

**DFB-XXX-BF-XX-EC-Fx-Hx-N126 Laser Module****Description**

The DFB-XXX-BF-XX-EC-Fx-Hx-N126 laser modules are designed for fiber optic sensor applications. The narrow linewidth and the option of using polarization maintaining optical fiber made it specially suitable for high sensitivity optical sensor development. The devices feature standard pin assignments (compatible with OC-48).

**Features**

- Standard OC-48 pin compatibility
- Narrow spectral linewidth
- Low noise
- Meets GR 468 reliability specifications

**Applications**

- Fiber optic sensor
- Test and measurement light source
- LIDAR



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**Absolute Maximum Ratings**

Parameter	Symbol	Condition	Min	Max	Unit
Operating Case Temperature	$T_c$	$I=I_{op}$	0	50	°C
Storage Temperature	$T_{stg}$	--	-40	85	°C
Laser Forward Current	$I_f$	--	--	360	mA
Laser Reverse Bias	$V_r$	--	--	2	V
TEC Current	$I_{TEC}$	$0^\circ\text{C} < T_c < 50^\circ\text{C}$ , $T_{op}=25^\circ\text{C}$ , $I_f=100\text{ mA}$	--	1.5	A

**Electrical and Optical Characteristics**

Parameters are over operating temperature range unless otherwise noted.

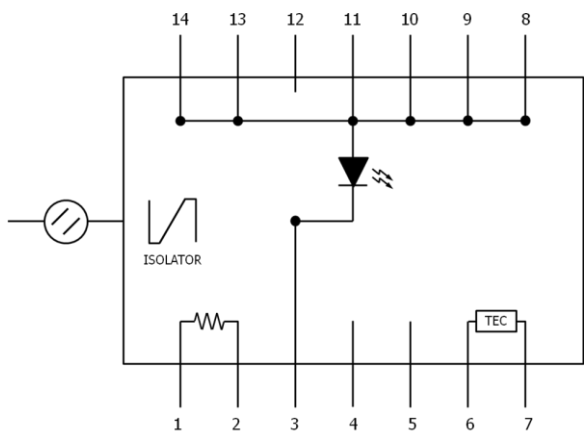
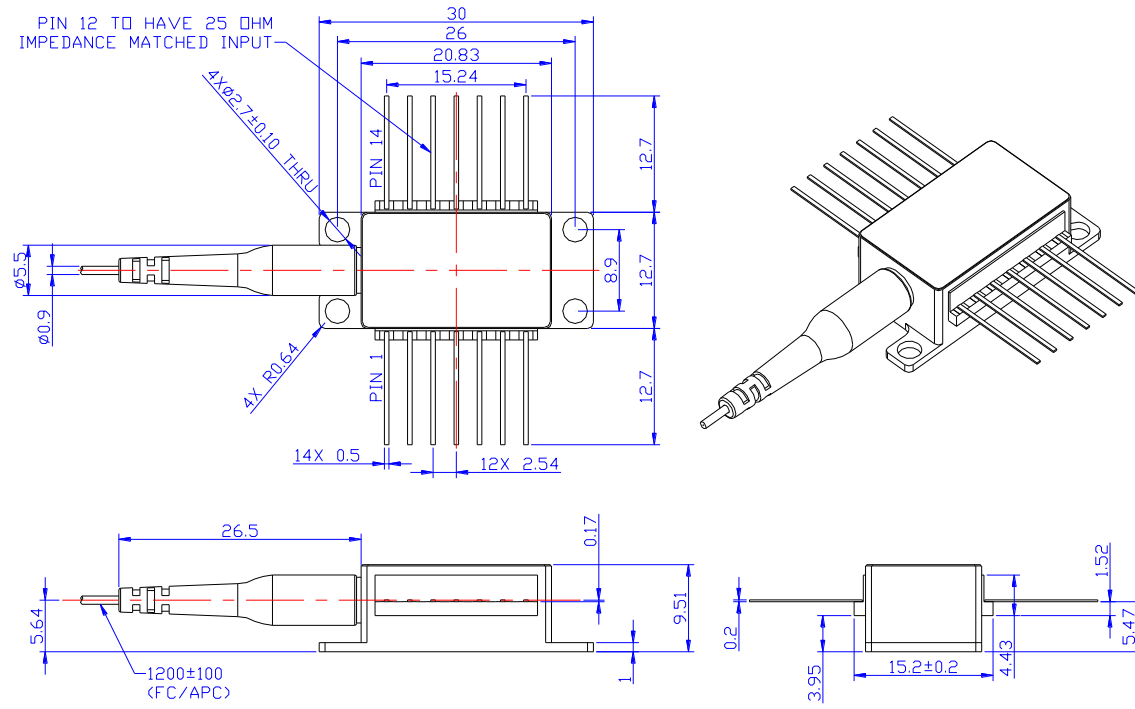
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Operating Case Temperature	T	0	--	50	°C	
Laser Set temperature	$T_L$	15	--	35	°C	
Center Wavelength*	$\lambda_c$	Refer to ordering option			nm	$P_L = P_o$ , CW, $T_{set} = 15^\circ\text{C} - 35^\circ\text{C}$
Center Wavelength Tolerance	$\Delta\lambda_c$	-0.1	--	0.1	nm	$P_L = P_o$ , CW, $T_{set} = 15^\circ\text{C} - 35^\circ\text{C}$
Optical Output Power	$P_o$	Refer to ordering option			mW	CW, $T_L = T_{set}$
Threshold Current	$I_{th}$	--	--	50	mA	$T_L = 25^\circ\text{C}$
Operating Current	$I_{op}$	--	--	200	mA	$P_L = P_o$
Optical Isolation	$I_s$	30	--	--	dB	$T = 25^\circ\text{C}$
Side-Mode Suppression Ratio	SMSR	45	--	--	dB	$P_L = P_o$
Spectral Linewidth	$\Delta\lambda$	--	--	60	kHz	Measured with self-heterodyne setup
Polarization Extinction Ratio	PER	20	--	--	dB	With PANDA PM fiber, Slow-axis align with E-field
Relative Intensity Noise	RIN	--	--	-145	dB/Hz	CW, $P_L = P_o$
Forward Voltage	$V_F$	--	1.2	2.0	V	$P_L = P_o$
Thermistor Resistance	$R_t$	9.5	--	10.5	K $\Omega$	$T = 25^\circ\text{C}$
Thermistor B Constant	B	--	3900	--	K	$T = 25^\circ\text{C}$
TEC Current	$I_C$	--	--	1.5	A	$\Delta T = 40^\circ\text{C}$
TEC Voltage	$V_C$	--	--	2.0	V	$\Delta T = 40^\circ\text{C}$

\*See available DWDM wavelengths from ordering options. Temp sweep measurement for center wavelength.

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## Outline Diagram

Dimensions are in millimeters

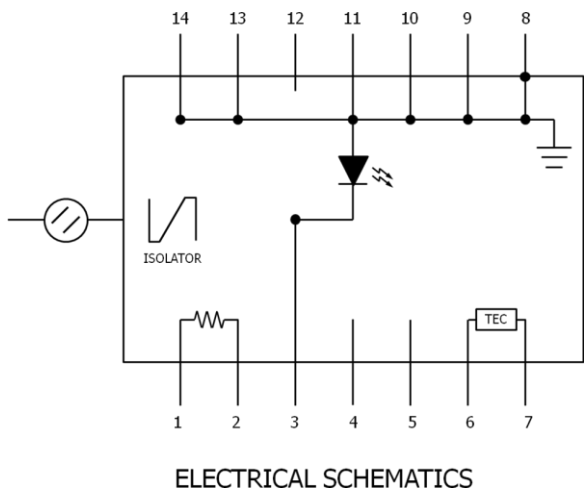
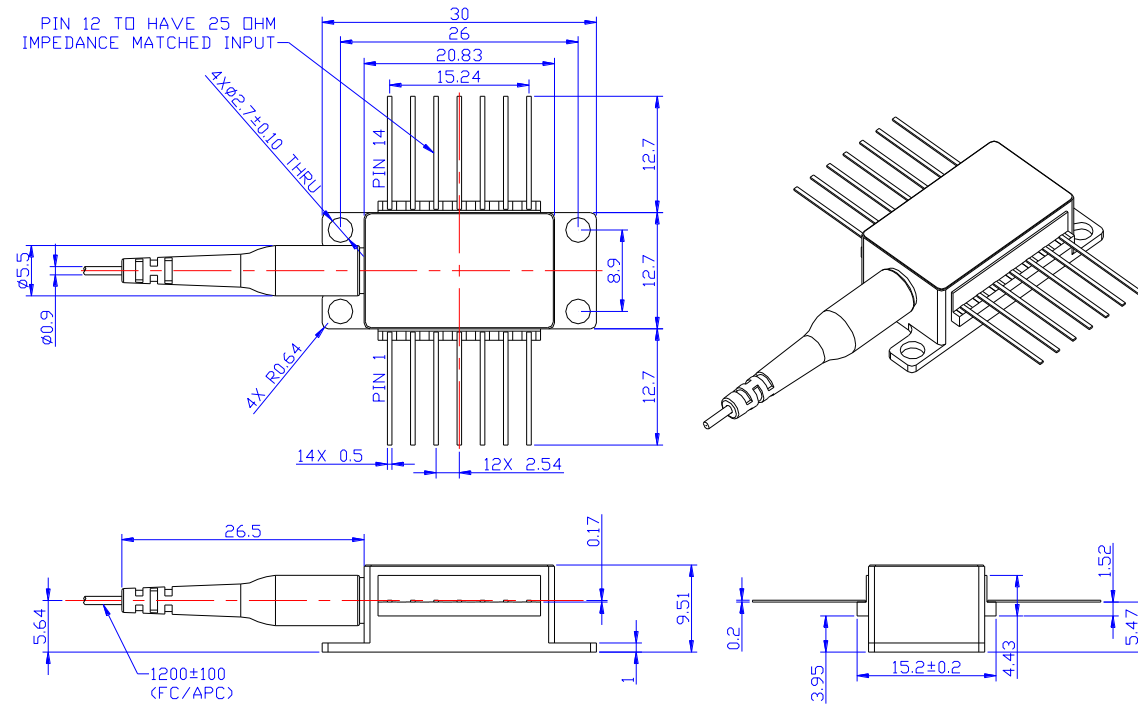


ELECTRICAL SCHEMATICS

PIN ASSIGNMENT:	
1	Thermistor
2	Thermistor
3	DC Laser Bias (-)
4	Not Connected
5	Not Connected
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (-)
8	Laser Common (+)
9	Laser Common (+)
10	Laser Common (+)
11	Laser Common (+)
12	Not Connected
13	Laser Common (+)
14	Laser Common (+)

## H1 (Floating LD design)

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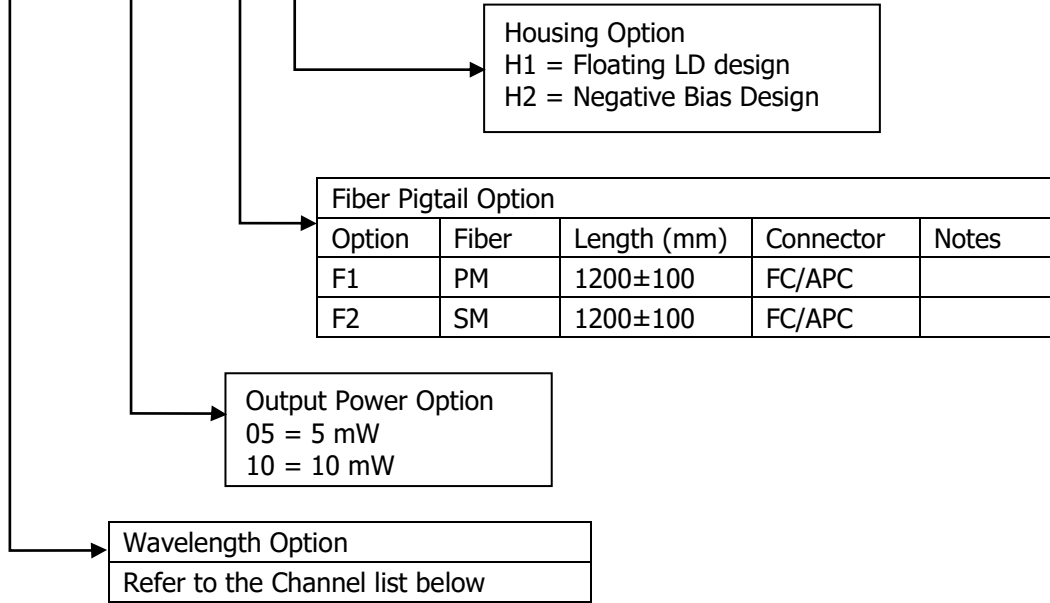
PIN ASSIGNMENT:	
1	Thermistor
2	Thermistor
3	DC Laser Bias (-)
4	Not Connected
5	Not Connected
6	Thermoelectric Cooler (+)
7	Thermoelectric Cooler (-)
8	Case Ground
9	Case Ground
10	Case Ground
11	Laser Common (+), Case Ground
12	Not Connected
13	Laser Common (+), Case Ground
14	Case Ground

## H2 (Negative Bias Design, Case GRD connected to LD Anode)

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**Ordering Options**

**DFB-XXX-BF-XX-EC-Fx-Hx-N126**



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**ITU-T DWDM Channel:**

<b>ITU Channel</b>	<b>Frequency (THz)</b>	<b>Wavelength (nm)</b>	<b>ITU Channel</b>	<b>Frequency (THz)</b>	<b>Wavelength (nm)</b>
933	193.3	1550.92	946	194.6	1540.56
934	193.4	1550.12			

Please consult factory for wavelength availability before ordering.

## DFB-XXX-BF-XX-EC-Fx-Hx-N126 Laser Module

### Safety Information

All versions of this laser are Class 1M laser products per IEC<sup>1</sup>/EN<sup>2</sup> 60825-1:2001-08. Users should observe safety precautions such as those recommended by ANSI<sup>3</sup> 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.

#### IEC<sup>1</sup>/EN<sup>2</sup> 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/cm<sup>2</sup> 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