电应普
BEST SENSOR

DATASHEET

A12 Series Sensor Module

TABLE OF CONTENTS

Product Description

1. General

A12 series 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.

2. Features

- Reflective structure design, high sensitivity, narrow beam angle.
- Adopts intelligent signal processing circuit, small blind zone.
- 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 or flat objects
- Multiple output interface optional, PWM, UART, RS485, SWITCH
- Internal temperature compensation, stable value output from -15℃ to +60℃
- Low power consumption design, Static current＜15uA, operating current＜10mA(5VDC power supply)
- 3.3-24V input voltage
- Anti-static electricity design in accordance with IEC61000-4-2 standard
- Operating temperature from -15℃ to +60℃

3. Applications

Horizontal distance sensing

Car parking system

Smart waste management system

Robot avoidance and automatic control

Object proximity and presence awareness

Module Description

Following different characteristics and advantages, the modules are including two series

A12A series, mainly used for plane distance measurement

A12B series is mainly used for human body distance measurement.

Module specification

1. Operating specification

Item	A12A Series	A12B series	Unit	Remark
Operating voltage	3.3~24	3.3~24	V	DC
Static current	15~5000	15~5000	uA	
Operating current	<10	<10	mA	(1)
Duration of operating	≤50	≤50	ms	
Blind zone	25	25	cm	(2)
Measuring range of flat object	25~500	25~500	cm	(2)
Beam angle	≈21°	≈21°	cm	(2)
Accuracy	±(1+S×0.3%)	±(1+S×0.3%)	cm	(2)
Temperature compensation	Support	Support	-	

Remark:

1.Static current≤5mA of RS485 output.

2.Typical data obtained by testing with a temperature of about 25℃, a power supply of 5V, and a 100ms duty cycle.

3.The temperature is about 25℃, the measured object is a 50cm×60cm flat carton, and the transducer should be as vertical as possible to the measured object.

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

(5) The temperature is 25±5℃, 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	℃	
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 current	30		50	mA	Peak value
Input Ripple			50	mV	Peak value
Input Noise			100	mV	Peak value
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.

Module Selection Instruction

The A12 sensor module including two series according to different applications, multiple output interfaces are optional. The user can choose the corresponding model according to the actual application needs.

Series	Model No.	Modes	Output interface	Reamrk
A12A Series	DYP-A12ANYMW-V1.0	Plane distance measurement	High level PWM output	
	DYP-A12ANYUW-V1.0		UART Auto	
	DYP-A12ANYTW-V1.0		UART Controlled	
	DYP-A12ANYGDW-V1.0		Switch output	
	DYP-A12ANY4W-V1.0		RS485 Output	
A12B Series	DYP-A12BNYMW-V1.0	Human body distance measurement	High level PWM output	
	DYP-A12BNYUW-V1.0		UART Auto	
	DYP-A12BNYTW-V1.0		UART Controlled	
	DYP-A12BNYGDW-V1.0		Switch output	
	DYP-A12BNY4W-V1.0		RS485 Output	

Beam Pattern

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

Beam characteristics   (Unit: Meter)

