

LASER DIODE NDL7620P Series

1 310 nm OPTICAL FIBER COMMUNICATIONS InGaAsP STRAINED MQW-DFB LASER DIODE COAXIAL MODULE FOR 2.5 Gb/s

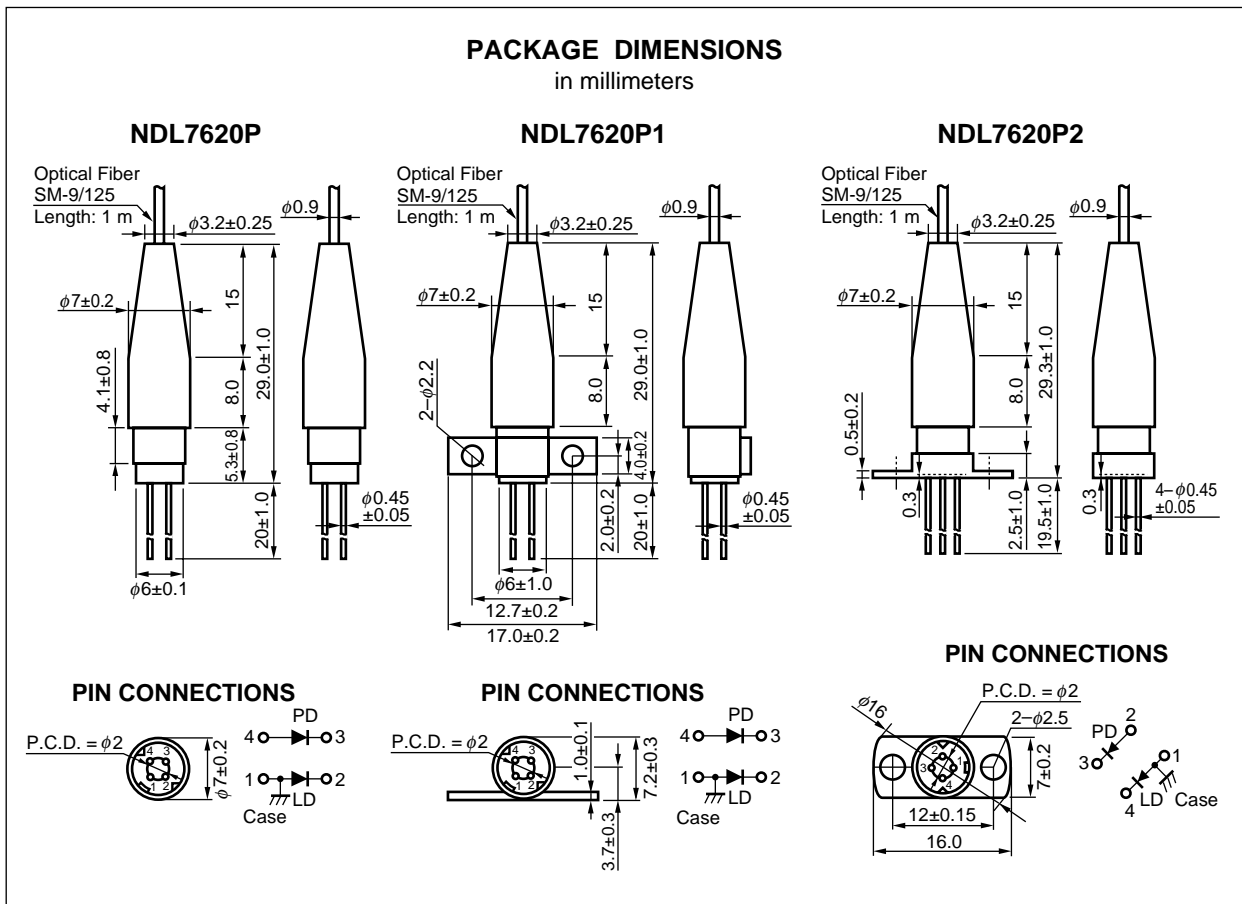
DESCRIPTION

The NDL7620P Series is a 1 310 nm $\lambda/4$ -phase-shifted DFB (Distributed Feed-Back) laser diode coaxial module with internal optical isolator. Newly developed strained Multiple Quantum Well (st-MQW) structure is adopted to achieve stable dynamic single longitudinal mode operation over wide temperature range of 0 to +70 °C. It is designed for STM-16 applications.

