

FEATURES

- **CENTER WAVELENGTH**
 $\lambda_c = 1310 \text{ nm}$
- **TWO TYPES OF OUTPUT POWER:**
1.0 mW (NDL7408PK Series)
0.2 mW (NDL7408PL Series)
- **LOW THRESHOLD CURRENT:**
 $I_{TH} = 12 \text{ mA TYP at } T_c = 25^\circ\text{C}$
- **HIGH CUT-OFF FREQUENCY**
 $f_c = 2.0 \text{ GHz}$
- **InGaAs MONITOR PIN-PD**
- **WIDE OPERATING TEMPERATURE RANGE:**
-40 to +85°C
- **BASED ON BELLCORE TA-NWT-000983**

DESCRIPTION

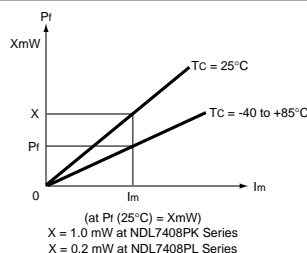
The NDL7408P Series is a 1310 nm laser diode coaxial module with single mode fiber. It has a strained Multiple Quantum Well (st-MQW) structure and a built-in InGaAs monitor photo diode. It is recommended for junction or access network systems. The series is available in two types of output power: 1.0 mW and 0.2 mW.

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

PART NUMBER PACKAGE OUTLINE			NDL7408P Series		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
V_{OP}	Operating Voltage ¹	V		1.1	1.3
I_{TH}	Threshold Current, $T_c = +85^\circ\text{C}$	mA		10 25	25 50
I_{MOD}	Modulation Current, $P_f = 1.0 \text{ mW for NDL7408PK Series}$ $P_f = 0.2 \text{ mW for NDL7408PL Series}$	mA		15	30
η_D	Differential Efficiency from Fiber for NDL7408PK Series, $T_c = +85^\circ\text{C}$	W/A	0.025 0.018	0.050 0.035	
η_D	Differential Efficiency from Fiber for NDL7408PL Series, $T_c = +85^\circ\text{C}$	W/A	0.010 0.005	0.015 0.010	
λ_c	Center Emission Wavelength ¹ , RMS (-20 dB) $T_c = -40 \text{ to } +85^\circ\text{C}$	nm	1290 1260	1310	1330 1360
$\Delta\lambda/\Delta T$	Temperature Dependence of Center Emission Wavelength, $T_c = -40 \text{ to } +85^\circ\text{C}$	nm/°C		0.4	0.5
σ	Spectral Width ¹ , RMS (-20 dB) $T_c = +85^\circ\text{C}$	nm		1.3 1.5	2.5 4
f_c	Cut-off Frequency, -3 dB	GHz		2.0	
t_r	Rise Time, 10 to 90%	ns		0.2	0.5
t_f	Fall Time, 90 to 10%	ns		0.3	0.5
I_m	Monitor Current of PD ¹ , $V_{RD} = 5 \text{ V}$	μA	100	700	
I_D	Dark Current of PD, $V_{RD} = 5 \text{ V}$	nA		0.1	10
γ	Tracking Error ² , $I_m = \text{const.}, T_c = -40 \text{ to } +85^\circ\text{C}$	dB		0.5	1.0

Note: 1. $P_f = 1.0 \text{ mW}$ for NDL7408PK Series
 $P_f = 0.2 \text{ mW}$ for NDL7408PL Series

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



NDL7408P SERIES

ABSOLUTE MAXIMUM RATINGS¹

(T_c = 25°C, unless otherwise specified)

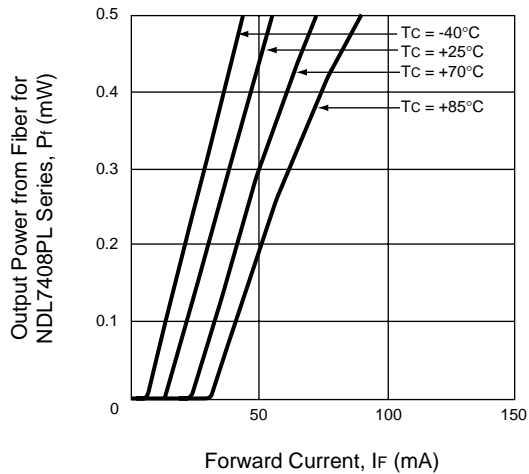
SYMBOLS	PARAMETERS	UNITS	RATINGS
I _F	Forward Current of LD	mA	I _{TH} + 50
V _R	Reverse Voltage of LD	V	2.0
I _F	Forward Current of PD	mA	10
V _R	Reverse Voltage of PD	V	20
T _c	Operating Case Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-40 to +85
T _{SLD}	Lead Soldering Temperature (10 s)	°C	260

