NEC

1500 nm OPTICAL FIBER COMMUNICATIONS InGaAsP MQW-DFB LASER DIODE COAXIAL MODULE

NDL7705P SERIES

FEATURES

- **PEAK EMISSION WAVELENGTH:** λ_P = 1550 nm
- **OPTICAL OUTPUT POWER:** P_f = 2.0 mW
- **INTERNAL OPTICAL ISOLATOR**
- **InGaAs MONITOR PIN-PD**
- **WIDE OPERATING TEMPERATURE RANGE:** T_C = -40 to +85°C
- **λ/4 - PHASE-SHIFTED DFB**

DESCRIPTION

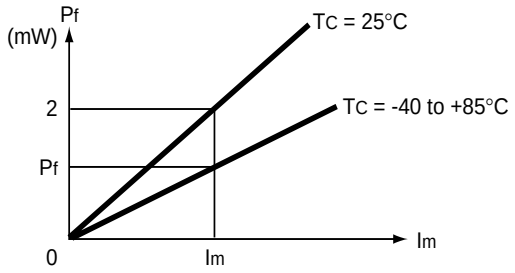
The NDL7705P Series is a 1550 nm phase-shifted DFB (Distributed Feed-Back) laser diode module with optical isolator. Newly developed strained Multiple Quantum Well (MQW) structure is adopted to achieve stable dynamic single longitudinal mode operation over a wide temperature range of -40 to +85°C. It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

ELECTRO-OPTICAL CHARACTERISTICS (T_C = -40 to +85°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 mA	V	0.9		1.3
I_{TH}	Threshold Current, T_C = 25˚C T_C = 85˚C	mA		15 35	 50
η_d	Differential Efficiency from Fiber, T_C = 25˚C T_C = 85˚C	W/A	0.070 0.035	0.120 0.075	
$\Delta\eta_d$	Temperature Dependence of Differential Efficiency from Fiber, $\Delta\eta_d = 10 \log \frac{\eta_d (T_C = 85° C)}{\eta_d (T_C = 25° C)}$	dB	-3	-2	
λ_p	Peak Emission Wavelength, P_f = 1 mW	nm	1530	1550	1570
SMSR	Side Mode Suppression Ratio, P_f = 1 mW	dB	30		
t_r	Rise Time, I_b = 0.9 x I_{th} ns			0.5	
t_f	Fall Time, I_b = 0.9 X I_{th} ns			0.5	
I_m	Monitor Current, V_R = 5 V, P_f = 2 mW	μA	300		2500
I_D	Monitor Dark Current, V_R = 5 V, T_C = 25°C	nA		0.1	5
γ[1]	Tracking Error, I_m = const.(P_f = 2 mW, T_C = 25˚C)	dB			1.0
R_{IN}	Relative Intensity Noise, Ref = -14 dB, P_f = 1 mW	dB/Hz		-140	-130

Note:

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



(at P_f (25°C) = 2 mW)

ABSOLUTE MAXIMUM RATINGS[1]

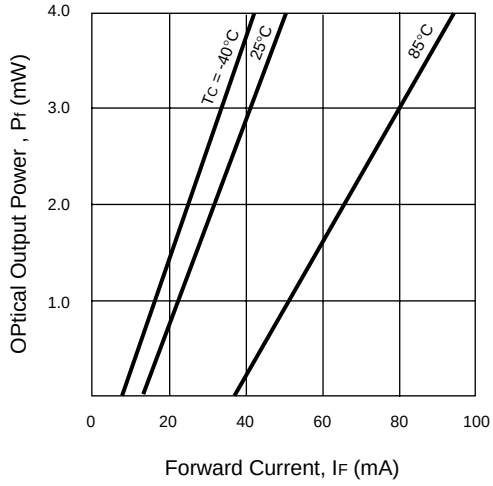
(T_C = 25°C, unless otherwise specified)

SYMBOLS	PARAMETERS	UNITS	RATINGS
I_F	Forward Current of LD	mA	I_{TH}+50
P_f	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