FEATURES

- High-speed response $t_r = 40 \text{ ps}, t_r = 100 \text{ ps}$
- Peak emission wavelength $\lambda_p = 1 310 \text{ nm}$
- Wide operating temperature range $T_c = 0 \text{ to } +70 \text{ }^\circ\text{C}$
- Internal optical isolator
- $\lambda/4$ -phase-shifted DFB
- InGaAs monitor PIN-PD

★



The information in this document is subject to change without notice.

ORDERING INFORMATION

Part Number	Available Connector	Flange Type
NDL7620P	Without Connector	No Flange
NDL7620PC	With FC-PC Connector	
NDL7620PD	With SC-PC Connector	
NDL7620P1	Without Connector	Flat Mount Flange
NDL7620P1C	With FC-PC Connector	
NDL7620P1D	With SC-PC Connector	
NDL7620P2	Without Connector	Vertical Flange
NDL7620P2C	With FC-PC Connector	
NDL7620P2D	With SC-PC Connector	

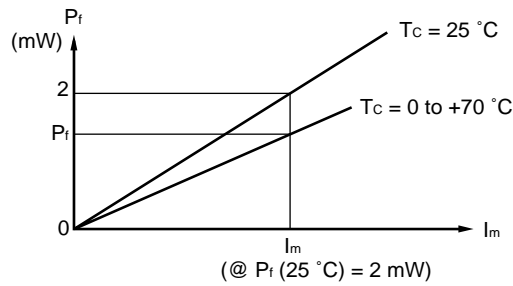
ABSOLUTE MAXIMUM RATINGS (T_c = 0 to +70 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I _F	150	mA
Optical Output Power from Fiber	P _r	5.0	mW
Reverse Voltage of LD	V _R	2.0	V
Forward Current of PD	I _F	10	mA
Reverse Voltage of PD	V _R	20	V
Operating Case Temperature	T _c	0 to +70	°C
Storage Temperature	T _{stg}	-40 to +85	°C
Lead Soldering Temperature (10 s)	T _{slid}	260	°C

ELECTRO-OPTICAL CHARACTERISTICS (T_c = 0 to +70 °C, unless otherwise specified)

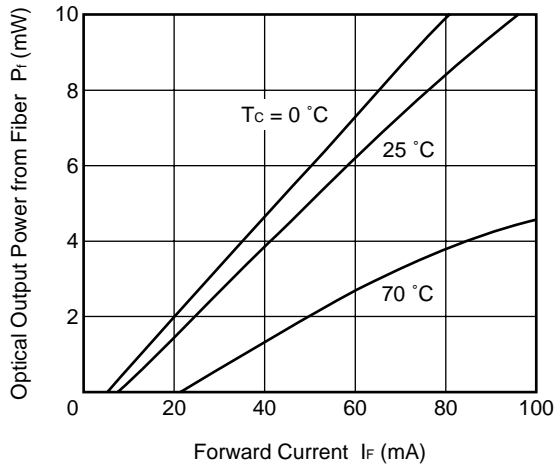
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Forward Voltage	V _F	P _f = 2 mW, T _c = 25 °C	0.9		1.4	V
Optical Output Power from Fiber	P _f	I _f = I _{th} + 40 mA	2.0			mW
Threshold Current	I _{th}				45	mA
Differential Efficiency from Fiber	η _d	P _f = 2 mW	0.05			W/A
Temperature Dependence of Differential Efficiency from Fiber	Δη _d	Δη _d = 10 log $\frac{\eta_d (T_c = 70\text{ °C})}{\eta_d (T_c = 25\text{ °C})}$	-3.5	-2.5		dB
Peak Emission Wavelength	λ _p	P _f = 1 mW, I _b = I _{th} ,	1 290	1 310	1 330	nm
Side Mode Suppression Ratio	SMSR	2.5 G/s-NRZ, PN 1/2	30	40		dB
Rise Time	t _r	10-90%, I _b = 0.9 × I _{th}		40	125	ps
Fall Time	t _f	90-10%, I _b = 0.9 × I _{th}		100	200	ps
Monitor Current	I _m	V _R = 5 V, P _f = 2 mW	50		2 000	μA
Monitor Dark Current	I _b	V _R = 5 V, T _c = 25 °C		0.5	5.0	nA
Monitor PD Terminal Capacitance	C _t	V _R = 5 V		1.0	1.5	pF
Tracking Error	γ ¹	I _m = const.			1.0	dB

