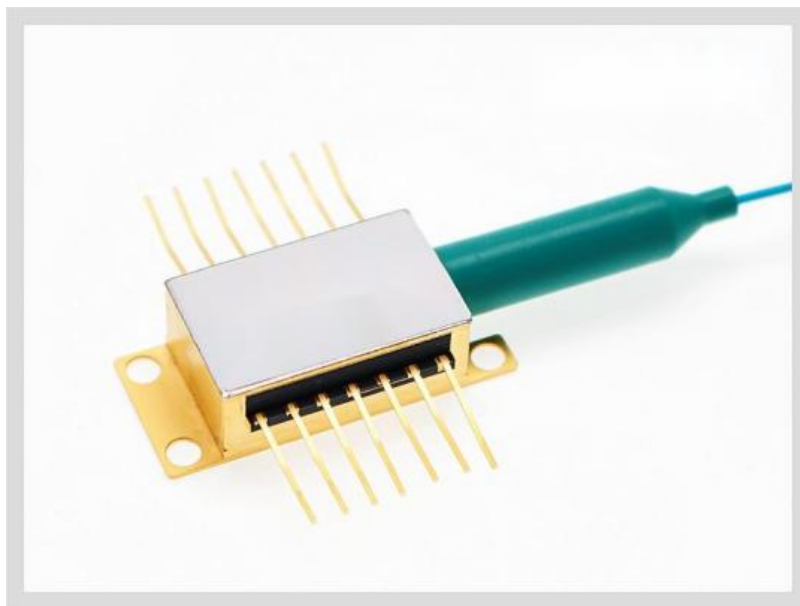


1398nm 20mW DFB Laser Diode for H₂O

Sensing



- **Product Description**

1398 nm distributed feedback (DFB) laser diode module is a cost-effective laser source with high coherence. The DFB laser diode chip is housed in an industry-standard hermetically sealed 14-pin butterfly package, integrated with a thermoelectric cooler (TEC) and a photodetector (PD). This module is designed for both performance and practicality. The hermetic package enhances stability in harsh environments, the built-in TEC enables precise temperature control to ensure wavelength stability, and the PD allows real-



time monitoring of laser output power. It is well suited for applications requiring high coherence and wavelength accuracy, such as gas sensing, optical fiber communications, and spectroscopic analysis.

● Product features

Narrow linewidth: < 2 MHz; industry-standard 14-pin butterfly package; excellent wavelength control and stability; mode-hop-free tuning; high reliability; customer-specific wavelengths available

