

**1 310 nm FOR 156 Mb/s, 622 Mb/s, 1.25 Gb/s, FTTH  
InGaAsP MQW-FP LASER DIODE****DESCRIPTION**

The NX5310 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.

**APPLICATIONS**

- STM-1 (I-1, S-1.1), STM-4 (I-4, S-4.1), ITU-T recommendations
- FTTH P2P (Fiber To The Home Point to Point) system

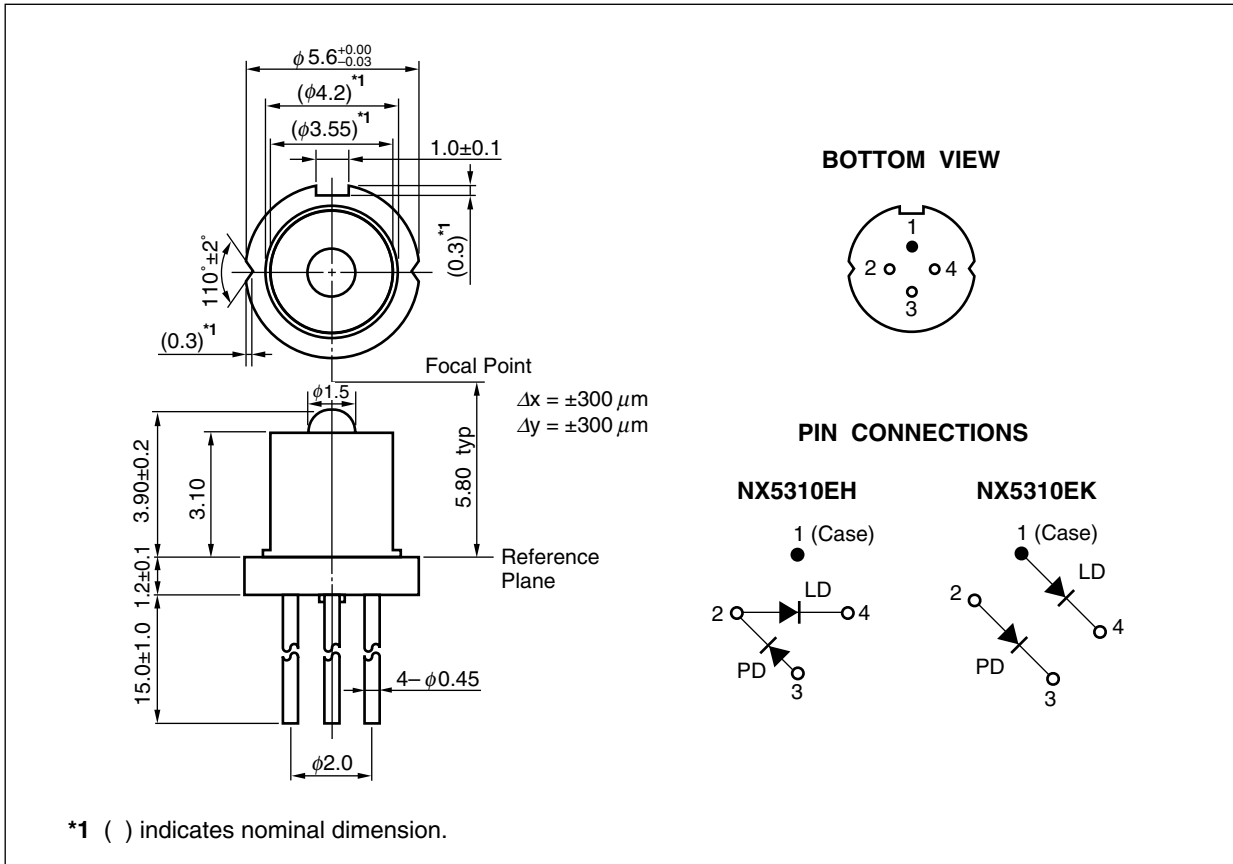
**FEATURES**

- Optical output power  $P_o = 5.0 \text{ mW}$
- Low threshold current  $I_{th} = 6 \text{ mA}$
- Differential efficiency  $\eta_d = 0.3 \text{ W/A}$
- Wide operating temperature range  $T_c = -40 \text{ to } +85^\circ\text{C}$
- InGaAs monitor PIN-PD
- CAN package  $\phi 5.6 \text{ mm}$
- Fiber coupling point  $5.8 \text{ mm}$

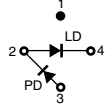



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<R> PACKAGE DIMENSIONS (UNIT: mm)



**ORDERING INFORMATION**

Part Number	Package	Pin Connections
NX5310EH	4-pin CAN with ball lens cap	 <p>Diagram showing pin connections for NX5310EH. Pin 1 is at the top, pin 2 on the left, pin 3 at the bottom, and pin 4 on the right. Pin 1 is connected to LD (Laser Diode) and pin 4. Pin 2 is connected to PD (Photodiode) and pin 3.</p>
NX5310EK		 <p>Diagram showing pin connections for NX5310EK. Pin 1 is at the top, pin 2 on the left, pin 3 at the bottom, and pin 4 on the right. Pin 1 is connected to LD (Laser Diode) and pin 4. Pin 2 is connected to PD (Photodiode) and pin 3.</p>

