

# Up to 250 mW Uncooled 980 nm Pump Modules

H11 Series



The Lumentum uncooled 3-pin low profile planar package pump laser – H11’s revolutionary chip and packaging design significantly reduces the 980 nm pumps’ size and power consumption. It meets the telecommunications industry’s stringent requirements, including Telcordia GR-468-CORE for hermetic 980 nm pump modules.

The H11 Series pump module employs Lumentum’s disruptive 980 nm Distributed Feedback Laser chip which integrates 980 nm high power laser and grating into a single high reliability laser die. It provides a noise-free, narrowband spectrum, even under temperature, drive current, and optical feedback changes.

**Key Features**

- Operating power range from 50 to 250 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
- Small fiber bending radius
- Reduced fiber length

**Applications**

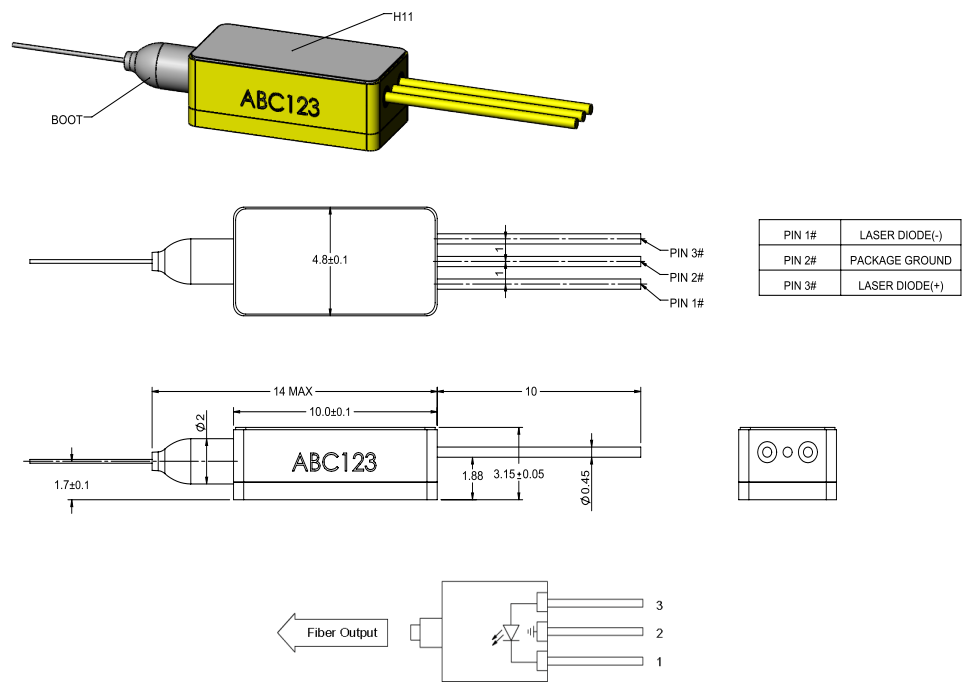
- Small Form Factor and pluggable EDFA
- High-bit-rate, low channel-count EDFAs
- CATV distribution
- Integrated amplification within high bit-rate transceiver modules - CFP2/4

**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: 0.8 m typical



**Table 1 Absolute Maximum Ratings**

Parameter	Symbol	Minimum	Maximum	Units	Notes
Forward current	If		0.9	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	
Fiber temperature		-40	75	°C	
Tensile stress			2	N	
Bend radius		7		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 H11 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)
H11-7402-050	50	160	55	180	0.3
H11-7402-100	100	250	110	270	0.5
H11-7402-150	150	350	165	380	0.7
H11-7402-200	200	450	220	500	0.9
H11-7402-250	250	550	275	600	1.1

**Table 3 Optical and Electrical Characteristics of H11 (BOL, Case temperature Tcase = 0°C to 75°C)**

Parameter	Symbol	Condition	Minimum	Maximum	Units
Center wavelength	λc	0-75°C, 10-250mW	970	980	nm
Power in band (λt±1.5 nm)	Pband	0-75°C > 30mW 10-30mW	90 80		%
Spectral width	ΔλRMS	0-75°C, Pop		2.0	nm
Spectral shift with temperature	Δλ/ΔT	Iop		0.1	nm/°C
Optical power stability	ΔPop/Δt	0-75°C, t = 60s, DC ~50kHz	>20mw 10-20mW	0.1 0.15	dBp-p
Threshold current	Ith			80	mA

**Table 4 RC 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	80 ±1 μm
Coating outside diameter	165 ±10 μm
Core-cladding concentricity	≤0.5 μm
Mode field diameter	5.9 ±0.5 μm
Fiber pigtail length	Typical 800 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.

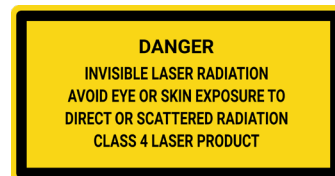
This component requires provisions of drive and control electronics before emitting laser radiation.

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

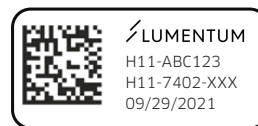
This diode-pumped laser module is not 21CFR 1040.10 or IEC 60825-1:2014 certified. It is a component intended for system integration. Compliance with 21CFR 1040.10 and/or IEC 60825-1:2014 will need to be determined at the system level.

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 500 mW



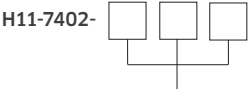
Module label



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
50mW	050
100 mW	100
150 mW	150
200 mW	200
250 mW	250

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