GZP197

Pressure Sensor

Datasheet

Version: V1.0

Issued Date: 2024.08.08

Table of Contents

Document Revision History

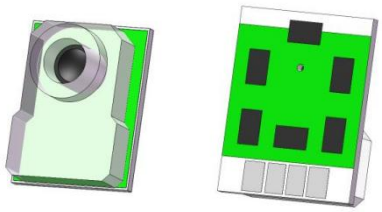
Revision	Description	Date
V1.0	Initial version	2024.08.08

1 Product Description

The GZP197 invasive pressure sensor is designed for use in disposable blood pressure monitoring medical instruments and conforms to AAMI requirements for blood pressure monitors. Its core component is a silicon piezoresistive pressure-sensitive chip fabricated using MEMS technology, mounted on a ceramic substrate. Thick-film circuitry calibrates and compensates for the sensor, generating a high-precision standard voltage output signal referenced to the supply voltage. A cap attached to the ceramic substrate not only protects the internal structure from damage but also facilitates installation and use in the system. Gel is used on the pressure-sensitive chip to ensure insulation from external sources.

1.1 Feature

- MEMS technology
- Gauge pressure type
- Output calibration and compensation
- Medical insulating gel
- Compliant with AAMI requirements



1.2 Applications

- Medical instruments
- Blood pressure monitor
- Hemodialysis machine
- Infusion pump

2 Function Description

The GZP197 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

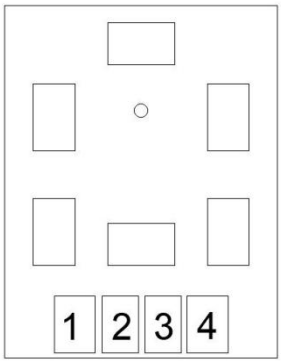


Fig.1 Pin Definition

The pin correspondence is shown in Table 1.

Tab.1 Pin correspondence table

PIN No.	Definition	Description
1	VDD	Power input positive
2	VOUT+	Signal output positive
3	VOUT-	Signal output negative
4	GND	Grounding

3 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: (6±0.005)V DC

3.1 Electrical Performance

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

Tab.2 Electrical performance table

Parameter	Min.	Typical values	Max.	Unit
Constant voltage power supply	1	6 (Calibration voltage)	10	V
Input impedance	1.2		3.2	kΩ
Output impedance	285		315	kΩ
Symmetry	-5		5	%
Insulation breakdown voltage		10000		VDC
Leakage current			2	μA
Response frequency (Note 1)	1200			
Phase drift (Note 1)			5	Degrees
Zero drift (Note 1)			1	mmHg/8hrs

3.2 Temperature Characteristics

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

Tab.3 Temperature characteristics

Parameter	Min.	Typical values	Max.	Unit
Operating temperature	15	22	40	°C
Storage temperature	-25		70	°C
Relative humidity	10		90	%
Linear hysteresis (Note 3) (-50~100 mmHg)			1	mmHg
Linear hysteresis (Note 3) (>100~200 mmHg)			1	%Output
Linear hysteresis (Note 3) (>200~300 mmHg)			1.5	%Output
Zero-point temperature coefficient	-0.3		0.3	mmHg/°C
Full-scale temperature coefficient	-0.1		0.1	%/°C

3.3 Mechanical Properties

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

Tab.4 Mechanical properties

Parameter	Min.	Typical values	Max.	Unit
Measuring range	-50		300	mmHg
Zero output	-25	0	25	mmHg
Sensitivity	4.95	5	5.05	μV/V/mmHg
Calibration (Note 2)	97.5	100	102.5	mmHg
Maximum pressure overload	125			PSI

3.4 More Characteristics

The more characteristics of the sensor are shown in Table 5.

Tab.5 More Characteristics

Parameter	Min.	Typical values	Max.	Unit
Light Sensitivity			1	mmHg
Lifespan		168		Hours
Storage Term		3		Year
Interface Media		medical grade		

Note:

1. The above are the empirical values and have not been tested in production.
2. By applying a pressure of 100mmHg at the sensor's pressure port, the output of the sensor is calibrated.
3. The linear deviation between data points ranging from 0 to 100mmHg.

4 Appearance Structure

The external dimensions of the pressure transmission type are shown in Figure 2.(Without tolerance marking, it is in accordance with GB/T1804-M) and the recommended pad size diagram.

