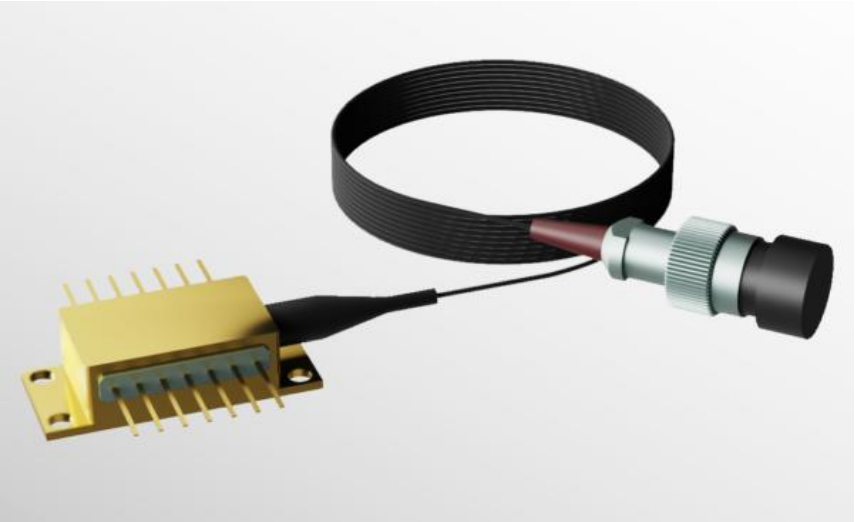
# 1083.33nm DBR Laser Diode



## Product Description

The 1083.33 nm DBR series high-performance edge-emitting laser diodes are fabricated with advanced monolithic single-frequency GaAs laser technology. This series delivers single spatial mode beam output and adopts facet passivation technology for superior reliability.1083.33 nm DBR devices are widely utilized in atomic spectroscopy applications based on metastable helium. Spectroscopic certification ensures accurate coverage of metastable helium transition lines within ±10 °C at room temperature.

## Product features

High output power; ultra-narrow linewidth; excellent single-mode performance; superior beam quality

## Part Number

MP-DBR-1083.33-120-14BF-PA

## Application area

Quantum sensing | Optical fiber communication | Precision measurement

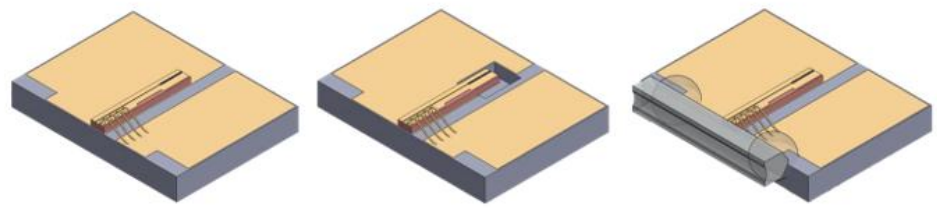
## Core parameters

| Central Wavelength |
| --- |
| 1083.33 nm |

## General Parameters

**Model Parameters**

**Detailed parameters**



Chip on Submount (CoS) CoS + Mode-Hop Free (MHF) CoS + Virtual Point Source (VPS) Lens

# 1083.33nm (COS) package characteristics

| | Chip architecture | |
|---|---|---|
| Parameter [1] | Low power | High power |
| Nominal wavelength (nm)[2] | 1083.33 ± 0.6 | |
| Power range (mW) | 40–120 | 100–350 |
| Maximum Operating Current (CW & Pulsed) (mA) | 250 | 550 |
| Optical power at maximum operating current (mW) | 120 | 350 |
| Nominal Slope Efficiency (W/A) | 0.75 | 0.7 |
| Nominal threshold current (mA) | 30 | 70 |

1. Characteristics at TC = 25 °C unless otherwise specified. Operating outside of these parameters voids warranty.

2. Hermetically sealed packages may contain CoS that are ± 1.2 nm from nominal.

# Available free-space package add-ons


9MM


TO-8


C-Mount


Transmitter Optical Subassembly (TOSA)

