

DFB-1XXX-BF-XX-CW-Fx-Hx-N127

**Description**

The DFB-1XXX-BF-XX-CW-Fx-Hx-N127 series of Multi-Quantum Well (MQW) Distributed Feedback (DFB) lasers have been designed specifically to satisfy the requirements of the sensor application.

The devices feature high output power and wide operating temperature range.

Their 14-pin butterfly packages are either pin-compatible with standard SONET OC-48 devices or can be "floating" from the metal house.

Features

- Advanced Multiple Quantum Well (MQW) Distributed Feedback (DFB) Laser Design
- High-output power
- Industry-standard 14-pin Butterfly package
- Option of SMF-28 Fiber Pigtail or PM fiber

Applications

- Sensor development
- Methane Gas detection
- External modulation





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Absolute Maximum Ratings

| Parameter | Symbol | Condition | Min | Max | Unit |
|----------------------------|-----------|---|-----|-----|------|
| Operating Case Temperature | T_c | $I=I_{op}$ | -10 | 50 | °C |
| Storage Temperature | T_{stg} | -- | -40 | 85 | °C |
| Laser Forward Current | I_f | -- | -- | 120 | mA |
| Laser Reverse Bias | V_f | -- | -- | 2 | V |
| Photodiode Reverse Bias | V_{rpd} | -- | -- | 10 | V |
| TEC Current | I_{TEC} | -10 °C < T_c < 50 °C, $T_{op}=25$ °C, $I_f=100$ mA | -- | 1.5 | A |

Electrical and Optical Characteristics

Parameters are tested at 25 °C unless otherwise noted.

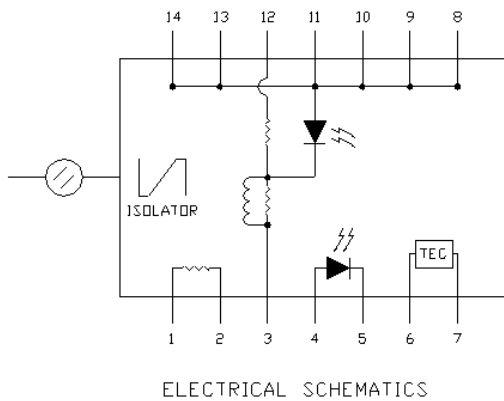
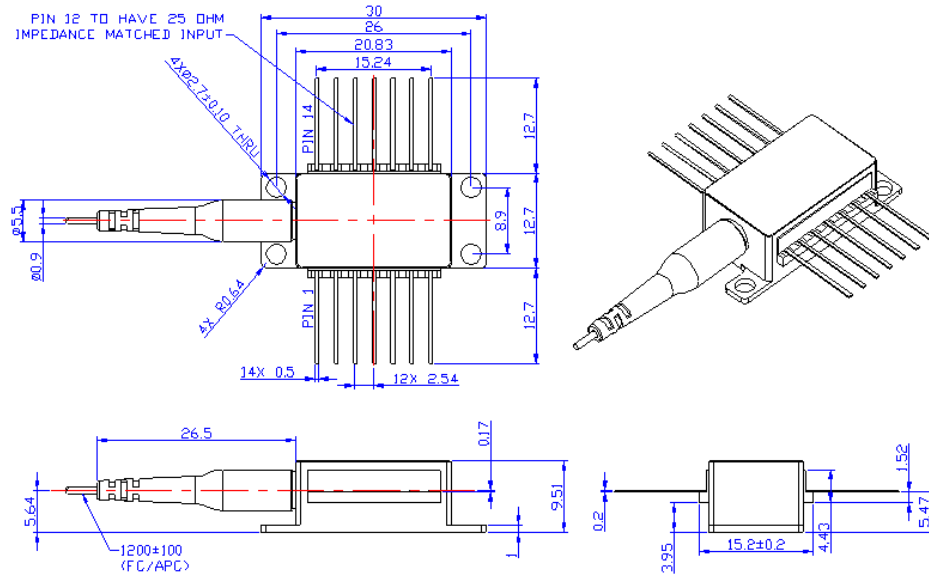
| Parameter | Symbol | Min | Typ | Max | Unit | Test Conditions |
|-----------------------------|-------------------|-----------------------|------|------|-------|---------------------------------------|
| Operating Case Temperature | T_c | -10 | -- | 50 | °C | |
| Laser Set temperature | T_L | 10 | 25 | 40 | °C | |
| Optical Output Power* | P_o | 6 | -- | -- | mW | CW, |
| Threshold Current | I_{th} | -- | -- | 50 | mA | $T_L=25$ °C |
| Forward Voltage | V_F | -- | -- | 2 | V | $P_o=P_L$ |
| Operating Current | I_{op} | -- | -- | 120 | mA | $P_o=P_L$, $T_L=25$ °C |
| Center Wavelength* | λ_c | Refer to order option | | | nm | $P_o=P_L$, CW, 10 °C ≤ T_L ≤ 40 °C |
| Center Wavelength Tolerance | $\Delta\lambda_c$ | -0.1 | -- | 0.1 | nm | $P_o=P_L$, CW, 10 °C ≤ T_L ≤ 40 °C |
| Spectral Linewidth | | -- | -- | 10 | MHz | $P_o=P_L$, $T_L=25$ °C |
| Side-mode Suppression Ratio | SMSR | 35 | -- | -- | dB | $P_o=P_L$ |
| Monitor Current | I_{mon} | 10 | -- | 150 | μA/mW | $V_{rpd}=5$ V |
| Monitor Dark Current | I_D | -- | -- | 200 | nA | $V_{rpd}=5$ V |
| Thermistor Resistance | R_t | 9.5 | -- | 10.5 | kΩ | $T=25$ °C |
| Thermistor B Constant | B | -- | 3900 | -- | K | $T=25$ °C |
| TEC Current | I_C | -- | -- | 1.5 | A | $\Delta T=40$ °C |
| TEC Voltage | V_C | -- | -- | 2.0 | V | $\Delta T=40$ °C |

