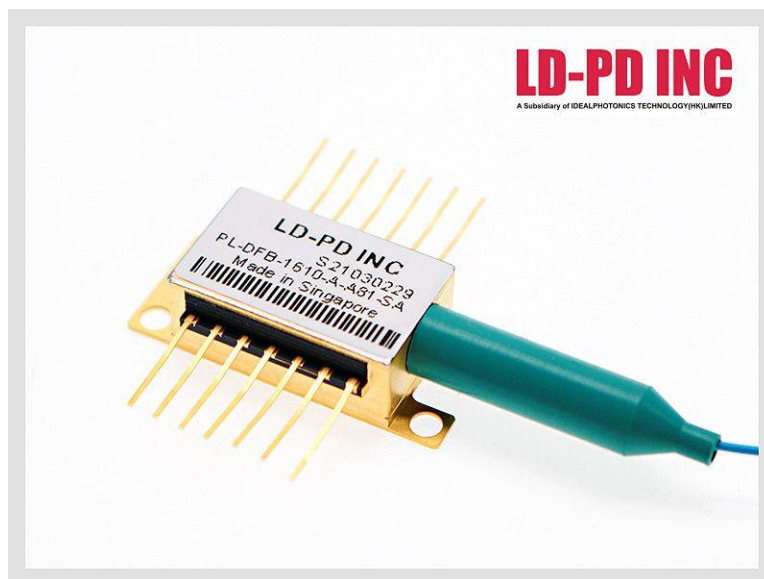


## 1610nm DFB Laser diode for CO<sub>2</sub> Sensing



### Description

The PL-DFB-1610-A1 1610nm DFB laser diode module made by LD-PD is a cost effective, highly coherent laser source. The DFB laser diode chip is packaged in an industry standard hermetically sealed 14 pin butterfly package with TEC and PD Built in.

### Features

- Narrow Linewidth < 2MHz
- Excellent wavelength control and stability
- Industry Standard 14 pin Butterfly package
- Mode-Hop free tuning
- Excellent reliability
- Customer specific wavelengths available

### Application

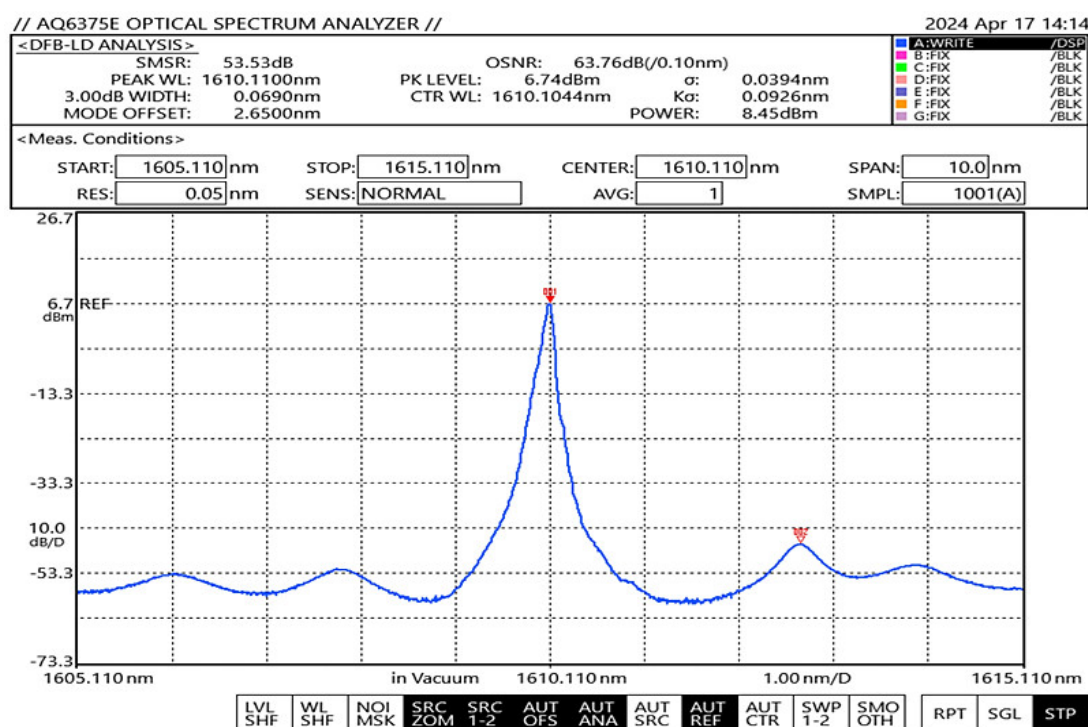
- Tunable diode laser absorption spectroscopy
- CO<sub>2</sub> Monitoring