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

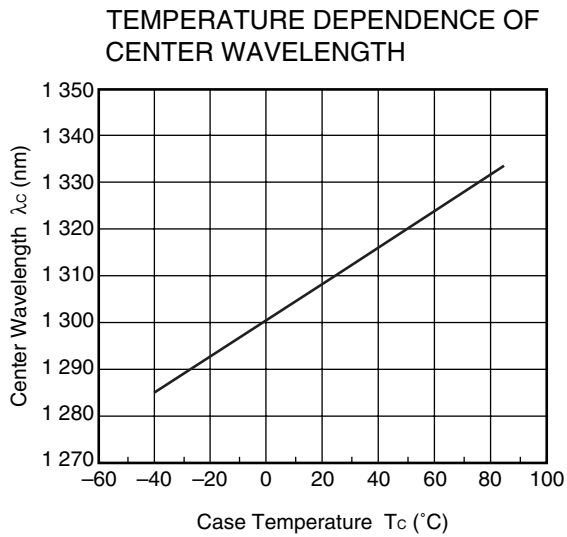
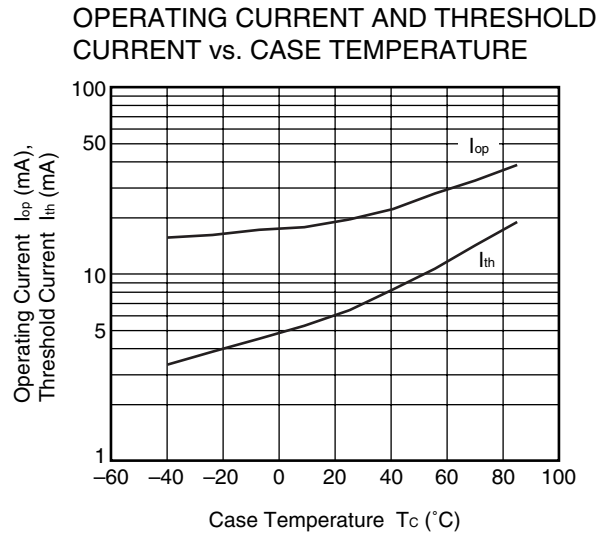
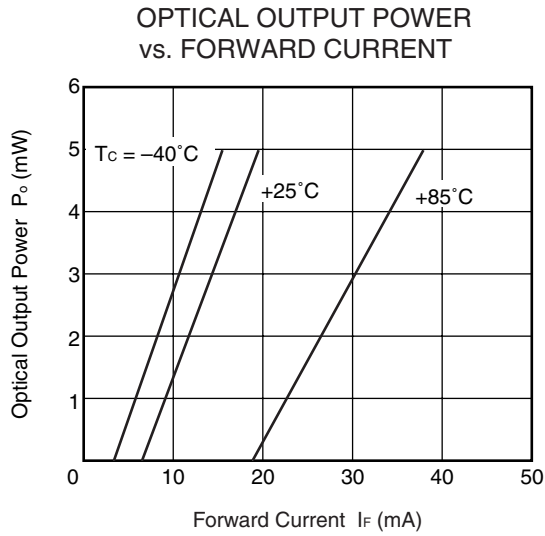
**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Ratings	Unit
Optical Output Power	$P_o$	10	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	$T_{slid}$	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	$V_{op}$	$P_o = 5.0 \text{ mW}$		1.1	1.5	V
Operating Current	$I_{op}$	$P_o = 5.0 \text{ mW}$	10	20	35	mA
Threshold Current	$I_{th}$		3	6	15	mA
Differential Efficiency	$\eta_d$		0.2	0.3	0.7	W/A
Center Wavelength	$\lambda_c$	$P_o = 5.0 \text{ mW, RMS } (-20 \text{ dB})$	1 290	1 310	1 330	nm
Spectral Width	$\sigma$	$P_o = 5.0 \text{ mW, RMS } (-20 \text{ dB})$		1.0	2.0	nm
Rise Time	$t_r$	10-90%		0.15	0.3	ns
Fall Time	$t_f$	90-10%		0.15	0.3	ns
Lateral Beam Angle	$\theta_l$	$P_o = 5.0 \text{ mW}$		11		deg.
Vertical Beam Angle	$\theta_v$	$P_o = 5.0 \text{ mW}$		11		deg.
Monitor Current	$I_m$	$V_R = 1.5 \text{ V, } P_o = 5.0 \text{ mW}$	100	500	900	$\mu\text{A}$
Monitor Dark Current	$I_D$	$V_R = 10 \text{ V}$			100	nA
Monitor PD Terminal Capacitance	$C_t$	$V_R = 10 \text{ V, } f = 1 \text{ MHz}$			20	pF
Focal Distance	$D_f$	$P_o = 5.0 \text{ mW}$	5.0	5.8	6.2	mm
Optical Output Power from Fiber	$P_f$	$P_o = 5.0 \text{ mW, 8 degree angled fiber, Optimized X, Y, } \theta, Z = 5.8 \pm 0.05 \text{ mm.}$	400	800		$\mu\text{W}$