* See Ordering Options and contact AOI marketing for availability.

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Outline Diagram

Dimensions are in millimeters

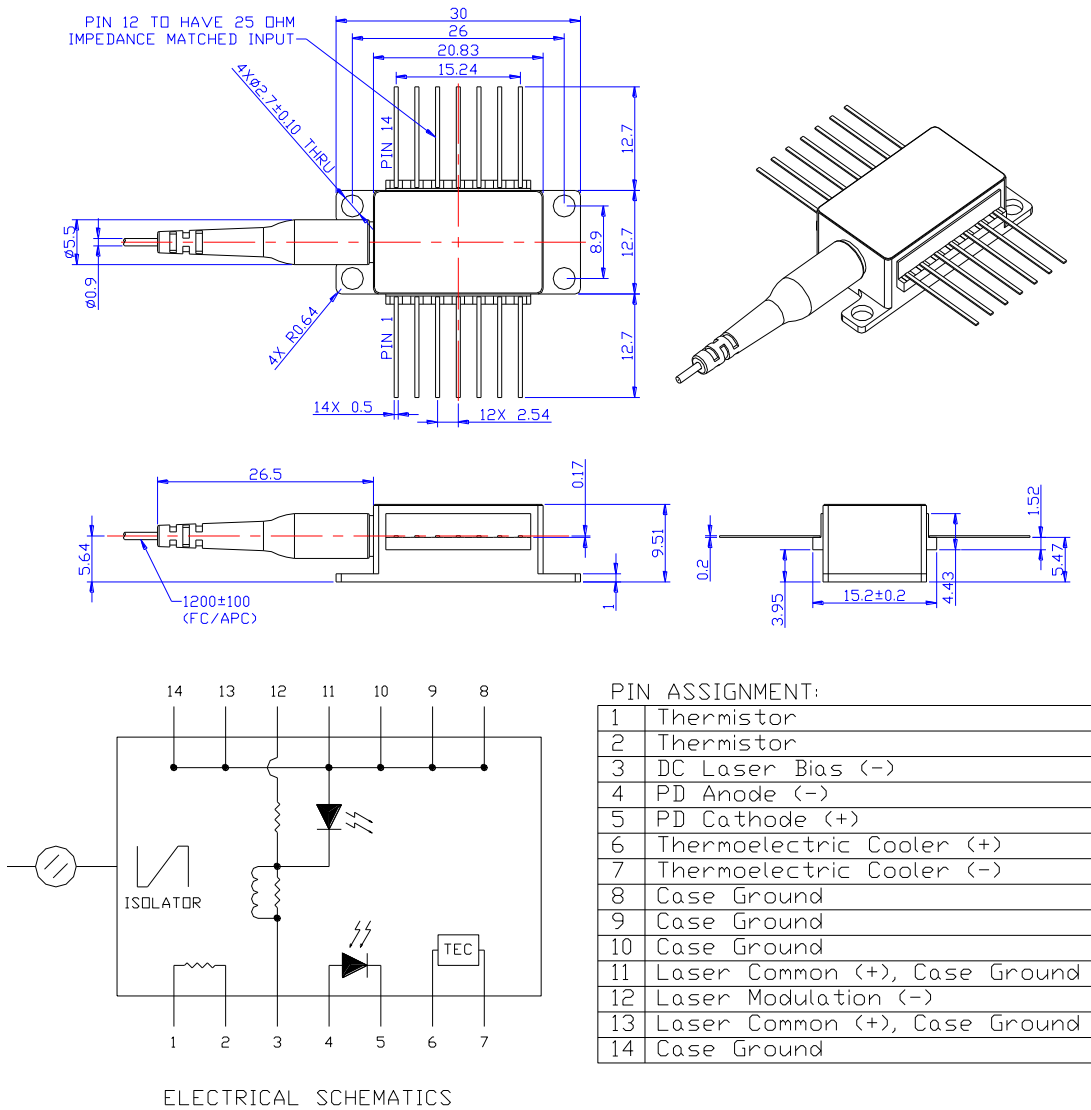


PIN ASSIGNMENT:

| | |
|----|---------------------------|
| 1 | Thermistor |
| 2 | Thermistor |
| 3 | DC Laser Bias (-) |
| 4 | PD Anode (-) |
| 5 | PD Cathode (+) |
| 6 | Thermoelectric Cooler (+) |
| 7 | Thermoelectric Cooler (-) |
| 8 | Laser Common (+) |
| 9 | Laser Common (+) |
| 10 | Laser Common (+) |
| 11 | Laser Common (+) |
| 12 | Laser Modulation (-) |
| 13 | Laser Common (+) |
| 14 | Laser Common (+) |

For ordering option –H1 (Floating LD design)

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For ordering option -H2 (Negative Bias Design, Case GRD connected to LD Anode)



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Ordering Options

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BF House Option :
 H1 = Floating LD design
 H2 = Negative Bias Design

Fiber Pigtail Option

| Option | Fiber | Length (mm) | Connector | Notes |
