

# Up to 400 mW Uncooled 980 nm Pump Modules

H12 Series



The Lumentum H12 uncooled 3-pin low profile planar package pump laser employs 6570 flagship chip and advanced packaging design to significantly reduce the 980 nm pump's size and power consumption. It meets the telecommunications industry's stringent requirements, including Telcordia GR-468-CORE for hermetic 980 nm pump modules.

The H12 Series pump module, which uses fiber Bragg grating stabilization to lock the emission wavelength, provides a noise-free, narrowband spectrum, even under changes in temperature, drive current, and optical feedback. Wavelength selection is available for applications requiring the highest performance in spectrum control with the highest power available.

**Key Features**

- Operating power range from 200 to 400 mW
- 0°C to 75°C operating temperature (case)
- Ultra-small form factor: 14.0x4.8x3.2 mm
- Low power consumption
- Excellent low-power stability
- Fiber Bragg grating stabilization
- Wavelength selection available

**Applications**

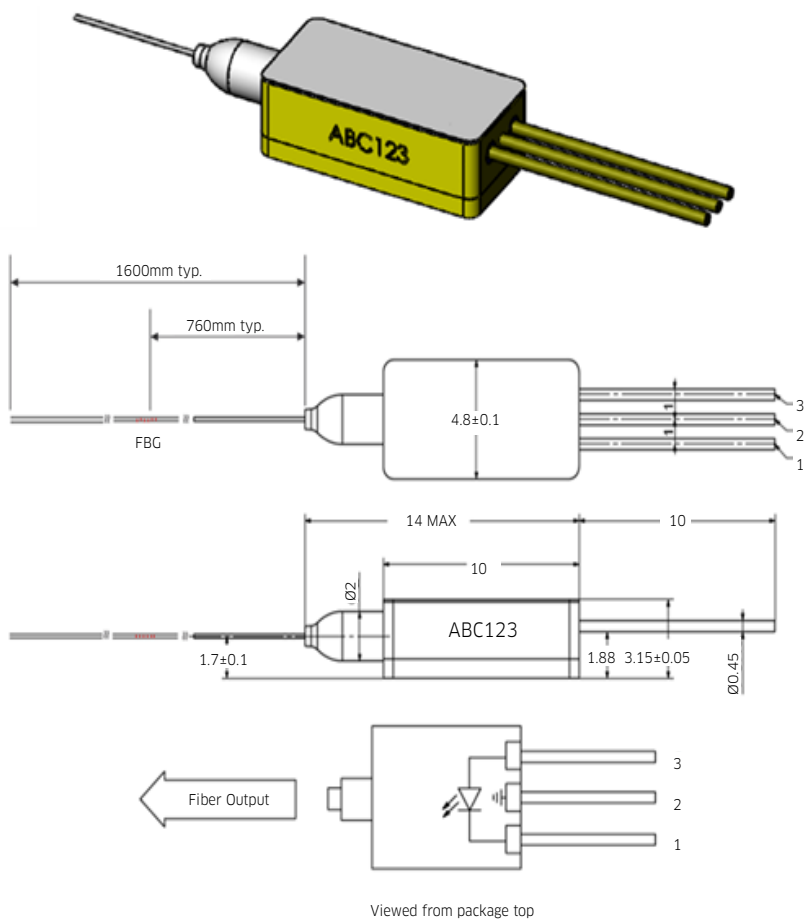
- Small Form Factor and pluggable EDFA
- High bit-rate and high channel-count EDFAs
- CATV distribution

**Compliance**

- Telcordia GR-468-CORE

Dimensions Diagram and Pin Assignment

- Package dimensions:
- Length (including boot and excluding pins): 14 mm
    - Pin length: 10 mm
    - Pin diameter: 0.45 mm
  - Width: 4.8 mm
  - Height: 3.2 mm
  - Fiber Length: 1.6 m typical



Pin	Connection
1	Laser Diode Cathode (-)
2	Package Ground
3	Laser Diode Anode (+)

**Table 1 Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units	Notes
Forward current	If		1.2	A	1 hour maximum cumulative
Reverse voltage	Vr		2	V	
Reverse current			10	μA	
ESD damage	VESD,LD		500	V	C=100pF, R=1.5kΩ, HBM
Operating temperature		0	75	°C	
Storage temperature		-40	85	°C	
Relative humidity	RH	5%	95%		
Lead soldering temperature			350	°C	T case at 25°C
Lead soldering time			5	s	
Tensile stress			5	N	
Fiber bend radius		16		mm	

Absolute maximum ratings are the maximum stresses that may be applied to the module for short periods of time without causing damage. Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Exposure to absolute maximum ratings for extended periods of time or exposure to more than one absolute maximum rating simultaneously may adversely affect device reliability. Specifications may not necessarily be met under these conditions.

