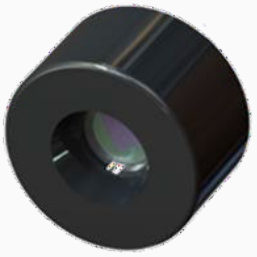
US5
DATASHEET
ALPHA



SonicMEMS (ZhengZhou) Technology Co.,Ltd.

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1 PRODUCT OVERVIEW

US5 is a miniature, ultra-low power ranging sensor. US5 is based on the ultrasonic time-of-flight (ToF) principle, and is designed with related acoustics, electricity and algorithms. High-precision distance measurement is achieved through the energy difference of ultrasonic echo signals on the surface of different materials, and output millimeter-level distance information and its echo energy intensity value, and can also output flag bits to distinguish soft and hard materials. Furthermore, it can be used for cleaning robots to identify ground materials and measure distances within a certain range. It is small size and easy to install.

1.1 Product Features

- Millimeter-level ranging accuracy, great ranging stability
- Recognize soft and hard materials and output I/O information
- The detection distance up to 20-50mm and blind area is small

1.2 Applications

- The cleaning robot recognizes the soft and hard materials on the ground
- Home service robot/ robot vacuum cleaner to obtain ground information
- 3D printer lever detection

1.3 Installation and Dimensions

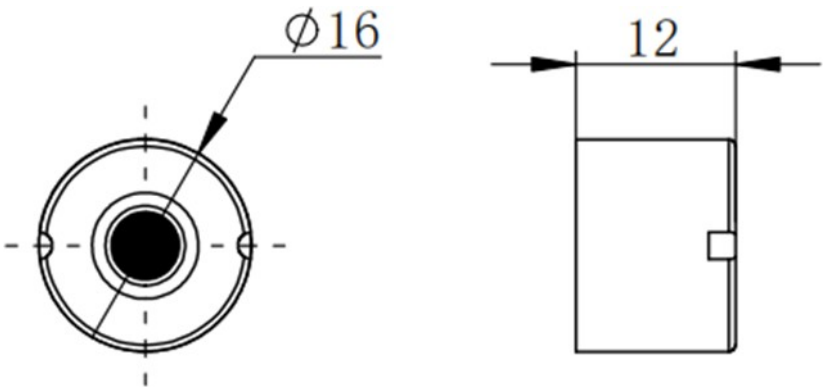

FIG 1 US5 MECHANICAL SIZE

2 SPECIFICATIONS

2.1 Product Parameter

CHART 1 US5 PRODUCT PARAMETER

Item	Min	Typical	Max	Unite	Remarks
Ranging frequency	/	100	/	Hz	Ranging 100 times per second
Ranging distance	20	/	50	mm	/

2.2 Electrical Parameter

CHART 2 US5 ELECTRICAL PARAMETER

Item	Min	Typical	Max	Unite	Remarks
Supply voltage	3.2	3.3	3.4	V	Excessive voltage might damage the Lidar while low affect normal performance
Voltage ripple	0	78	90	mV	High ripple effects performance or even distance measurement
Sleeping current	/	<30	/	mA	/
Working current	/	40	50	mA	/

2.3 Interface Definition

US5 provides PH1.0-4P plug connector to realize power and data communication function.

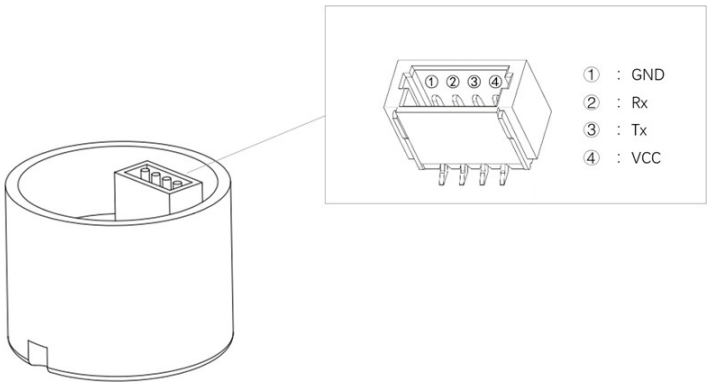

FIG 2 US5 INTERFACES

CHART 3 US5 INTERFACE DEFINITION

Pin	Type	Description	Defaults	Range	Remarks
VCC	Power supply	Positive	3.3V	/	/
Tx	Output	System serial port output	/	/	Data stream: Lidar→Peripherals
Rx	Input	System serial port Input	/	/	Data stream: Peripherals→Lidar
GND	Power supply	Negative	0V	0V	/

2.4 Data Communication

With a 3.3V level serial port (UART), users can connect the external system and the product through the physical interface. After that, users can obtain the real-time scanned point cloud data, device information as well as device status, and can set the working mode of the equipment, etc. The communication protocol of parameters are as follows:

CHART 4 US5 SERIAL SPECIFICATION

Item	Min	Typical	Max	Unit	Remarks
Baud rate	/	115200	/	bps	8-bit data bit,1 stop bit, no parity
High signal level	2.4	3.3	3.4	V	Signal voltage>1.8V is high signal
Low signal level	0	0	0.5	V	Signal voltage<0.5V is low signal

2.5 Others

CHART 5 US5 OTHERS

Item	Min	Typical	Max	Unit	Remarks
Operating temperature	-10	25	40	℃	Long-term working in a high temperature environment will reduce the life span
Weight	/	2.5	/	g	N.W.

3 REVISION

Date	Version	Content
2021-11-06	0.1.0	The 1st release
2022-04-26	0.1.1	Update FIG 1 Mechanical Dimensions, FIG 2 Interface Definition
2022-06-13	0.1.2	Update Product Parameter, operating temperature and storage temperature
2022-11-09	0.1.3	Update product parameter and weight

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