

**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

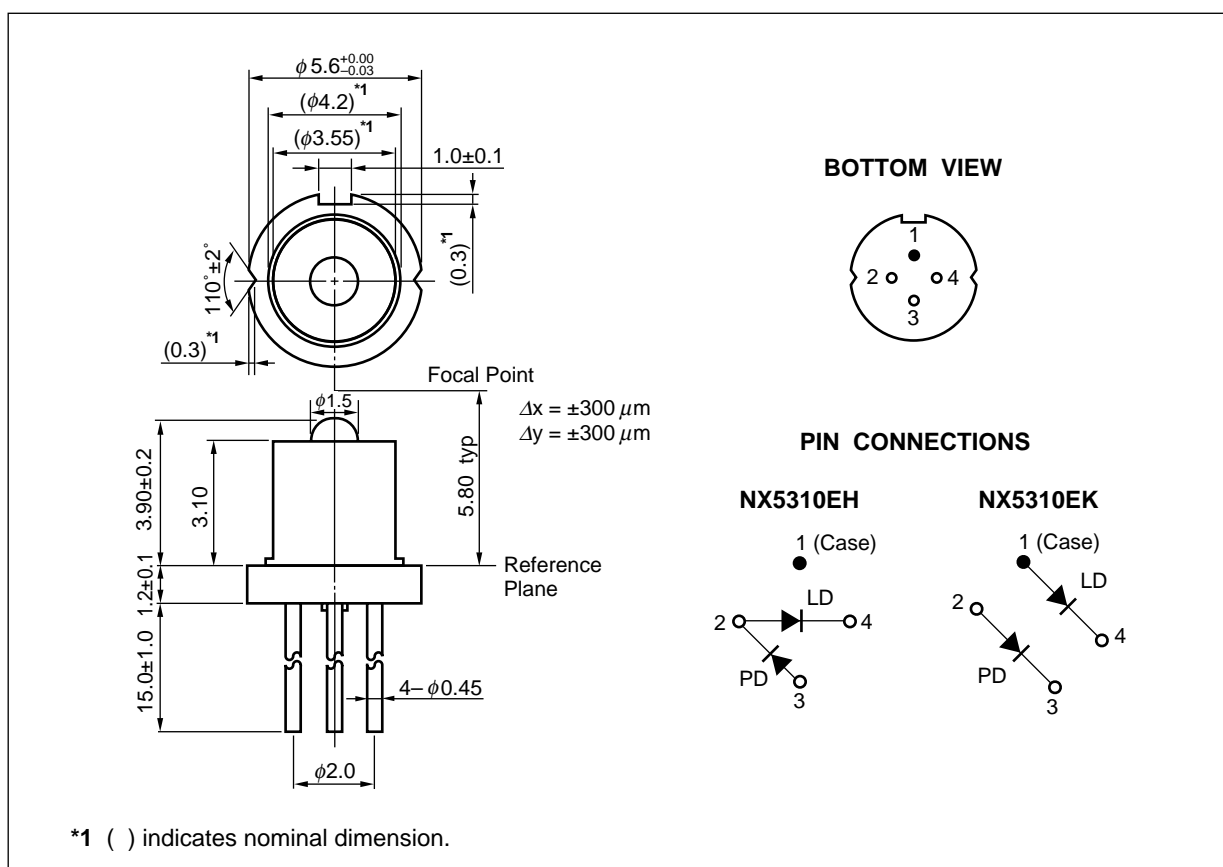
**FEATURES**

- 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  $5.8 \text{ mm}$

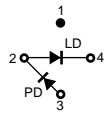



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**<R> PACKAGE DIMENSIONS (UNIT: mm)**



**ORDERING INFORMATION**

| Part Number  | Package                      | Pin Connections   |
|--------------|------------------------------|---|
| NX5310EH-AZ* | 4-pin CAN with ball lens cap |  |
| NX5310EK-AZ* |                              |  |

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

**\*NOTE:**

Please refer to the last page of this data sheet, "Compliance with EU Directives" for Pb-Free RoHS Compliance Information.