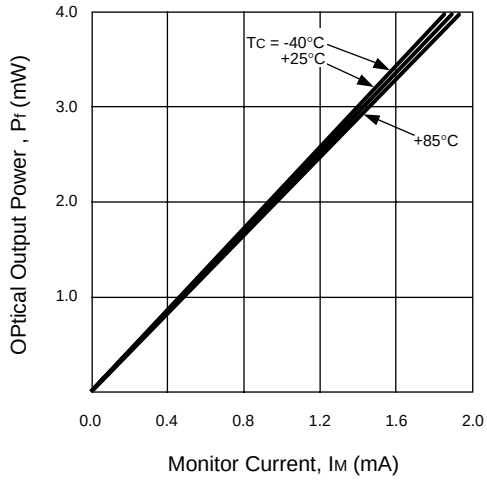
Note:
1. Operation in excess of any one of these parameters may result in permanent damage.

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

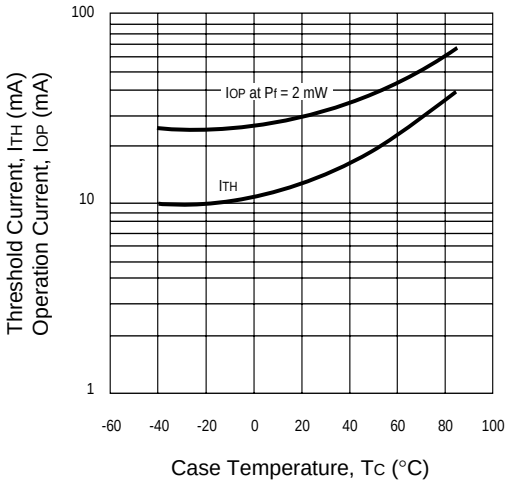
OPTICAL OUTPUT POWER vs. FORWARD CURRENT



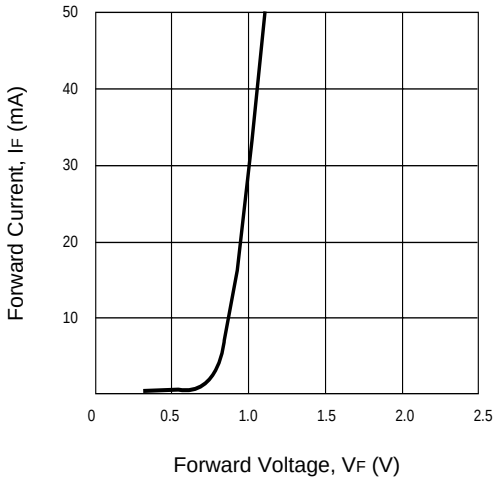
OPTICAL OUTPUT POWER vs. MONITOR CURRENT



OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE

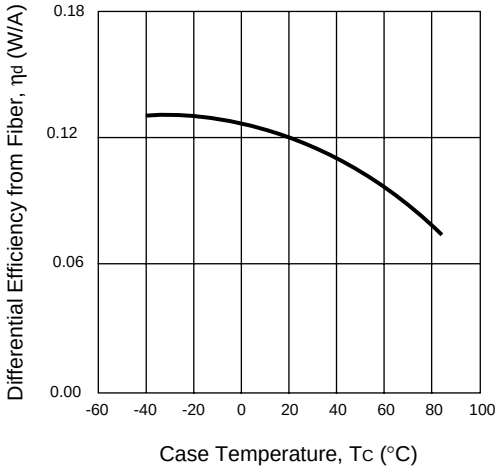


FOWARD CURRENT vs. FORWARD VOLTAGE

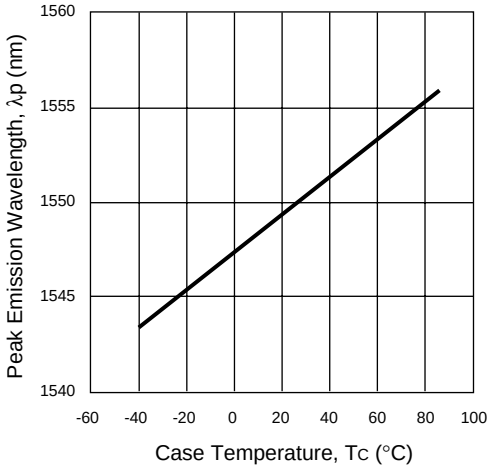


TYPICAL PERFORMANCE CURVES (Tc = 25°C, unless otherwise specified)

