# AMRL-001 Series Solid state laser for atmospheric particulate matter lidar

## DESCRIPTION

AMRL-001 series is a high frequency nanosecond all solid state laser. These lasers have high peak power, repetition rate over KHz, and pulse width of about 10ns.

Optical design with end pump + acoustooptic Q-switch. Full air cooling design can meet the complex working conditions at wide temperature. Structural stability and reliability, after a long period of customer validation, can achieve 7 × 24 hours of trouble-free operation.

Typical applications are the matching light sources for atmospheric particulate matter lidar. Used for real-time monitoring of atmospheric environment changes. Backscattered light is produced by the interaction of a pulsed laser with particulate matter in the atmosphere. The scattered signal is received by the telescope system and passed through the photoelectric detection system and the signal acquisition system. The spatial distribution of extinction coefficient and depolarization coefficient of atmospheric particulates is then inverted by computer. This enables the detection of atmospheric quality.

## FEATURES

- Compact structure and high compatibility
- Wide temperature, working temperature -10~60 °C
- Good beam quality and directional stability
- Adaptive parameter control
- High level of protection, anti-vibration design
- Industrial grade 7*24 hour design

## APPLICATIONS

- Atmospheric Particle Detection
- Laser ranging
- 3-D Imaging, Remote Sensing

## PARAMETERS

| | | |
|---|---|---|
| Energy@532nm[a] | | ≥500μJ@25℃ |
| Average output power | | 2.5 W @ 5 KHz |
| Power stability | | ≤ 2 % @ 25℃ @ 8h |
| Pulse width | | <15ns, Type.13ns |
| Beam quality $M^2$ | | <1.3 |
| Repetition frequency | | 3-7KHz Adjustable Default 5KHz |
| Full angle of beam divergence | <3mrad | <150μrad @ Full angle @ Beam expansion ×15 |
| Spot diameter | | <600μm |
| Polarization ratio | | >100:1 |
| Beam directivity | | ≤50μrad @ 25℃ |
| Synchronous output signal | | 3.3V~5V @ 50Ω TTL signal，Width≥1μs，Rising edge≤50ns，Jitter<2ns |
| Communication interface | | 4PM terminal ，RS232 communication protocol |
| Cooling mode | | TEC refrigeration, radiator and fan |
| Power supply | | 24V DC |
| Laser Head Size[b] | | 250mm×240mm×105mm |
| Power waste[c] | | Normal temperature：90W；<br>High temperature：200W |
| Total weight | | 7Kg |
| Laser lifetime | | > 8500h |
| Working temperature[d] | | -10~+60℃ |
| Storage temperature | | -20~+70℃ |
| Relative humidity | | 0~80% |

a. The output index and shape of 1064nm and 532nm lasers are the same, and they are two lasers of the same model.

b. This laser is convenient for customers. Except for the four laser modules (laser head module, LD pump source module, Q-switch module and circuit control module), it cannot be changed. The layout of other parts of the laser can be adjusted according to customer requirements.

c. The laser cooling fan is adaptive. The power consumption of low-speed operation at room temperature is about 90W, and that of high-speed operation at high temperature is about 200W.

d. Under high temperature, the laser can work normally, but the output energy will be reduced.