## Laser Specifications

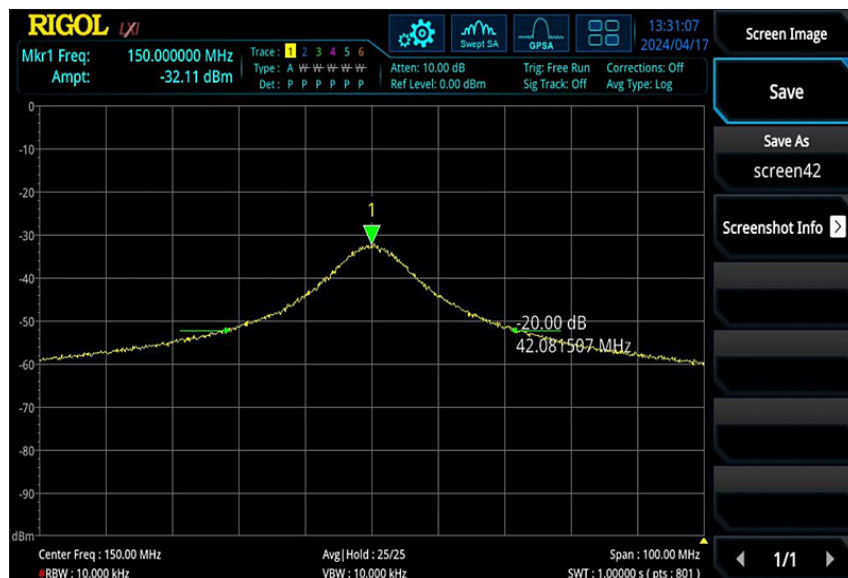
Tsub=25°C, CW bias unless stated otherwise

| Parameter                      | Symbol                   | Min    | Typ   | Max    | Unit       |
|--------------------------------|--------------------------|--------|-------|--------|------------|
| Centre Wavelength              | $\lambda$                | 1609.5 | 1610  | 1610.5 | nm         |
| Side Mode Suppression Ratio    | SMSR                     | 30     | 40    |        | dB         |
| Threshold Current              | I <sub>th</sub>          |        | 20    | 30     | mA         |
| Operating Current              | I <sub>op</sub>          |        | 80    | 120    | mA         |
| Chip output Power              | P <sub>f</sub>           | 10     | 15    | 30     | mW         |
| Quantum Efficiency             | $\eta$                   | 0.08   | 0.12  |        | mW/mA      |
| Current Tuning Coefficient     | $\Delta\lambda/\Delta I$ |        | 0.015 |        | nm/mA      |
| Temperature Tuning Coefficient | $\Delta\lambda/\Delta T$ |        | 0.12  |        | nm/K       |
| Forward Voltage                | V <sub>f</sub>           |        | 1.3   | 2      | V          |
| Thermistor Resistance          | R <sub>T</sub>           | 9.5    | 10    | 10.5   | K $\Omega$ |
| Thermistor Temp. Coefficient   |                          |        | -4.4  |        | %/°C       |
| Connector                      | FC/APC                   |        |       |        |            |

