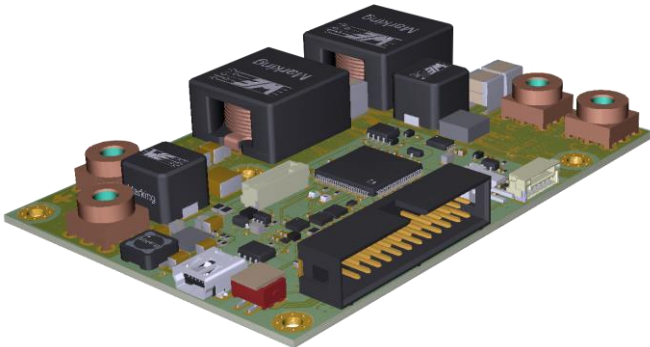


**Advanced OEM CW Laser Diode Driver  
with Laser Power Control [LPC optional]**



**Features**

**Laser Diode Driver:**

- Output Current: 0-20 A, <0.2% Ripple
- Compliance Voltage: 1.5-45 V
- Temperature Coefficient: Typ: 20 ppm/K
- CW Current Resolution: 1.8 mA

**Laser Power Control (LPC): [LPC option]**

- CW Laser Power Control: Configurable PID
- Start up phase: Fully parameterizable
- LPC Feedback.  $PD_{Current}$ : up to 4 mA

**Main Features:**

- Internal Generators: Nominal Current, Limited Modulation capabilities
- Error: Ultra-Fast Switch-off for optimal LD protection
- Configuration / Diagnosis: on PC (via USB / RS485)
- Dimensions (L x W x H): 90 mm x 75 mm x 25 mm
- Efficiency: >95% (@ >50% Load)
- Cooling: over Base Plate

**Interfaces**

- USB 2.0
- RS485
- RS232 TTL
- CAN
- 2x NTC for LD or Heatsink Temp.

**Digital I/O, 3.3 V**

- Pulse Input
- Interlock (Enable)
- 0-10V Analog Input
- 0-10V analog Output
- And more configurable functions

Absolute Maximum Ratings	
Supply voltage (DC)	53 V
Supply current (DC)	19 A
Output current	20 A
Output voltage	V <sub>IN</sub>

Operating Ratings	
System base plate	< 50°C
Operation temperature	0 – 50°C
Storage	-40 – 80°C
Humidity	5 – 95%, non-condensing

### Electrical Characteristics

Unless otherwise noted: T<sub>A</sub> = 25°C, V<sub>IN</sub> = 48 V, V<sub>LD</sub> = 40 V

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>DC Power Supply Input:</b>						
V <sub>IN</sub>	Supply voltage		10.5	48	53	V
V <sub>IN_RIPPLE</sub>	Ripple tolerance				200	mV <sub>PP</sub>
<b>System Characteristics:</b>						
η <sub>50%</sub>	Power efficiency	@ 50% load		96		%
η <sub>90%</sub>	Power efficiency	@ 90% load		95		%

### Output Characteristics

Unless otherwise noted: T<sub>A</sub> = 25°C, V<sub>IN</sub> = 48 V, V<sub>LD</sub> = 40 V

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Output CW:</b>						
I <sub>OUT</sub>	Current range	When V <sub>OUT</sub> ≤ 40 V	0		20	A
I <sub>OUT</sub>	Current range	When V <sub>OUT</sub> > 40 V	0		12	A
T <sub>coefficient</sub>	Temp. coefficient	I <sub>out</sub> = 20 A, T <sub>A</sub> = 25°C - 50°C		??	??	ppm/K
I <sub>OUT_RES</sub>	Current resolution			1.8		mA
I <sub>OUT_RIPPLE</sub>	Current ripple	I <sub>out</sub> > 2A		25	40	mA
I <sub>OUT_ACC</sub>	Current Accuracy	Calibrated		30	50	mA
V <sub>OUT_MAX</sub>	Diode voltage	V <sub>IN</sub> = 48V	1.5	40	45	V
V <sub>OUT_LIMIT</sub>	Output voltage			V <sub>IN</sub> - 4		V
V <sub>OUT_ACC</sub>	Voltage accuracy	Calibrated		60	100	mV
P <sub>OUT</sub>	Output power	V <sub>LD</sub> = 60 V			800	W
I <sub>OUT_Rise</sub>	Output current rise time	I <sub>out</sub> > 20 A			500	ms

### Safety Characteristics

Unless otherwise noted: T<sub>A</sub> = 25°C, V<sub>IN</sub> = 24 V, V<sub>LD</sub> = 10 V

Symbol	Parameter	Comments	Min	Typ	Max	Units
<b>I/O Ports:</b>						
t <sub>OFF_CURRENT</sub>	Overcurrent			20	50	μs
t <sub>OFF_OPVAL</sub>	Operating Values	Voltages, currents		50		μs
t <sub>OFF_SFAL</sub>	System failure	System status		50		μs

### Laser Diode Temperature Measurement (NTC only)

T<sub>A</sub> = 25 °C, measurement configuration = 12 bit / 2-wire / unshielded cable <50 mm, °T probe = NTC B<sub>25/100</sub> 3988K R<sub>25</sub> 10k

Symbol	Parameter	Test Conditions / Hints	Min	Typ	Max	Units
R <sub>LR_RANGE</sub>	Range	Corresponding temperature range	50	214 to -8.1	49781	Ω °C

**General Purpose Digital I/O Characteristics (GPIO1 ... GPIO10)**

Unless otherwise noted: T<sub>A</sub> = 25°C

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>Input Characteristics:</b>						
U <sub>IH</sub>	Logic high input threshold		2.38			V
U <sub>IL</sub>	Logic low input threshold				0.93	V
U <sub>IMAX</sub>	Maximum input voltage		-0.5		5.5	V
<b>Output Characteristics:</b> (Microprocessor)						
U <sub>OH</sub>	Logic high output voltage	Output current 8mA	2.8		3.3	V
U <sub>OL</sub>	Logic low output voltage	Input current 8mA			0.4	V
Z <sub>OUT</sub>	Output Impedance		110	120	150	Ω
I <sub>OUT</sub>	Output Sink or Source Current			±8	±20	mA
<b>ESD Protection:</b> (Between Processor and Connector)						
UPP	ESD discharge	IEC61000-4-2		18		kV
	Series resistance		85	100	115	Ω

*Laser diode, temperature probes, power supply and connectors not included.*

**Current-Controlled Operation-Modes and Communication Option**

The LDD-1301 is an OEM high performance current source that is primarily designed to operate in CW mode. It is configured over an industry-standard RS485 or a USB connection, either GUI-driven using the included LDD Service Software, or by direct parameter control using the predefined communication protocol. Basic system status is visually indicated by on-board LEDs, more detailed status information can be polled at any time. The LDD-1301 can operate in a stand-alone configuration as well as in a remotely-controlled manner, with parameters adjusted on the fly. The laser diode driver is current-PID-controlled.

Configuration parameters further include: control source selection, maximum current limits, nominal current ramping, PID controller settings, NTC temperature sensor modeling coefficients, measurement circuitry calibration, error thresholds, etc. Please refer to the user manual for further information.