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

Beam characteristics   (Unit: Meter)
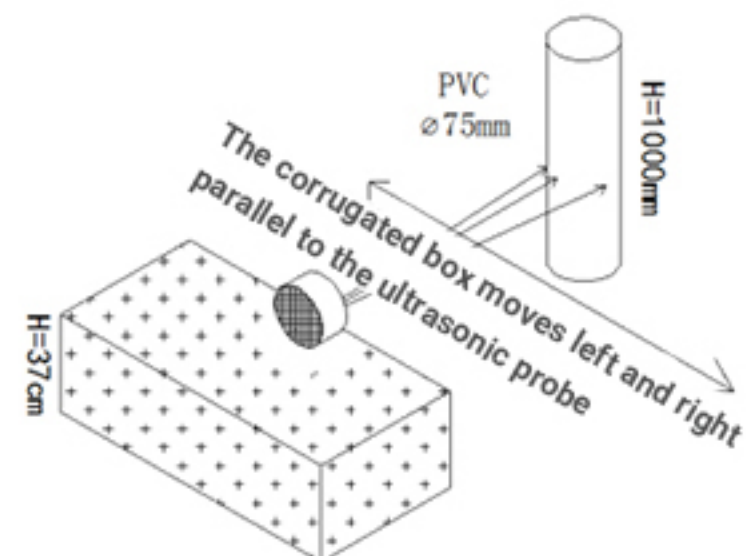