

Narrow Line Laser Module

ATR20202

Features:

- Laser wavelength: 532, 638, 785, 830, 1064nm optional
- High output power, output power can be set
- Fiber output, flexible integration
- Laser Linewidth (FWHM): < 0.08 nm
- Output Fiber: 105/125 μ m, 0.22NA
- Optical interface: FC/PC
- Electrical interface: UART
- +5V/DC power supply

Applications:

- Raman spectrometer
- Bio-medical
- Optical Fiber Sensing

Description:

ATR20202 series narrow linewidth Raman laser, built-in high stability laser, supplemented by TEC cooling, constant temperature management of laser tube, to ensure the stability of laser wavelength and power output. The ATR20202 outputs an ultra-pure monochromatic laser with a linewidth <0.08nm, which is very suitable for Raman spectrometers. ATR20202 adopts UART interface, accepts the command from the system, and according to the command turns on or off the laser, or outputs the laser with the specified power. All actions can be controlled through the UART interface.

ATR20202 only needs 5V power supply, the current and laser power of each model will be slightly different.

Model	Laser Wavelength	Maximum laser output power
ATR20202	785nm	600mW
ATR20202-532	532nm \pm 0.5nm	100mW
ATR20202-638	638nm \pm 0.5nm	100mW
ATR20202-830	830nm \pm 0.5nm	600mW
ATR20202-1064	1064nm \pm 0.5nm	600mW



Figure 1 ATR20202 with optical fiber

1. Selection Guide

Table 1 ATR20202 product selection table

Model	Laser Wavelength	Maximum laser output power	Line-width
ATR20202	785nm±0.5nm	600mW	< 0.08 nm
ATR20202-532	532nm±0.5nm	100mW	< 0.08 nm
ATR20202-638	638nm±0.5nm	100mW	< 0.08 nm
ATR20202-830	830nm±0.5nm	600mW	< 0.08 nm
ATR20202-1064	1064nm±0.5nm	600mW	< 0.08 nm

2. Parameter

Parameter	ATR20202	ATR20202-532	ATR20202-638	ATR20202-830	ATR20202-1064
Center Wavelength	785nm±0.5 nm	532nm±0.5nm	638nm±0.5nm	830nm±0.5nm	1064nm±0.5nm
Line-width FWHM	<0.08 nm				
Maximum output power	600 mW	100mW	100mW	600mW	600mW
Long-term stability (2 hours, RMSE)	0.2%	0.5%	0.5%	0.2%	0.2%
Power stabilization Time	<7s	<12s	<12s	<7s	<7s
SMSR	>40 dB	>38 dB	>38 dB	>40 dB	>40 dB
Output fiber	105/125um multi-mode fiber 0.22NA				
Connector	FC/PC				
Electrical parameters					
Laser chip Working Temp	25 °C				
Power Supply	5 V±5%				
Working current (laser on)	2.5 A	1.8 A	1.8 A	2.5 A	2.5 A
Working current (laser off)	1.3 A	1.3 A	1.3 A	1.3 A	1.3 A
Dimension/mm	67.5X67X26mm				
Weight	~85g±20g				

