

# NDL7620P Series

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

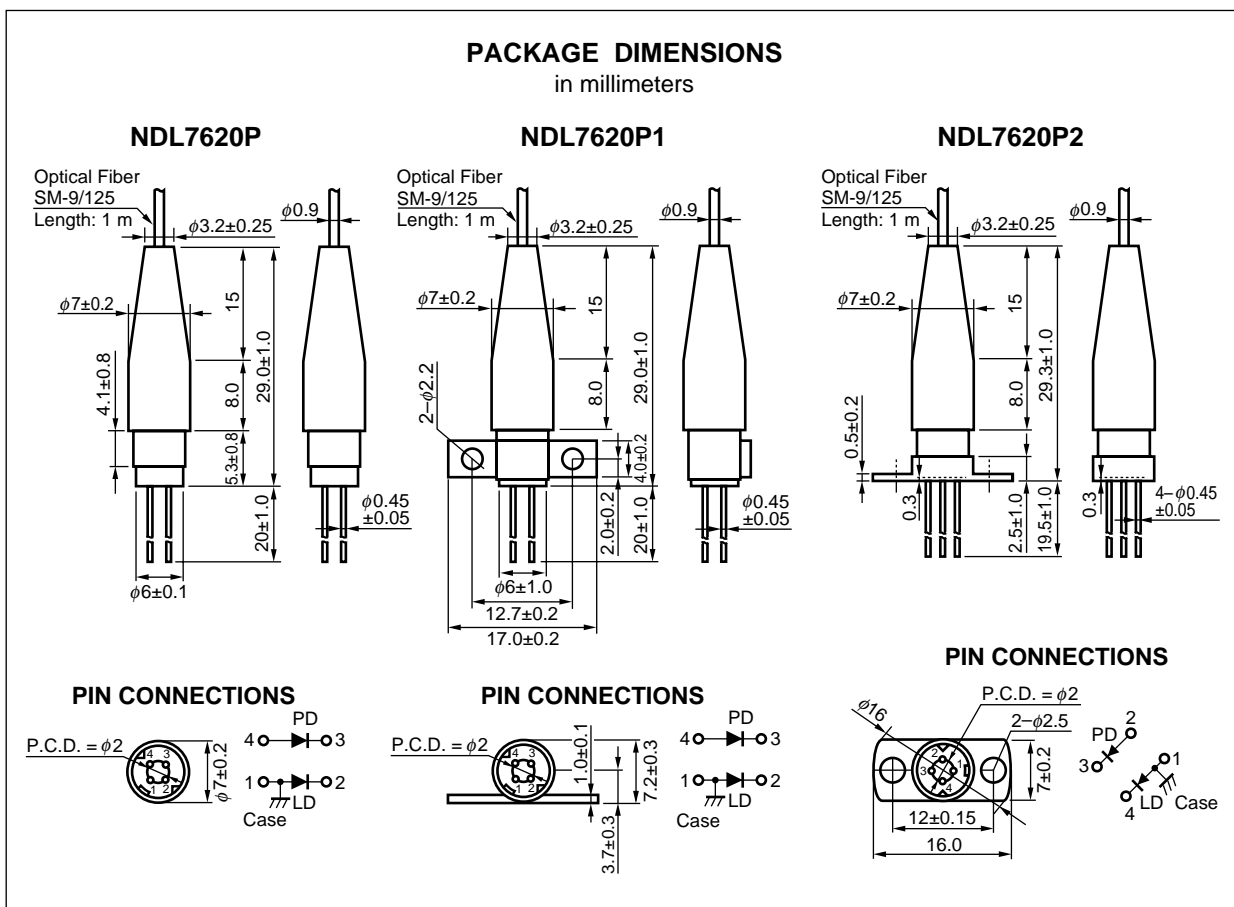
### DESCRIPTION

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  $t_r = 40 \text{ ps}, t_f = 100 \text{ ps}$
- 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

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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	

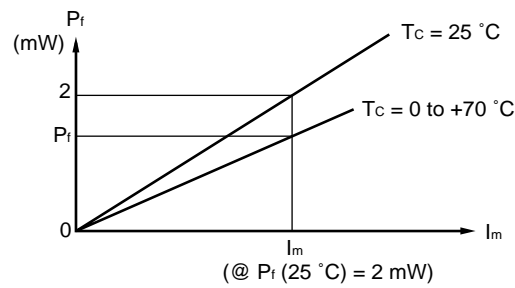
**ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub> = 0 to +70 °C, unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I <sub>F</sub>	150	mA
Optical Output Power from Fiber	P <sub>r</sub>	5.0	mW
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>	0 to +70	°C
Storage Temperature	T <sub>stg</sub>	-40 to +85	°C
Lead Soldering Temperature (10 s)	T <sub>slid</sub>	260	°C

