

# Continuous Wave (CW) Single-Frequency IR Laser

## NPRO® 125/126 Series

**Key Features**

- 1319 or 1064 nm outputs available
- Fiber-coupled output
- Proven nonplanar ring oscillator (NPRO) design
- Superior power stability
- Narrow linewidth
- Tunability
- Ease of use
- Ideal for OEM applications

**Applications**

- Fiber-optic sensing
- Coherent communications
- Remote antenna links
- Optical heterodyne
- Lidar oscillator
- Passive sonar

The JDSU NPRO 125/126 diode-pumped lasers produces CW, single-frequency output at either 1064 nm or 1319 nm. Key features include fiber-optic or free-space output, narrow linewidth, low noise, frequency tunability, and adjustable power.

The NPRO 125/126 lasers are used for a variety of applications including fiber-optic sensing, coherent communications, remote antenna links, optical heterodyne, lidar oscillators, and passive sonar.

At the heart of each NPRO 125/126 laser is JDSU's unique, monolithic, NPRO laser cavity delivering true single-frequency laser output. Since its initial development in 1985, NPRO technology has demonstrated a record of reliability and top-level performance.

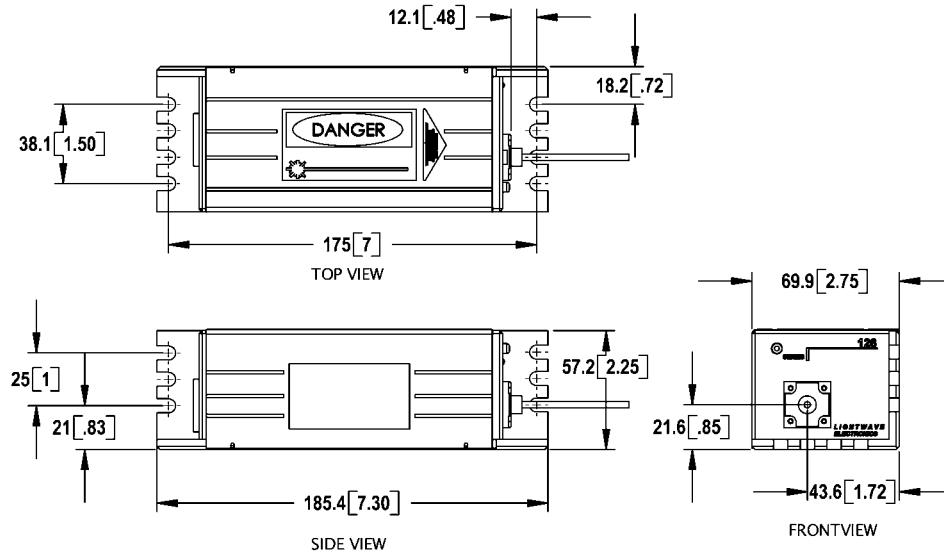
Amplitude noise for a typical NPRO 125/126 laser is <0.05% rms over the range from 10 Hz to 2 MHz, and less than -165 dB/Hz above 10 MHz (shot noise limited). This performance is achieved by combining an inherently quiet laser oscillator with a noise reduction circuit which effectively eliminates the laser's natural relaxation oscillation.

NPRO lasers are built in a compact, OEM-friendly package. All necessary control electronics are onboard the laser head allowing for easy integration with existing systems or new product platforms.

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**NPRO 125 Laser Head**

(Specifications in mm [inches] unless otherwise noted.)