Note:

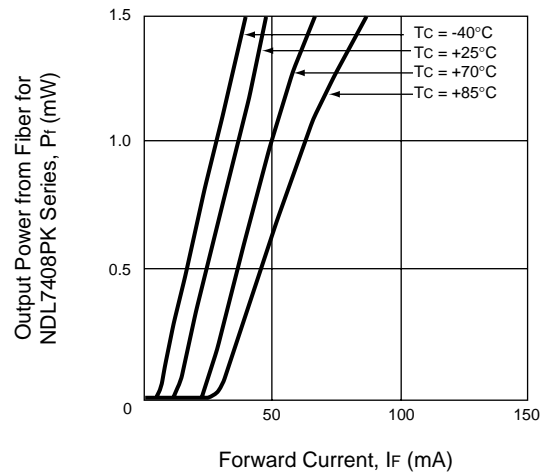
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_c = -40 to +85°C)

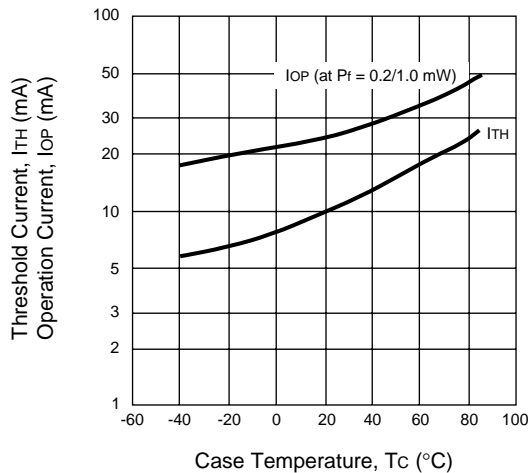
OUTPUT POWER FROM FIBER vs. FORWARD CURRENT FOR NDL7408PL SERIES



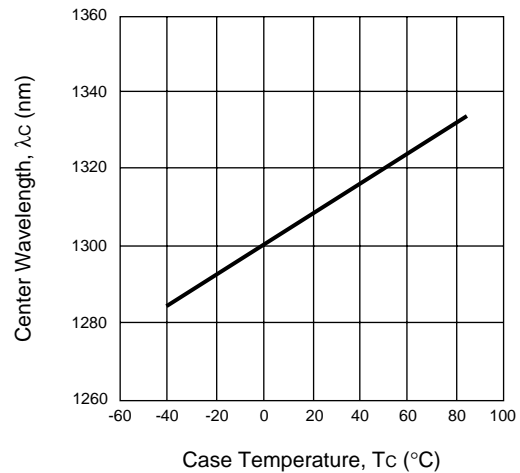
OUTPUT POWER FROM FIBER vs. FORWARD CURRENT FOR NDL7408PK SERIES



