

FEATURES

- **PEAK EMISSION WAVELENGTH:**
 $\lambda_P = 1550 \text{ nm}$
- **OPTICAL OUTPUT POWER:**
 $P_f = 2.0 \text{ mW}$
- **INTERNAL OPTICAL ISOLATOR**
- **InGaAs MONITOR PIN-PD**
- **WIDE OPERATING TEMPERATURE RANGE:**
 $T_C = -40 \text{ to } +85^\circ\text{C}$
- $\lambda/4$ - PHASE-SHIFTED DFB

DESCRIPTION

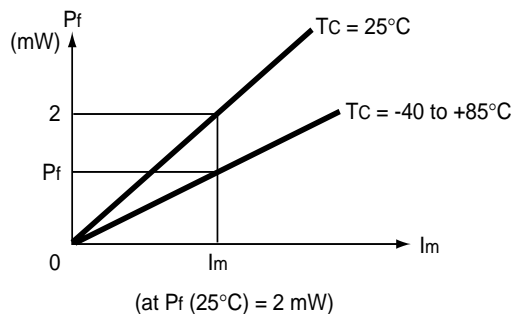
The NDL7705P Series is a 1550 nm phase-shifted DFB (Distributed Feed-Back) laser diode module with optical isolator. Newly developed strained Multiple Quantum Well (MQW) structure is adopted to achieve stable dynamic single longitudinal mode operation over a wide temperature range of -40 to +85°C. It is designed for all STM-1 and STM-4 applications.

ELECTRO-OPTICAL CHARACTERISTICS ($T_C = -40 \text{ to } +85^\circ\text{C}$, unless otherwise specified)

PART NUMBER PACKAGE OUTLINE			NDL7705P Series		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
V_F	Forward Voltage, $I_F = 30 \text{ mA}$	V	0.9		1.3
I_{TH}	Threshold Current, $T_C = 25^\circ\text{C}$ $T_C = 85^\circ\text{C}$	mA		15 35	50
η_d	Differential Efficiency from Fiber, $T_C = 25^\circ\text{C}$ $T_C = 85^\circ\text{C}$	W/A	0.070 0.035	0.120 0.075	
$\Delta\eta_d$	Temperature Dependence of Differential Efficiency from Fiber, $\Delta\eta_d = 10 \log \frac{\eta_d(T_C = 85^\circ\text{C})}{\eta_d(T_C = 25^\circ\text{C})}$	dB	-3	-2	
λ_p	Peak Emission Wavelength, $P_f = 1 \text{ mW}$	nm	1530	1550	1570
SMSR	Side Mode Suppression Ratio, $P_f = 1 \text{ mW}$	dB	30		
t_r	Rise Time, $I_b = 0.9 \times I_{th}$ ns			0.5	
t_f	Fall Time, $I_b = 0.9 \times I_{th}$ ns			0.5	
I_m	Monitor Current, $V_R = 5 \text{ V}$, $P_f = 2 \text{ mW}$	μA	300		2500
I_D	Monitor Dark Current, $V_R = 5 \text{ V}$, $T_C = 25^\circ\text{C}$	nA		0.1	5
γ^1	Tracking Error, $I_m = \text{const.}$ ($P_f = 2 \text{ mW}$, $T_C = 25^\circ\text{C}$)	dB			1.0
RIN	Relative Intensity Noise, Ref = -14 dB, $P_f = 1 \text{ mW}$	dB/Hz		-140	-130

Note:

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



NDL7705P SERIES

ABSOLUTE MAXIMUM RATINGS¹

(T_C = 25°C, unless otherwise specified)

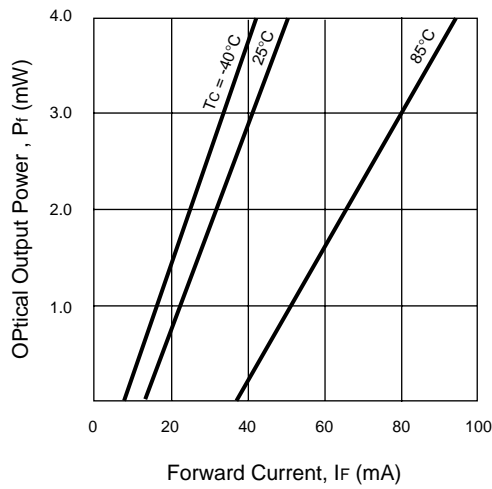
SYMBOLS	PARAMETERS	UNITS	RATINGS
I _F	Forward Current of LD	mA	I _{TH} +50
P _r	Optical Output Power	mW	5.0
V _R	Reverse Voltage of LD	V	2.0
I _F	Forward Current of PD	mA	2.0
V _R	Reverse Voltage of PD	V	15
T _C	Operating Case Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-40 to +85
T _{SLD}	Lead Soldering Temperature (10 s)	°C	260