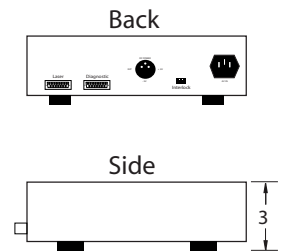
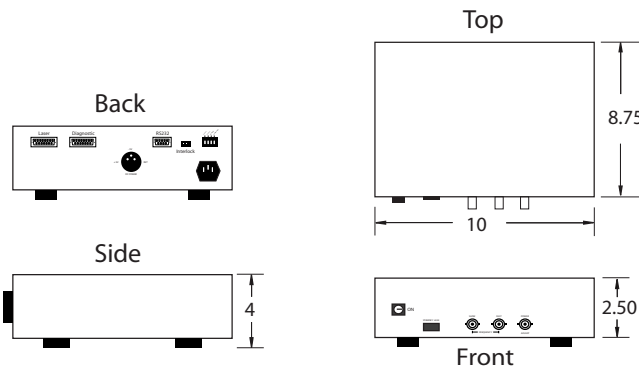
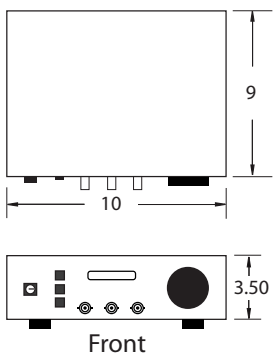


**Power Supply**

(Specifications in inches unless otherwise noted.)

**125/6-OPN-PS**

**125/6-OPN-PS-A**



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NPRO 125 Specifications <sup>1</sup>

Parameter	125N-1319-xxx	125N-1064-xxx
Wavelength	1319 nm	1064 nm
CW power	>100, 150, 200 mW	>25 mW
Spatial mode	TEM <sub>00</sub>	TEM <sub>00</sub>
Longitudinal mode	Single frequency	Single frequency
Linewidth	<5 kHz/ms	<5 kHz/ms
Coherence length, calculated	>1000 m	>1000 m
Frequency drift <sup>2</sup>	<50 MHz/hour	<50 MHz/hour
Amplitude noise, 10 Hz to 2 MHz	<0.05% rms	<0.05% rms
Power drift over 8 hours <sup>3</sup>	<5% peak-to-peak	<5% peak-to-peak
Thermal tuning range, continuous	>10 GHz	>10 GHz
Thermal tuning range, total	>30 GHz	>30 GHz
Thermal tuning rate	>1 GHz/second	>1 GHz/second
Piezo tuning range, 0 to 100 V	>30 MHz	>30 MHz
Piezo response bandwidth, small signal	>30 kHz	>30 kHz
Warm-up time, from cold start (AC off)	1 minute	1 minute
Dimensions		
Laser head size (W x H x D)	6 x 8 x 20 cm	6 x 8 x 20 cm
Weight	1.2 kg (2.65 lbs)	1.2kg (2.65 lbs)
<b>Fiberoptic</b>		
Fiber supplier and part number	Fujikura SM13-P7/125-UV/UV-400	3M FS-PM-5121
Fiber pigtail length	>2 m	>2 m
Fiber pigtail connector alignment	FC/PC, key parallel to slow axis	FC/PC, key parallel to slow axis
Polarization, linear	>30:1, parallel to connector key	>30:1, parallel to connector key
Mode field diameter, NA	9.5 μm, 0.11	7.2 μm, 0.11

1. Fiber-coupled output.

2. Base temperature constant to within <2 °C, total range, after 30 minute warm-up.

3. Base temperature constant to within <5 °C, total range, after 30 minute warm-up.

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## NPRO 126 Specifications <sup>1</sup>

