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High Power Single Mode 1550nm Laser

(Up to 10W SM or 5W PM, Benchtop)

The HPSL High Power Single Mode Laser is a user-friendly benchtop unit that delivers up to 10W of single-mode output and 5W of polarization-maintaining stable laser output at 1550nm. It operates in constant power mode (CW) and offers selectable spectral widths, including broadband, 10nm, and 0.03nm. The standard output is fiber-based, with options for a high-power connector or a collimator. The unit includes a front power control knob and a USB computer interface for easy operation. An emission switch is also provided for added safety. The laser is susceptible to damage from strong back reflections; the included output isolator protects up to 0.5W of back reflection. For enhanced protection in applications prone to unintended reflections, a 5W back reflection protector is available as an option.

The laser output can be adjusted via GUI

Warning: The laser is vulnerable to damage from strong back reflection. Therefore, the one-year warranty applies only if the back reflection protector is included.

Features

- Low Cost
- High Reliability
- High Power
- Single Mode
- USB
- Turn-Key Benchtop

Applications

- Lab
- OEM
- Sensor
- Instrumentation

Specifications

Parameters	Min	Typical	Max	Unit
Operation Wavelength	1545	1550	1575	nm
Operation Mode		CW		
Output Power *	0.2		10	W
Bam Quality	1.1	1.2	1.3	M2
Spectral Linewidth		4	40	nm
Polarization Extinction Ratio	18	26	35	dB
Output Power Adjust Range	10		100	%
Output Power Stability (within 48 hr)		± 2	± 5	%
Operating Temperature	-5		35	°C
Storage Temperature	-40		85	°C
Electrical Power Consumption			150	W
Power Input	110		120	VAC
Computer Interface		USB		
Package Dimension				

* PM output maximum is 5W

RoHS COMPLIANT

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

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Rev 01/24/26

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Operation Manual

- Plug AC power
- Turn ON The Power Switch
- The Laser Can be Controlled By a Computer via The USB/GUI Interface
- Turn On The Emission Switch

For Manual Operation (option)

- Adjust The Output Power to Minimum by Turning The Knob All Way Counter Clockwise
- Increase The Out Put Power by Turning The Knob Clockwise

Special Feature

- To Modulator The Laser, Turn On The Modulation Switch at the Back, Input a 0-5V Modulation Signal Via The BNC Connector

Mechanical Dimension

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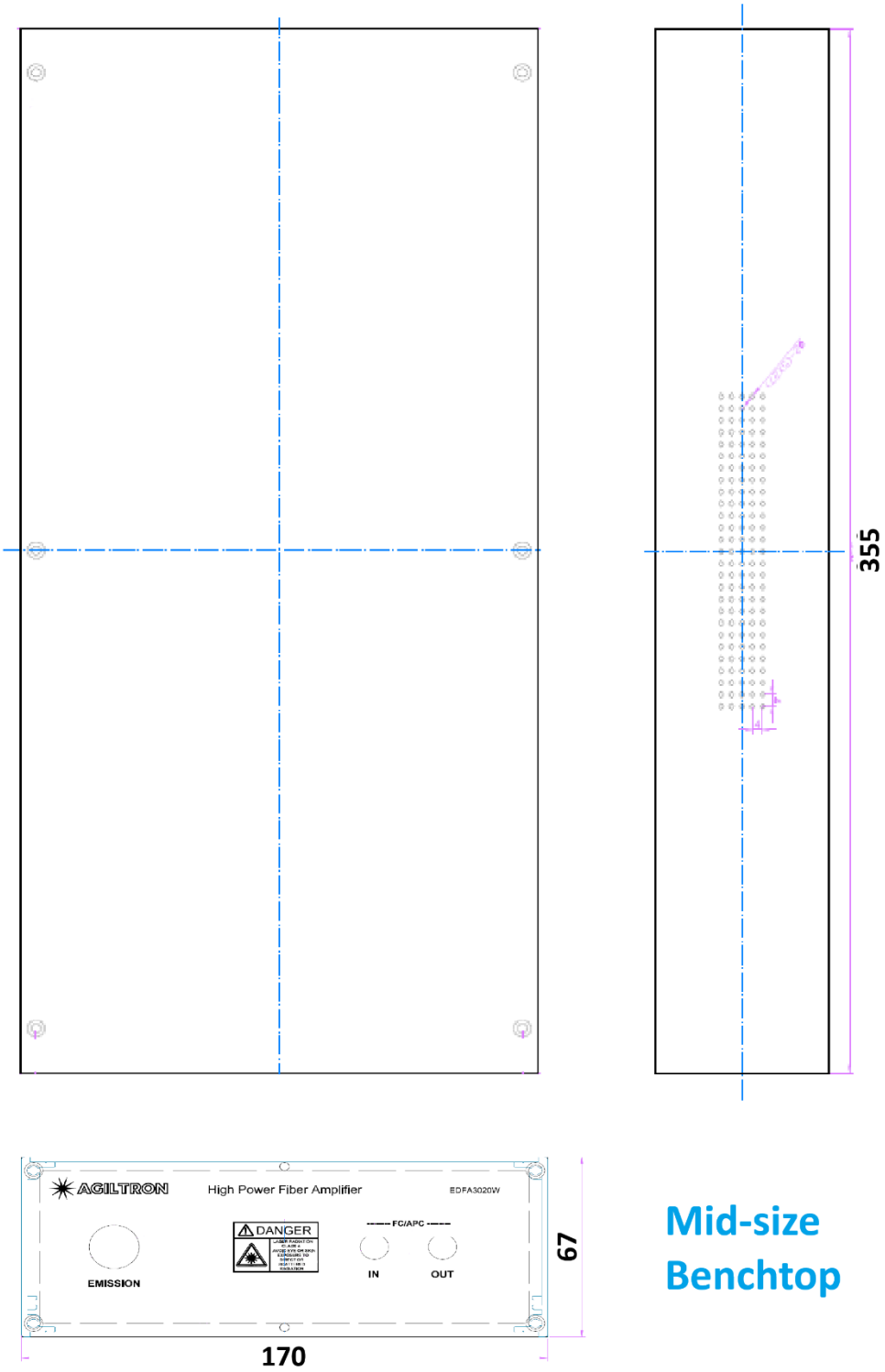
Mechanical Dimension