Note:

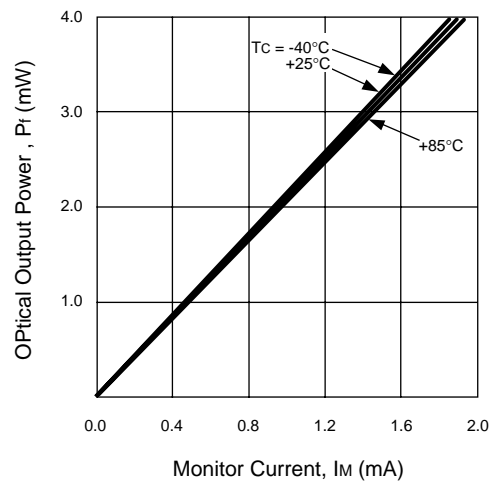
1. Operation in excess of any one of these parameters may result in permanent damage.

TYPICAL PERFORMANCE CURVES (T_C = 25°C, unless otherwise specified)

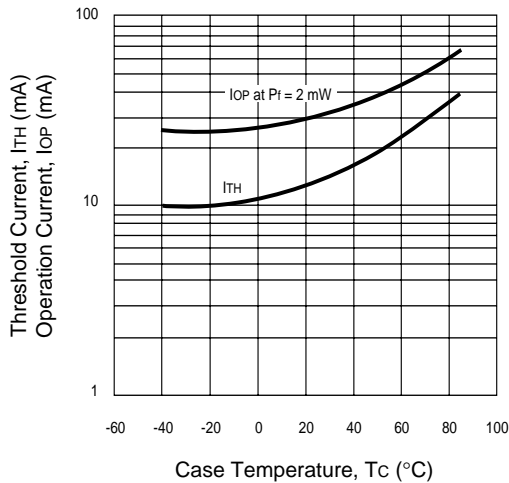
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



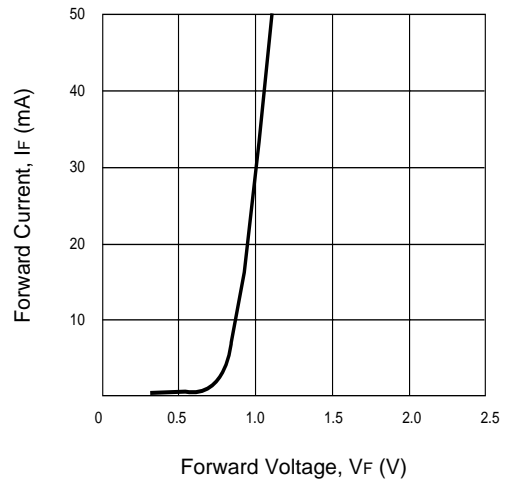
OPTICAL OUTPUT POWER vs. MONITOR CURRENT



OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE

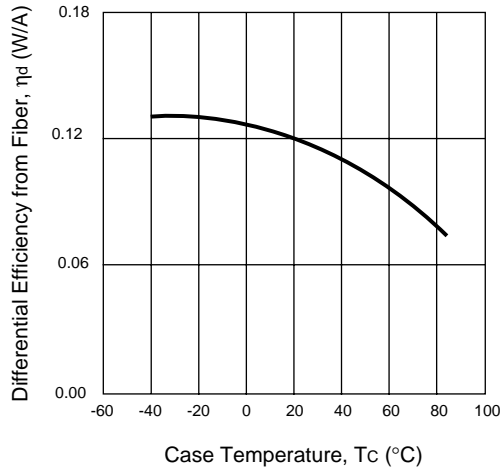


FORWARD CURRENT vs. FORWARD VOLTAGE

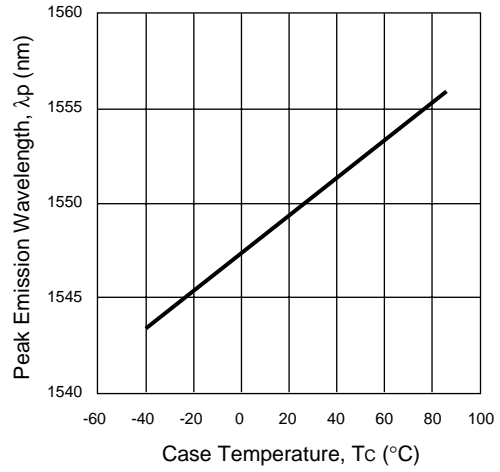


TYPICAL PERFORMANCE CURVES ($T_c = 25^\circ\text{C}$, unless otherwise specified)

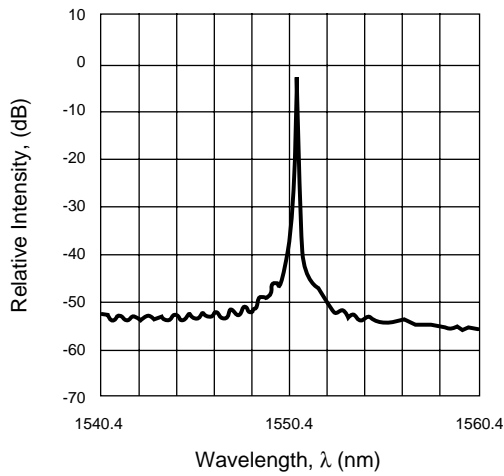
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY FROM FIBER



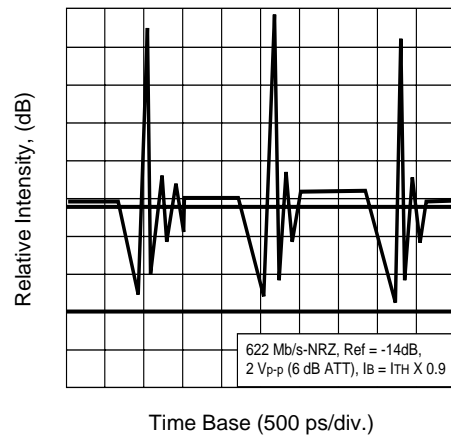
TEMPERATURE DEPENDENCE OF PEAK EMISSION WAVELENGTH



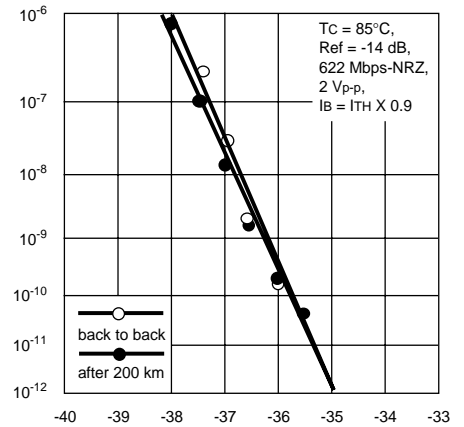
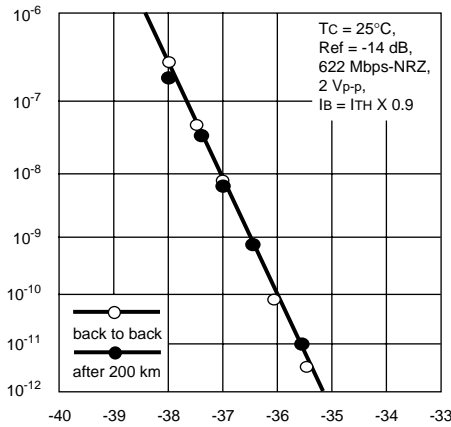
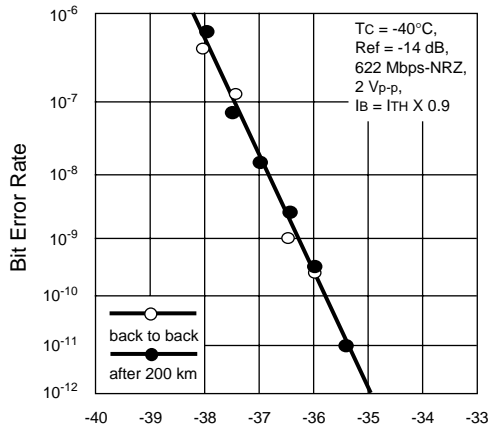
LONGITUDINAL MODE FROM FIBER



