

Laser Diode/TEC Controllers–Compact



up to 1A laser current, , constant current/power mode, up to 2A TEC current, ultra-stable feedback control

DATASHEET

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Features

- Compact
- Easy to User
- LD Current up to 1A
- Compatible with All Laser Types
- Adjustable Laser Diode Current
- Constant Current or Constant Power
- Ultra-Stable Feedback Control

Applications

- Laser Modules
- Laboratory Use
- Systems



Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 μ m. Maximum power = 30 mW.

Rev 01/06/26

This LDCD series of Compact Laser Diode Driver and TEC Temperature Controller is based on a proven design that have wide deployments. The module provides a low noise laser driving current up to 1A, and TEC colling current up to 2A. It is designed for easy integration into your laser system: 1) connect the LDCD to a DC power supply using the accompanied cable with a connector, 2) select a mounting hardware for your type of laser and connect to the LDCD with the prefabricated latching connector. The setups are detailed in the following pages. The laser controller setting adjustments are straightforward with turning pots, once the limits have been set to protect the laser.

Specifications

Parameter	Min	Typical	Max	Unit
Output Laser Control Current			1	A
Noise Ripple		150	180	μ A RMS
Stability ^[1]	1hr	0.08		%
	24hr	0.04		
Slow Start Ramp	15			mA/ msec
External Modulation Bandwidth ^[1]	DC		500	kHz
External Modulation Depth ^[2]	97			%
External Modulation Rise/Fall ^[3]	300		-	ns
Power Supply Voltage	4.5	5	6	V
Power Supply Current			6	A
Internal Power Dissipation ^[4]			2	W
Operating Temperature	-40		80	$^{\circ}$ C
Storage Temperature	-60		85	$^{\circ}$ C
TEC Control Current			2.2	A
Lase Temperature Stability ^[4]	0.02		0.3	$^{\circ}$ C

Notes:

- [1] Constant current
- [2] 100kHz since wave
- [3] laser current 500 mA
- [4] 25 $^{\circ}$ C



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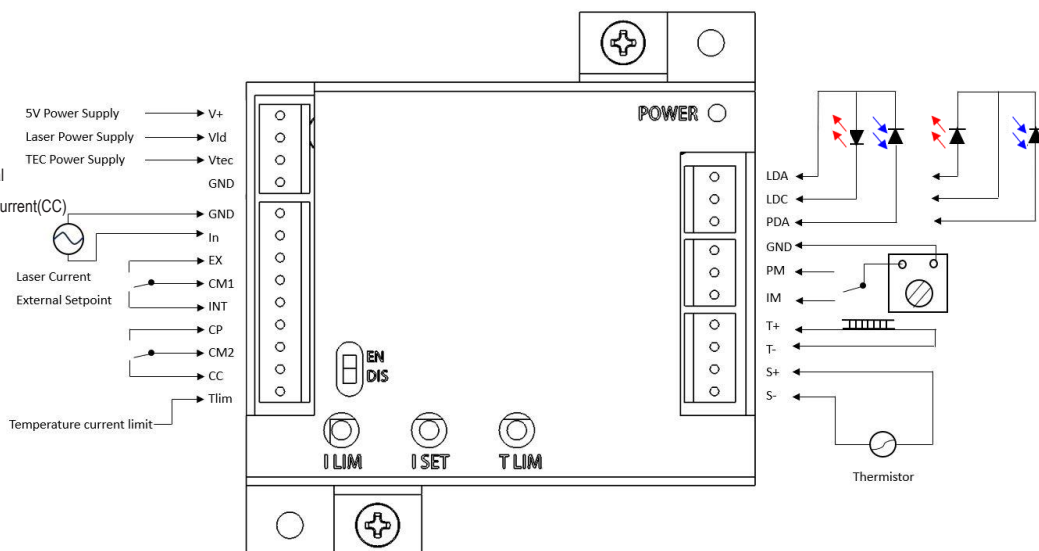