**Table 2 Optical and Electrical Characteristics of H12 Pump (Case temperature Tcase = 0°C to 75°C) for different Pop**

Part Number	Maximum Operating Power Pop (mW)	Maximum Operating Current Iop (mA)	Minimum Kink-Free Power Pmax (mW)	Kink-Free Current Imax (mA)	Total Power Consumption Pcon (W)
H12-7x02-200	200	540	220	575	1.1
H12-7x02-220	220	575	242	620	1.2
H12-7x02-240	240	615	265	665	1.3
H12-7x02-260	260	655	286	705	1.4
H12-7x02-280	280	700	310	770	1.6
H12-7x02-300	300	745	330	820	1.7
H12-7x02-320	320	795	355	890	1.9
H12-7x02-340	340	850	375	950	2.1
H12-7x02-360	360	910	400	1035	2.25
H12-7x02-380	380	970	420	1105	2.45
H12-7x02-400	400	1035	440	1175	2.65

The x denotes the wavelength per the product code in Table 3.

**Table 3 Available Peak Wavelength Selection**

Product Code	Minimum Peak Wavelength	Maximum Peak Wavelength
H12-7402-yyy	972.5 nm	975.5 nm
H12-7602-yyy	974.5 nm	977.5 nm

The yyy denotes the operating power per the product code in Table 2

**Table 4 Optical and Electrical Characteristics (BOL, case temperature Tcase = 0°C to 75°C)**

Parameter	Symbol	Condition		Minimum	Maximum	Units
Center wavelength	$\lambda_c$	0-75°C, 200-400 mW		970	980	nm
Power in band ( $\lambda \pm 1.5$ nm)	Pband	0-75°C	100 mW-Pop 30-100 mW 20-30 mW	90 85 80		%
Spectral width	$\Delta\lambda_{RMS}$	0-75°C, Pop			2.0	nm
Spectral shift with temperature	$\Delta\lambda/\Delta T$	Iop			0.01	nm/°C
Optical power stability	$\Delta Pop/\Delta t$	t = 60 s, DC ~ 50 kHz	≥ 20 mW		0.15	dBp-p
Threshold current	Ith				80	mA

**Table 5 HI 1060 Fiber Nominal Characteristics and Tolerances**

Parameters	Specification
Cutoff wavelength	920 nm
Maximum attenuation at 980 nm	2.1 dB/km
Cladding outside diameter	125 ± 1 μm
Coating outside diameter	245 ± 10 μm
Core-cladding concentricity	≤ 0.5 μm
Mode field diameter	5.9 ± 0.3 μm
Fiber pigtail length	Typical 1600 mm

## User Safety

### Safety and Operating Considerations

The laser light emitted from this laser diode is invisible and may be harmful to the human eye. Avoid looking directly into the fiber when the device is in operation.

CAUTION: THE USE OF OPTICAL INSTRUMENTS WITH THIS PRODUCT INCREASES EYE HAZARD.

Operating the laser diode outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with this component cannot exceed maximum peak optical power.

CW laser diodes may be damaged by excessive drive current or switching transients. When using power supplies, the laser diode should be connected with the main power on and the output voltage at zero. The current should be increased slowly while monitoring the laser diode output power and the drive current. Careful attention to heat sinking and proper mounting of this device is required to ensure specified performance over its operating life.

ESD PROTECTION—Electrostatic discharge (ESD) is the primary cause of unexpected laser diode failure. Take extreme precaution to prevent ESD. Use wrist straps, grounded work surfaces, and rigorous antistatic techniques when handling laser diodes.

### Laser Safety

The Lumentum pump laser module emits hazardous invisible laser radiation.

Due to the small size of the pump module, the box packaging is labeled with the laser radiation hazard symbol and safety warning label shown below.

This component requires provisions of drive and control electronics before emitting laser radiation.

Laser classification depends on the system control circuit and laser safety features provided.

This diode-pumped laser module is not 21CFR 1040.10 or IEC 60825-1:2014 certified. It is a component intended for system integration. Compliance with 21CFR 1040.10 and/or IEC 60825-1:2014 will need to be determined at the system level.

Lumentum has registered this laser with the FDA/CDRH as an OEM component. Please contact Lumentum for an FDA/CDRH accession number for this laser component.

Labeling



Laser radiation safety warning  
Laser classification per IEC 60825-1:2014  
Maximum output power 2 W



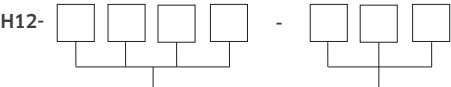
Module label



Box label

Ordering Information

For more information on this or other products and their availability, please contact your local Lumentum account manager or Lumentum directly at [customer.service@lumentum.com](mailto:customer.service@lumentum.com).



Peak Wavelength	Code
974 nm	7402
976 nm	7602

Maximum Operating Power	Code
200 mW	200
220 mW	220
240 mW	240
260 mW	260
280 mW	280
300 mW	300
320 mW	320
340 mW	340
360 mW	360
380 mW	380
400 mW	400

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