EYE DIAGRAM



ERROR RATE CHARACTERISTICS

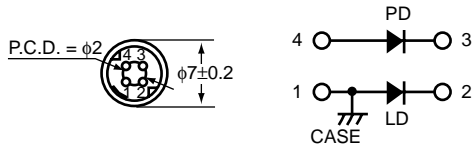
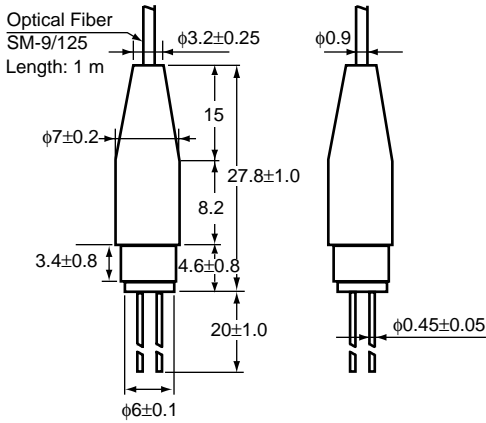


Average Received Power, \bar{P} (dBm)

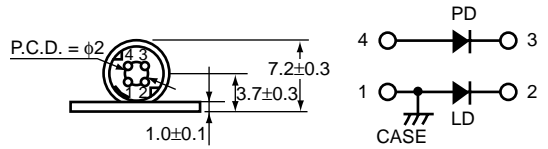
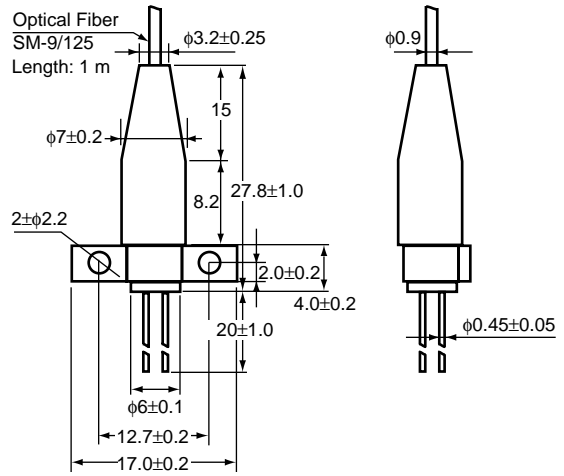
NDL7705P SERIES

OUTLINE DIMENSIONS (Units in mm)

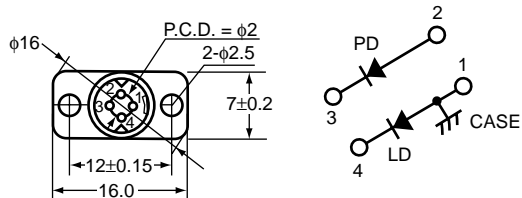
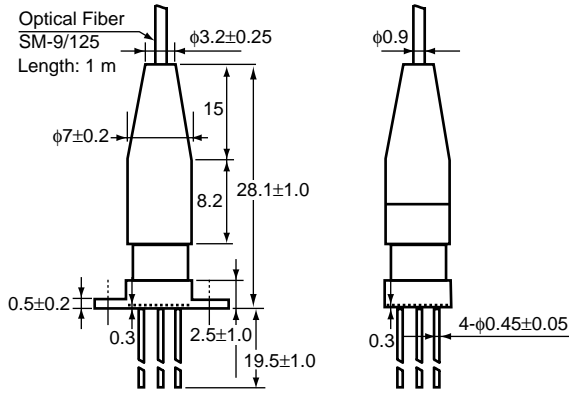
NDL7705P



NDL7705P1



NDL7705P2



ORDERING INFORMATION

PART NUMBER	AVAILABLE CONNECTOR	DESCRIPTION
NDL7705P	Without Connector	No Flange
NDL7705PC	With FC-PC Connector	
NDL7705PD	With SC-PC Connector	
NDL7705P1	Without Connector	Flat Mount Flange
NDL7705P1C	With FC-PC Connector	
NDL7705P1D	With SC-PC Connector	
NDL7705P2	Without Connector	Vertical Flange
NDL7705P2C	With FC-PC Connector	
NDL7705P2D	With SC-PC Connector	