Mid-size Benchtop

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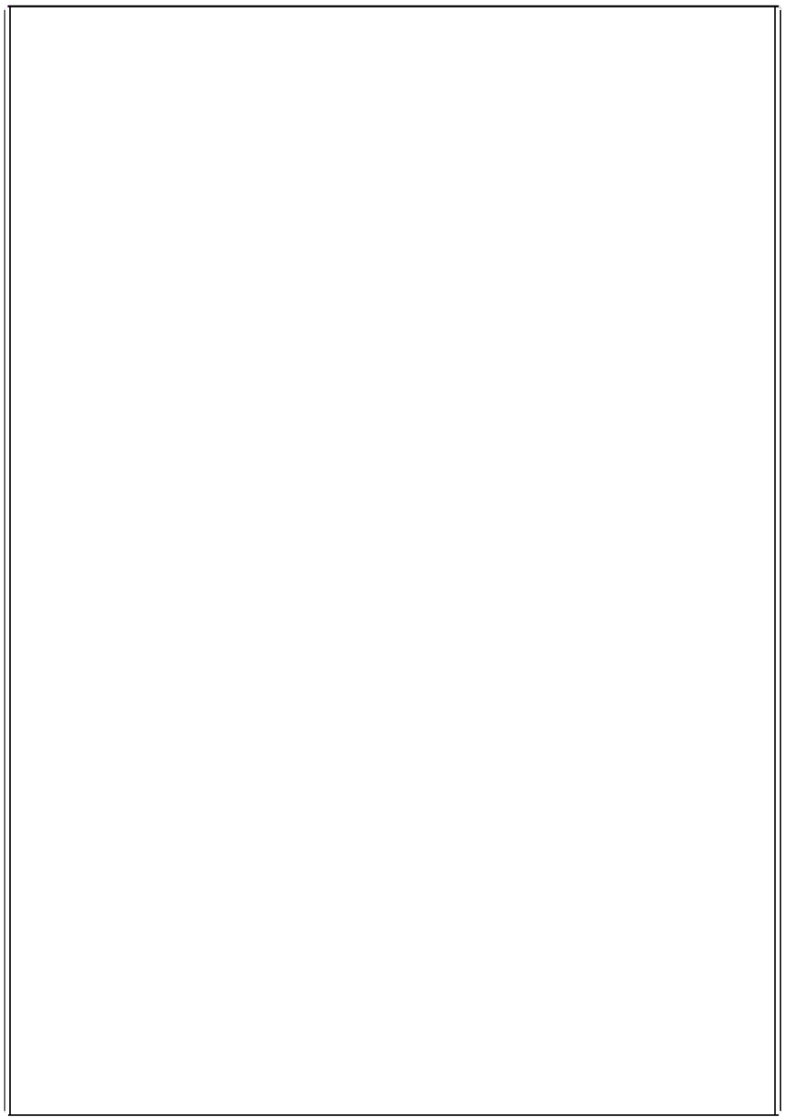

