GZP183

Pressure Sensor

mV Signal Output

Datasheet

Version: V1.7

Issued Date: 2025.03.04

Table of Contents

Document Revision History

Revision	Description	Date
V1.0	Initial version	2020.05.15
V1.1	Improve product information	2020.10.28
V1.2	Modify the product size diagram Modify the selection table	2020.11.06
V1.3	Add the cover and table of contents	2021.11.07
V1.4	Update address	2022.08.29
V1.5	Update the template	2023.06.15
V1.6	Change the size of the external structure diagram	2023.09.27
V1.7	Update the drawings and templates	2025.03.04

1 Product Description

The GZP183 pressure sensor is a state-of-the-art MEMS pressure sensor designed for a wide applications in medical&health care,industry&automation, household appliances and consumer electronics with specific pressure range. It is composed of a silicon piezoresistive pressure sensing chip and a signal conditioning integrated circuit. The initial signal from the sensing chip is amplified, temperature compensated, calibrated and finally converted to a digital signal(I2C) that is corresponding to the applied pressure.

1.1 Feature

- Pressure range 10/40/100/200kPa
- MEMS technology
- Gauge pressure type
- SOP package
- Suitable for non-corrosive gases or liquid
- Driven by constant voltage or constant current
- Low cost for mass production

1.2 Applications

- The field of small household appliances such as rice cookers, soy milk makers, water purifiers, coffee makers, etc
- Water pressure measurement, diving equipment
- Air pump, air compressor
- Instrumentation and other gauge pressure system

2 Function Description

The GZP183 pressure sensor is suitable for applications in medical and healthy care, automotive electronics, industry automation and other fields. Its key component is a silicon piezoresistive pressure sensor manufactured using MEMS technology . This pressure sensor consists of an elastic membrane and four resistors integrated into the membrane. These four piezoresistors form a Wheatstone bridge structure. When pressure acts on the membrane, the bridge generates a voltage output signal that is linearly proportional to the applied pressure.

2.1 Electrical Connections

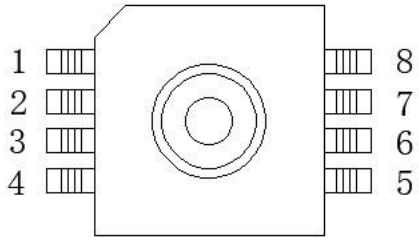

Fig.1 Pin Definition

The pin correspondence is shown in Table 1.

Tab.1 Pin correspondence table

PIN No.	Definition	Description		PIN No.	Definition	Description
1	NC	No connect		4	NC	No connect
2	VO+	Output positive		5	VO-	Output negative
3	NC	No connect		6	NC	No connect
4	GND	Power input negative		8	VS+	Power input positive

2.2 Block Diagram

The principle block diagram of the pressure sensor is shown in Figure 2.

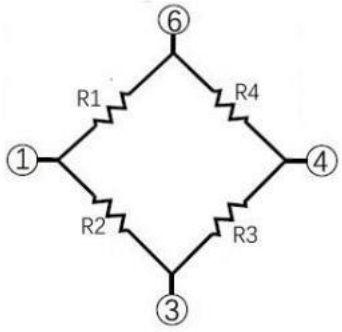

Fig.2 Schematic diagram

3 Structural Performance

Pressure sensitive chip: silicon material

Lead: Gold wire

Package shell: PPS material

Pins: Copper with silver plating

Bottom cover material: LCP material

Net weight: about 0.4 grams

4 Technical Indicators

The following indicators of the pressure sensor are measured under the following conditions:

Measuring medium: Air

Medium temperature: (25±1) °C

Ambient temperature: (25±1) °C

Vibration : 0.1g (1m/s2) Max

Humidity: (50% ± 10%) RH

Power supply: (5±0.005)V DC

4.1 Electrical Performance

The electrical performance of the sensor is shown in Table 2.

