



## Typical Electrical and Optical Characteristics (at 25°C (T<sub>chip</sub> and T<sub>case</sub>) and Begin of Life (BOL)):

| Parameter                             | Conditions                                                                              | Symbol              | Min  | Typ                 | Max  | Unit    |
|---------------------------------------|-----------------------------------------------------------------------------------------|---------------------|------|---------------------|------|---------|
| Operating power                       | c.w.                                                                                    | P <sub>op</sub>     |      | 200                 |      | mW      |
| Operating current                     | c.w.                                                                                    | I <sub>op</sub>     |      | 350                 | 400  | mA      |
| Pulsed operating peak power           | < 500ns / duty cycle <5%                                                                | P <sub>op</sub>     |      | 550                 |      | mW      |
| Pulsed operating peak current         | < 500ns / duty cycle <5%                                                                | I <sub>op</sub>     |      |                     | 750  | mA      |
| Rise and fall time                    |                                                                                         |                     | 1    |                     | 2    | nsec    |
| Threshold current                     |                                                                                         | I <sub>th</sub>     |      | 80                  |      | mA      |
| Forward voltage                       | at I <sub>op</sub>                                                                      | V <sub>op</sub>     |      | 1.9                 | 2.0  | V       |
| Peak wavelength λ <sub>peak</sub> (3) | at P <sub>op</sub> , without FBG                                                        | λ                   | 845  | 850                 | 855  | nm      |
| Spectral width (FWHM) (3)             | at P <sub>op</sub> , without FBG                                                        | Δλ                  | 0.05 | multiple peaks, 0.1 | <1   | nm      |
| Spectral width (FWHM) (4)             | at P <sub>op</sub> , with FBG only                                                      | Δλ                  | 0.05 | 0.08                | 0.5  | nm      |
| Optical power stability               | at I <sub>op</sub> , t = 60 sec                                                         | P <sub>op</sub> / t |      |                     | 0.5  | %       |
| Polarization extinction ratio (2)     | PM fiber version                                                                        |                     | 6    | 14                  |      | dB      |
| Spectral shift with internal temp.    | without FBG, internal T <sub>chip</sub>                                                 | Δ / T               |      | 0.25                |      | nm/ °C  |
| Spectral shift with temp.             | FBG Temp.                                                                               | Δ / T               |      | 0.005               | 0.01 | nm/ °C  |
| Spectral shift with current no FBG    | (c.w.)                                                                                  |                     |      | 5                   |      | nm/A    |
| Spectral shift with current no FBG    | (100ns / duty cycle 1%)                                                                 |                     |      | 1                   |      | nm/A    |
| Side mode suppression (3)             | at P <sub>op</sub> , with FBG                                                           |                     |      | 20                  |      | dB      |
| Monitor responsivity                  |                                                                                         | R                   | 1    | 5                   | 20   | μA / mW |
| Monitor dark current                  |                                                                                         |                     |      | 5                   | 40   | nA      |
| TEC current                           | chip 25°C, case 70°C                                                                    | I <sub>TEC</sub>    |      | 1.1                 |      | A       |
| TEC voltage                           | chip 25°C, case 70°C                                                                    | V <sub>TEC</sub>    |      | 1.9                 |      | V       |
| Thermistor resistance                 | T=25°C                                                                                  | R <sub>th</sub>     | 9.5  | 10                  | 10.5 | kOhm    |
| Thermistor B constant                 |                                                                                         | B                   | 3850 | 3950                | 4050 | K       |
| Steinhart-Hart-Equation coefficients  | C <sub>1</sub> = 1.1292E-03 / C <sub>2</sub> = 2.3411E-04 / C <sub>3</sub> = 8.7755E-08 |                     |      |                     |      |         |
| Large signal modulation bandwidth     |                                                                                         |                     |      | 200                 |      | MHz     |

### Fiber Specifications

Fiber type: single mode Hi780 fiber (PM780 on request)

Note:

- 1) Ensure sufficient protection against high energy back reflection pulses from solid state lasers. High energy back reflection damages the diode (for example stimulated Brillouin scattering). Typical damage threshold for 8ns pulsed @200KHz is 0.05μJ (this level is not covered under warranty).
- 2) Intensity noise of light from modules with PM fiber after polarizer increases with lower polarization extinction ratio (example 6 / 10/13 dB can result in intensity noise as high as 50/20/5 %). The intensity noise is sensitive to varying stress (by mechanical and temperature effects) introduced to the PM fiber.
- 3) Wavelength is measured in air. Without wavelength stabilisation by a fiber bragg grating (FBG) multiple peaks (side modes) around the average wavelength for a specific current in a range of (1-3) nm are observed. The full width half maximum (FWHM) of those peaks can suddenly narrow or broaden. Side mode suppression counts the first side peaks to the main peak. A peak is defined by significant lower values left and right to this peak.
- 4) With wavelength stabilisation by a fiber bragg grating (FBG) a single peak with accuracy of ±1nm of the center wavelength for a specific current is observed. The full width half maximum (FWHM) of this single peak is stable over time as long as it is not disturbed by further back reflection from the outgoing optical path.
- 5) Rise and fall depends on appropriate driver and can be lower than 1ns with the low inductive version.

## Absolute Maximum Ratings

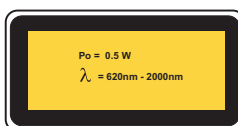
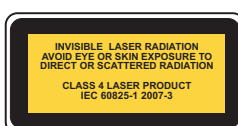
| Parameter                                | Symbol                | Min | Max | Unit |
|------------------------------------------|-----------------------|-----|-----|------|
| Storage temp.                            | T <sub>max</sub>      | -40 | 85  | °C   |
| Operating case temp.                     | T <sub>op, case</sub> | -20 | 70  | °C   |
| Operating chip temp.                     | T <sub>op, chip</sub> | 20  | 40  | °C   |
| Soldering temp. (max. 10sec)             |                       | 260 |     | °C   |
| LD forward current (c.w.)                | I <sub>op max</sub>   |     | 500 | mA   |
| LD forward current (Pulse 500ns 5% D.C.) |                       |     | 700 | mA   |
| LD reverse voltage                       | V <sub>R, max</sub>   |     | 2   | V    |
| Monitor forward current                  | I <sub>F, PD</sub>    |     | 5   | mA   |
| Monitor reverse voltage                  | V <sub>R, PD</sub>    |     | 20  | V    |
| TEC current                              | I <sub>TEC</sub>      |     | 2.5 | A    |
| TEC voltage                              | V <sub>TEC</sub>      |     | 3.2 | V    |
| ESD damage (1)                           |                       |     | 500 | V    |
| Fiber pigtail bend radius                |                       |     | 25  | mm   |
| Maximum transient (<3μs) forward current |                       |     | 0.8 | A    |

(1) A standard human body model (1.5kOhm, 1000pF) is used for ESD thresholds

### Note:

Absolute maximum rating for the laser diode operating current in cw mode may be applied for short period of time only (<10s). Exposure to maximum ratings for extended period of time or exposure above one or more max ratings may cause damage or affect the reliability of the device.

## User Safety



We manufacture diode lasers.