NEC

LASER DIODE
NX7312UA

1 310 nm FOR SHORT HAUL 156 Mb/s AND 622 Mb/s InGaAsP MQW-FP LASER DIODE TOSA

DESCRIPTION

The NX7312UA is a 1 310 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) 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, short haul STM-1 (S-1.1) and short haul STM-4 (S-4.1), ITU-T recommendations, and SONET OC-3 (IR) and OC-12 (IR).

FEATURES

- Optical output power P_f = 0.2 mW
- Low threshold current I_{th} = 8 mA TYP. @ T_C = 25°C
- Wide operating temperature range T_C = –40 to +85°C
- InGaAs monitor PIN-PD
- Small package ϕ 3.8 mm TOSA (Total length 12.0 mm MAX.)
- Based on Telcordia reliability GR-468-CORE

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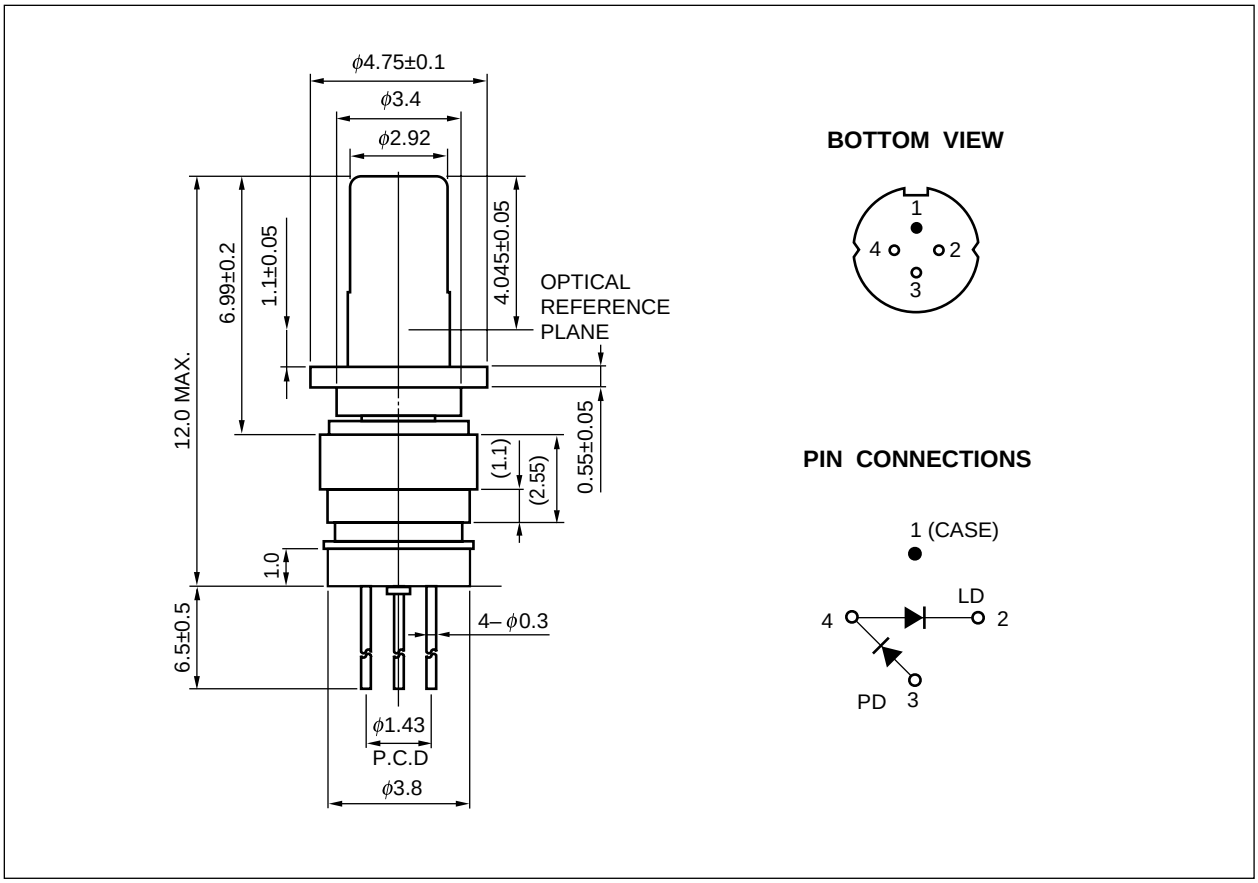
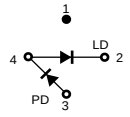
PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