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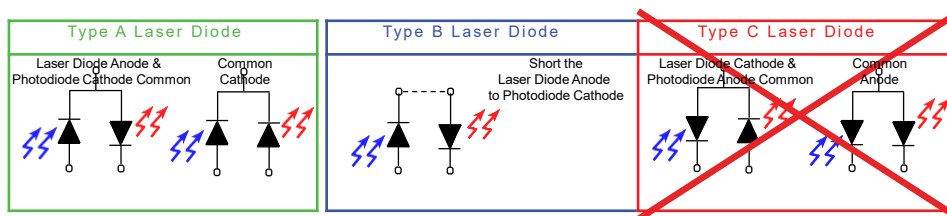
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Connection Guide

- V+ controller power supply
- Vld laser power supply, if <5V connect to V+
- Vtec TEC power supply, if <5V connect to V+
- CM1 laser setting selection: external or internal
- In external laser setting input (0-2V) 0-100%, if CM1 is set as external
- CM2 laser control mode selection: constant power(CP), or constant current(CC)
- Tlimit external TEC current setting
- LDA laser diode anode
- LDC laser diode cathode
- PDA power detector anode
- PM laser power monitor
- IM laser current monitor
- T+ TEC positive connection ($R \sim 1 \Omega$, $>10W$)
- T- TEC negative connection ($R \sim 1 \Omega$, $>10W$)
- S+ thermistor positive connection ($R \sim 10k\Omega$, $>0.25W$)
- S- thermistor negative connection ($R \sim 10k\Omega$, $>0.25W$)



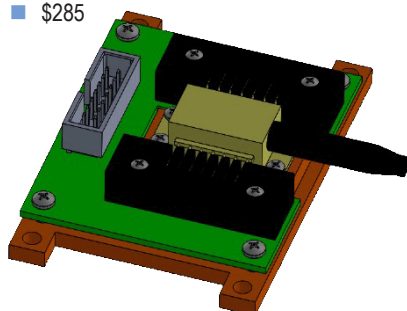
Note: only suitable to driver lasers with connection type of A and B of both butterfly and TOCAN packages



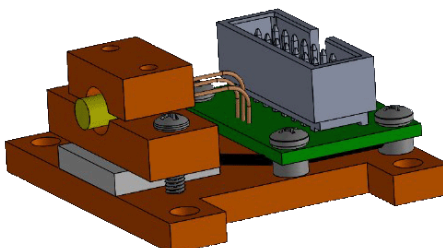
Laser Mounts

Note: we offer laser mounts for butterfly, DIL, and TOCAN packages with cable direct connect to the LDCD laser driver module

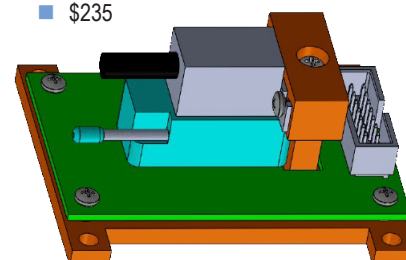
- Butterfly
- Cable included
- Bottom to heat sink
- \$285



- TOCAN
- Cable included
- Bottom to heat sink
- \$145



- 14-pin DIL
- Cable included
- Bottom to heat sink
- \$235



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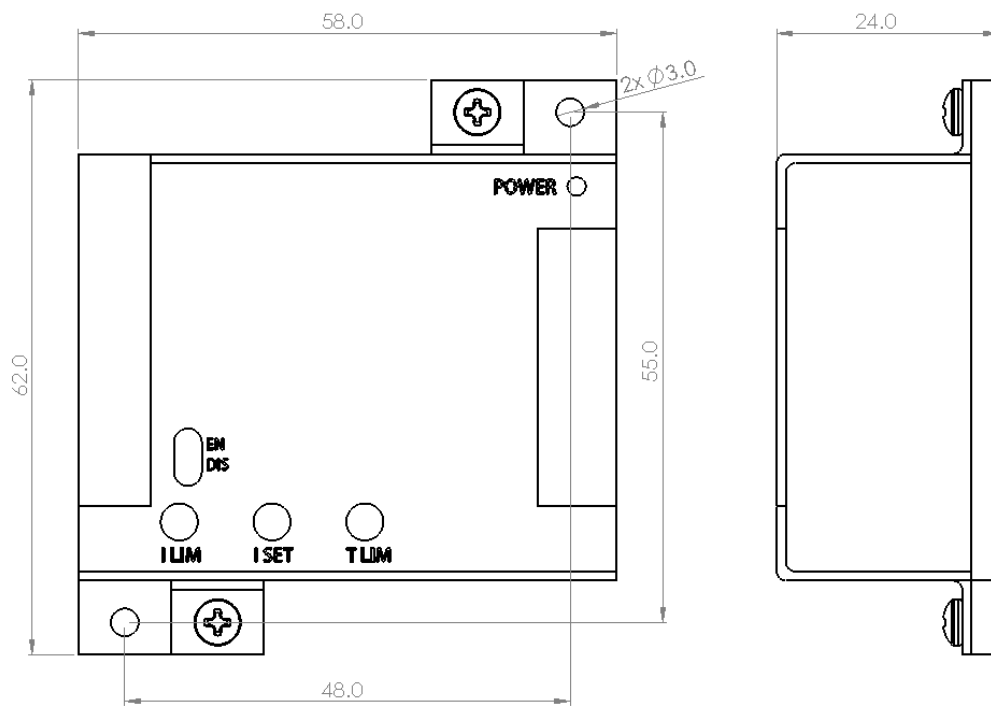


