

NEC

LASER DIODE

NDL7408P Series**1 310 nm InGaAsP STRAINED MQW DC-PBH LASER DIODE
COAXIAL MODULE WITH SINGLE MODE FIBER****DESCRIPTION**

NDL7408P Series is a 1 310 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.

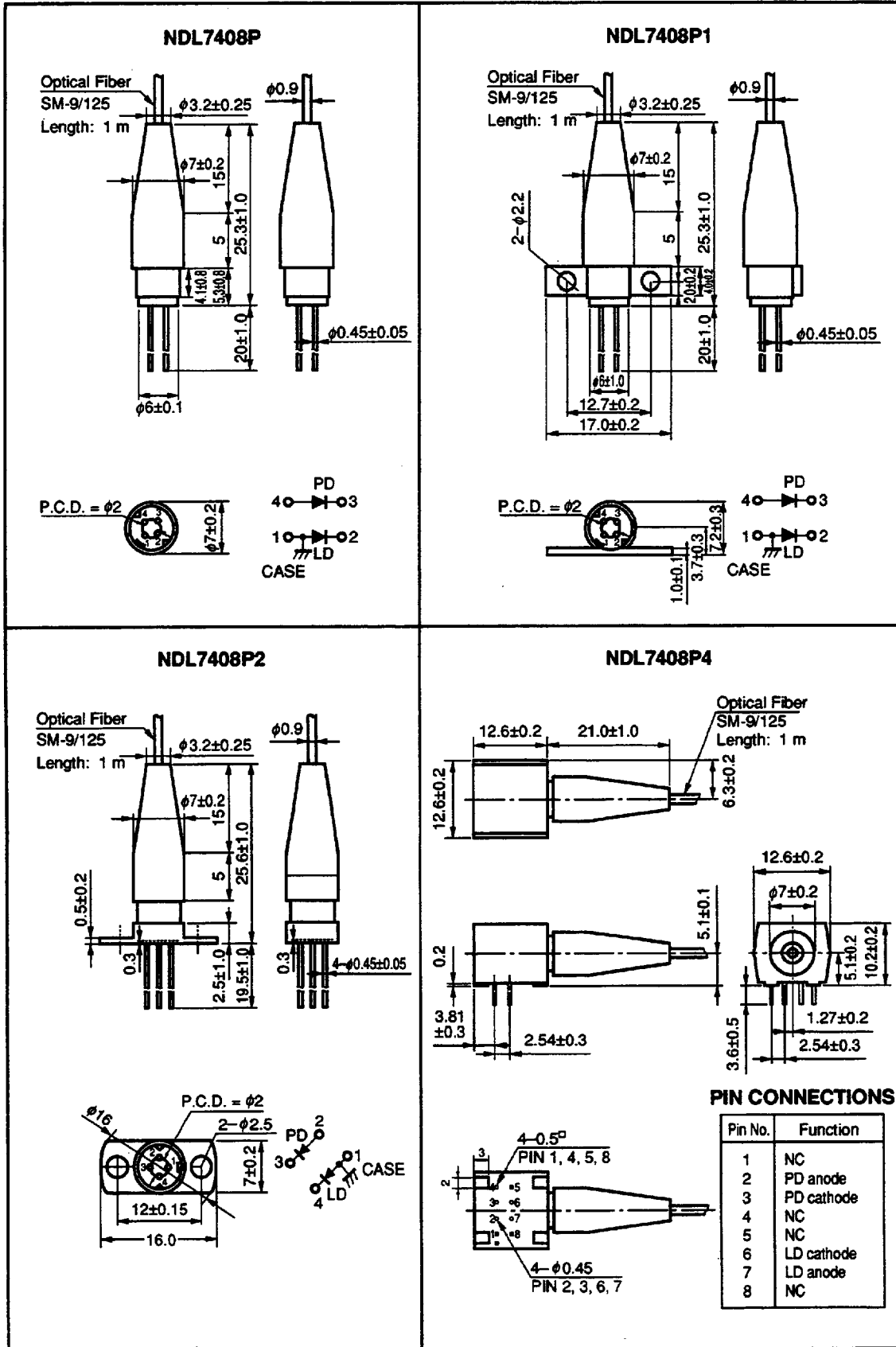
FEATURES

- Center wavelength $\lambda_c = 1\ 310\ \text{nm}$
- Two types of output power : 1.0 mW (NDL7408PK Series)
0.2 mW (NDL7408PL Series)
- Low threshold current $I_{th} = 12\ \text{mA TYP. @}T_c = 25\ ^\circ\text{C}$
- High cut-off frequency $f_c = 2.0\ \text{GHz}$
- InGaAs monitor PIN-PD
- Wide operating temperature range: $-40\ \text{to}\ +85\ ^\circ\text{C}$
- Based on Bellcore TA-NWT-000983

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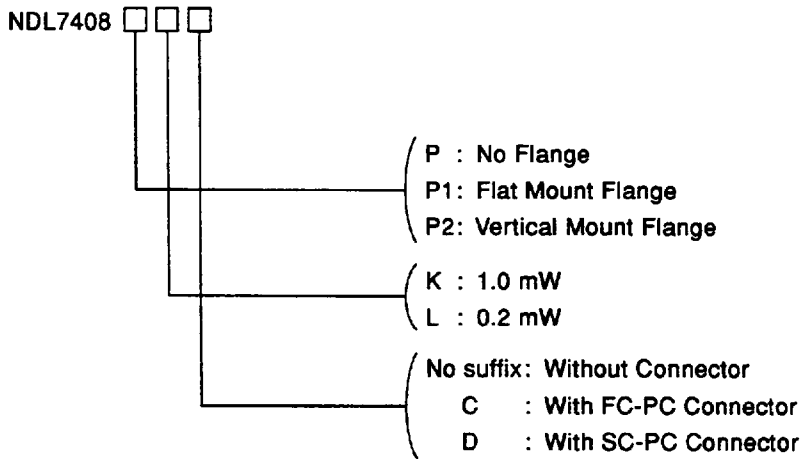
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★ PACKAGE DIMENSIONS (in millimeters)



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ORDERING INFORMATION



Part Number	Ranks	Description	
NDL7408PK	M	1.0 mW No Flange	Without Connector
