DATA SHEET

NEC

LASER DIODE
NX8501 Series

1 510 nm OPTICAL FIBER COMMUNICATIONS
InGaAsP STRAINED MQW DC-PBH LASER DIODE MODULE

DESCRIPTION

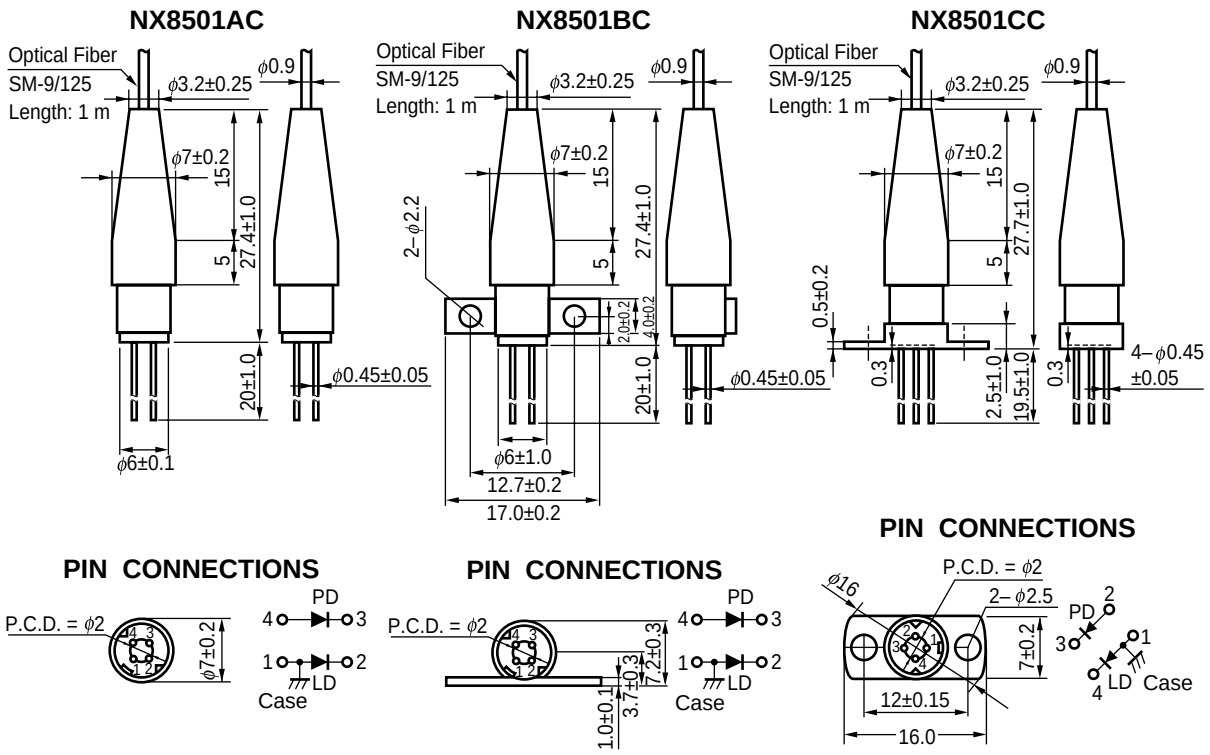
The NX8501 Series is a 1 510 nm phase-shifted DFB (Distributed Feed-Back) laser diode with single mode fiber. The Multiple Quantum Well (MQW) structure is adopted to achieve stable dynamic single longitudinal mode operation over wide temperature range of 0 to +65 °C.

It is designed for on-line monitoring of dense WDM fiber-optic networks.

FEATURES

- Peak wavelength λ_p = 1 510 nm
- Output power P_f = 2.0 mW
- Low threshold current I_{th} = 20 mA @ T_C = 25 °C
- Wide operating temperature range T_C = 0 to +65 °C
- InGaAs monitor PIN-PD
- Based on Bellcore TA-NWT-000983

PACKAGE DIMENSIONS
in millimeters



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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

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The mark ★ shows major revised points.