3. Technical Parameter

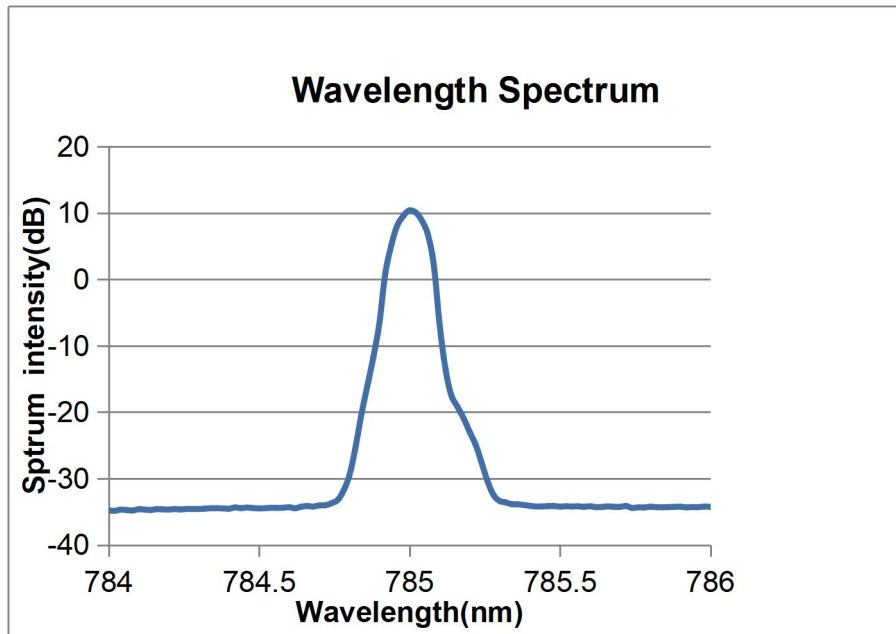


Figure 2 the locked center wavelength of the laser ATR20202 output

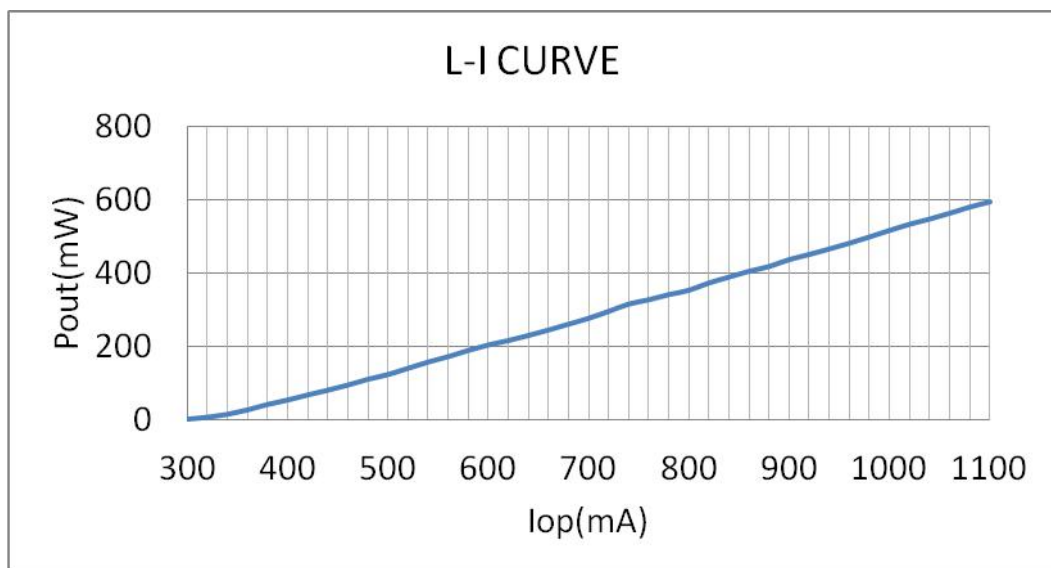


Figure 3 the relationship between output laser power and the operation current

4. Reliability and Stability

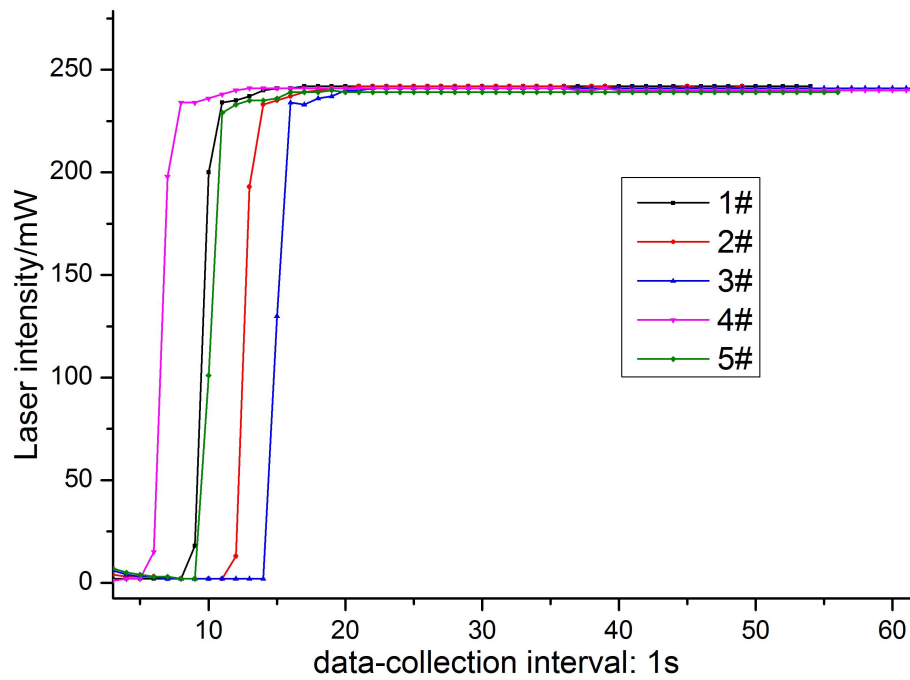