# Laser specifications

| Parameters | unit | Minimum | Typical values | Maximum |
|---|---|---|---|---|
| Storage temperature | °C | 0 | - | 70 |
| Shell operating temperature | °C | 5 | - | 70 |
| Laser chip operating temperature [1] | °C | 5 | - | 45 |
| Laser series resistance | Ω | - | 2 | - |
| Forward voltage of the laser at LIV current | V | - | 2 | - |
| Nominal laser line width at LIV current | kHz | - | 500 | - |
| Beam divergence angle at half-height and full width (θ∥ × θ⊥) | ° | - | 6 x 28 | 8 x 32 |
| Edge-mode rejection ratio (SMSR) | dB | - | -40 | - |
| Polarization extinction ratio | dB | -17 | -20 | - |
| Polarized state of the laser | TE | | | |
| Pattern structure | Fundamental mode | | | |
| Temperature tuning rate | nm/°C | - | 0.06 | - |
| Current tuning rate | nm/mA | - | 0.002 | - |
| Laser reverse voltage | V | - | - | 0 |

If not sealed, it is not recommended to use below the dew point

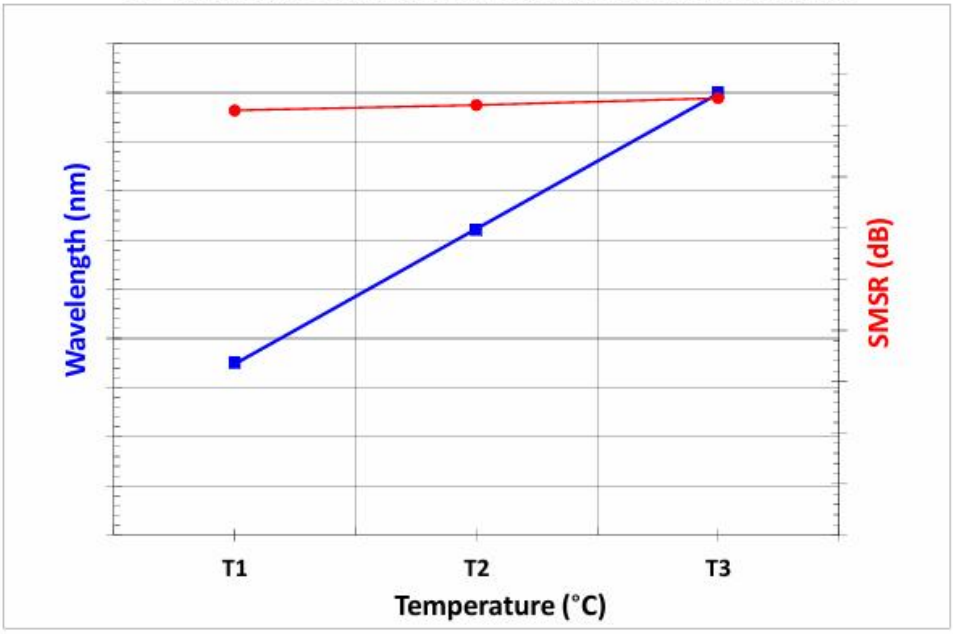
## Freespace Encapsulation add-on specifications

| Parameters | unit | Minimum | Typical values | Maximum |
|---|---|---|---|---|
| Photodiode forward current | mA | - | - | 10 |
| Photodiode reverse voltage | V | - | - | 50 |
| TEC Current (TOSA) | A | -1.1 | - | 1.1 |
| TEC Voltage (TOSA) | V | -3.0 | - | 3.0 |
| TEC current TO-8 | A | -1.8 | - | 1.8 |
| TEC voltage TO-8 | V | -2.2 | - | 2.2 |
| Thermistors | kΩ | - | 10 | - |

## Handling Precautions

These devices are sensitive to ESD. When handling the module, grounded work area and wrist strap must be used. Always store in an antistatic container with all leads shorted together.


Air Wavelength Characteristics at Constant Current by Temperature




LIV Characteristics by Current