YZT-CJ-1210A

Laser Range Finder Module

Technical Specification

1. Overview

The YZT-CJ-1210A Laser Rangefinder is an eye-safe laser rangefinder within the optoelectronic system, capable of detecting target distances and transmitting the measured distance to the host computer via serial communication.

2. Structural Composition and Main Performance Indicators

The YZ-CJ-1210A Laser Rangefinder consists of a laser, a transmission optical system, a reception optical system, and a control circuit. The main performance characteristics are as follows:

2.1 Main Function

- Responds to laser ranging commands, enabling single measurement, continuous
- measurement, and stop measurement;
- Self-check function
- Distance measurement has a gating function
- Multi-target ranging capability;

2.2 Performance

- wavelength：1535nm±5nm；
- Continuous ranging frequency：1~10HzAdjustable；
- Ranging Range: Visibility not less than 15km, relative humidity not more than 70%,
- diffuse reflection coefficient not less than 0.2, for a 2.3m×2.3m target; maximum range ≥12000m, minimum range ≤50m;
- Ranging cycle: 10 minutes of continuous ranging (10Hz);
- Ranging Accuracy：≤±3m（RMS）；
- Accuracy Rate：≥98%；
- Ranging resolution：≤30m（Multi Tasks）；
- Emission Aperture: 14.4±1mm, Reception Aperture: 47±1mm
- Power Supply Voltage：DC9V～36V；（Adjustable）
- Power consumption: average power consumption ≤2W (working at 1Hz), peak power consumption ≤7W, standby power consumption ≤1W;
- Dimension：≤101mm×60mm×70mm；
- Weight：≤260g；

2.3 Interface Description

Communication Interface: RS422, 115200bps, wiring definition as shown in Table 1;

Table 1: Wiring Definition for 8P Socket

Serial No.	Definition	wire color	Remarks
1	RS422 RX+	Brown	RS422 Receive (+)
2	RS422 RX-	Blue	RS422 Receive (-)
3	RS422 TX-	Yellow	RS422 Transmit (-)
4	RS422 TX+	Purple	RS422 Transmit (+)
5	GND	White	Communication Interface Ground
6	+5V	Red	Power Supply
7	GND	Black	Power Supply Ground
8	Reserved	Blank	Reserved

2.4 External Dimensions, Installation Size Requirements

For detailed information, please refer to the product's three-dimensional envelope and assembly drawing.

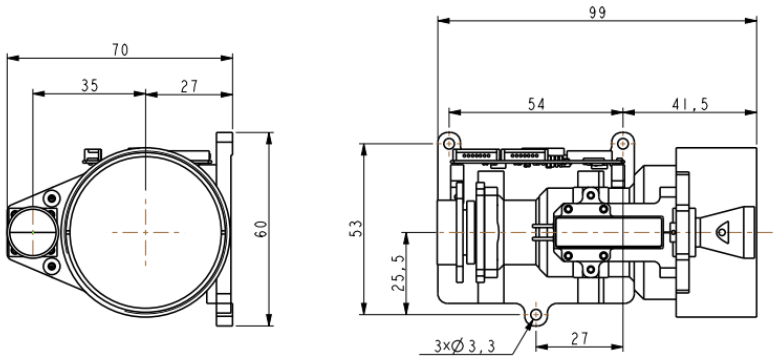

Figure 1: Three-dimensional Envelope Diagram

Figure 2: Three-dimensional Diagram of the Rangefinder

2.5 Power Supply Characteristics Requirements

Must meet the requirements for DC power supply characteristics as specified in GJB181A-2003 section 5.3;

2.6 Ventilation and Cooling Method and Heat Dissipation

Natural Cooling

2.7 Reliability Requirements (Assessed with the System)

MTBF (Mean Time Between Failures): The design specifies a value of 4200 hours, with the lowest acceptable value for design finalization being 3400 hours.

2.8 Environmental Technical Requirements

2.8.1 High Temperature Requirements:：

Operating temperature range: +60°C, maintain temperature for 2 hours; storage temperature range +65°C.

