

# LASER DIODE NX8511UD

## 1 550 nm FOR LONG HAUL 2.5 Gb/s InGaAsP MQW-DFB LASER DIODE TOSA

### DESCRIPTION

The NX8511UD is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode TOSA (transmitter optical sub-assembly) with InGaAs monitor PIN-PD in a receptacle type package designed for SFF/SFP transceiver with LC duplex receptacle.

This device is ideal for Synchronous Digital Hierarchy (SDH) system, long haul STM-16 (L-16.2), ITU-T recommendations, and SONET OC-48 (LR-2).

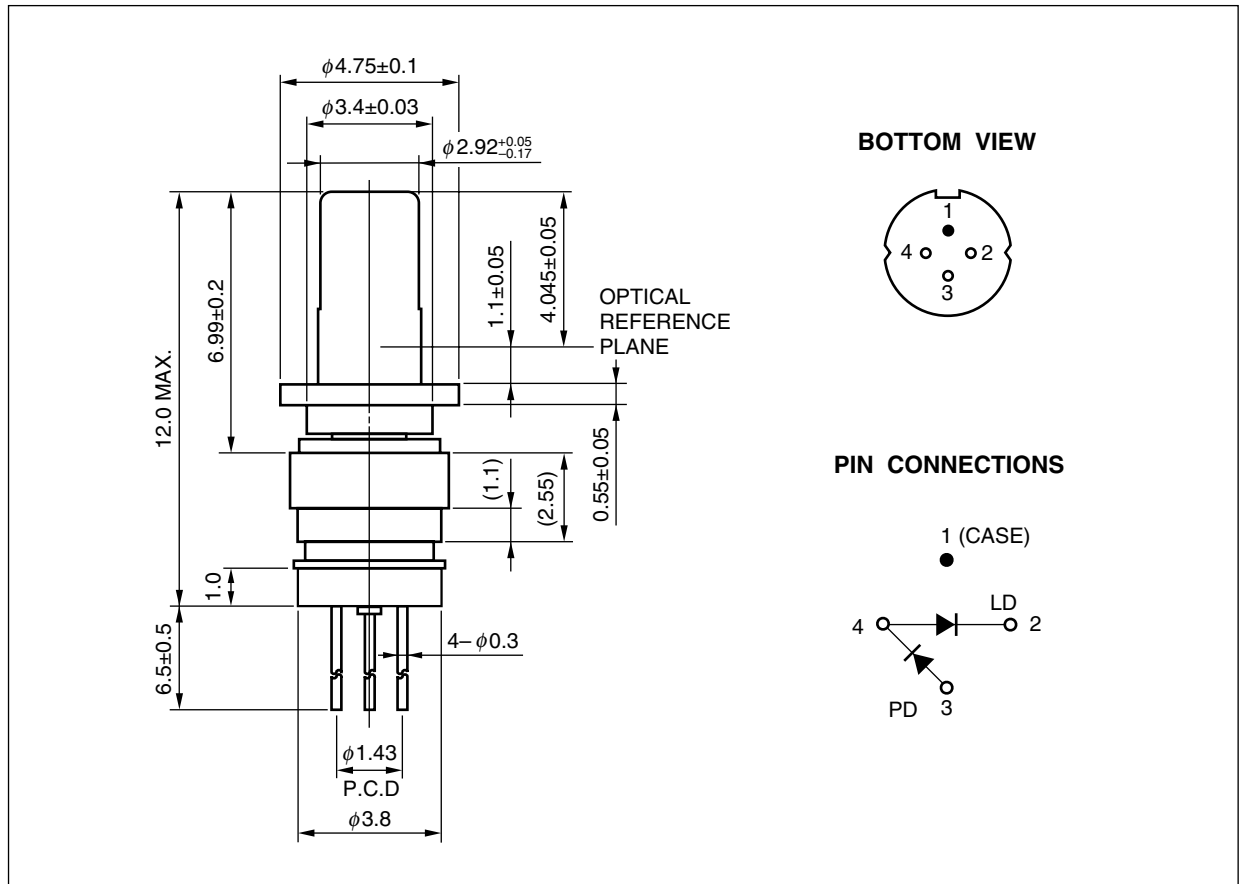
### FEATURES

- Peak emission wavelength  $\lambda_p = 1\,550\text{ nm}$
- Optical output power  $P_t = 2.0\text{ mW}$
- Wide operating temperature range  $T_c = -20\text{ to }+85^\circ\text{C}$
- Side mode suppression ratio  $\text{SMSR} = 40\text{ dB}$
- InGaAs monitor PIN-PD
- Internal optical isolator
- Based on Telcordia reliability



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

PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

Part Number	Package	Pin Connections
NX8511UD	$\phi 3.8$ mm TOSA	

# ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Optical Output Power from Fiber	$P_f$	5.0	mW
Forward Current of LD	$I_F$	150	mA
Reverse Voltage of LD	$V_R$	2.0	V
Forward Current of PD	$I_F$	2.0	mA
Reverse Voltage of PD	$V_R$	15	V
Operating Case Temperature	$T_C$	-20 to +85	°C
Storage Temperature	$T_{stg}$	-40 to +85	°C
Lead Soldering Temperature	$T_{sld}$	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

# ELECTRO-OPTICAL CHARACTERISTICS ( $T_C = -20$ to $+85^{\circ}\text{C}$ , unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Optical Output Power from Fiber	$P_f$	CW		2.0		mW
Operating Voltage	$V_{op}$	$P_f = 2.0$ mW		1.1	1.6	V