● Part Number

MP-DFB-1398-20-A81-14BF-PA

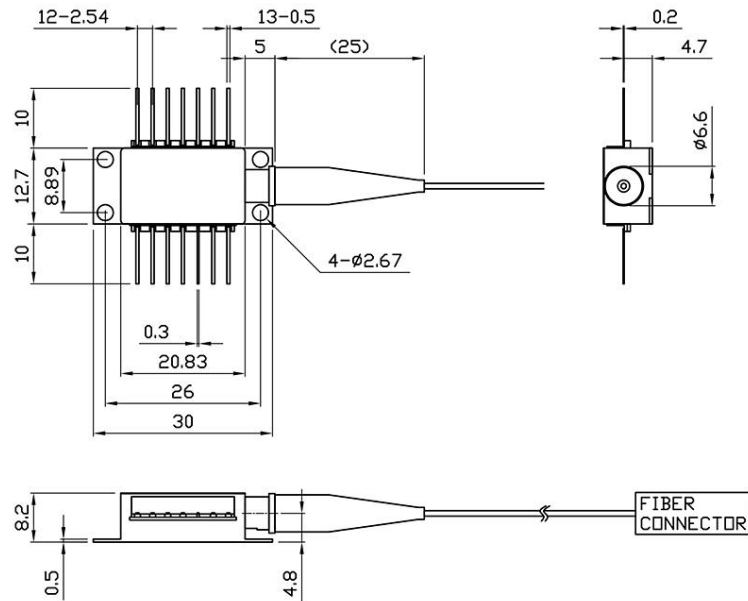
● Application area

Tunable Diode Laser Absorption Spectroscopy | H₂O (gas) monitoring

● Core parameters

Central Wavelength	Output Power
1398nm	20mW

● Dimension Drawing



● General Parameters

Detailed Parameters

Specification Table

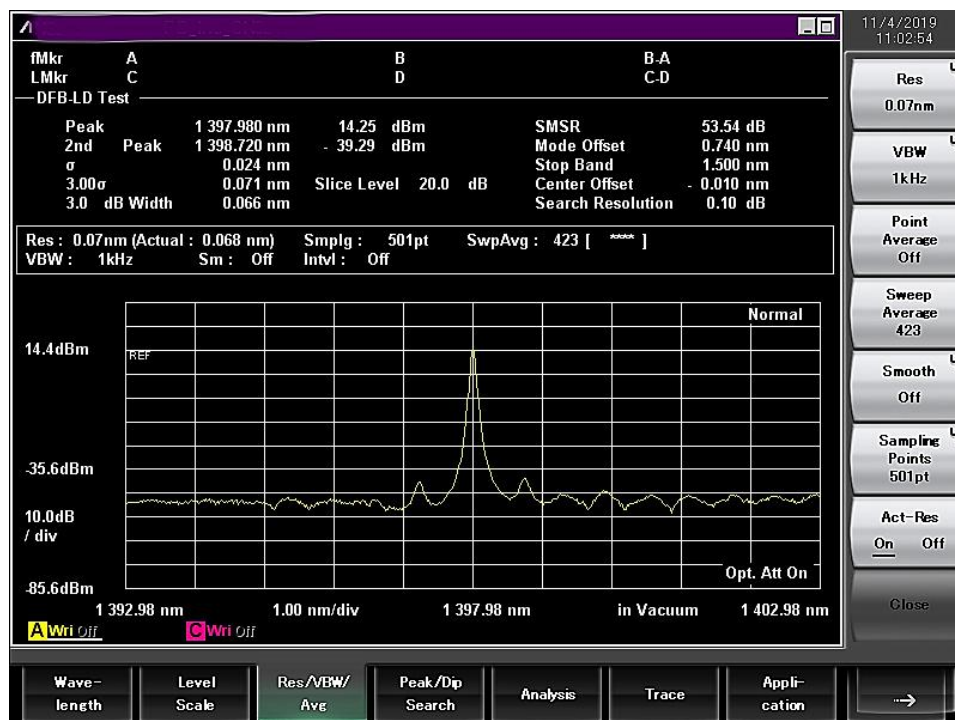
Electrical / Optical Characteristics (Tsub = 25 °C, CW bias, unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Center Wavelength	λ	1397.5	1398	1398.5	nm
Side-Mode Suppression Ratio	SMSR	30	40	—	dB
Threshold Current	I _{th}	—	20	30	mA
Operating Current	I _{op}	—	80	120	mA



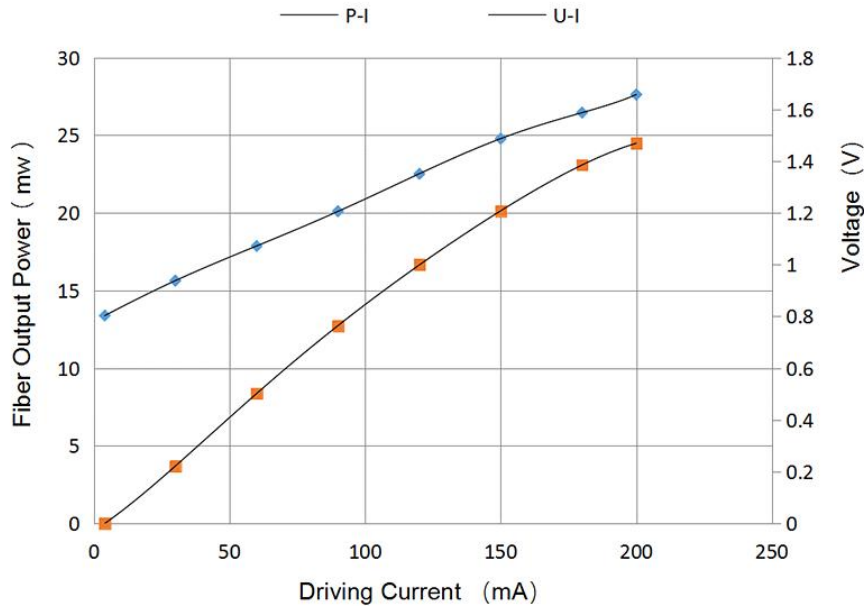
Chip Output Power	Pf	15	20	30	mW
Quantum Efficiency	η	0.08	0.12	—	mW/mA
Current Tuning Coefficient	$\Delta\lambda/\Delta I$	—	0.015	—	nm/mA
Temperature Tuning Coefficient	$\Delta\lambda/\Delta T$	—	0.12	—	nm/K
Forward Voltage	Vf	—	1.3	2	V
Thermistor Resistance	RT	9.5	10	10.5	k Ω
Thermistor Temperature Coefficient	—	—	-4.4	—	%/ $^{\circ}$ C