NDL7408PKC			With FC-PC Connector
NDL7408PKD			With SC-PC Connector
NDL7408P1K	M	1.0 mW Flat Mount Flange	Without Connector
NDL7408P1KC			With FC-PC Connector
NDL7408P1KD			With SC-PC Connector
NDL7408P2K	M	1.0 mW Vertical Flange	Without Connector
NDL7408P2KC			With FC-PC Connector
NDL7408P2KD			With SC-PC Connector
NDL7408P4K	M	1.0 mW 8-pin DIP	Without Connector
NDL7408P4KC			With FC-PC Connector
NDL7408P4KD			With SC-PC Connector
NDL7408PL	N	0.2 mW No Flange	Without Connector
NDL7408PLC			With FC-PC Connector
NDL7408PLD			With SC-PC Connector
NDL7408P1L	N	0.2 mW Flat Mount Flange	Without Connector
NDL7408P1LC			With FC-PC Connector
NDL7408P1LD			With SC-PC Connector
NDL7408P2L	N	0.2 mW Vertical Flange	Without Connector
NDL7408P2LC			With FC-PC Connector
NDL7408P2LD			With SC-PC Connector
NDL7408P4L	N	0.2 mW 8-pin DIP	Without Connector
NDL7408P4LC			With FC-PC Connector
NDL7408P4LD			With SC-PC Connector

ABSOLUTE MAXIMUM RATINGS (Tc = 25 °C, unless otherwise specified)