THRESHOLD CURRENT AND OPERATION CURRENT vs. CASE TEMPERATURE

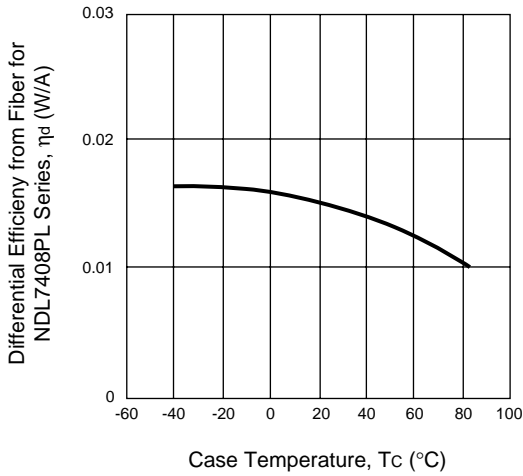


TEMPERATURE DEPENDENCE OF CENTER WAVELENGTH FOR NDL7408P SERIES

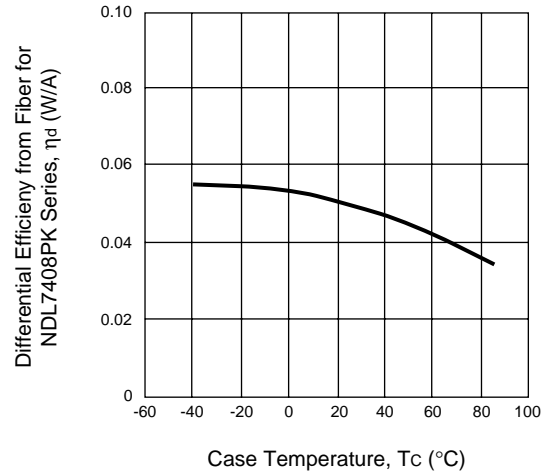


TYPICAL PERFORMANCE CURVES ($T_c = -40$ to $+85^\circ\text{C}$)

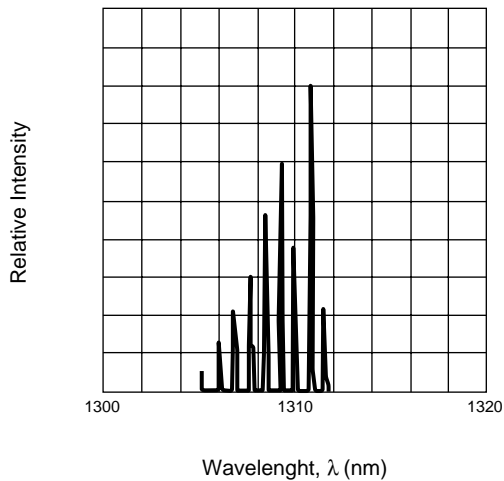
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY FROM FIBER FOR NDL7408PL SERIES



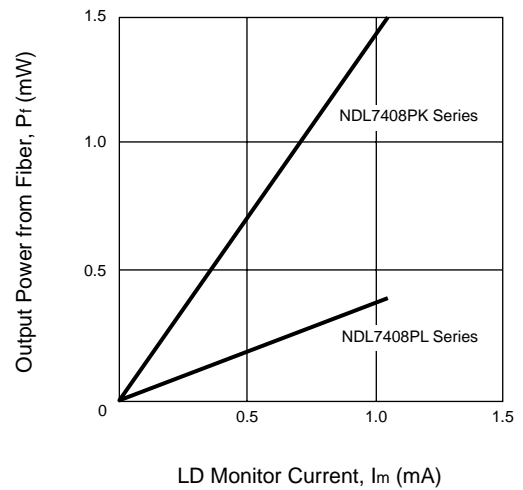
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY FROM FIBER FOR NDL7408PK SERIES



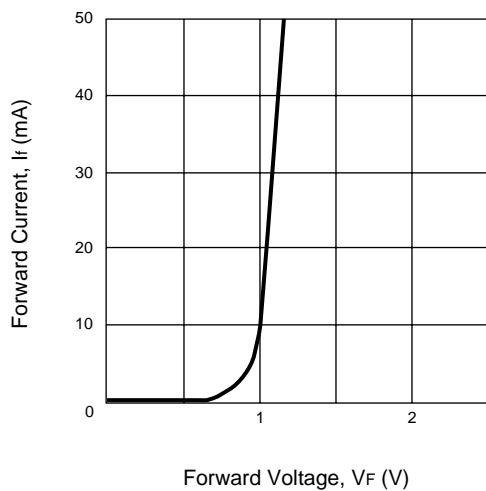
LONGITUDINAL MODE FROM FIBER FOR NDL7408P SERIES



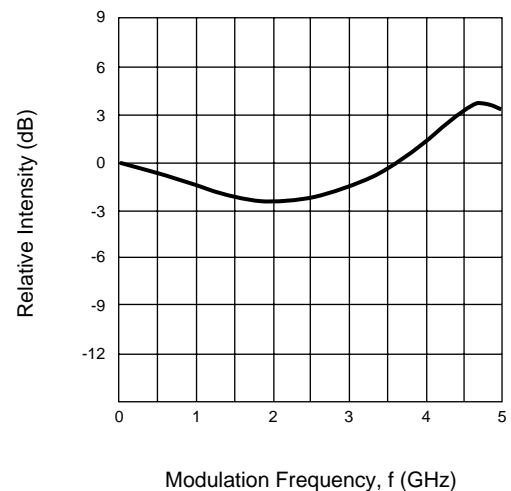
OUTPUT POWER FROM FIBER vs. LD MONITOR CURRENT



