

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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# NX5313 Series

## 1 310 nm FOR FTTH PON APPLICATION InGaAsP MQW-FP LASER DIODE

### DESCRIPTION

The NX5313 Series is a 1 310 nm Multiple Quantum Well (MQW) structured Fabry-Perot (FP) laser diode with InGaAs monitor PIN-PD. These devices are designed for application up to 1.25 Gb/s.

### APPLICATION

- FTTH PON (B-PON, G-PON, GE-PON 10 km) system

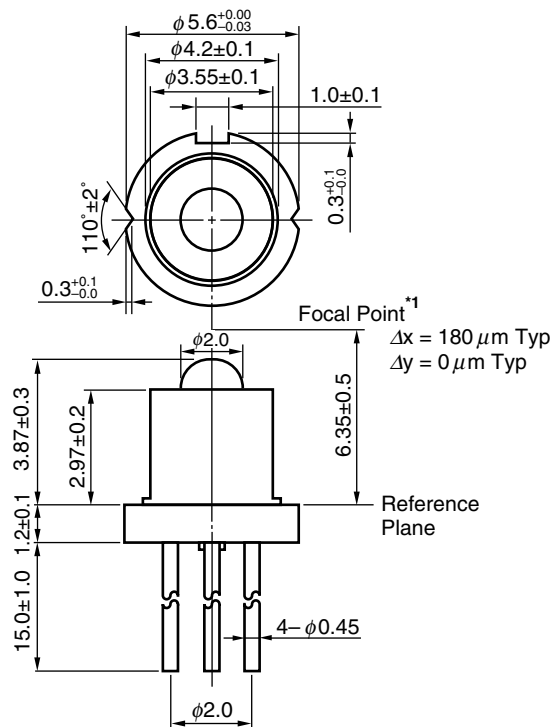
### FEATURES

- Optical output power  $P_o = 13.0 \text{ mW}$
- Low threshold current  $I_{th} = 6 \text{ mA}$
- Differential Efficiency  $\eta_d = 0.5 \text{ W/A}$
- Wide operating temperature range  $T_c = -40 \text{ to } +85^\circ\text{C}$
- InGaAs monitor PIN-PD
- CAN package  $\phi 5.6 \text{ mm}$
- Focal point  $6.35 \text{ mm}$
- LD beam angle optimized for 8 degree angled SMF

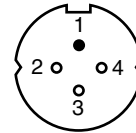


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PACKAGE DIMENSIONS (UNIT: mm)

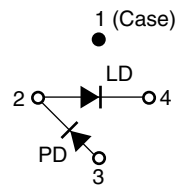


BOTTOM VIEW

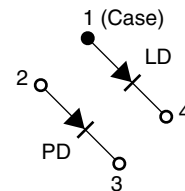


PIN CONNECTIONS

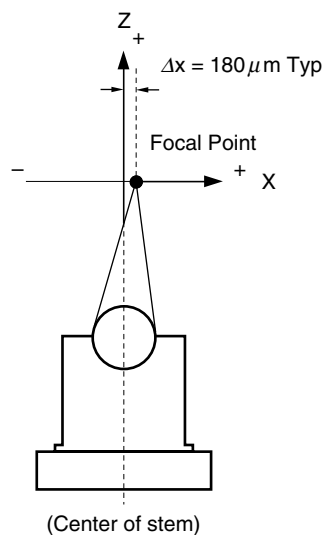
NX5313EH



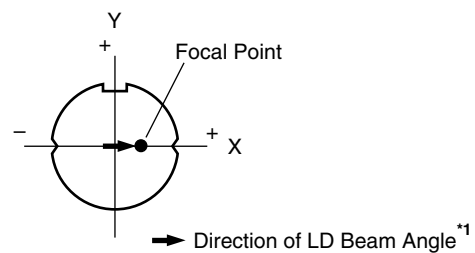
NX5313EK



\*1 Focal Point: A point to get maximum optical output power from fiber.



