

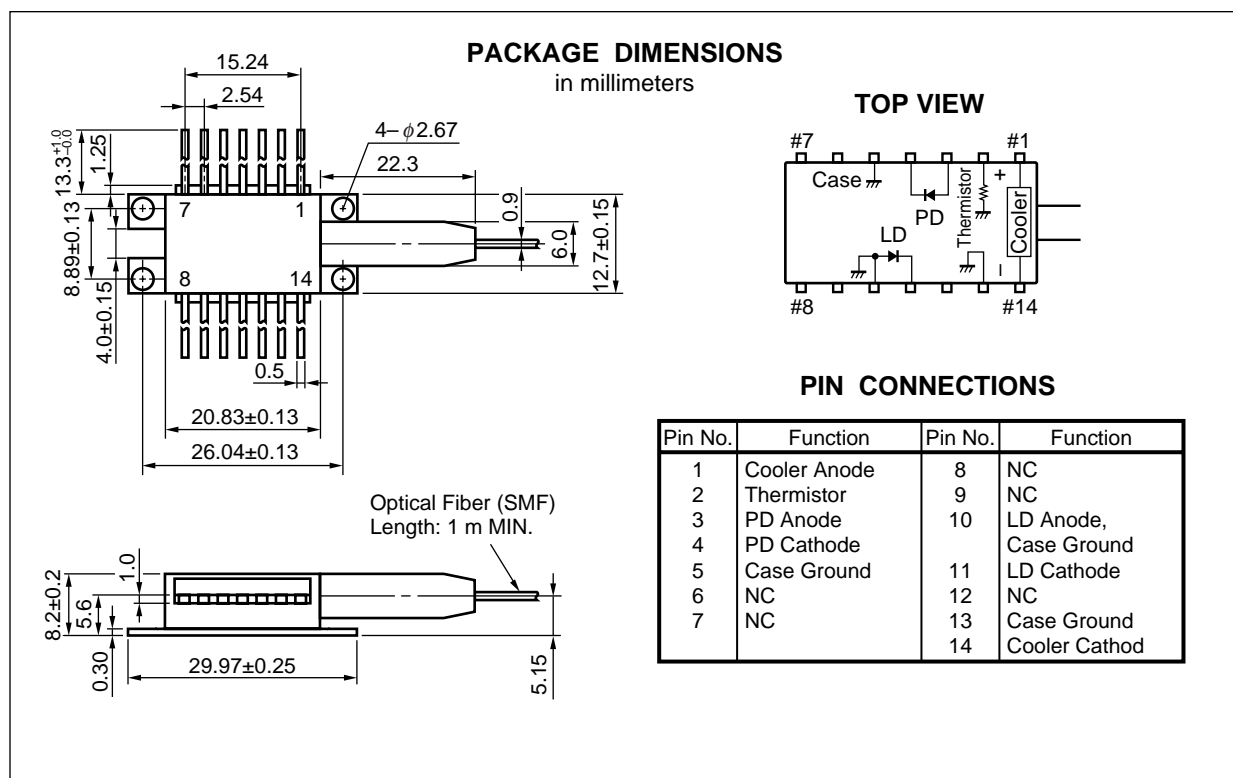
## 1 480 nm EDFA APPLICATION InGaAsP STRAINED MQW DC-PBH LASER DIODE MODULE

### DESCRIPTION

The NX7460LE is a 1 480 nm pumping laser diode module with optical isolator for an EDFA (Er Doped optical Fiber Amplifier) that can expand the transmission span and compensate optical losses. It has a strained Multiple Quantum Well (st-MQW) DC-PBH laser diode that features high output power, high efficiency, and stable fundamental mode.

### FEATURES

- InGaAsP strained MQW DC-PBH laser diode
- ★ • High output power  $P_r = 120 \text{ mW MIN. @ } I_f = 550 \text{ mA CW}$
- Internal optical isolator, thermoelectric cooler and InGaAs monitor photo diode
- Hermetically sealed 14-pin butterfly package
- Single mode fiber pigtail
- ★ • Wide operating temperature range  $T_c = 0 \text{ to } +65 \text{ }^\circ\text{C}$



The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.  
Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

## ORDERING INFORMATION

Part Number	Available Connector
NX7460LE	Without Connector
NX7460LE-BA	With FC-PC Connector
NX7460LE-CA	With SC-PC Connector

## ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub> = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I <sub>F</sub>	700	mA
Reverse Voltage of LD	V <sub>R</sub>	2.0	V
Forward Current of PD	I <sub>F</sub>	10	mA
Reverse Voltage of PD	V <sub>R</sub>	20	V
Operating Case Temperature	T <sub>c</sub>	−20 to +65	°C
Storage Temperature	T <sub>stg</sub>	−40 to +85	°C
Lead Soldering Temperature (10 s)	T <sub>sld</sub>	260	°C