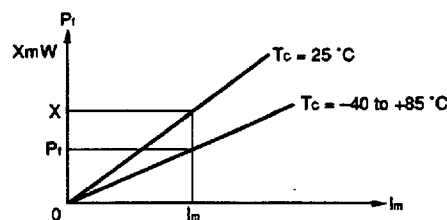
Parameter	Symbol	Ratings	Unit
Forward Current of LD	I _F	I _m + 50	mA
Reverse Voltage of LD	V _R	2.0	V
Forward Current of PD	I _F	10	mA
Reverse Voltage of PD	V _R	20	V
Operating Case Temperature	T _c	-40 to +85	°C
Storage Temperature	T _{stg}	-40 to +85	°C
Lead Soldering Temperature (10 s)	T _{sld}	260	°C

ELECTRO-OPTICAL CHARACTERISTICS (Tc = 25 °C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V _{op}	*1		1.1	1.3	V
Threshold Current	I _{th}			10	25	mA
		T _c = +85 °C		25	50	
Modulation Current	I _{mod}	P _r = 1.0 mW @NDL7408PK Series		15	30	mA
		P _r = 0.2 mW @NDL7408PL Series				
Differential Efficiency from Fiber for NDL7408PK Series	η _d		0.025	0.050		W/A
		T _c = +85 °C	0.018	0.035		
Differential Efficiency from Fiber for NDL7408PL Series	η _d		0.010	0.015		
		T _c = +85 °C	0.005	0.010		
Center Emission Wavelength	λ _c	*1, RMS (-20 dB)	1 290	1 310	1 330	nm
		T _c = -40 to +85 °C	1 260		1 360	
Temperature Dependence of Center Emission Wavelength	Δλ/ΔT	T _c = -40 to +85 °C		0.4	0.5	nm/°C
Spectral Width	σ	*1, RMS (-20 dB)		1.3	2.5	nm
		T _c = +85 °C		1.5	4	
Cut-off Frequency	f _c	-3 dB		2.0		GHz
Rise Time	t _r	10 to 90 %		0.2	0.5	ns
Fall Time	t _f	90 to 10 %		0.3	0.5	ns
Monitor Current of PD	I _m	V _{RD} = 5 V, *1	100	700		μA
Dark Current of PD	I _d	V _{RD} = 5 V		0.1	10	nA
Tracking Error	γ ²	I _m = const., T _c = -40 to +85 °C		0.5	1.0	dB

