

# DATA SHEET

# NEC

# LASER DIODE NX8562LB

## 1 550 nm CW LIGHT SOURCE InGaAsP STRAINED MQW-DFB LASER DIODE MODULE

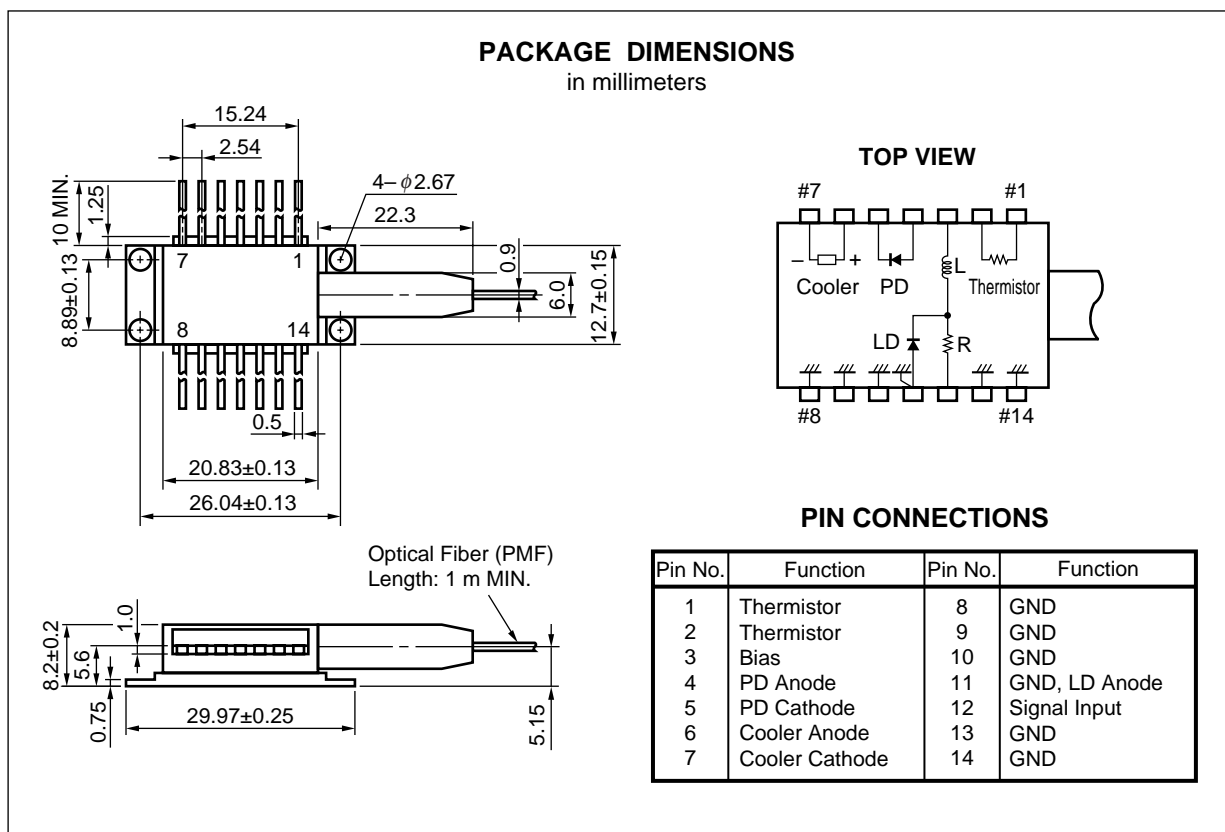
### DESCRIPTION

The NX8562LB is a 1 550 nm laser diode with Polarization Maintain Fiber (PMF).

This device is designed as CW light source and ideal for transmission systems in which external modulators are used.

