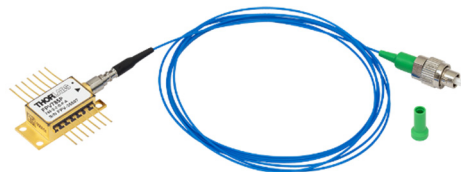


785 nm Grating Stabilized, Single-Frequency Laser Diode

FPV785P



Description

The FPV785P 785 nm, Single-Frequency, Wavelength-Stabilized Laser Diode is based on quantum well epitaxial layer growth and a highly reliable ridge waveguide structure with external volume-holographic-grating (VHG) feedback. This single-frequency laser diode is housed in a butterfly package with an internal optical isolator, monitor diode, TEC and a thermistor that allows the laser to be temperature controlled. This laser diode produces a wavelength-stabilized spectrum with a single-frequency narrow linewidth over the operating power range of approximately 30 to 50 mW. The output is coupled to 1.0 m of FC/APC-terminated PM780-HP fiber.

Specifications

Absolute Maximum Ratings ^a	
LD Reverse Voltage (Max)	2 V
PD Reverse Voltage (Max)	20 V
Absolute Max Current	410 mA
Absolute Max Power	100 mW
Operating Case Temperature	0 to 70 °C
Storage Temperature	-10 to 70 °C
Pin Code	14 Pin, Type 1

a. Do not exceed the maximum optical power or maximum drive current, whichever occurs first.

Characteristics (CW; $T_{CHIP} = T_{CS}$, $T_{CASE} = 0 - 70\text{ °C}$)				
	Symbol	Min	Typical	Max
Center Wavelength	λ_C	784 nm	785 nm	786 nm
Single Frequency Output Power ^a (CW @ I_{CW} and T_{CS})	P_{CW-SF}	40 mW	50 mW	-
Single Frequency Power Range	ΔP_{SF}	20 mW ^b	-	-
Operating Current (CW)	I_{CW}	-	-	410 mA
Center Temperature for $\Delta T_{stabilized}$	T_{CS}	15 °C	-	35 °C
Wavelength-Stabilized Temperature Range	$\Delta T_{stabilized}$	5 °C	-	-
Threshold Current	I_{TH}	-	80 mA	150 mA
Side Mode Suppression Ratio (SMSR)	SMSR	25 dB	40 dB	-
Internal Isolator Isolation	ISO	35 dB	-	-
Forward Voltage	V_F	-	2.1 V	2.8 V
Slope Efficiency at 25 °C	$\Delta P/\Delta I$	-	0.25 W/A	-
Laser Linewidth	$\Delta \nu$	-	15 MHz	-
Monitor Photodiode Current	I_{photo}	-	0.15 mA	-
Polarization Extinction Ratio	PER	15 dB		
TEC Operation (Typical/Max @ $T_{CASE} = 25\text{ °C} / 70\text{ °C}$)				
-TEC Current	I_{TEC}	-	0.13 A	1.4 A
-TEC Voltage	V_{TEC}	-	0.40 V	6.0 V
-Thermistor Resistance	R_{TH}	-	10 k Ω	-

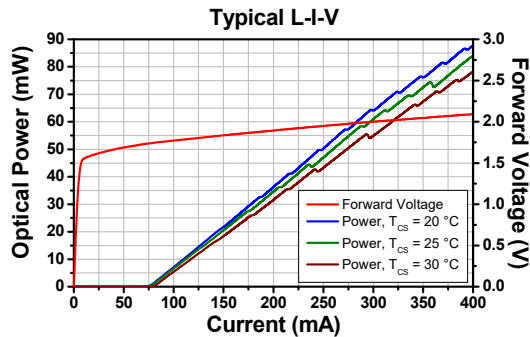
- This value is the upper limit of the range where the diode can produce a single-frequency output and varies from laser to laser. The performance of each individual laser can be found on the unit-specific data sheet.
- Multimode operation may occur below a minimum power threshold. This minimum power threshold can be found by subtracting the single frequency power range, ΔP_{SF} , from the maximum power, P_{CW-SF} . The maximum power will vary by item; see the item-specific data sheet for these values. This is valid over the temperature range $T_{CS} \pm \Delta T_{stabilized}/2$.

June 11, 2019

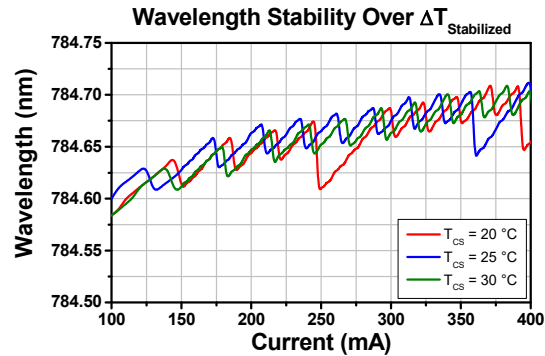
QTN034758-S01, Rev A

Typical Performance Plots

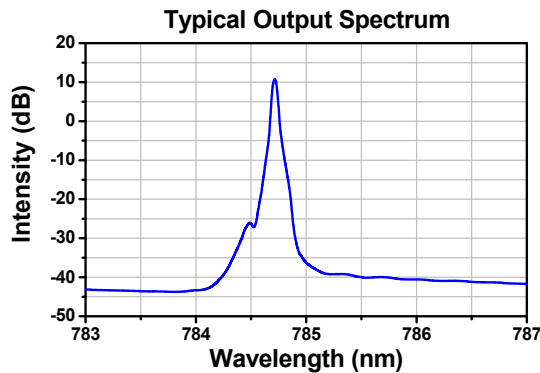
The plots below are typical; performance will vary between individual lasers. Each laser includes a serial-number-specific datasheet detailing performance.