*1 P_r = 1.0 mW @NDL7408PK Series
 P_r = 0.2 mW @NDL7408PL Series

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

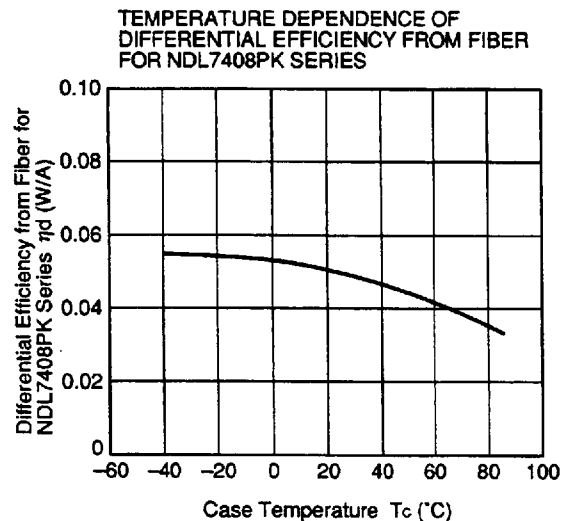
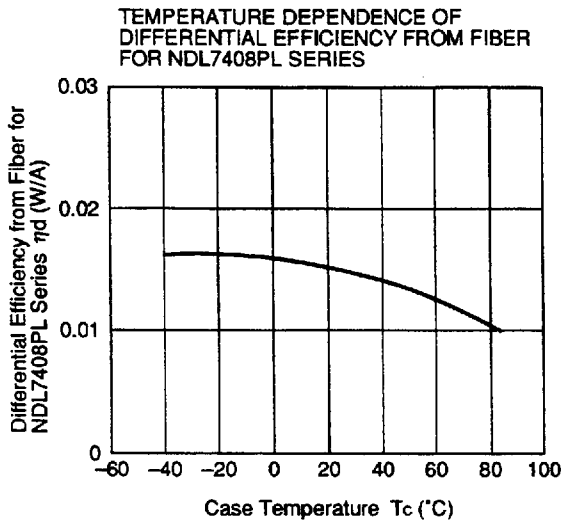
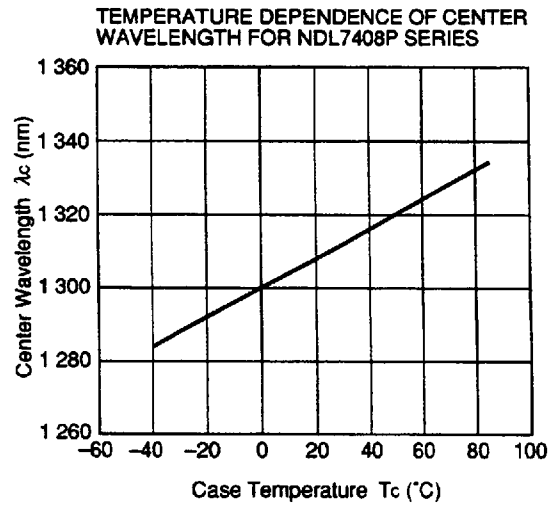
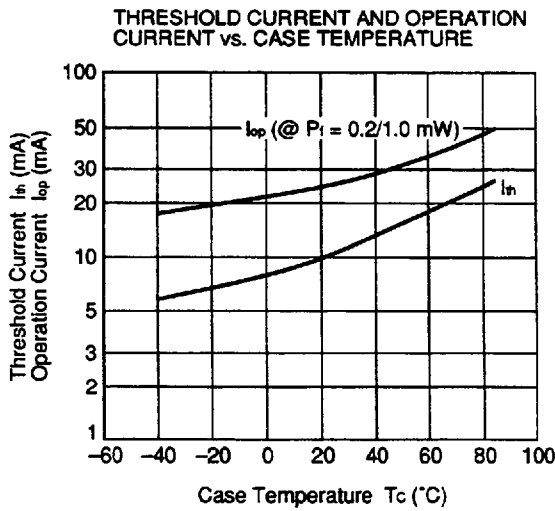
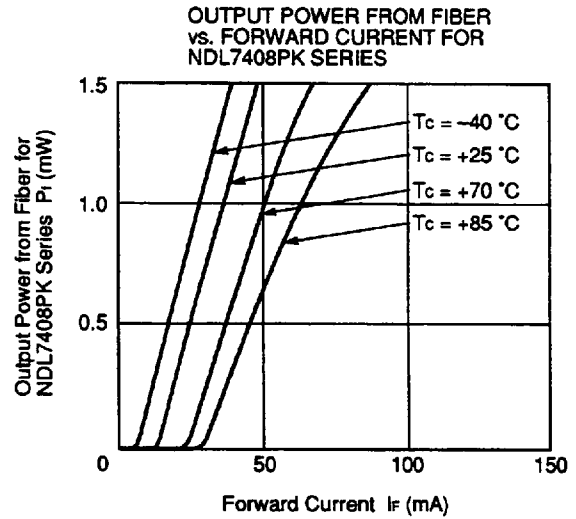
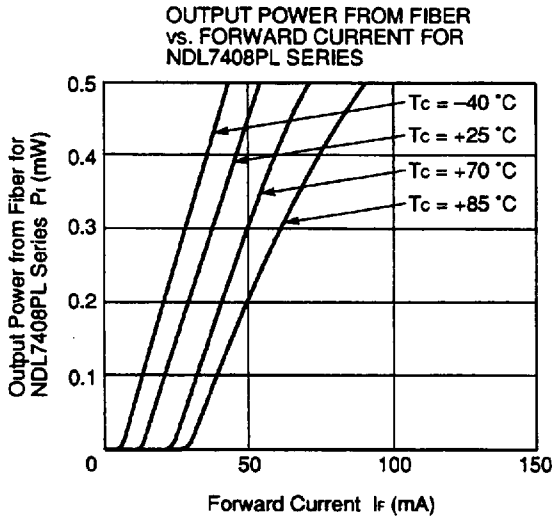


