广告位

安防监控摄像头购买/电气智能化工程安装可联系-超低价

无线AP覆盖/音响安装/智慧门禁/车牌识别

（电子与智能化二级资质）

廉价版智能沙盘/展厅移动机器人可联系

山西本地特种车辆租赁/混凝土/买车买房/抵押贷款需要可联系

办理各类企业/工程师人工智能工信部证书可联系（包过一条龙）

高光谱相机/100kg大型吊装无人机购买可联系

山西本地无人机高空清洗作业可联系/数字人视频生成

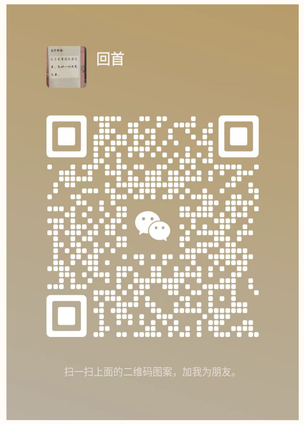
ERP沙盘模拟赛可dd/高校实验室装修/化工电子类实验设备

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	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	

以下说明来源为数据手册内容

ADXL345性能参数

SPECIFICATIONS

T_A = 25°C, V_S = 2.5 V, $V_{DD I/O}$ = 1.8 V, acceleration = 0 g, C_S = 10 µF tantalum, $C_{I/O}$ = 0.1 µF, output data rate (ODR) = 800 Hz, unless otherwise noted. All minimum and maximum specifications are guaranteed. Typical specifications are not guaranteed.

Table 1.

Parameter	Test Conditions	Min	Typ[1]	Max	Unit
SENSOR INPUT	Each axis				
Measurement Range	User selectable		±2, ±4, ±8, ±16		g
Nonlinearity	Percentage of full scale		±0.5		%
Inter-Axis Alignment Error			±0.1		Degrees
Cross-Axis Sensitivity[2]			±1		%
OUTPUT RESOLUTION	Each axis				
All g Ranges	10-bit resolution		10		Bits
±2 g Range	Full resolution		10		Bits
±4 g Range	Full resolution		11		Bits
±8 g Range	Full resolution		12		Bits
±16 g Range	Full resolution		13		Bits
SENSITIVITY	Each axis				
Sensitivity at X_{OUT}, Y_{OUT}, Z_{OUT}	All g ranges, full resolution	230	256	282	LSB/g
	±2 g, 10-bit resolution	230	256	282	LSB/g
	±4 g, 10-bit resolution	115	128	141	LSB/g
	±8 g, 10-bit resolution	57	64	71	LSB/g
	±16 g, 10-bit resolution	29	32	35	LSB/g
Sensitivity Deviation from Ideal	All g ranges		±1.0		%
Scale Factor at X_{OUT}, Y_{OUT}, Z_{OUT}	All g ranges, full resolution	3.5	3.9	4.3	mg/LSB
	±2 g, 10-bit resolution	3.5	3.9	4.3	mg/LSB
	±4 g, 10-bit resolution	7.1	7.8	8.7	mg/LSB
	±8 g, 10-bit resolution	14.1	15.6	17.5	mg/LSB
	±16 g, 10-bit resolution	28.6	31.2	34.5	mg/LSB
Sensitivity Change Due to Temperature			±0.01		%/°C
0 g OFFSET	Each axis				
0 g Output for X_{OUT}, Y_{OUT}		−150	0	+150	mg
0 g Output for Z_{OUT}		−250	0	+250	mg
0 g Output Deviation from Ideal, X_{OUT}, Y_{OUT}			±35		mg
0 g Output Deviation from Ideal, Z_{OUT}			±60		mg
0 g Offset vs. Temperature for X-, Y-Axes			±0.4		mg/°C
0 g Offset vs. Temperature for Z-Axis			±1.2		mg/°C
NOISE					
X-, Y-Axes	ODR = 100 Hz for ±2 g, 10-bit resolution or all g ranges, full resolution		0.75		LSB rms
Z-Axis	ODR = 100 Hz for ±2 g, 10-bit resolution or all g ranges, full resolution		1.1		LSB rms
OUTPUT DATA RATE AND BANDWIDTH	User selectable				
Output Data Rate (ODR)[3, 4]		0.1		3200	Hz
SELF-TEST[5]					
Output Change in X-Axis		0.20		2.10	g
Output Change in Y-Axis		−2.10		−0.20	g
Output Change in Z-Axis		0.30		3.40	g
POWER SUPPLY					
Operating Voltage Range (V_S)		2.0	2.5	3.6	V
Interface Voltage Range ($V_{DD I/O}$)		1.7	1.8	V_S	V
Supply Current	ODR ≥ 100 Hz		140		µA
	ODR < 10 Hz		30		µA
Standby Mode Leakage Current			0.1		µA
Turn-On and Wake-Up Time[6]	ODR = 3200 Hz		1.4		ms

