LUMENTUM

Up to 200 mW Uncooled 980 nm Pump Modules

TO T13 Series

The Lumentum uncooled ultra-small form factor “TO” pump laser - T13 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 T13 Series pump module employs Lumentum 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 200 mW
- 0°C to 70°C operating temperature (case)
- Ultra-small form factor: 23mmxϕ5.6 mm
- Low power consumption
- Excellent low-power stability
- Small fiber bending radius
- Reduced fiber length

Applications

- Small-form-factor and pluggable EDFAs
- High-bit-rate, low channel-count EDFAs
- CATV distribution

Compliance

- Telcordia GR-468-CORE

Dimensions Diagram and Pin Assignment

Package dimensions:

- Length (including boot and excluding pins): 23.0 mm
- Pin length: 12 mm
- Diameter: 5.6 mm
- Fiber Length: 0.8 m typ.

Package will require clamping on the header side for optimum heat sink.

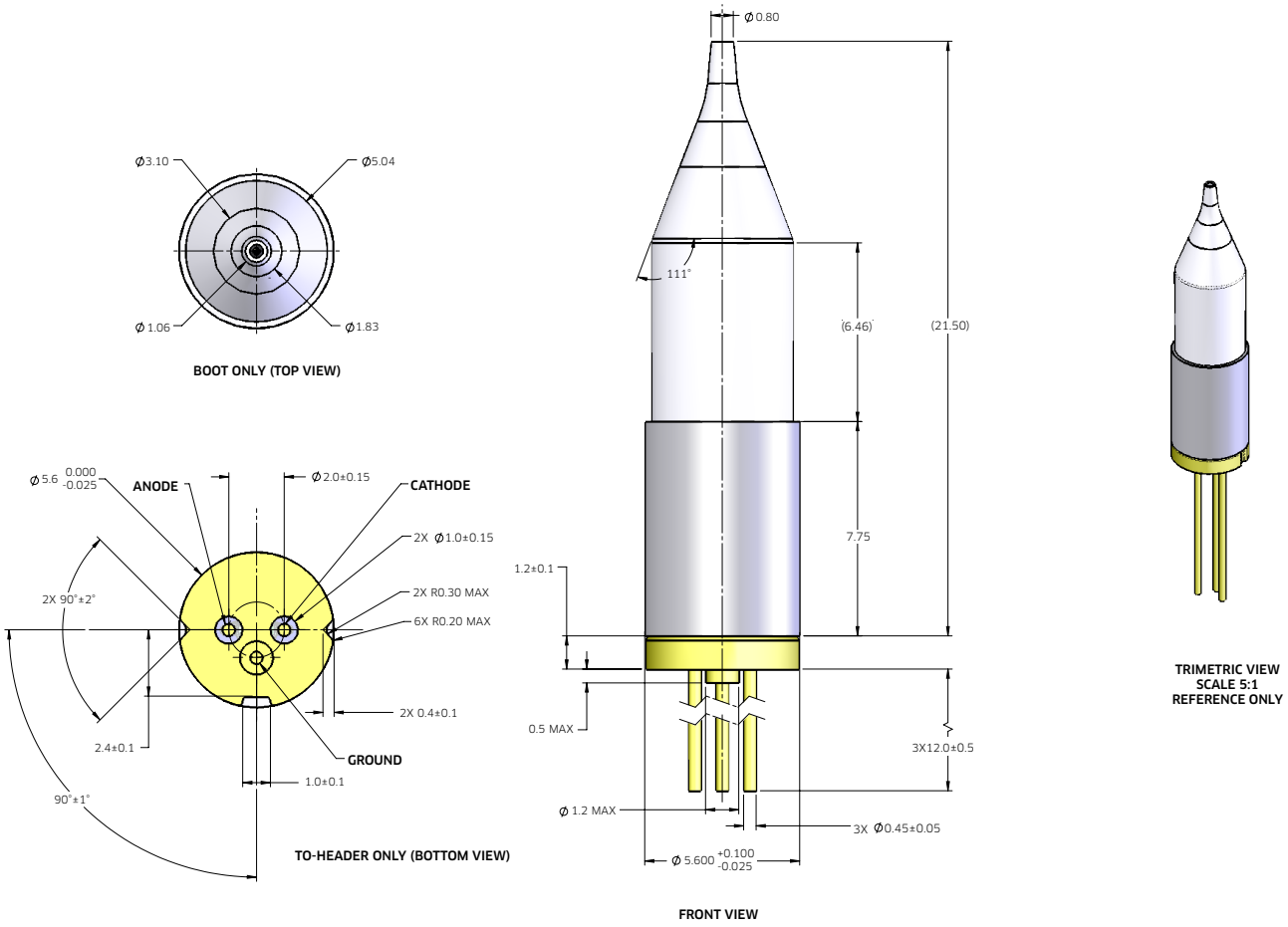


Table 1. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Forward current	I_f		0.9	A	1 hour maximum cumulative
Reverse voltage	V_r		2	V	
Reverse current			10	µA	
ESD damage	VESD,LD		500	V	C=100$_p$F, R=1.5kΩ, HBM
Operating temperature		0	70	°C	
Storage temperature		-40	85	°C	
Relative humidity	RH	5%	95%		
Lead soldering temperature			350	°C	Tcase at 25°C
Lead soldering time			5	s	
Fiber temperature		-40	75	°C	
Tensile stress			5	N	
Bend radius		7.5		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 T13 Pump (Case temperature Tcase = 0°C to 70°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)
T13-7402-050	50	200	60	225	0.34
