

# **GS2 DATA SHEET**

# CONTENTS

<b>1</b>	<b>PRODUCT OVERVIEW.....</b>	<b>1</b>
1.1	Product Features .....	1
1.2	Applications .....	1
1.3	Installation and Dimensions.....	1
<b>2</b>	<b>SPECIFICATIONS .....</b>	<b>4</b>
2.1	Performance Parameter .....	4
2.2	Electrical Parameter.....	4
2.3	Interface Definition.....	5
2.4	Data Communication .....	6
2.5	Optical Characteristic.....	6
2.6	Others .....	6
<b>3</b>	<b>REVISE.....</b>	<b>7</b>

# 1 PRODUCT OVERVIEW

GS2 is a Linear array solid LiDAR. Based on the principle of Triangulation, it is equipped with related optics, electricity, and algorithm design, to achieve 100 degrees high-precision laser distance measurement, and output point cloud data of the scanning environment. It can be used for robot obstacle avoidance, path planning, etc.

## 1.1 Product Features

- High accuracy, stable performance
- High resolution of ranging angle, up to 0.6 degrees
- Good obstacle avoidance effect, the smallest object with a diameter of 3mm can be detected
- Wide detection range, no blind zone in combination, FOV up to 100 degrees
- Small detection range blind area, detectable distance is 25mm~300mm
- Class I eye safety
- 10000h Service life

## 1.2 Applications

- Robot obstacle avoidance
- Obstacle avoidance of smart equipment
- Navigation and obstacle avoidance of home service robots/vacuum clean robots