Parameter	Test Conditions	Min	Typ[1]	Max	Unit
TEMPERATURE					
Operating Temperature Range		−40		+85	°C
WEIGHT					
Device Weight			30		mg

[1] The typical specifications shown are for at least 68% of the population of parts and are based on the worst case of mean ± 1 σ, except for 0 g output and sensitivity, which are ±3 σ limits. For 0 g output, the ideal value is 0 g; therefore, deviation from the ideal describes the worst case of mean ±1 σ.

[2] Cross-axis sensitivity is defined as coupling between any two axes.

[3] Bandwidth is the −3 dB frequency and is half the output data rate, bandwidth = ODR/2.

[4] The output format for the 3200 Hz and 1600 Hz ODRs is different than the output format for the remaining ODRs. This difference is described in the Data Formatting of Upper Data Rates section.

[5] Output data rates below 6.25 Hz exhibit additional offset shift with increased temperature, depending on selected output data rate. Refer to the Offset Performance at Lower Data Rates section for details.

[6] Turn-on time is defined as the output (g) when the SELF_TEST bit = 1 (in the DATA_FORMAT register, Address 0x31) minus the output (g) when the SELF_TEST bit = 0. Due to device filtering, the output reaches its final value after 4 × 1/(data rate). Where t = 1/(data rate). The part must be in normal power operation (LOW_POWER bit = 0 in the BW_RATE register, Address 0x2C) for self-test to operate correctly.

[7] Turn-on and wake-up times are determined by the user-defined bandwidth. At a 100 Hz data rate, the turn-on and wake-up times are each approximately 11.1 ms. For other data rates, the turn-on and wake-up times are each approximately n × 1.1 in milliseconds, where t = 1/(data rate).

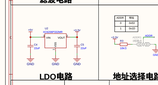
基于ADXL345的三轴加速度模块-V1.0.0



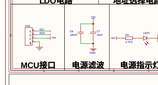
ADXL345电路



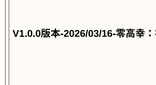
滤波电路



LDO电路



地址选择电路



MCU接口

电源滤波

电源指示灯

公众号链接



设计特点

1、本模块基于ADXL345BCCZ-RL7芯片，是一款三轴数字加速度计，测量范围可在 ±2 g、±4 g、±8 g、±16 g 之间选择，在 ±2 g 量程下分辨率可达约 3.9 mg/LSB (13-bit 有效分辨率)，能够实现较高精度的运动与姿态检测。

2、该器件支持 I²C（最高约 400 kHz）和 SPI（最高约 5 MHz）两种数字通信接口，并内置 32 级 FIFO 缓冲区，可降低 MCU 的读取频率并减少系统功耗。

3、芯片具有 低功耗特性，典型工作电流约 140 µA（测量模式），待机电流仅 约 0.1 µA，适用于电池供电或便携式设备。

原理图	Schematic1		更新日期	2026-03-17
图页	P3		创建日期	2026-03-16
规则			物料编码	
单元	基于ADXL345的三轴加速度模块			
嘉立创EDA		版本	尺寸	页 1 共 1
		V1.0	A4	嘉立创EDA