*1 $\gamma = \left| 10 \log \frac{P_f}{2 \text{ mW}} \right|$

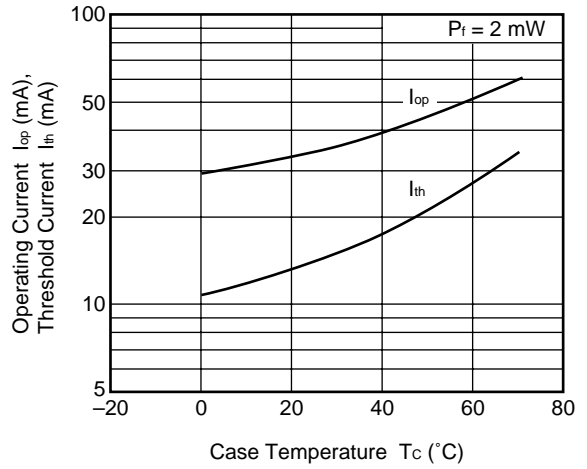


TYPICAL CHARACTERISTICS ($T_c = 25\text{ }^\circ\text{C}$, unless otherwise specified)

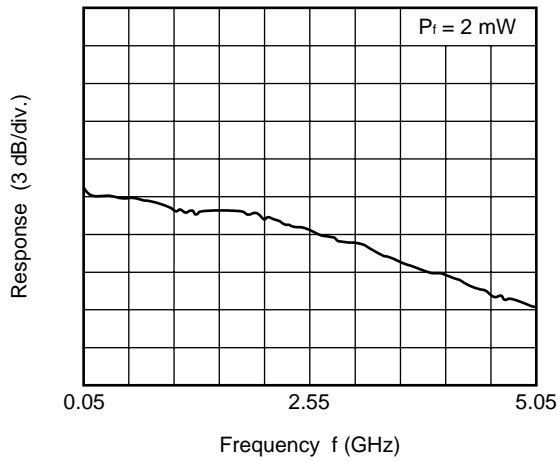
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



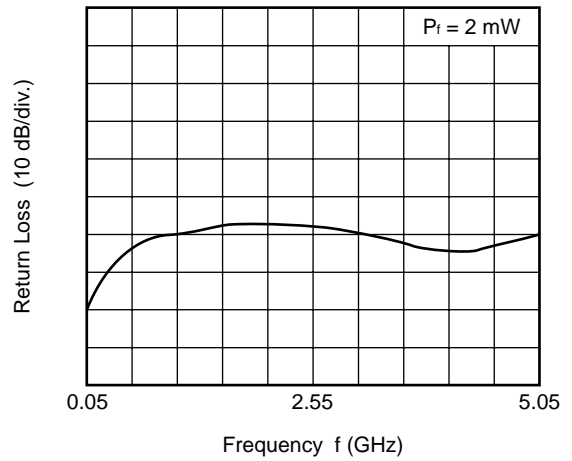
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



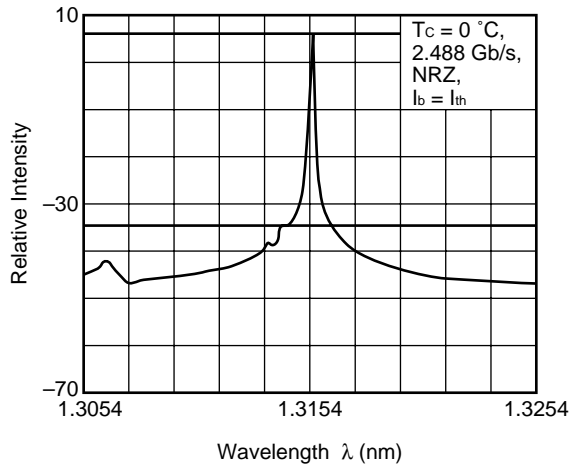
FREQUENCY RESPONSE (S21)