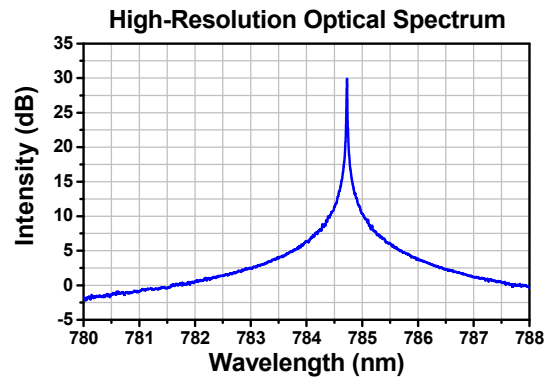
The typical output power vs. current is shown for three temperatures within the wavelength stabilized temperature range ($T_{CS} \pm \Delta T_{\text{stabilized}}/2$) of a FPV785P laser diode.



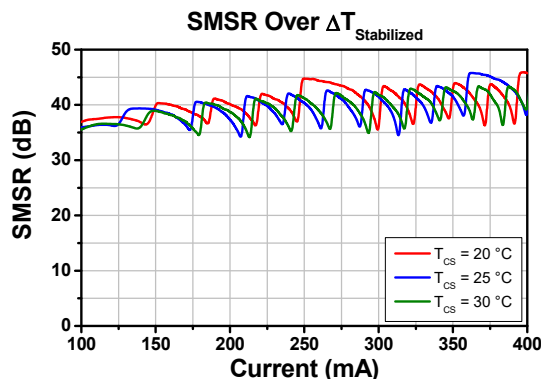
When used within the wavelength stabilized temperature range ($T_{CS} \pm \Delta T_{\text{stabilized}}/2$), the FPV785P laser shows excellent wavelength stability over a range of drive currents.



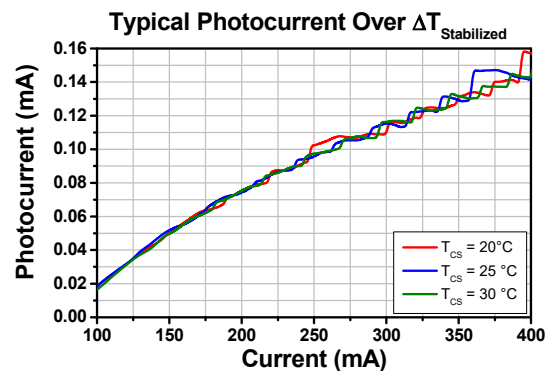
The typical optical spectrum is shown above. The data was obtained with a 400 mA drive current and the device held at $25\text{ }^{\circ}\text{C}$.



This high-resolution optical spectrum was obtained using one of Thorlabs' Optical Spectrum Analyzers (OSA201C), which provides 8 pm resolution at 785 nm.

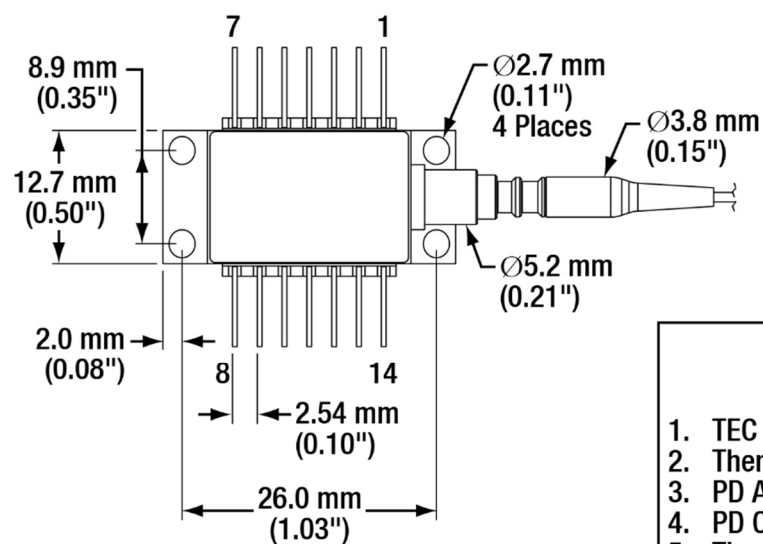


The typical side mode suppression ratio (SMSR) is shown for three temperatures within the wavelength stabilized temperature range ($T_{CS} \pm \Delta T_{\text{stabilized}}/2$).



The typical monitor photodiode current over laser diode current is shown above.

Drawing



PIN IDENTIFICATION

1. TEC +	14. TEC -
2. Thermistor	13. Case Ground
3. PD Anode	12. NC
4. PD Cathode	11. Laser Cathode
5. Thermistor	10. Laser Anode
6. NC	9. NC
7. NC	8. NC