版本记录

V1.0.0版本-2026/03/16-零高幸：初版完成设计

以下说明来源为数据手册内容

ADXL345简介

FEATURES

Ultralow power: as low as 23 µA in measurement mode and 0.1 µA in standby mode at V_S = 2.5 V (typical)
Power consumption scales automatically with bandwidth
User-selectable resolution
Fixed 10-bit resolution
Full resolution, where resolution increases with g range, up to 13-bit resolution at ±16 g (maintaining 4 mg/LSB scale factor in all g ranges)
Embedded memory management system with FIFO technology minimizes host processor load
Single tap/double tap detection
Activity/inactivity monitoring
Free-fall detection
Supply voltage range: 2.0 V to 3.6 V
I/O voltage range: 1.7 V to V_S
SPI (3- and 4-wire) and I²C digital interfaces
Flexible interrupt modes mappable to either interrupt pin
Measurement ranges selectable via serial command
Bandwidth selectable via serial command
Wide temperature range (−40°C to +85°C)
10,000 g shock survival
Pb free/RoHS compliant
Small and thin: 3 mm × 5 mm × 1 mm LGA package

APPLICATIONS

Handsets
Medical instrumentation
Gaming and pointing devices
Industrial instrumentation
Personal navigation devices
Hard disk drive (HDD) protection

GENERAL DESCRIPTION

The ADXL345 is a small, thin, ultralow power, 3-axis accelerometer with high resolution (13-bit) measurement at up to ±16 g. Digital output data is formatted as 16-bit twos complement and is accessible through either a SPI (3- or 4-wire) or I²C digital interface.

The ADXL345 is well suited for mobile device applications. It measures the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration resulting from motion or shock. Its high resolution (3.9 mg/LSB) enables measurement of inclination changes less than 1.0°.

Several special sensing functions are provided. Activity and inactivity sensing detect the presence or lack of motion by comparing the acceleration on any axis with user-set thresholds. Tap sensing detects single and double taps in any direction. Free-fall sensing detects if the device is falling. These functions can be mapped individually to either of two interrupt output pins. An integrated memory management system with a 32-level first in, first out (FIFO) buffer can be used to store data to minimize host processor activity and lower overall system power consumption.

Low power modes enable intelligent motion-based power management with threshold sensing and active acceleration measurement at extremely low power dissipation.

The ADXL345 is supplied in a small, thin, 3 mm × 5 mm × 1 mm, 14-lead, plastic package.

ADXL345引脚说明



Figure 3. Pin Configuration (Top View)

Table 5. Pin Function Descriptions

Pin No.	Mnemonic	Description
1	$V_{DD I/O}$	Digital Interface Supply Voltage.
2	GND	This pin must be connected to ground.
3	RESERVED	Reserved. This pin must be connected to V_S or left open.
4	GND	This pin must be connected to ground.
5	GND	This pin must be connected to ground.
6	V_S	Supply Voltage.
7	$\overline{CS}$	Chip Select.
8	INT1	Interrupt 1 Output.
9	INT2	Interrupt 2 Output.
10	NC	Not Internally Connected.
11	RESERVED	Reserved. This pin must be connected to ground or left open.
12	SDO/ALT ADDRESS	Serial Data Output (SPI 4-Wire)/Alternate I²C Address Select (I²C).
13	SDA/SDI/SDIO	Serial Data (I²C)/Serial Data Input (SPI 4-Wire)/Serial Data Input and Output (SPI 3-Wire).
14	SCL/SCLK	Serial Communications Clock. SCL is the clock for I²C, and SCLK is the clock for SPI.

ADXL345额定最大参数

ABSOLUTE MAXIMUM RATINGS

Table 2.

Parameter	Rating
Acceleration	
Any Axis, Unpowered	10,000 g
Any Axis, Powered	10,000 g
V_S	−0.3 V to +3.9 V
$V_{DD I/O}$	−0.3 V to +3.9 V
Digital Pins	−0.3 V to $V_{DD I/O}$ + 0.3 V or 3.9 V, whichever is less
All Other Pins	−0.3 V to +3.9 V
Output Short-Circuit Duration (Any Pin to Ground)	Indefinite
Temperature Range	
Powered	−40°C to +105°C
Storage	−40°C to +105°C

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

	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	商务数椐分析师	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

企业认证证书 | 工信部职业 | 工信部人才交流中心测评证书 | 工

	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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