

Narrow-Linewidth Laser Module **ATR20201**

Features

- Maximum Output Power: 500 mW
- Central Wavelength: 785, 830, or 1064 ± 0.5 nm
- Narrow Linewidth (FWHM): < 0.08 nm
- Power Stability: $< 0.4\%$ over 2 hours
- Long Lifespan: Over 10,000 hours of fault-free operation
- Output Fiber: 105/125 μm , 0.22 NA, FC/PC
- Control Interface: UART
- Power Supply: +5V DC $\pm 5\%$

Application

- Raman Spectroscopy
- Biomedical Research
- LiDAR (Laser Imaging, Detection, and Ranging)

Description

The Optosky ATR20201 ultra-thin narrow-linewidth laser is a cutting-edge tool for constructing high-performance Raman spectrometers. It operates with a constant power control mode, allowing precise adjustment of laser output power through software commands. Featuring a 105 μm core diameter fiber output and an FC/PC fiber interface, it is designed for optimal performance.

Available in wavelengths of 785 nm, 830 nm, and 1064 nm, the ATR20201 is known for its high reliability and ultra-narrow linewidth, making it ideal for Raman spectroscopy. This narrow-linewidth laser uses a 5V power supply and can output up to 500 mW of power, enhancing spectral stability and high resolution in scientific research and analytical instrumentation. It features low noise and adjustable power, controlled via a TTL interface with specific output definitions and communication protocols. This advanced laser technology is well-suited for spectral analysis, biomedical research, and material characterization, providing precise control for both research laboratories and industrial applications.

Model	Features
ATR20201-785	785 nm, 500 mW
ATR20201-830	830 nm, 500 mW
ATR20201-1064	1064 nm, 500 mW

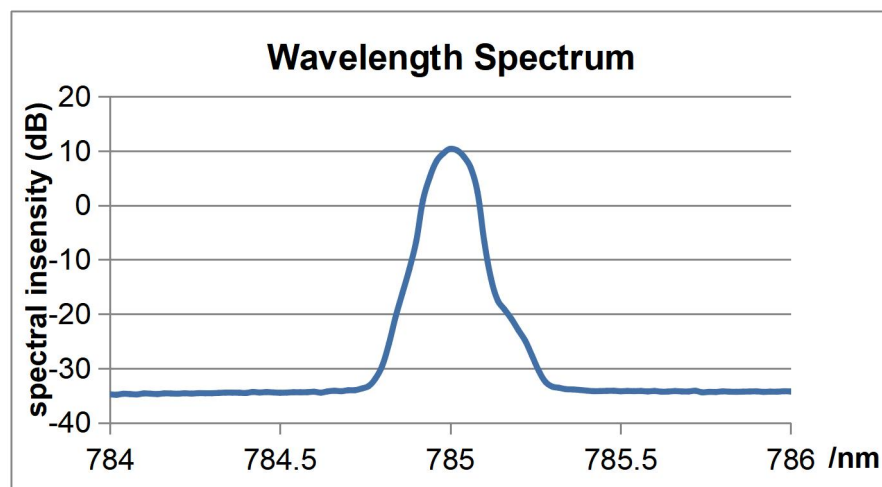


1. Parameter

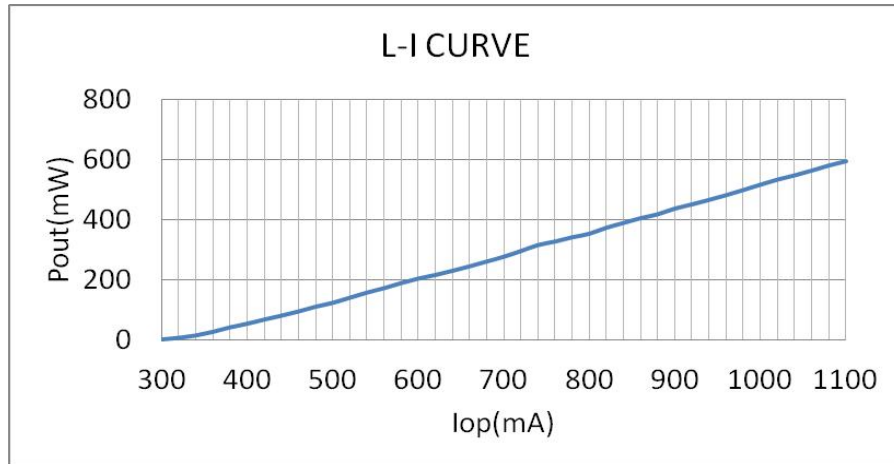
Optical Parameter	Specification			Working Conditions
Central Wavelength	785, 830, 1064 ±0.5 nm			/
Spectral Linewidth	0.06 ±0.02 nm			FWHM
Maximum Output Power	500 mW			Multi-mode fiber coupling
2h Power Stability	0.40%			RMSE
Stability Time	5 s			Warm-up Time
SMSR	>40 dB			/
Fiber Specification	105/125 μm Multi-mode fiber 0.22 NA			Fiber Coupling
Fiber Interface	FC/PC			Fiber Coupling
Electrical Parameter				
LD Operating Current	300 mA	700 mA	1000 mA	/
TEC (°C) (±5)	/	25 °C	/	/
Operating Voltage	4.75 V	5 V	5.25 V	/
Current (Laser On)	/	0.75 A	2.5 A	TEC ON
Current (Laser Off)	/	0.3 A	1.3 A	TEC ON