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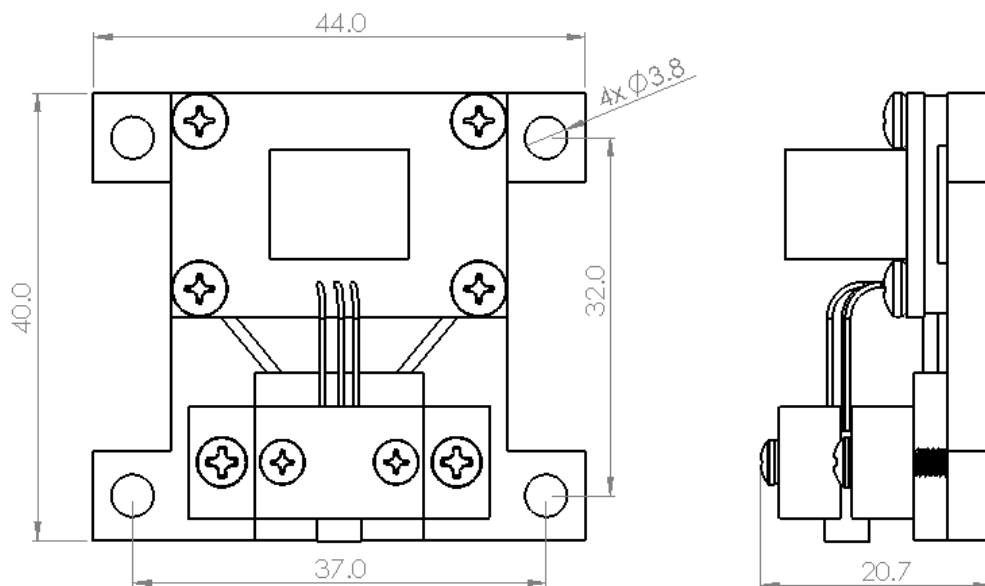
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Mechanical Dimensions (mm)

Laser Control Kit



TO Can Laser Mounting



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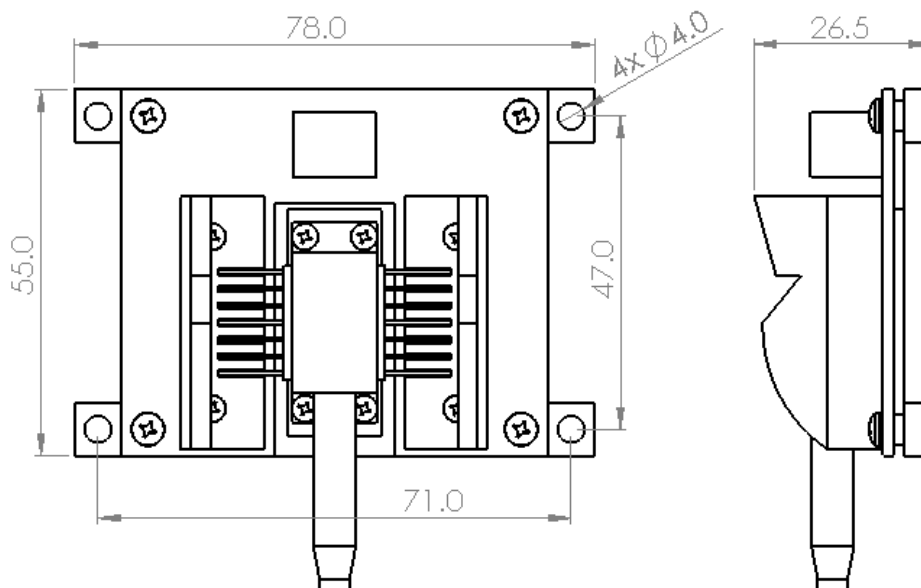


