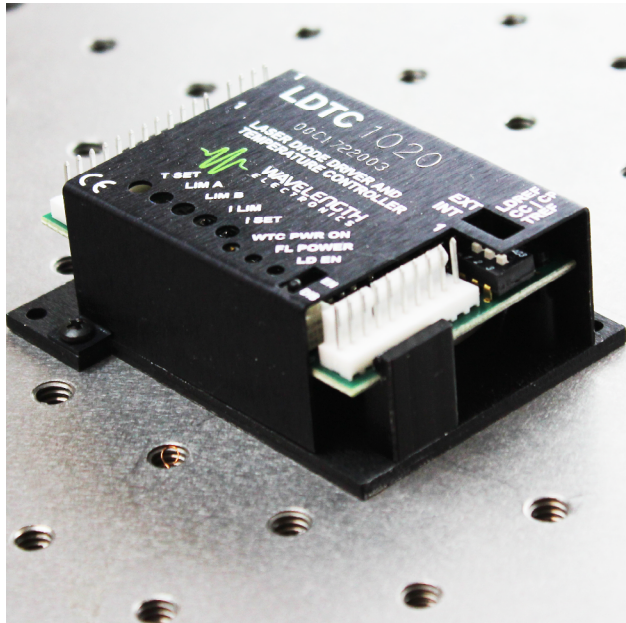


# LDT Series

## Laser Driver & Temperature Controller



### FEATURES

- Laser diode output current of 500 mA or 1 A
- Bipolar output up to  $\pm 2.2$  A for TEC, or unipolar output for resistive heaters
- Our most compact integrated Laser and TEC controller
- Feature-rich for OEM applications
  - » Constant Current or Constant Power laser driver modes
  - » Internal or External setpoint controls
  - » Modulation input up to 500 kHz bandwidth
  - » Monitors for all settings and status values
- Safety features protect the laser diode
  - » Adjustable laser driver current limit
  - » Laser delay and slow-start
  - » Default failsafe temperature setpoint
  - » Brown-out protection
- Robust and compact chassis-mount
- Molex-connectorized cables included
- Custom product variations also available

### PROVEN RELIABILITY SAVES YOU TIME AND MONEY

The LDT Laser Diode Driver and Temperature Controller combines Wavelength's proprietary FL500 and highly stable WTC3243 in one compact module.

LDT modules are in use around the world providing trouble-free reliability in range finders, telecom laser modules, military-aerospace research and development, airborne metrology, academic research, laser diode LIV testers, and more.

### DESIGNED FOR EASY INTEGRATION

The LDT module requires minimal overhead electronics, so your engineers can focus on high-level design features that differentiate you from your competitor.

The compact LDT is easily mounted in your laser system, with latching connectors for easy manufacturing. The flexibility of the LDT design allows the controller to be operated from a single power supply. The power supplies can also be separated, if your application requires higher compliance voltage.

### POWER YOUR APPLICATION WITH THE RIGHT FEATURES

The laser driver is based on our popular FL500, known for low noise output and trouble-free operation. Two models are available, providing either 500 mA or 1.0 A output current. The current limit circuit cleanly clamps laser diode current without ringing or overshoot, and recovers without inducing a phase shift in a modulated laser signal.

The temperature controller is designed around the WTC3243, our ultra-stable temperature control module known for the ability to sweep load temperature across ambient. Independent cooling- and heating-current limits allow the LDT to be used with thermoelectric coolers or resistive heaters and either negative or positive temperature coefficient sensors.

Wavelength has done critical research and design work into safely controlling laser diodes. The result is a module that saves you money in development and manufacturing, and delivers trouble-free service over the life of the system.

### COUNT ON WAVELENGTH ELECTRONICS

You can rely on our experienced Sales Engineers to help you successfully integrate the LDT into your application. Call today or visit our website to learn more.