Parameter	126N-1319-xxx	126N-1064-xxx
Wavelength	1319 nm	1064 nm
CW power	>100, 250, 350 mW	>100, 200, 500, 700 mW
Spatial mode	TEM <sub>00</sub>	TEM <sub>00</sub>
Longitudinal mode	Single frequency	Single frequency
Linewidth	<5 kHz/ms	<5 kHz/ms
Coherence length, calculated	>1000 m	>1000 m
Frequency drift <sup>2</sup>	<50 MHz/hour	<50 MHz/hour
Amplitude noise, 10 Hz to 2 MHz	<0.05% rms	<0.05% rms
Power drift over 8 hours <sup>3</sup>	<5% peak-to-peak	<5% peak-to-peak
Thermal tuning range, continuous	>10 GHz	>10 GHz
Thermal tuning range, total	>30 GHz	>30 GHz
Thermal tuning rate	>1 GHz/second	>1 GHz/second
Piezo tuning range, 0 to 100 V	>30 MHz	>30 MHz
Piezo response bandwidth, small signal	>30 kHz	>30 kHz
Polarization	300:1, vertical	300:1
Beam roundness	<20% elliptical	<20% elliptical
Waist location, from shutter housing	5 cm nominal outside laser	5 cm nominal outside laser
Waist diameter, 1/e <sup>2</sup>		
Vertical	0.35 mm nominal	0.38 mm nominal
Horizontal	0.46 mm nominal	0.50 mm nominal
Beam divergence, full angle		
Vertical	3.9 mrad nominal	4.4 mrad nominal
Horizontal	3.0 mrad nominal	3.4 mrad nominal
Warm-up time, from cold start (AC off)	1 minute	1 minute
Dimension		
Laser head size (W x H x D)	6 x 8 x 20 cm	6 x 8 x 20 cm
Weight	1.2 kg (2.65 lbs)	1.2kg (2.65 lbs)

1. Free-space output
2. Base temperature constant to within <2 °C, total range, after 30 minute warm-up.
3. Base temperature constant to within <5 °C, total range, after 30 minute warm-up.

## NPRO 12x Integration Requirements

Parameter	Specification
<b>Input and Ambient</b>	
Voltage, frequency	90 to 250 V AC, 47 to 63 Hz)
Power	<550 W (400 W typical)
Operating ambient temperature	15 to 35 °C
Relative humidity, non-condensing	10 to 80%
Storage temperature	-20 to 55 °C

**Ordering Information**

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at customer.service@jdsu.com.

**Sample: 125N-1319-100 (fiber-coupled, 1319 nm, 100 mW laser head) and 125/6-OPN-PS (microprocessor-based power supply)**

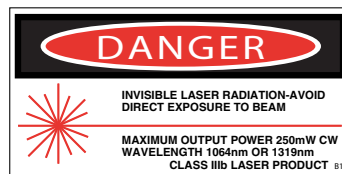
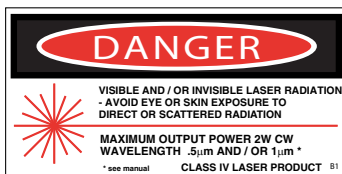
**Laser Head**

Product Code	Description
125N-1319-100	NPRO 125, CW fiber-coupled, 1319 nm, 100 mW laser head
125N-1319-150	NPRO 125, CW fiber-coupled, 1319 nm, 150 mW laser head
125N-1319-200	NPRO 125, CW fiber-coupled, 1319 nm, 200 mW laser head
125N-1064-025 <sup>1</sup>	NPRO 125, CW fiber-coupled, 1064 nm, 25 mW laser head
126N-1064-100	NPRO 126, CW free-space, 1064 nm, 100 mW laser head
126N-1064-200	NPRO 126, CW free-space, 1064 nm, 200 mW laser head
126N-1064-500	NPRO 126, CW free-space, 1064 nm, 500 mW laser head
126N-1064-700	NPRO 126, CW free-space, 1064 nm, 700 mW laser head
126N-1319-100	NPRO 126, CW free-space, 1319 nm, 100 mW laser head
126N-1319-250	NPRO 126, CW free-space, 1319 nm, 250 mW laser head
126N-1319-350	NPRO 126, CW free-space, 1319 nm, 350 mW laser head

1. Uses 3M PM fiber instead of Fujikura

**Power Supply**

Product Code	Description
125/6-OPN-PS	Microprocessor-based
125/6-OPN-PS-A	Analog-based

**Safety Labels**


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