TOP VIEW



\*1 LD Beam angle is optimized for coupling with 8 degree angled SMF.

# ORDERING INFORMATION

Part Number	Package	Pin Connections
NX5313EH	4-pin CAN with ball lens cap	
NX5313EK		

- Remarks**
1. The color of ball lens cap might be observed differently from our can package products.
  2. The hermetic test will be performed as AQL 1.0%.

# ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Ratings	Unit
Optical Output Power	$P_o$	20	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
Assembly Temperature	$T_{asb}$	150 (15 Hr)	°C
Lead Soldering Temperature	$T_{sld}$	350 (3 sec.)	°C
Relative Humidity (noncondensing)	RH	85	%

# ELECTRO-OPTICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Operating Voltage	$V_{op}$	$P_o = 13.0 \text{ mW}$		1.1	1.5	V
Threshold Current	$I_{th}$			6	15	mA
Differential Efficiency	$\eta_d$		0.40	0.50		W/A
Center Wavelength	$\lambda_C$	$P_o = 13.0 \text{ mW, RMS } (-20 \text{ dB})$ $T_C = -40 \text{ to } +85^\circ\text{C}$	1 276	1 310	1 352	nm
Spectral Width	$\sigma$	$P_o = 13.0 \text{ mW, RMS } (-20 \text{ dB})$ $T_C = -40 \text{ to } +85^\circ\text{C}$		1.5	2.8	nm
Rise Time	$t_r$	10-90%		0.15	0.3	ns
Fall Time	$t_f$	90-10%		0.15	0.3	ns
Monitor Current	$I_m$	$V_R = 1.5 \text{ V, } P_o = 13.0 \text{ mW}$	50	100		$\mu\text{A}$
Monitor Dark Current	$I_D$	$V_R = 10 \text{ V}$			100	nA
Monitor PD Terminal Capacitance	$C_t$	$V_R = 10 \text{ V, } f = 1 \text{ MHz}$		5	20	pF
Fiber Coupling Power	$P_f$	$P_o = 13.0 \text{ mW, Optimized Coupling with } 8 \text{ degree angled SMF}$		2.6		mW
Focal Distance	$D_f$		5.85	6.35	6.85	mm

**REFERENCE**

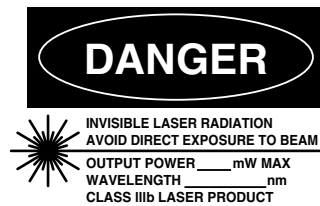
Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

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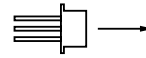
M8E 00.4-0110



SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible  
Laser Radiation is emitted from  
this aperture

<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>

► For further information, please contact

**NEC Compound Semiconductor Devices, Ltd.** <http://www.ncsd.necel.com/>

E-mail: [salesinfo@ml.ncsd.necel.com](mailto:salesinfo@ml.ncsd.necel.com) (sales and general)

[techinfo@ml.ncsd.necel.com](mailto:techinfo@ml.ncsd.necel.com) (technical)

Sales Division TEL: +81-44-435-1588 FAX: +81-44-435-1579

**NEC Compound Semiconductor Devices Hong Kong Limited**

E-mail: [ncsd-hk@elhk.nec.com.hk](mailto:ncsd-hk@elhk.nec.com.hk) (sales, technical and general)

Hong Kong Head Office TEL: +852-3107-7303 FAX: +852-3107-7309

Taipei Branch Office TEL: +886-2-8712-0478 FAX: +886-2-2545-3859

Korea Branch Office TEL: +82-2-558-2120 FAX: +82-2-558-5209

**NEC Electronics (Europe) GmbH** <http://www.ee.nec.de/>

TEL: +49-211-6503-0 FAX: +49-211-6503-1327

**California Eastern Laboratories, Inc.** <http://www.cel.com/>

TEL: +1-408-988-3500 FAX: +1-408-988-0279