

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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**1 310 nm InGaAsP MQW-DFB LASER DIODE  
 FOR 1.25 Gb/s FTTH PON APPLICATION**
**DESCRIPTION**

The NX6309GH is a 1 310 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode with InGaAs monitor PIN-PD.

**APPLICATION**

- 1.25 Gb/s FTTH PON (Fiber To The Home Passive Optical Network)

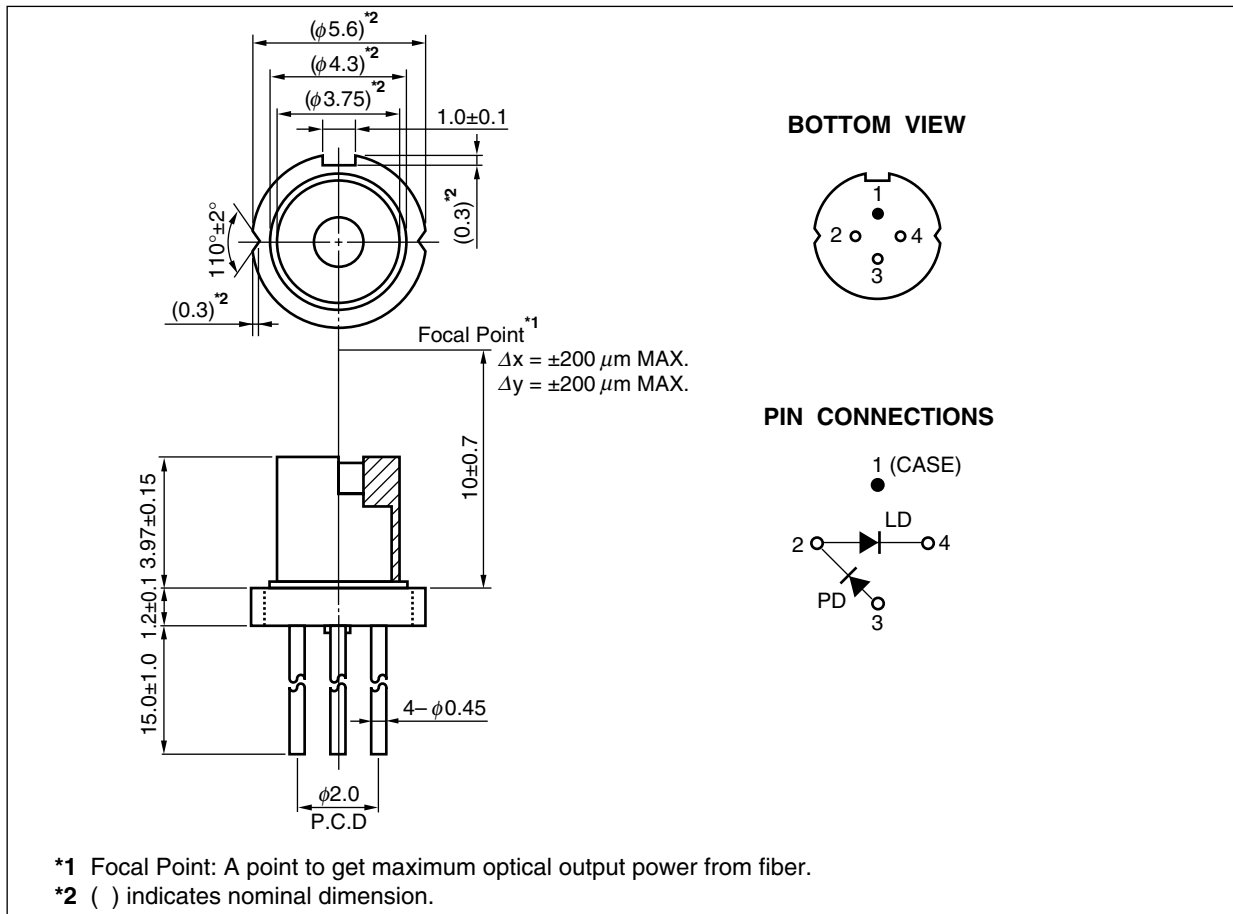
**FEATURES**

- |                                    |   |
|------------------------------------|---|
| • Optical output power             | $P_o = 10.0 \text{ mW}$                   |
| • Low threshold current            | $I_{th} = 10 \text{ mA}$                  |
| • Differential efficiency          | $\eta_d = 0.40 \text{ W/A}$               |
| • 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                      | 10 mm                                     |