Threshold Current	$I_{th}$	$T_C = 25^{\circ}\text{C}$		10	20	mA
					50	
Threshold Output Power	$P_{th}$	$I_F = I_{th}$			100	$\mu\text{W}$
Differential Efficiency	$\eta_d$	$P_f = 2.0$ mW, $T_C = 25^{\circ}\text{C}$	0.07	0.1		W/A
		$P_f = 2.0$ mW	0.04			
Peak Emission Wavelength	$\lambda_p$	CW, $P_f = 2.0$ mW	1 530	1 550	1 570	nm
Side Mode Suppression Ratio	SMSR	$P_f = 2.0$ mW	30	40		dB
Rise Time	$t_r$	20-80%, $P_{pk} = 2.0$ mW, $I_F = I_{th}$			100	ps
Fall Time	$t_f$	80-20%, $P_{pk} = 2.0$ mW, $I_F = I_{th}$			150	ps
Monitor Current	$I_m$	$V_R = 1.5$ V, $P_f = 1.0$ mW	100	500	1 000	$\mu\text{A}$
Monitor Dark Current	$I_D$	$V_R = 1.5$ V, $T_C = 25^{\circ}\text{C}$		0.1	50	nA
		$V_R = 1.5$ V		10	500	
Tracking Error	$\gamma$	$I_m = \text{const.}$	-1.0		1.0	dB
Connector Repeatability	-	With master pigtail	-1.0		1.0	dB

**LD  $\phi$ 3.8 mm FP-TOSA PACKAGES FAMILY FOR OPTICAL FIBER COMMUNICATIONS**

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics				Application	Package
			@T <sub>C</sub> = 25°C	@T <sub>C</sub>				
	T <sub>C</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>f</sub> (mW)	λ <sub>C</sub> (nm)			
			TYP.	TYP.	MIN.	MAX.		
NX7312UA	−40 to +85	−40 to +85	8	0.2	1 274	1 356	156 Mb/s: STM-1 (S-1.1)	ϕ 3.8 mm TOSA
							622 Mb/s: STM-4 (S-4.1)	
NX7313UA	−40 to +85	−40 to +85	8	0.6	1 270	1 355	1.25 Gb/s: GbE	ϕ 3.8 mm TOSA
NX7314UA	−40 to +85	−40 to +85	8	1.0	1 263	1 360	156 Mb/s: STM-1 (L-1.1)	ϕ 3.8 mm TOSA
NX7315UA	−40 to +85	−40 to +85	8	0.6	1 266	1 360	2.5 Gb/s: STM-16 (I-16)	ϕ 3.8 mm TOSA

