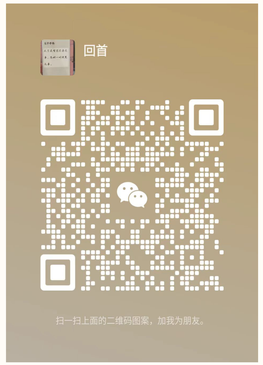
广告位

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	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

SGP40参考电路

Parameter	Rating
Supply voltage VDD	−0.3 to +3.6 V
Supply voltage VDDH	−0.3 to +3.6 V
Short-term storage temperature range[4]	−40 to +70 °C
Operating temperature range	−20 to +55 °C
Short-term storage humidity range[4]	0 to 80 % (non-condensing)
Operating humidity range	0 to 90 % (non-condensing)
ESD HBM	2 kV
ESD CDM	500 V
Latch-up, JESD78 Class II, 125 °C	100 mA

Table 5 Absolute minimum and maximum ratings.

2.5 Hardware Interface Specifications

The SGP40 comes in a 6-pin DFN package, see **Table 6**. **Figure 5** shows a typical application circuit. The VDD pin must be decoupled with an RC element. The required decoupling for VDDH depends on the power supply network connected to the sensor, a capacitor of 1 µF is recommended. VDD and VDDH must be connected to one single supply VDD. The external pull-up resistors (e.g., R_P = 10 kΩ) are required to pull the SDA and SCL signal lines high. For dimensioning resistor sizes please take bus capacity and communication frequency into account (see section 7.1 of *NXP I²C-bus specification and user manual* for more details). It should be noted that pull-up resistors may be included in I/O circuits of microcontrollers. The die pad or center pad is electrically connected to GND. Hence, electrical considerations do not impose constraints on the wiring of the die pad. However, for mechanical stability it is recommended to solder the die pad to the PCB.

Pin	Name	Comments
1	VDD	Supply voltage
2	VSS	Ground
3	SDA	Serial data, bidirectional
4	n/a	Connect to ground (no electrical function)
5	VDDH	Supply voltage, hotplate
6	SCL	Serial clock, bidirectional



Table 6 Pin assignment (transparent top view). Dashed lines are only visible from the bottom.

SGP40性能参数

1 Sensor Performance

Table 1 lists specifications characterizing the gas sensing performance. The SGP40 chip provides a digital raw signal (SRAW_VOC) which is sensitive to most VOC gases typically present in indoor environments and which is proportional to the logarithm of the resistance of the sensing material. This signal is intended for further processing by an algorithm providing quantitative information about the VOC based indoor air quality. For this purpose, Sensirion offers its robust VOC Algorithm, which is included in the VOC Index driver package available on github (see SGP40 product page on Sensirion's webpage). The algorithm maps all VOC and fresh air events to a VOC Index scale (see 3.2 VOC Index Measurement). For the specifications given below, ethanol in clean air has been used as proxy gas for typical indoor air events.

Parameter	Comments		Min.	Typ.	Max.	Units
Output signals[1]	VOC Index, processed value from SRAW_VOC		1	–	500	VOC Index points
	SRAW_VOC, digital raw value		0	–	65'535	ticks[2]
Measurement range	Ethanol in clean air		0	–	1'000	ppm
Specified range	Ethanol in clear air		0.3	–	30	ppm
Device-to-device variation	VOC Index[3]		–	±x.10 ±15	–	VOC Index points or % m.v. (the larger)
Repeatability	VOC Index[3]		–	±x.5 ±5	–	VOC Index points or % m.v. (the larger)
Limit of detection[4,5]	Ethanol in specified r.range		–	–	±0.05 ±10	ppm or % of concentration setpoint (the larger)
Response time	Changing concentration from 0 to 10 ppm of ethanol at sampling interval of 1 s	t90	–	≤10	–	s
		t99	–	≤30	–	s
Switch-on behavior	Time until reliability detecting VOC events[4]		–	≤60	–	s
	Time until specifications in this table are met		–	≤1	–	h
Sensitivity[4]	SRAW_VOC, doubling VOC concentration	Ethanol in specified range	–	≈510	–	ticks
		0 to 10 ppm of ethanol	≈110	≈570	≈1'030	ticks
Sampling-interval	VOC Index		–	1	–	s
	SRAW_VOC		0.5	1	10	s

Table 1 Gas sensing specifications at 25 °C and 50 % RH in zero air (considered as clean air for indoor air quality applications) and a power supply of VDD of 3.3 V. All concentrations refer to ethanol as test gas.

