



LASER DIODE

NX8510UD Series

1 470 TO 1 610 nm FOR CWDM 2.5 Gb/s
InGaAsP MQW-DFB LASER DIODE TOSA

DESCRIPTION

The NX8510UD is a 1 470 to 1 610 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 2.5 Gb/s CWDM application.

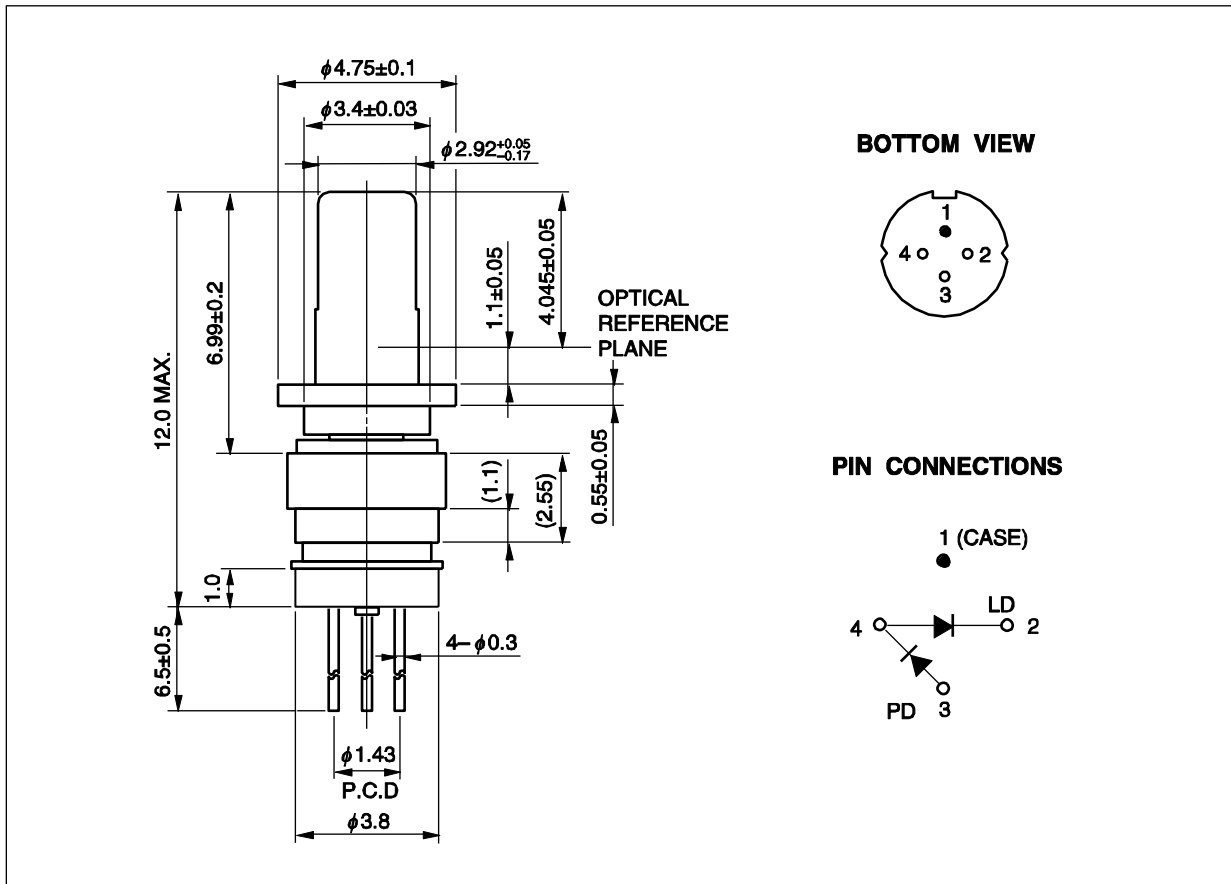
FEATURES

- Internal optical isolator
- Optical output power $P_t = 2.0 \text{ mW}$
- Peak emission wavelength $\lambda_p = 1\,470 \text{ to } 1\,610 \text{ nm}$ (Based on CWDM)
- Low threshold current $I_{th} = 10 \text{ mA TYP. @ } T_c = 25^\circ\text{C}$
- Operating case temperature range $T_c = 0 \text{ to } +70^\circ\text{C}$
- Side mode suppression ratio $\text{SMSR} = 40 \text{ dB}$
- InGaAs monitor PIN-PD
- Small package $\phi 3.8 \text{ mm TOSA (Total length } 12.0 \text{ mm MAX.)}$