**LD  $\phi$ 3.8 mm DFB-TOSA PACKAGES FAMILY FOR OPTICAL FIBER COMMUNICATIONS**

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics				Application	Package
			@T <sub>C</sub> = 25°C	@T <sub>C</sub>				
	T <sub>C</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>f</sub> (mW)	λ <sub>p</sub> (nm)			
			TYP.	TYP.	MIN.	MAX.		
NX8310UA	−40 to +85	−40 to +85	10	2.0	1 280	1 335	622 Mb/s: STM-4 (L-4.1)	ϕ 3.8 mm TOSA
NX8311UD	−20 to +85	−40 to +85	10	2.0	1 280	1 335	2.5 Gb/s: STM-16 (L-16.1)	ϕ 3.8 mm TOSA
NX8312UA	−20 to +85	−40 to +85	10	1.0	1 280	1 335	2.5 Gb/s: STM-16 (S-16.1)	ϕ 3.8 mm TOSA
NX8312UD	−20 to +85	−40 to +85	10	1.0	1 280	1 335	2.5 Gb/s: STM-16 (S-16.1)	ϕ 3.8 mm TOSA
NX8510UD Series	0 to +70	−40 to +85	10	2.0	λ <sub>p</sub> −3 <sup>*1</sup>	λ <sub>p</sub> +3 <sup>*1</sup>	2.5 Gb/s: CWDM	ϕ 3.8 mm TOSA
NX8511UD	−20 to +85	−40 to +85	10	2.0	1 530	1 570	2.5 Gb/s: STM-16 (L-16.2)	ϕ 3.8 mm TOSA

\*1 Available for CWDM Wavelengths based on ITU-T recommendations

$\lambda_p$  = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

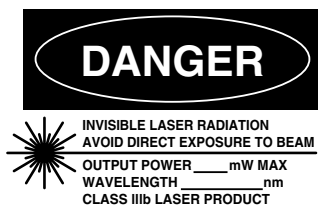
**REFERENCE**

Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

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# SAFETY INFORMATION ON THIS PRODUCT



## SEMICONDUCTOR LASER



**AVOID EXPOSURE-Invisible**  
Laser Radiation is emitted from  
this aperture

<b>Warning</b> Laser Beam	<p>A laser beam is emitted from this diode during operation. The laser beam, visible or invisible, directly or indirectly, may cause injury to the eye or loss of eyesight.</p> <ul style="list-style-type: none"> <li>• Do not look directly into the laser beam.</li> <li>• Avoid exposure to the laser beam, any reflected or collimated beam.</li> </ul>
<b>Caution</b> GaAs Products	<p>This product uses gallium arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.</p> <ul style="list-style-type: none"> <li>• Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.             <ol style="list-style-type: none"> <li>1. Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.</li> <li>2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.</li> </ol> </li> <li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li> <li>• Do not lick the product or in any way allow it to enter the mouth.</li> </ul>

### ► For further information, please contact

**NEC Compound Semiconductor Devices, Ltd.** <http://www.ncsd.necel.com/>

E-mail: [salesinfo@ml.ncsd.necel.com](mailto:salesinfo@ml.ncsd.necel.com) (sales and general)

[techinfo@ml.ncsd.necel.com](mailto:techinfo@ml.ncsd.necel.com) (technical)

5th Sales Group, Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579

**NEC Compound Semiconductor Devices Hong Kong Limited**

E-mail: [ncsd-hk@elhk.nec.com.hk](mailto:ncsd-hk@elhk.nec.com.hk) (sales, technical and general)

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

**NEC Electronics (Europe) GmbH** <http://www.ee.nec.de/>

TEL: +49-211-6503-01 FAX: +49-211-6503-487

**California Eastern Laboratories, Inc.** <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279