# LDTc Series

## Laser Driver & Temperature Controller

### LASER DRIVER SPECIFICATIONS

DRIVER OUTPUT CURRENT	LDTc0520	LDTc1020	UNIT	NOTE
Max Output Current	495 to 505	990 to 1010	mA	
Noise and Ripple	7.5	22	µA RMS	$I_{LD} = 100 \text{ mA}$ , 100kHz
<b>STABILITY AT 25°C AMBIENT</b>				
Short Term, 1 hr	35 to 40		ppm	constant current
Long Term, 24 hr	50 to 75		ppm	constant current
Short Term, 1 hr	0.019		%	constant power
Long Term, 24 hr	0.011		%	constant power
Compliance Voltage	$V_{DD-FL} - (0.5 \times V_{EXT LD SET})$		V	$V_{EXT LD SET} = 0 \text{ to } 2 \text{ V}$
Leakage Current	1 0.2 0.3		mA	$V_{EXT LD SET} = 0 \text{ V, output=ON}$ $V_{EXT LD SET} = 0 \text{ V, output=OFF}$ $V_{EXT LD SET} = 2 \text{ V, output=OFF}$
Slow Start Ramp	15		mA/ msec	
<b>EXTERNAL MODULATION</b>				
Modulation Bandwidth (Sinewave)	500		kHz	constant current
Rise Time / Fall Time	300 / 300		nsec	$I_{LD} = 500 \text{ mA}$
Depth of Modulation	99		%	100 kHz sinewave
<b>LASER DRIVER MAXIMUM RATINGS</b>		<b>VALUE</b>	<b>UNIT</b>	<b>NOTE</b>
Power Supply Voltage ( $V_{DD-FL}$ )		3 to 12	VDC	
Internal Power Dissipation, LDTc0520		2	W	at 25°C
Internal Power Dissipation, LDTc1020		4	W	at 25°C

### TEMPERATURE CONTROLLER SPECIFICATIONS

DRIVER OUTPUT CURRENT	MIN	TYP	MAX	UNIT	NOTE
Max Output Current	± 2.0		± 2.2	A	
Setpoint vs. Actual Temp. Accuracy	0.1	2	4	mV	$T_{SET} = 25^\circ\text{C}$ , 10 kΩ thermistor
Short Term Stability, 1 hr	0.001	0.002	0.010	°C	OFF ambient, 10kΩ thermistor @25°C
Long Term Stability, 24 hr	0.003	0.008	0.010	°C	
Output Compliance Voltage	$V_S - 0.7$	$V_S - 0.5$		V	100 mA output
Output Compliance Voltage	$V_S - 1.8$	$V_S - 1.6$		V	2 A output
Sensor Compatibility	Thermistor, RTD, IC Sensors				
Sensor Voltage Range	0.3 to ( $V_{DD-WTC} - 2.0$ )			V	
<b>EXTERNAL SETPOINT INPUT</b>					
External $T_{SET}$ Input Range	0 to 3.3			V	
Damage Threshold	0 to 3.6			V	
Input Impedance	1			MΩ	
<b>TEMP. CONTROLLER MAX RATINGS</b>		<b>VALUE</b>	<b>UNIT</b>	<b>NOTE</b>	
TC Power Supply Voltage ( $V_{DD-WTC}$ )		4.5 to 12	VDC		
TEC Supply Voltage ( $V_S$ )		4.5 to 30	VDC		
Internal Power Dissipation		9	W	at 25°C	

### MODULE SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS	VALUE	UNIT	NOTE		
Case Operating Temperature	-40 to 85	°C			
Storage Temperature	-55 to 125	°C			
Weight (LDTc0520 / LDTc1020)	3.04 / 3.13	oz	86.2 g / 88.7 g (LDTc0520 / LDTc1020)		
Size	2.9 x 2.35 x 1.08	in	73.6 x 59.7 x 27.3 mm		
POWER SUPPLY REQUIREMENTS	MIN	TYP	MAX	UNIT	NOTE
Laser Driver Voltage ( $V_{DD-FL}$ )	3 to 12			VDC	
$V_{DD-FL}$ Quiescent Current, LDTc0520	2.2		4.6	mA	
$V_{DD-FL}$ Quiescent Current, LDTc1020	4.4		9.2	mA	
Temp. Controller Supply Voltage ( $V_{DD-WTC}$ )	4.5 to 12			VDC	
$V_{DD-WTC}$ Quiescent Current		55	105	mA	$V_{DD-FL}$ , $V_{DD-WTC}$ , and $V_S$ can be tied and operated from a single power supply if the laser diode and thermoelectric cooler specifications and pin configuration allow it. Review Safe Operating Area design criteria if any operating voltages will exceed 5 VDC.
TEC Supply Voltage ( $V_S$ )	4.5 to 30			VDC	
$V_S$ Quiescent Current	20	50	100	mA	

Additional specifications are available in the product datasheet; download at <https://www.teamwavelength.com/download/Datasheets/ldtc1020.pdf>

### ORDERING INFORMATION

PART NUMBER	DESCRIPTION
LDTc0520	500 mA Laser / ± 2.2 A TEC Controller
LDTc1020	1.0 A Laser / ± 2.2 A TEC Controller
USBKIT	USB Interface kit, with software

Free, effective, and responsive technical support is available to simplify integration of Wavelength products into your OEM design. Standard product can be modified to meet your unique application requirements.

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