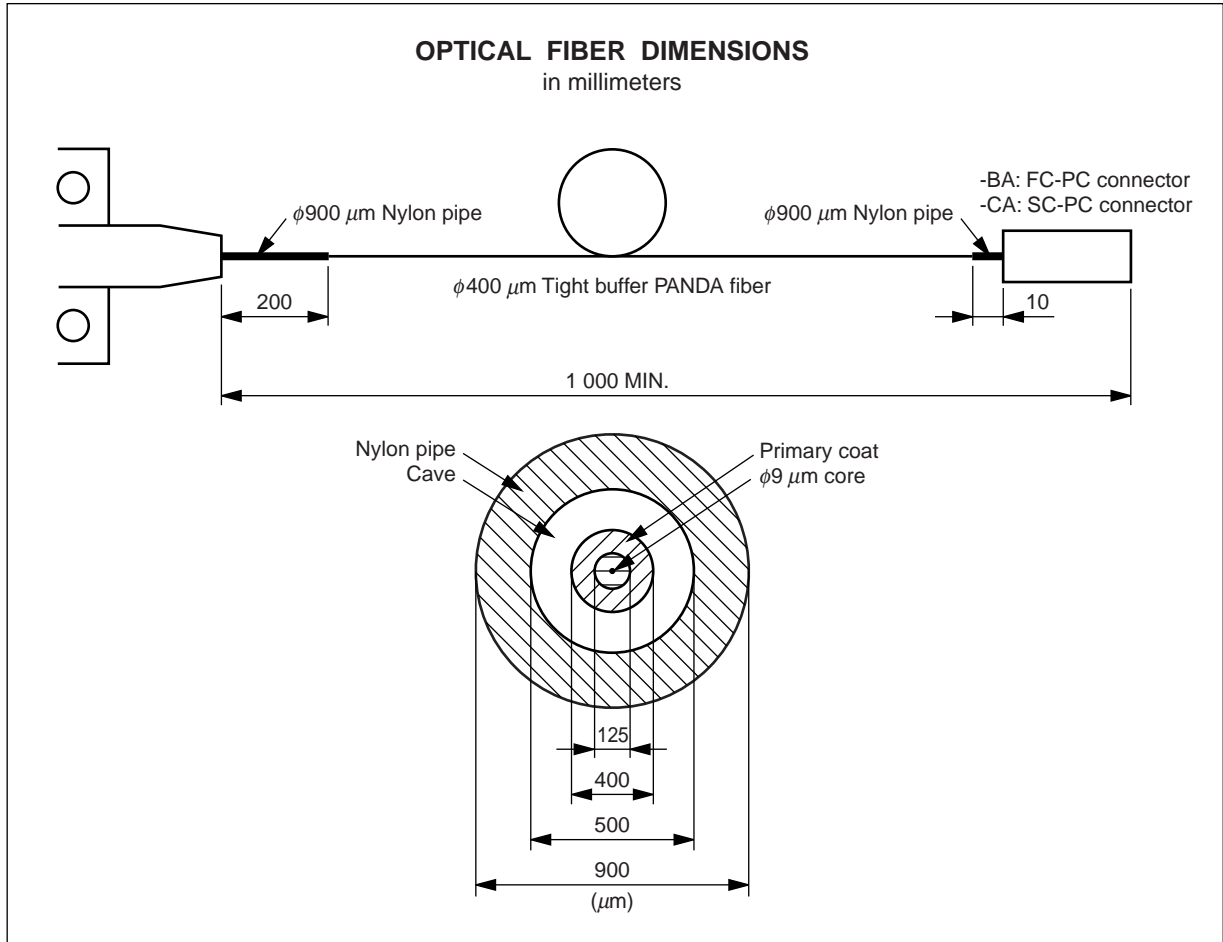
### FEATURES

- Output power  $P_f = 20 \text{ mW MIN.}$
- Wavelength selectable for ITU-T standards
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Polarization maintain fiber pigtail



The information in this document is subject to change without notice.

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**ORDERING INFORMATION**

Part Number	Available Connector
NX8562LB	Without Connector
NX8562LB-BA	With FC-PC Connector
NX8562LB-CA	With SC-PC Connector

**ABSOLUTE MAXIMUM RATINGS (T<sub>c</sub> = 25 °C, unless otherwise specified)**

Parameter	Symbol	Ratings	Unit
Forward Current of LD	I <sub>F</sub>	300	mA
Reverse Voltage of LD	V <sub>R</sub>	2.0	V
Forward Current of PD	I <sub>F</sub>	10	mA
Reverse Voltage of PD	V <sub>R</sub>	20	V
Operating Case Temperature	T <sub>c</sub>	-20 to +65	°C
Storage Temperature	T <sub>stg</sub>	-40 to +85	°C
Lead Soldering Temperature (10 s)	T <sub>slid</sub>	260	°C

**ELECTRO-OPTICAL CHARACTERISTICS (T<sub>LD</sub> = 25 °C, T<sub>c</sub> = -20 to +65 °C)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Laser Set Temperature	T <sub>set</sub>		20		35	°C
Forward Voltage	V <sub>F</sub>	P <sub>f</sub> = 20 mW	0.9		1.5	V
Threshold Current	I <sub>th</sub>			20	40	mA
Optical Output Power from Fiber	P <sub>f</sub>	I <sub>F</sub> = 167 mA, T <sub>LD</sub> = T <sub>set</sub>	20			mW
Threshold Output Power from Fiber	P <sub>th</sub>	I <sub>F</sub> = I <sub>th</sub>			100	μW
Quantum Efficiency	η		0.13			W/A
Peak Emission Wavelength <sup>*1</sup>	λ <sub>p</sub>	P <sub>f</sub> = 20 mW, CW, T <sub>LD</sub> = T <sub>set</sub>	1 540		1 561	nm
Spectral Line Width	Δν	P <sub>f</sub> = 20 mW, CW, 3 dB down		1	2	MHz
Side Mode Suppression Ratio	SMSR	P <sub>f</sub> = 20 mW, CW	30	35		dB
FM Response	η <sub>FM</sub>	P <sub>f</sub> = 20 mW	50	70		MHz/mA
Relative Intensity Noise	RIN	P <sub>f</sub> = 20 mW, 20 MHz to 3 GHz			-150	dB/Hz
Flat frequency response	f <sub>m</sub>	P <sub>f</sub> = 20 mW, +/-3 dB	1.8			GHz
Polarization Extinction Ratio <sup>*2</sup>	ext	P <sub>f</sub> = 20 mW, CW	15	20		dB

\*1 Wavelength selectable for ITU-T standards.

