

**1 310 nm FOR LONG HAUL 2.5 Gb/s
InGaAsP MQW-DFB LASER DIODE TOSA****DESCRIPTION**

The NX8311UD is a 1 310 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.

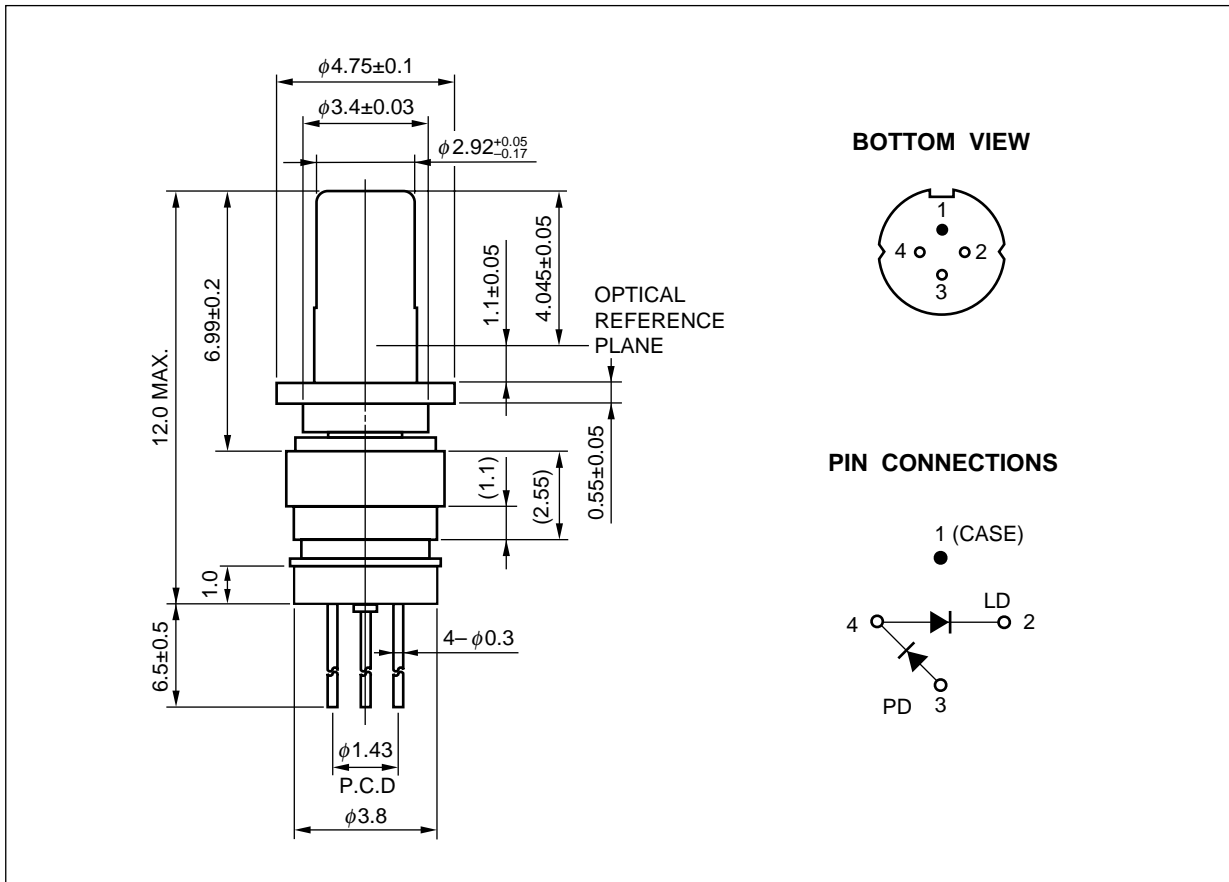
FEATURES

- ★ • Applications STM-16 (L-16.1), SONET OC-48 (LR)
- Internal optical isolator
- Optical output power $P_r = 2.0$ mW
- Low threshold current $I_{th} = 10$ mA TYP. @ $T_c = 25^\circ\text{C}$
- Wide operating temperature range $T_c = -20$ to $+85^\circ\text{C}$
- InGaAs monitor PIN-PD
- ★ • Small package ϕ 3.8 mm TOSA (Total length 12.0 mm MAX.)



