

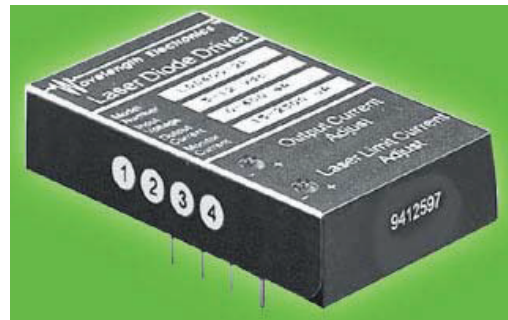


**WAVELENGTH
ELECTRONICS**

January, 2013

LDD P Series Laser Diode Drivers

Low Noise Driver for Laser Diodes



GENERAL DESCRIPTION:

The LDD P Series of laser diode drivers come in three compact models to work with all laser diode / photodiode configurations. Each model is available in 200 mA and 400 mA versions to best fit your laser diode requirements.

When it is essential to have high performance in your application, these low noise drivers offer excellent current stability in constant current mode or power stability in constant power mode.

Precisely control the laser diode or photodiode setpoint current with the on-board Output Current Adjust trimpot or via a remote voltage to the modulation input. The modulation input's small signal 3 dB bandwidth is DC to 2 MHz in constant current mode and dependent on photodiode speed in constant power mode.

Measure laser diode and photodiode current from two buffered monitor outputs.

Optional evaluation boards are available to assist with operating and evaluating any LDD P series module.

FEATURES:

- Up to 400 mA Current Drive Capacity
- Operates in Constant Current or Constant Power Modes
- +5 to +12 V single supply operation
- Output power stability <0.02% typical (24 hours, ambient conditions)
- 12-Turn Trimpots control Current Setpoint and Limit Setpoint
- Operates all low power Laser Diodes
- Constant Current Modulation to 2 MHz
- Slow start circuitry
- Buffered Measurement Outputs

Online Design Tools at
www.teamwavelength.com

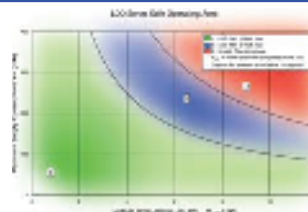
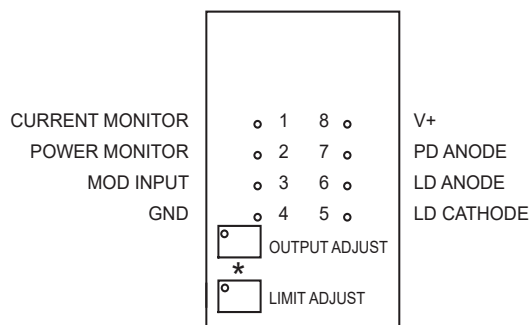


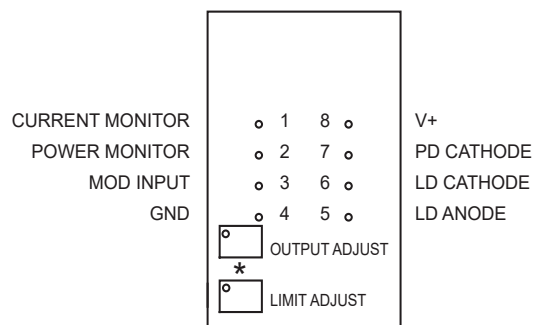
Figure 1
Top View Pin Layout
and Descriptions

TOP VIEW

LDD 1P or LDD 3P



LDD 2P



* Trimpots shown for proper orientation

ELECTRICAL AND OPERATING SPECIFICATIONS PAGE 4

ABSOLUTE MAXIMUM RATINGS	SYMBOL	VALUE	UNIT
Supply Voltage (Voltage on Pin 8)	V _{DD}	+5 to +12.5	Volts DC
Output Current (See SOA Chart)	I _{LD}	200 or 400	mA
Power Dissipation, T _{AMBIENT} = +25°C ^[1]	P _{MAX}	1 or 2	Watts
Operating Temp- case, T _{AMB} = +25°C ^[1]	T _{OPR}	0 to + 50	°C
Storage Temperature	T _{STG}	- 40 to +125	°C
Weight		< 1	oz
Soldering Temp		260°C (10 secs)	