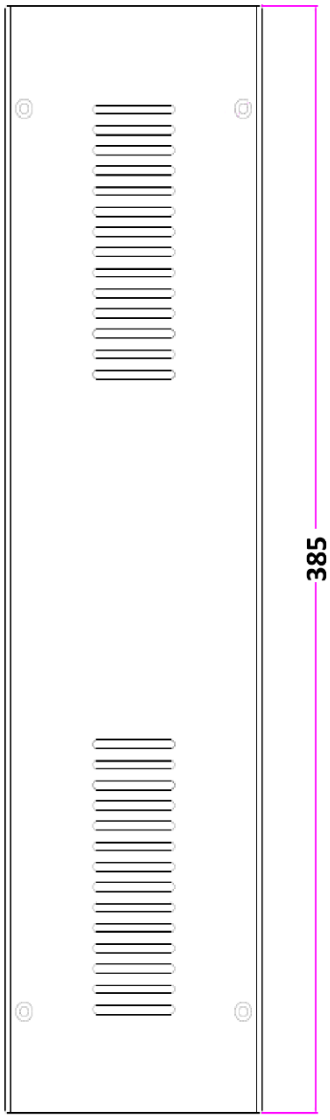

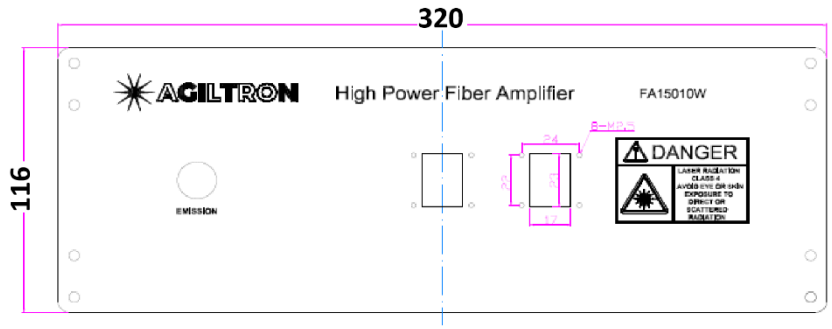

Large-size Benchtop

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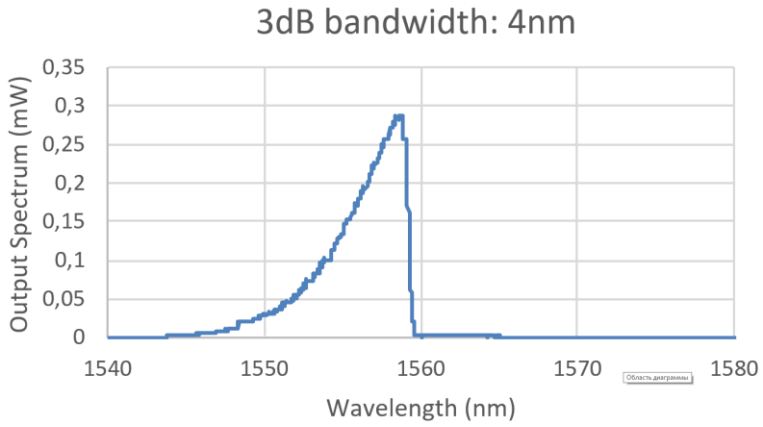
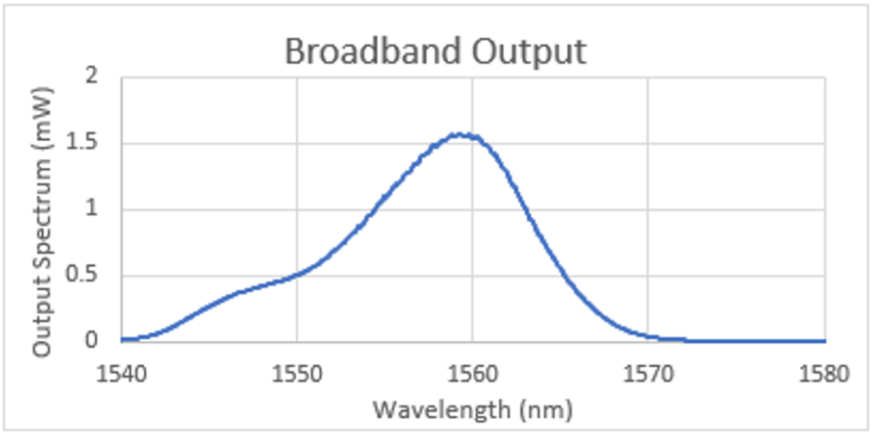
Typical Spectrum





