广告位

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山西本地无人机高空清洗作业可联系/数字人视频生成

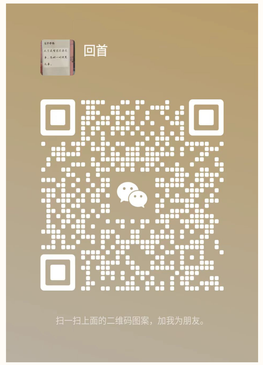
ERP沙盘模拟赛可dd/高校实验室装修/化工电子类实验设备

项目科技查新/双软评估/科小认证等包过一条龙可联系

企业代理记账/知识产权代缴/企业科技项目申报可联系

中国创翼创业创新大赛等各类企业创赛可代做（PPT/申报书/知识产权一条龙）

有以上需要均可dd我，介绍人来给提成！



办证

认证企业	方向	周期/方式	证书实物图
英伟达NVIDIA认证	人工智能计算证书	一周内全包下证	
腾讯云	交付工程师	一周内全包下证	
	云计算技能认证 区块链从业认证		
	腾讯高级工程师-数据库产品认证		
华为云	鲲鹏/华为云 技能认证	一周内全包下证	
	开发者工作级认证		
	大数据技能认证 hicp证书		
	openGauss数据库开发者证书		

	A	B
1	项目类别	认证专业
2	商务管理类	人力资源管理师
3		风险管理师
4		项目管理师
5		物联网管理师
6		新媒体运营师
7		大数据分析师
8		互联网营销师
9		数字经济管理师
10		电子商务师
11		电子政务师
12		社会工作师
13	医疗防疫公共卫生类	消毒员
14		公共场所卫生管理员
15	美学艺术类	化妆品测评师
16		新媒体主播
17		美业培训师
18		美容院管理师
19		摄影摄像与后期制作
20	经贸管理类	酒店经营管理师
21		理财规划制师
22		连锁经营管理师
23		双碳管理师
24		财务税务管理师
25		工商企业管理师
26		公共关系管理师
27		微商经营管理师
28		市场营销师
29	计算机与软件	劳动关系协调师
30		计算机信息技术
31		企业培训师
32		管理会计师
33		中式京调师
34		中式面点师

以下内容数据来源为官方数据手册

VL53L1X电气特性

6 Electrical characteristics

6.1 Absolute maximum ratings

Warning: *Stresses above those listed in the following table may cause permanent damage to the device. These are stress ratings only. Functional operation of the device is not implied at these or any other conditions above those indicated in the operational sections of the specification. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*

Table 12. **Absolute maximum ratings**

Parameter	Min.	Typ.	Max.	Unit
AVDD	-0.5	—	3.6	V
SCL, SDA, XSHUT, and GPIO1				

6.2 Recommended operating conditions

Table 13. **Recommended operating conditions**

There are no power supply sequencing requirements. The VDs may be high, low, or floating when AVDD is applied. The VDs are internally tolerant with no diode connecting them to AVDD.

Parameter		Min.	Typ.	Max.	Unit
Voltage (AVDD)		2.6	2.8	3.5	V
IO (IOVDD) [1]	Standard mode	1.6	1.8	1.9	
	2V8 mode [2] [3]	2.6	2.8	3.5	

1. *XSHUT should be high only when AVDD is on.*
2. *SDA, SCL, XSHUT and GPIO1 high levels have to be equal to AVDD in 2V8 mode.*
3. *The default driver mode is 1V8. 2V8 mode is programmable using the device settings backed by the driver. For more details, refer to the VL53L1X API user manual (UM2356).*

6.3 Electrostatic discharge

The VL53L1X is compliant with the ESD values presented in the following table.

Table 14. **ESD performances**

Parameter	Specification	Conditions
Human body model	JS-001-2012	± 2 kV, 1500 ohms, 100 pF
Charged device model	JESD22-C101	± 500 V

VL53L1X规格说明

2.1 Technical specification

Table 2. **Technical specification**

Feature	Detail
Package	Optical LGA12
Size	4.4 x 2.5 x 1.56 mm
Operating voltage	2.6 to 3.5 V
Operating temperature	-20 to 80°C
Receiver FoV (diagonal FoV)	Programmable from 15 to 27 degrees
Infrared emitter	940 nm
I²C	Up to 400 kHz (fast mode) serial bus Programmable address default is 0x52

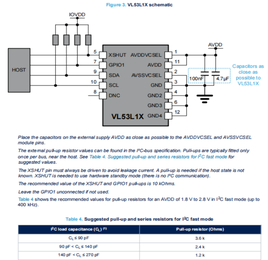
以下内容数据来源为官方数据手册

VL53L1X参考电路

2.4 Application schematic

The following figure shows the application schematic of the VL53L1X.