The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

★ PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION (Solder Contains Lead)

Part Number	Package	Pin Connections
NX8311UD	ϕ 3.8 mm TOSA	<p>The diagram shows a laser diode (LD) and a photodiode (PD) in a TOSA package. Pin 1 is the top contact. Pin 2 is the LD anode. Pin 3 is the PD cathode. Pin 4 is the LD cathode.</p>

ORDERING INFORMATION (Pb-Free)

Part Number	Package	Pin Connections
NX8311UD-AZ*	ϕ 3.8 mm TOSA	<p>The diagram shows a laser diode (LD) and a photodiode (PD) in a TOSA package. Pin 1 is the top contact. Pin 2 is the LD anode. Pin 3 is the PD cathode. Pin 4 is the LD cathode.</p>

***NOTE:**

Please refer to the last page of this data sheet, "Compliance with EU Directives" for Pb-Free RoHS Compliance Information.

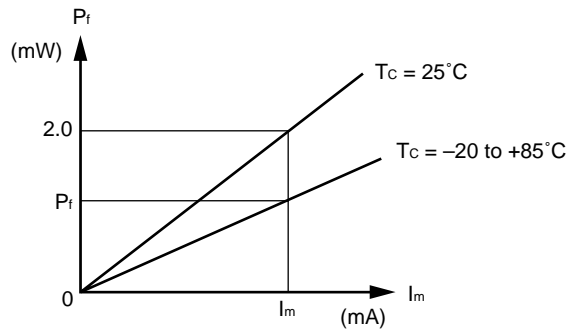
ABSOLUTE MAXIMUM RATINGS

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_{slid}	350 (3 sec.)	°C

ELECTRO-OPTICAL CHARACTERISTICS (Tc = -20 to +85°C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V _{op}	CW, P _f = 2.0 mW		1.2	1.6	V
Threshold Current	I _{th}	CW,	2		50	mA
		CW, T _c = 25°C	4	10	20	
Optical Output Power from Fiber	P _f	CW		2.0		mW
Modulation Current	I _{mod}	CW, P _f = 2.0 mW	7		50	mA
		CW, P _f = 2.0 mW, T _c = 25°C	9	20	30	
Differential Efficiency	η _d	CW, P _f = 2.0 mW	0.04		0.29	W/A
		CW, P _f = 2.0 mW, T _c = 25°C	0.07	0.10	0.20	
Peak Emission Wavelength	λ _p	CW, P _f = 2.0 mW, RMS (-20 dB)	1 280		1 335	nm
Side Mode Suppression Ratio	SMSR	CW, P _f = 2.0 mW	30			dB
Rise Time	t _r	I _b = I _{th} , 10-90%			200	ps
Fall Time	t _f	I _b = I _{th} , 90-10%			200	ps
Monitor Current	I _m	CW, V _R = 1.5 V, P _f = 1.0 mW	100		2 000	μA
Monitor Dark Current	I _d	V _R = 1.5 V			500	nA
		V _R = 1.5 V, T _c = 25°C			50	
Tracking Error* ¹	γ	CW, I _m = const. (@ P _f = 2.0 mW)	-1.0		1.0	dB
Connector Repeatability	-	With master pigtail	-1.0		1.0	dB
Optical Isolation	I _s	CW, P _f = 2.0 mW	20			dB

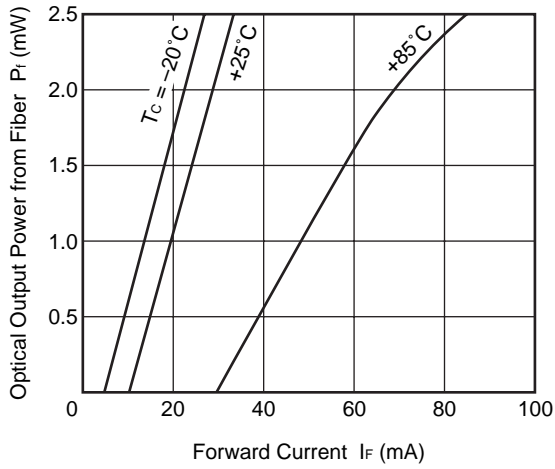
*1 Tracking Error: γ



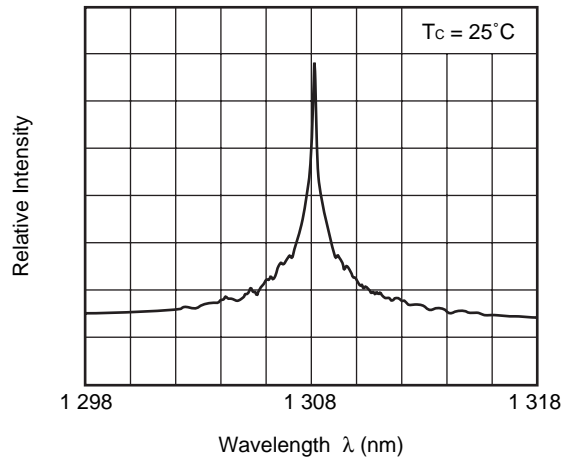
$$\gamma = \left| 10 \log \frac{P_f}{2.0} \right| \text{ [dB]}$$