Ordering Information (Part Number)

	☐	☐	☐	☐	☐	☐	☐	☐	☐
Prefix	**Wavelength**	**Output Power**	**Mode [1]**	**Linewidth**	**Interface**	**Fiber Type**	**Fiber Cover**	**Fiber Connector [2][4]**	**Back reflection Protector[3]**
HPSL-	1550nm = 5	10W = T 5W = 5 2W = 2 1W = 1 Special = 0	Random = 1 PMER18dB = 2 PMER25dB = 3 PMER30dB = 4	Broad = 1 4nm = 2 Special = 0	USB = 1 RS232 = 2	SM28 = 1 PM1550 = 2	0.9mm tube = 1 3mm tube = 2 Special = 0	Non = 1 High Power FC/PC = 2 Special = 0	Non = 1 Yes = B

[1]. PMER- Polarization Maintaining Extinction Ratio. When select PM fiber, the max output is 5W

[2]. High-power FC/PC connector works in pairs with maximum rating of 5W. The system includes a front panel connector and a matching patch cable, where one end features the high-power FC/PC connector, and the other end is bare fiber for splicing. This product is priced at $950

[3] 'Back Reflection Protector' will increase 1.5dB extra loss

[4]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

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High Power Single Mode 1550nm Laser

(Up to 10W SM or 5W PM, Benchtop)

> 26dBm SM and >23dBm PM CW 1550nm Lasers – UART Protocol

1. Port Setting

Baud rate:	115200 bps
Data size:	8 bits
Parity:	none
Stop Bits:	1 bit

2. Command (CMD) Packet Format

2.1 Packet sent to device

Description	Frame Head	Frame ID	CMD ID	Data length	data	Checksum
Length (byte)	2	4	1	1	n	1

Frame head	1st byte is 55, 2nd byte is AA, fixed
Frame ID	xx xx xx xx, 4 bytes HEX data, device ID/SN
CMD ID	1 byte
Data length	1 byte, max length is 255(DEC). If Data length is zero then it's followed directly by checksum
Data	Data to send
Checksum	Add all data (except the frame head), subtract it from 0xFF and add 0x01

2.2 Response packet from device

Description	Frame Head	Frame ID	CMD ID	Data length	data	Checksum
Length (byte)	2	4	1	1	n	1

Frame head	1st byte is AA, 2nd byte is 55, fixed
Frame ID	xx xx xx xx, 4 bytes HEX data, MSB first
CMD ID	1 byte
Data length	1 byte, max length is 255(DEC).
Data	Data to send
Checksum	Add all data (except the frame head), subtract it from 0xFF and add 0x01

2.3 Checksum Example

Command	55 AA 24 FF 6F 15 0C 00 (not include checksum)
Checksum	0x24+0xFF+0x6F+0x15+0x0C+0x00=0xB3 (use single-byte to add) Subtract it from 0xFF, 0xFF – 0xB3=0x4C, then add 0x01, and the result Checksum is 0x4D.
Complete CMD	55 AA 24 FF 6F 15 0C 00 4D

3. Communication Notes

a) Device sends data only when command from master is received with correct device address.

b) No response from device to incorrect command.

c) When command is correct, then proceed with one of the following:
For 'Set' commands, execute command, then send out response
For 'Get' commands, send out required data.

d) A command can be sent out only when previous one is completed.

