

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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# NX8517XC Series

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

## DESCRIPTION

The NX8517XC 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
- Peak emission wavelength
- Low threshold current
- Operating case temperature range
- Side mode suppression ratio
- InGaAs monitor PIN-PD

$P_r = 2.0 \text{ mW}$

$\lambda_p = 1\,470 \text{ to } 1\,610 \text{ nm}$  (Based on CWDM)

$I_{th} = 10 \text{ mA TYP. @ } T_c = 25^\circ\text{C}$

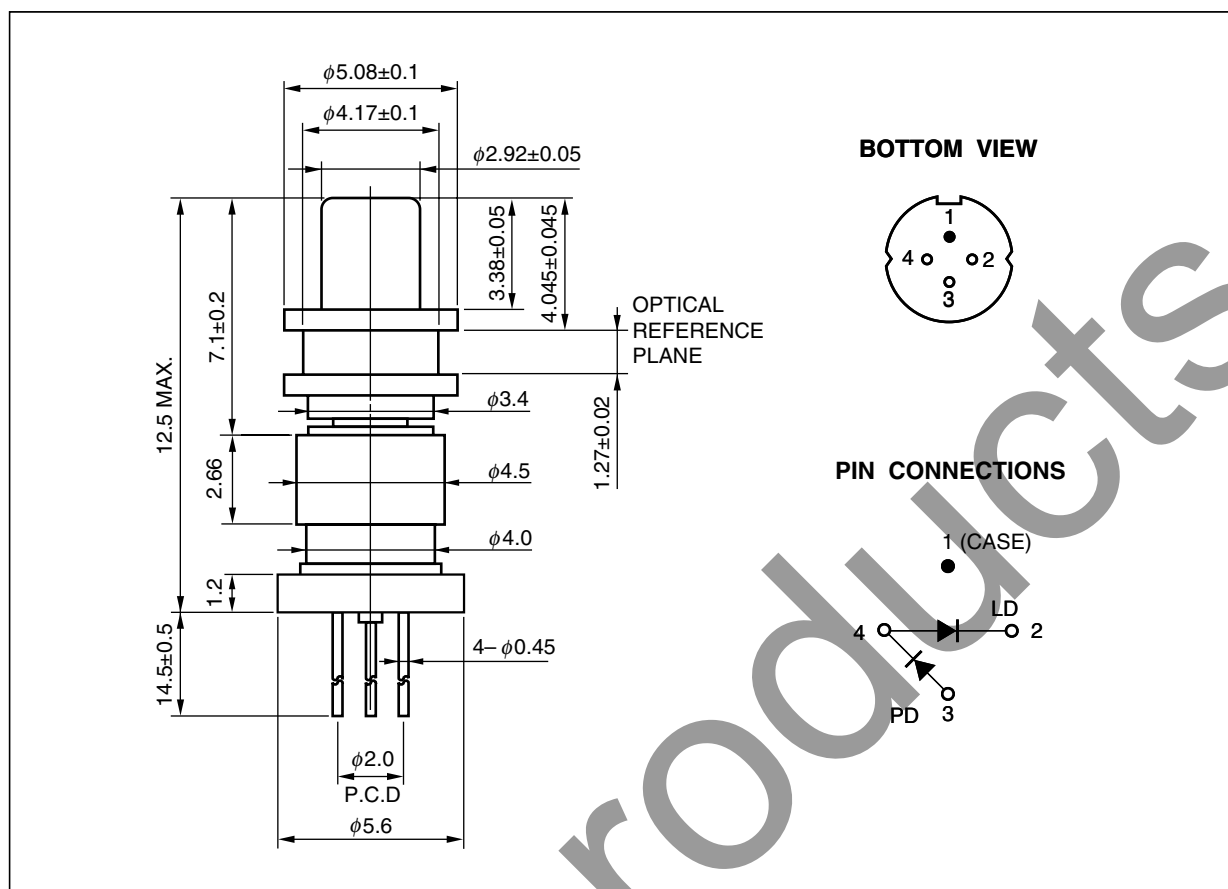
$T_c = -20 \text{ to } +85^\circ\text{C}$

$\text{SMSR} = 40 \text{ dB}$



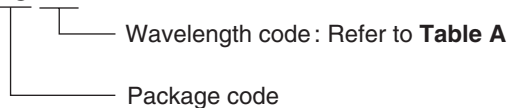
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PACKAGE DIMENSIONS (UNIT: mm)



## ORDERING INFORMATION

NX8517XC xx



## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Optical Output Power from Fiber	$P_r$	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<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>	CW, T <sub>c</sub> = 25°C		10	20	mA
		CW			50	
Differential Efficiency	η <sub>d</sub>	CW, P <sub>f</sub> = 2.0 mW, T <sub>c</sub> = 25°C	0.07	0.1		W/A
		CW, P <sub>f</sub> = 2.0 mW	0.04			
Peak Emission Wavelength	λ <sub>p</sub>	CW, P <sub>f</sub> = 2.0 mW, RMS (-20 dB), 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	CW, P <sub>f</sub> = 2.0 mW	30	40		dB
Rise Time	t <sub>r</sub>	I <sub>b</sub> = I <sub>th</sub> , 20-80%, P <sub>f</sub> = 2.0 mW			100	ps
Fall Time	t <sub>f</sub>	I <sub>b</sub> = I <sub>th</sub> , 80-20%, P <sub>f</sub> = 2.0 mW			150	ps
Monitor Current	I <sub>m</sub>	CW, 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	50	nA
		V <sub>R</sub> = 1.5 V		10	500	
Tracking Error <sup>2</sup>	γ	CW, I <sub>m</sub> = const. (@ P <sub>f</sub> = 2.0 mW)	-1.0		1.0	dB
Connector Repeatability	—	With master pigtail	-1.0		1.0	dB

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

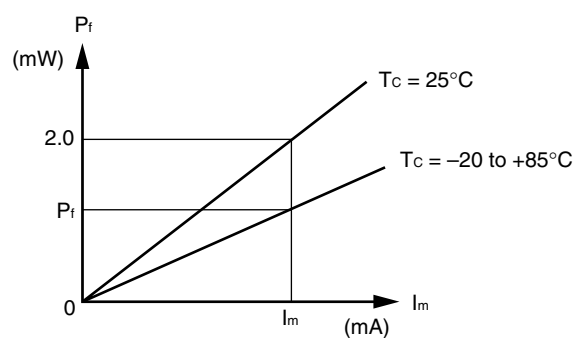
λ<sub>p</sub> = 1 470, 1 490, 1 510, 1 530, 1 550, 1 570, 1 590, 1 610 nm

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:  $\gamma$



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

**REFERENCE**

Document Name	Document No.
Opto-Electronics Devices Pamphlet	PX10160E

EOl products



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"Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

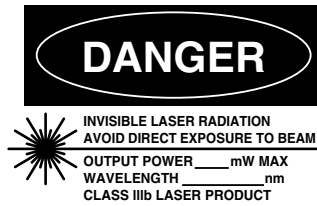
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(Note)

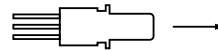
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M8E0904E

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SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible  
Laser Radiation is emitted from  
this aperture

<b>Warning</b> Laser Beam	<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>
<b>Caution</b> GaAs Products	<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"> <li>• 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"> <li>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.</li> <li>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.</li> </ol> </li> <li>• Do not burn, destroy, cut, crush, or chemically dissolve the product.</li> <li>• Do not lick the product or in any way allow it to enter the mouth.</li> </ul>