available With Highest Modulation Bandwidth (QCL)
- Multiple Operation Modes
- LabVIEW Connectivity
- Multiple Interface Options
- Product Variations
- Accessories
- Excellent Technical Support
- On Time Delivery
- OEM Friendly Pricing



LASER DIODE DRIVERS



SUMMARY

The table below outlines the major differences between the different types of products that are available for purchase from Wavelength.

TYPE	SIZE	MOUNT	POWER SUPPLY	CONNECTION	UI
Component*	Smallest	Circuit Board	User-supplied	Pins (to PCB)	Via PCB
Module*	Medium	Benchtop or Chassis	User-supplied	Cables	Via Cables
Instrument	Largest	Benchtop or Rack	AC Wall Power	Cables	Display or Remote

* OEM Products

Table 2. Comparison of packaging sizes for Wavelength products.

If you have needs that are not met by any of our standard products, please contact Technical Support (techsupport@teamwavelength.com), to discuss product variations that best suit your needs.

At Wavelength Electronics, we are committed to producing top of the line products that have best-in-class stability with high precision. Please contact us if you have any other questions.

KEYWORDS

product selection, OEM, components, modules, instruments, laser diode drivers, quantum cascade laser drivers, temperature controllers

REVISION HISTORY

Document Number: AN-LDTC08

REVISION	DATE	NOTES
A	April 2017	Initial Release
B	August 2018	Added LDxCHA