



DATASHEET

A06 Series Sensor Module

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Product Description

1. General

The A06 sensor module uses ultrasonic sensing technology for distance measurement. The module adopts high-performance processor and high-quality components, the product is stable and reliable, and has a long service life. The module uses a waterproof ultrasonic transducer, has a built-in high-precision ranging algorithm and power management program, with high ranging accuracy, low power consumption, long measurement distance, and small measurement angle.

The A06 integrated ultrasonic sensor module has a variety of ranging modes and output modes to choose from. You can choose to perform targeted measurements on the human body or flat objects. The output can be set to high-level pulse width output, UART output (automatic or controlled) , Switch output.

2. Features

- Adopts intelligent signal processing circuit, small blind zone and long measuring range
- Build-in high precision algorithm, minimum error <5mm
- Controllable measuring angle, high sensitivity and strong anti-interference ability
- Build-in true target recognition algorithm, high target recognition accuracy
- The measurement mode can be set to target the human body and flat objects.
- Multiple output interface optional, PWM, UART, SWITCH
- Internal temperature compensation, stable value output from -15°C to +60°C
- Low power consumption design, operating current<15mA(3.3V input voltage) Static current<5uA
- 3.3-5.0V power input
- nti-static electricity design in accordance with IEC61000-4-2 standard
- Operating temperature from -15°C to +60°C

3. Applications

Horizontal distance sensing

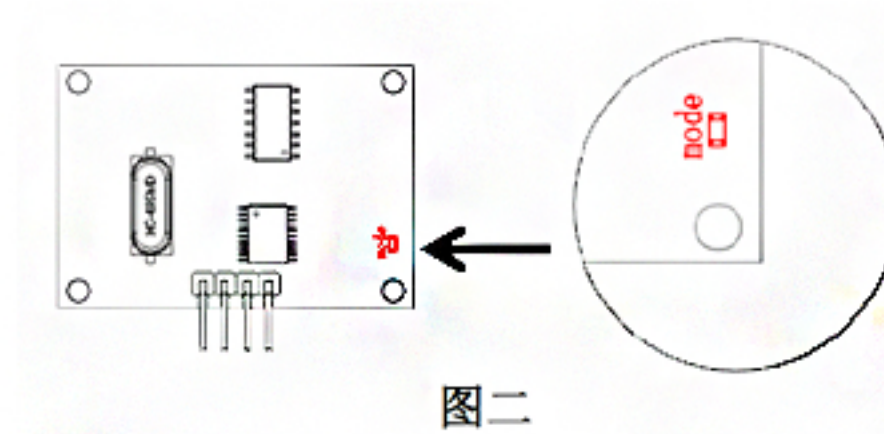
Car Parking system

Smart waste bin management system

Robot avoidance and automatic control

Object proximity and presence awareness

Operating Modes



The module has two measurement modes: plane and human body which set by hardware. The module can be set to different measurement modes by changing the circuit board mode and setting the resistance value.

The mode setting resistor is located on the back of the circuit board, the position marked mode, the following figure is a detailed description.

Note: The mode setting resistance is 0603 volume package, factory default is empty.

1. Flat Object mode

When the mode setting resistance value is floating, 0Ω , $20K\Omega$, $36K\Omega$, the module is set to plane mode. In plane mode, there are four output interfaces including UART automatic output, UART controlled output, high-level pulse width output, and switch output.

Under UART automatic output, the RX pin is connected to a low level, output real-time value (real-time measurement data), which can improve the output data refresh speed. when it is floating or connected to a high level, the output data is the processed value (data processed by the algorithm), the output data is more stable, but the refresh speed has decreased.

2. Human body mode

When the mode setting resistance value is $56K\Omega$, $82K\Omega$, $120K\Omega$, $200K\Omega$, the module is set to plane mode. In plane mode, there are four output interfaces including UART automatic output, UART controlled output, high-level pulse width output, and switch output.

The human body mode is sensitive to human body detection, target measurement is more stable. The object measured in the blind zone has high stability. It can stably measure the upper body of the human body within 150cm, and the measurable distance is relatively short.

Under UART automatic output, the RX pin is connected to a low level, output real-time value (real-time measurement data), which can improve the output data refresh speed. when it is floating or connected to a high level, the output data is the processed value (data processed by the algorithm), the output data is more stable, but the refresh speed has decreased.

Module Specification

1. Operating specification

| Item | Flat Object | Human body | Unit | Remark |
|--------------------------------|-----------------------|-----------------------|------|--------|
| Operating voltage | 3.3~5.0 | 3.3~5.0 | V | DC |
| Static current | <8 | <8 | uA | |
| Operating current | <20 | <20 | mA | |
| Duration of operating | ≤65 | ≤25 | ms | |
| Blind zone | 25 | 30 | cm | (1) |
| Measuring range of flat object | 25~600 | 30~200 | cm | (1) |
| Beam Angle | ≈45° | ≈70° | - | (2) |
| Accuracy | ±(1+S×0.3~0.5%) | ±(1+S×0.3~0.5%) | cm | (3) |
| Temp. compensation | Depend on output mode | Depend on output mode | - | (4) |

Note:

(1) The temperature is 25°C, humidity is 65% RH, measured object is a 50cm×60cm flat carton, the transducer should be as vertical as possible to the measured object.

(2) The reference data obtained from the test object of φ75mm×100cm white PVC pipe with a distance of 100cm.

(3) The temperature is 25°C, humidity is 65% RH, measured object is a 50cm×60cm flat carton, S represents the measurement distance. The high-level pulse width output accuracy is ±(1+S×0.5%), UART automatic output, UART The precision of controlled output and switch output is ±(1+S×0.3%).

(4) High-level pulse width output has no temperature compensation, UART automatic output, UART controlled output, and switch output have temperature compensation.

2.Environment

| Item | Minimum value | Typical value | Max value | Unit | Remark |
|--------------------|---------------|---------------|-----------|------|--------|
| Storage Temp | -25 | 25 | 70 | ℃ | |
| Storage Humidity | | 65% | 90% | RH | (1) |
| Operating Temp | -15 | 25 | 60 | ℃ | |
| Operating Humidity | | 65% | 80% | RH | (2) |

Remark:

- (1) Environment temperature is 0-39℃, max humidity is 90%(Non-condensation)
 (2) Environment is 40-50℃, max humidity is the highest at current temperature in nature.

3.Electronics

| Item | Minimum value | Typical value | Max value | Unit | Remark |
|-------------------|---------------|---------------|-----------|------|------------|
| Operating voltage | 3.2 | 5.0 | 5.25 | V | |
| Peak current | 50 | | 75 | mA | Peak value |
| Input Ripple | | | 50 | mV | Peak value |
| Input Noise | | | 100 | mV | Peak value |
| ESD | | | ±200/±2K | V | (1) |
| ESD | | | ±4K/±8K | V | (2) |

Note:

- (1) The probe shell and output pin conform to the IEC61000-4-2 standard.
 (2) Assembly line contact static electricity ±200V, air static electricity ±2KV.

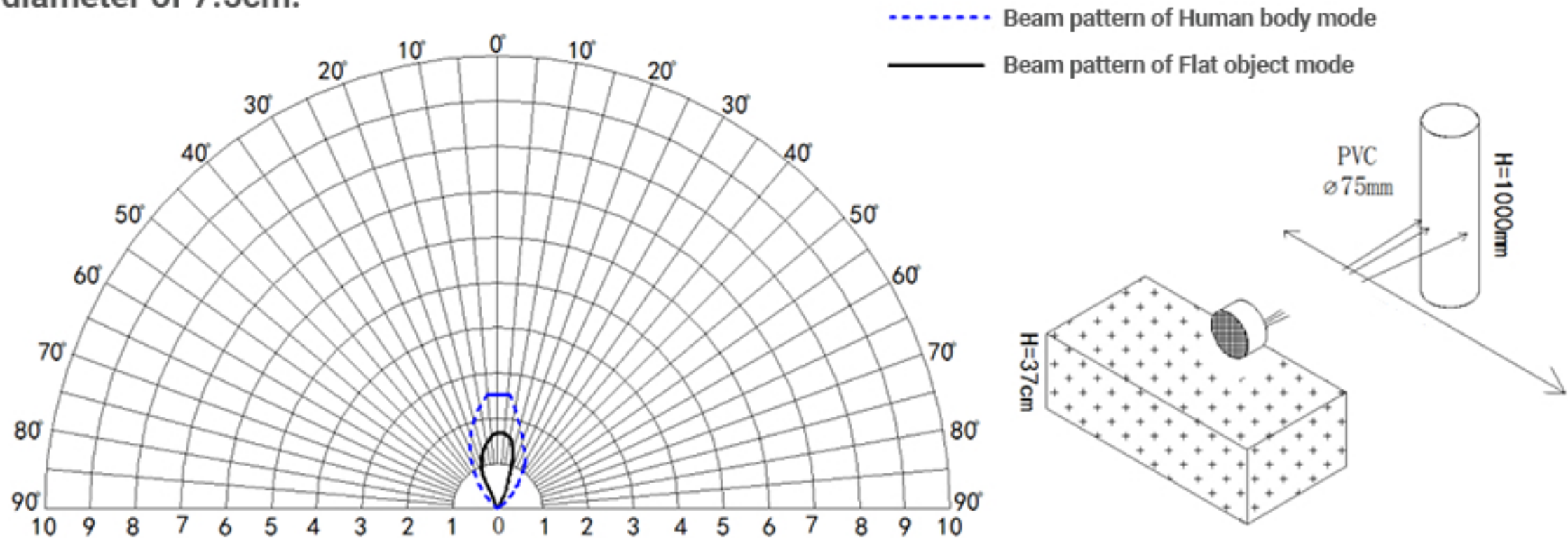
Sensor Selection Instruction

The mechanical structure of this series of ranging modules including with wire probe and without wire probe series. Users can choose the corresponding model according to actual application needs.

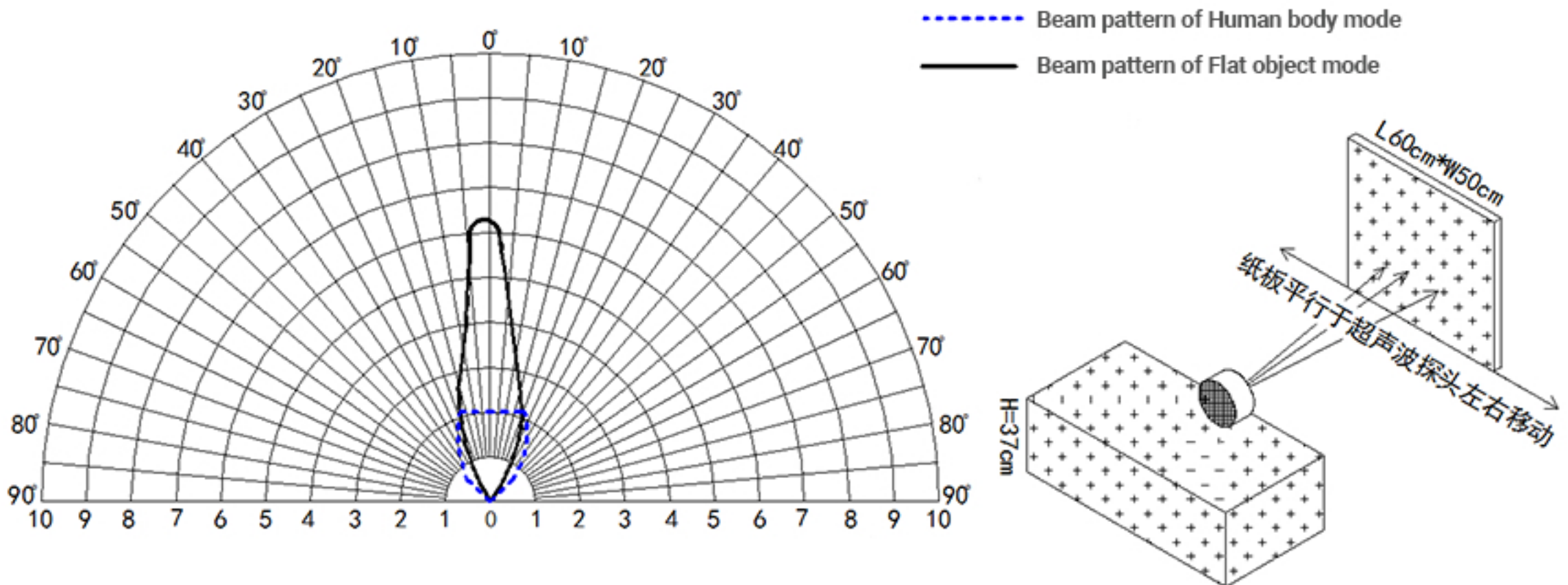
| Series | Model No. | Mode | Feature | Output interface |
|-------------|-------------------|-------------|--------------------------------------|-----------------------|
| A06 Series | DYP-A06NYM-V1.1 | Flat Object | Integrated closed transducer | High level PWM output |
| | DYP-A06NYU-V1.1 | | | UART Auto |
| | DYP-A06NYT-V1.1 | | | UART Controlled |
| | DYP-A06NYGD-V1.1 | | | Switch output |
| | DYP-A06LYM-V1.1 | | Reversing radar with wire transducer | High level PWM output |
| | DYP-A06LYU-V1.1 | | | UART Auto |
| | DYP-A06LYT-V1.1 | | | UART Controlled |
| | DYP-A06LYGD-V1.1 | | | Switch output |
| A06B Series | DYP-A06BNYM-V1.1 | Human body | Integrated closed transducer | High level PWM output |
| | DYP-A06BNYU-V1.1 | | | UART Auto |
| | DYP-A06BNYT-V1.1 | | | UART Controlled |
| | DYP-A06BNYGD-V1.1 | | | Switch output |
| | DYP-A06BLYM-V1.1 | | Reversing radar with wire transducer | High level PWM output |
| | DYP-A06BLYU-V1.1 | | | UART Auto |
| | DYP-A06BLYT-V1.1 | | | UART Controlled |
| | DYP-A06BLYGD-V1.1 | | | Switch output |