[1] 95 % of the sensors will be within the minimum-maximum tolerance. Typical tolerance refers to the mean of the distribution for ± 1SD sensors.
[2] Humidity compensated when actual humidity value is provided except for the sensor (see section 3.1 Raw Signal Measurement).
[3] Signal in ticks is proportional to the logarithm of the resistance of the sensing layer.
[4] Specified by design, characterization or production test. Not tested in SGP40 – Testing Guide.
[5] Limit of detection is defined as the minimum change of concentration required to obtain a new signal change is three-times higher than the noise at the given concentration setpoint. Typical limit of detection is 0.05 ppm of ethanol, 0.1 ppm of acetaldehyde, 0.1 ppm of acetone, 0.1 ppm of isopropanol, 0.1 ppm of hydrogen and 0.25 ppm of hexamethyldisiloxane (D5).
[6] Signal change: during 60 s event of 5 to 10 ppm of ethanol is three times larger than signal drift within the event during the same duration.

以下内容数据来源为官方数据手册

SGP40电气参数

2 Specifications

2.1 Electrical Specifications

Table 2 lists electrical specifications of the SGP40. Default conditions of 25 °C and 3.3 V supply voltage apply to values in the table below, unless otherwise stated. The SGP40 supports both I²C "standard-mode" and "fast-mode".

Parameter	Symbol	Values Min.	Typ.	Max.	Unit	Comments
Supply voltage, hotplate supply voltage*	VDD, VDDH	1.7	3.3	3.6	V	Min-imal voltage must be guaranteed also for the maximum supply current specified in this table. VDD and VDDH must be connected to the same power supply, see Figure 5.
Idle current	IDD	–	3.4	105	µA	The idle mode is activated after power-up, after a *Turn_Heater_Off* command, or after a soft reset.
Supply current under operation*		–	3.5	4.0	mA	Average current consumption while the sensor is continuously operated at VDD, VDDH = 3.3 V.
		–	2.6	3.0	mA	Average current consumption while the sensor is continuously operated at VDD, VDDH = 2.5 V.
Communication		Digital 2-wire interface, I²C				

Table 2 Electrical specifications.

2.2 Timing Specifications

Timings in **Table 3** refer to the power up and reset of the ASIC part and do not reflect the usefulness of the readings.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Power-up time	t_{PU}	After hard reset, VDD ≥ VPOR	–	0.4	0.6	ms
Soft reset time	t_{SR}	After soft reset	–	0.4	0.6	ms
SCL clock frequency	f_{SCL}	–	–	–	400	kHz

Table 3 System timing specifications.

2.3 Recommended Operating and Storage Conditions

Gas Sensing Specifications as detailed in **Table 1** are guaranteed only when the sensor is stored and operated under the recommended conditions as specified in **Table 4** and displayed in **Figure 3** and **Figure 4**. Prolonged exposure to conditions outside these conditions may temporarily affect sensor performance. The sensor must not be exposed towards condensing conditions (i.e., >90 % relative humidity) at any time.

*Any supply voltage as defined by the min-/max. ranges may be used for continuous operation of the sensor. The typical value specifies the supply voltage at which outgoing qualification tests are performed.
†Specified by the sgp40_measure_raw_blocking() command enables continuous operation of the sensor. A 35 % higher current is drawn during 3 ms per VOC® after entering the measurement mode.

Condition	Parameter	Min.	Max.	Unit
Operating conditions	Relative humidity	0	90	% RH
	Temperature	+10	50	°C
Operating conditions of humidity compensation	Humidity	1.5 (-10) –	30 (+31) 90 (the smaller)	g·m⁻³ (°C dew point) or % RH
	Temperature	+10	50	°C
Storage conditions	Relative humidity	0	80	% RH
	Temperature	5	30	°C

Table 4 Recommended humidity and temperature conditions for storing and operating the SGP40. Dew point refers to maximum humidity allowed at minimum and maximum temperature, respectively.