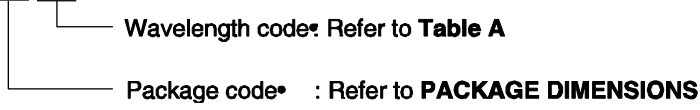
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PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

NX8510UD xx



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	0 to +70	°C
Storage Temperature	T_{stg}	-40 to +85	°C
Lead Soldering Temperature	T_{sld}	350 (3 sec.)	°C

ELECTRO-OPTICAL CHARACTERISTICS (T_c = 0 to +70°C, unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	V _{op}	CW, P _r = 2.0 mW		1.1	1.6	V
Threshold Current	I _{th}	CW, T _c = 25°C		10	20	mA
		CW			40	
Optical Output Power from Fiber	P _f	CW, T _c = 25°C, I _f = I _{th} + 20 mA		2.0		mW
Differential Efficiency	η _d	CW, P _r = 2.0 mW, T _c = 25°C	0.07	0.1		W/A
		CW, P _r = 2.0 mW	0.04			
Peak Emission Wavelength	λ _p	CW, P _r = 2.0 mW, RMS (-20 dB)	λ _p -3	λ _p *1	λ _p +3	nm
Temperature Dependence of Peak Emission Wavelength	Δλ/ΔT	CW	0.08	0.10	0.12	nm/°C
Side Mode Suppression Ratio	SMSR	CW, P _r = 2.0 mW	30	40		dB
Rise Time	t _r	I _b = I _{th} , 20-80%, P _r = 2.0 mW			100	ps
Fall Time	t _f	I _b = I _{th} , 80-20%, P _r = 2.0 mW			150	ps
Monitor Current	I _m	CW, V _R = 1.5 V, P _r = 1.0 mW	100	500	1 000	μA
Monitor Dark Current	I _D	V _R = 1.5 V, T _c = 25°C		0.1	50	nA
		V _R = 1.5 V		10	500	
Tracking Error ²	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

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

λ_p = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

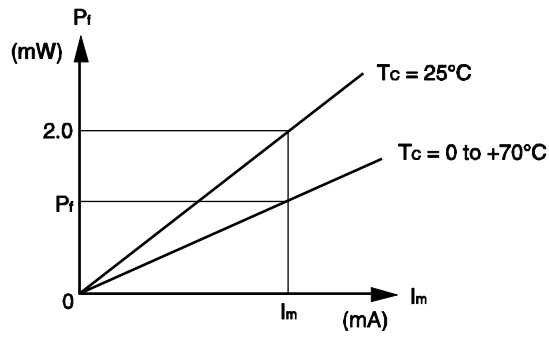
Please refer to **Table A**.

Table A: CWDM wavelength code (@ T_c = 25°C)

Wavelength Code	MIN. (nm)	TYP. (nm)	MAX. (nm)
47	1 467	1 470	1 473
49	1 487	1 490	1 493
51	1 507	1 510	1 513
53	1 527	1 530	1 533
55	1 547	1 550	1 553
57	1 567	1 570	1 573
59	1 587	1 590	1 593
61	1 607	1 610	1 613

Remark ±2 nm to tolerance for optional

*2 Tracking Error: γ



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

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 _i (mW)	λ_c (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 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 _i (mW)	λ_p (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	$\lambda_p - 3^{*1}$	$\lambda_p + 3^{*1}$	2.5 Gb/s: CWDM	ϕ 3.8 mm TOSA
NX8511UD Series	-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

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

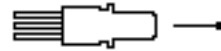
REFERENCE

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

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE - Invisible Laser Radiation is emitted from this aperture

<p>Warning Laser Beam</p>	<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"> • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam.
<p>Caution GaAs Products</p>	<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"> • 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"> 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. 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. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth.