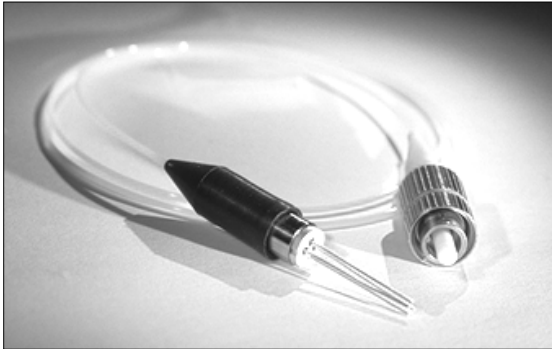


## DFB-1310-C5-2-A-xx-x-x

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### Description

The DFB-1310-C5-2-A-xx-x-x series of Multi-Quantum Well (MQW) Distributed Feedback (DFB) lasers have been designed specifically analog applications, especially CATV return-path.

The devices feature high output power, wide operating temperature range, low distortion characteristics, low RIN noise, and high side mode suppression.

Their uncooled, hermetically sealed, coaxial fiber-pigtailed packages are a cost-effective means of providing a highly linear light source for intermediate-reach and long-reach analog transmission applications.

### Features

- ❑ Advanced Multiple Quantum Well (MQW) Distributed Feedback (DFB) Laser Design
- ❑ Low Distortion
  - IMD2 typ. -54 dBc
  - IMD3 typ. -60 dBc
- ❑  $RIN < -145$  dB/Hz
- ❑ Cost-effective Uncooled Laser Technology
- ❑ SMSR typ. 40 dB
- ❑ 5.6-mm TO-style package

### Applications

- ❑ CATV Return-path
- ❑ Analog transmission

## DFB-1310-C5-2-A-xx-x-x

### Absolute Maximum Ratings

Exceeding the conditions specified below may result in permanent damage to the laser module. In normal operation, refer to the operating conditions in Table 1, below. Exceeding the conditions in Table 1, but below the absolute maximum ratings may result in unacceptable performance in some applications. Exposure to conditions above the absolute maximum ratings may negatively impact the reliability of the devices.

| Parameter                  | Symbol           | Condition         | Min | Max | Unit |
|----------------------------|------------------|-------------------|-----|-----|------|
| Operating Case Temperature | T <sub>c</sub>   | I=I <sub>op</sub> | -20 | 85  | °C   |
| Storage Temperature        | T <sub>stg</sub> | --                | -40 | 100 | °C   |
| Laser Forward Current      | --               | --                | --  | 120 | mA   |
| Laser Reverse Bias         | V <sub>r</sub>   | --                | --  | 2   | V    |
| Photodiode Reverse Bias    | V <sub>rpd</sub> | --                | --  | 10  | V    |

### Electrical/Optical Characteristics

**Table 1. Electrical and Optical Characteristics**

Parameters are over operating temperature range unless otherwise noted.

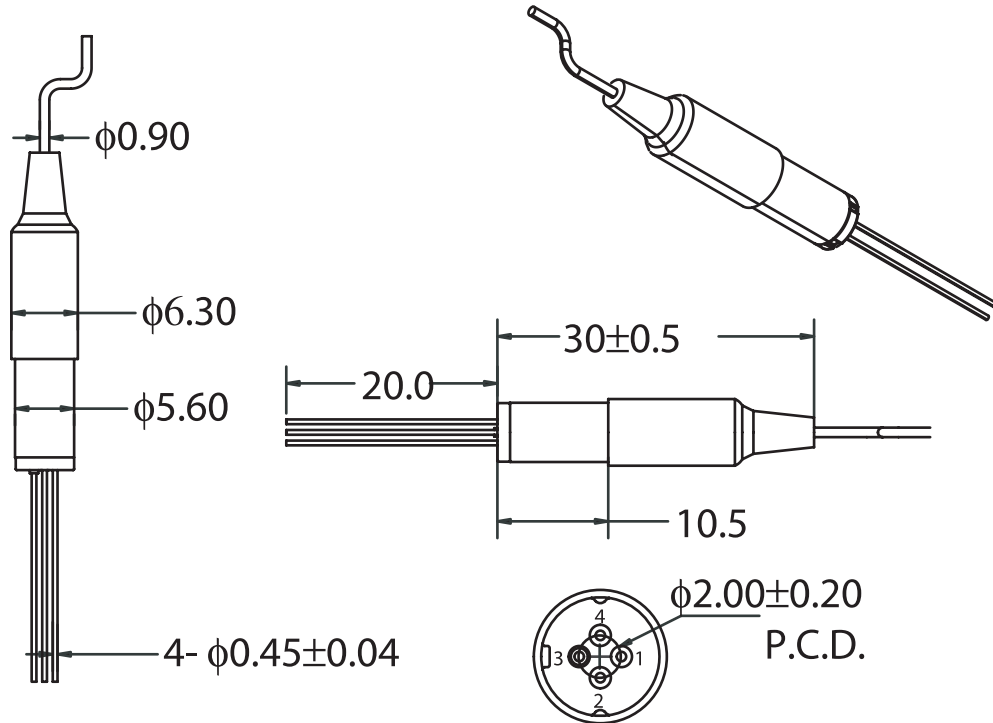
| Parameter                          | Symbol           | Min  | Typ      | Max      | Unit  | Test Conditions                                              |
|------------------------------------|------------------|------|----------|----------|-------|--------------------------------------------------------------|
| Operating Temperature              | T                | -20* | --       | 85*      | °C    |                                                              |
| Optical Output Power               | P <sub>o</sub>   | 2.0  | 2.2      | --       | mW    | CW                                                           |
| Threshold Current                  | I <sub>th</sub>  | --   | 12<br>35 | 18<br>50 | mA    | T=25 °C<br>T=85 °C                                           |
| Operating Current                  | I <sub>op</sub>  | --   | 60       | 75       | mA    | T=85 °C                                                      |
| Forward Voltage                    | V <sub>F</sub>   | --   | 2.1      | 1.6      | V     | P <sub>o</sub> =2.0 mW                                       |
| Center Wavelength                  | λ <sub>c</sub>   | 1280 | 1310     | 1340     | nm    | P <sub>o</sub> =2.0 mW, CW                                   |
| Spectral Width (-20 dB)            | Δλ               | --   | 0.1      | 1.0      | nm    | P <sub>o</sub> =2.0 mW                                       |
| Wavelength temperature coefficient | Δλ/ΔT            | --   | 0.09     | --       | nm/°C |                                                              |
| Side-mode Suppression Ratio        | SMSR             | 30   | 40       | --       | dB    | P <sub>o</sub> =2 mW                                         |
| Monitor Current                    | I <sub>mon</sub> | 100  | --       | 1000     | μA    | V <sub>R</sub> =5 V                                          |
| Monitor Dark Current               | I <sub>D</sub>   | 10   | --       | 200      | nA    | V <sub>R</sub> =5 V                                          |
| Tracking Error                     | γ                | -1   | --       | 1        | dB    | I <sub>mon</sub> =const, γ=10 log (P <sub>f</sub> /2.0) [dB] |

**DFB-1310-C5-2-A-xx-x-x****Table 2. RF Characteristics**

| Parameter                        | Symbol | Min | Typ | Max  | Unit  | Test Conditions                                                                                                                              |
|----------------------------------|--------|-----|-----|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Relative Intensity Noise         | RIN    |     |     | -145 | dB/Hz | CW, $P_o=2.0$ mW, $f=5$ MHz to 300 MHz                                                                                                       |
| Relaxation Oscillation Frequency | $f_R$  |     | 4.5 |      | GHz   | $P_o=2.0$ mW                                                                                                                                 |
| Modulation Bandwidth             | BW     | 1.0 |     |      | GHz   | -3 dB, $P_o=2$ mW                                                                                                                            |
| Second-Order Intermodulation     | IMD2   |     | -54 | -50  | dBc   | $T=25$ °C, $P_o=2$ mW, OMI=0.2, Two-tone test, 13 MHz and 19 MHz, 7 dB plus connector loss                                                   |
| Third-Order Intermodulation      | IMD3   |     | -60 | -55  | dBc   | $T=25$ °C, $P_o=2.0$ mW, OMI=0.2, Two-tone test, 13 MHz and 19 MHz, 7 dB plus connector loss, all peaks from 5 MHz to 50 MHz meet this level |
| Carrier-to Noise ratio           | CNR    |     | 52  |      | dB    | $T=25$ °C, $P_o=2.0$ mW, OMI=0.2, ref. To one-tone: 5 MHz to 50 MHz, 7 dB plus connector loss                                                |
| RF Bandpass Flatness             | BF     |     |     | 1.0  | dB    | Peak to valley, 5 MHz to 200 MHz                                                                                                             |

**DFB-1310-C5-2-A-xx-x-x**

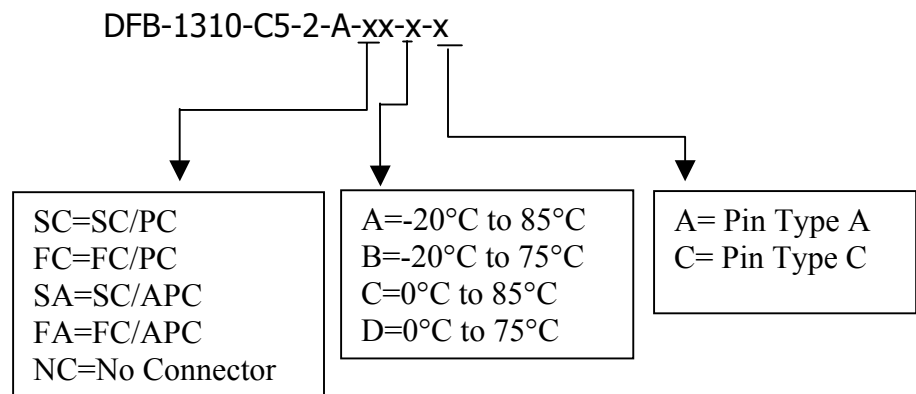
**DIMENSIONS**



**Pin Assignment**

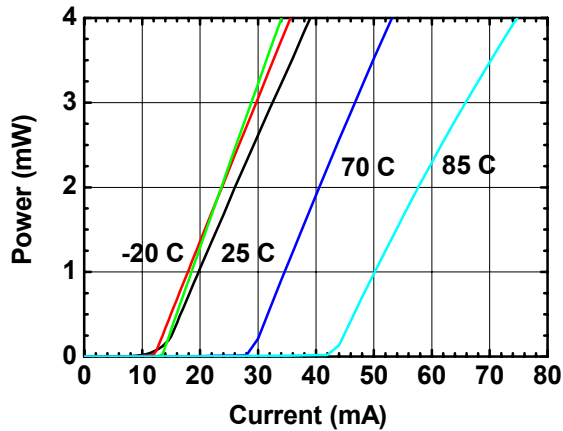
|   | Type A        | Type C               |
|---|---------------|----------------------|
| 1 | PD Cathode    | PD Anode             |
| 2 | PD Anode      | LD Anode, PD Cathode |
| 3 | LD Anode, GRD | GRD                  |
| 4 | LD cathode    | LD cathode           |

**ORDERING OPTIONS:**

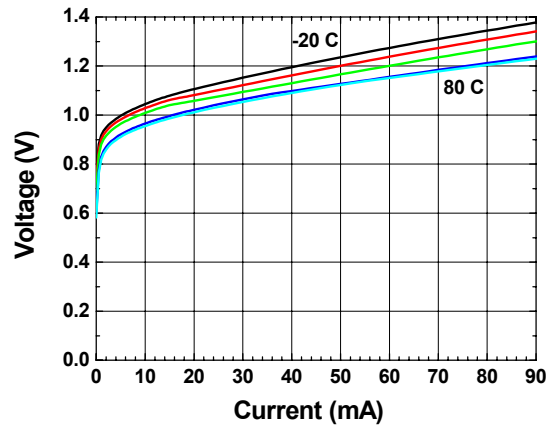


**TYPICAL PERFORMANCE DATA** (T=25 °C unless otherwise noted)

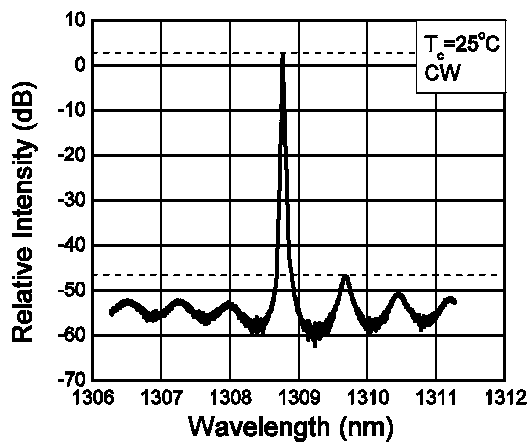
**Output Power vs. Current**



**Forward Voltage vs. Current**



**Output Spectrum**



**DFB-1310-C5-2-A-xx-x-x**

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**Safety Information**

All version of this laser are Class 3R laser products per IEC\* 60825-1:2001. Users should observe safety precautions such as those recommended by ANSI\*\* Z136.1-2000, ANSI Z36.2-1997 and IEC 60825-1:2001.

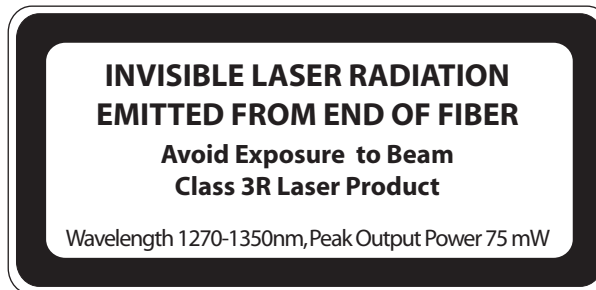
This product does not conform to 21 CFR 1040.10 and 1040.11. Consequently, this laser module is only intended for use as a component by manufacturers of electronic products and equipment.

Wavelength = 1.3  $\mu\text{m}$   
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

\*IEC is a registered trademark of the International Electrotechnical Commission

\*\*ANSI is a registered trademark of the American National Standards Institute