Beam Pattern

(1) The tested object is a white cylindrical tube made of PVC material, with a height of 100cm and a diameter of 7.5cm.



(2) The tested object is a corrugated box perpendicular to the 0° central axis, with a length * width of 60cm*50cm.



Reliable testing Instruction

| No. | Description | Testing condition | sample QTY | remark |
|-----|-------------------------------|---------------------------------|------------|--------|
| 1 | High temperature and humidity | 65°C, 85%RH, Power ON@5V, 72hrs | 3 | |
| 2 | low temperature | -20°C, Power ON@5V,72hrs | 3 | |

| | | | | |
|---|---------------------------------------|---|---|--|
| 3 | High temperature and humidity storage | 80°C, 80%RH, storage, 72hrs | 3 | |
| 4 | Low temperature storage | -30°C, storage, 72hrs | 3 | |
| 5 | Vibration test | 10-200Hz,15min,2.0G, XYZ three axes, each axis is 0.5 hours | 3 | |
| 6 | Drop test | 50cm free fall, 5 times on wooden floor | 3 | |

Note: After the test, the module is determined to be OK after the function test, and the performance degradation rate is $\leq 10\%$.

Notice

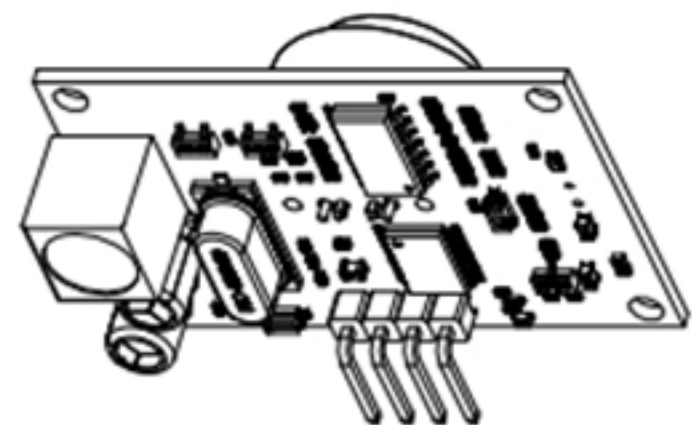
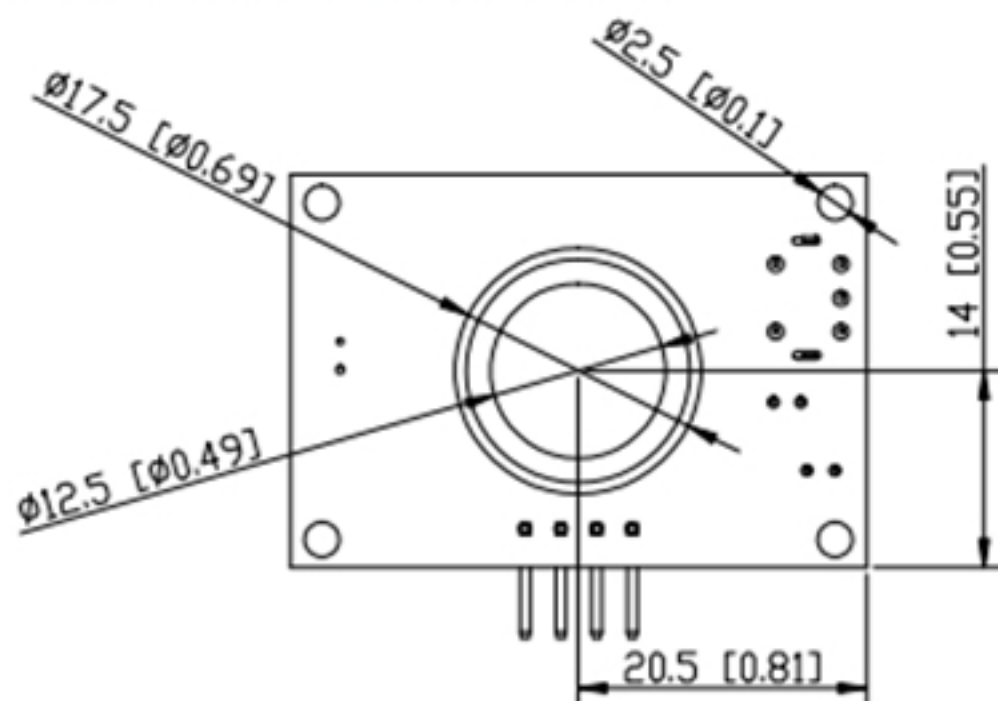
- (1). Please pay attention to the structural tolerances when designing. Unreasonable structural design may cause temporary abnormalities in module functions.
- (2). Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause malfunction of the module.
- (3). When the boundary application of the product limit parameter is involved, you can contact after sale service dept. to confirm the relevant precautions.
- (4). The company reserves the right to change this document and update the functions without prior notice.