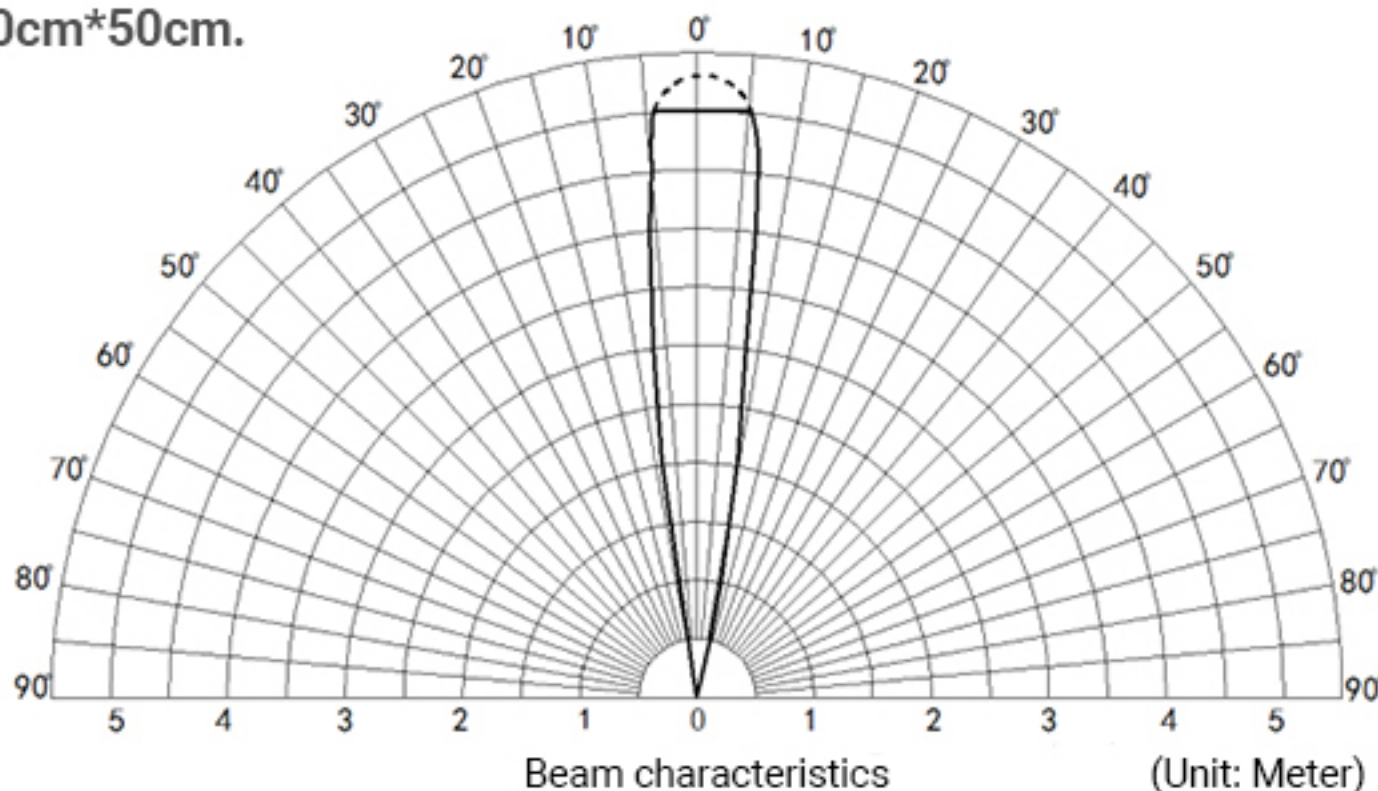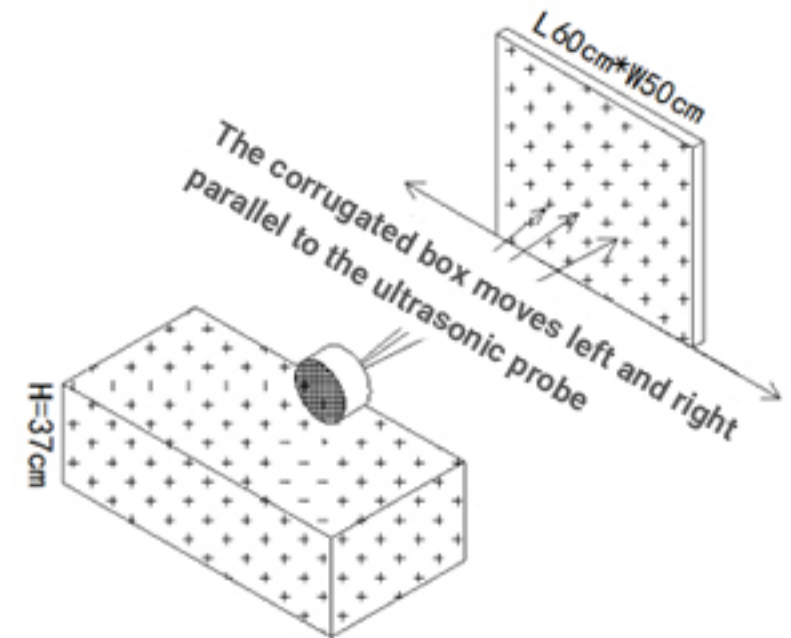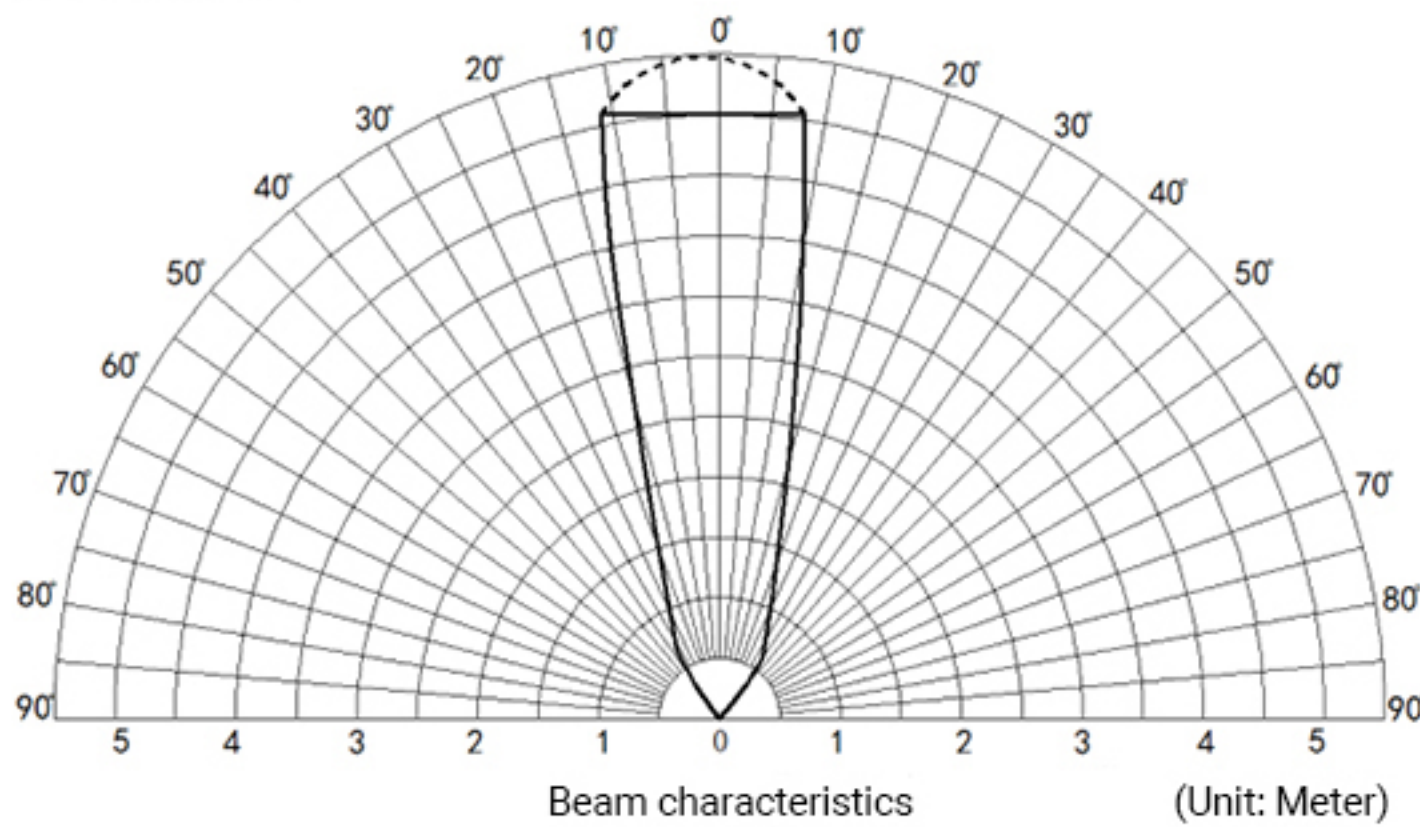
Reliable testing Instruction