FORWARD CURRENT vs. FORWARD VOLTAGE FOR NDL7408P SERIES



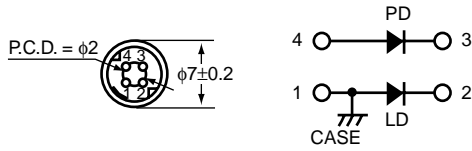
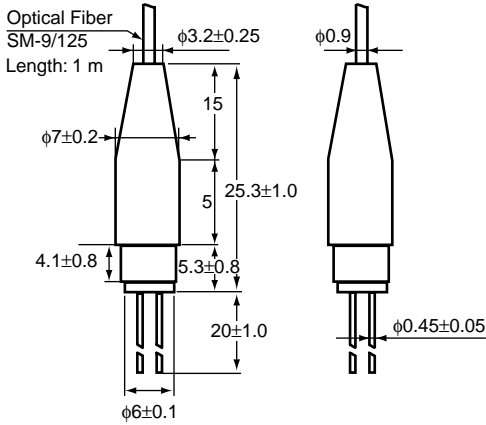
FREQUENCY RESPONSE ($P_r = 0.2/1.0$ (mW))



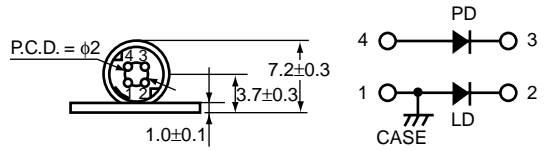
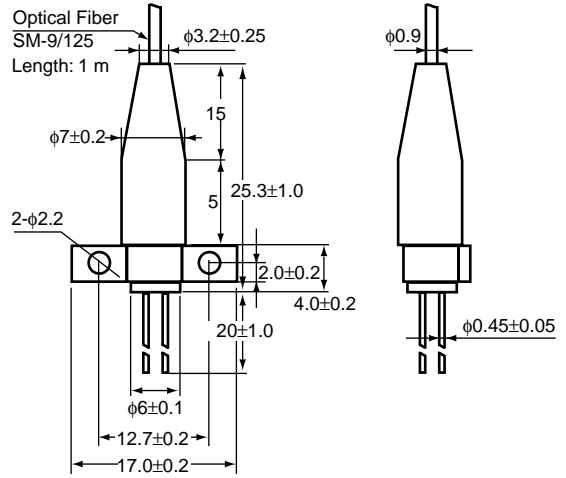
NDL7408P SERIES

OUTLINE DIMENSIONS (Units in mm)

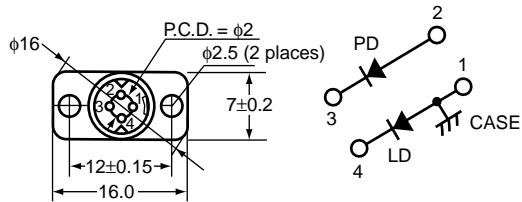
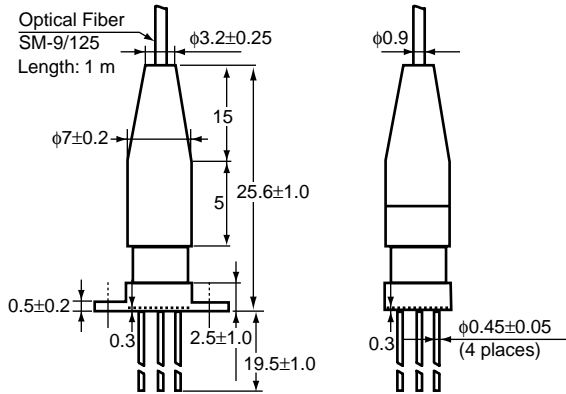
NDL7408P