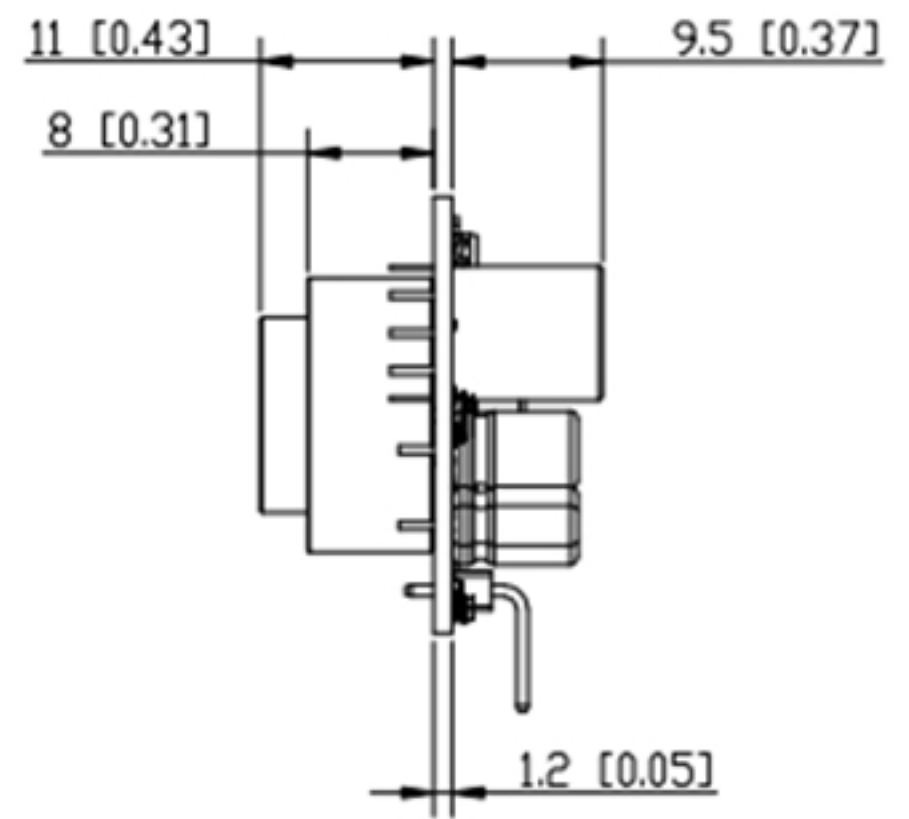
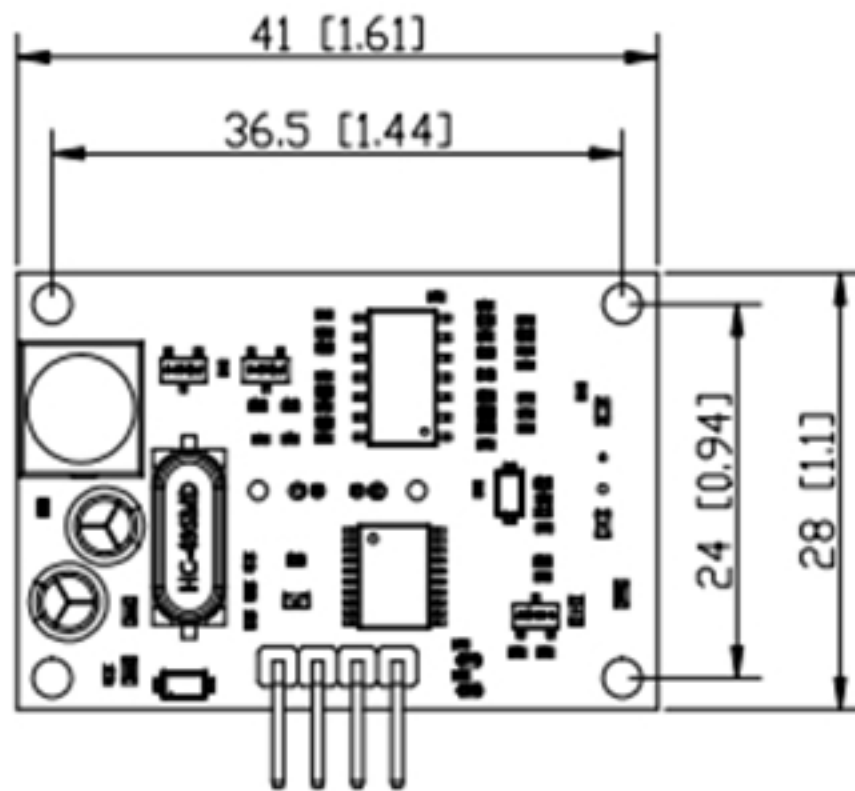
Mechanics