## ★ ELECTRO-OPTICAL CHARACTERISTICS (T<sub>LD</sub> = 25 °C, T<sub>c</sub> = 0 to +65 °C)

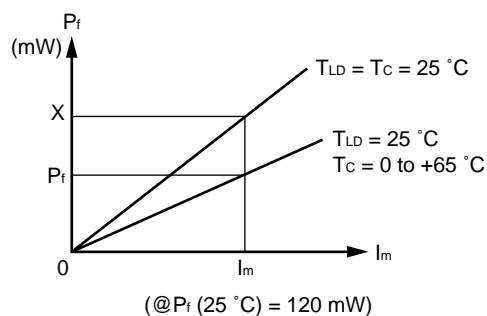
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Threshold Current	I <sub>th</sub>	CW		25	35	mA
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 550 mA		2.2	2.7	V
Optical Output Power from Fiber	P <sub>r</sub>	I <sub>F</sub> = 550 mA	120	140		mW
Center Wavelength	λ <sub>c</sub>	I <sub>F</sub> = 550 mA, RMS (−20 dB)	1 470	1 480	1 490	nm
Spectrum Width	σ	I <sub>F</sub> = 550 mA, RMS (−20 dB)		4.0	8.0	nm
Isolation	I <sub>s</sub>	1 470 nm to 1 490 nm	20			dB

★ ELECTRO-OPTICAL CHARACTERISTICS

(Applicable to Monitor PD:  $T_{LD} = 25\text{ }^{\circ}\text{C}$ ,  $T_c = 0\text{ to }+65\text{ }^{\circ}\text{C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	$I_m$	$V_R = 5\text{ V}$ , $I_F = 550\text{ mA}$	500	1 000	1 500	$\mu\text{A}$
Monitor Dark Current	$I_D$	$V_R = 5\text{ V}$		2.0	10	nA
Tracking Error	$\gamma^*$	$I_m = \text{const.}$			0.5	dB

$$*1 \quad \gamma = \left| 10 \log \frac{P_f}{120\text{ mW}} \right|$$



★ ELECTRO-OPTICAL CHARACTERISTICS

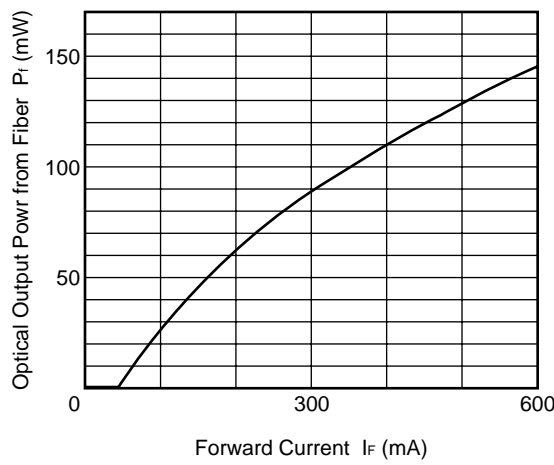
(Applicable to Thermistor and TEC:  $T_{LD} = 25\text{ }^{\circ}\text{C}$ ,  $T_c = 0\text{ to }+65\text{ }^{\circ}\text{C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	$T_{LD} = 25\text{ }^{\circ}\text{C}$	9.5	10.0	10.5	$\text{k}\Omega$
B Constant	B		3 300	3 400	3 500	K
Cooler Current	$I_c$	$\Delta T = 40\text{ K}$		1.0	1.25	A
Cooler Voltage	$V_c$	$\Delta T = 40\text{ K}$		3.5	4.3	V
Cooling Capacity	$\Delta T^*$	$I_c = 1.25\text{ A}$ , $I_F = 660\text{ mA}$	40			K

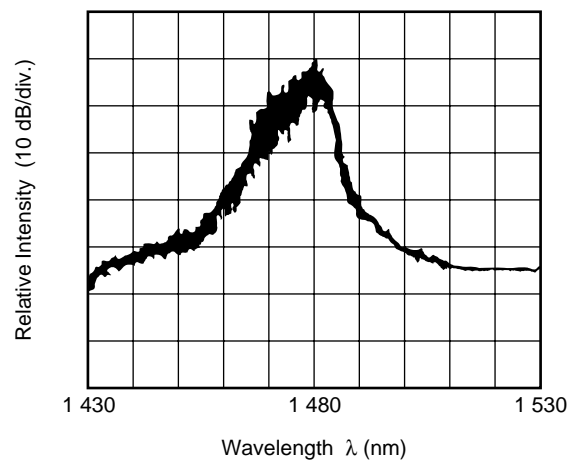
$$*1 \quad \Delta T = |T_c - T_{LD}|$$

TYPICAL CHARACTERISTICS (T<sub>c</sub> = 25 °C)

