

电应普
BEST SENSOR



DATASHEET

A16 Series Sensor Module

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SHENZHEN DIANYINGPU TECHNOLOGY CO., LTD.

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Product Description

1. General

A16 series module uses proven ultrasonic sensing technology for distance measurement. Adopts high-performance processor and superior quality elements which output reliable stability value and has long life span. Waterproof ultrasonic transducer with strong adaptability to various operating environment. This module build-in high precision ranging algorithm and power consumption management procedure, has high ranging accuracy, low power consumption, long measuring distance and narrow measurement angle features.

2. Features

- Adopting reflective structure, long detection distance and small beam angle
- Adopting smart signal processing circuit, small blind zone
- Build-in high accuracy ranging algorithm, minimum error < 5mm
- Controllable measuring angle, high sensitivity, strong anti-interference ability
- Build-in true target recognition algorithm, high recognition accuracy of target
- Multiple output interfaces optional, PWM, UART, Switch, RS232, RS485
- Internal temperature compensation function, stable ranging from -15°C to +60°C
- Low power consumption design, static current < 15uA, operating current < 10mA (5VDC power input)
- Wide voltage supply, 3.3-24V applicable
- Anti-static electricity design in accordance with IEC61000-4-2 standard
- Operating temperature from -15°C to +60°C

3. Applications

Horizontal distance sensing

Object proximity and presence awareness

Dam water level monitoring

Module specification

1. Operating specification

| Item Description | PWM output | UART Auto | UART Controlled | Switch output | RS232 output | RS485 output | Unit | Remark |
|--------------------------------|-------------|-----------|-----------------|---------------|--------------|--------------|------|--------|
| Operating voltage | 3.3~24 | | | | | | V | DC |
| Standby current | ≤15 | - | ≤15 | - | - | - | uA | (1) |
| Average operating current | ≤15 | ≤15 | ≤15 | ≤15 | ≤15 | ≤15 | mA | (1) |
| Blind zone | 50 | 50 | 50 | 50 | 50 | 50 | cm | (2) |
| Measuring range of flat object | 50~1500 | | | | | | cm | (2) |
| Beam angle | ≈40° | | | | | | - | (3) |
| Accuracy | ±(1+S×0.3%) | | | | | | cm | (4) |
| Temp Compensation | Support | | | | | | | |

Note:

(1) Typical data obtained from a test with a temperature of about 25°C, power supply of 12V, 500ms duty cycle.

(2) The temperature is about 25°C, the measured object is a 50cm×60cm flat carton, and the transducer must be as vertical as possible to the measured object.

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

(4) The temperature is about 25°C, and the indoor environment without wind, the measured object is a 50cm×60cm flat carton, and S means the measuring distance.

2. Environment

| Item | Minimum value | Typical value | Max value | Unit | Remark |
|--------------|---------------|---------------|-----------|------|--------|
| Storage Temp | -25 | 25 | 80 | °C | |

| | | | | | |
|--------------------|-----|-----|-----|----|-----|
| 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 | 24 | V | Peak value |
| Peak current | 50 | | 70 | 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) |

Remark:

1) The static electricity specification of assembly line, contact static electricity should not be higher than ±200V, and air static electricity should not be higher than ±2KV.

(2) The probe shell and output lead comply with the IEC61000-4-2 standard.