Figure 4 Power stability testing results of 5 samples

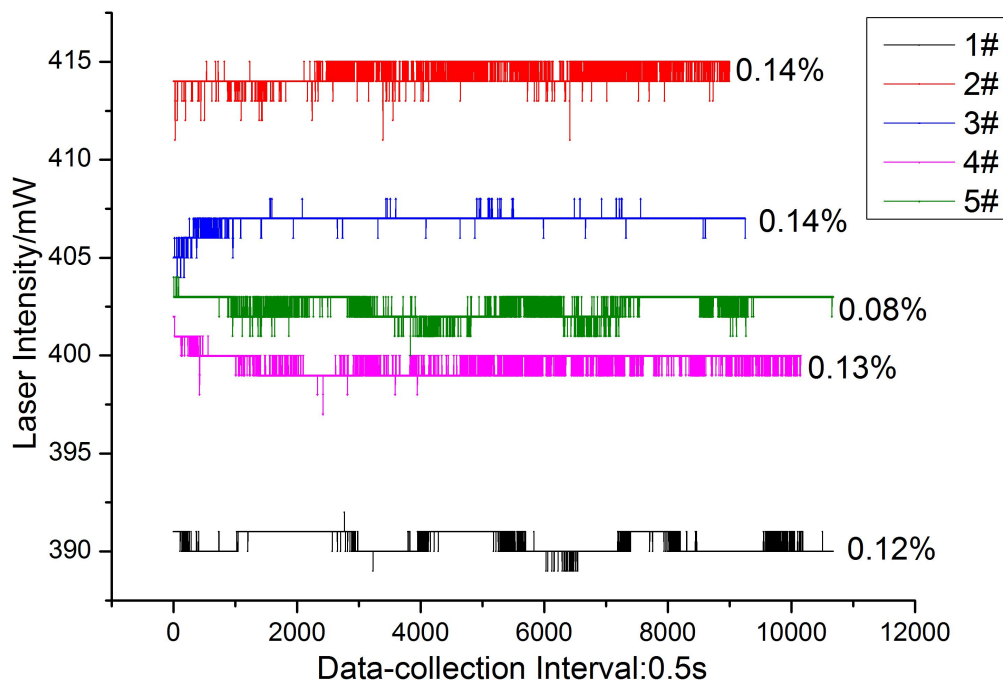


Figure 5 Long term stability testing results of 5 samples

5. Electrical Pin-out

The module is equipped with a 10-pin (male) connector (2x5, 2 mm pitch) The Pin-out is outlined in Table below. Refer to the Figure 6 for the pin numbering.