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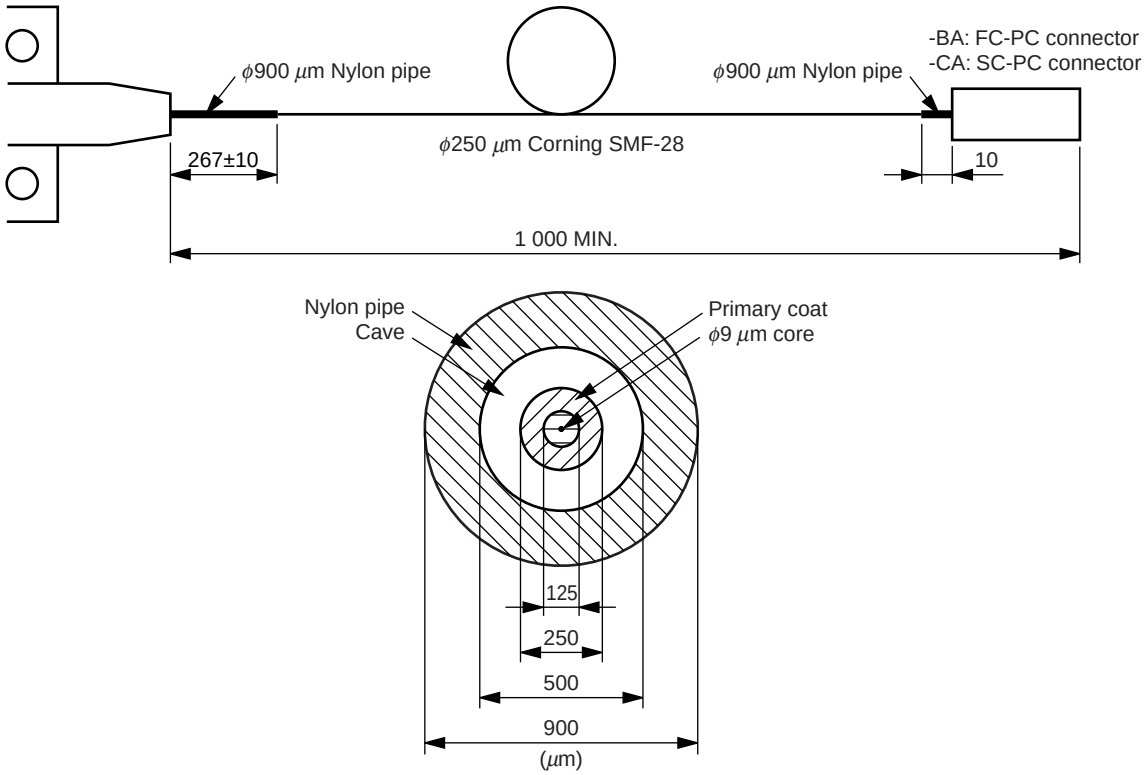
OPTICAL FIBER DIMENSIONS
in millimeters



★ ORDERING INFORMATION

Part Number	Available Connector	Flange Type	Fiber Type
NX8501AC	Without Connector	No Flange	ϕ250 μm Corning SMF-28 with loose tube*1
NX8501AC-BA	With FC-PC Connector		
NX8501AC-CA	With SC-PC Connector		
NX8501BC	Without Connector	Flat Mount Flange	
NX8501BC-BA	With FC-PC Connector		
NX8501BC-CA	With SC-PC Connector		
NX8501CC	Without Connector	Vertical Flange	
NX8501CC-BA	With FC-PC Connector		
NX8501CC-CA	With SC-PC Connector		
NX8501AG	Without Connector	No Flange	Standard SMF
NX8501AG-BA	With FC-PC Connector		
NX8501AG-CA	With SC-PC Connector		
NX8501BG	Without Connector	Flat Mount Flange	
NX8501BG-BA	With FC-PC Connector		
NX8501BG-CA	With SC-PC Connector		
NX8501CG	Without Connector	Vertical Flange	
NX8501CG-BA	With FC-PC Connector		
NX8501CG-CA	With SC-PC Connector		