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

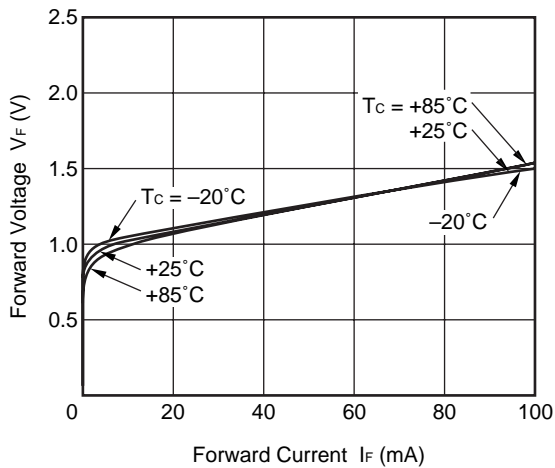
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



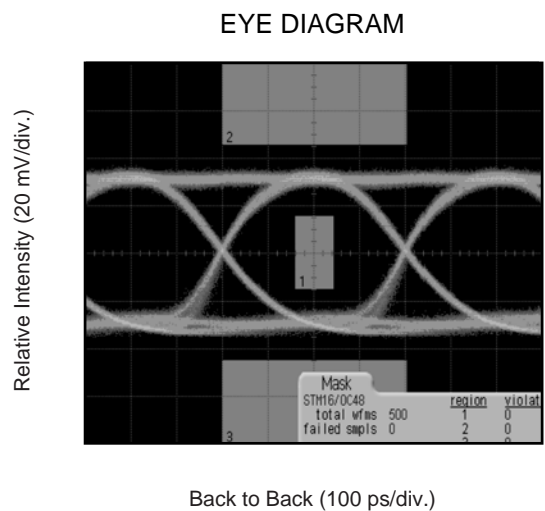
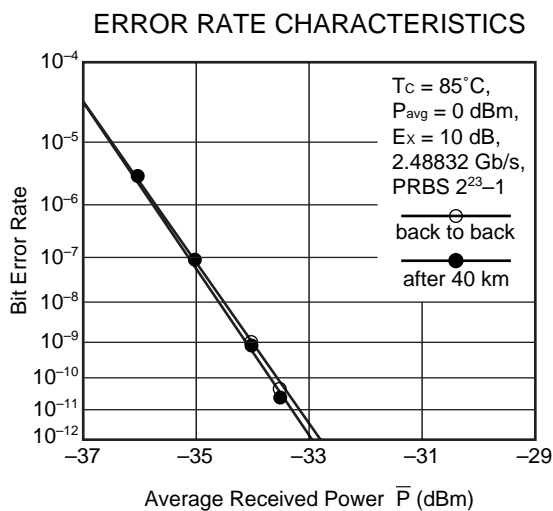
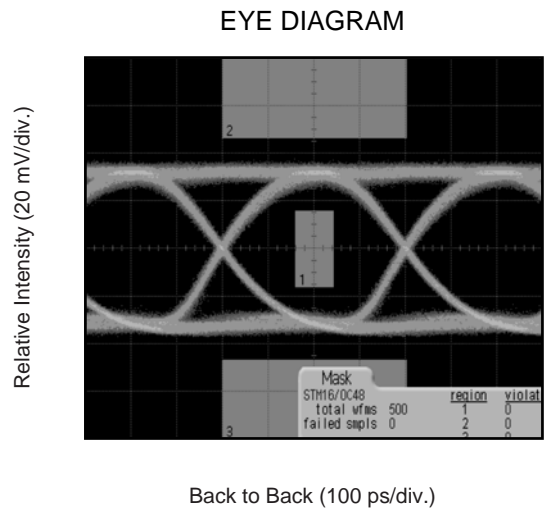
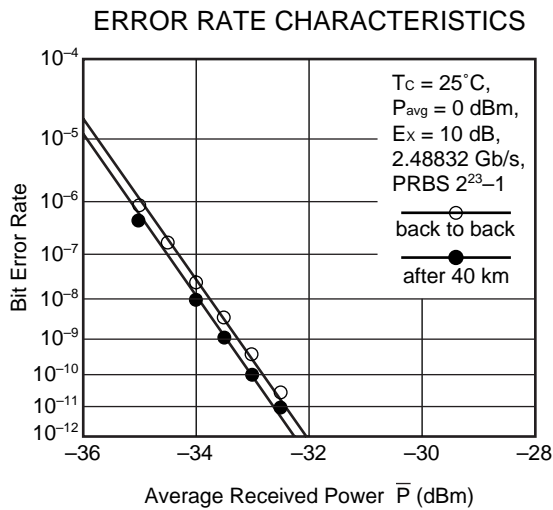
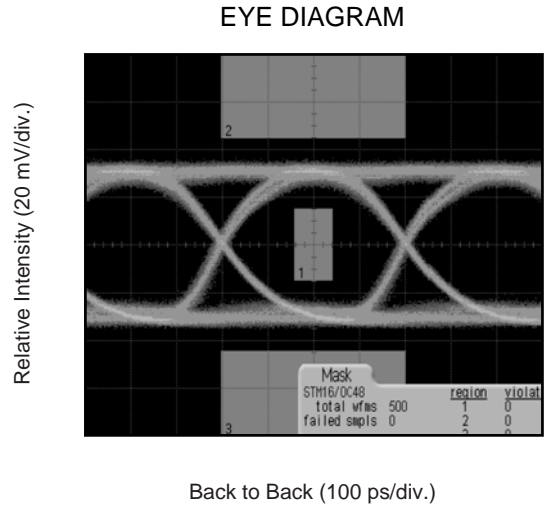
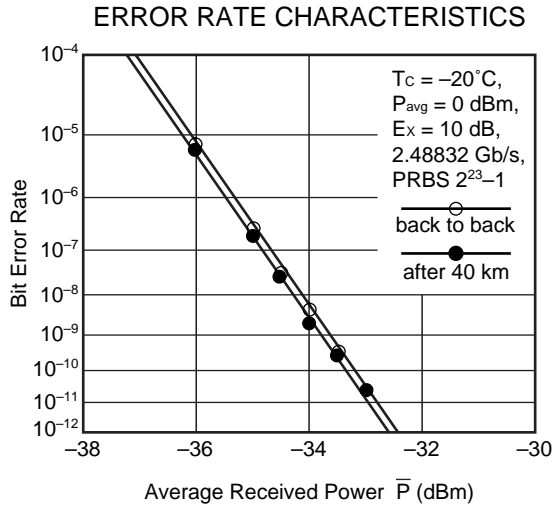
SPECTRUM