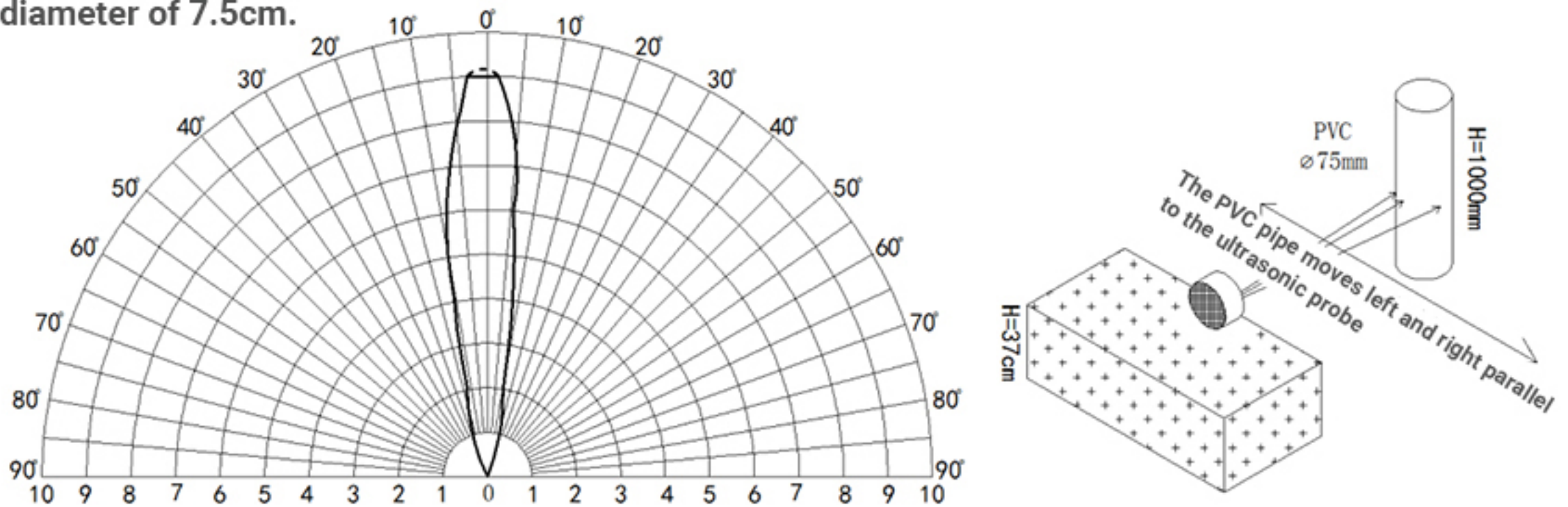
Sensor Selection instruction

The A16-module providing variety of output formats, customer can choose the corresponding model according to actual application needs.

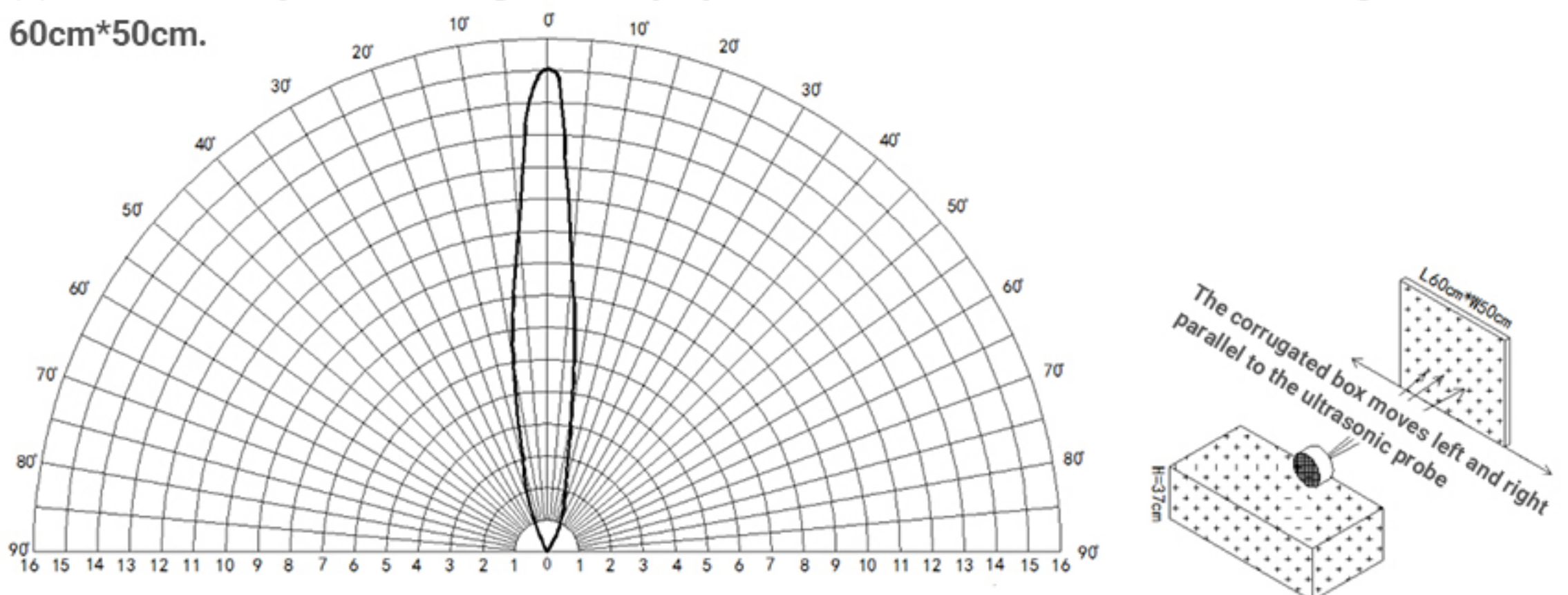
| No. | Output interface | Model No. | Remark |
|--------------------------------|------------------|-------------------|--------|
| A16 Series sensor module | PWM output | DYP-A16NYMW-V1.0 | |
| | UART Auto | DYP-A16NYUW-V1.0 | |
| | UART Controlled | DYP-A16NYTW-V1.0 | |
| | Switch output | DYP-A16NYGDW-V1.0 | |
| | RS232 | DYP-A16NY2W-V1.0 | |
| | RS485 | DYP-A16NY4W-V1.0 | |