***1** Please refer to **OPTICAL FIBER DIMENSIONS**.

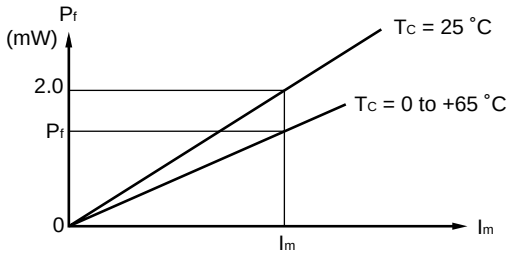
ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Optical Output Power from Fiber	P_f	5	mW
Forward Current of LD	I_F	200	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	0 to +65	°C
Storage Temperature	T_{stg}	–40 to +85	°C
Lead Soldering Temperature (10 s)	T_{sld}	260	°C

ELECTRO-OPTICAL CHARACTERISTICS (T_C = 0 to +65 °C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Forward Voltage	V_F	P_f = 2.0 mW, T_C = 25 °C		1.6	2.0	V
Operating Current	I_{op}	P_f = 2.0 mW		80	100	mA
Threshold Current	I_{th}	P_f = 0.2 to 1.0 mW, T_C = 25 °C		20	30	mA
Differential Efficiency from Fiber	η_d	P_f = 2.0 mW	0.04	0.08		W/A
Peak Emission Wavelength	λ_p	P_f = 2.0 mW	1 500	1 510	1 520	nm
Side Mode Suppression Ratio	SMSR	P_f = 2.0 mW	30	35		dB
Spectral Line Width	$\Delta\nu$	P_f = 2.0 mW, 3 dB down, T_C = 25 °C		2	10	MHz
Relative Intensity Noise	RIN	P_f = 2.0 mW, T_C = 25 °C		–155	–150	dB/Hz
Rise Time	t_r	10-90 %, T_C = 25 °C, P_f = 2.0 mW		0.3	0.5	ns
Fall Time	t_f	90-10 %, T_C = 25 °C, P_f = 2.0 mW		0.3	0.5	ns
Monitor Current	I_m	V_R = 5 V, P_f = 2.0 mW, T_C = 25 °C	100	1 000	2 000	μA
Monitor Dark Current	I_D	V_R = 5 V, T_C = 25 °C			10	nA
Tracking Error	γ^{*1}	I_m = const. (@ P_f = 2.0 mW, T_C = 25 °C)	–1.0		1.0	dB

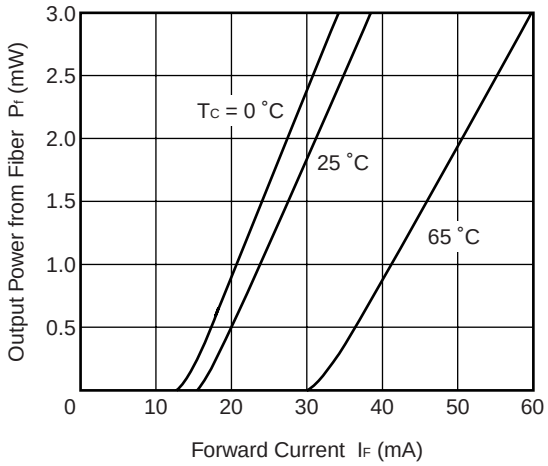
***1** $\gamma = \left| 10 \log \frac{P_f}{2.0 \text{ mW}} \right|$