Tab.2 Electrical performance table

Parameter	Minimum	Typical values	Maximum	Unit
Constant voltage power supply		5	15	V
Constant current power supply		1	3	mA
Bridge resistance	4	5	6	kΩ
Input impedance	4	5	6	kΩ
Output impedance	4	5	6	kΩ

4.2 Temperature Characteristics

The temperature characteristics of the sensor are shown in Table 3.

Tab.3 Temperature characteristics

Parameter	Min.	Typ.	Max.	Unit
Operating temperature	-30		+100	°C
Storage temperature	-40		+125	°C
Resistance temperature coefficient	1600	2100	2600	ppm/ °C
Zero temperature coefficient	-0.05	±0.02	0.05	%FS/°C Constant current power supply
	-0.2		0.2	%FS/°C Constant voltage power supply
Full-scale temperature coefficient	-0.05	±0.02	0.05	%FS/°C Constant current power supply
	-0.25	-0.21	-0.17	%FS/°C Constant voltage power supply

4.3 Mechanical Properties

The mechanical properties of the sensor are shown in Table 4.

Tab.4 Mechanical properties

Parameter	Minimum	Typical values	Maximum	Unit
Measuring range	10、40、100、200			kPa
Zero output	-10		10	mV
Full scale output 10kPa	35	45	85	mV
Full scale output 40kPa	50	75	100	mV
Full scale output 100kPa/200kPa	60	90	120	mV
Overload Pressure (pressure range ≤ 40kPa)	3X			Rate
Overload Pressure (40kPa≤pressure range≤200kPa)	2X			Rate
Overload Pressure (pressure range > 200kPa)	1.5X			Rate
Non-linearity (pressure range≤10kPa)	-0.8	±0.5	0.8	%FS
Non-linearity (pressure range≥10kPa)	-0.3	±0.15	0.3	%FS
Hysteresis	-0.3	±0.15	0.3	%FS
Repeatability	-0.3	±0.15	0.3	%FS

5 Appearance Structure

The external dimensions of the pressure sensor are shown in Figures 3， 4. (If tolerance is unspecified , it shall be in accordance with GB/T1804-M).

