

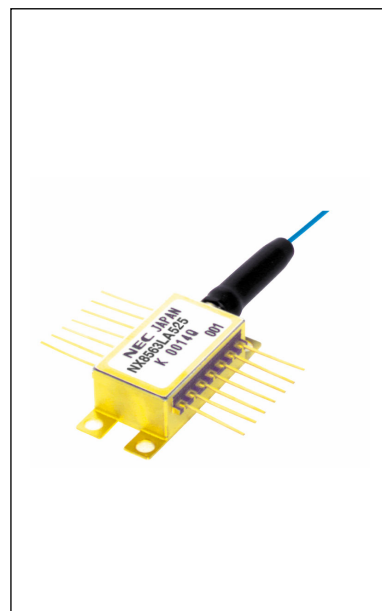
**1 550 nm InGaAsP MQW-DFB LASER DIODE MODULE
2.5 Gb/s DIRECTLY MODULATION LIGHT SOURCE FOR DWDM APPLICATIONS****DESCRIPTION**

The NX8563LA Series is a 1 550 nm Multiple Quantum Well (MQW) structured Distributed Feed-Back (DFB) laser diode module with Single Mode Fiber.

It is designed as directly modulation light source and ideal for optical transmission systems. The device is available for Dense Wavelength Division Multiplexing (DWDM) wavelengths based on ITU-T recommendations, enabling a wide range of applications.

