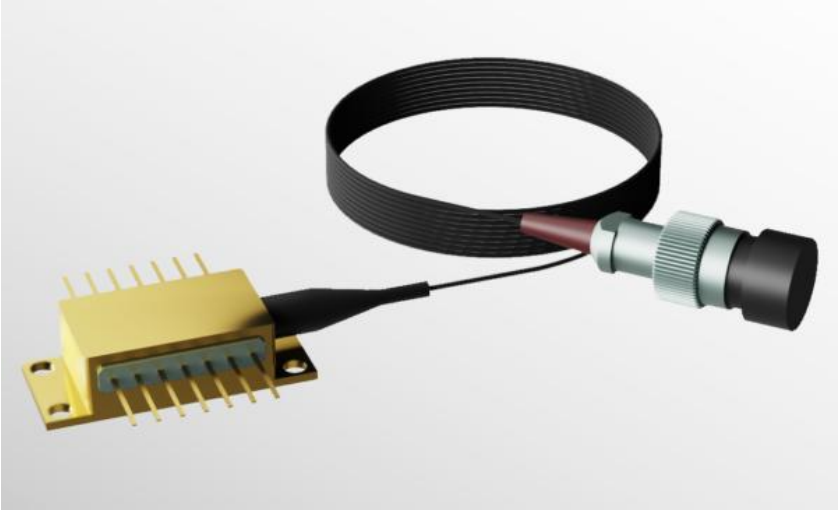
# 794.978 nm DBR Laser Diode



## Product Description

The 794.978 nm Distributed Bragg Reflector (DBR) high-performance edge-emitting laser diode is fabricated based on monolithic integrated single-frequency Gallium Arsenide (GaAs) laser technology.This series of diodes outputs single spatial mode laser beams, with passivated cavity facet design to guarantee device reliability. The 794.978 nm DBR device is applied for rubidium (Rb) atomic spectral analysis and quantum sensing fields. It has passed spectral certification, which can precisely match the D1 transition spectral line of rubidium within the temperature range of room temperature ±10 °C.

## Product features

Precise matching with atomic energy level transition； Excellent spectral performance；Professional package and integrated control interface

## Part Number

MP-DBR-794.978-60-14BF-PA

## Application area

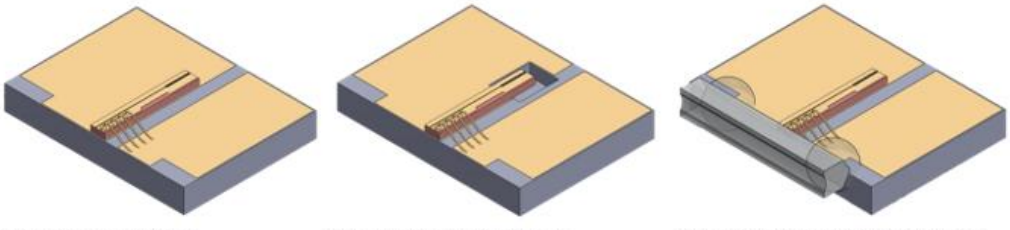
Rubidium Atomic Quantum Technology & Precision Physics | High-Resolution Spectroscopy

## Core parameters

| Central Wavelength |
| --- |
| 794.97nm |

## General Parameters

Detailed parameters



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

# 794.978nm DBR Chip Carrier Package (CoS) Characteristics

| | Chip structure | | |
|---|---|---|---|
| Parameter [1] | HOT[3] (High Operating Temperature). | Low power | High power |
| Nominal wavelength (nm)[2] | 794.978 ± 0.6 | | |
| Power range | 10-30 | 40-80 | 80-180 |
| Maximum Operating Current (CW & Pulse) (mA) | 80 | 140 | 250 |
| Maximum Operating Current Hour Power (mW) | 30 | 80 | 180 |
| Nominal Slope Efficiency (W/A) | 0.6 | 0.9 | 0.85 |
| Nominal threshold current (mA) | 30 | 30 | 60 |

1. Unless otherwise stated, all characteristics are measured at a case temperature (TC) of 25°C. Operating outside of these parameters will void the warranty.

2. The sealed package may contain a chip carrier (CoS) with a wavelength deviation of ±1.2 nm from the nominal value.

3. The high-temperature (HOT) characteristic parameter is performed at 65°C.

# Available free-space encapsulation add-ons


9MM


TO-8


C-Mount


Transmitter Optical Subassembly (TOSA)

# Parameters

**Laser**

| Parameters | unit | Minimum | Typical values | Maximum |
|---|---|---|---|---|
| Storage temperature | ℃ | 0 | - | 70 |
| Shell operating temperature | ℃ | 5 | - | 70 |
| The laser chip operating temperature[1] | ℃ | 5 | - | 45 |
| Laser series resistance | Ω | - | 2 | - |
| Laser forward voltage @LIV current | V | - | 2 | - |
| Laser line width, typical @LIV current | kHz | - | 500 | - |
| Beam Divergence Angle @FWHM (θ∥ x θ⊥) | ° | - | 6x28 | 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/℃ | - | 0.06 | - |
| Current tuning rate | nm/mA | - | 0.002 | - |
| Laser reverse voltage | V | - | - | 0 |