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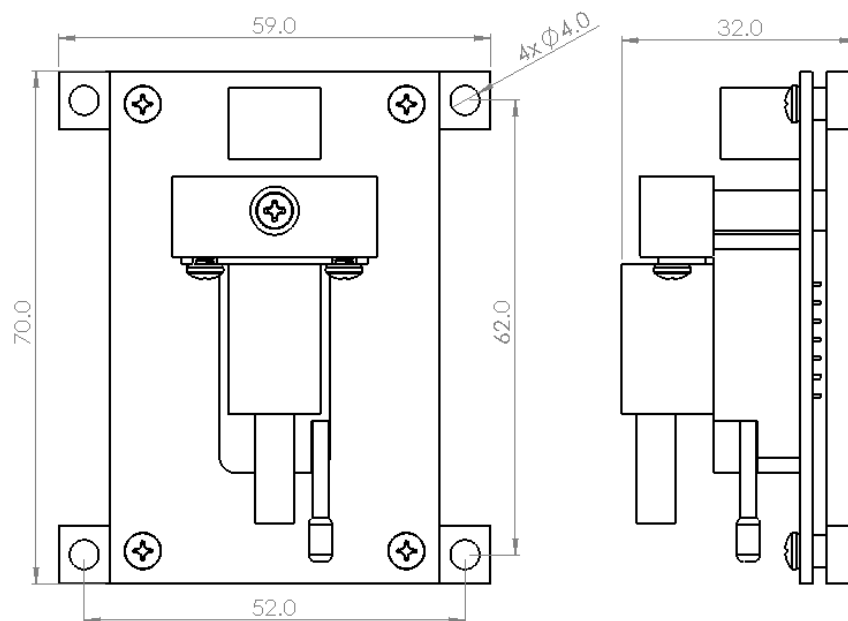
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Mechanical Dimensions (mm)

Butterfly Laser Mounting



DIL Laser Mounting



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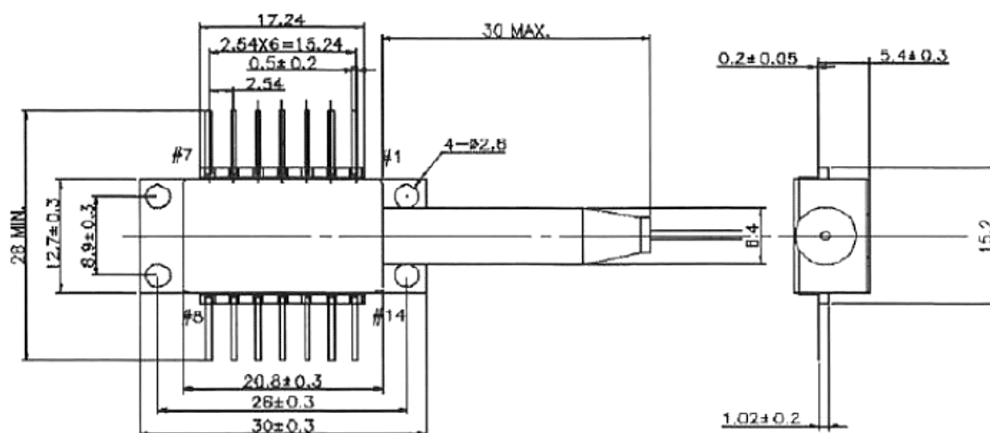


