

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**

# NX6406 Series

## 1 490 nm InGaAsP MQW-DFB LASER DIODE FOR FTTH PON APPLICATION

### DESCRIPTION

The NX6406 Series is a 1 490 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode with InGaAs monitor PIN-PD.

### APPLICATION

- FTTH PON (Fiber To The Home Passive Optical Network)

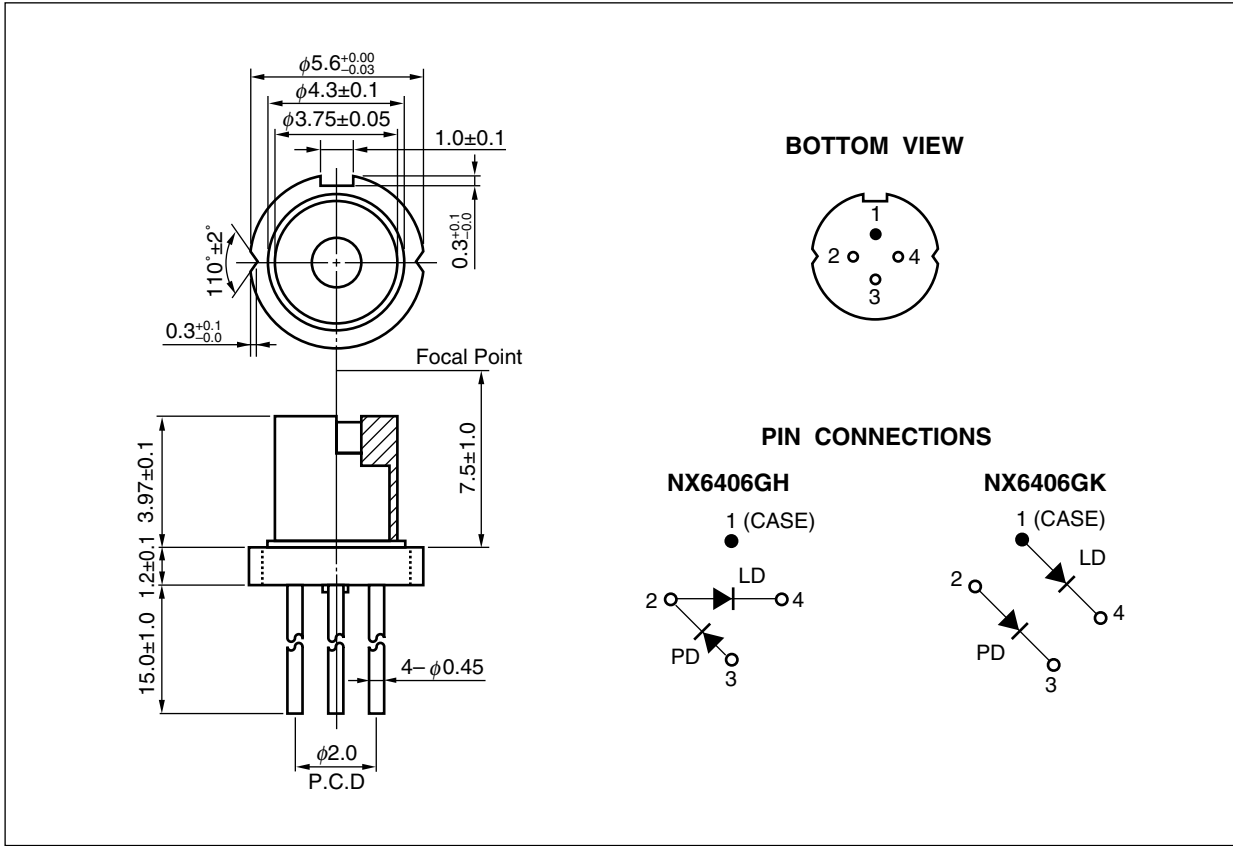
### FEATURES

- |                                    |                                           |
|------------------------------------|-------------------------------------------|
| • Optical output power             | $P_o = 5.0 \text{ mW}$                    |
| • Low threshold current            | $I_{th} = 10 \text{ mA}$                  |
| • Differential efficiency          | $\eta_d = 0.3 \text{ W/A}$                |
| • Wide operating temperature range | $T_c = -20 \text{ to } +85^\circ\text{C}$ |
| • InGaAs monitor PIN-PD            |                                           |
| • CAN package                      | $\phi 5.6 \text{ mm}$                     |
| • Focal point                      | 7.5 mm                                    |

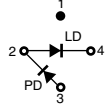



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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

PACKAGE DIMENSIONS (UNIT: mm)



**ORDERING INFORMATION**

Part Number	Package	Pin Connections
NX6406GH	4-pin CAN with aspherical lens cap	
NX6406GK		

**Remark** The hermetic test will be performed as AQL 1.0%.

**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Optical Output Power	P <sub>o</sub>	10	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
Assembly Temperature	T <sub>asb</sub>	150 (15 Hr)	°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	P <sub>o</sub>	CW		5.0		mW
Operating Voltage	V <sub>op</sub>	P <sub>o</sub> = 5.0 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>o</sub> = 5.0 mW, T <sub>C</sub> = 25°C	0.18	0.3		W/A
		P <sub>o</sub> = 5.0 mW	0.10			
Temperature Dependence of Differential Efficiency	Δη <sub>d</sub>	$\Delta\eta_d = 10 \log \frac{\eta_d (@ T_c^\circ\text{C})}{\eta_d (@ 25^\circ\text{C})}$	-3.0	-1.6		dB
Peak Emission Wavelength	λ <sub>p</sub>	CW, P <sub>o</sub> = 5.0 mW	1 480		1 500	nm
Side Mode Suppression Ratio	SMSR	P <sub>o</sub> = 5.0 mW	30	40		dB
Rise Time	t <sub>r</sub>	I <sub>b</sub> = I <sub>th</sub> , 20-80%			100	ps
Fall Time	t <sub>f</sub>	I <sub>b</sub> = I <sub>th</sub> , 80-20%			150	ps
Monitor Current	I <sub>m</sub>	V <sub>R</sub> = 1.5 V, P <sub>o</sub> = 5.0 mW	200	600	2 000	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	

REFERENCE

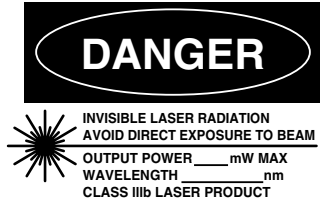
Document Name	Document No.
OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE	PL10161E
Opto-Electronics Devices Pamphlet	PX10160E

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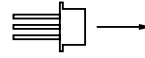
M8E 00.4-0110



**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>
<p><b>Caution</b> GaAs Products</p>	<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

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