(@ P_r(25 °C) = X mW)

X = 1.0 mW @NDL7408PK Series
 X = 0.2 mW @NDL7408PL Series

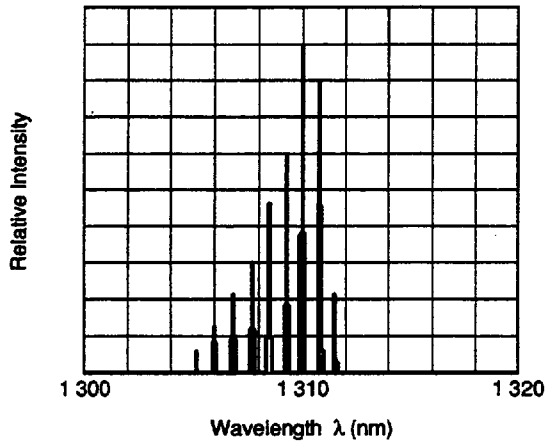
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TYPICAL CHARACTERISTICS ($T_c = -40$ to $+85$ °C)

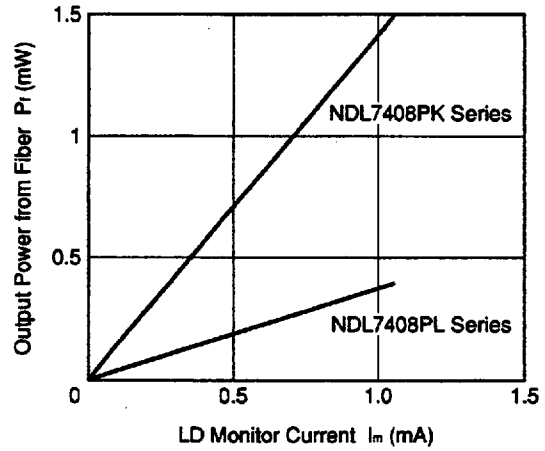


TYPICAL CHARACTERISTICS (T_c = 25 °C)

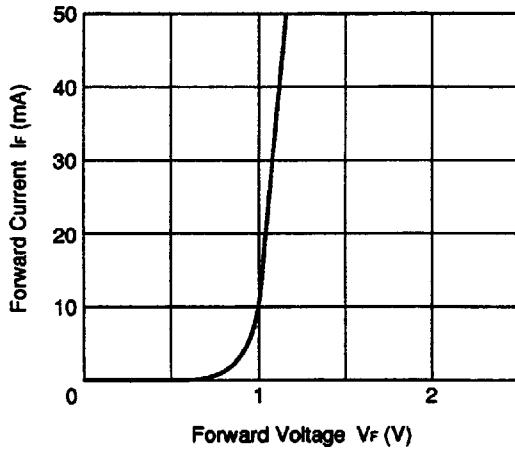
LONGITUDINAL MODE FROM FIBER FOR NDL7408P SERIES



OUTPUT POWER FROM FIBER vs. LD MONITOR CURRENT



FORWARD CURRENT vs. FORWARD VOLTAGE FOR NDL7408P SERIES



FREQUENCY RESPONSE (P_f = 0.2 / 1.0 (mW))