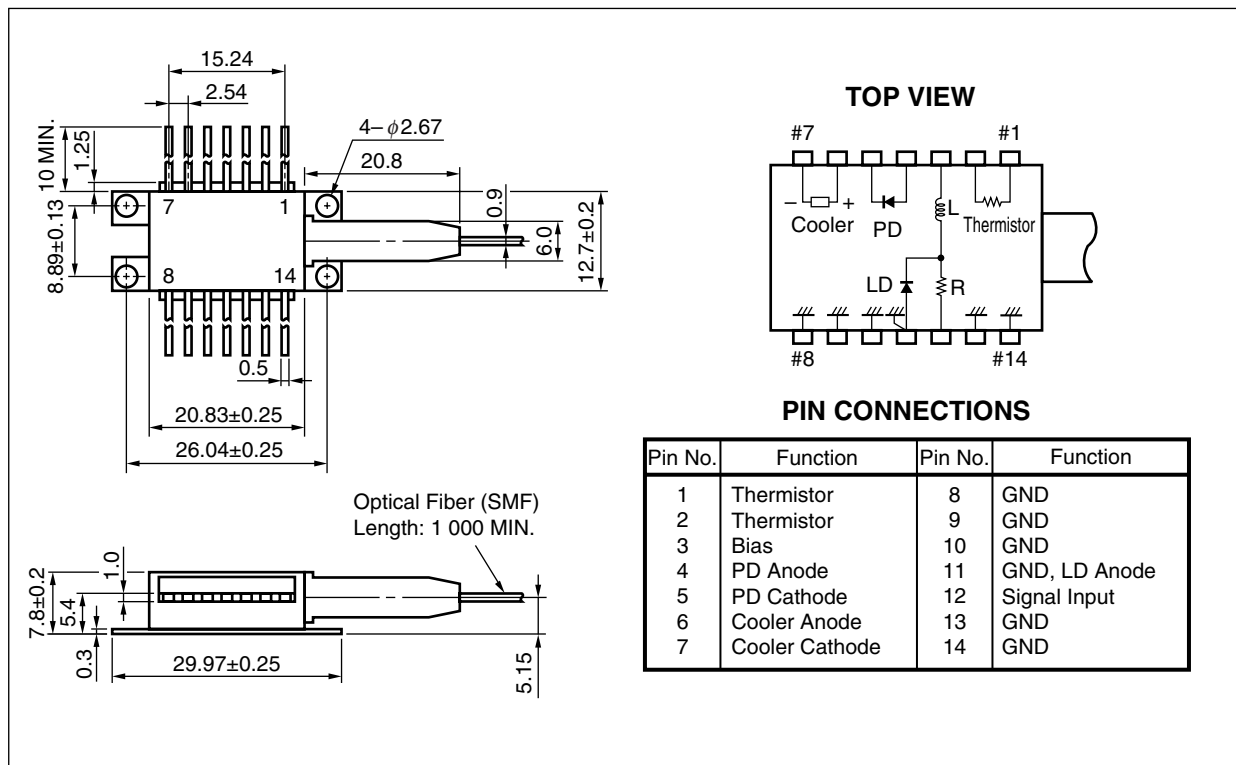
FEATURES

- Peak output power $P_r = 10 \text{ mW MIN.}$
- Available for DWDM wavelengths based on ITU-T recommendations (100 GHz grid, please refer to the **ORDERING INFORMATION**)
- Internal thermo-electric cooler and isolator
- Hermetically sealed 14-pin butterfly package
- Single mode fiber pigtail
- Wide operation temperature range



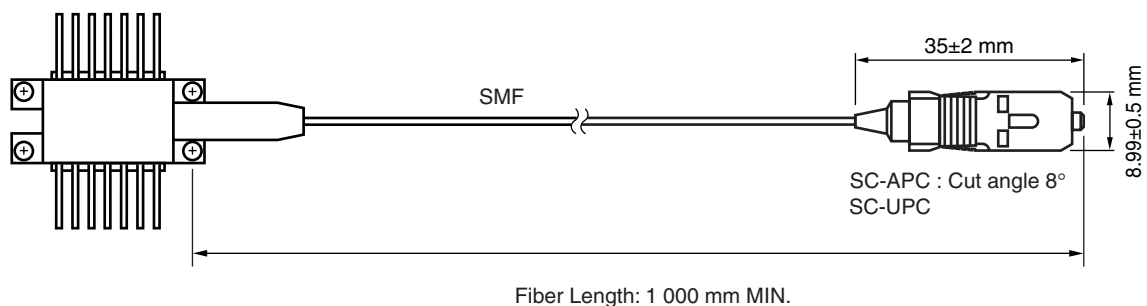
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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

★ PACKAGE DIMENSIONS (UNIT: mm)



OPTICAL FIBER DIMENSIONS (UNIT: mm)

| Parameter | Specification | Unit |
|------------------------------|---------------|------|
| Outer Diameter | 0.9±0.1 | mm |
| Minimum Fiber Bending Radius | 30 | mm |
| Fiber Length | 1 000 MIN. | mm |



ORDERING INFORMATION

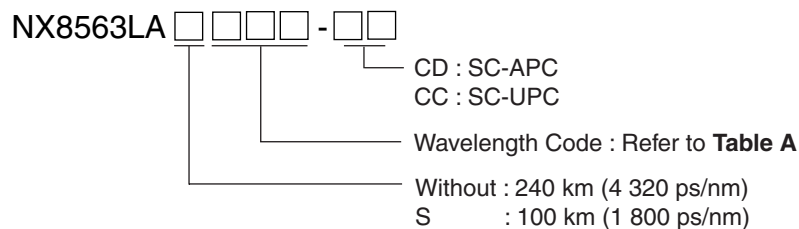


Table A: DWDM wavelength based on ITU-T recommendations (@T_{LD} = T_{set})