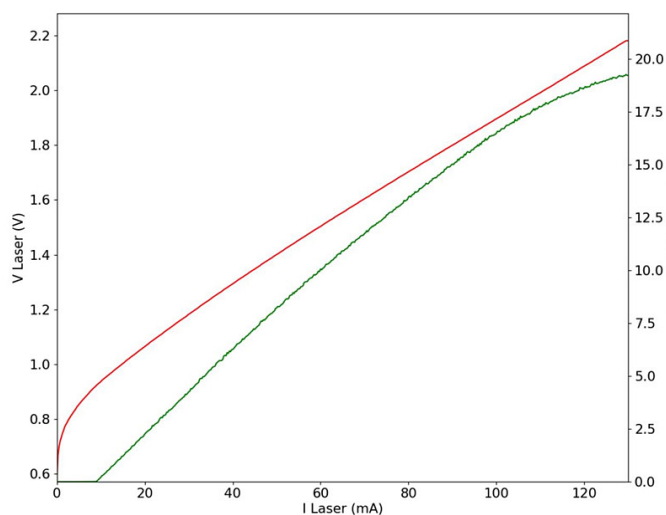
## Spectrum



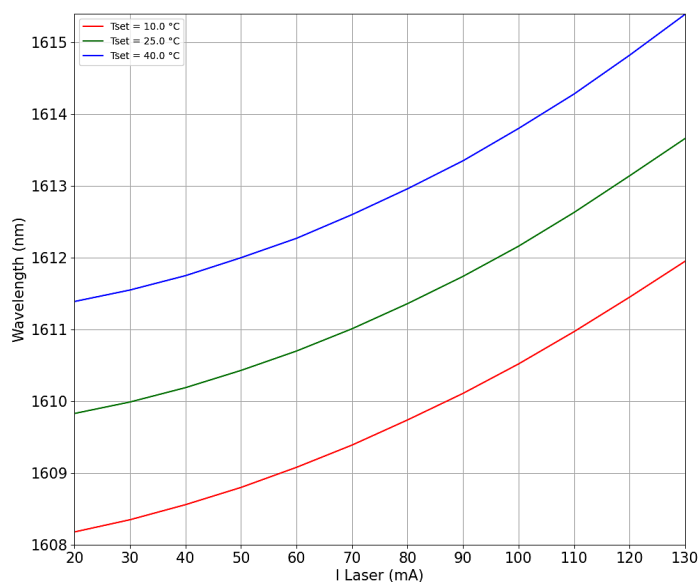
## DFB Linewidth Testing Result



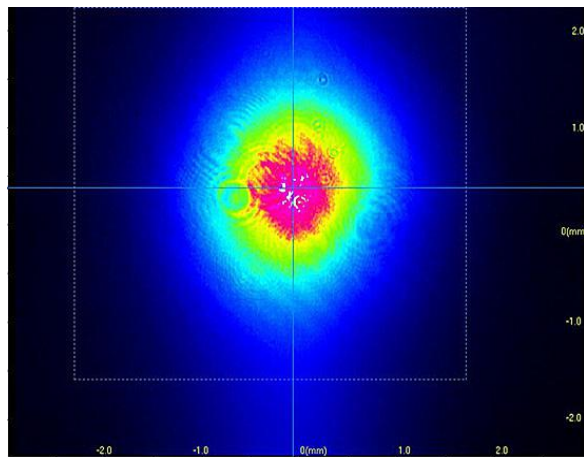
## L-I Curve



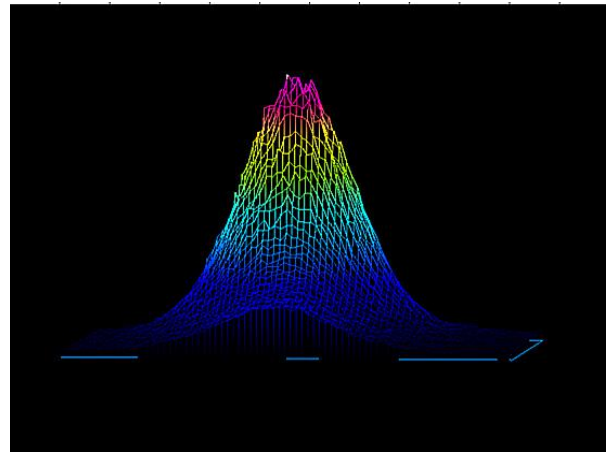
## Tuning characteristics



## Beam Quality Profiler (2D/3D)

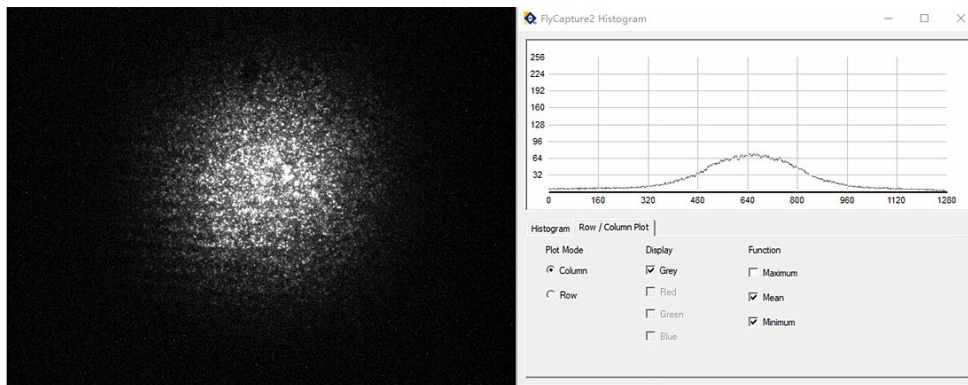


2D

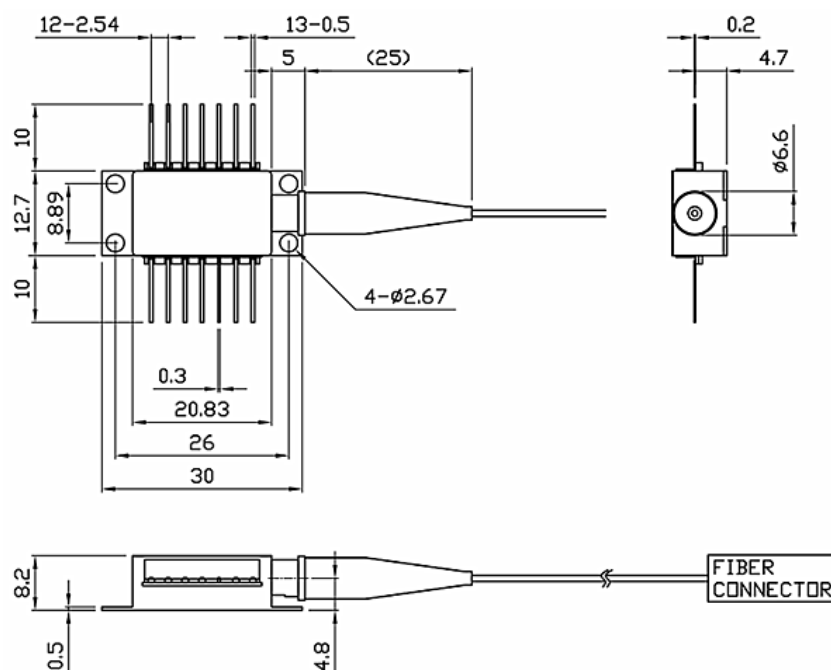


3D

## Camera Analysis

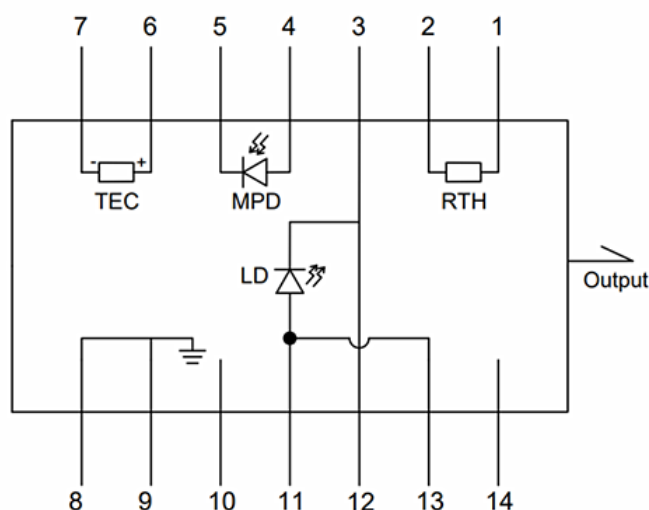


## Package Size



## Pin definition

## Schematic Diagram (Top View)

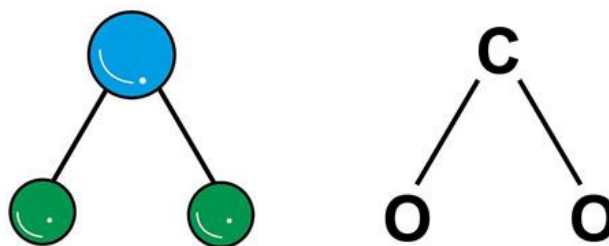
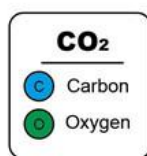
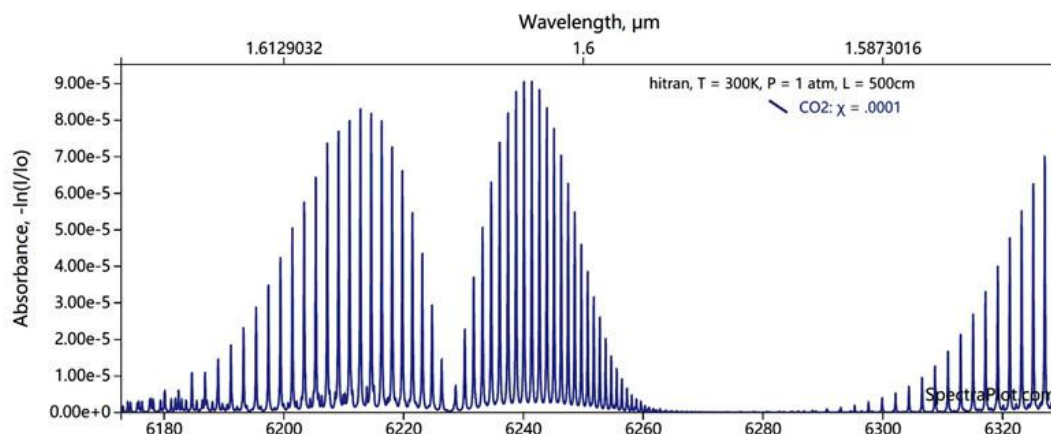


