To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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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_f = 2.0 mW
- Peak emission wavelength λ_p = 1 470 to 1 610 nm (Based on CWDM)
- Low threshold current I_{th} = 10 mA TYP. @ T_C = 25°C
- ★ Operating case temperature range T_C = –20 to +85°C
- Side mode suppression ratio SMSR = 40 dB
- InGaAs monitor PIN-PD
- Small package ϕ3.8 mm TOSA (Total length 12.0 mm MAX.)

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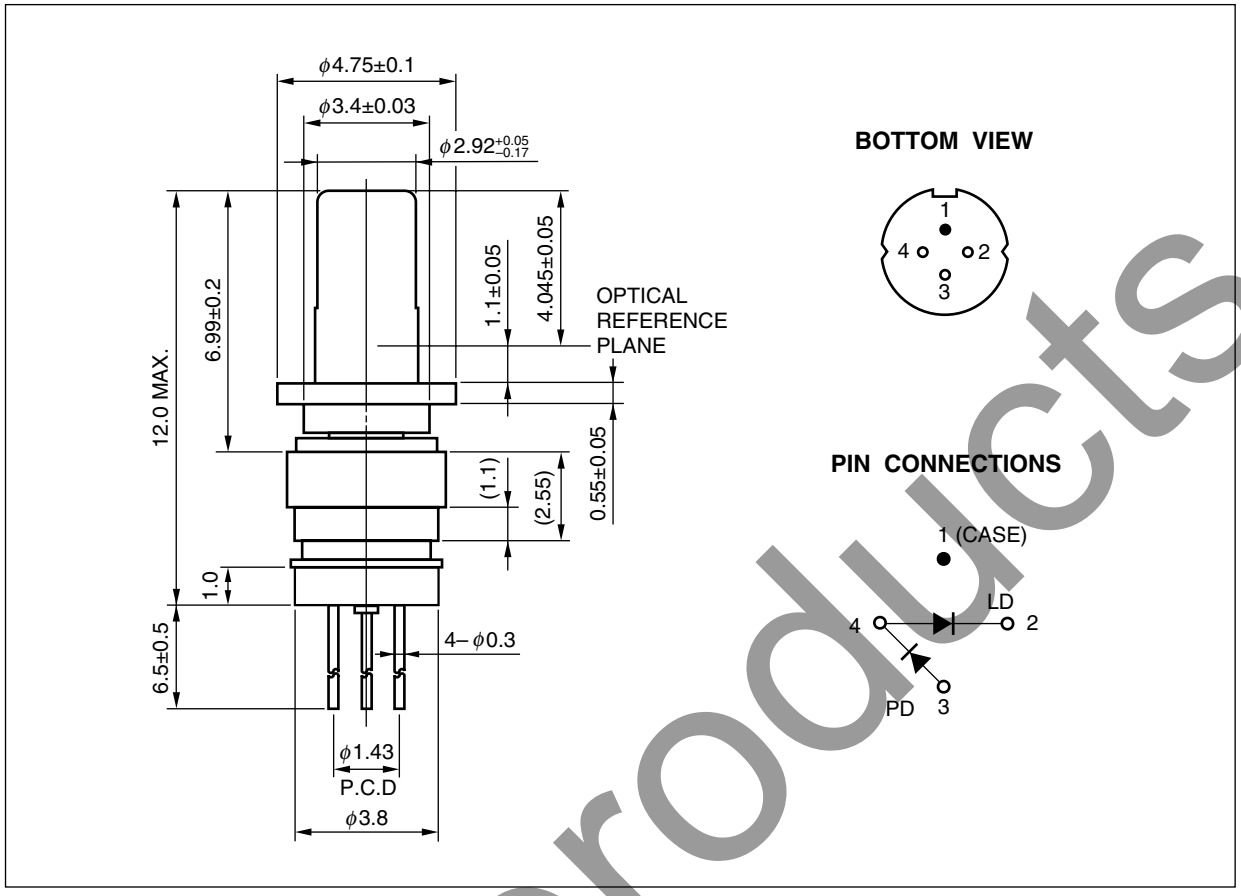
Date Published March 2004 CP(K)
Printed in Japan

The mark ★ shows major revised points.