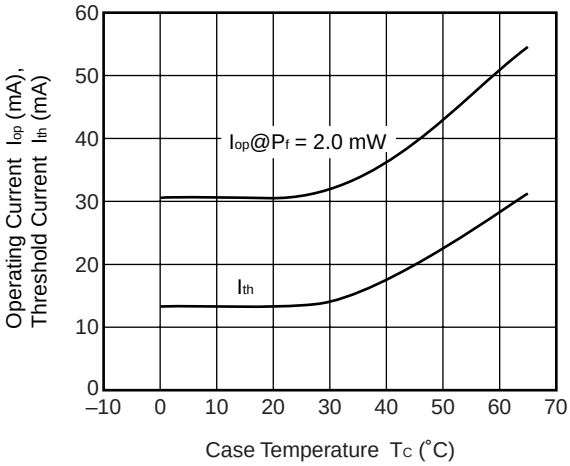
(@ P_f (25 ˚C) = 2.0 mW)

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

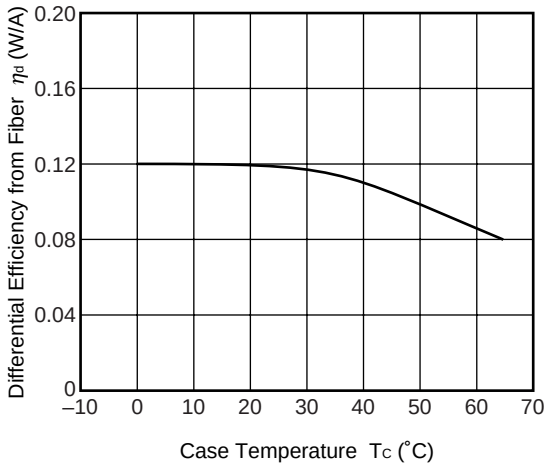
OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



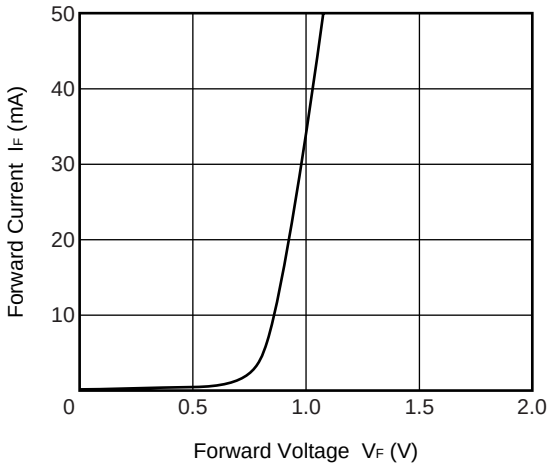
OPERATING CURRENT AND THRESHOLD CURRENT vs. CASE TEMPERATURE