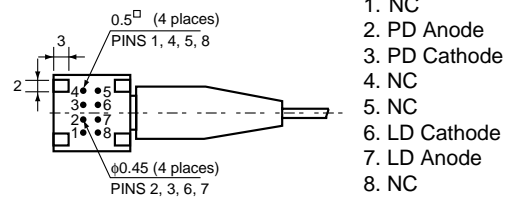
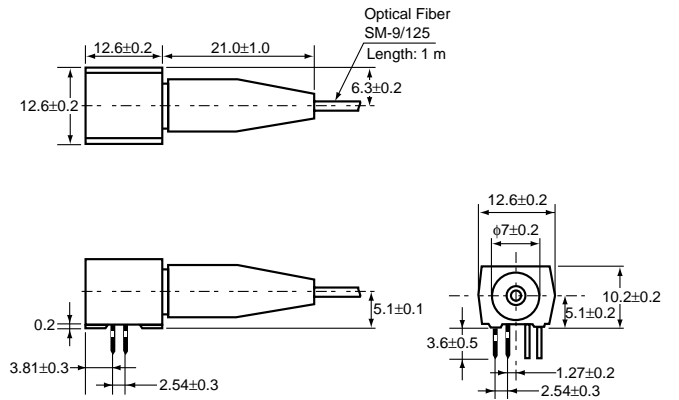
NDL7408P1



NDL7408P2



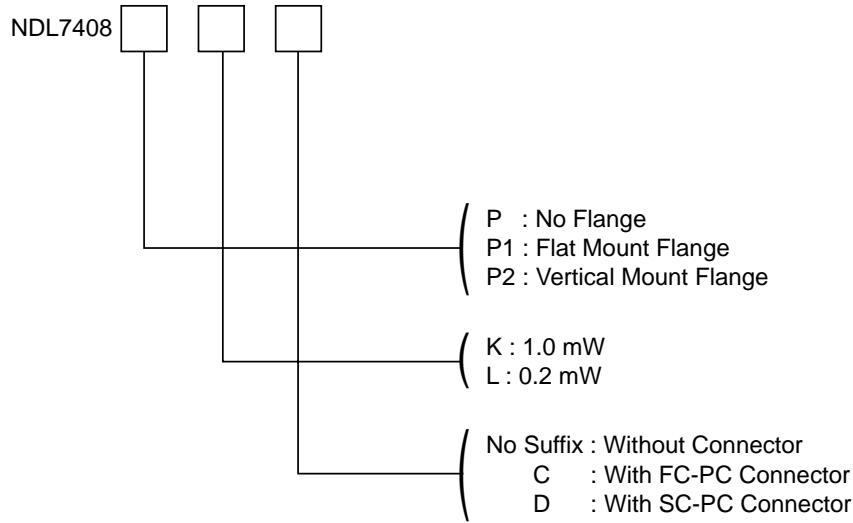
NDL7408P4



PIN CONNECTIONS

- 1. NC
- 2. PD Anode
- 3. PD Cathode
- 4. NC
- 5. NC
- 6. LD Cathode
- 7. LD Anode
- 8. NC

ORDERING INFORMATION



PART NUMBER	RANKS		DESCRIPTION
NDL7408PK	M	1.0 mW	Without Connector
NDL7408PKC		No Flange	With FC-PC Connector
NDL7408PKD			With SC-PC Connector
NDL7408P1K	M	1.0 mW	Without Connector
NDL74081KC		Flat Mount Flange	With FC-PC Connector
NDL7408P1KD			With SC-PC Connector
NDL7408P2K	M	1.0 mW	Without Connector
NDL74082KC		Vertical Flange	With FC-PC Connector
NDL7408P2KD			With SC-PC Connector
NDL7408P4K	M	1.0 mW	Without Connector
NDL7408P4KC		8-pin DIP	With FC-PC Connector
NDL7408P4KD			With SC-PC Connector
NDL7408PL	N	0.2 mW	Without Connector
NDL7408PLC		No Flange	With FC-PC Connector
NDL7408PLD			With SC-PC Connector
NDL7408P1L	N	0.2 mW	Without Connector
NDL7408P1LC		Flat Mount Flange	With FC-PC Connector
NDL7408P1LD			With SC-PC Connector
NDL7408P2L	N	0.2 mW	Without Connector
NDL7408P2LC		Vertical Flange	With FC-PC Connector
NDL7408P2LD			With SC-PC Connector
NDL7408P4L	N	0.2 mW	Without Connector
NDL7408P4LC		8-pin DIP	With FC-PC Connector
NDL7408P4LD			With SC-PC Connector

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