Part Number	Package	Pin Connections
NX7312UA	ϕ 3.8 mm TOSA	

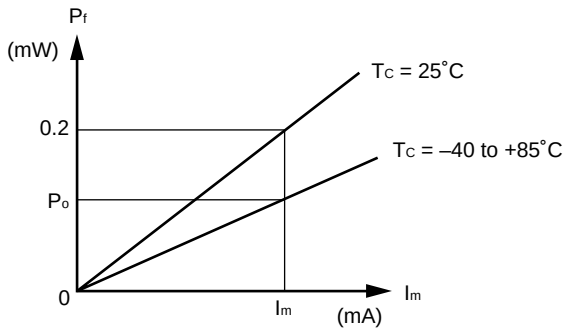
ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Optical Output Power from Fiber	P_f	2.0	mW
Forward Current of LD	I_F	150	mA
Reverse Voltage of LD	V_R	2.0	V
Forward Current of PD	I_F	10	mA
Reverse Voltage of PD	V_R	20	V
Operating Case Temperature	T_C	–40 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 = –40 to +85°C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V_{op}	CW, P_f = 0.2 mW	–	1.2	1.5	V
Threshold Current	I_{th}	CW	2	–	50	mA
		CW, T_C = 25°C	4	8	20	
Optical Output Power from Fiber	P_f	CW	–	0.2	–	mW
Modulation Current	I_{mod}	CW, P_f = 0.2 mW	5	–	40	mA
		CW, P_f = 0.2 mW, T_C = 25°C	8	10	25	
Differential Efficiency	η_d	CW	0.005	–	0.040	W/A
		CW, T_C = 25°C	0.008	0.020	0.025	
Center Wavelength	λ_C	CW, P_f = 0.2 mW, RMS (–20 dB)	1 274	–	1 356	nm
Spectral Width	σ	CW, P_f = 0.2 mW, RMS (–20 dB)	–	–	2.5	nm
Rise Time	t_r	I_b = I_{th}, 10-90%	–	–	0.5	ns
Fall Time	t_f	I_b = I_{th}, 90-10%	–	–	0.5	ns
Monitor Current	I_m	CW, V_R = 1.5 V, P_f = 0.1 mW	100	–	1 000	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 = 0.2 mW)	–1.5	–	1.5	dB
Connector Repeatability	–	With master pigtail	–1.0	–	1.0	dB

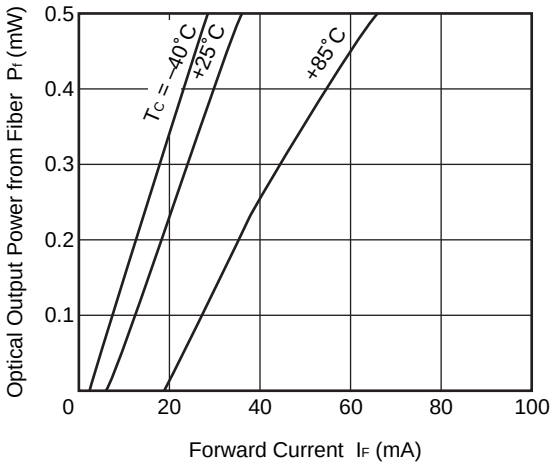
***1** Tracking Error: γ



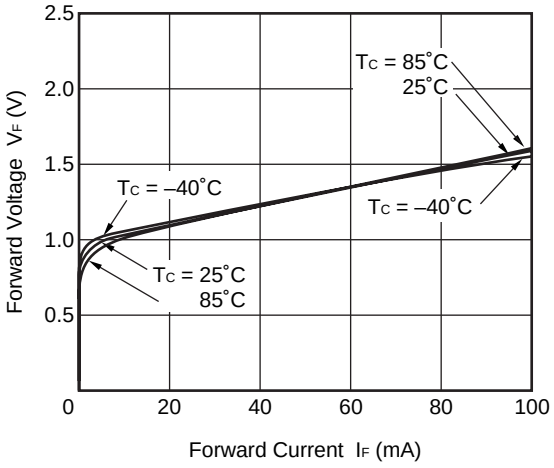
$$\gamma = \left| 10 \log \frac{P_f}{0.2} \right| \text{[dB]}$$

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

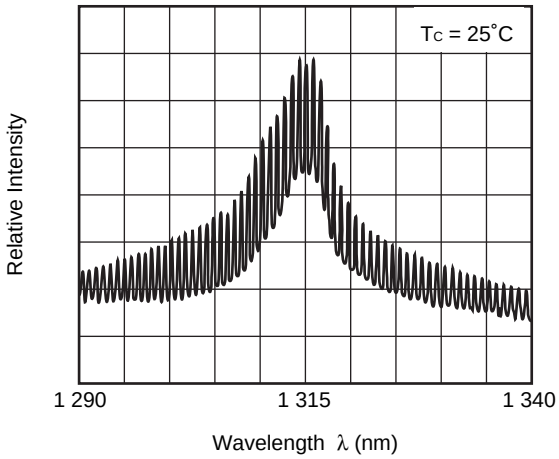
OPTICAL OUTPUT POWER FROM FIBER vs. FORWARD CURRENT



FORWARD VOLTAGE vs. FORWARD CURRENT



SPECTRUM



Remark The graphs indicate nominal characteristics.

LD ϕ3.8 mm 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 (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)	ϕ3.8 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	ϕ3.8 mm TOSA
NX7314UA	–40 to +85	–40 to +85	8	1.0	1 263	1 360	156 Mb/s: STM-1 (L-1.1)	ϕ3.8 mm TOSA

REFERENCE

Document Name	Document No.
Optical semiconducrtor devices for fiberoptic communications Selection Guide	P12480E
Opto-Electronics Devices Pamphlet	P13623E
Opto-Electronics Devices (CD-ROM)	P12944X
NEC semiconductor device reliability/quality control system[*1]	C11159E
Quality grades on NEC semiconductor devices[*1]	C11531E
SEMICONDUCTOR SELECTION GUIDE –Products and Packages–[*1]	X13769E

***1** Published by NEC Corporation

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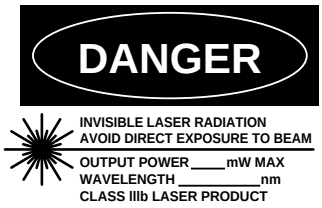
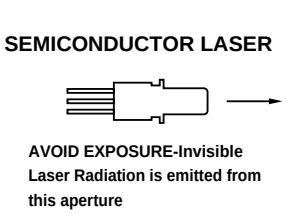
SAFETY INFORMATION ON THIS PRODUCT





Warning Laser Beam	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. • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
Caution GaAs Products	The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested. • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

▶**Business issue**

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▶**Technical issue**

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