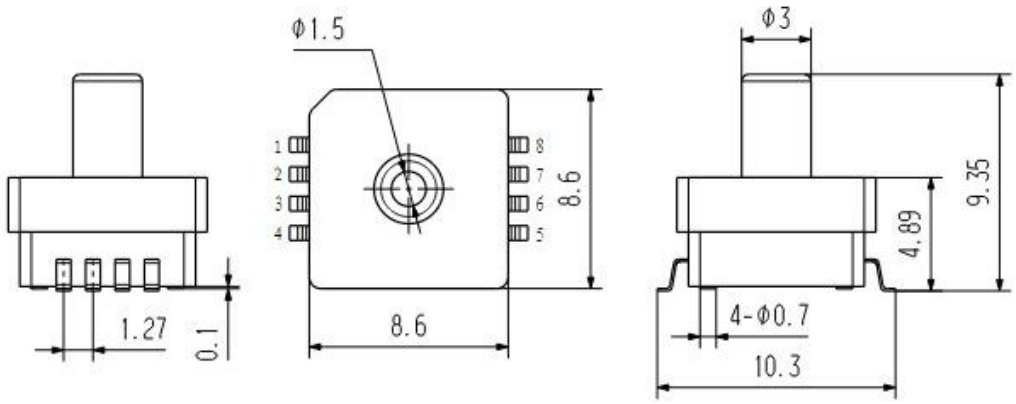

Fig.3 Appearance structure

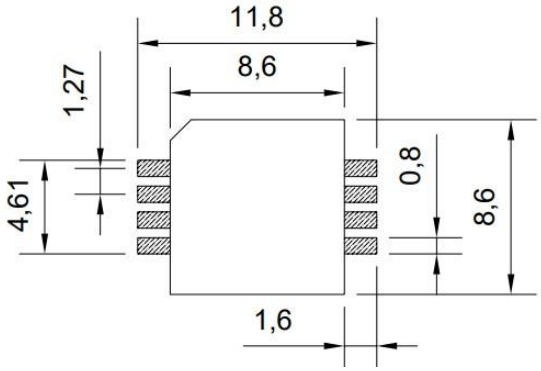

Fig.4 Recommended footprint

6 Order Guide

GZP 183 - 101 S F01 - L01

GZP	Pressure Sensor Series
167	Product Series
101	Pressure range 010：10kPa 040：40kPa 101：100kPa 201：200kPa
S	Appearance type　S: SOP　D:DIP
F01	Packaging method　F01: Tube　B01: Reel&Tape
WX	Company interior code

Order Tips

- Some models do not include all the ranges mentioned above.
- Some product models are only available in specific packages.
- For more information, please contact Sencoch.

7 Precautions for Use

7.1 Soldering

Because this product has a small structure with low heat capacity, please minimize the effects of external heat. Failure to do so may cause damage due to thermal deformation and change in characteristics. Please use non-corrosive rosin-based flux . Also, since the product is exposed to the outside, be careful not to allow flux to penetrate the interior.

(1) Manual welding

■ Use a soldering iron with a head temperature between 260 and 300°C (30 W) and perform the work within 5 seconds.

■ Please note that the output may change when soldering with a load applied to the terminals.

■ Please keep the soldering iron tip clean.

(2) Wave soldering (SMD terminal type)

■ The recommended wave oven temperature setting conditions are shown in Figure 9.

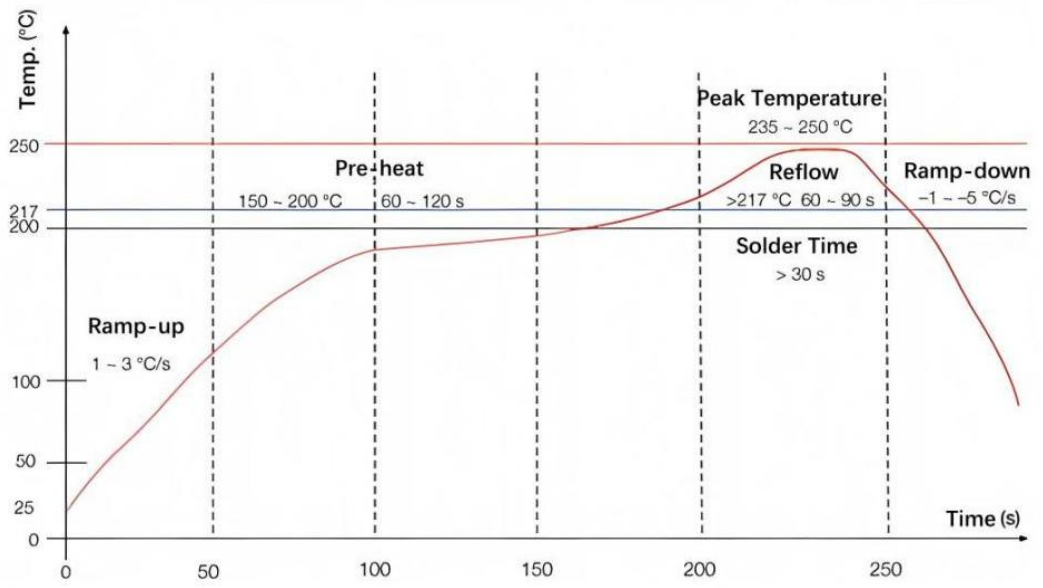

Fig.5 Reflow soldering temperature setting conditions

(3) The warping of the printed circuit board relative to the entire sensor should be kept below 0.05mm. Please manage this.

(4) After installing the sensor, be careful not to generate stress on the solder joint when cutting and bending the substrate .

(5) Since the sensor terminals are exposed, contact with metal pieces or other objects may cause abnormal output. Be careful not to touch the terminals with metal pieces or your hands.