## 1.3 Installation and Dimensions

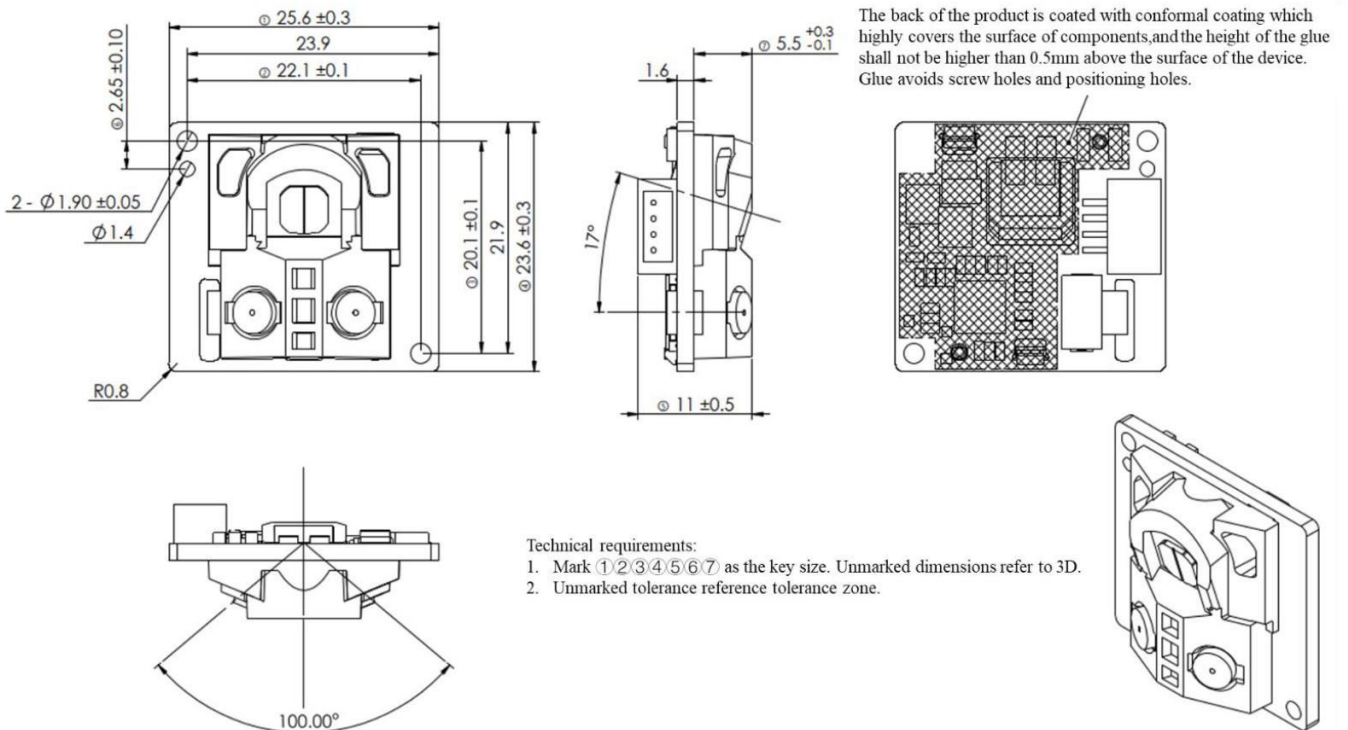


FIG 1A GS2-S808G01 INSTALLATION&MECHANICAL SIZE (SCREW SPECIFICATIONS: PB1.7MM)



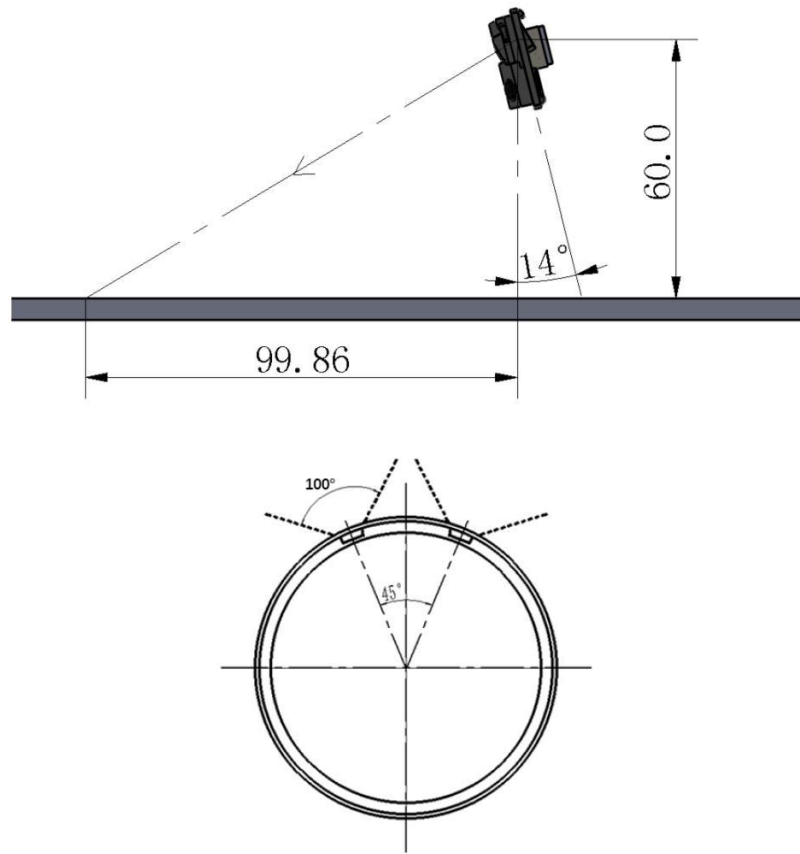


FIG 2A GS2 OBSTACLE AVOIDANCE REFERENCE INSTALLATION DRAWING (UNIT MM)

