

**1 310 nm FOR 2.5 Gb/s
 InGaAsP MQW-DFB LASER DIODE**

DESCRIPTION

The NX6307 Series is a 1 310 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode with InGaAs monitor PIN-PD. This device is ideal for Synchronous Digital Hierarchy (SDH) system, short haul and long haul STM-16, ITU-T recommendations.

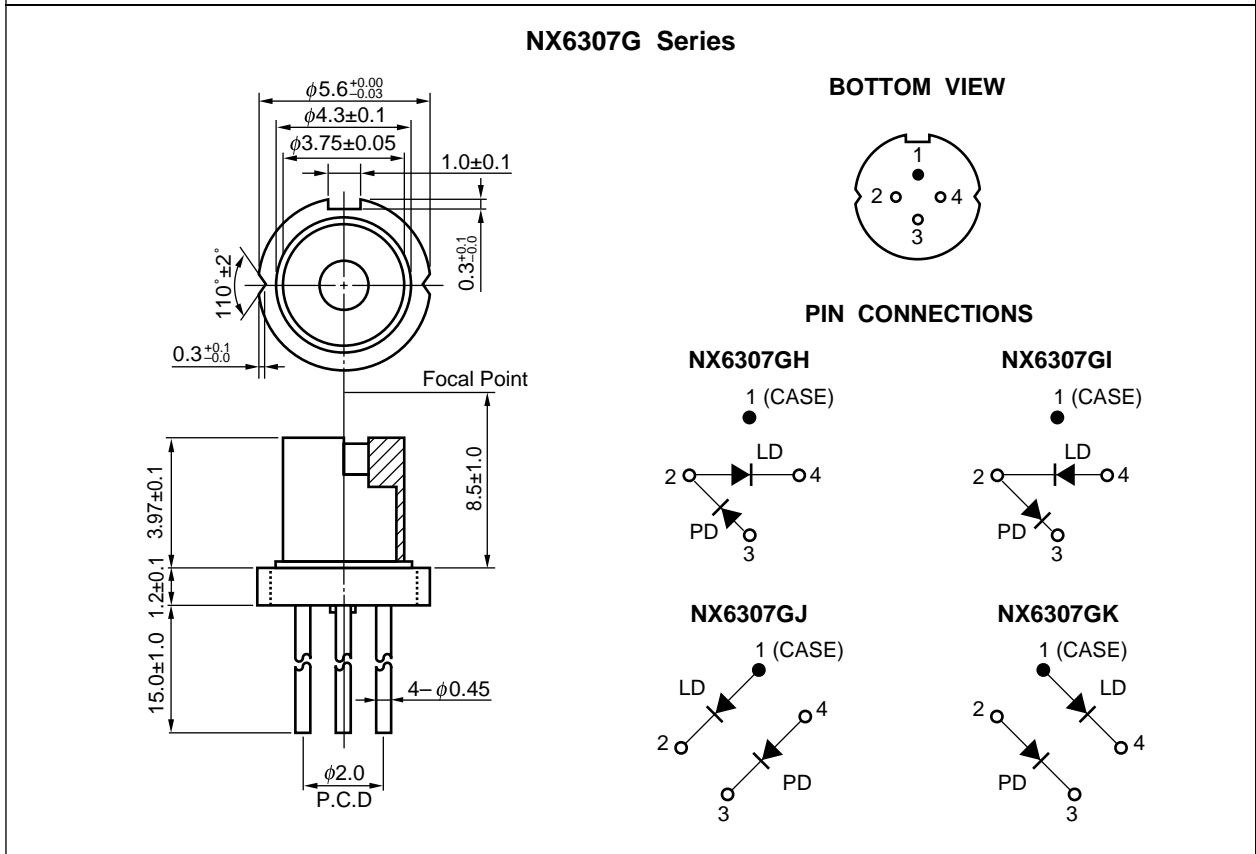
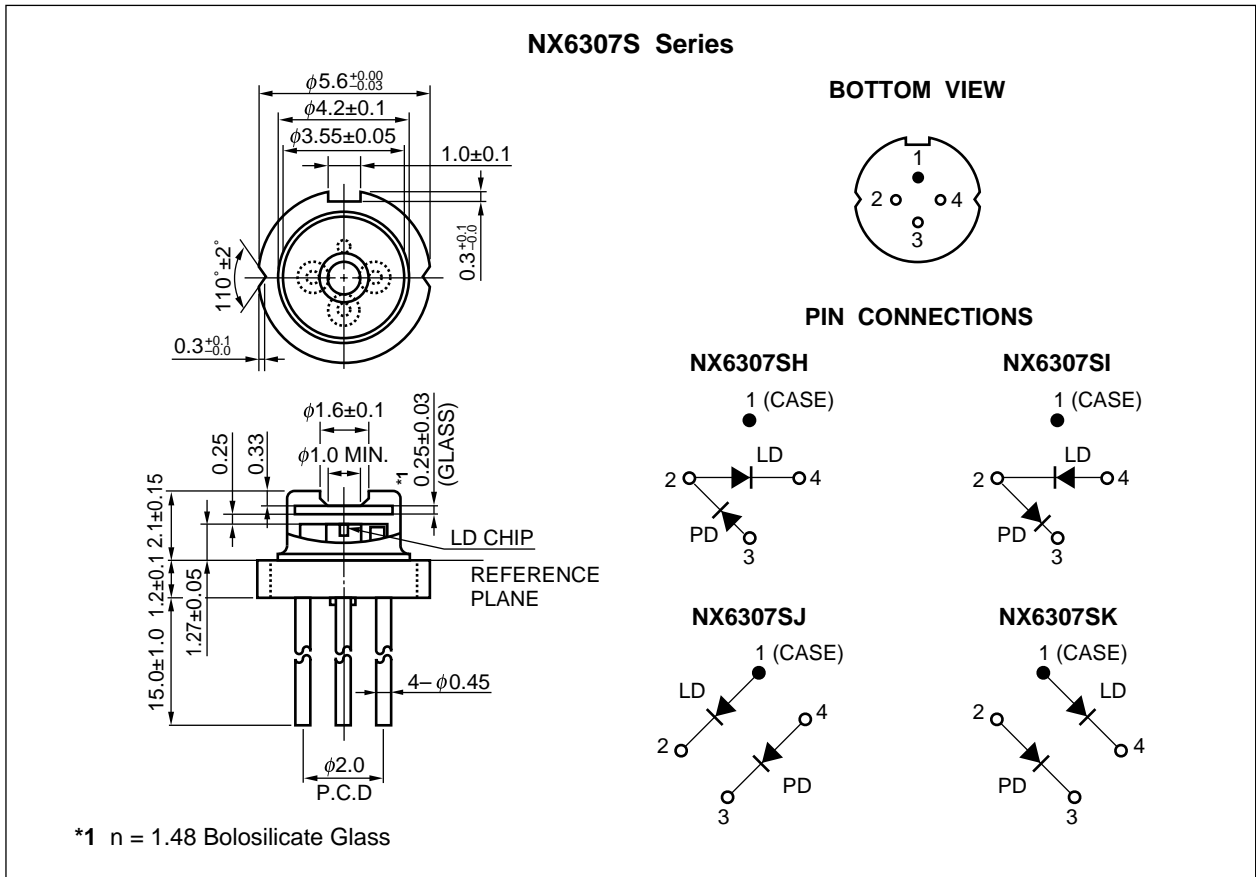
FEATURES