(6) After soldering, when applying coating to prevent deterioration of the insulation of the substrate, be careful not to allow chemicals to adhere to the sensor.

7.2 Cleaning requirements

Avoid using ultrasonic cleaning as it may cause product failure.

7.3 Storage and transportation

(1) Due to the structure of the pressure sensor chip, the output will fluctuate when it is exposed to light. Especially when applying pressure through a transparent cover, etc., please avoid light from reaching the sensor chip.

(2) Normally packaged pressure sensors can be transported by ordinary transportation vehicles. Please note: The product must be protected from moisture, shock, sunburn and pressure during transportation.

7.4 Other precautions for use

(1) If the installation method is incorrect, it may cause an accident, so please be careful.

(2) Avoid using the product in a manner that applies high-frequency vibrations, such as ultrasonic waves.

(3) The only pressure media that can be used directly are non-corrosive gases or liquid. Other media, especially corrosive media or media containing foreign matter, may cause malfunction and damage. Therefore, please avoid using it in the above environments .

(4) A pressure sensor chip is located inside the pressure inlet. Inserting a needle or other foreign object into the pressure inlet can damage the chip and clog the inlet , so please avoid such an operation.

(5) Please use the product within the rated pressure range. Using the product outside the rated pressure range may cause damage.

(6) Since static electricity may cause damage, please be careful to ground charged objects on the table and operators when using it to allow the surrounding static electricity to discharge safely.

(7) Depending on the pressure used, please pay full attention to the fixing and selection of the product, sleeve, and introduction tube.

If you have any questions, please feel free to ask.

■ Please confirm under actual usage conditions

Since this specification is for a single product, please confirm the performance and quality under actual usage conditions to improve reliability.

8 Amplifier Circuit Example

The pressure sensor is driven by a constant current to convert the voltage, which is then amplified as needed. The circuit shown below is a commonly used circuit.

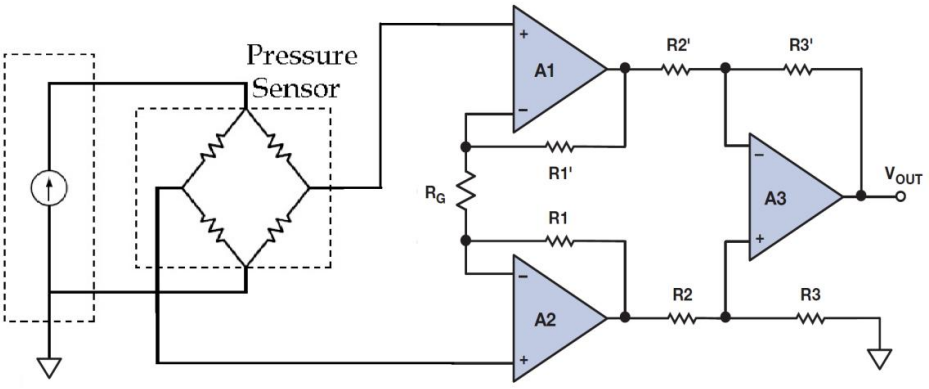

Fig.6 Amplifier circuit example

Safety Precautions

This product is made of semiconductor components for general electronic equipment (communication equipment, measuring equipment, working machinery, etc.). Products using these semiconductor components may malfunction and fail due to external interference and surges, so please confirm the performance and quality under actual use. To be on the safe side, please perform safety design on the device (setting of protection circuits such as fuses and circuit breakers, multiple devices, etc.) so that life, body, property, etc. will not be harmed in the event of a malfunction. To prevent injuries and accidents, please be sure to comply with the following matters:

·The driving current and voltage should be used below the rated values.

Please wire according to the electrical definition . In particular, reverse connection of the power supply may cause accidents due to circuit damage such as heat, smoke, and fire, so please be careful.

·Be careful when fixing the product and connecting the pressure inlet .

Warranty and Disclaimer

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