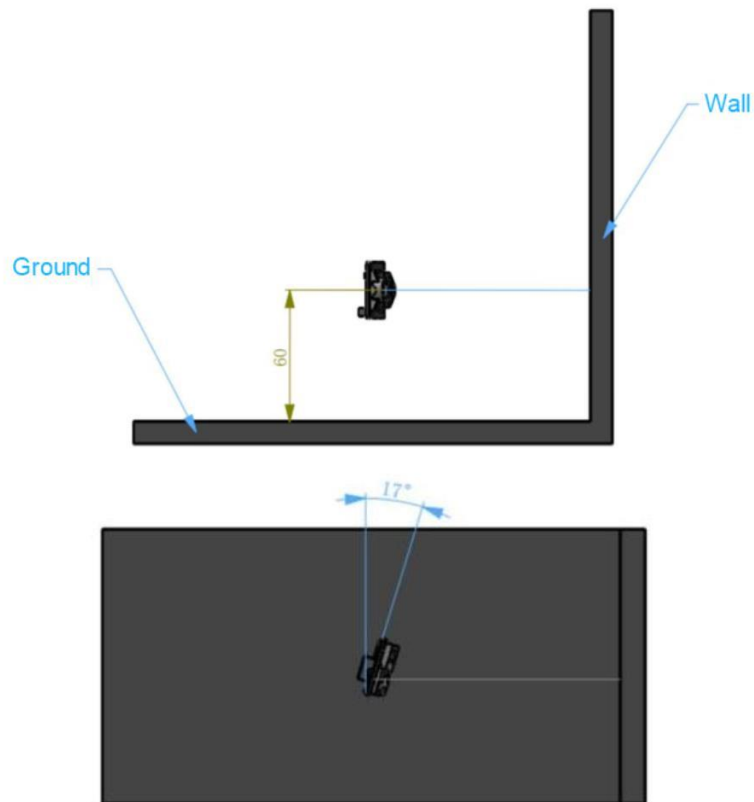


FIG 2B GS2 EDGE REFERENCE INSTALLATION DRAWING (UNIT MM)

## 2 SPECIFICATIONS

### 2.1 Performance Parameter

**CHART 1 GS2 PERFORMANCE PARAMETER**

Item	Min	Typical	Max	Unit	Remarks
Ranging frequency	7.5	/	28	Hz	Indicates the ranging times per second, and the frequency changes in real time according to the scene
Ranging distance	25	/	300	mm	80% reflectivity
Field of view	100	/	108	Deg	/
Angle resolution	/	0.6	/	Deg	/
Relative error	/	≤3	/	mm	Distance ≤ 100mm
	/	≤3%	/	/	100 < Distance < 200mm
	/	≤8%	/	/	200 ≤ Distance < 300mm
Angle error	/	±3	/	Deg	/
Sunlight resistant	/	/	25k	Lux	/
Life-time	10000	/	/	h	/

Note 1: It is factory FQC standard value, 80% reflectivity material object.

Note 2: The relative error value indicates the accuracy of the Lidar measurement. Relative error (mean value) = (average measured distance - actual distance) / actual distance \* 100%, sample size: 100pcs.

Note 3: Lidar is a precision device, please avoid using Lidar under high or low temperature or strong vibration situation, the relative error parameter index will be relatively larger, and it may exceed the typical value.

### 2.2 Electrical Parameter

**CHART 2 GS2 ELECTRICAL PARAMETER**

Item	Min	Typical	Max	Unit	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
Start-up current	/	240	/	mA	/
Working current	/	100	/	mA	/

## 2.3 Interface Definition

GS2 provides ZH1.5-4P receptacle, which has system power supply and data communication interface (functional interface can be customized), and has two specifications of side entry type(3A) and top entry type(3B).