Figure 3. **VL53L1X schematic**



Note: Place the capacitors on the external supply AVDD as close as possible to the AVDDVCSEL and AVSSVCSEL module pins.

Note: The external pull-up resistor values can be found in the I²C-bus specification. Pull-ups are typically fitted only once per bus, near the host. See Table 4. Suggested pull-up and series resistors for I²C fast mode for suggested values.

Note: The XSHUT pin must always be driven to avoid leakage current. A pull-up is needed if the host state is not known. XSHUT is needed to use hardware standby mode (there is no I²C communication).

Note: The recommended value of the XSHUT and GPIO1 pull-ups is 10 kOhms.

Note: Leave the GPIO1 unconnected if not used.

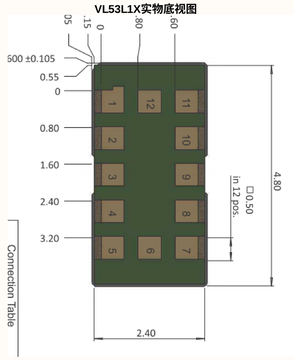
Table 4 shows the recommended values for pull-up resistors for an AVDD of 1.8 V to 2.8 V on I²C fast mode (up to 400 kHz).

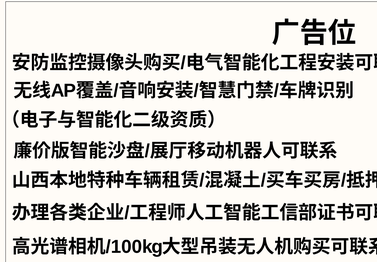
Table 4. **Suggested pull-up and series resistors for I²C fast mode**

I²C load capacitance (C_b) [1]	Pull-up resistor (Ohms)
C_b ≤ 90 pF	0.6 k
90 pF < C_b ≤ 140 pF	2.4 k
140 pF < C_b ≤ 270 pF	1.2 k
270 pF < C_b ≤ 400 pF	0.6 k

1. *For each bus line, C_b is measured in the application PCB by the customer.*

VL53L1X实物底视图





版本记录

V1.0.0版本-2026/04/13-常高幸：初版完成设计

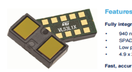
设计特点

1、GP2Y0E03 是夏普（Sharp）推出的高精度红外测距传感器，采用红外三角测距原理，用于测量物体距离和位。
2、可测量 4 ~ 50 cm 距离，内部集成 DSP 与 ADC，直接输出数字距离值。
3、数字输出为基准输出频率，且定性对于传统模拟红外传感器。
4、2.7 ~ 5.5V 宽压工作，适配多数嵌入式系统，支持数字 I2C 读取兼容3.3V电平的单片机通信。

以下内容数据来源为官方数据手册

VL53L1X简介

A new generation, long distance ranging Time-of-Flight sensor based on ST's FlightSense technology



Product status link

VL53L1X

Features

Fully integrated miniature module

- 940 nm invisible laser emitter (Class 1)
- SPAD (single photon avalanche diode) receiving array with integrated lens
- Low power microcontroller running advanced digital firmware
- 4.9 x 2.5 x 1.56 mm

Fast, accurate distance ranging

- Fast and accurate long distance ranging
  - Up to 400 cm distance measurement
  - Up to 50 Hz ranging frequency
- Pin-to-pin compatible with the VL53L0X FlightSense ranging sensor
- 27° typical full field of view (FoV)
- Multiple user-defined Region of Interest (ROI) size on the receiving array allows reduction of the sensor FoV
- A programmable ROI position on the receiving array, provides multizone operation control from the host

Eye safety

- Class 1 laser device compliant with latest standard IEC 60825-1:2014 + 3rd edition

Easy integration

- Software driver and code example for turnkey ranging
- Single reflowable component
- Single power supply 2v8
- Can be hidden behind many cover glass materials
- I²C interface (up to 400 kHz)
- Shutdown and interrupt pins

Application

- User detection (autonomous low-power mode) to power on/off and lock/unlock devices like personal computers/laptops and the Internet of Things (IoT)
- Service robots and vacuum cleaners (long distance and fast obstacle detection)
- Drones (landing assistance, hovering, ceiling detection)
- Smart shelves and vending machines (goods inventory monitoring)
- Sanitary (robust user detection whatever the target reflectance)
- Smart building and smart lighting (people detection, gesture control)
- 1 D gesture recognition
- Laser assisted autofocus (AF) enhances the camera AF system's speed and robustness, especially in difficult scenes such as low light and low contrast, and provides video focus tracking assistance

Description

The VL53L1X is a state-of-the-art, Time-of-Flight (ToF) laser-ranging sensor, enhancing the ST FlightSense product family. It is the fastest miniature ToF sensor on the market with accurate ranging up to 4 m and fast ranging frequency up to 50 Hz.

