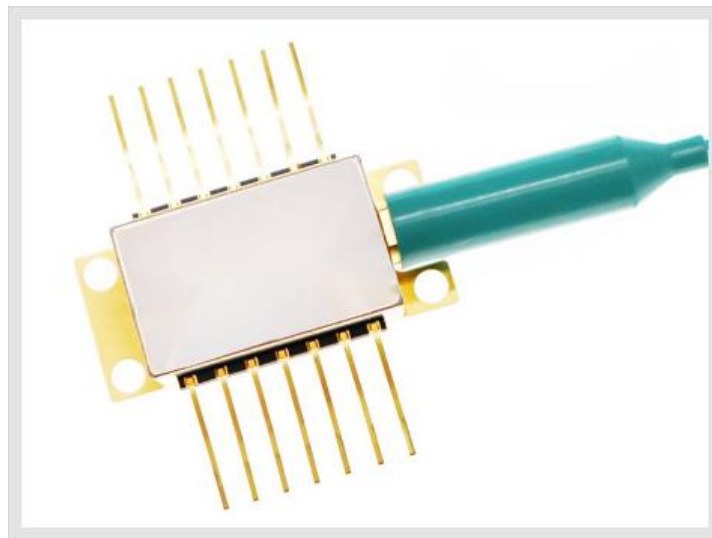


## 1680nm 15mW DFB Laser Diode for C<sub>2</sub>H<sub>6</sub>

### Sensing



- **Product Description**

1680nm DFB laser diode module is a cost-effective, high-coherence laser source. The DFB laser diode chip adopts industry-standard 14-pin hermetic butterfly package, with built-in TEC and PD.

- **Product features**

Narrow linewidth (< 2MHz); excellent wavelength control and stability; industry-standard 14-pin butterfly package; mode-hop-free tuning; outstanding reliability; customizable wavelength available on request

## ● Part Number

MP-DFB-1680-15-A81-14BF-SA

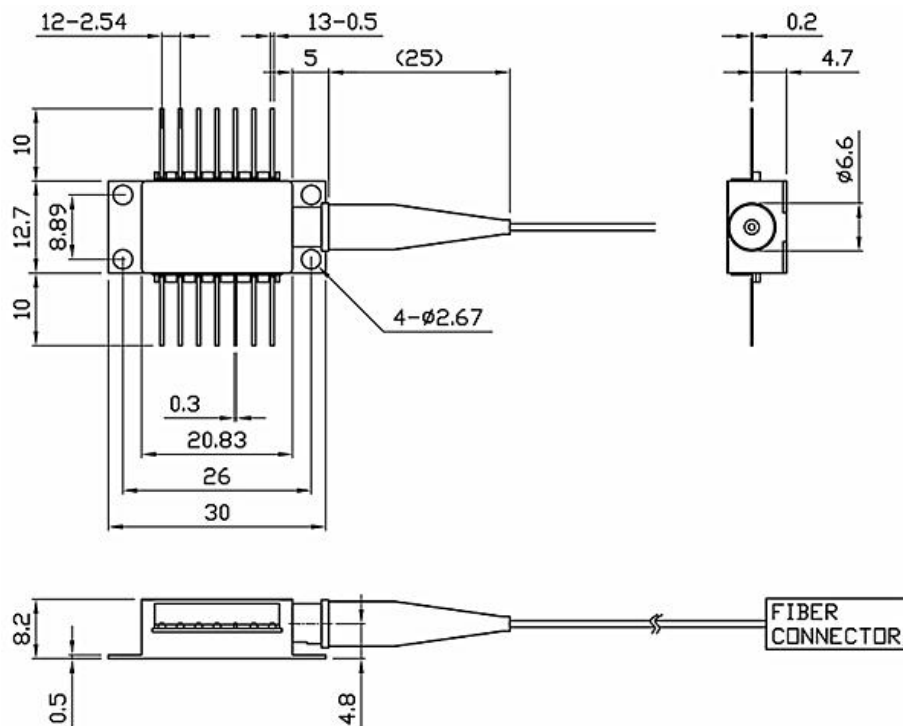
## ● Application area

Tunable Diode Laser Absorption Spectroscopy (TDLAS); C<sub>2</sub>H<sub>6</sub> monitoring

## ● Core parameters

| Central Wavelength | Output Power |
|--------------------|--------------|
| 1680nm             | 15mW         |