FORWARD VOLTAGE vs. FORWARD CURRENT



Remark The graphs indicate nominal characteristics.



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LD ϕ 3.8 mm FP-TOSA PACKAGES FAMILY FOR OPTICAL FIBER COMMUNICATIONS

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics				Application	Package
			@T _c = 25°C	@T _c				
	T _c (°C)	T _{stg} (°C)	I _{th} (mA)	P _f (mW)	λ_c (nm)			
		TYP.	TYP.	MIN.	MAX.			
NX7312UA-AZ*	-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-AZ*	-40 to +85	-40 to +85	8	0.6	1 270	1 355	1.25 Gb/s: GbE	ϕ 3.8 mm TOSA
NX7314UA-AZ*	-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-AZ*	-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

***NOTE:**

Please refer to the last page of this data sheet, "Compliance with EU Directives" for PB-Free RoHS Compliance Information.

LD ϕ 3.8 mm DFB-TOSA PACKAGES FAMILY FOR OPTICAL FIBER COMMUNICATIONS

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics				Application	Package
			@T _c = 25°C	@T _c				
	T _c (°C)	T _{stg} (°C)	I _{th} (mA)	P _f (mW)	λ_p (nm)			
		TYP.	TYP.	MIN.	MAX.			
NX8310UA-AZ*	-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-AZ*	-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-AZ*	-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-AZ*	-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

***NOTE:**

Please refer to the last page of this data sheet, "Compliance with EU Directives" for PB-Free RoHS Compliance Information.

REFERENCE

Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PX10161E
Opto-Electronics Devices Pamphlet	PX10160E

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL’s understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

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