

To our customers,

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## Old Company Name in Catalogs and Other Documents

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

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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**Phase-out/Discontinued**

# NX8508 Series

## 1 470 TO 1 610 nm InGaAsP MQW-DFB LASER DIODE COAXIAL MODULE FOR 2.5 Gb/s, CWDM

### DESCRIPTION

The NX8508 Series is a 1 470 to 1 610 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode coaxial module with an internal optical isolator.

These devices are ideal for 2.5 Gb/s CWDM application.

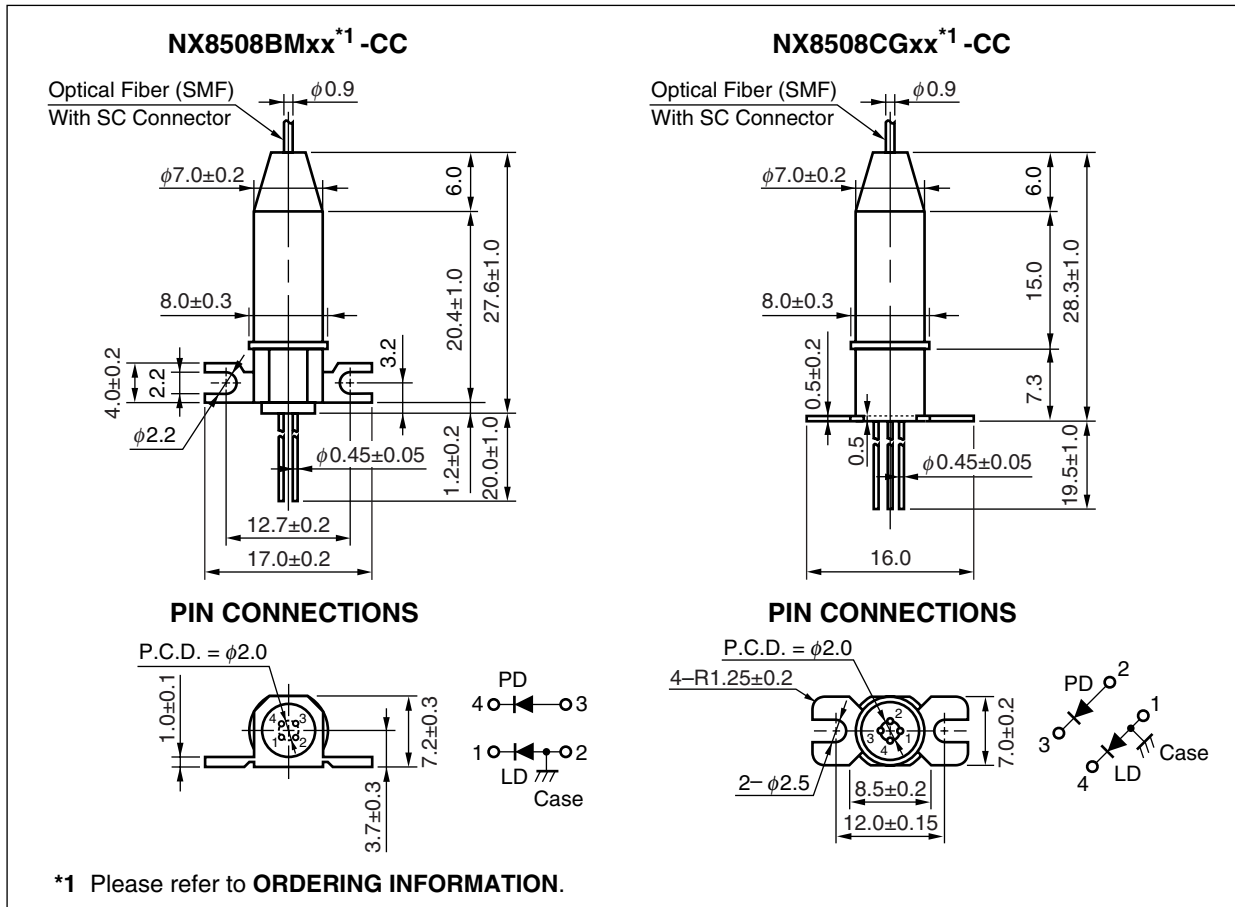
### FEATURES

- Internal optical isolator
- Peak emission wavelength  $\lambda_p = 1\,470$  to  $1\,610$  nm (Based on CWDM)
- Optical output power  $P_t = 2.0$  mW
- ★ Operating case temperature range  $T_c = -20$  to  $+85^\circ\text{C}$
- Side mode suppression ratio SMSR = 40 dB
- InGaAs monitor PIN-PD
- With SC-UPC connector
- Based on Telcordia reliability