Housed in a miniature and reflowable package, it integrates a SPAD receiving array, a 940 nm invisible Class 1 laser emitter, physical infrared filters, and optics to achieve the best ranging performance in various ambient lighting conditions and range of up to 4 m.

It can be controlled via I²C interface. It is also possible to use ST's latest generation ToF technology, which allows absolute distance measurement whatever the target color and reflectance.

It is also possible to program the size of the ROI on the receiving array, allowing the sensor FoV to be reduced.

VL53L1X引脚说明

2.3 Device pinout

The following figure shows the pinout of the VL53L1X (see also Section 8: Outline drawings).

Figure 5. **VL53L1X pinout (bottom view)**

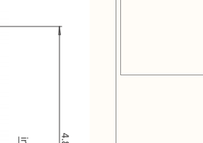


Table 3. **VL53L1X pin description**

Pin number	Signal name	Signal type	Signal description
1	AVDDVCSEL	Supply	VCSEL supply, connect to main supply
2	AVSSVCSEL	Ground	VCSEL ground, connect to main ground
3	GND	Ground	Connect to the main ground
4	GND2		
5	XSHUT	Digital input	Xshutdown pin, active low
6	GND3	Ground	Connect to the main ground
7	GPIO1	Digital output	Interrupt output. Open drain output
8	DNC	Digital input	Do not connect, must be left floating
9	SDA	Digital input/output	I²C serial data
10	SCL	Digital input	I²C serial clock input
11	AVDD	Supply	Supply, connect to the main supply
12	GND4	Ground	Connect to the main ground

Note: AVDDVCSEL and GND are ground pins and can be connected together in the application schematic.

Note: GND2, GND3, and GND4 are standard pins that we force to the ground domain in the application schematics to avoid possible instabilities if set to other states.

	A	B	C
1	序号	专业名称	级别
2	1	广告艺术设计师	高级
3	2	网络工程师	高级
4	3	电子商务师	高级
5	4	室内设计师	高级
6	5	平面设计师	高级
7	6	ERP财务应用师	高级
8	7	JAVA软件工程师	高级
9	8	计算机辅助设计师	高级
10	9	软件技术开发工程师	高级
11	10	软件开发工程师	高级
12	11	物联网技术应用工程师	高级
13	12	数据库管理工程师	高级
14	13	软件设计师	高级
15	14	网络安全架构师	高级
16	15	渗透测试工程师	高级
17	16	提示工程师	高级
18	17	大模型开发工程师	高级
19	18	数字技术应用工程师	高级
20	19	大数据治理工程师	高级
21	20	数据安全工程师	高级
22	21	程序设计工程师	高级
23	22	AIGC应用工程师	高级
24	23	大模型应用工程师	高级
25	24	大数据采集工程师	高级
26	25	商务数模分析师	高级
27	26	移动安全工程师	高级
28	27	安全运维工程师	高级
29	28	软件工程师	高级
30	29	数据库工程师	高级
31	30	音响工程	高级
32	31	舞台灯光	高级
33	32	通信工程师	高级
34	33	软件测试工程师	高级
35	34	新能源应用工程师	高级
36	35	新材料检测工程师	高级
37	36	新材料研发工程师	高级
38	37	新材料技术与应用工程师	高级
39	38	固体废物资源综合利用技术工程师	高级
40	39	现场管理工程师	高级
41	40	网络信息与安全工程师	高级
42	41	机器学习工程师	高级
43	42	python技术应用工程师	高级

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	A	B	C
1	类别	编号	测评科目
2	计算机与软件	CPOO1	Office办公软件
3		CPOO2	信息化办公
4		CPOO3	计算机硬件维护
5		CPOO4	系统管理
6		CPOO8	设备管理
7		CPOO9	网站管理
8		CPO10	物流管理
9		CPO11	网络营销
10		CPO12	局域网组建
11		CPO13	网络工程师
12		CPO15	信息安全与管理
13		CPO17	电子商务师
14		CPO19	跨境电子商务师
15		CPO20	数据管理
16		CPO21	数据库应用技术
17		CPO22	C语言编程高阶
18		CPO24	.NET开发工程师
19		CPO25	Android软件开发工程师
20		CPO26	Java软件开发工程师
21		CPO27	J2EE软件开发工程师
22		CPO31	Web前端开发工程师
23		CPO42	软件测试工程师
24		CP206	财务信息化管理
25		CPO45	平面设计师
26		CPO47	网页设计师
27		CPO48	二维动画设计师
28		CPO49	三维设计师

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