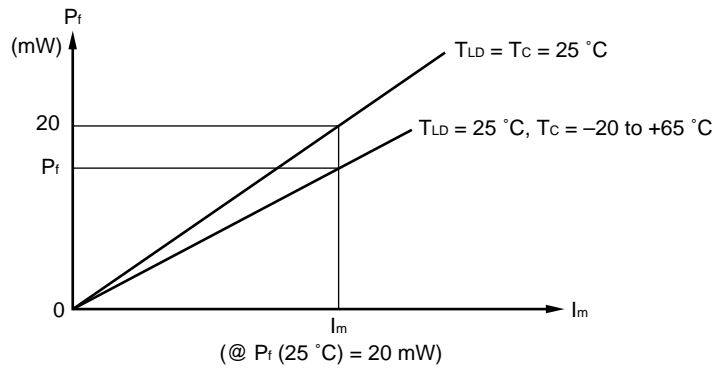
\*2 Polarization state of LD is aligned parallel to the slow axis.

**ELECTRO-OPTICAL CHARACTERISTICS**

(Applicable to Monitor PD:  $T_{LD} = 25\text{ °C}$ ,  $T_c = -20\text{ to }+65\text{ °C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Monitor Current	$I_m$	$P_f = 20\text{ mW}$ , $V_R = 5\text{ V}$	100			$\mu\text{A}$
Dark Current	$I_D$	$V_R = 5\text{ V}$		2	10	nA
Tracking Error	$\gamma^{*1}$	$I_m = \text{const.}$			0.5	dB

$$*1 \gamma = \left| 10 \log \frac{P_f}{20\text{ mW}} \right|$$



**ELECTRO-OPTICAL CHARACTERISTICS**

(Applicable to Thermistor and TEC:  $T_{LD} = 25\text{ °C}$ ,  $T_c = -20\text{ to }+65\text{ °C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Thermistor Resistance	R	$T_{LD} = 25\text{ °C}$	9.5	10.0	10.5	$\text{k}\Omega$
B Constant	B		3 300	3 400	3 500	K
Cooler Current	$I_c$	$\Delta T = 65 - T_{set}$ , $P_f = 20\text{ mW}$			1.0	A
Cooler Voltage	$V_c$	$\Delta T = 65 - T_{set}$ , $P_f = 20\text{ mW}$			2.0	V

DFB-LD FAMILY FOR TELECOM

Part Number	Absolute Maximum Ratings		Typical Characteristics			SDH Application	Package
	T <sub>c</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>r</sub> (mW)	λ <sub>p</sub> (nm)		
			TYP.	MIN.	TYP.		
NDL7603P Series	-40 to +85	-40 to +85	15	2	1 310	≤ STM-4 : 622 Mb/s	Coaxial
NDL7620P Series	0 to +70	-40 to +85	45 (MAX.)	2	1 310	≤ STM-16: 2.5 Gb/s	Coaxial
NDL7701P Series	-20 to +85	-40 to +85	15	2	1 550	≤ STM-4 : 622 Mb/s	Coaxial
NDL7705P Series	-40 to +85	-40 to +85	15	2	1 550	≤ STM-4 : 622 Mb/s	Coaxial
NX8562LB	-20 to +65	-40 to +85	20	20	1 550 <sup>*1</sup>	CW Light Source for external modulator	BFY
NX8563LB Series	-20 to +65	-40 to +85	20	10	ITU-T <sup>*2</sup>	CW Light Source for external modulator	BFY
NDL7910P	-20 to +70	-40 to +85	7	0.5	1 550 <sup>*1</sup>	≤ STM-16: 2.5 Gb/s EA modulator integrated DFB-LD	BFY

\*1 Wavelength selectable for ITU-T standards upon request.

\*2 Wavelength selectable for ITU-T standards.

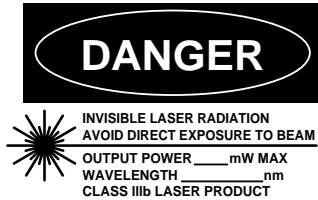
**REFERENCE**

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

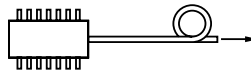
[MEMO]

**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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**Standard:** Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

**Special:** Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

**Specific:** Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.