# 4600 nm FP Quantum Cascade Laser, 2.5 W

## QF4600D4

## Description

The QF4600D4 is a single spatial mode, Fabry-Perot Quantum Cascade Laser designed and manufactured by Thorlabs. This laser operates in continuous wave (CW) mode at room temperature. The QF4600D4 is mounted on an open heatsink D-mount package with both the cathode and anode isolated from the heatsink base. This discrete semiconductor laser is a compact light source suited to many applications. A thermistor is integrated for temperature monitoring. There is no monitor photodiode.

## Specifications

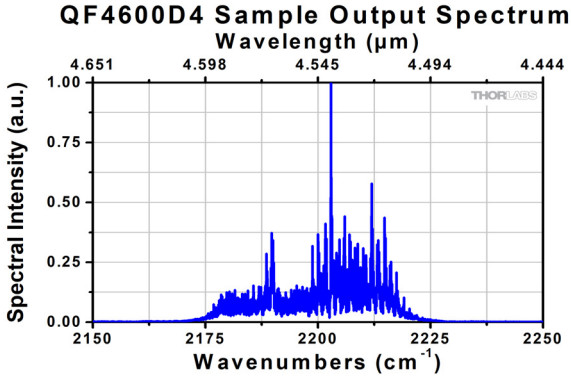
| General Specifications | |
|---|---|
| **LD Reverse Voltage (Max)** | 1 V |
| **PD Reverse Voltage (Max)** | N/A |
| **Absolute Max Current** | Varies Between Devices[a] |
| **Absolute Max Power** | 3500 mW |
| **Operating Temperature** | 15 to 50 °C[b] |
| **Storage Temperature** | -40 to 85 °C[b] |

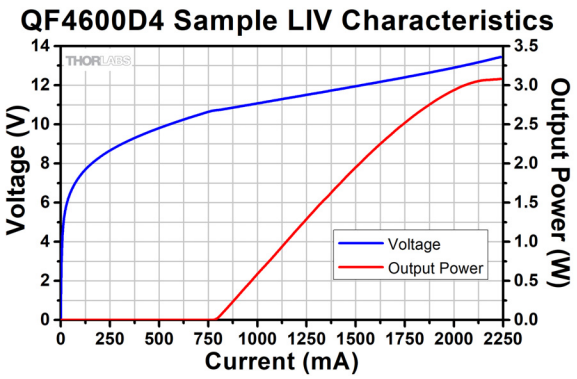
a. The absolute maximum current is determined on a device-by-device basis and is listed on the device's data sheet.
b. Non-condensing environment. Single spatial mode performance is tested and guaranteed at 25 °C.

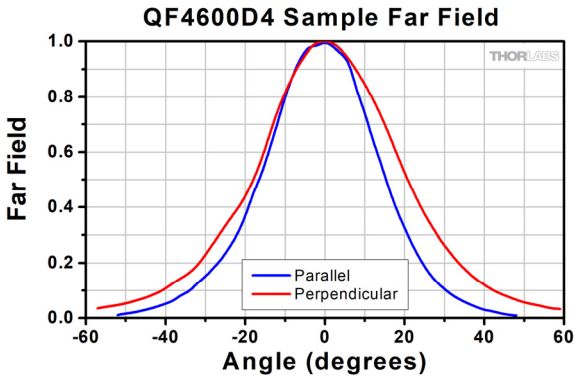
| Optical/Electrical Specifications[a] | | | | |
|---|---|---|---|---|
| | **Symbol** | **Min** | **Typical** | **Max** |
| **Center Wavelength**[b] | $\lambda_C$ | 4.45 µm | 4.6 µm | 4.75 µm |
| **Spectral Bandwidth (5 - 95% Integrated Power)** | $\Delta\lambda$ | - | 60 nm | - |
| **Output Power** | $P_{out}$ | 2.5 W | - | - |
| **Operating Current** | $I_{op}$ | - | 1800 mA | 2500 mA |
| **Threshold Current** | $I_{TH}$ | - | 800 mA | - |
| **Forward Voltage** | $V_F$ | - | 12.5 V | 15 V |
| **Slope Efficiency** | $\Delta P/\Delta I$ | - | 2.8 W/A | - |
| **Perpendicular Beam Divergence Angle (FWHM)** | $\theta_\perp$ | - | 40° | - |
| **Parallel Beam Divergence Angle (FWHM)** | $\theta_\parallel$ | - | 30° | - |
| **Thermistor Resistance**[c] | $R_T$ | - | 10 kΩ | - |
| **Steinhart-Hart Coefficients** | A | - | $1.129 \times 10^{-3}\ K^{-1}$ | - |
| | B | - | $2.341 \times 10^{-4}\ K^{-1}$ | - |
| | C | - | $0.878 \times 10^{-7}\ K^{-1}$ | - |

a. T = 25 °C, CW Current Operation
b. This laser exhibits broadband emission. The center wavelength is defined as a weighted average over all the modes.
c. Thermistor Resistance follows the Steinhart-Hart Equation: $\frac{1}{T} = A + B\ln(R_{TH}) + C(\ln R_{TH})^3$

## Performance Plots




## Drawing