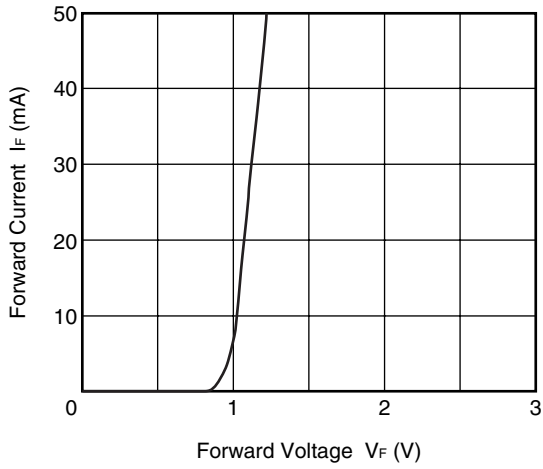
<R> **TYPICAL CHARACTERISTICS (T<sub>c</sub> = -40 to +85°C, unless otherwise specified)**



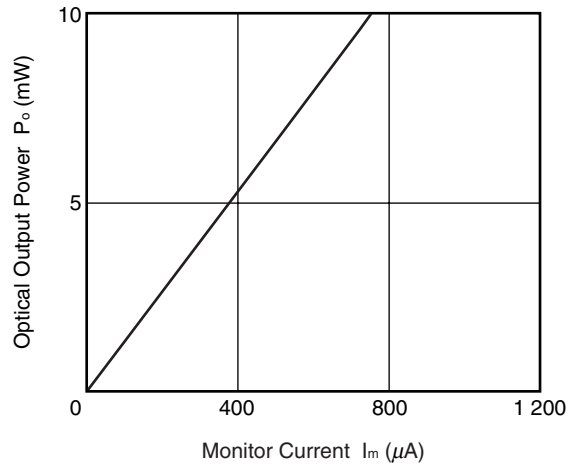
**Remark** The graphs indicate nominal characteristics.

<R> **TYPICAL CHARACTERISTICS (T<sub>c</sub> = 25°C, unless otherwise specified)**

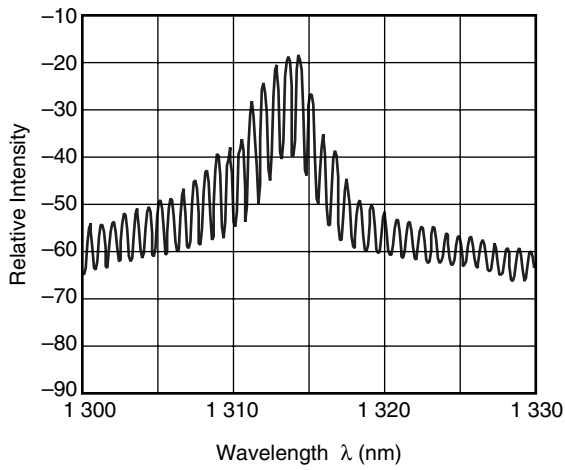
**FORWARD CURRENT vs. FORWARD VOLTAGE**



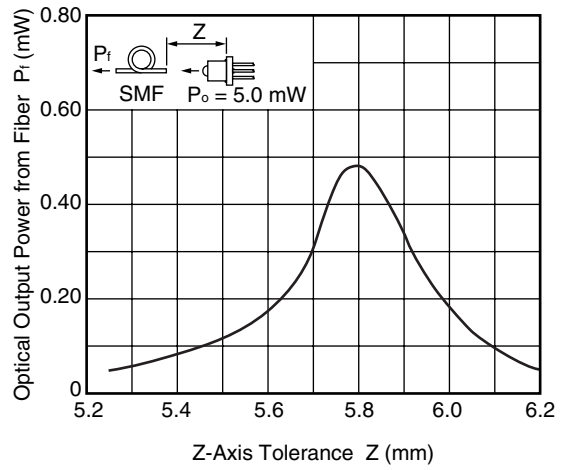
**OPTICAL OUTPUT POWER vs. MONITOR CURRENT**



**SPECTRUM**



**TOLERANCE OF FIBER COUPLING DISTANCE (Z)**



**Remark** The graphs indicate nominal characteristics.

**REFERENCE**

Document Name	Document No.
Opto-Electronics Devices Pamphlet <sup>*1</sup>	PX10160E

\*1 Published by the former NEC Compound Semiconductor Devices, Ltd.

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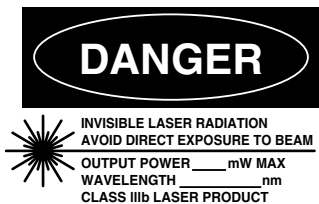
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(Note)

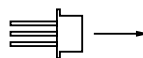
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**SAFETY INFORMATION ON THIS PRODUCT**



**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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