| Wavelength Code | ITU-T Wavelength ^{*1} (nm) | Frequency (THz) | Wavelength Code | ITU-T Wavelength ^{*1} (nm) | Frequency (THz) |
|-----------------|--|--------------------|-----------------|--|--------------------|
| 303 | 1 530.33 | 195.90 | 509 | 1 550.91 | 193.30 |
| 311 | 1 531.11 | 195.80 | 517 | 1 551.72 | 193.20 |
| 318 | 1 531.89 | 195.70 | 525 | 1 552.52 | 193.10 |
| 326 | 1 532.68 | 195.60 | 533 | 1 553.32 | 193.00 |
| 334 | 1 533.46 | 195.50 | 541 | 1 554.13 | 192.90 |
| 342 | 1 534.25 | 195.40 | 549 | 1 554.94 | 192.80 |
| 350 | 1 535.03 | 195.30 | 557 | 1 555.74 | 192.70 |
| 358 | 1 535.82 | 195.20 | 565 | 1 556.55 | 192.60 |
| 366 | 1 536.60 | 195.10 | 573 | 1 557.36 | 192.50 |
| 373 | 1 537.39 | 195.00 | 581 | 1 558.17 | 192.40 |
| 381 | 1 538.18 | 194.90 | 589 | 1 558.98 | 192.30 |
| 389 | 1 538.97 | 194.80 | 597 | 1 559.79 | 192.20 |
| 397 | 1 539.76 | 194.70 | 606 | 1 560.60 | 192.10 |
| 405 | 1 540.55 | 194.60 | 614 | 1 561.41 | 192.00 |
| 413 | 1 541.34 | 194.50 | | | |
| 421 | 1 542.14 | 194.40 | | | |
| 429 | 1 542.93 | 194.30 | | | |
| 437 | 1 543.73 | 194.20 | | | |
| 445 | 1 544.52 | 194.10 | | | |
| 453 | 1 545.32 | 194.00 | | | |
| 461 | 1 546.11 | 193.90 | | | |
| 469 | 1 546.91 | 193.80 | | | |
| 477 | 1 547.71 | 193.70 | | | |
| 485 | 1 548.51 | 193.60 | | | |
| 493 | 1 549.31 | 193.50 | | | |
| 501 | 1 550.11 | 193.40 | | | |

*1 The value which omitted and computed the 3rd place below the decimal point

ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Ratings | Unit |
|----------------------------|------------|---------------|------|
| Forward Current of LD | I_F | 300 | 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 |
| Lead Soldering Temperature | T_{slid} | 260 (10 sec.) | °C |

ELECTRO-OPTICAL CHARACTERISTICS ($T_{LD} = T_{set}$, $T_C = -20$ to $+85^{\circ}\text{C}$)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---------------------------------|---------------|---|-------|---------------------|-------|-------|
| Laser Set Temperature | T_{set} | | 30 | | 45 | °C |
| Forward Voltage | V_F | $P_f = 10$ mW | 0.9 | | 2.0 | V |
| Threshold Current | I_{th} | | | 20 | 40 | mA |
| Optical Output Power from Fiber | P_f | $I_F = I_{op}$, $T_{LD} = T_{set}$ | 10 | | | mW |
| Operation Current | I_{op} | | | | 125 | mA |
| Threshold Output Power | P_{th} | $I_F = I_{th}$ | | | 100 | μW |
| Quantum Efficiency | η | CW | 0.142 | 0.17 | | W/A |
| Peak Emission Wavelength | λ_p | $P_f = 10$ mW, CW, $T_{LD} = T_{set}$ | 1 530 | ITU-T ^{*1} | 1 562 | nm |
| Spectral Line Width | $\Delta\nu$ | $P_f = 10$ mW, CW, 3 dB down | | 1 | 5 | MHz |
| Side Mode Suppression Ratio | SMSR | $P_f = 10$ mW, under modulation | 30 | 35 | | dB |
| Input Impedance | ZIN | | | 25 | | Ω |
| Relative Intensity Noise | RIN | $P_f = 10$ mW, 20 MHz to 3 GHz | | | -140 | dB/Hz |
| Rise and Fall Time | t_r / t_f | 20-80%/80-20%, $T_C = 25^{\circ}\text{C}$ | | | 120 | ps |
| Input Return Loss | S_{11} | f = 50 MHz to 3 GHz | 6 | | | dB |
| | | f = 3 GHz to 6 GHz | 3 | | | |
| Band Width | BW | -3 dB, $P_f = 10$ mW | 2.5 | | | GHz |
| Dispersion Penalty | DP | $T_C = 25^{\circ}\text{C}^{*2}$ | | | 2.0 | dB |