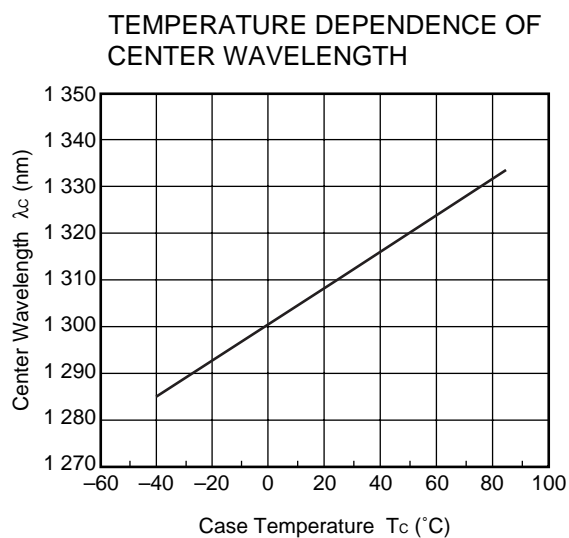
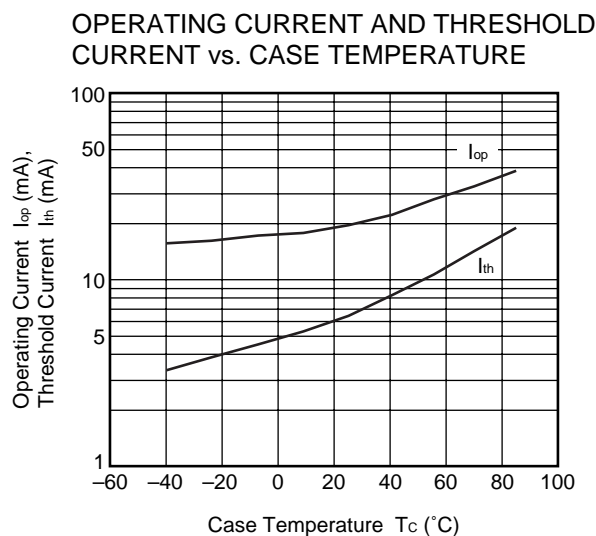
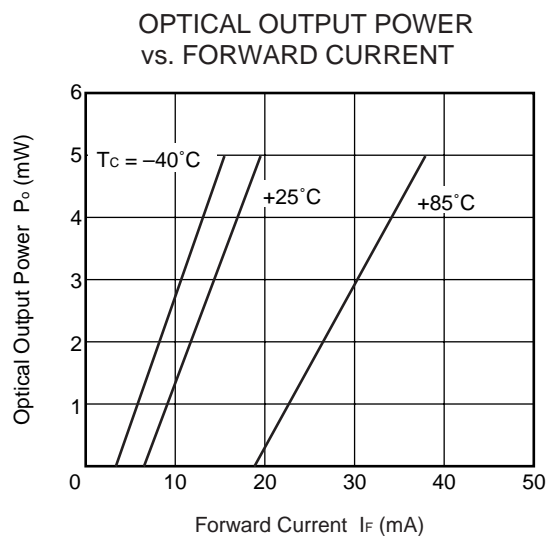
**ABSOLUTE MAXIMUM RATINGS**

| 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        | $T_{sld}$ | 350 (3 sec.) | °C   |
| Relative Humidity (noncondensing) | RH        | 85           | %    |

