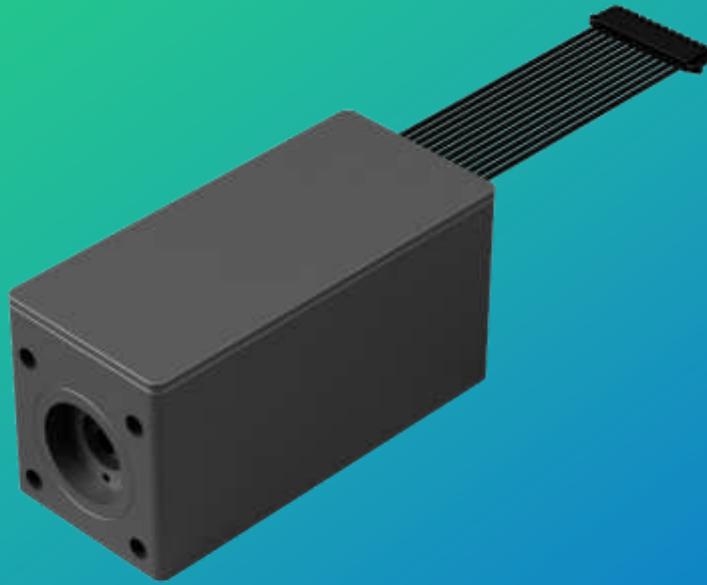


Datasheet (preliminary)



microchip laser module

Description

The microchip laser module is a passive Q-switched microchip laser that can generate nanosecond and picosecond pulses at high peak powers. It offers cutting-edge capabilities and excellent performance in an exceptionally compact form factor. Ideal for integration into space-constrained and mobile applications.

Applications

LiDAR (Atmospheric, Underwater)
3D Imaging
Nonlinear Optics
Atmospheric Sensing
Laser-Induced Breakdown Spectroscopy
Micromachining, Marking
Biophotonics and Medical Diagnostics

Features

- 1064 nm, 532 nm, 355 nm, 266 nm
- Output peak power up to 70 kW
- Typical pulse energy up to 30 μ J
- Repetition rate up to 100 kHz
- Sync output for pulse monitoring
- 2 GPIO pins for flexible control
- UART communication interface
- Integrated control electronics
- Ultra compact form factor

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min.	Max.	Unit
Supply Voltage	V_{DD}	—	-0.5	+32	V
Logic Input Voltage	V_L	UART, GPIO $V_{DD} = 0$	-0.3	+5.5	V
		I/O Pins $V_{DD} = 0$	-0.3	+0.3	
		$V_{DD} = 28$	-0.3	+5.5	
Storage Temperature	T_{STG}	—	-20	+60	°C
Operating Temperature	T_{OP}	Non-condensing	+10	+40	°C

Optical Specifications — ELM-532 nm configuration

$V_{DD} = +28V$, $T_{amb} = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Center Wavelength	λ	—	532	—	nm
Average Output Power	P_V	—	160	—	mW
Pulse Duration	t_{FWHM}	—	1.5	—	ns
Pulse Energy	E_P	—	8	—	μJ
Divergence (half angle)	Θ_0	—	3	—	mrad
Beam waist	ω_0	—	240	—	μm
Pulse to Pulse Jitter (rms) @ 10 kHz	—	—	< 3	—	%
Beam Quality Product	M^2	—	—	1.3	—