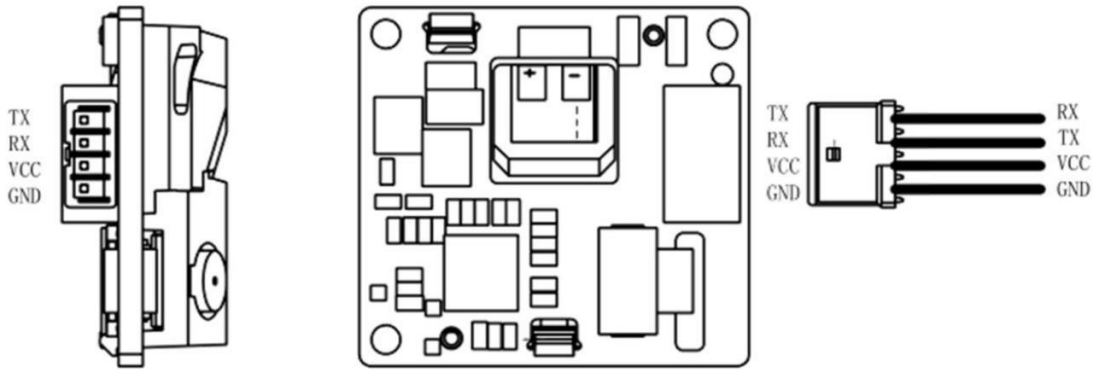


FIG 3A GS2-SxxxG01 INTERFACE

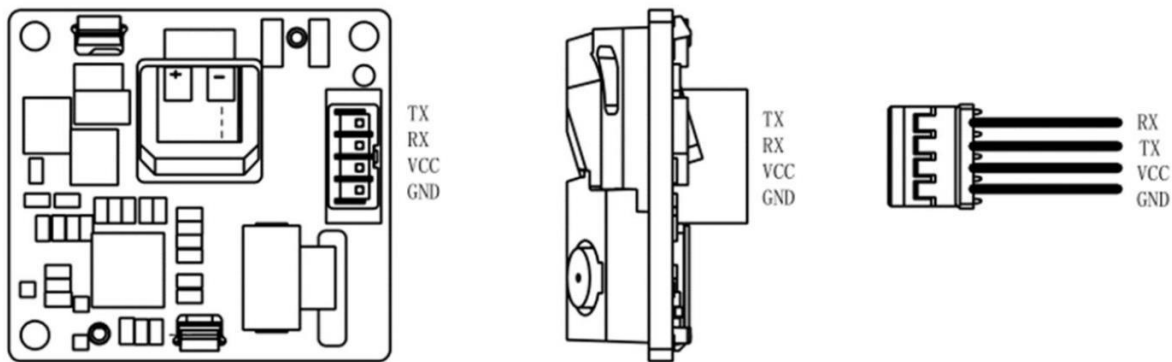


FIG 3B GS2-TxxxG01 INTERFACE

Note: The plug insertion method of the top entry type and side entry type is mirrored, please refer to the schematic diagram for details, and pay attention to the line sequence.

### CHART 3 GS2 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, it 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 GS2 SERIAL SPECIFICATION**

Item	Min	Typical	Max	Unit	Remarks
Baud rate	/	921600	1500000	bps	8-bit data bit,1 stop bit, no parity
High signal level	2.4	3.3	3.4	V	Signal voltage>2.4V is high signal
Low signal level	0	0	0.5	V	Signal voltage<0.5V is low signal

## 2.5 Optical Characteristic

GS2 uses an infrared laser that meets FDA Class I eye safety standards. The laser and optical lens finish the transmission and reception of the laser signal to achieve high-frequency ranging while working. To ensure system ranging performance, please keep the laser and optical lens clean. The detailed optical parameters are as follows:

**CHART 5 GS2 LASER OPTICAL PARAMETERS**

Item	Min	Typical	Max	Unit	Remarks
Laser wavelength	798	808	818	nm	GS2-x808x01 Infrared band
	840	850	860	nm	GS2-x850x01 Infrared band
Laser power	/	25	/	mW	/
FDA	 Class I IEC60825-1				
FPC description	Yellow FPC/ Screen printing 808 Black FPC/ Screen printing 850				

## 2.6 Others

**CHART 6 GS2 OTHERS**

Item	Min	Typical	Max	Unit	Remarks
Operating temperature	-10	25	40	°C	Long-term working in a high temperature environment will reduce the life span
Storage temperature	-30	25	70	°C	/
weight	/	4.2	/	g	N.W. (Without cable)



### 3 REVISE

Date	Version	Content
2021-06-24	1.0	Compose a first draft
2021-11-03	1.1	Update related structure diagram
2021-11-08	1.2	Added support for 1.5Mbps serial port baud rate
2022-01-07	1.3	Increase the appearance tolerance and apply the installation drawing along the edge, revise Band and current
2022-03-28	1.4	1) Update fig 1: installation & mechanical size 2) Update fig 3: GS2 interface
2022-05-09	1.5	1) Chart 1: add angle error 2) Chart 2: update start-up current and working current 3) Update installation&mechanical size (FIG 1A to 1C)
2022-06-20	1.6	1) Update Fig 2A GS2 obstacle avoidance reference installation drawing 2) Update fig 3: GS2 interface in section 2.3 3) Update chart 1 minimum ranging frequency as 7.5Hz
2022-07-28	1.7	Chart 5: update maximum and minimum value of GS2-x808x01 laser wavelength
2022-10-21	1.8	1) Update fig 1A&1B 2) Update Chart 2 start-up current and working current