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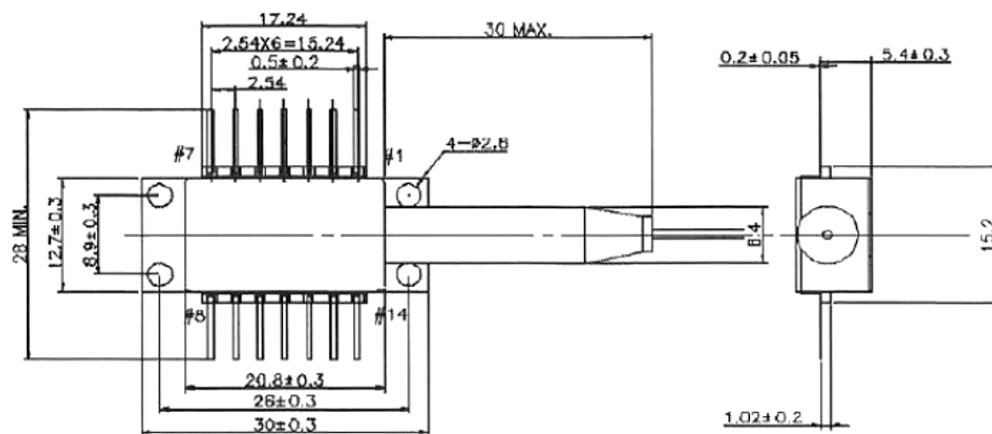
Butterfly LD A&B Pin Map

PIN	Connection
1	TE Cooler (+)
2	Thermistor
3	PD Anode (+)
4	PD Cathode (-)
5	Thermistor
10	LD Anode (+)
11	LD Cathode (-)
14	TE Cooler (-)



Type A

PIN	Connection
1	Thermistor
2	Thermistor
3	LD Cathode (-)
4	PD Anode (+)
5	PD Cathode (-)
6	TE Cooler (+)
7	TE Cooler (-)
13	LD Anode (+)



Type B

TOP VIEW

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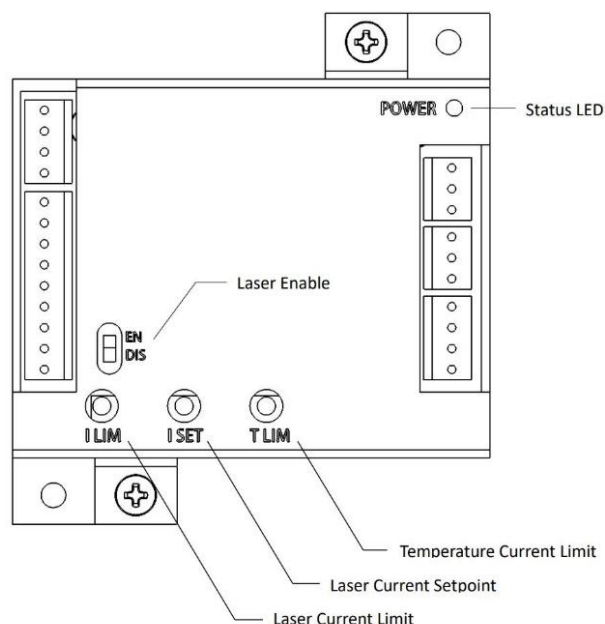


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Manual Setting

- EN/DIS Enable or Disable Laser Emission
- LLIM Hard Setting the Maximum Laser Current Limit
- ISET Set the Laser Current for Internal Control Mode (CM1 is set Internal)
- TLIM Hard Setting the Maximum TEC Current



Ordering Information (Part Number) System

Prefix	Configuration	Laser Current	TEC Current	Type	Package	Power Supply	Laser Mount
LDCk-	Standard = 1 Special = 0	1A = 1 Special = 0	2.2A = 1 Special = 0	Standard = 11 Special = 00	Module = 1 Benchtop = 2 Special = 0	Non = 00 Yes = 11	None = 0 TOCAN A = 1 Butterfly A = 2 Butterfly B = 3 Butterfly C = 4 TOCAN B = 5 DIL A = 6 DIL B = 7

Red is non-standard specially made at a higher cost

Caution Extremely Electrostatic Sensitivity



- Never touch laser diode and the module using hands
- Always use protections when handle a laser diode
- Recommend mounting the laser diode using an ionic gun and ESD finger cots



