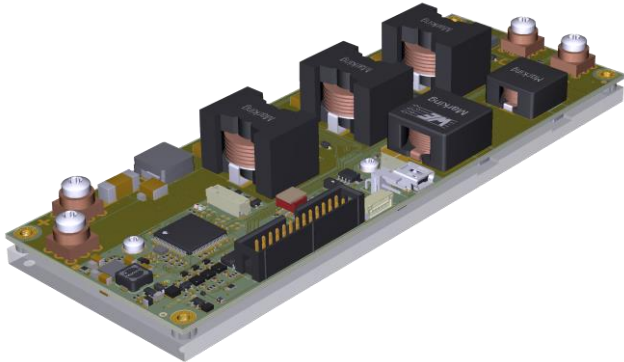


Advanced OEM CW Laser Diode Driver with Laser Power Control [LPC optional]



Features

Laser Diode Driver:

- Output Current: 0-20 A, <0.2% Ripple
- Compliance Voltage: 5-120V
- 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): 190 mm x 70 mm x 28 mm
- Efficiency: >90% (@ >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)	50 A
Output current	20 A
Output voltage	120 V

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: $T_A = 25^\circ\text{C}$, $V_{IN} = 48\text{ V}$, $V_{LD} = 40\text{ V}$

Symbol	Parameter	Conditions	Min	Typ	Max	Units
DC Power Supply Input:						
V_{IN}	Supply voltage		10.5	48	53	V
V_{IN_RIPPLE}	Ripple tolerance				200	mV _{PP}
System Characteristics:						
$\eta_{50\%}$	Power efficiency	@ 50% load		94		%
$\eta_{90\%}$	Power efficiency	@ 90% load		90		%

Output Characteristics

Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{IN} = 48\text{ V}$, $V_{LD} = 40\text{ V}$

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Output CW:						
I_{OUT}	Current range		0		20	A
$T_{\text{coefficient}}$	Temp. coefficient	$I_{out} = 20\text{ A}$, $T_A = 25^\circ\text{C} - 50^\circ\text{C}$??	??	ppm/K
I_{OUT_RES}	Current resolution			1.8		mA
I_{OUT_RIPPLE}	Current ripple	$I_{out} > 2\text{ A}$		25	40	mA
I_{OUT_ACC}	Current Accuracy	Calibrated		30	50	mA
V_{OUT_MAX}	Diode voltage	$V_{IN} = 48\text{ V}$	10		120	V
V_{OUT_LIMIT}	Output voltage			120		V
V_{OUT_ACC}	Voltage accuracy	Calibrated		100	300	mV
P_{OUT}	Output power	$V_{LD} = 60\text{ V}$			800	W
I_{OUT_Rise}	Output current rise time	$I_{out} > 20\text{ A}$			500	ms

Safety Characteristics

Unless otherwise noted: $T_A = 25^\circ\text{C}$, $V_{IN} = 24\text{ V}$, $V_{LD} = 10\text{ V}$

Symbol	Parameter	Comments	Min	Typ	Max	Units
I/O Ports:						
$t_{OFF_CURRENT}$	Overcurrent			60	80	μs
t_{OFF_OPVAL}	Operating Values	Voltages, currents		100		μs
t_{OFF_SFALL}	System failure	System status		100		μs

Laser Diode Temperature Measurement (NTC only)

$T_A = 25^\circ\text{C}$, measurement configuration = 12 bit / 2-wire / unshielded cable <50 mm, °T probe = NTC B_{25/100} 3988K R₂₅ 10k

Symbol	Parameter	Test Conditions / Hints	Min	Typ	Max	Units
R_{LR_RANGE}	Range	Corresponding temperature range	50	214 to -8.1	49781	Ω °C

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

Unless otherwise noted: $T_A = 25^\circ\text{C}$

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Input Characteristics:						
U_{IH}	Logic high input threshold		2.38			V
U_{IL}	Logic low input threshold				0.93	V
U_{IMAX}	Maximum input voltage		-0.5		5.5	V
Output Characteristics: (Microprocessor)						
U_{OH}	Logic high output voltage	Output current 8mA	2.8		3.3	V
U_{OL}	Logic low output voltage	Input current 8mA			0.4	V
Z_{OUT}	Output Impedance		110	120	150	Ω
I_{OUT}	Output Sink or Source Current			± 8	± 20	mA
ESD Protection: (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-1303 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-1303 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.