Electrical Specifications

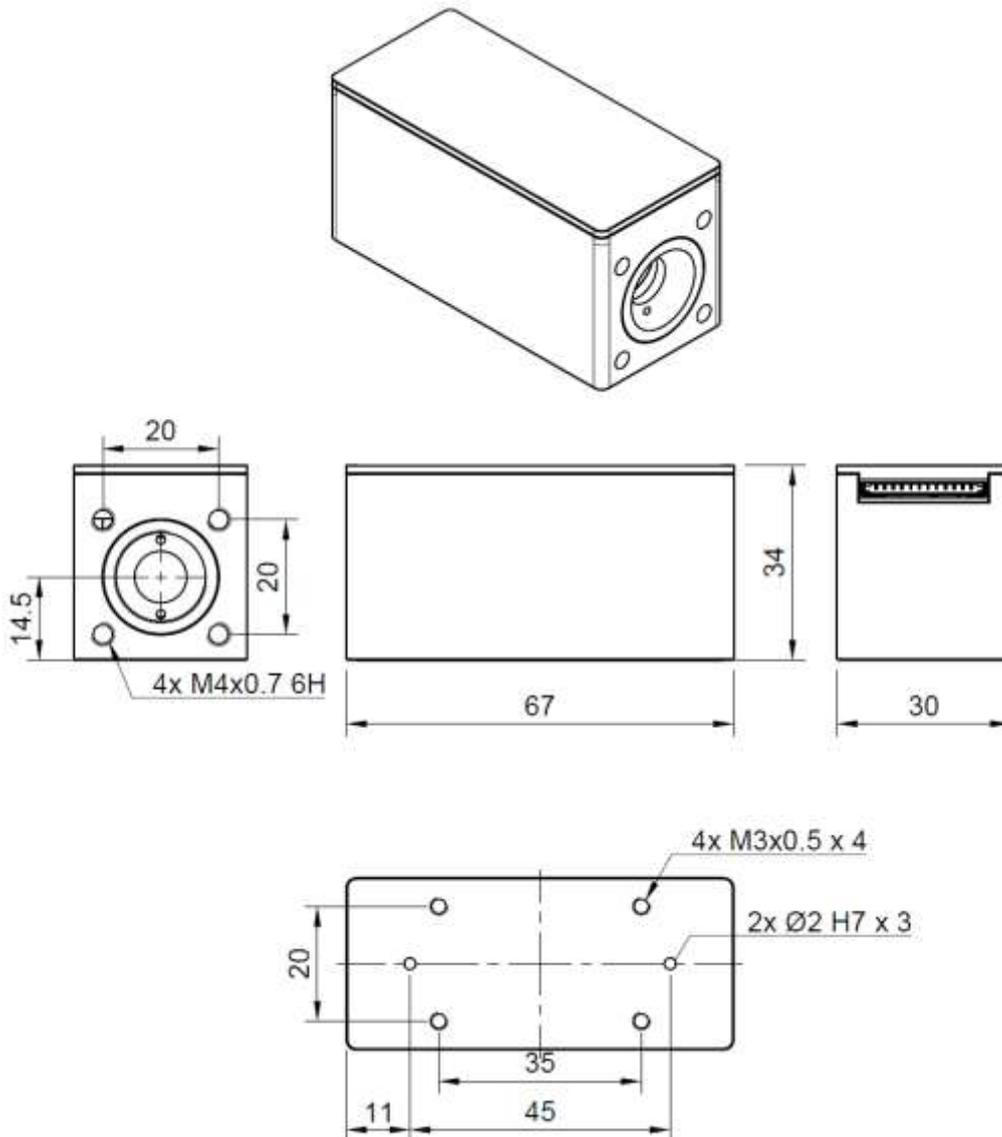
$V_{DD} = +28V$, $T_{amb} = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	+18	+28	+30	V
Logic Input Voltage	V_L	-	3.3	5	V
Supply Current	I_{IN}	—	—	500	mA
UART Baud Rate	BR_{UART}	—	115200	—	—
Pulse to Sync Out Jitter		—	—	0.5	ns
Pulse to Sync Out Delay		—	—	80	ns

Mechanical Specifications

Parameter	Symbol	Conditions	Typ.	Unit
Weight	M	—	180	g
Dimensions	D	(L x W x H)	67x30x34	mm
Heat Dissipation			10	W
Optical Tube Connector	—	—	M16x0.5 – 4	mm
Optical Cage Mount	—	—	20mm pitch, 4 x M4	mm

Technical Drawing



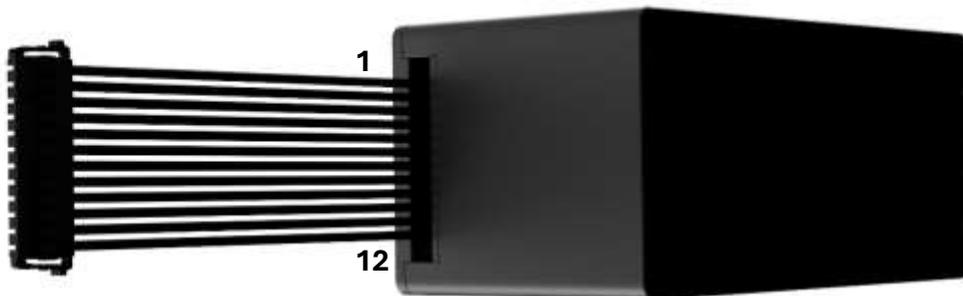
NOTE: All dimensions are in mm. 3D CAD files available upon request.

Main Connector

The main connector on the microchip laser module provides different input and output signals such as power input, auxiliary power output, trigger-I/O and serial communication via UART.

The connector on the microchip laser module is a Molex 504050-1291.

The connector can be used with a matching cable assembly, Molex 15132-1203.



The following table describes all the interface pins. Contact Laphtec for custom pinout.

Table 1: Interface Pin Descriptions

Pin Number	Signal Name	Type	Description
1	SYNC_DP	O	LVDS Synchronization Output +
2	SYNC_DN	O	LVDS Synchronization Output -
3	GND	I	Signal Ground
4	GPIO1	I/O	General Purpose IO
5	GPIO2	I/O	General Purpose IO
6	UART_TxD	O	Transmitter Output for UART
7	UART_RxD	I	Receiver Input for UART
8	GND	PWR	Power Ground
9	AUX_SUPPLY	PWR	Auxiliary +12V Output
10	SAFETY_INTERLOCK	I	Safety Interlock Input
11	GND	PWR	Power Ground
12	POWER_IN	I/O	28 V Power Input

Revision History

Revision 0.1, January 2026

Initial preliminary datasheet.