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.



(1) 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 | 120 cm free fall, 5 times on wooden floor | 3 | |

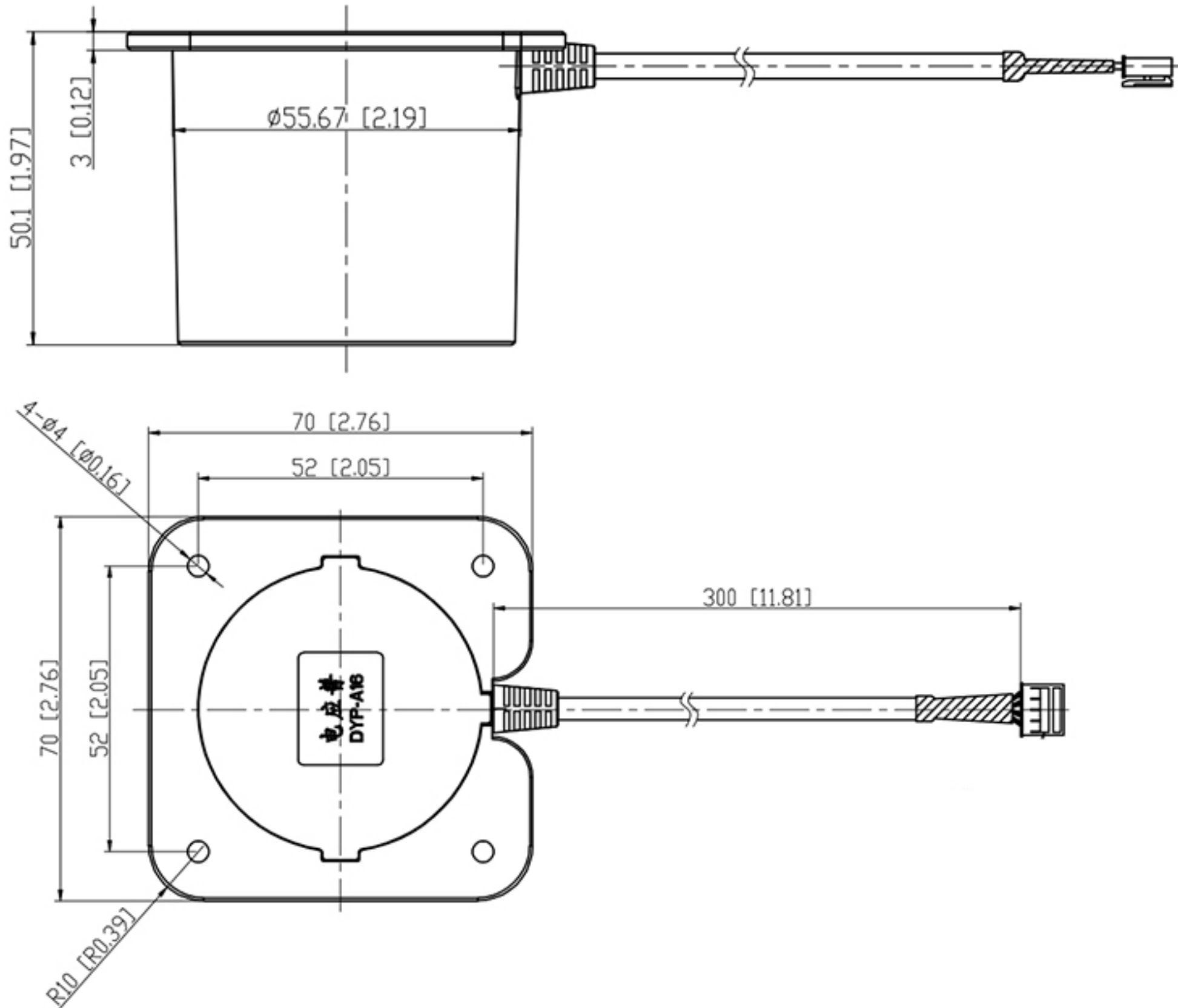
Note: After the test, the module is determined to be OK after the function test, and the performance degradation rate is $\leq 10\%$.