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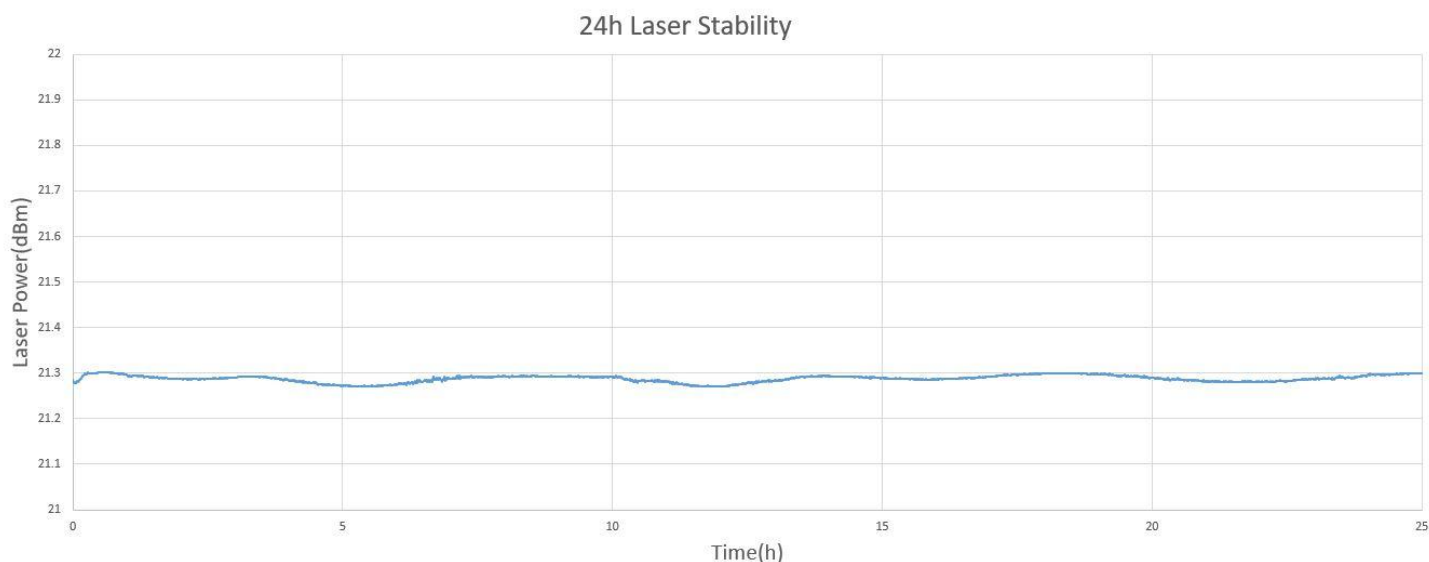
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Typical Laser Output Stability (butterfly package with temperature control)



Q & A

Q1. How can ILIM be monitored to verify that the laser drive current limit is set correctly?

A1. The laser current will not exceed the ILIM setting. To set and verify ILIM, first turn ILIM fully counterclockwise, then turn ISET fully clockwise to its maximum. The laser current should remain at 0. Slowly rotate ILIM clockwise while monitoring the laser current; the current will begin to increase gradually. When the laser current approaches the desired limit, stop adjusting ILIM and begin turning ISET counterclockwise. At a specific point, the laser current will momentarily peak and then decrease as ISET continues counterclockwise. This peak corresponds to the ILIM set value.

Q2. What is the relationship between the IM monitor voltage and the laser drive current?

A2. The laser drive current can be monitored at the IM test point. The conversion factor between IM voltage and laser current is 1000 mA/V.

Q3. How is the temperature setpoint configured on the TEC controller?

A3. The TLIM setting limits the maximum current supplied to the TEC. For lasers using a standard 10 k Ω thermistor, setting TLIM fully clockwise allows sufficient TEC current to maintain the laser temperature at approximately 19 °C. Turning TLIM counterclockwise reduces the allowable TEC current, which results in an increase in laser temperature.

Q4. How can the TEC current limit be determined or verified?

A4. The TEC current can be monitored at the TLIM test point. The conversion factor between TLIM voltage and TEC current is 1000 mA/V.

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