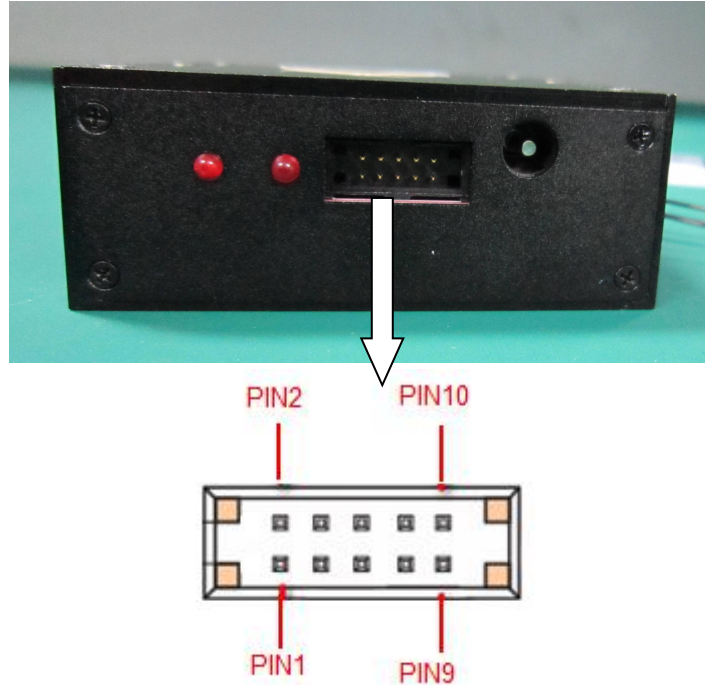


Figure 6 PIN drawing

Table 1 Pin-Out Function Descriptions

Pin	Description	INPUT/OUTPUT	Function Description
1	NC		Not used
2	NC		Not used
3	NC		Not used
4	NC		Not used
5	TX	Output	RS-232 serial input signal,3.3V TTL levels
6	RX	Input	RS-232 serial output signal ,3.3 V TTL levels
7	GND	Input/output	Ground
8	GND	Input/output	Ground
9	VCC	Output	5V power supply
10	VCC	Output	5V power supply

6. Communication Protocol

6.1 Serial Interface

The RS232 serial interface is at 3.3V TTL levels, and the default setting as below:

Table 2 Defaults UART parameters

Parameter	Default
Data rate (baud)	115200
Data bits	8
Parity	None
Stop bits	1
Flow control	None

a) RS232 Protocol and Command Format

Host send:

0,1	2, 3	4	5... (N-1)	N
Head (2bytes)	Length (2 bytes)	Command ID (1byte)	Data	Checksum (1byte)

LD module response:

0, 1	2, 3	4	5... (N-1)	N
Head (2bytes)	Length (2bytes)	Command ID (1byte)	Data	Checksum (1byte)

Description:

All data sent to/from the spectrometer is encoded in Hexadecimal format.

Head: 2bytes, used to locate the start of a communication packet, fixed to "0xAA 0x55".

Length: 2 bytes, number of bytes from "Length" to "Checksum".

Example: the command length is 1000 bytes, the length = 0x03E8.

The MSB byte is 0x03, and the LSB byte is 0xE8.

Command ID: 1byte.

Data: The Data is determined according to the command, and the Data can be empty.

Checksum: 1byte, accumulation of all bytes from "Length" to "Data".

i.e Checksum = (Length + Message ID + Data)&0xff.

Example:

Command : Get spectrum version: (all data is Hexadecimal data)

Host send: AA 55 00 04 02 06

Note:

Head: AA 55

Length: 00 04

Command ID: 02

Data: Blank

Checksum: 06 = 0x00+0x04+0x02.

