January, 2013



WAVELENGTH

# 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</li> (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







ELECTRICAL AND OPERATING SPECIFICATIONS PAGE 4								
ABSOLUTE MAXIMUM RATINGS								
RATING	SYMBOL		VALUE		l	UNIT		
Supply Voltage (Voltage on Pin 8)	V <sub>DD</sub>		+5 to +12.5			Volts DC		
Output Current (See SOA Chart)	I <sub>LD</sub>		200 or 400			mA		
Power Dissipation, T <sub>AMBIENT</sub> = +25°C <sup>[1]</sup>	P <sub>MAX</sub>		1 or 2		'	Watts		
Operating Temp- case, T <sub>AMB</sub> = +25°C <sup>[1]</sup>	T <sub>OPR</sub>		0 to + 50			°C		
Storage Temperature	T <sub>STG</sub>		- 40 to +125			°C		
Weight			< 1		-	oz		
Soldering Temp			260	260°C (10 secs)				
PARAMETER								
For Laser Type	A or B			A or		3	С	
MODEL NUMBER	LDD200-1P	-1P LDD400-1P		LDD200-3P L		D400-3P	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		/ °C	< 100 ppm / °C	
Long Term Stability, 24 hours [2]	< 50 ppm			< 50 pr		n	< 50 ppm	
Noise and Ripple (rms) [3]	< 5 μA			< 5 µ/			< 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		A	15-25	00 μA
Power Stability, 24 hours [2]	< 0.02%			< 0.02		/o	< 0.02%	
Power Monitor Transfer Function	1000 μA / V			50 μA / V		V	1000 μA / V	
MODULATION								
Input Impedance	1 MΩ			1 MΩ			1 MΩ	
Depth of Modulation (at 10kHz) <sup>[4]</sup>	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 <sup>[5]</sup>	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 + 0		0.5V	V -0.5V < ModIn < V <sub>pp</sub> + 0.5V			-0.5V < ModIn < V <sub>DD</sub> + 0.5V	
POWER SUPPLY		00				00		00
Voltage, V <sub>DD</sub> , min	5 V			5 V			5 V	
Voltage, V <sub>DD</sub> , max	12 V			12 V		12 V		2 V
Current, V <sub>DD</sub> supply, quiescent	50 mA			50 mA			50	mA
Power Up Trip Point <sup>[6]</sup>	4.9 V			4.9 V			4.9	θV
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	
<ul> <li>[1]. Maximum Operating Power derates above 25°C. The online Safe Operating Area (SOA) Chart includes this derating. <u>http://www.teamwavelength.com/support/calculator/soa/soald.php</u></li> <li>[2]. Stability tests were performed in an ambient air environment.</li> <li>[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.</li> <li>Full Current [100 %]</li> </ul>								

[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. Current 0 mA 100% Depth of Modulation at 10 Hz 0 % Depth of Modulation 0 % Depth of Modulation 0 % Depth of Modulation

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

#### **PIN DESCRIPTIONS**

PAGE 5

LDD P Series

# 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**