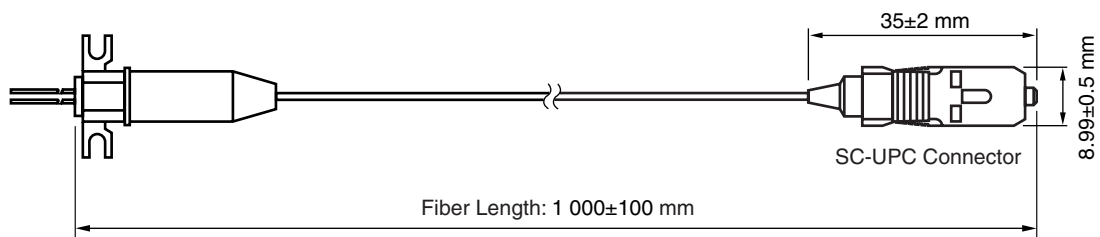
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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

★ PACKAGE DIMENSIONS (UNIT : mm)



**OPTICAL FIBER CHARACTERISTICS**

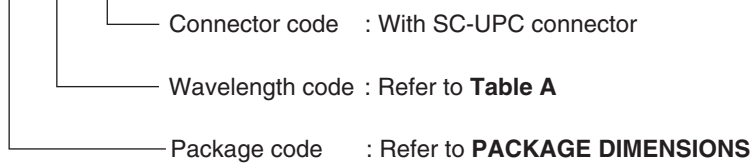
Parameter	Specification	Unit
Mode Field Diameter	9.5 $\pm$ 1	$\mu$ m
Cladding Diameter	125 $\pm$ 2	$\mu$ m
Maximum Cladding Noncircularity	2	%
Maximum Core/Cladding Concentricity	1.6	%
Outer Diameter	0.9 $\pm$ 0.1	mm
Cut-off Wavelength	1 100 to 1 270	nm
Minimum Fiber Bending Radius	30	mm
Fiber Length	1 000 $\pm$ 100	mm
Flammability	UL1581 VW-1	



**ORDERING INFORMATION**

Part Number	Flange Type	Available Connector
NX8508BMxx-CC	Flat Mount Flange	With SC-UPC Connector
★ NX8508CGxx-CC	Vertical Mount Flange	

NX8508□□xx-CC



**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Optical Output Power from Fiber	P <sub>f</sub>	5	mW
Forward Current of LD	I <sub>F</sub>	150	mA
Reverse Voltage of LD	V <sub>R</sub>	2.0	V
Forward Current of PD	I <sub>F</sub>	2.0	mA
Reverse Voltage of PD	V <sub>R</sub>	15	V
★ Operating Case Temperature	T <sub>C</sub>	-20 to +85	°C
Storage Temperature	T <sub>stg</sub>	-40 to +85	°C
Lead Soldering Temperature	T <sub>slid</sub>	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

★ **ELECTRO-OPTICAL CHARACTERISTICS (T<sub>c</sub> = -20 to +85°C, unless otherwise specified)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Optical Output Power from Fiber	P <sub>f</sub>	CW, T <sub>c</sub> = 25°C, I <sub>F</sub> = I <sub>th</sub> + 20 mA		2.0		mW
Operating Voltage	V <sub>op</sub>	CW, P <sub>f</sub> = 2.0 mW		1.1	1.6	V
Threshold Current	I <sub>th</sub>	T <sub>c</sub> = 25°C		10	20	mA
					50	
Differential Efficiency	η <sub>d</sub>	P <sub>f</sub> = 2.0 mW, T <sub>c</sub> = 25°C	0.07	0.1		W/A
		P <sub>f</sub> = 2.0 mW	0.04			
Peak Emission Wavelength	λ <sub>p</sub>	CW, P <sub>f</sub> = 2.0 mW, T <sub>c</sub> = 35°C	λ <sub>p</sub> -2	λ <sub>p</sub> *1	λ <sub>p</sub> +2	nm
Temperature Dependence of Peak Emission Wavelength	Δλ/ΔT	CW	0.08	0.10	0.12	nm/°C
Side Mode Suppression Ratio	SMSR	P <sub>f</sub> = 2.0 mW	30	40		dB
Rise Time	t <sub>r</sub>	20-80%, P <sub>f</sub> = 2.0 mW			100	ps
Fall Time	t <sub>f</sub>	80-20%, P <sub>f</sub> = 2.0 mW			150	ps
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 1.5 V, P <sub>f</sub> = 1.0 mW	100	500	1 000	μA
Monitor Dark Current	I <sub>D</sub>	V <sub>R</sub> = 1.5 V, T <sub>c</sub> = 25°C		0.1	10	nA
		V <sub>R</sub> = 1.5 V		10	100	
Tracking Error <sup>*2</sup>	γ	I <sub>m</sub> = const.	-1.0		1.0	dB

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

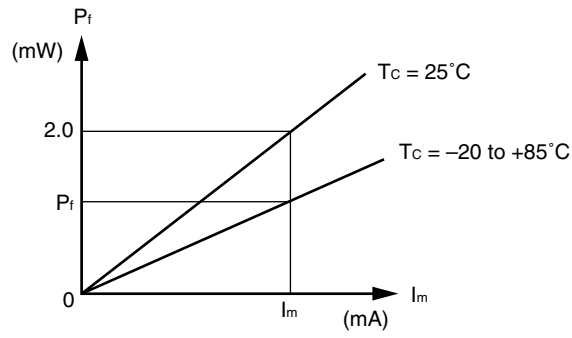
λ<sub>p</sub> = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

Please refer to **Table A**.