- | | |
|------------------------------------|--|
| • Optical output power | $P_o = 7.0 \text{ mW}$ |
| • Low threshold current | $I_{th} = 10 \text{ mA @ } T_c = 25^\circ\text{C}$ |
| • High speed | $t_r, t_f = 0.2 \text{ ns MAX.}$ |
| • SMSR | 45 dB @ TYP. |
| • Wide operating temperature range | $T_c = -20 \text{ to } +85^\circ\text{C}$ |
| • InGaAs monitor PIN-PD | |
| • CAN package | $\phi 5.6 \text{ mm}$ |
| • Based on Telcordia reliability | |



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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

NX6307S Series

| Part Number | Package | Pin Connections |
|-------------|-------------------------------|-----------------|
| NX6307SH | 4-pin CAN with flat glass cap | |
| NX6307SI | | |
| NX6307SJ | | |
| NX6307SK | | |

NX6307G Series

| Part Number | Package | Pin Connections |
|-------------|------------------------------------|-----------------|
| NX6307GH | 4-pin CAN with aspherical lens cap | |
| NX6307GI | | |
| NX6307GJ | | |
| NX6307GK | | |

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|-----------------------------------|-------------------|--------------|------|
| Optical Output Power | P _o | 20 | 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 | -20 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 | % |

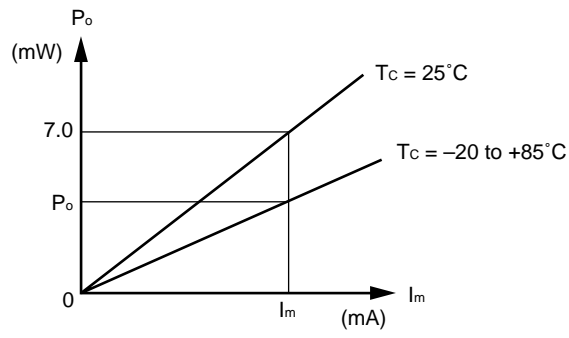
ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, unless otherwise specified)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|------------------|---|-------|------|-------|------|
| Operating Voltage | V _{op} | P _o = 7.0 mW, T _C = -20 to +85°C | | 1.1 | 1.6 | V |
| Threshold Current | I _{th} | | | 10 | 20 | mA |
| | | T _C = 85°C | | 30 | 40 | |
| Threshold Output Power | P _{th} | T _C = -20 to +85°C, I _F = I _{th} | | 100 | 200 | μW |
| Optical Output Power | P _o | I _F = I _{th} + 20 mA | 4 | 7 | | mW |
| Differential Efficiency | η _d | | 0.2 | 0.35 | | W/A |
| Temperature Dependence of Differential Efficiency | Δη _d | $\Delta\eta_d = 10 \log \frac{\eta_d (@ 85^\circ\text{C})}{\eta_d (@ 25^\circ\text{C})}$ | -3.0 | -2.5 | | dB |
| Modulation Current | I _{mod} | T _C = 85°C | | | 50 | mA |
| Peak Emission Wavelength | λ _p | P _o = 7.0 mW, RMS (-20 dB), T _C = -20 to +85°C | 1 280 | | 1 335 | nm |
| Side Mode Suppression Ratio | SMSR | P _o = 7.0 mW, RMS (-20 dB), T _C = -20 to +85°C | 30 | 45 | | dB |
| Vertical Beam Angle ^{*1} | θ _v | P _o = 7.0 mW, FAHM ^{*2} | | 35 | 40 | deg. |
| Lateral Beam Angle ^{*1} | θ _l | P _o = 7.0 mW, FAHM ^{*2} | | 30 | 35 | deg. |
| Rise Time | t _r | 10-90% | | | 0.2 | ns |
| Fall Time | t _f | 90-10% | | | 0.2 | ns |
| Monitor Current | I _m | V _R = 5 V, I _F = I _{th} + 20 mA | 280 | 840 | 1 400 | μA |
| Monitor Dark Current | I _d | V _R = 5 V | | 0.1 | 10 | nA |
| | | V _R = 5 V, T _C = -20 to +85°C | | | 500 | |
| Monitor PD Terminal Capacitance | C _t | V _R = 5 V, f = 1 MHz | | 6.0 | 20 | pF |
| Tracking Error ^{*3} | γ | I _m = const. (@ P _o = 7.0 mW, T _C = 25°C) T _C = -20 to +85°C | -1.0 | | 1.0 | dB |

