DATA SHEET

NEC

LASER DIODE

# NX5321 Series

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

### DESCRIPTION

The NX5321 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 mW
- Low threshold current $I_{th}$ = 7 mA
- Differential efficiency $\eta_d$ = 0.3 W/A
- Wide operating temperature range $T_C$ = –40 to +85°C
- InGaAs monitor PIN-PD
- CAN package $\phi$5.6 mm
- Fiber coupling point 5.8 mm



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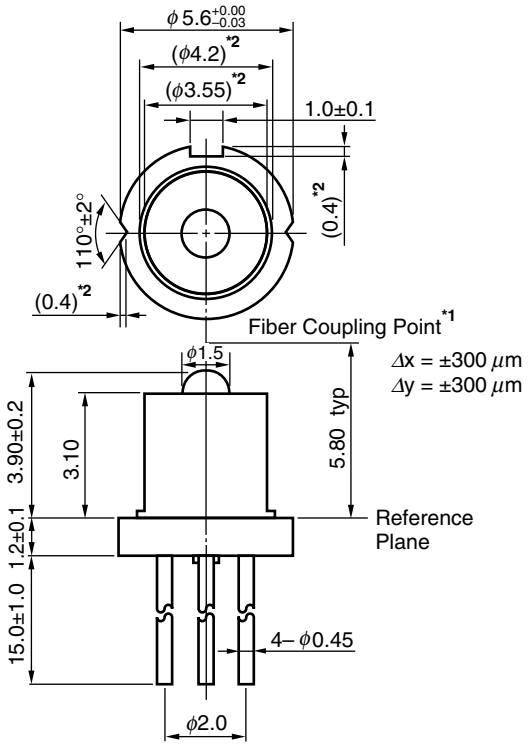
The mark <R> shows major revised points.



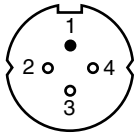


The revised points can be easily searched by copying an "<R>" in the PDF file and specifying it in the "Find what:" field.

**PACKAGE DIMENSIONS (UNIT: mm)**

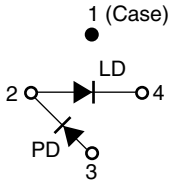



**BOTTOM VIEW**

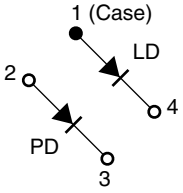



**PIN CONNECTIONS**

**NX5321EH**



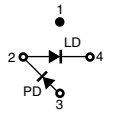
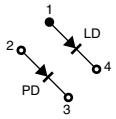

**NX5321EK**




***1** Recommendation of Fiber Coupling Conditions
Fiber : SMF with 8 degree angle-polished ferrule
Fiber coupling distance : 5.80±0.05 mm from reference plane.
Fiber coupling alignment : optimixed x, y, $\theta$ ($\Delta$x, $\Delta$y ≤ ±300 $\mu$m).

***2** ( ) indicates nominal dimension.

## ORDERING INFORMATION

| Part Number | Package | Pin Connections |
|---|---|---|
| NX5321EH | 4-pin CAN with ball lens cap |   |
| NX5321EK | |   |

**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 | $P_o$ | 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 |
| <R> Reverse Voltage of PD | $V_R$ | 15 | V |
| Operating Case Temperature | $T_C$ | –40 to +85 | °C |
| Storage Temperature | $T_{stg}$ | –40 to +85 | °C |
| Lead Soldering Temperature | $T_{sld}$ | 350 (3 sec.) | °C |
| Relative Humidity (noncondensing) | RH | 85 | % |

## ELECTRO-OPTICAL CHARACTERISTICS ($T_C$ = 25°C, unless otherwise specified)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| Operating Voltage | $V_{op}$ | $P_o$ = 5.0 mW | | 1.1 | 1.5 | V |
| Operating Current | $I_{op}$ | $P_o$ = 5.0 mW | 10 | 20 | 35 | mA |
| Threshold Current | $I_{th}$ | | 3 | 7 | 15 | mA |
| Differential Efficiency | $\eta_d$ | | 0.2 | 0.3 | 0.7 | W/A |
| Center Wavelength | $\lambda_C$ | $P_o$ = 5.0 mW, RMS (–20 dB) | 1 290 | 1 310 | 1 330 | nm |
| Spectral Width | $\sigma$ | $P_o$ = 5.0 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 | $\theta_{//}$ | $P_o$ = 5.0 mW | | 11 | | deg. |
| Vertical Beam Angle | $\theta_{\perp}$ | $P_o$ = 5.0 mW | | 11 | | deg. |
| Monitor Current | $I_m$ | $V_R$ = 1.5 V, $P_o$ = 5.0 mW | 100 | 500 | 900 | $\mu$A |
| Monitor Dark Current | $I_D$ | $V_R$ = 10 V | | | 100 | nA |
| Monitor PD Terminal Capacitance | $C_t$ | $V_R$ = 10 V, f = 1 MHz | | | 20 | pF |
| Focal Distance | $D_f$ | $P_o$ = 5.0 mW | 5.0 | 5.8 | 6.2 | mm |
| Optical Output Power from Fiber | $P_f$ | $P_o$ = 5.0 mW, 8 degree angled fiber, Optimized x, y, $\theta$. z = 5.80±0.05 mm | 400 | 800 | | $\mu$W |

## REFERENCE

| Document Name | Document No. |
|---|---|
| Opto-Electronics Devices Pamphlet | PX10160E |

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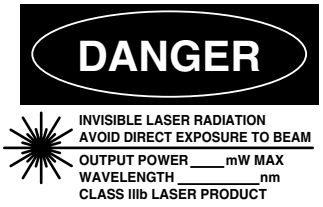
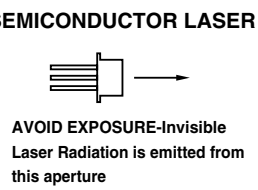
## SAFETY INFORMATION ON THIS PRODUCT




| | |
|---|---|
| **Warning** Laser Beam | A laser beam is emitted from this diode during operation.<br>The laser beam, visible or invisible, directly or indirectly, may cause injury to the eye or loss of eyesight.<br>• Do not look directly into the laser beam.<br>• Avoid exposure to the laser beam, any reflected or collimated beam. |
| **Caution** GaAs Products | This product uses gallium arsenide (GaAs).<br>GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.<br>• 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.<br>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.<br>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.<br>• Do not burn, destroy, cut, crush, or chemically dissolve the product.<br>• Do not lick the product or in any way allow it to enter the mouth. |