1. Mechanical Dimensions (mm-inch)

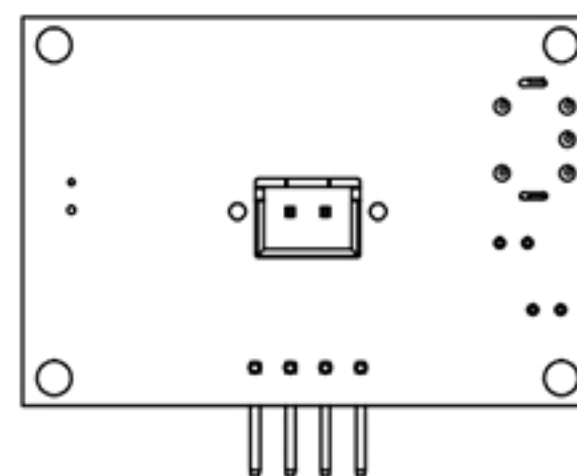
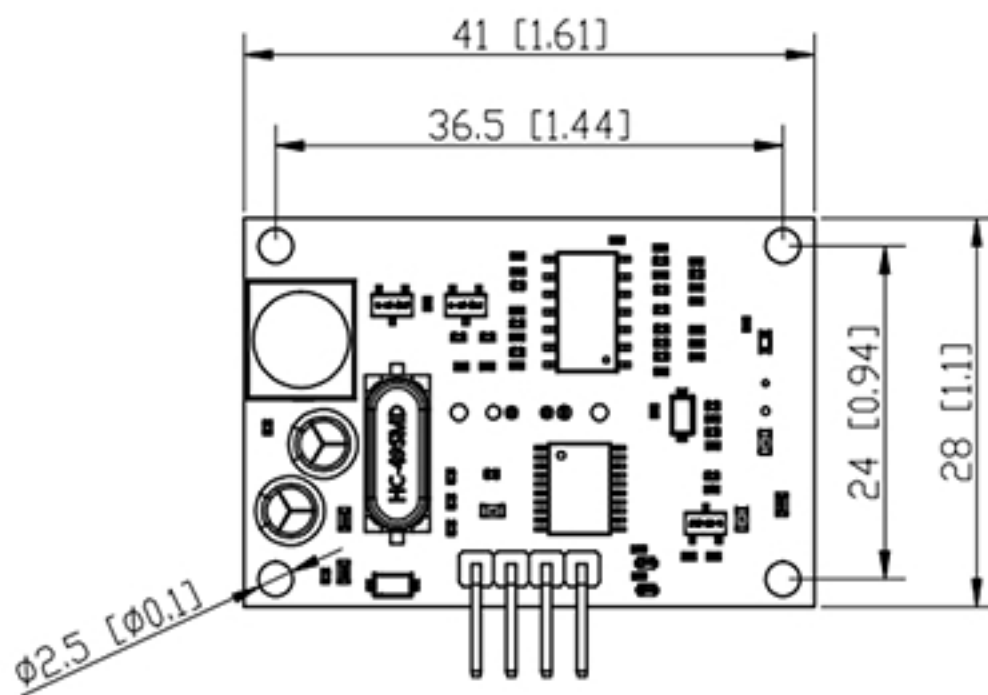
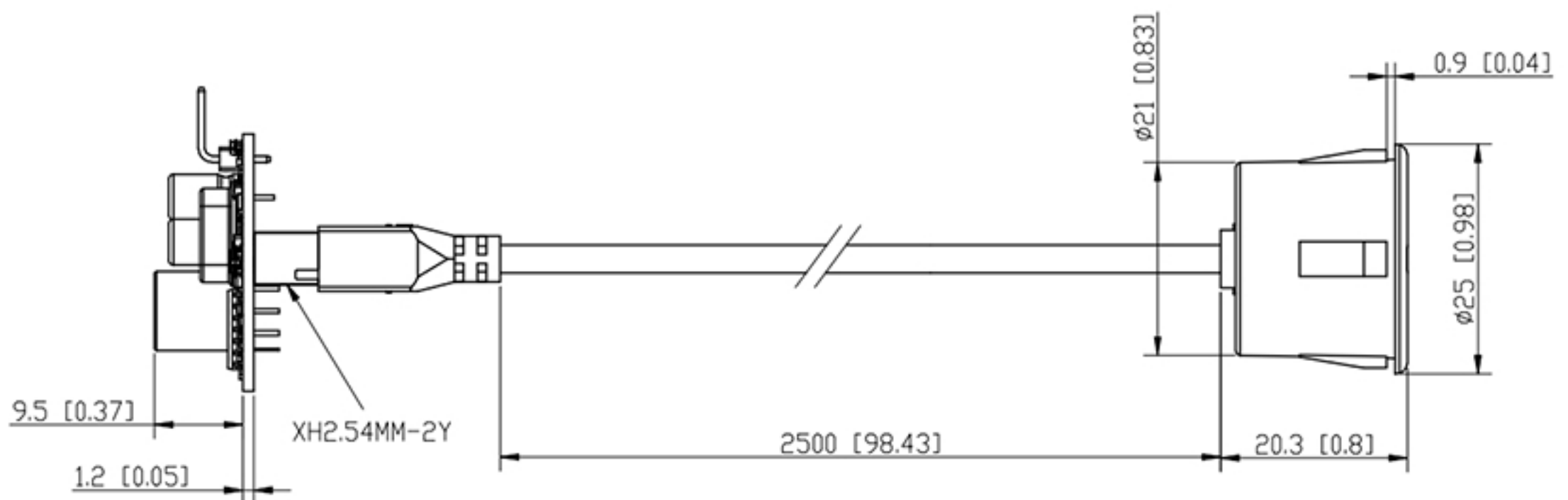
DYP-A06NYx Series module