| No.	Description	Testing condition	sample QTY	remark
1	High temperature and humidity	65℃，85%RH，Power ON@5V，72hrs	3	
2	low temperature	-20℃，Power ON@5V,72hrs	3	
3	High temperature and humidity storage	80℃，80%RH，storage，72hrs	3	
4	Low temperature storage	-30℃，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 ≤10%.

Notice

(1)   Factory supply the module with assembled net cover. If the net cover cannot be used or is not required in the application, please contact factory before ordering.

(2)   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.

(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)
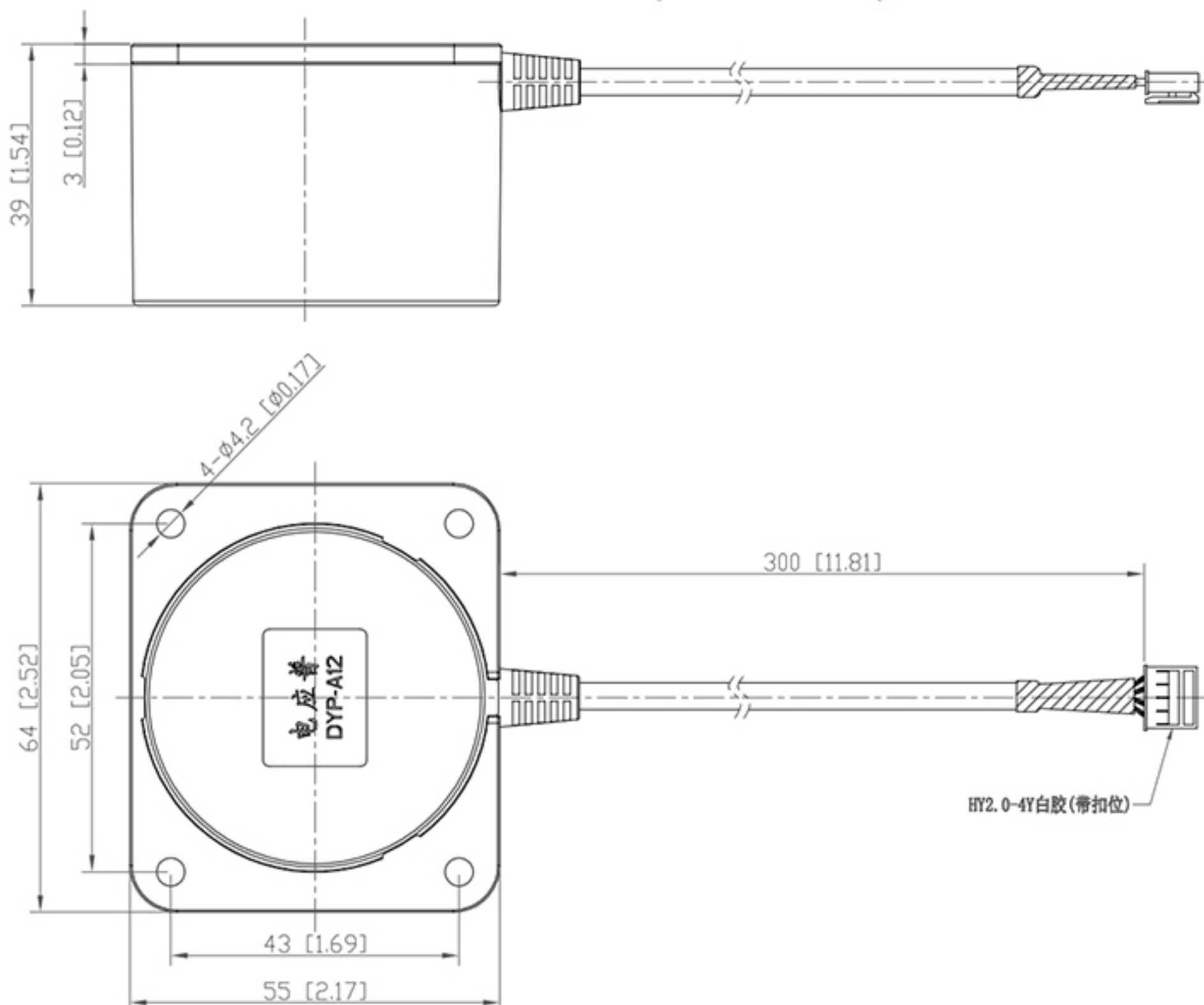
2. Parts Description
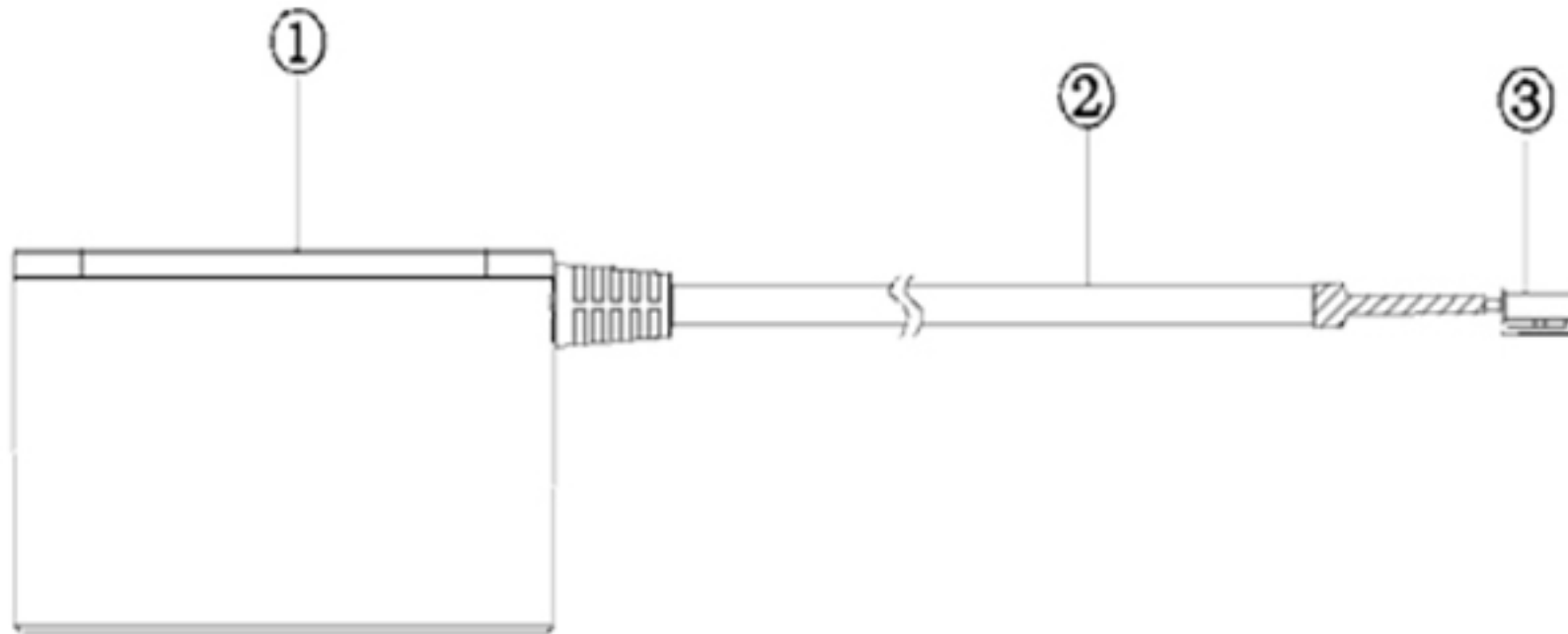
① Ultrasonic transducer
② Wire
③ HY2.0-4Y connector

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