2.8.2 Low Temperature Requirements:：

Operating temperature range: -40°C, maintain temperature for 2 hours; storage temperature range -55°C.

2.8.3 Vibration Requirements

Shock and vibration: Capable of withstanding flight vibration and the shock during takeoff and landing, all equipment can endure the environmental conditions of automobile transportation. Specific requirements are as follows:

Vibration: The vibration spectrum is shown in Figure 3 and Table 2.

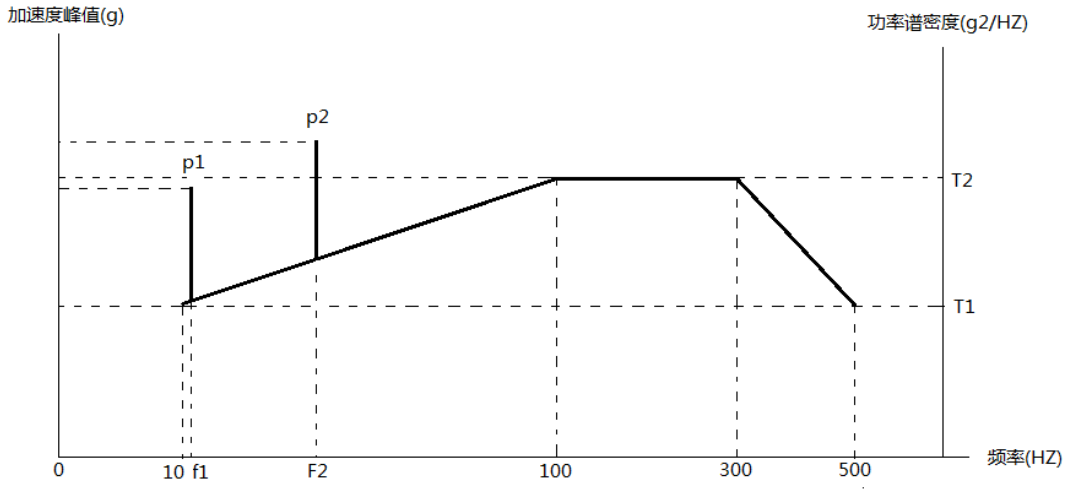

Figure 3: Vibration Spectrum

Table 2: Vibration Spectrum Values

Fixed Frequency Vibration		Random Vibration	
Frequency（HZ）	Peak Acceleration（g）	Frequency（HZ）	Power Spectral Density（g²/HZ）
f 1 =12.1	p 1=0.1	10～500	T1=0.0007
F 2=24.3	P 2=0.2		T2=0.006

The vibration test should be conducted in accordance with the GJB150.16 A -2009 "Military Equipment Laboratory Environmental Test Methods Vibration Test" regulations. The requirements for shock are as follows:

- Vertical axis ≥ 10g，
- Lateral axis ≥ 10g，
- Longitudinal axis ≥ 10g；

The tests should be conducted in accordance with GJB150.18 A -2009, "Military Equipment Laboratory Environmental Test Methods - Shock Tests."

3. User Precautions

The laser emitted by this rangefinder is 1535nm, which is safe for human eyes. Although it is an eye-safe wavelength, it is advised not to look directly into the laser.

When adjusting the parallelism of the optical axis, be sure to cover the receiving

lens to avoid permanent damage to the detector due to excessively strong echoes.

This rangefinder module is not airtight. Ensure that the relative humidity of the environment is below 80% and maintain a clean and sanitary environment to prevent damage to the laser.

The range of the rangefinder is related to atmospheric visibility and the nature of the target. Range will be reduced in fog, rain, and sandstorms. Targets like green tree clusters, white walls, and exposed limestone have better reflectivity and can increase range. Additionally, increasing the angle of the laser beam to the target will reduce the range.

Do not emit lasers at highly reflective targets such as glass or white walls within 20 meters to avoid echo overstrength and damage to the APD detector.

Do not plug or unplug cables while the device is powered on.

Ensure the correct polarity of the power supply connection to avoid permanent damage to the equipment.