1. If the package is not sealed, it is not recommended to work in an environment below the dew point

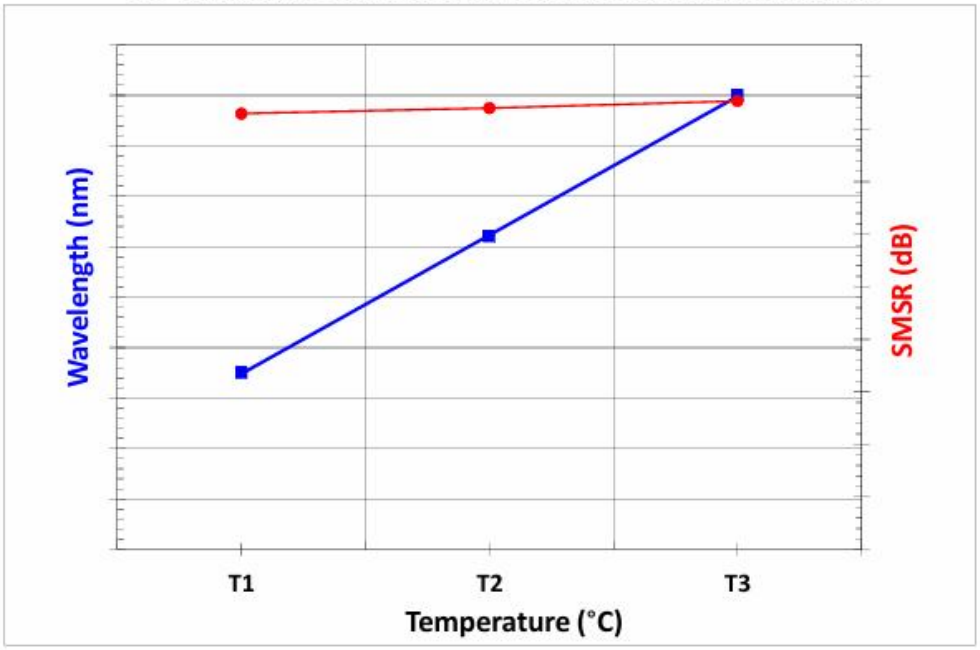
## Free space encapsulation add-ons

| 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 | - |

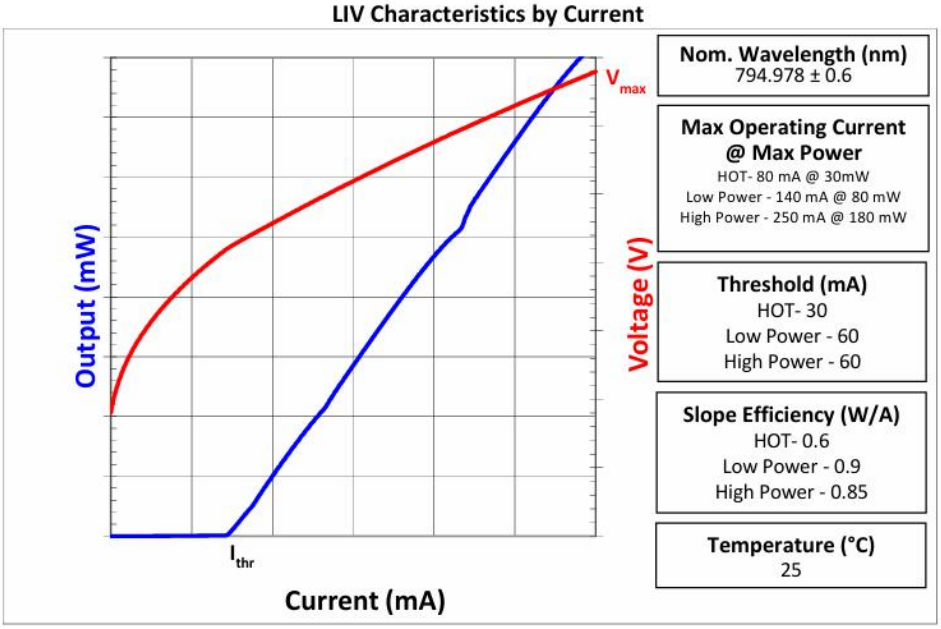
## Handling Precautions

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




**Nom. Wavelength (nm)**
794.978 ± 0.6

**Max Operating Current @ Max Power**
HOT- 80 mA @ 30mW
Low Power - 140 mA @ 80 mW
High Power - 250 mA @ 180 mW

**Threshold (mA)**
HOT- 30
Low Power - 60
High Power - 60

**Slope Efficiency (W/A)**
HOT- 0.6
Low Power - 0.9
High Power - 0.85

**Temperature (°C)**
25