*1 Applicable to only NX6307S Series

*2 FAHM: Full Angle at Half Maximum

*3 Tracking Error: γ



$$\gamma = \left| 10 \log \frac{P_o}{7.0} \right| \text{ [dB]}$$

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| Part Number | Absolute Maximum Ratings | | Electro-Optical Characteristics | | | | Application | Package |
|---------------|--------------------------|-----------------------|---------------------------------|---------------------|--------|-------|-------------------------------------|---------|
| | | | @T _c = 25°C | @T _c | | | | |
| | T _c (°C) | T _{stg} (°C) | I _{th} (mA) | P _o (mW) | λ (nm) | | | |
| | | | TYP. | TYP. | MIN. | MAX. | | |
| NX5302 Series | -40 to +85 | -40 to +85 | 10 | 5 | 1 263 | 1 360 | 156 Mb/s: STM-1 (I-1, S-1.1, L-1.1) | CAN |
| | | | | | | | 622 Mb/s: STM-4 (I-4, S-4.1) | |
| NX5306 Series | -40 to +85 | -40 to +85 | 10 | 5 | 1 263 | 1 360 | 156 Mb/s: STM-1 (I-1, S-1.1, L-1.1) | CAN |
| | | | | | | | 622 Mb/s: STM-4 (I-4, S-4.1) | |
| NX5307 Series | -40 to +85 | -40 to +85 | 10 | 10 | 1 266 | 1 360 | 2.5 Gb/s: STM-16 | CAN |
| NX6301 Series | -40 to +85 | -40 to +85 | 13 | 5 | 1 280 | 1 335 | 156 Mb/s: STM-1 | CAN |
| | | | | | | | 622 Mb/s: STM-4 | |
| NX6306 Series | -40 to +85 | -40 to +85 | 10 | 5 | 1 280 | 1 335 | 156 Mb/s: STM-1 (I-1, S-1.1, L-1.1) | CAN |
| | | | | | | | 622 Mb/s: STM-4 (I-4, S-4.1, L-4.1) | |
| NX6307 Series | -20 to +85 | -40 to +85 | 10 | 7 | 1 280 | 1 335 | 2.5 Gb/s: STM-16 (S-16.1, L-16.1) | CAN |
| NX6504 Series | -10 to +85 | -40 to +85 | 12 | 5 | 1 530 | 1 570 | 156 Mb/s: STM-1 | CAN |
| | | | | | | | 622 Mb/s: STM-4 | |

REFERENCE

| Document Name | Document No. |
|---|--------------|
| OPTICAL SEMICONDUCTOR DEVICES FOR FIBEROPTIC COMMUNICATIONS SELECTION GUIDE | PX10161E |
| Opto-Electronics Devices Pamphlet | PX10160E |
| NEC semiconductor device reliability/quality control system ^{*1} | C11159E |
| Quality grades on NEC semiconductor devices ^{*1} | C11531E |
| SEMICONDUCTOR SELECTION GUIDE –Products and Packages– ^{*1} | X13769E |

*1 Published by NEC Corporation

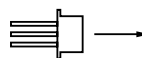
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SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



AVOID EXPOSURE-Invisible Laser Radiation is emitted from this aperture

| | |
|-------------------------------------|---|
| <p>Warning 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"> • Do not look directly into the laser beam. • Avoid exposure to the laser beam, any reflected or collimated beam. |
| <p>Caution GaAs Products</p> | <p>The product contains gallium arsenide, GaAs. GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> • Do not destroy or burn the product. • Do not cut or cleave off any part of the product. • Do not crush or chemically dissolve the product. • Do not put the product in the mouth. <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p> |

► **Business issue**

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► **Technical issue**

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