## ● Dimension Drawing



## ● General Parameters

Detailed Parameters

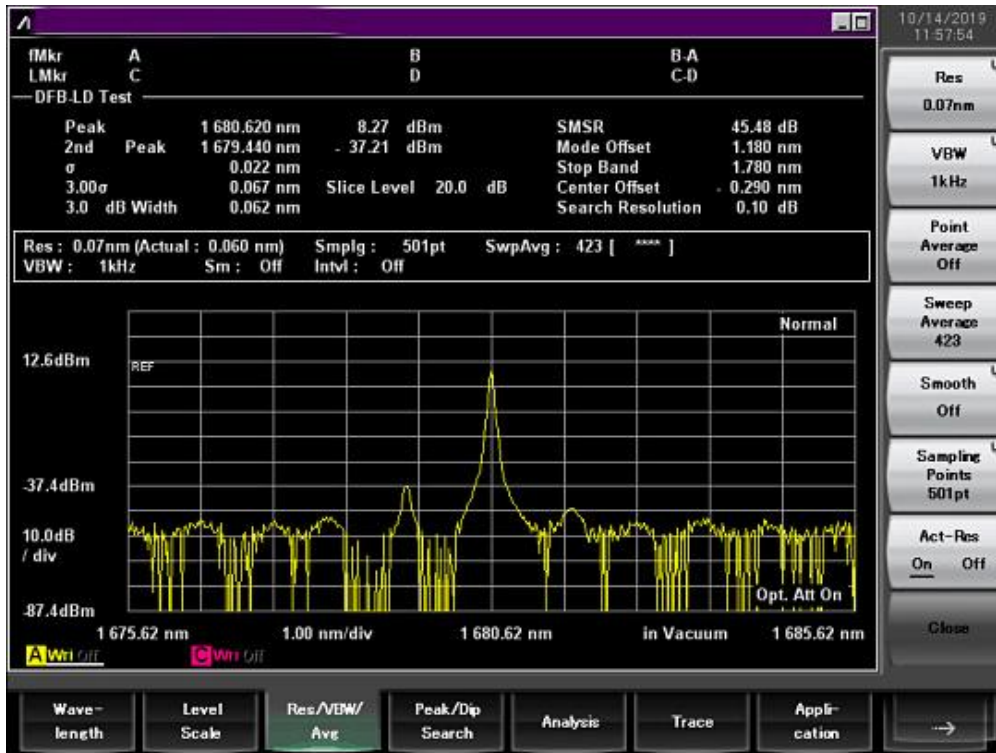
Laser Specifications

Electrical/Optical Characteristics (Tsub=25° C, CW bias, unless otherwise specified)

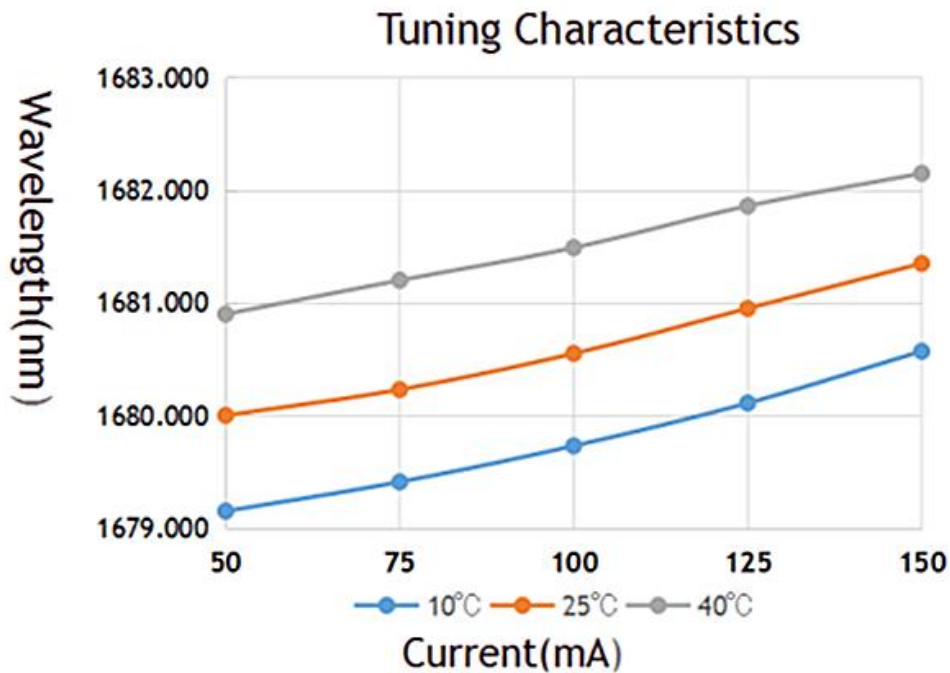
| Parameter                          | Symbol                   | Min. | Typical | Max. | Unit       |
|------------------------------------|--------------------------|------|---------|------|------------|
| Central Wavelength                 | $\lambda$                | 1679 | 1680    | 1681 | nm         |
| Side Mode Suppression Ratio (SMSR) | 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 Temperature Coefficient | -                        | -    | -4.4    | -    | %/°C       |
| Fiber Connector                    | FC/APC                   |      |         |      |            |



## Spectrum

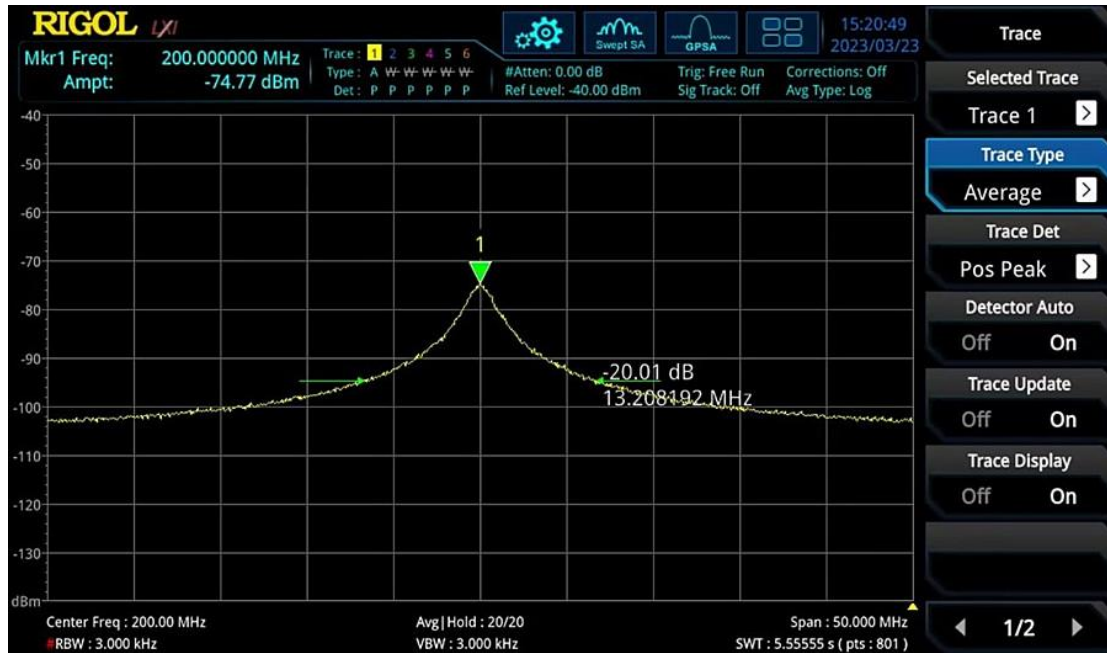


## Tuning Characteristics

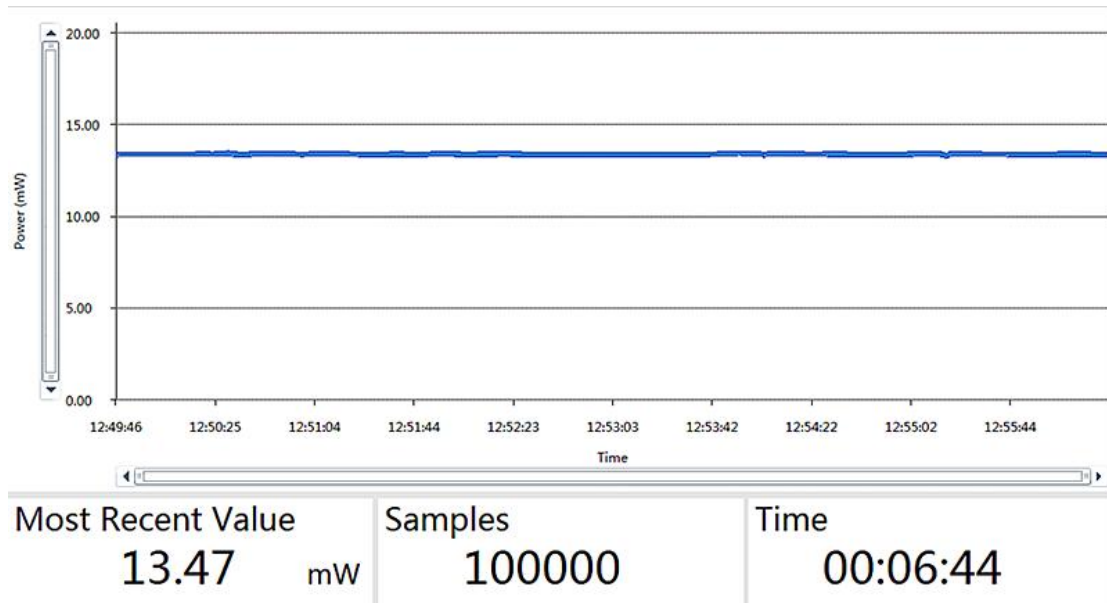




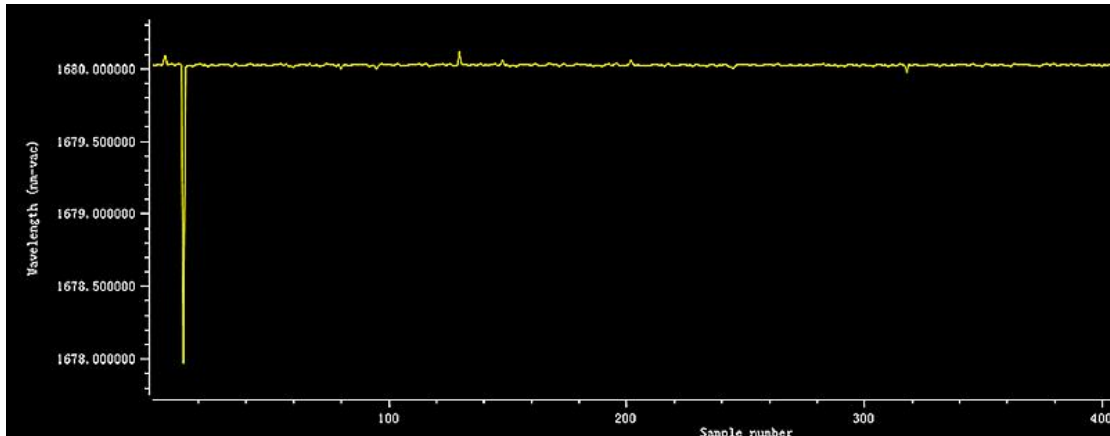
## DFB Linewidth Test Results



## Power Stability

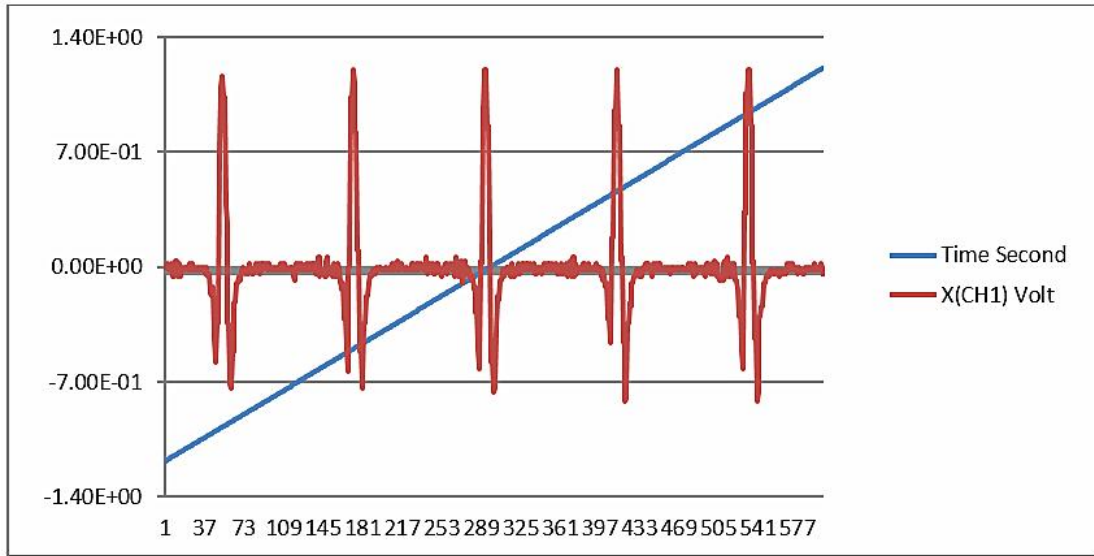


## Wavelength Stability

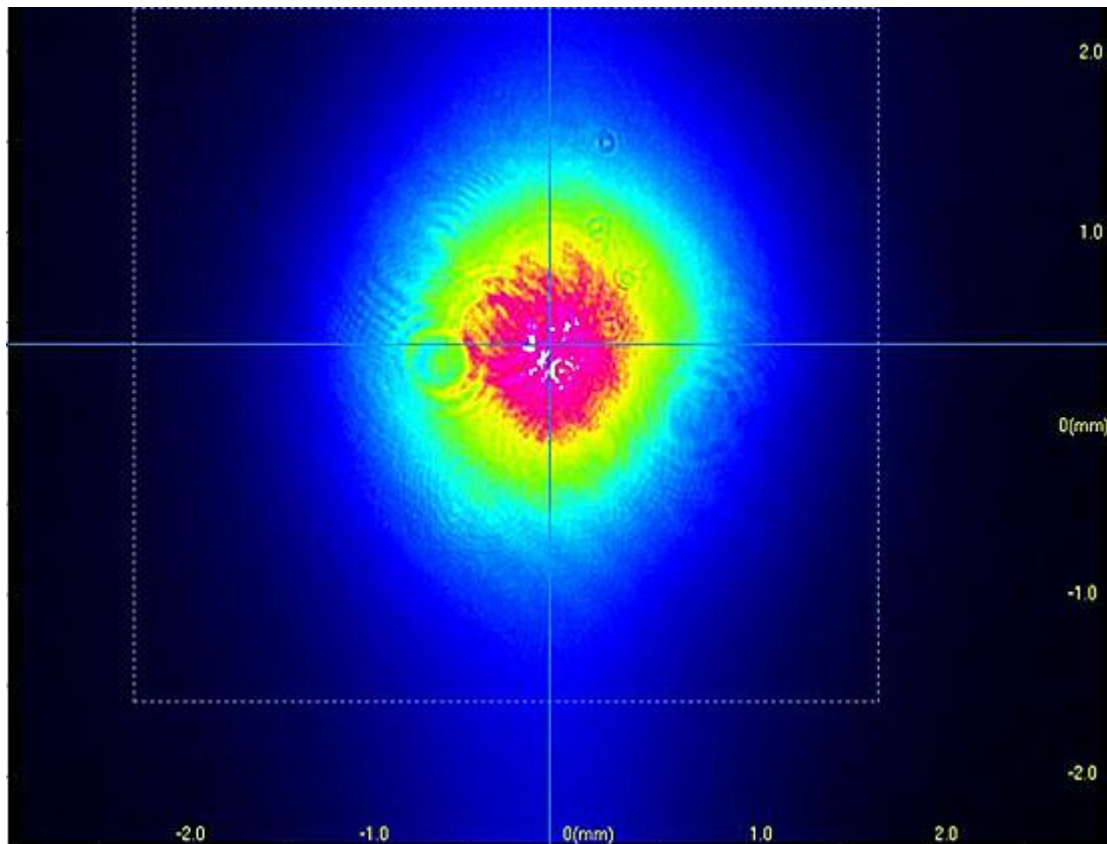


## 2F Signal Test Conditions

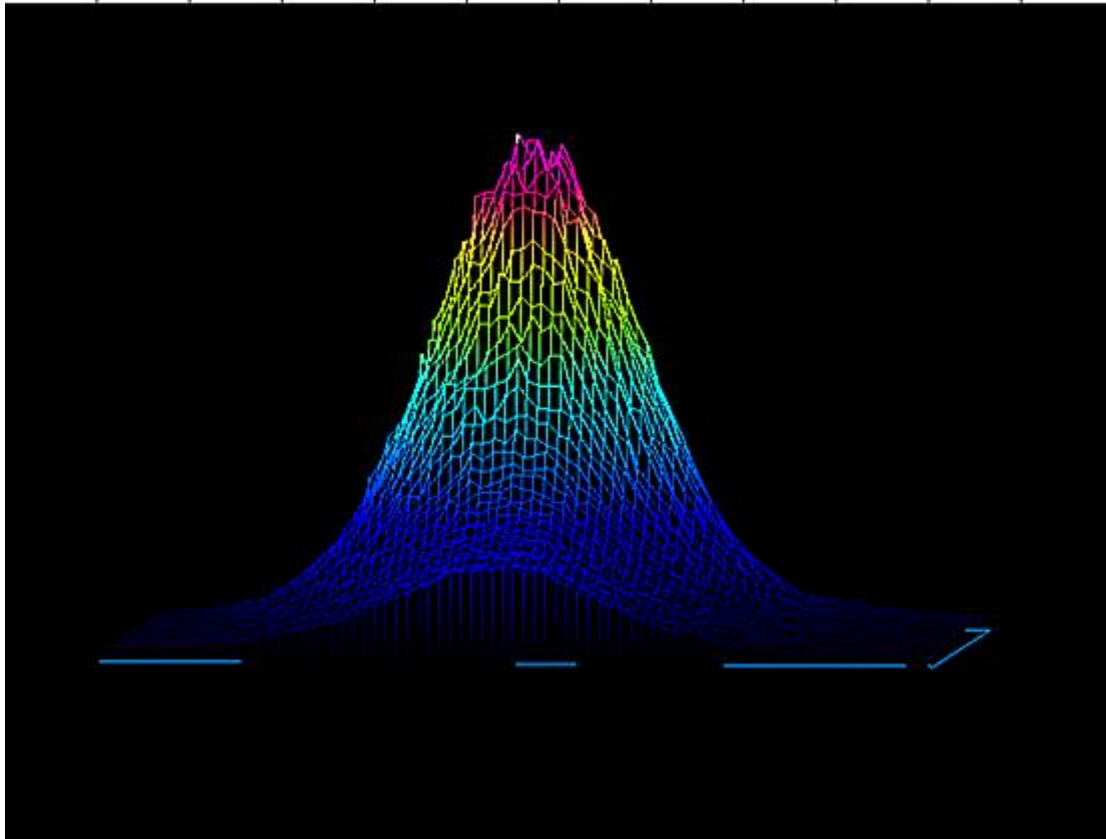