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(Up to 10W SM or 5W PM, Benchtop)

> 26dBm SM and >23dBm PM CW 1550nm Lasers – UART Protocol

4. Command List

Command	Packet to device	Response packet from device
Get device status	55 AA 00 00 00 6F 2F 00 62	AA 55 00 00 00 6F 2F 18 00 00 01 00 00 4A 00 00 00 00 00 00 00 00 E8 90 E8 90 E8 90 E8 90 00 70 AF
Get settings	55 AA 00 00 00 6F 2E 00 63	AA 55 00 00 00 6F 2E 18 00 01 00 01 00 01 00 00 00 00 00 00 1F 40 1F 40 00 21 00 21 00 00 00 00 48
Get PN	55 AA 00 00 00 6F 1E 00 73	AA 55 00 00 00 6F 1F 20 48 33 30 31 32 39 30 31 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 AA
Get SN	55 AA 00 00 00 6F 1F 00 72	
Get thresholds	55 AA 00 00 00 6F 5F 00 32	AA 55 00 00 00 6F 5F 28 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0A
Set pump ON	55 AA 00 00 00 6F 20 02 00 00 6F	AA 55 00 00 00 6F 20 02 00 00 6F
Set pump OFF	55 AA 00 00 00 6F 20 02 00 01 6E	AA 55 00 00 00 6F 20 02 00 01 6E
Set 940-1 control mode 00-APC, 01-ACC	55 AA 00 00 00 6F 21 02 00 01 6D	AA 55 00 00 00 6F 21 02 00 01 6D
Set 940-2 control mode 00-APC, 01-ACC	55 AA 00 00 00 6F 29 02 00 01 65	AA 55 00 00 00 6F 29 02 00 01 65
Set 940-1 current in ACC, Max 8000mA	55 AA 00 00 00 6F 23 02 1F 40 0D	AA 55 00 00 00 6F 23 04 1F 40 0D 00 FE
Set 940-2 current in ACC, Max 8000mA	55 AA 00 00 00 6F 24 02 1F 40 0C	AA 55 00 00 00 6F 24 04 1F 40 0C 00 FE
Set 940-1 power in APC, max 33dBm	55 AA 00 00 00 6F 25 02 00 21 49	AA 55 00 00 00 6F 25 02 00 21 49
Set 940-2 power in APC, max 33dBm	55 AA 00 00 00 6F 28 02 00 21 46	AA 55 00 00 00 6F 28 02 00 21 46

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> 26dBm SM and >23dBm PM CW 1550nm Lasers – UART Protocol

5. Command details

5.1 Get device status

Send

55 AA 00 00 00 6F 2F 00 62

Response

AA 55 00 00 00 6F 2F 18 00 00 01 1A 00 B5 17 6C 03 C0 00 00 10 B6 FF CB 08 34 E8 90 0C E2 00 70 92

-- AA 55	Frame head
-- 00 00 00 6F	Frame ID: device serial number in HEX
-- 2F	CMD ID
-- 18	Data length
-- 00 00	Spare
-- 01 1A	Module temperature (28.2 °C)
-- 00 B5	Pre-amp temperature (18.1 °C)
-- 17 6C	Pre-amp current (599.6mA)
-- 03 C0	TEC current (9.60mA)
-- 00 00	Pump-1 current (0.00mA)
-- 10 B6	Pump-2 current (4278mA)
-- FF CB	Input optical power (-0.53dBm)
-- 08 34	Pre-amp output power (21.00dBm)
-- E8 90	Output-1 power (-60.00dBm)
-- 0C E2	Output-2 power (32.97dBm)
-- 00 70	Warning 70
-- 92	Checksum

Warning code 00 70

Example 70:

Bit	Value	Meaning	Warning	Normal
7	0	Overall warning status	1	0
6	1	Pump ON/OFF	0 - OFF	1 - ON
5	1	TEC current	0	1
4	1	Pump temperature	0	1
3	0	Pump current	1	0
2	0	Device temperature	1	0
1	0	Input LOS	1	0
0	0	Output LOS	1	0

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> 26dBm SM and >23dBm PM CW 1550nm Lasers – UART Protocol

5.2 Get Setting

Send

55 AA 00 00 00 6F 2E 00 63

Response

AA 55 00 00 00 6F 2E 18 00 00 00 01 00 01 00 00 00 00 00 D2 00 00 10 B8 01 4A 01 4A 00 00 00 00 19

-- AA 55	Frame head
-- 00 00 00 6F	Frame ID: device serial number in HEX
-- 2E	CMD ID
-- 18	Data length
-- 00 00	Pump ON
-- 00 01	Pump-1 mode (ACC)
-- 00 01	Pump-1 mode (ACC)
-- 00 00	Pre-amp mode (AP)
-- 00 00	Pre-amp current (0mA)
-- 00 D2	Pre-amp output power (21.0dBm)
-- 00 00	Pump-1 current (0mA)
-- 10 B8	Pump-2 current (4280mA)
-- 01 4A	Pump-1 power (33dBm)
-- 01 4A	Pump-2 power (33dBm)
-- 00 00	spare
-- 00 00	Spare
-- 19	Checksum