★ **Table A: CWDM wavelength code (@ T<sub>c</sub> = 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:  $\gamma$



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

**DFB-LD FAMILY**

Part Number	Absolute Maximum Ratings		Electro-Optical Characteristics (T <sub>c</sub> = 25°C)			Application	Package
	T <sub>c</sub> (°C)	T <sub>stg</sub> (°C)	I <sub>th</sub> (mA)	P <sub>r</sub> (mW)	λ <sub>p</sub> (nm)		
			TYP.	MIN.	TYP.		
NX8300BE-CC NX8300CE-CC	0 to +75	-40 to +85	15	2 <sup>*1</sup>	1 310	2.5 Gb/s: STM-16 (S-16.1, L-16.1)	Coaxial
NX8303BG-CC NX8303CG-CC	-10 to +85	-40 to +85	15	2 <sup>*1</sup>	1 310	622 Mb/s: STM-4 (L-4.1)	Coaxial
NX8304BE-CC NX8304CE-CC	-40 to +85	-40 to +85	15	2 <sup>*1</sup>	1 310	For fiberoptic communications	Coaxial
NX8503BG-CC NX8503CG-CC	-10 to +85	-40 to +85	15	2 <sup>*1</sup>	1 550	156 Mb/s: STM-1 (L-1.2, L-1.3)	Coaxial
						622 Mb/s: STM-4 (L-4.2, L-4.3)	
NX8504BE-CC NX8504CE-CC	-10 to +85	-40 to +85	15	2 <sup>*1</sup>	1 550	622 Mb/s: STM-4 (L-4.2, L-4.3)	Coaxial
★ NX8508 Series	-20 to +85	-40 to +85	10	2 <sup>*1</sup>	λ <sub>p</sub> <sup>*2</sup>	2.5 Gb/s: CWDM	Coaxial
NX8509 Series	-20 to +85	-40 to +85	10	2 <sup>*1</sup>	1 550	2.5 Gb/s: STM-16 (L-16.2)	Coaxial
NX8562 Series	-20 to +70	-40 to +85	20	20	1 550 <sup>*3</sup>	CW Light Source for external modulator	BFY
NX8563 Series	-20 to +70	-40 to +85	20	10	1 550 <sup>*3</sup>	CW Light Source for external modulator	BFY
NX8563LA Series	-20 to +85	-40 to +85	20	10	1 550 <sup>*3</sup>	2.5 Gb/s: DWDM	BFY
NX8570SA/SCxxx-BA	-20 to +70	-40 to +85	20	20	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD single channel wavelength, 50 GHz-spacing	BFY
NX8570SA/SCxxxD-BA	-20 to +70	-40 to +85	20	20	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD 4 channel wavelength tunable capability for 50 GHz-spacing	BFY
NX8570SCxxxQ-BA	-20 to +70	-40 to +85	20	20	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD 8 channel wavelength tunable capability for 50 GHz-spacing	BFY
NX8571SA/SCxxx-BA	-20 to +70	-40 to +85	20	10	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD single channel wavelength, 50 GHz-spacing	BFY
NX8571SA/SCxxxD-BA	-20 to +70	-40 to +85	20	10	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD 4 channel wavelength tunable capability for 50 GHz-spacing	BFY
NX8571SCxxxQ-BA	-20 to +70	-40 to +85	20	10	1 550 <sup>*3</sup>	CW Light Source with λ monitoring PD 8 channel wavelength tunable capability for 50 GHz-spacing	BFY

\*1 TYP.

★ \*2 T<sub>c</sub> = 35°C

Available for CWDM Wavelengths based on ITU-T recommendations

λ<sub>p</sub> = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

\*3 Available for DWDM Wavelengths based on ITU-T recommendations also



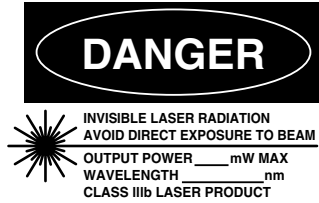
REFERENCE

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

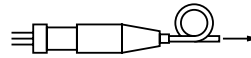
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M8E 00.4-0110

**SAFETY INFORMATION ON THIS PRODUCT**



**SEMICONDUCTOR LASER**



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

<p><b>Warning</b> 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"> <li>Do not look directly into the laser beam.</li> <li>Avoid exposure to the laser beam, any reflected or collimated beam.</li> </ul>
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<p><b>Caution</b> Optical Fiber</p>	<p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> <li>When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments.</li> </ul>

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