**ELECTRO-OPTICAL CHARACTERISTICS (T<sub>c</sub> = 0 to +70 °C, unless otherwise specified)**

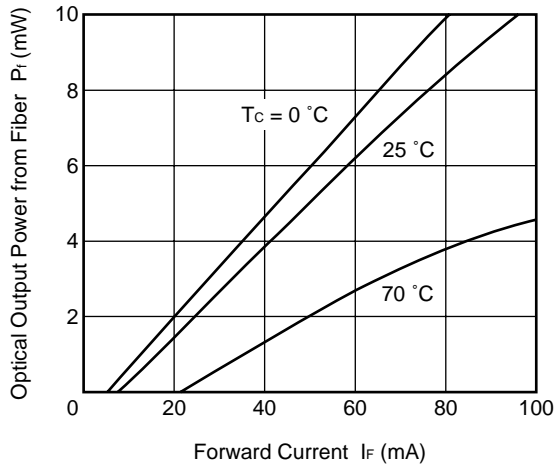
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Forward Voltage	V <sub>F</sub>	P <sub>f</sub> = 2 mW, T <sub>c</sub> = 25 °C	0.9		1.4	V
Optical Output Power from Fiber	P <sub>f</sub>	I <sub>f</sub> = I <sub>th</sub> + 40 mA	2.0			mW
Threshold Current	I <sub>th</sub>				45	mA
Differential Efficiency from Fiber	η <sub>d</sub>	P <sub>f</sub> = 2 mW	0.05			W/A
Temperature Dependence of Differential Efficiency from Fiber	Δη <sub>d</sub>	Δη <sub>d</sub> = 10 log $\frac{\eta_d (T_c = 70 \text{ }^\circ\text{C})}{\eta_d (T_c = 25 \text{ }^\circ\text{C})}$	-3.5	-2.5		dB
Peak Emission Wavelength	λ <sub>p</sub>	P <sub>f</sub> = 1 mW, I <sub>b</sub> = I <sub>th</sub> ,	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 <sub>r</sub>	10-90%, I <sub>b</sub> = 0.9 × I <sub>th</sub>		40	125	ps
Fall Time	t <sub>f</sub>	90-10%, I <sub>b</sub> = 0.9 × I <sub>th</sub>		100	200	ps
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 5 V, P <sub>f</sub> = 2 mW	50		2 000	μA
Monitor Dark Current	I <sub>b</sub>	V <sub>R</sub> = 5 V, T <sub>c</sub> = 25 °C		0.5	5.0	nA
Monitor PD Terminal Capacitance	C <sub>t</sub>	V <sub>R</sub> = 5 V		1.0	1.5	pF
Tracking Error	γ <sup>1</sup>	I <sub>m</sub> = const.			1.0	dB

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

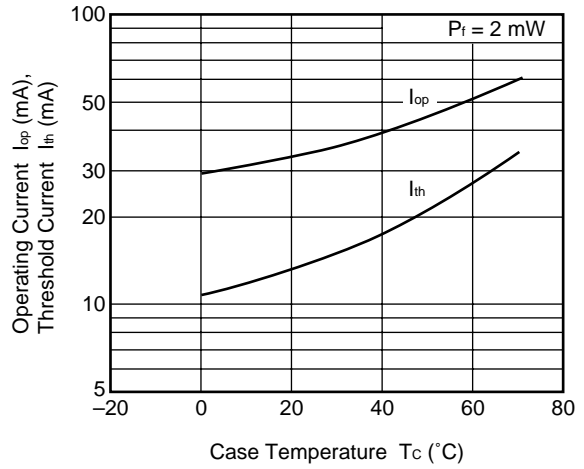


**TYPICAL CHARACTERISTICS ( $T_c = 25\text{ }^\circ\text{C}$ , unless otherwise specified)**

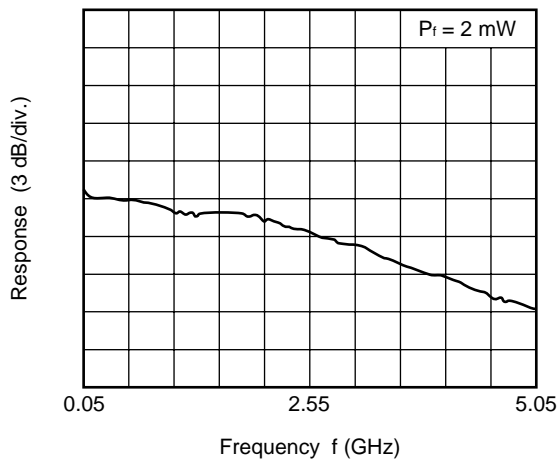
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



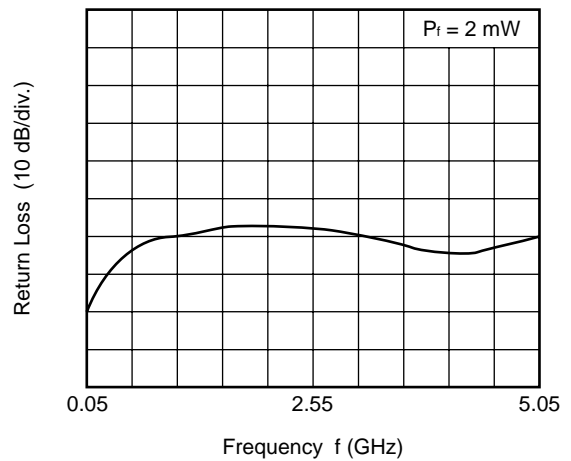
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