Notice

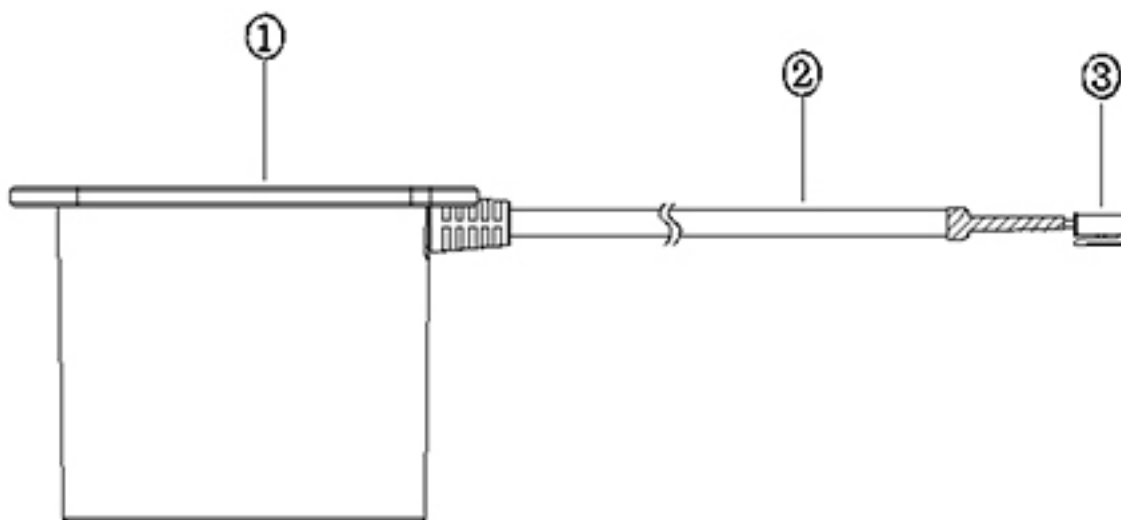
- (1) When two or more modules are used in the application scenario, it is recommended to use a module with controlled output (high-level pulse width output, UART controlled output), and use a time-sharing work method to prevent mutual communication between modules interference.
- (2) In an environment with fast wind speed, the measurement and accuracy of the module will be affected. You can contact our sales to confirm related matters.
- (3) Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause malfunction of the module.
- (4) When it comes to the application of the module limit parameter boundary, you can contact our engineer to confirm the relevant precautions.
- (5) The company reserves the right to change this document and update the functions without prior notice.

Mechanics

1. Mechanical Dimensions(mm-inch)



2. Parts Description



- ① Ultrasonic transducer
- ② Wire
- ③ HY2.0-4Y plug

3. Pin out



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

Note: The pin function setting followed customer's order, can't coexist with other output modes.