LD module response: AA 55 00 0A 02 30 30 30 30 30 30 2C

B) Commands overview

No.	Description	Command ID	Host Send	LD module Response
1	Get spectrum firmware version	0X02	<Head><Length><Command ID><Checksum>	<Head><Length><Command ID><Data><Checksum> Data: 6 bytes, Hardware version (3bytes) + software version (3bytes), encoded in US ASCII.
2	Get manufacture name	0X09	<Head><Length><Command ID><Checksum>	<Head><Length><Command ID><Data><Checksum> Data: 6 bytes, encoded in US ASCII. i.e OPTOSKY
3	Set LD Current	0X20	<Head><Length><Command ID><data><Checksum> Data: 2bytes, encoded in HEX. Range from (0x0000~0x03E8mA),the units is mA.	<Head><Length><Command ID><Data><Checksum> Data: 0x00 -- success 0x01 -- fail

7. Mechanical Drawings

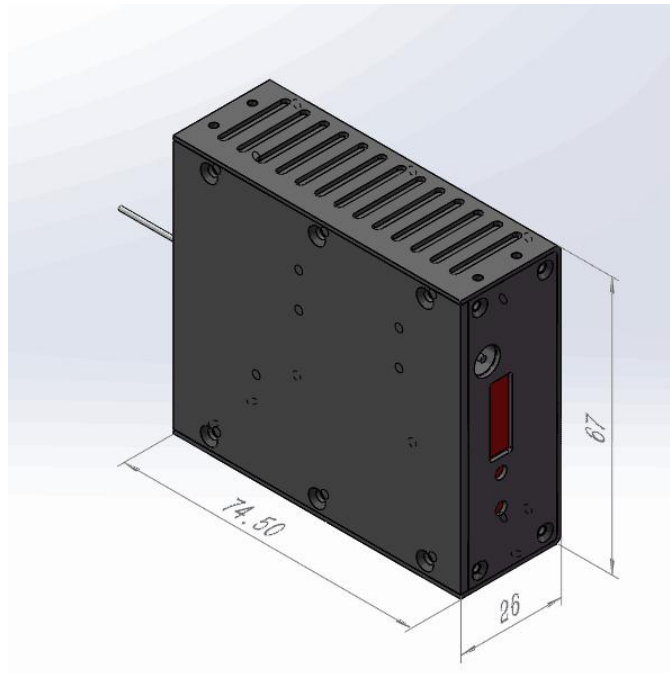


Figure 7 ATR20202 outline dimensions

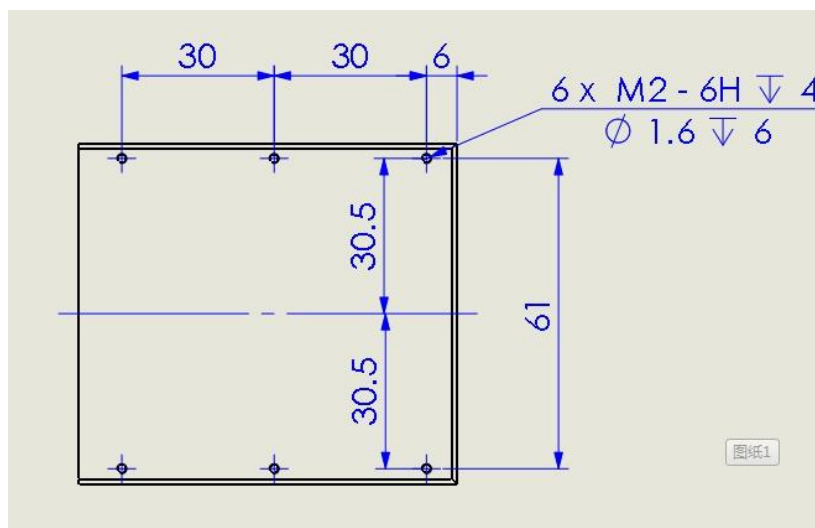


Figure 8 The mount holes of ATR20202

8. Application for Raman Spectrometer

