7500 nm Quantum Cascade Laser, 100 mW

QD7500DM1

Description

The QD7500DM1 is a single spatial mode, single longitudinal mode, Distributed Feedback Quantum Cascade Laser designed and manufactured by Thorlabs. This discrete semiconductor laser is a compact light source suited to many applications. This laser operates in Continuous Wave (CW) mode at room temperature.

The QD7500DM1 is mounted on an open heat sink D-mount package with both the cathode and the anode isolated from the heat sink base and includes an integrated thermistor that can be used to precisely control the temperature of the laser. There is no monitor photodiode.

Specifications

QD7500DM1	
LD Reverse Voltage (Max)	1 V
PD Reverse Voltage (Max)	N/A
Absolute Max Current	Varies Between Devices[a]
Absolute Max Power	250 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

T_{case} = 20 °C, CW Operation

Optical Electrical Characteristics				
	Symbol	**Min**	**Typical**	**Max**
Wavelength at Minimum Operating Current	λ	7.00 µm	-	8.00 µm
Temperature Tuning	$\Delta\bar{\nu}/\Delta T$	-	-0.09 cm^{-1}/°C	-
Side Mode Suppression	SMSR	20 dB	-	-
Optical Output Power	P_{out}	20 mW	100 mW	-
Operating Current	I_{op}	-	-	600 mA[c]
Threshold Current	I_{th}	-	200 mA	400 mA
Forward Voltage	V_F	-	11.5 V	13.0 V
Perpendicular Beam Divergence Angle (FWHM)	$\theta_\perp$	-	55°	-
Parallel Beam Divergence Angle (FWHM)	$\theta_\parallel$	-	40°	-
Slope Efficiency, Front Facet	$\Delta P/\Delta I$	-	0.8 W/A	-

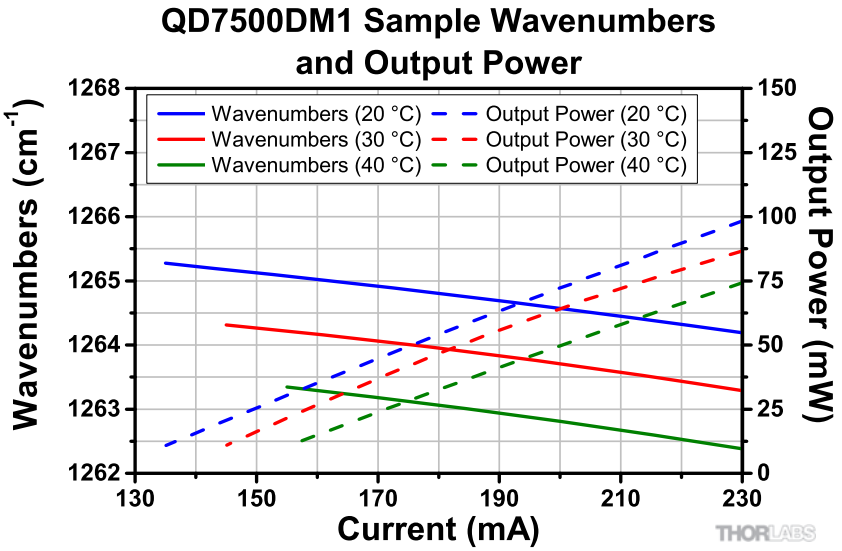
[c] No QD7500DM1 laser will have an absolute maximum current greater than 600 mA.

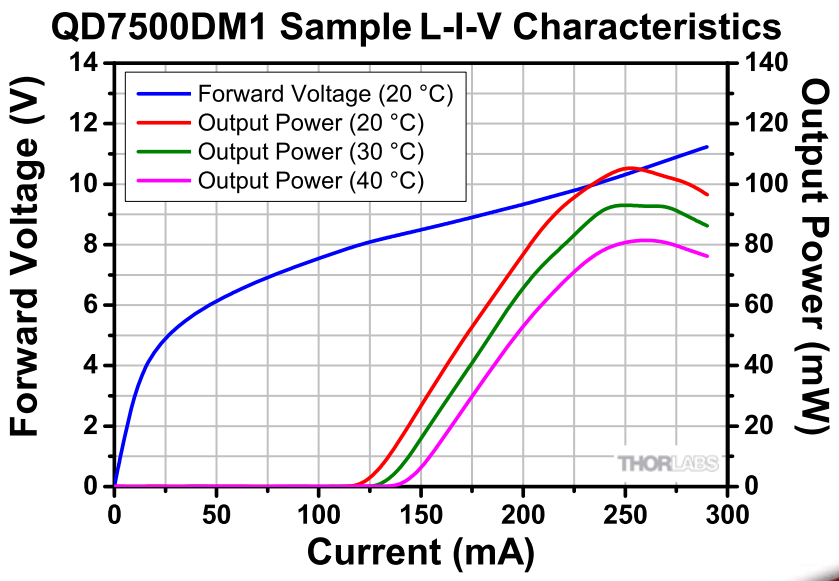
Thermistor Characteristics				
	Symbol	Min	Typical	Max
Thermistor Resistance[d]	R_{th}	-	10 kΩ	-
Steinhart-Hart Coefficients (T_{case} = 25 °C)	A	-	$1.129 \times 10^{-3}\ K^{-1}$	-
	B	-	$2.341 \times 10^{-4}\ K^{-1}$	-
	C	-	$0.878 \times 10^{-7}\ K^{-1}$	-

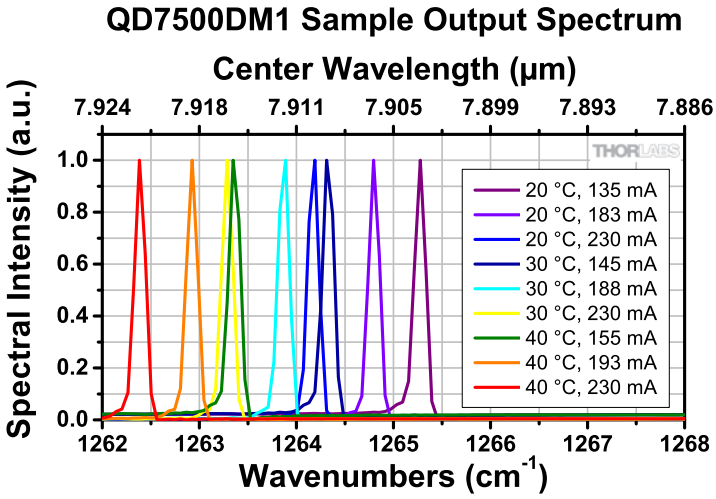
[d] Thermistor resistance follows the Steinhart-Hart equation:

$$\frac{1}{T} = A + B(\ln R_{th}) + C(\ln R_{th})^3$$

Sample Performance Plots







Drawings for QD7500DM1