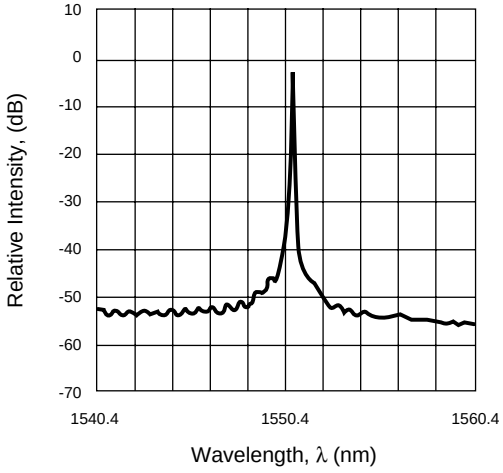
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY FROM FIBER



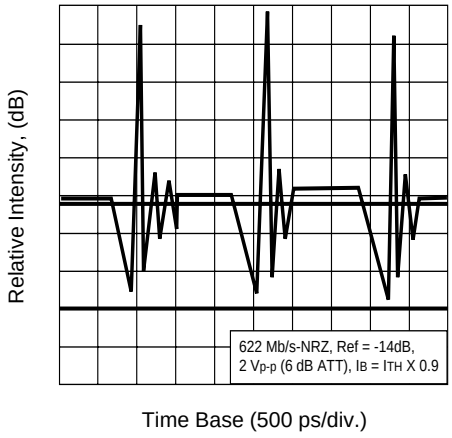
TEMPERATURE DEPENDENCE OF PEAK EMISSION WAVELENGTH