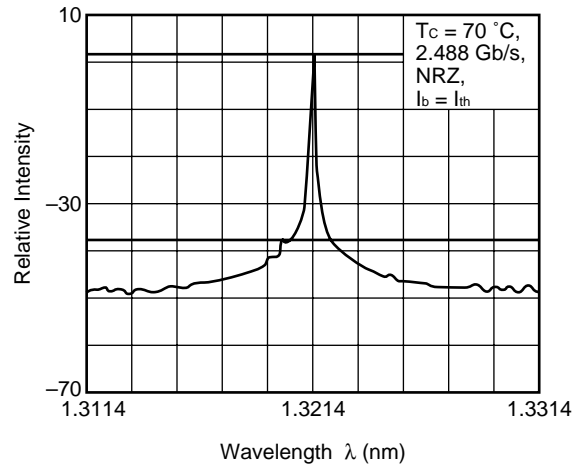
RETURN LOSS CHARACTERISTICS (S11)



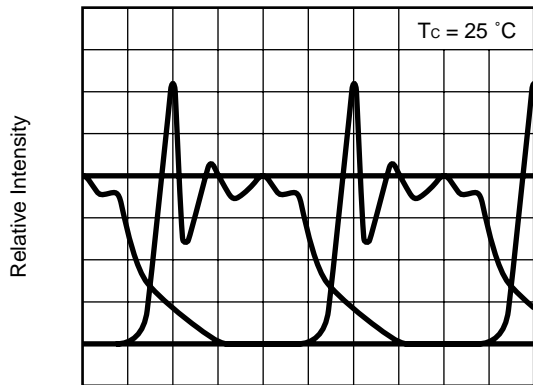
LONGITUDINAL MODE



LONGITUDINAL MODE

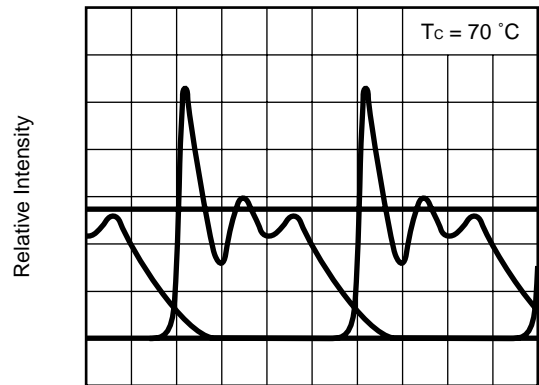


EYE DIAGRAM



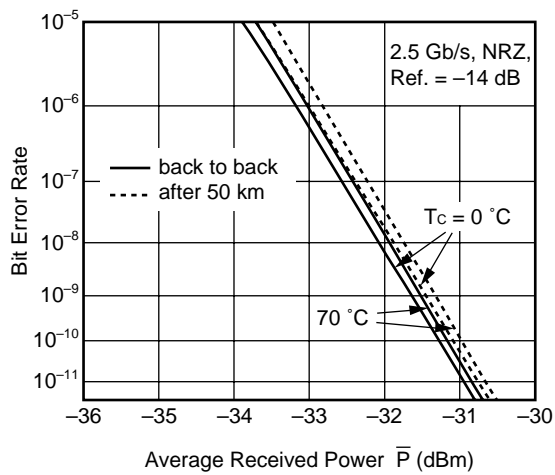
Time Base (100 ps/div.)

EYE DIAGRAM



Time Base (100 ps/div.)

ERROR RATE CHARACTERISTICS



Remark The measurement of TYPICAL CHARACTERISTICS are only for reference, not guaranteed.

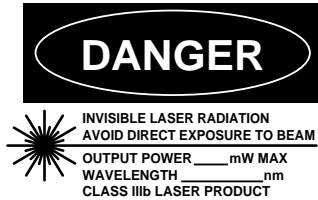
REFERENCE

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	X10679E

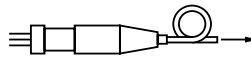
[MEMO]

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.

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.

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: Aircrafts, 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.

Anti-radioactive design is not implemented in this product.