(200pm C<sub>2</sub>H<sub>6</sub>, optical path length 20 m, 25° C, 1 atm)



## Wavelength Stability

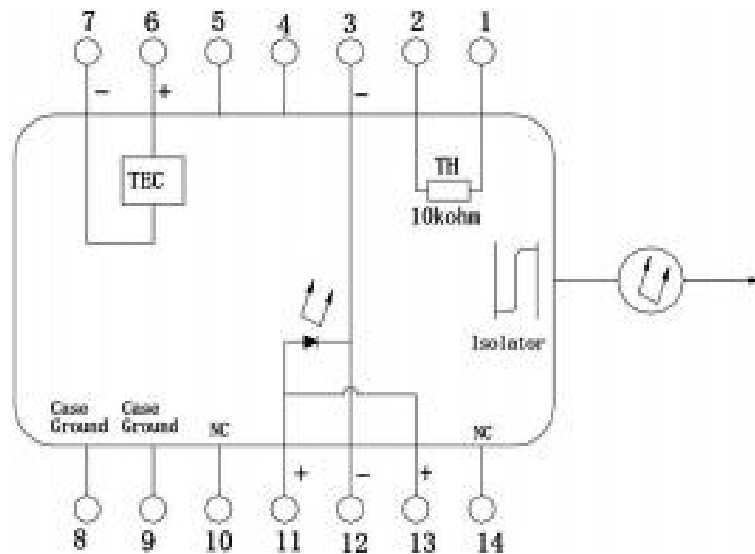


2D



3D

### Schematic (Top View)





## Pin Definition

| PIN# | Definition          | PIN# | Definition          |
|------|---------------------|------|---------------------|
| 1    | Thermistor          | 8    | Case Ground         |
| 2    | Thermistor          | 9    | Case Ground         |
| 3    | Laser Cathode (-)   | 10   | N/C (Not Connected) |
| 4    | N/C (Not Connected) | 11   | Laser Anode (+)     |
| 5    | N/C (Not Connected) | 12   | Laser Cathode (-)   |
| 6    | TEC (+)             | 13   | Laser Anode (+)     |
| 7    | TEC (-)             | 14   | N/C (Not Connected) |

## Absolute Maximum Ratings

| Item                 | Unit | Min. | Typical | 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   |



## Order information

MP-DFB-□□□□-☆-A8▽-14BF-XX

□□□□: Wavelength

1512: 1512nm

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1653.7: 1653.7nm

1680: 1680nm

☆ : 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