|--------|-------|-------------|-----------|-------|
| F1 | PM | 1200+100 | FC/APC | |
| F2 | SMF | 1200+100 | FC/APC | |

Output Power Option

| Option | Output Power (mW) | Notes |
|--------|-------------------|-------|
| 06 | 6 | |
| 08 | 8 | |
| 10 | 10 | |
| 15 | 15 | |
| 20 | 20 | |
| 25 | 25 | |

Wavelength Option

| Option | Center Wavelength (nm) | Max Output Power (mW) | Notes |
|--------|------------------------|-----------------------|----------------------|
| 1653 | 1653.7 | 12 | CH ₄ |
| 1651 | 1651.0 | 8 | CH ₄ |
| 1631 | 1631.46 | 8 | |
| 1630 | 1630.98 | 8 | |
| 1625 | 1625.0 | 10 | |
| 1623 | 1623.5 | 8 | |
| 1578 | 1578.0 | 10 | CO ₂ |
| 1531 | 1531.7 | 20 | NH ₃ |
| 1512 | 1512.0 | 20 | NH ₃ |
| 1392 | 1392.0 | 20 | H ₂ O |
| 1312 | 1312.0 | 30 | HF |
| 1580 | 1580.0 | 10 | H ₂ S, CO |
| 1590 | 1590.0 | 10 | H ₂ S |

Note 1: Please check with AOI marketing for the availability of the wavelength before order.
 Note 2: Other wavelength may be possible for a different absorption line, Please check with AOI market department for the availability.