PACKAGE DIMENSIONS (UNIT: mm)



ORDERING INFORMATION

NX8510UD xx

- xx: Wavelength code: Refer to **Table A**
- UD: Package code : Refer to **PACKAGE DIMENSIONS**

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

★ **ELECTRO-OPTICAL CHARACTERISTICS (T_C = –20 to +85°C, unless otherwise specified)**

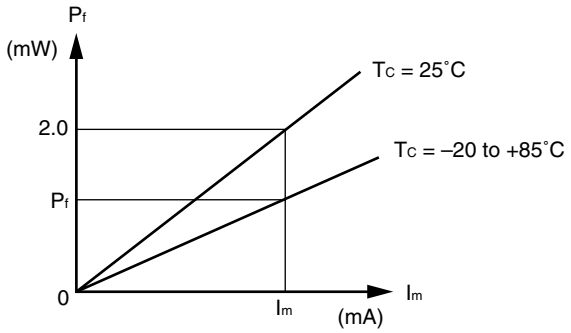
	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
	Operating Voltage	V_{op}	CW, P_f = 2.0 mW		1.1	1.6	V
	Threshold Current	I_{th}	CW, T_C = 25°C		10	20	mA
★			CW			50	
	Optical Output Power from Fiber	P_f	CW, T_C = 25°C, I_F = I_{th} + 20 mA		2.0		mW
	Differential Efficiency	η_d	CW, P_f = 2.0 mW, T_C = 25°C	0.07	0.1		W/A
			CW, P_f = 2.0 mW	0.04			
★	Peak Emission Wavelength	λ_p	CW, P_f = 2.0 mW, RMS (–20 dB), T_C = 35°C	λ_p–2	λ_p *1	λ_p+2	nm
	Temperature Dependence of Peak Emission Wavelength	$\Delta\lambda/\Delta T$	CW	0.08	0.10	0.12	nm/°C
	Side Mode Suppression Ratio	SMSR	CW, P_f = 2.0 mW	30	40		dB
	Rise Time	t_r	I_b = I_{th}, 20-80%, P_f = 2.0 mW			100	ps
	Fall Time	t_f	I_b = I_{th}, 80-20%, P_f = 2.0 mW			150	ps
	Monitor Current	I_m	CW, V_R = 1.5 V, P_f = 1.0 mW	100	500	1 000	μA
★	Monitor Dark Current	I_D	V_R = 1.5 V, T_C = 25°C		0.1	10	nA
★			V_R = 1.5 V		10	100	
	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 = 35°C)**

Wavelength Code	MIN. (nm)	TYP. (nm)	MAX. (nm)
47	1 468	1 470	1 472
49	1 488	1 490	1 492
51	1 508	1 510	1 512
53	1 528	1 530	1 532
55	1 548	1 550	1 552
57	1 568	1 570	1 572
59	1 588	1 590	1 592
61	1 608	1 610	1 612

★ ***2** Tracking Error: γ



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

LD ϕ3.8 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	−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
NX7315UA	−40 to +85	−40 to +85	8	0.6	1 266	1 360	2.5 Gb/s: STM-16 (I-16)	ϕ3.8 mm TOSA

LD ϕ3.8 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	−40 to +85	−40 to +85	10	2.0	1 280	1 335	622 Mb/s: STM-4 (L-4.1)	ϕ3.8 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)	ϕ3.8 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)	ϕ3.8 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)	ϕ3.8 mm TOSA
★ NX8510UD Series	−20 to +85	−40 to +85	10	2.0	λ_p−2 *1	λ_p+2 *1	2.5 Gb/s: CWDM	ϕ3.8 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)	ϕ3.8 mm TOSA

★ ***1** T_C = 35°C

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

REFERENCE

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

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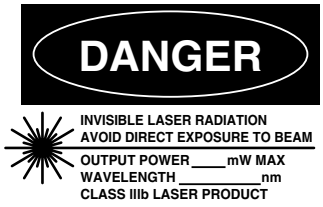
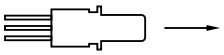
M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible Laser Radiation is emitted from this aperture

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.
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