Spectrum Diagram





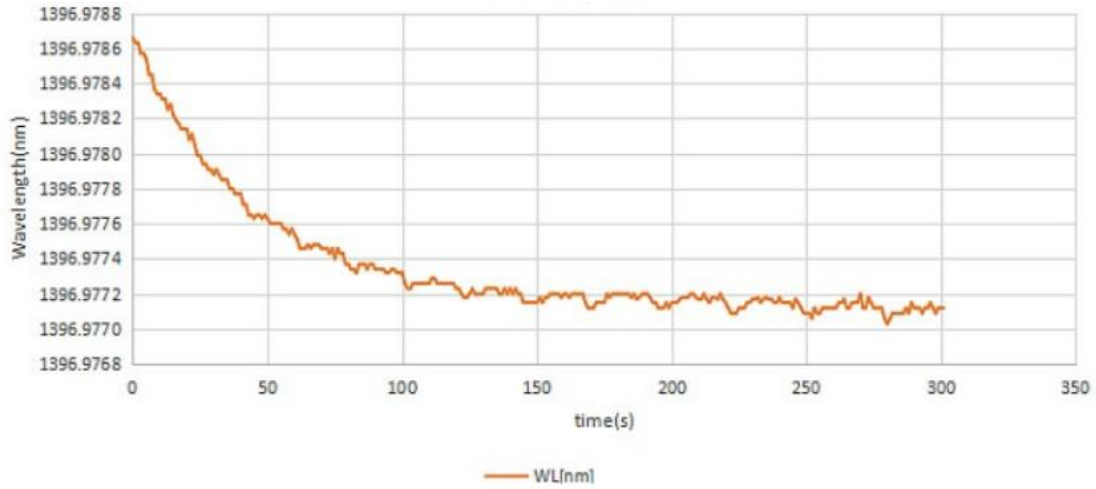
L-I Curve



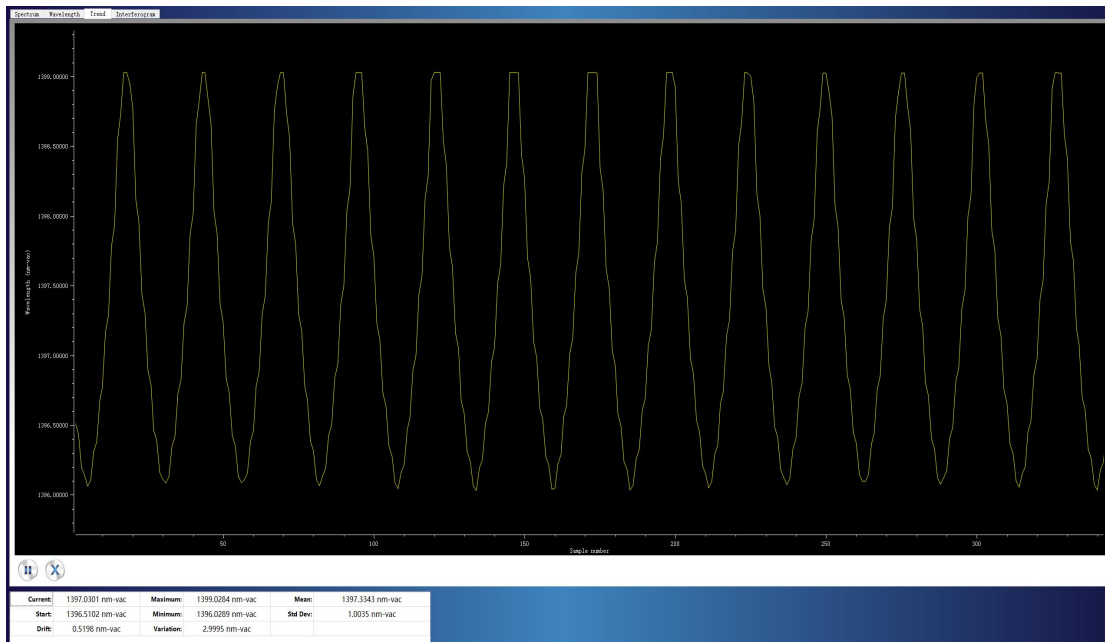
DFB Laser Linewidth Test Results



Wavelength Stability

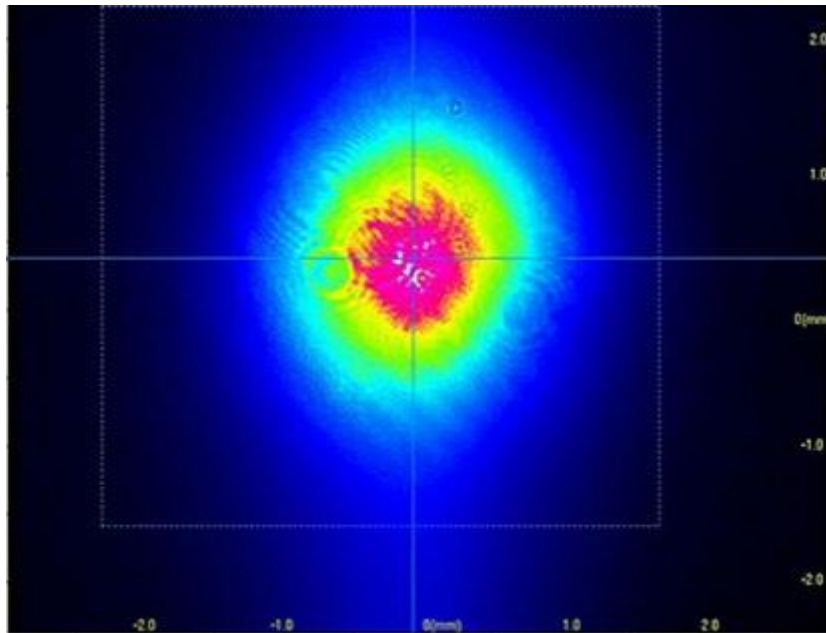


Mode-hop-free tuning range

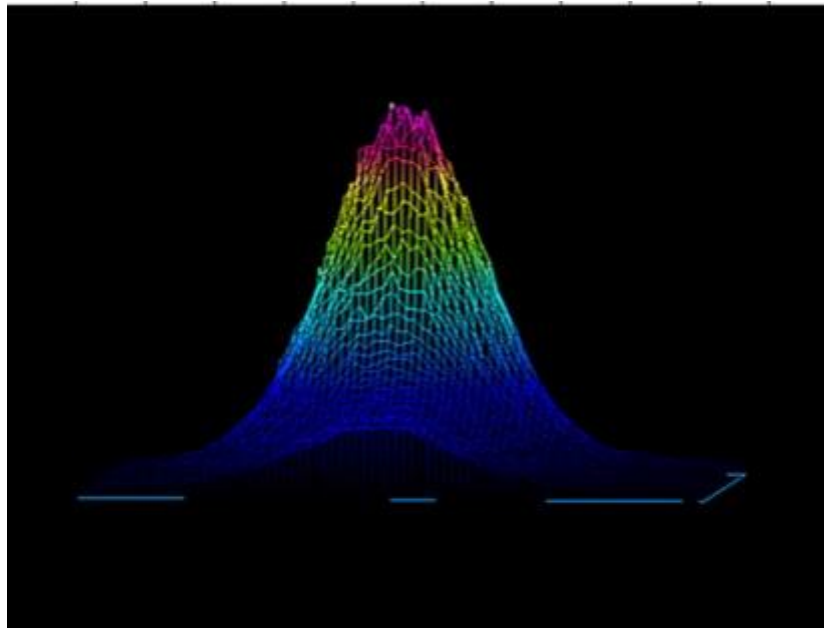




Beam Quality

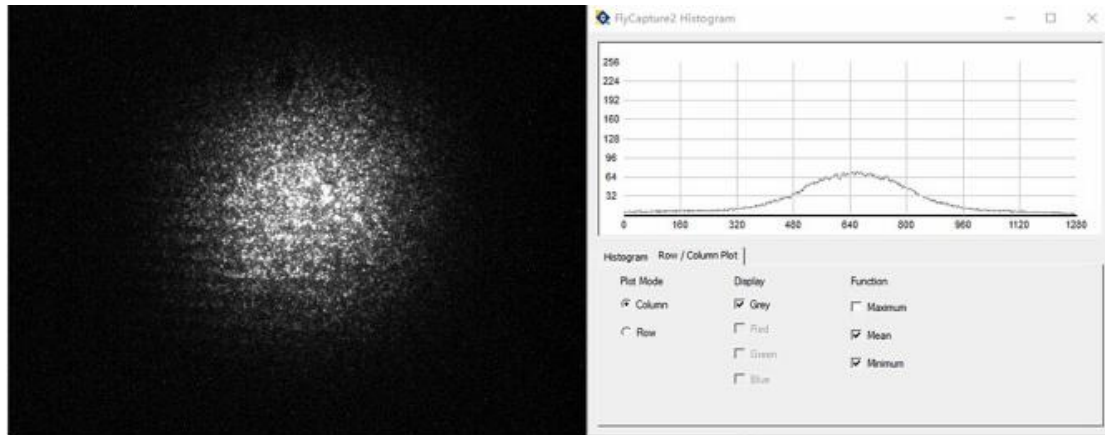