OPTICAL OUTPUT POWER FROM FIBER vs.  
FORWARD CURRENT



LONGITUDINAL MODE



**Remark** The graphs indicate nominal characteristics.

LD FAMILY FOR DENSE WDM APPLICATION

★

Part Number	Absolute Maximum Ratings		Typical Characteristics			Description	Package
	T <sub>c</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>r</sub> (mW)	λ <sub>c</sub> (nm)		
			TYP.	MIN.	TYP.		
NDL7540PA	−20 to +65	−40 to +85	40	90	1 480	1 480 nm pump LD module	BFY
NX7460LE	0 to +65	−40 to +85	25	120	1 480	1 480 nm pump LD module	BFY
NX8501 Series	0 to +65	−40 to +85	20	2	1 510	Telemetry	Coaxial
NX8561JD <sup>*1</sup>	0 to +65	−40 to +85	20	3	1 510	Telemetry	DIP
NX7660JC <sup>*1</sup>	−20 to +65	−40 to +85	15	5	1 625	Telemetry	DIP
NDL7910P	−20 to +70	−40 to +85	7	0.5	1 550 <sup>*2</sup>	2.5 G EA modulator integrated module	BFY
NX8562LB	−20 to +65	−40 to +85	20	20	1 550 <sup>*2</sup>	1 550 CW LD module	BFY
NX8563LB	−20 to +65	−40 to +85	20	10	ITU-T <sup>*3</sup>	1 550 CW LD module	BFY

\*1 Under development

\*2 Wavelength selectable for ITU-T standards upon request

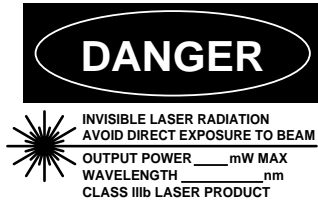
\*3 Wavelength selectable for ITU-T standards

REFERENCE

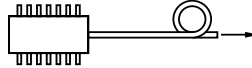
	Document Name	Document No.
	NEC semiconductor device reliability/quality control system	C11159E
	Quality grades on NEC semiconductor devices	C11531E
	Semiconductor device mounting technology manual	C10535E
★	SEMICONDUCTOR SELECTION GUIDE Products & Packages (CD-ROM)	X13769X

## CAUTION

Within this device there exists GaAs (Gallium Arsenide) material which is a harmful substance if ingested. Please do not under any circumstances break the hermetic seal.



### SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible  
Laser Radiation is emitted from  
this aperture

### NEC Corporation

NEC Building, 7-1, Shiba 5-chome,  
Minato-ku, Tokyo 108-01, Japan

Type number: \_\_\_\_\_

Manufactured: \_\_\_\_\_

Serial Number: \_\_\_\_\_

This product conforms to FDA  
regulations as applicable  
to standards 21 CFR Chapter 1.  
Subchapter J.

The export of this product from Japan is prohibited without governmental license. To export or re-export this product from a country other than Japan may also be prohibited without a license from that country. Please call an NEC sales representative.

- **The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.**
  - No part of this document may be copied or reproduced in any form or by any means without the prior written consent of NEC Corporation. NEC Corporation assumes no responsibility for any errors which may appear in this document.
  - NEC Corporation does not assume any liability for infringement of patents, copyrights or other intellectual property rights of third parties by or arising from use of a device described herein or any other liability arising from use of such device. No license, either express, implied or otherwise, is granted under any patents, copyrights or other intellectual property rights of NEC Corporation or others.
  - Descriptions of circuits, software, and other related information in this document are provided for illustrative purposes in semiconductor product operation and application examples. The incorporation of these circuits, software, and information in the design of the customer's equipment shall be done under the full responsibility of the customer. NEC Corporation assumes no responsibility for any losses incurred by the customer or third parties arising from the use of these circuits, software, and information.
  - While NEC Corporation has been making continuous effort to enhance the reliability of its semiconductor devices, the possibility of defects cannot be eliminated entirely. To minimize risks of damage or injury to persons or property arising from a defect in an NEC semiconductor device, customers must incorporate sufficient safety measures in its design, such as redundancy, fire-containment, and anti-failure features.
  - NEC devices are classified into the following three quality grades:  
 "Standard", "Special", and "Specific". The Specific quality grade applies only to devices developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a device depend on its quality grade, as indicated below. Customers must check the quality grade of each device before using it in a particular application.
    - Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots
    - Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)
    - Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.
- The quality grade of NEC devices is "Standard" unless otherwise specified in NEC's Data Sheets or Data Books. If customers intend to use NEC devices for applications other than those specified for Standard quality grade, they should contact an NEC sales representative in advance.