PARAMETER	A or B		A or B		C	
For Laser Type						
MODEL NUMBER	LDD200-1P	LDD400-1P	LDD200-3P	LDD400-3P	LDD200-2P	LDD400-2P
CONSTANT CURRENT CONTROL	0 - 200 mA	0 - 400 mA	0 - 200 mA	0 - 400 mA	0 - 200 mA	0 - 400 mA
Temperature Coefficient	< 100 ppm / °C		< 100 ppm / °C		< 100 ppm / °C	
Long Term Stability, 24 hours ^[2]	< 50 ppm		< 50 ppm		< 50 ppm	
Noise and Ripple (rms) ^[3]	< 5 µA		< 5 µA		< 5 µA	
Current Limit Range	0 - 200 mA	0 - 400 mA	0 - 200 mA	0 - 400 mA	0 - 200 mA	0 - 400 mA
Current Monitor Transfer Function	80 mA / V	160 mA / V	80 mA / V	160 mA / V	80 mA / V	160 mA / V
CONSTANT POWER CONTROL						
Photodiode Range	15-2500 µA		5-125 µA		15-2500 µA	
Power Stability, 24 hours ^[2]	< 0.02%		< 0.02%		< 0.02%	
Power Monitor Transfer Function	1000 µA / V		50 µA / V		1000 µA / V	
MODULATION						
Input Impedance	1 MΩ		1 MΩ		1 MΩ	
Depth of Modulation (at 10kHz) ^[4]	90%		90%		90%	
Constant Current						
Bandwidth, small signal sine wave 3dB	up to 2 MHz		up to 2 MHz		up to 2 MHz	
Transfer Function [LD]	-40 mA / V -80 mA / V		-40 mA / V -80 mA / V		-40 mA / V -80 mA / V	
Constant Power						
Bandwidth, Constant Power ^[5]	Depends on PD		Depends on PD		Depends on PD	
Transfer Function [PD]	-500 µA / V		-25 µA / V		-500 µA / V	
Mod Input Safe Range	-0.5V < ModIn < V _{DD} + 0.5V		-0.5V < ModIn < V _{DD} + 0.5V		-0.5V < ModIn < V _{DD} + 0.5V	
POWER SUPPLY						
Voltage, V _{DD} , min	5 V		5 V		5 V	
Voltage, V _{DD} , max	12 V		12 V		12 V	
Current, V _{DD} supply, quiescent	50 mA		50 mA		50 mA	
Power Up Trip Point ^[6]	4.9 V		4.9 V		4.9 V	
Power Down Trip Point ^[6]	4.2 V		4.2 V		4.2 V	
Setpoint vs. Monitor Accuracy	< 5%		< 5%		< 5%	
Warm-up to rated accuracy	1 hour		1 hour		1 hour	

[1]. Maximum Operating Power derates above 25°C. The online Safe Operating Area (SOA) Chart includes this derating. <http://www.teamwavelength.com/support/calculator/soa/soald.php>

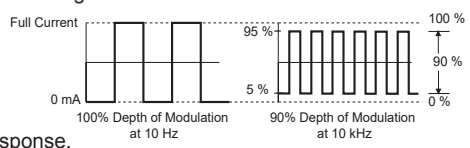
[2]. Stability tests were performed in an ambient air environment.

[3]. Laser diode forward current noise. Test was performed by measuring the AC voltage across a 50 Ω metal film resistor in series with a laser diode.

[4]. As squarewave modulation frequency increases, the peak-to-peak output amplitude diminishes. For example, these graphs show the waveform shape at 10 Hz and 10 kHz. Depth of modulation continues to decrease after 10 kHz.

[5]. Modulation bandwidth in constant power mode depends on photodiode response.

[6]. The LDD P Series has internal control circuitry which turns the output on and off depending on the voltage at pin 8. When the voltage reaches the power up trip point, the module soft starts the laser diode. When the voltage reaches the power down trip point, the module shunts current around the laser diode, powering it down in a controlled fashion.



PIN DESCRIPTIONS

LDD 1 P AND LDD 3P

Pin #	Name	Function
1	CURRENT MONITOR	Current Monitor (measures Laser Diode current). 0 to 2.5 V range.
2	POWER MONITOR	Power Monitor (measures Photodiode current). 0 to 2.5 V range.
3	MOD INPUT	Inverting modulation input. 0 to 5 V range.
4	GND	Power supply and monitor common connection.
5	LD CATHODE	Laser Diode Cathode.
6	LD ANODE	Laser Diode Anode. (Pin 6 internally shorted to pin 8.)
7	PD ANODE	Photodiode Anode.
8	V+	Power supply voltage connection. (Pin 6 internally shorted to pin 8.) Supply range: +5 V to +12 VDC

LDD 2 P

Pin #	Name	Function
1	CURRENT MONITOR	Current Monitor (measures Laser Diode current). 0 to 2.5 V range.
2	POWER MONITOR	Power Monitor (measures Photodiode current). 0 to 2.5 V range.
3	MOD INPUT	Inverting modulation input. 0 to 5 V range.
4	GND	Power supply and monitor common connection. (Pin 4 internally shorted to pin 6.)
5	LD ANODE	Laser Diode Anode.
6	LD CATHODE	Laser Diode Cathode. (Pin 6 internally shorted to pin 4.)
7	PD CATHODE	Photodiode Cathode.
8	V+	Power supply voltage connection. Supply range: +5 V to +12 VDC

ORDERING INFORMATION

LDD - MODEL	200 - LASER DIODE CURRENT RANGE	1 PHOTODIODE CURRENT RANGE & LASER DIODE PIN CONFIGURATION	P FUNCTIONS
	200 = 0 to 200 mA 400 = 0 to 400 mA	1 = 50 to 2500 μ A (Type A or B lasers) 2 = 50 to 2500 μ A (Type C lasers) 3 = 5 to 125 μ A (Type A or B lasers)	P = Laser Diode Current Limit & Analog Modulation Input



*Evaluation Board and Cable**

Laser Type	Model Number	Description
A, B, or C	LDDPCB-P	Evaluation Board
A, B or C	LDDCAB-50	50 cm cable with 3-pin teflon connector

*LDD P sold separately