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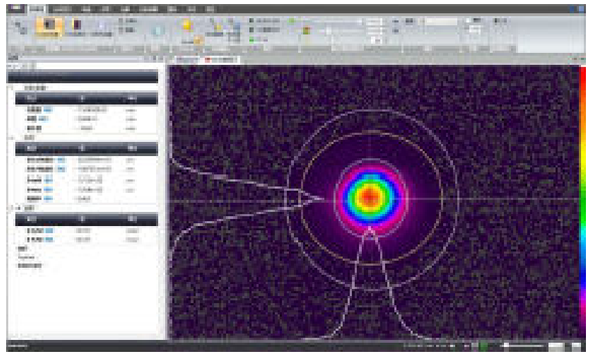
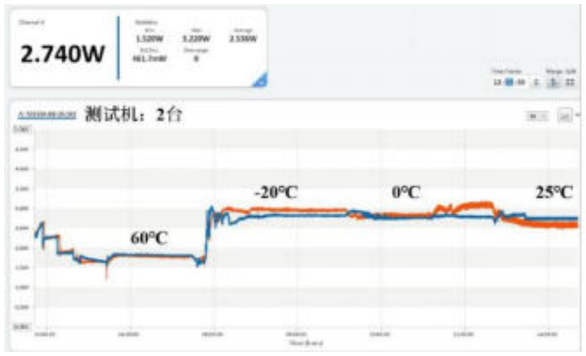
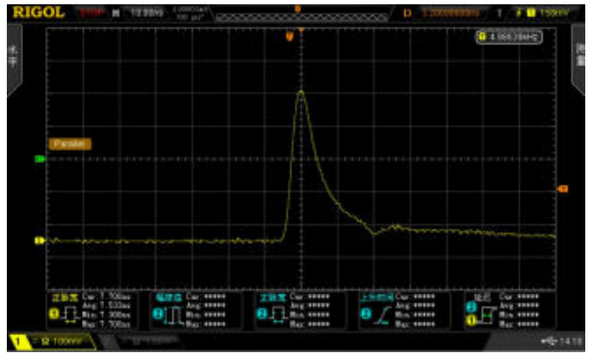
## OPTICAL PARAMETERS



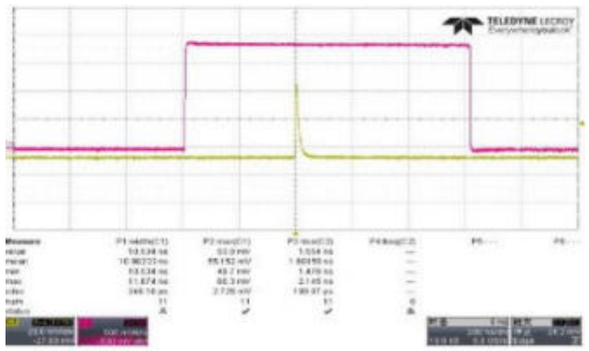
Divergence angle X:0.151mrad Y:0.131mrad