*1 Available for DWDM wavelengths based on ITU-T recommendations
(100 GHz grid, please refer to the **ORDERING INFORMATION**)

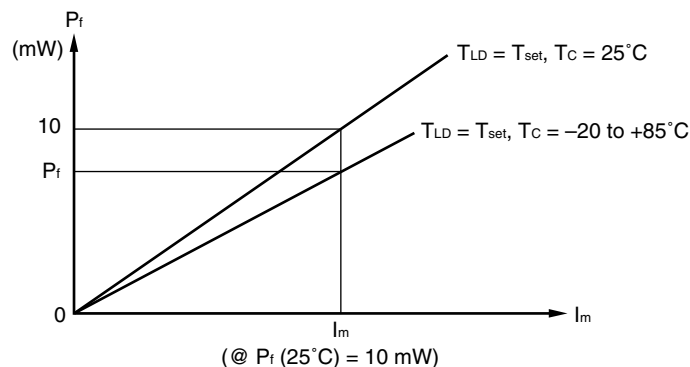
*2 2.48832 Gb/s, PRBS 2²³-1, duty cycle, Extinction Ratio ≥ 8.5 dB, BER = 10⁻¹⁰,
NX8563LAS: 1 800 ps/nm (100 km), NX8563LA: 4 320 ps/nm (240 km)

ELECTRO-OPTICAL CHARACTERISTICS

(Applicable to Monitor PD: $T_{LD} = T_{set}$, $T_C = -20$ to $+85^{\circ}\text{C}$)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------------|---------------|---|------|------|-------|---------------|
| Monitor Current | I_m | $P_f = 10 \text{ mW}$, $V_R = 5 \text{ V}$ | 100 | | 2 000 | μA |
| Dark Current | I_D | $V_R = 5 \text{ V}$ | | | 10 | nA |
| Tracking Error | γ^{*1} | $I_m = \text{const.}$ | | | 0.6 | dB |

$$*1 \quad \gamma = \left| 10 \log \frac{P_f}{10 \text{ mW}} \right|$$



ELECTRO-OPTICAL CHARACTERISTICS

(Applicable to Thermistor and TEC: $T_{LD} = T_{set}$, $T_C = -20$ to $+85^{\circ}\text{C}$)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|-----------------------|--------|---|-------|-------|-------|------------------|
| Thermistor Resistance | R | $T_{LD} = 25^{\circ}\text{C}$ | 9.5 | 10.0 | 10.5 | $\text{k}\Omega$ |
| B Constant | B | | 3 350 | 3 450 | 3 550 | K |
| Cooler Current | I_C | $\Delta T = 85 - T_{set}$, $P_f = 10 \text{ mW}$ | | | 1.2 | A |
| Cooler Voltage | V_C | $\Delta T = 85 - T_{set}$, $P_f = 10 \text{ mW}$ | | | 2.4 | V |

REFERENCE

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

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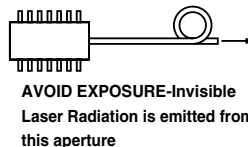
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M8E 00.4-0110

SAFETY INFORMATION ON THIS PRODUCT



SEMICONDUCTOR LASER



| | |
|------------------------------|--|
| Warning Laser Beam | <p>A laser beam is emitted from this diode during operation.</p> <p>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. |
| Caution GaAs Products | <p>This product uses gallium arsenide (GaAs).</p> <p>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"> • 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"> 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. 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. • Do not burn, destroy, cut, crush, or chemically dissolve the product. • Do not lick the product or in any way allow it to enter the mouth. |
| Caution Optical Fiber | <p>A glass-fiber is attached on the product. Handle with care.</p> <ul style="list-style-type: none"> • When the fiber is broken or damaged, handle carefully to avoid injury from the damaged part or fragments. |

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