2. Laser Parameter

Minimum Operating Current (A)	Maximum Laser Power (mW)	Maximum Operating Current (A)	Central Wavelength (nm)	FWHM (nm)	SMSR (dB) TYP.
0.3	500	0.98	785 $\pm$ 0.5	0.1	>40



****Figure 1: Center Wavelength Output of the ATR20201-785 Laser****



****Figure 2: Relationship Between Output Laser Power and Operating Current****

3. Reliability and Stability

Figure 3 shows the power measurement taken every second after the laser is turned on, recording the time required for the laser power to stabilize at the set value of 250 mW. The typical stabilization time is 5 seconds. This parameter directly impacts its application in rapid detection.

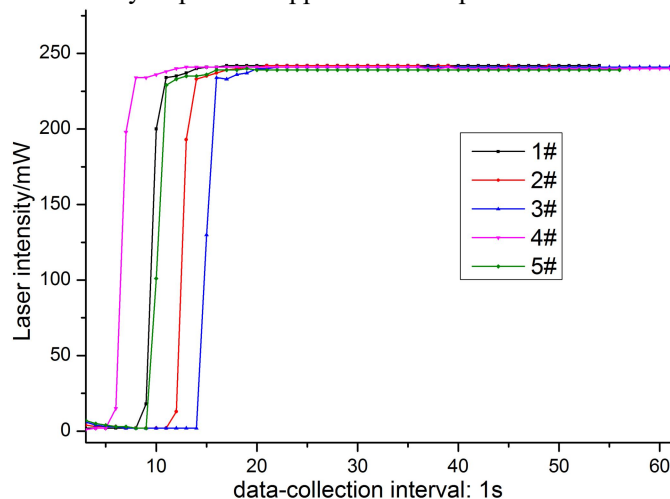


Figure 3 shows the power stability test results for five units, with 2-hour power stability being less than 0.4%.

Figure 4 presents the long-term power stability test results for these five units, indicating that the laser exhibits good stability during continuous operation.

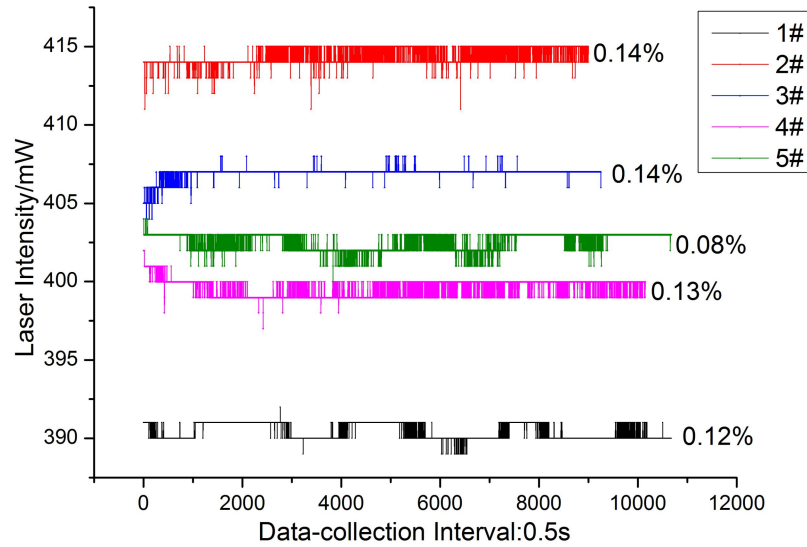


Figure 4 shows the long-term stability results (1.5 hours) for five units

4. Mechanical Drawings

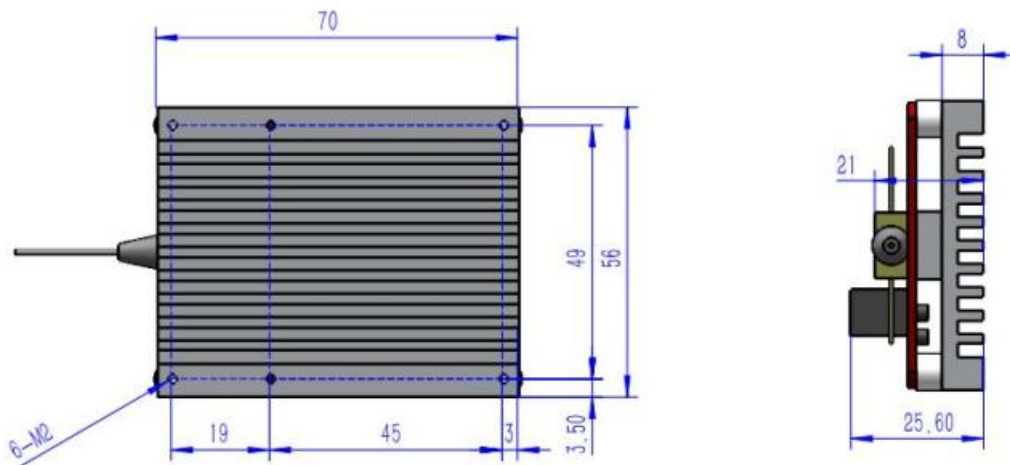


Figure 5 Installation Hole Diagram and Dimensions of the ATR20201