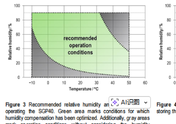


Figure 3 Recommended relative humidity and temperature for operating the SGP40. Green area marks conditions for which humidity compensation has been optimized. Additionally, gray areas mark operating conditions without considering the humidity compensation feature.

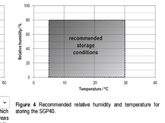
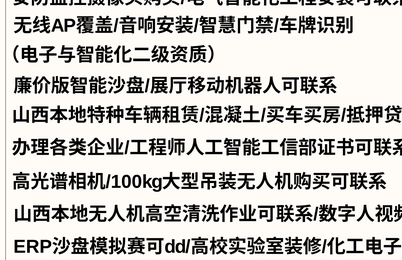


Figure 4 Recommended relative humidity and temperature for storing the SGP40.

To ensure an optimal performance of the SGP40, *Handling and Assembly Instructions for SGPxx Gas Sensors* as well as the *Design-in Guide for Integrating SGPxx Gas Sensors* need to be followed.

2.4 Absolute Minimum and Maximum Ratings

Stress levels beyond those listed in **Table 5** may cause permanent damage to the device. Exposure to minimum/maximum rating conditions for extended periods may affect sensor performance and reliability of the device.



以下内容数据来源为官方数据手册

SGP40简介

Datasheet SGP40

Indoor Air Quality Sensor for VOC Measurements

- MOx based gas sensor for indoor air quality applications
- Outstanding long-term stability and lifetime
- I²C interface with digital output signal
- Very small 6-pin DFN package: 2.44 x 2.44 x 0.85 mm³
- Low power consumption: 2.6 mA at 3.3 V
- Tape and reel packaged, reflow solderable

Product Summary

The SGP40 is a digital gas sensor designed for easy integration into air purifiers or demand-controlled ventilation systems. Sensirion's CMOSens® technology offers a complete, easy-to-use sensor system on a single chip featuring a digital I²C interface and a temperature controlled micro hotplate, providing a humidity-compensated VOC based indoor air quality signal. The output signal can be directly processed by Sensirion's powerful VOC Algorithm to translate the raw signal into a VOC Index as a robust measure for indoor air quality. The VOC Algorithm automatically adapts to the environment the sensor is exposed to. Both sensing element and VOC Algorithm feature an unmatched robustness against contaminating gases present in real-world applications enabling a unique long-term stability as well as low drift and device-to-device variation. The very small 2.44 x 2.44 x 0.85 mm³ DFN package enables applications in limited spaces. Sensirion's state-of-the-art production process guarantees high reproducibility and reliability. Tape and reel packaging together with suitability for standard SMD assembly processes make the SGP40 predestined for high-volume applications.

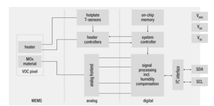


Figure 1 Functional block diagram of the SGP40.

SGP40引脚说明

2.5 Hardware Interface Specifications

The SGP40 comes in a 6-pin DFN package, see **Table 6**. **Figure 5** shows a typical application circuit. The VDD pin must be decoupled with an RC element. The required decoupling for VDDH depends on the power supply network connected to the sensor, a capacitor of 1 µF is recommended. VDD and VDDH must be connected to one single supply VDD. The external pull-up resistors (e.g., R_P = 10 kΩ) are required to pull the SDA and SCL signal lines high. For dimensioning resistor sizes please take bus capacity and communication frequency into account (see section 7.1 of *NXP I²C-bus specification and user manual* for more details). It should be noted that pull-up resistors may be included in I/O circuits of microcontrollers. The die pad or center pad is electrically connected to GND. Hence, electrical considerations do not impose constraints on the wiring of the die pad. However, for mechanical stability it is recommended to solder the die pad to the PCB.

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3	SDA	Serial data, bidirectional
4	n/a	Connect to ground (no electrical function)
5	VDDH	Supply voltage, hotplate
6	SCL	Serial clock, bidirectional

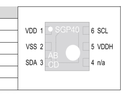


Table 6 Pin assignment (transparent top view). Dashed lines are only visible from the bottom.

	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

	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

企业认证证书 | 工信部职业 | 工信部人才交流中心测评证书 | 工信部职业 | 工信部人才交流中心测评证书 | 工信部信创证书 | 中国未来研究会 | 人力