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

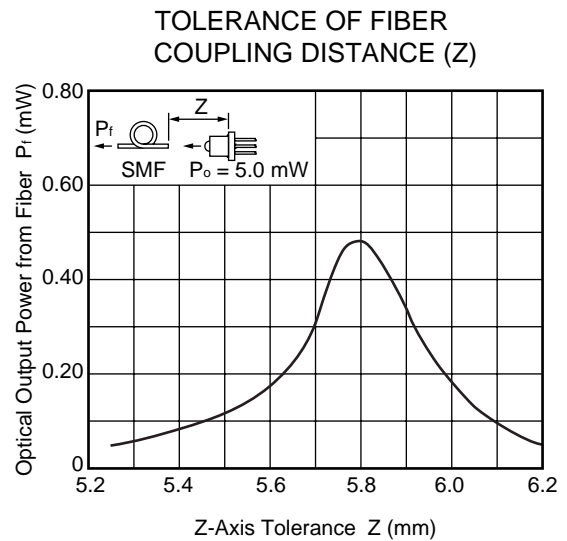
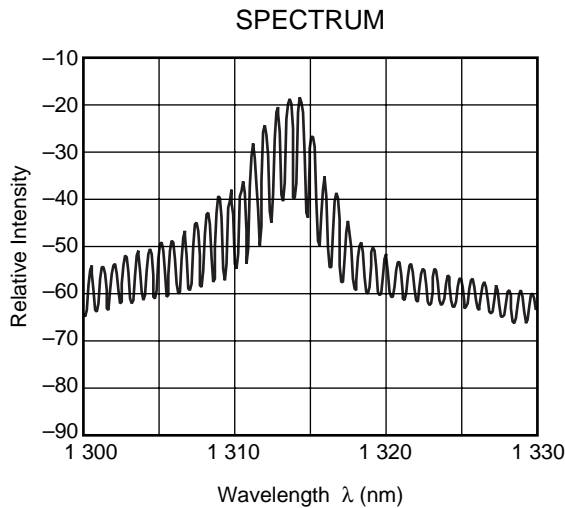
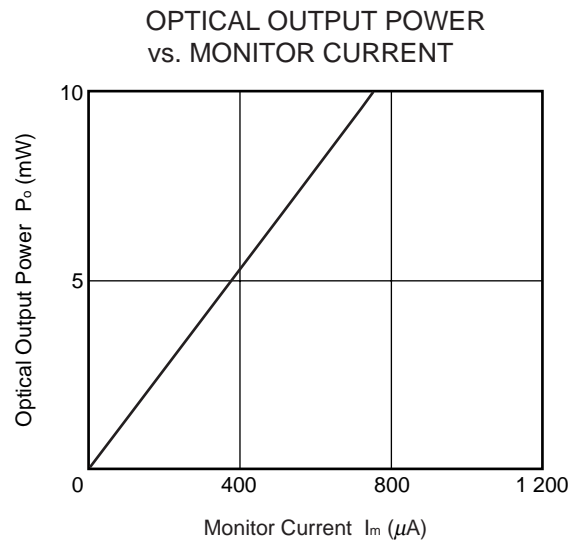
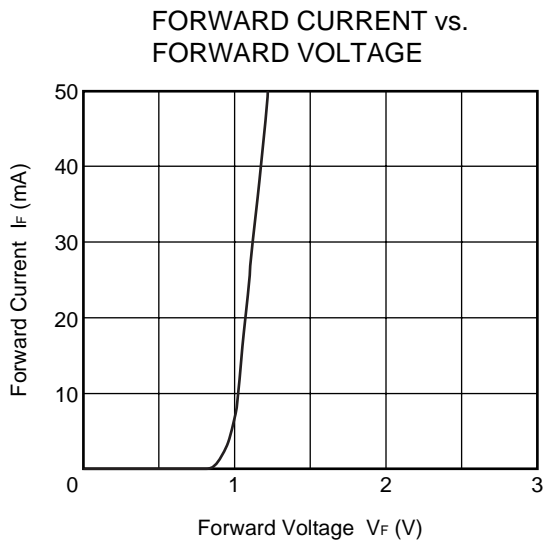
| Parameter                       | Symbol      | Conditions  | MIN.  | TYP.  | MAX.  | Unit          |
|---------------------------------|-------------|---|-------|-------|-------|---------------|
| Operating Voltage               | $V_{op}$    | $P_o = 5.0 \text{ mW}$  |       | 1.1   | 1.5   | V             |
| 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 dB)   | 1 290 | 1 310 | 1 330 | nm            |
| Spectral Width                  | $\sigma$    | $P_o = 5.0 \text{ mW}$ , RMS (-20 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,<br>Optimized X, Y, $\theta$ . Z = $5.8 \pm 0.05 \text{ mm}$ . | 400   | 800   |       | $\mu\text{W}$ |

<R> **TYPICAL CHARACTERISTICS ( $T_c = -40$  to  $+85^\circ\text{C}$ , unless otherwise specified)**



**Remark** The graphs indicate nominal characteristics.

<R> **TYPICAL CHARACTERISTICS ( $T_c = 25^\circ\text{C}$ , unless otherwise specified)**



**Remark** The graphs indicate nominal characteristics.

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (\*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

| Restricted Substance per RoHS | Concentration Limit per RoHS (values are not yet fixed) | Concentration contained in CEL devices |     |
|-------------------------------|---|--|-----|
|                               |   | -A                                     | -AZ |
| Lead (Pb)                     | < 1000 PPM  | Not Detected                           | (*) |
| Mercury                       | < 1000 PPM  | Not Detected                           |     |
| Cadmium                       | < 100 PPM   | Not Detected                           |     |
| Hexavalent Chromium           | < 1000 PPM  | Not Detected                           |     |
| PBB                           | < 1000 PPM  | Not Detected                           |     |
| PBDE                          | < 1000 PPM  | Not Detected                           |     |

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

**Important Information and Disclaimer:** Information provided by CEL on its website or in other communications concerning the substance content of its products represents knowledge and belief as of the date that it is provided. CEL bases its knowledge and belief on information provided by third parties and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. CEL has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. CEL and CEL suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

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See CEL Terms and Conditions for additional clarification of warranties and liability.