2D

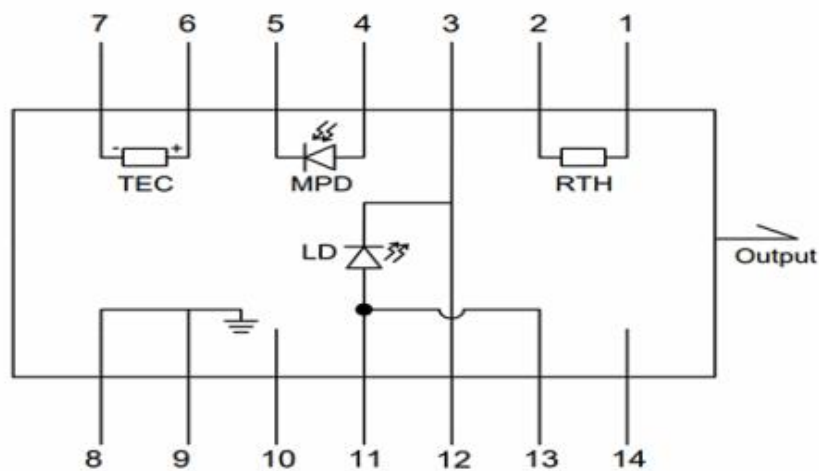


3D

Image Analysis



Pin Definition:



Pin #	Definition	Pin #	Definition
1	Thermistor	8	Case Ground
2	Thermistor	9	Case Ground
3	LD(-)	10	NC
4	Detector (+)	11	LD(+)



Pin #	Definition	Pin #	Definition
5	Detector (-)	12	LD(-), RF
6	TEC (+)	13	LD(+)
7	TEC (-)	14	NC

Absolute Maximum Ratings:

Parameter	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
Reverse Voltage (PD)	V	—	—	20

Ordering Information:

MP-DFB-□□□□-☆-A8▽-XX

**□□□□: Wavelength

1398: 1398nm

1512: 1512nm



1567: 1567nm

1570: 1570nm

1653.7: 1653.7nm

☆ : Output Power

A: 15mW

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