## Pin Connection

| PIN# | Function     | PIN# | Function    |
|------|--------------|------|-------------|
| 1    | Thermistor   | 8    | Case Ground |
| 2    | Thermistor   | 9    | Case Ground |
| 3    | LD(-)        | 10   | NC          |
| 4    | Detector (+) | 11   | LD(+)       |
| 5    | Detector (-) | 12   | LD (-), RF  |
| 6    | TEC (+)      | 13   | LD(+)       |
| 7    | TEC (-)      | 14   | NC          |

## Absolute Maximum Ratings

| Item                 | Unit | Min | Typ | Max |
|----------------------|------|-----|-----|-----|
| Case Temperature     | °C   | -5  | 25  | 70  |
| Chip Temperature     | °C   | +10 | 25  | 40  |
| Operating Current    | mA   | 0   | 100 | 150 |
| Forward Voltage      | V    | 0.8 | 1.2 | 1.8 |
| TEC Current          | A    | -   | -   | 1.2 |
| Reverse Voltage (LD) | V    | -   | -   | 2.0 |
| Reverse Voltage (PD) | V    | -   | -   | 20  |

CO<sub>2</sub>**TDLAS: 1599/1604/1610nm****Ordering Info****PL-DFB-□□□□-☆-A8▽-XX**

□□□□: Wavelength

1392: 1392nm

1512: 1512nm

1567: 1567nm

1572: 1572nm

\*\*\*\*\*

1610: 1610nm

☆: Output Power

A: 10mW

B: 20mW

▽: Wavelength Tolerance

1: ±1nm

2: ±2nm

XX: Fiber and Connector Type

SA=SMF-28E+ FC/APC

SP=SMF-28E+ FC/PC

PP=PM Fiber+ FC/PC

PA=PM Fiber+ FC/APC