5.3 Get Threshold

Command

55 AA 00 00 00 6F 5F 00 32

Response

AA 55 00 00 00 6F 5F 28 00 00 03 E8 00 00 05 14 00 00 03 E8 00 00 05 28 00 00 25 1C 00 00 0F A0 00 00 25 1C 00 00 0F A0 FF FF FF 38 00 00 02 8A 4D

-- AA 55	Frame head
-- 00 00 00 6F	Frame ID: device serial number in HEX
-- 5F	CMD ID
-- 28	Data length
-- 00 00 03 E8	Max pre-pump current (1000mA)
-- 00 00 05 14	Max pre-pump DAC (1300)
-- 00 00 03 E8	Max pre-pump TEC current (1000mA)
-- 00 00 05 28	Max pre-pump TEC DAC (1320)
-- 00 00 25 1C	Max pump-1 current (9500rnA)
-- 00 00 0F A0	Max pump-1 DAC (4000)
-- 00 00 25 1C	Max pump-2 current (9500mA)
-- 00 00 0F A0	Max pump-2 DAC (4000)
-- FF FF FF 38	Input threshold (-20dBm)
-- 00 00 02 8A	Highest temperature pump is allowed to turn on (65°C)
-- 4D	CRC checksum

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USB Command List

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 µm.

Maximum power = 30 mW.

*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
*IEC is a registered trademark of the International Electrotechnical Commission.

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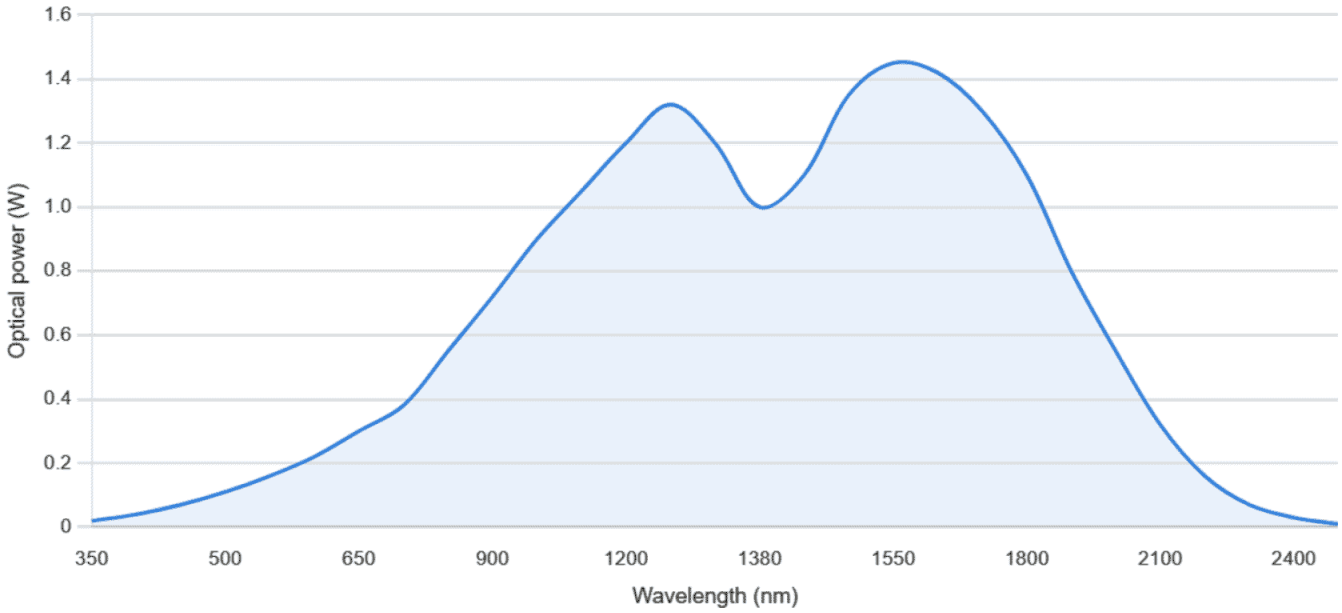
Regular Single Mode / Polarization Maintaining Fiber Optical Power Handing vs Wavelength



Single mode fiber optical power is limited by nonlinear effects in addition to absorption that increase loss and generate heat. The curve shows the approximate safe CW power envelope for standard single-mode fiber. Actual limits depend on fiber design, core size, length, and laser characteristics. Specialty fibers can significantly increase the power limit.

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