High and low temperature energy test

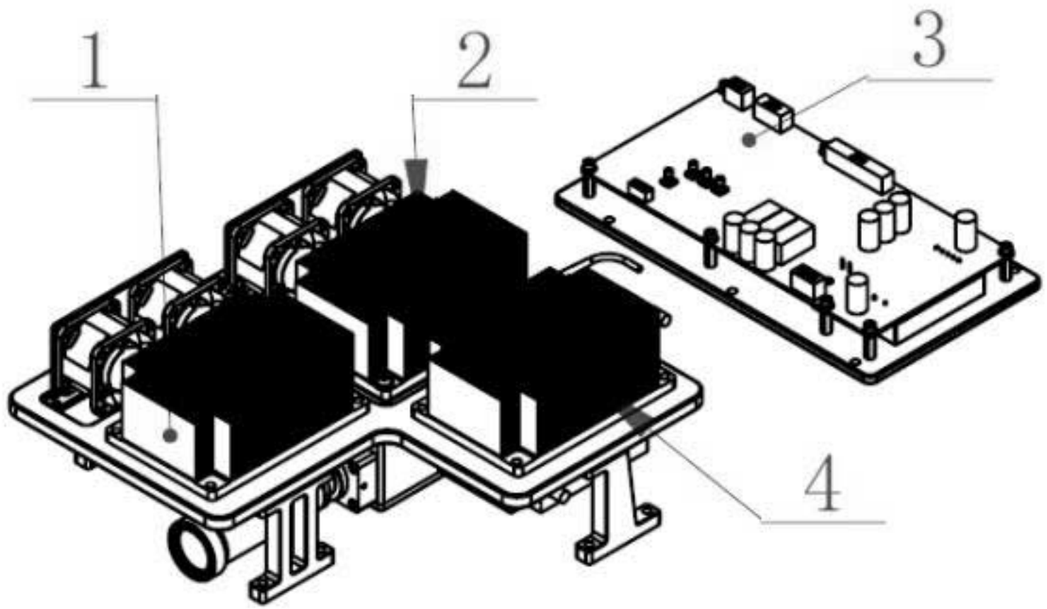



Pulse width: 7.53ns




Q signal synchronous output

## OUTLINE SIZE(mm)




1. LD module
2. Laser head
3. Power control module
4. Acoustooptic drive module

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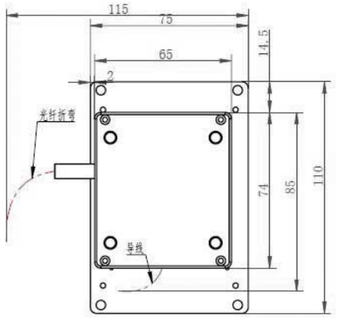
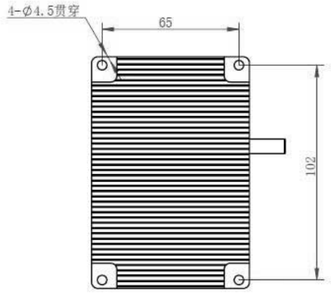
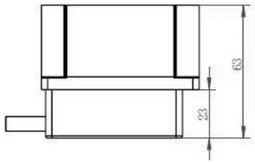
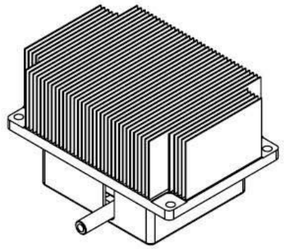
## OUTLINE SIZE(mm)

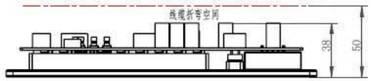


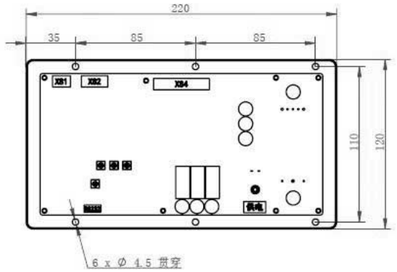



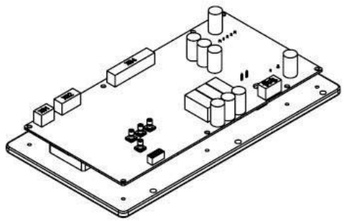



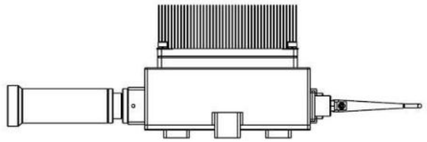
LD module

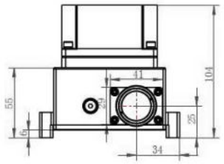


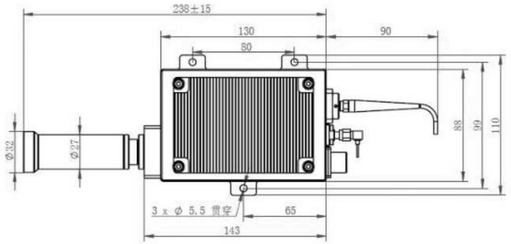



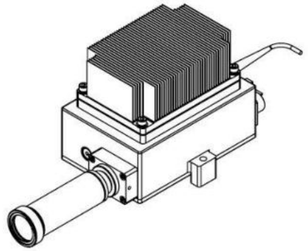



Power control module

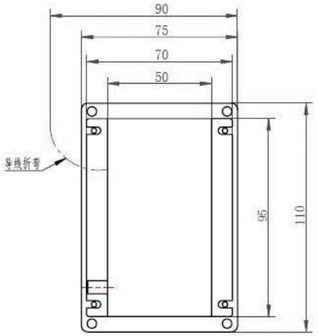


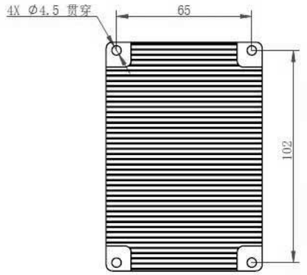


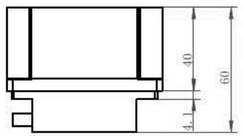



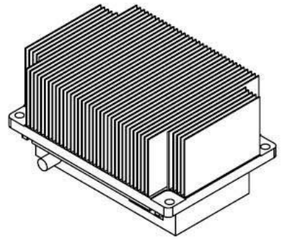



Laser head module



Acoustooptic drive module

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