DYP-A06BNYx Series module



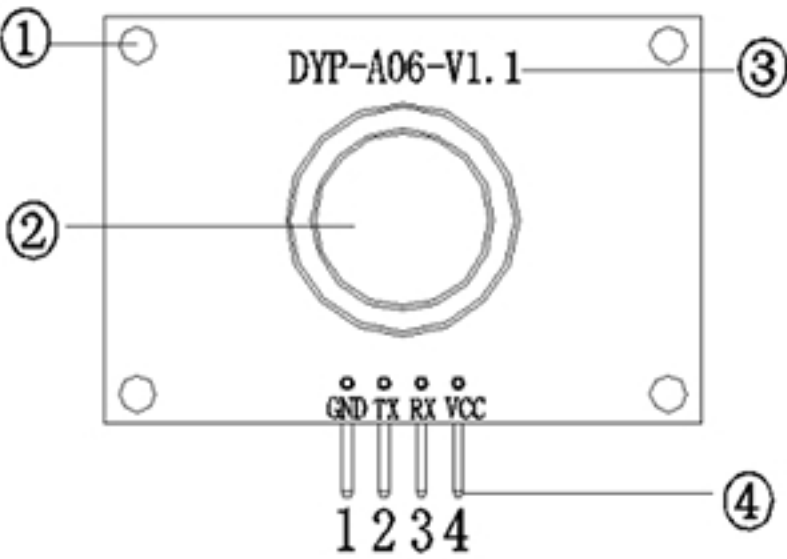


DYP-A06LYx 、DYP-A06BLYx Series module



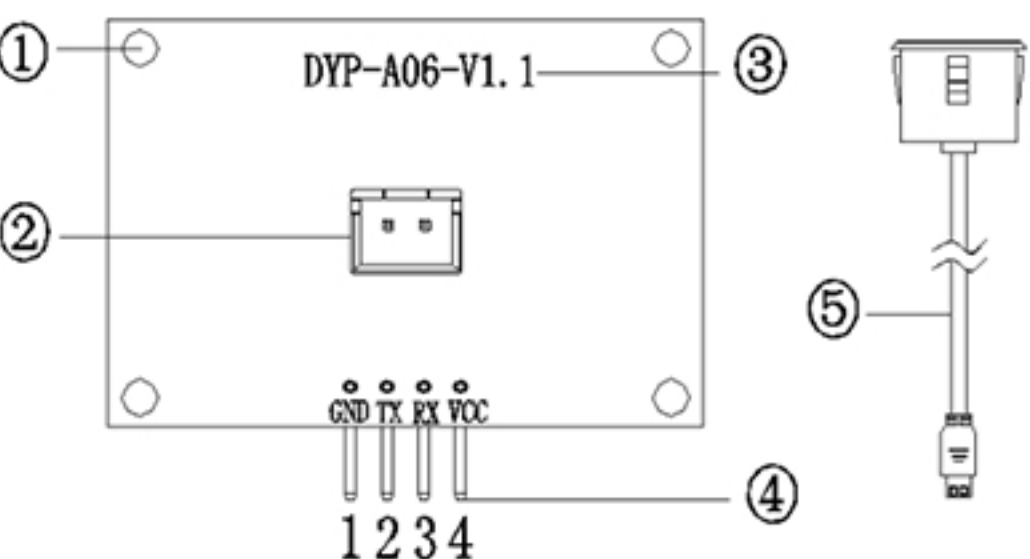
2. Parts Description

DYP-A06NYx Series module
DYP-A06BNYx Series module



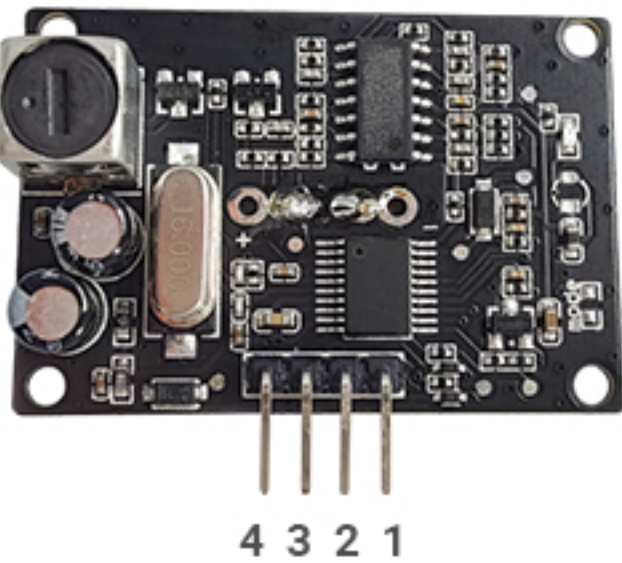
- ① Fixing hole
- ② Ultrasonic transducer
- ③ model no
- ④ Pin

DYP-A06LYx Series module
DYP-A06BLYx Series module



- ① Fixing hole
- ② Connector
- ③ model no
- ④ Pin
- ⑤ Transducer with cable

3. Pin out



| Pin No. | Mark | Description | Remark |
|---------|------|----------------|---|
| ① | GND | GND | |
| ② | TX | Functional PIN | different output modes have different functions |
| ③ | RX | Functional PIN | different output modes have different functions |
| ④ | VCC | Power input | |