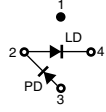


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<R> PACKAGE DIMENSIONS (UNIT: mm)



**ORDERING INFORMATION**

Part Number	Package	Pin Connections
NX6309GH	4-pin CAN with aspherical lens cap	

- <R> **Remarks**
1. The color of ball lens cap might be observed differently.
  2. The hermetic test will be performed as AQL 1.0%.

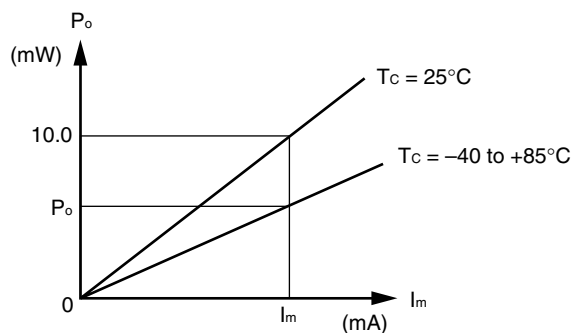
**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Optical Output Power	P <sub>o</sub>	20	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>	10.0	mA
Reverse Voltage of PD	V <sub>R</sub>	15	V
Operating Case Temperature	T <sub>c</sub>	-40 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> = -40 to +85°C, unless otherwise specified)**

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Optical Output Power	P <sub>o</sub>	CW		10.0		mW
Operating Voltage	V <sub>op</sub>	P <sub>o</sub> = 10.0 mW		1.1	1.6	V
Threshold Current	I <sub>th</sub>	T <sub>c</sub> = 25°C		10	20	mA
				30	45	
Differential Efficiency	η <sub>d</sub>	T <sub>c</sub> = 25°C	0.30	0.40		W/A
			0.15			
Peak Emission Wavelength	λ <sub>p</sub>	CW, P <sub>o</sub> = 10.0 mW, RMS (-20 dB)	1 290		1 330	nm
Side Mode Suppression Ratio	SMSR	P <sub>o</sub> = 10.0 mW, RMS (-20 dB)	30	45		dB
Rise Time	t <sub>r</sub>	I <sub>b</sub> = I <sub>th</sub> , 10-90%			500	ps
Fall Time	t <sub>f</sub>	I <sub>b</sub> = I <sub>th</sub> , 90-10%			500	ps
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 1.5 V, P <sub>o</sub> = 10.0 mW	80		800	μA
Monitor Dark Current	I <sub>D</sub>	V <sub>R</sub> = 5 V			100	nA
Monitor PD Terminal Capacitance	C <sub>t</sub>	V <sub>R</sub> = 5 V			20	pF
Tracking Error*1	γ	I <sub>m</sub> = const. (@ P <sub>o</sub> = 10.0 mW, T <sub>c</sub> = 25°C)	-1.0		1.0	dB

\*1 Tracking Error: γ



$$\gamma = \left| 10 \log \frac{P_o}{10.0} \right| \text{ [dB]}$$

**REFERENCE**

Document Name	Document No.
Opto-Electronics Devices Pamphlet	PX10160E

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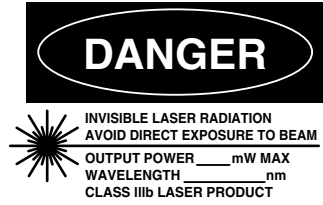
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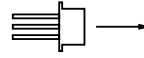
M8E0904E



**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>