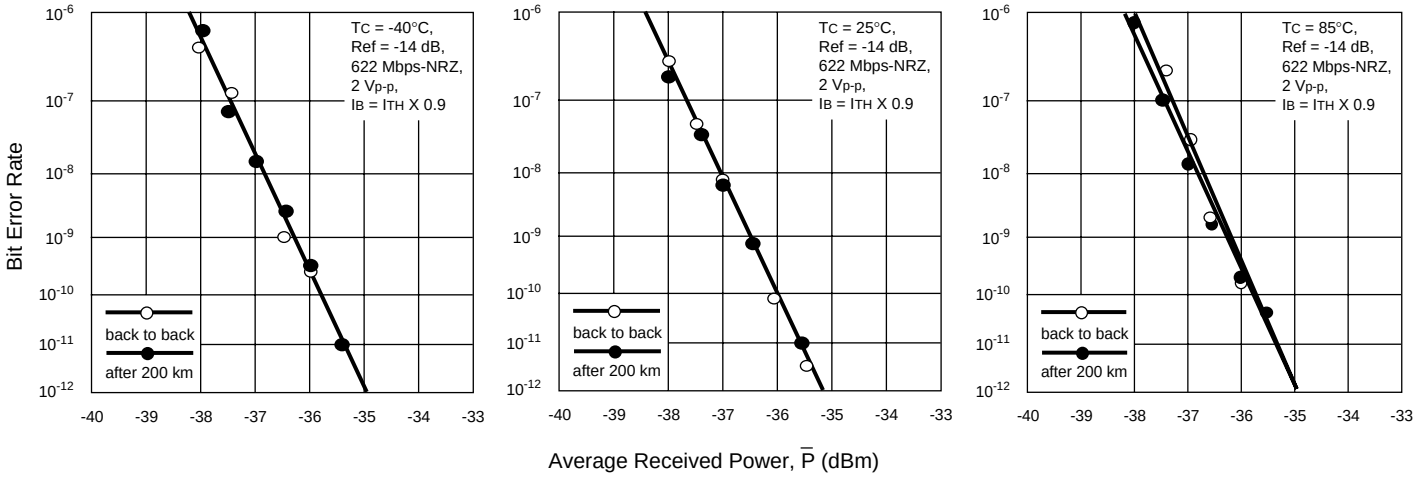
LONGITUDINAL MODE FROM FIBER



EYE DIAGRAM

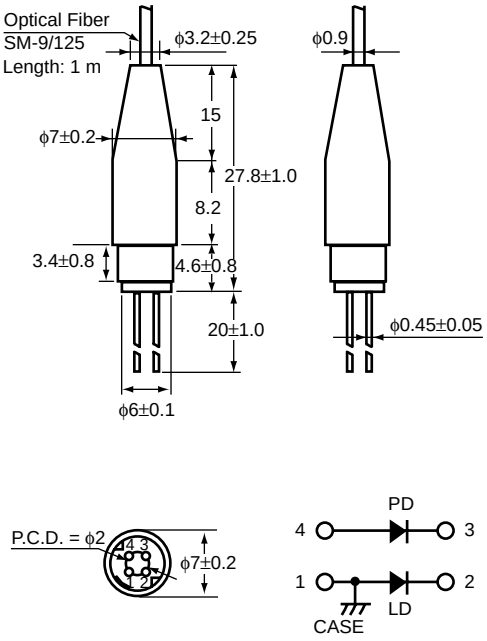


ERROR RATE CHARACTERISTICS

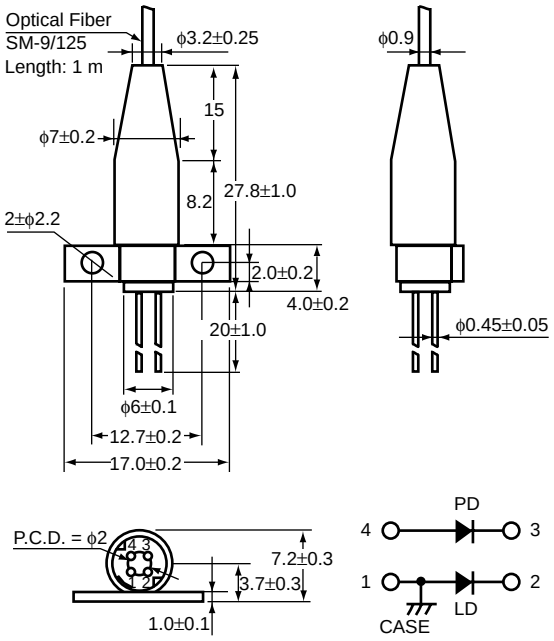


OUTLINE DIMENSIONS (Units in mm)

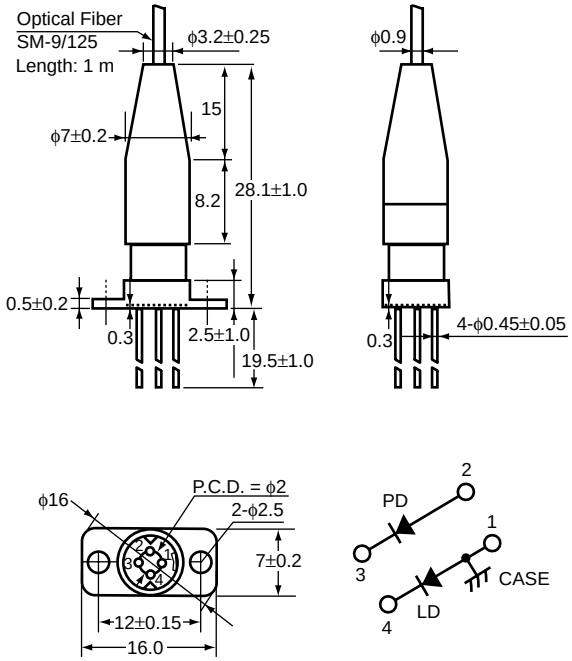
NDL7705P



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	