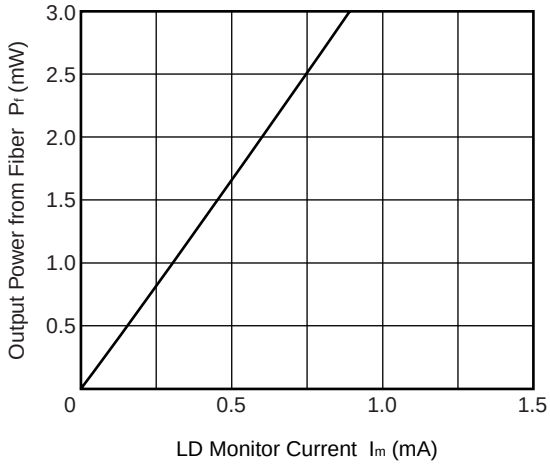
TEMPERATURE DEPENDENCE OF DIFFERENTIAL EFFICIENCY FROM FIBER



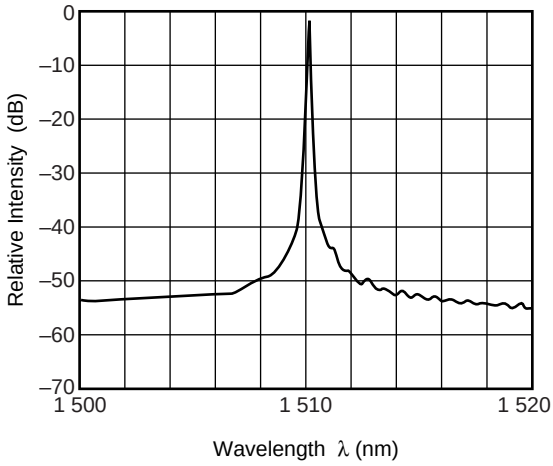
FORWARD CURRENT vs. FORWARD VOLTAGE



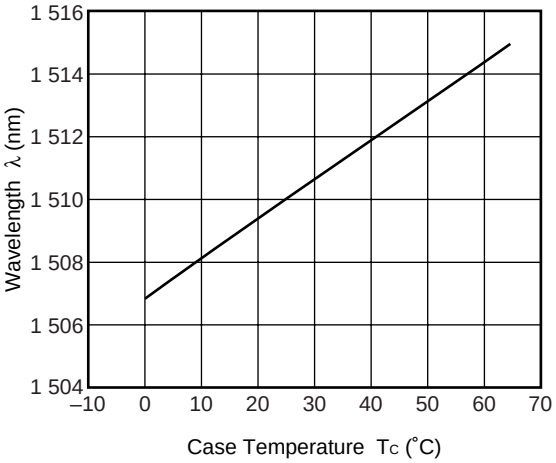
OUTPUT POWER FROM FIBER vs. LD MONITOR CURRENT



LONGITUDINAL MODE FROM FIBER



TEMPERATURE DEPENDENCE
OF WAVELENGTH



Remark The graphs indicate nominal characteristics.

★ LD FAMILY FOR DENSE WDM APPLICATION

Part Number	Absolute Maximum Ratings		Typical Characteristics			Description	Package
	T_C (°C)	T_{stg} (°C)	I_{th} (mA)	P_f (mW)	λ_C (nm)		
			TYP.	MIN.	TYP.		
NDL7540PA	−20 to +65	−40 to +85	40	90	1 480	1 480 nm pump LD module	BFY
NX7460LE[*1]	−20 to +65	−40 to +85	25	120	1 480	1 480 nm pump LD module	BFY
NX8501 Series	0 to +65	−40 to +85	20	2	1 510	Telemetry	Coaxial
NX8561JC[*1]	0 to +65	−40 to +85	20	3	1 510	Telemetry	DIP
NX7660JC[*1]	−20 to +65	−40 to +85	15	5	1 625	Telemetry	DIP
NDL7910P	−20 to +70	−40 to +85	7	0.5	1 550[*2]	2.5 G EA modulator integrated module	BFY
NX8562LB	−20 to +65	−40 to +85	20	20	1 550[*2]	1 550 CW LD module	BFY
NX8563LB	−20 to +65	−40 to +85	20	10	ITU-T[*3]	1 550 CW LD module	BFY

***1** Under development

***2** Wavelength selectable for ITU-T standards upon request.

***3** Wavelength selectable for ITU-T standards.

REFERENCE

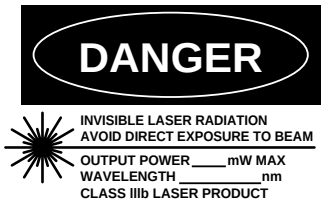
Document Name	Document No.
NEC semiconductor device reliability/quality control system	C11159E
Quality grades on NEC semiconductor devices	C11531E
Semiconductor device mounting technology manual	C10535E
Semiconductor selection guide	X10679E

[MEMO]

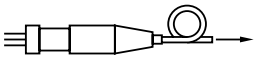
[MEMO]

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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