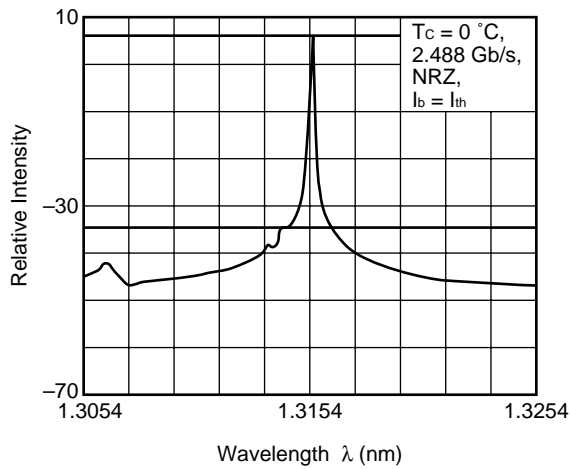
FREQUENCY RESPONSE (S21)



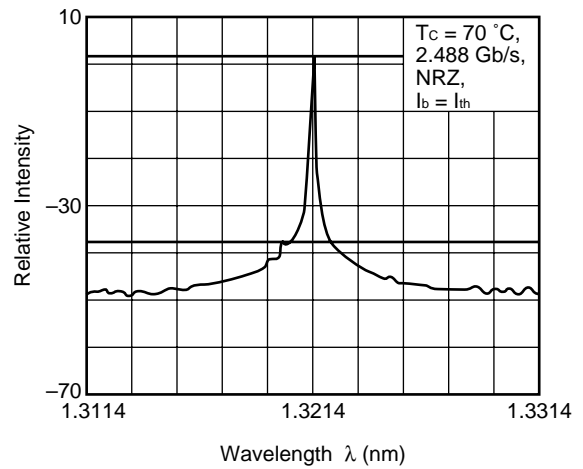
RETURN LOSS CHARACTERISTICS (S11)



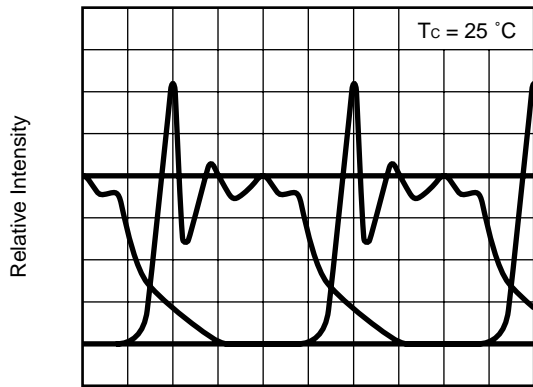
LONGITUDINAL MODE



LONGITUDINAL MODE

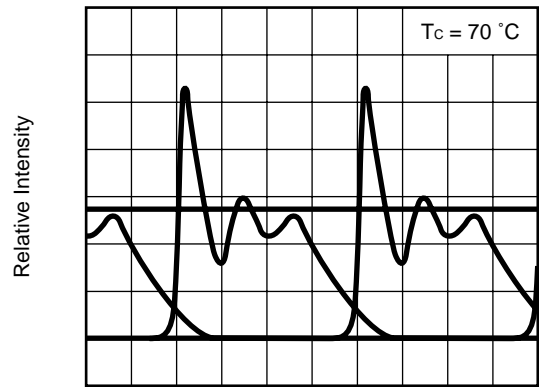


EYE DIAGRAM



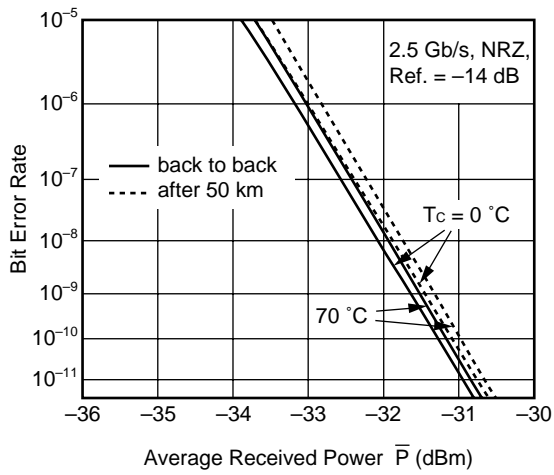
Time Base (100 ps/div.)

EYE DIAGRAM



Time Base (100 ps/div.)

ERROR RATE CHARACTERISTICS



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

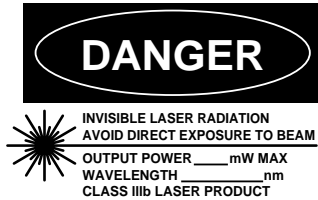
**REFERENCE**

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

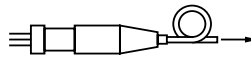
[MEMO]

**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.

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**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)

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Anti-radioactive design is not implemented in this product.



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