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Safety Information

All versions of this laser are Class 1M laser products per IEC¹/EN² 60825-1:2001-08. Users should observe safety precautions such as those recommended by ANSI³ Z136.1-2000, ANSI Z36.2-1997 and IEC 60825-1:2001-08.

Notes about Laser Safety Class:

The Food and Drug Administration's Center for Devices and Radiological Health (FDA/CDRH) in the USA has decided to harmonize their requirements with 21 CFR 1040.10 and 1040.11 with the IEC/EN 60825-1 and IEC/EN 60601-2-22 standards. This process has not yet happened and in the interim, the CDRH agency has released '[Laser Notice No.50](#)' to reduce the regulatory burden. This notice allows IEC/EN classification and labeling of lasers within the USA.

IEC¹/EN² 60825-1 Laser Class

Class 1M: laser is safe for all conditions of use except when passed through magnifying optics such as microscopes and telescopes. Class 1M lasers produce large-diameter beams, or beams that are divergent. The MPE for a Class 1M laser cannot normally be exceeded unless focusing or imaging optics are used to narrow the beam. If the beam is refocused, the hazard of Class 1M lasers may be increased and the product class may be changed. A laser can be classified as Class 1M if the total output power is below (IEC/EN) class 3B but the power that can pass through the pupil of the eye is within Class 1.

FDA Laser Class

Class IIIB: moderate power lasers (cw: 5-500 mW, pulsed: 10 J/cm² or the diffuse reflection limit, whichever is lower). In general Class IIIB lasers will not be a fire hazard, nor are they generally capable of producing a hazardous diffuse reflection. Specific controls are recommended.

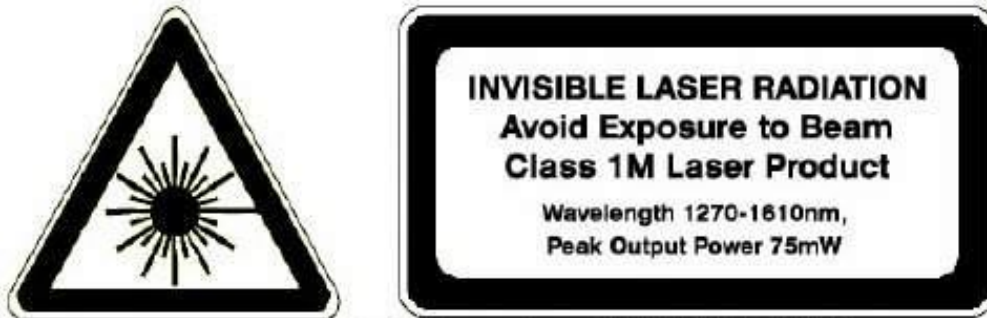
This product does not conform to 21 CFR 1040.10 and 1040.11. Consequently, this laser module is only intended for use as a component by manufacturers of electronic products and equipment.

Wavelength = 1270 – 1610 nm
 Maximum Power = 75mW
 Single-mode fiber pigtail
 Fiber Numerical Aperture = 0.14

Labeling is not affixed to the laser module due to size constraints; rather, labeling is placed on the outside of the shipping box.

This product is not shipped with a power supply.

Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



classified in accordance with IEC 60825-1: 2001-08

(1) IEC is a registered trademark of the International Electrotechnical Commission

(2) Within Europe the IEC standard has been adopted as a European Normative standard known as EN 60825, and each European country will have its own version of this standard, for example, the British Standards version known as BS EN 60825. There can be small differences between the different countries versions of EN 60825, and these are in part caused by the process of translating the standard into the native language of that country.

(3) ANSI is a registered trademark of the American National Standards Institute.