T13-7402-060	60	225	70	260	0.4
T13-7402-080	80	280	95	330	0.52
T13-7402-100	100	340	120	400	0.65
T13-7402-120	120	400	145	470	0.8
T13-7402-150	150	475	180	560	0.98
T13-7402-160	160	500	190	590	1.03
T13-7402-180	180	550	215	650	1.16
T13-7402-200	200	600	240	730	1.4

Table 3. Optical and Electrical Characteristics of T13 (BOL, Case temperature Tcase = 0°C to 70°C)

Parameter	Symbol	Condition	Min	Max	Units	Notes
Center wavelength	λc	0-70°C, 10-200mW	970	980	nm	
Power in band (λt±1.5nm)	Pband	0-70°C, 30mW-Pop 10-30mW	 90 80		%	
Spectral width	ΔλRMS	0-70°C, Pop		2.0	nm	
Spectral shift with temperature	Δλ/ΔT	Iop		0.1	nm/°C	
Optical power stability	ΔPop/Δt	25°C, t = 60s, DC ~ 50kHz		0.15	dBp-p	
Threshold current	Ith			80	mA	

Table 4. 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

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.

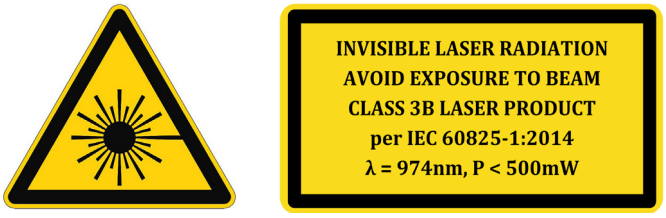
Labeling

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 labels shown

Shipping box label



Output power and laser emission indicator 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.

T13-7402 - ☐ ☐ ☐

Maximum Operating Power	Code
50 mW	050
60 mW	060
80 mW	080
100 mW	100
120 mW	120
150 mW	150
160 mW	160
180 mW	180
200 mW	200

Telcordia is a registered trademark of Telcordia Technologies Incorporated.

LUMENTUM

North America
Toll Free: 844 810 LITE (5483)

Outside North America
Toll Free: 800 000 LITE (5483)

China
Toll Free: 400 120 LITE (5483)

© 2021 Lumentum Operations LLC
Product specifications and descriptions in this document are subject to change without notice.