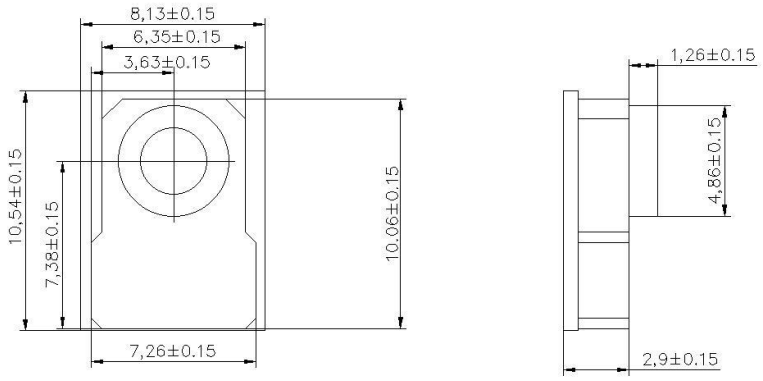


Fig.2 Appearance structure

5 Order Guide

GZP 197 014 G F01 WX

GZP	Pressure Sensor Series
197	Product Series
014	Pressure range 014：-50~300mmHg
G	Pressure Type：G: Gauge Pressure
F01	Packaging method F01: Tube
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.

6 Precautions for Use

6.1 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) Reflow soldering (SMD terminal type)

■ The recommended reflow oven temperature setting conditions are shown in Figure 3.

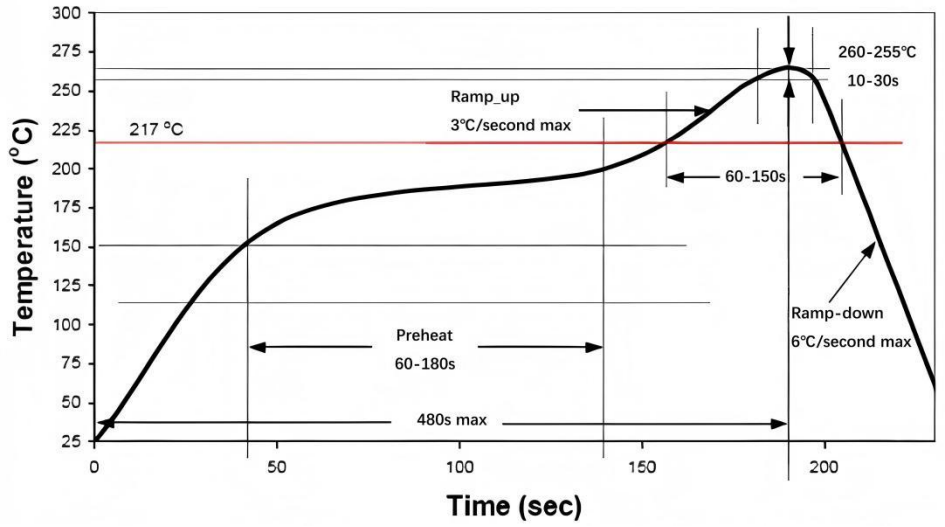


Fig.3 Reflow soldering temperature setting conditions

(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.

6.2 Cleaning requirements

Avoid using ultrasonic cleaning as it may cause product failure.

6.3 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.

6.4 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 air and non-corrosive gases or blood 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.

7 Packing Information

Pipe information (in millimeters), quantity per pipe: 46 PCS.

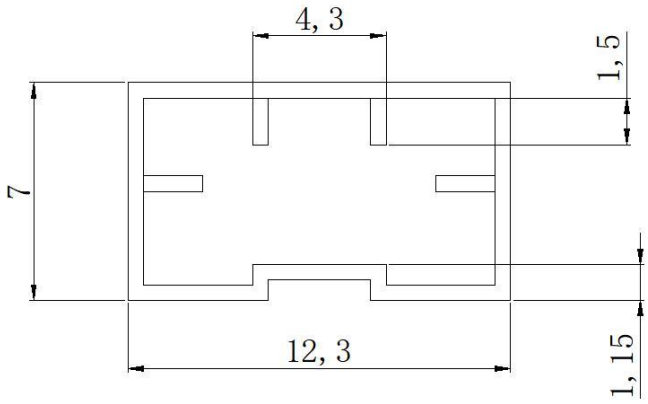
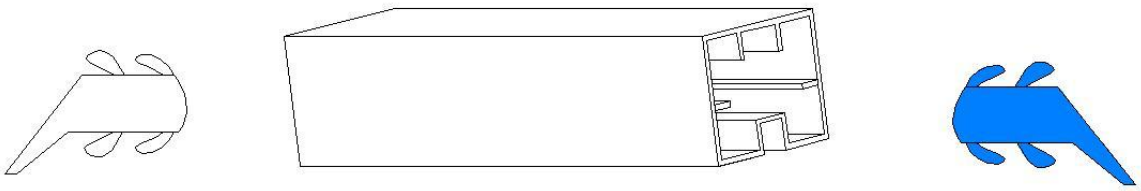


Fig.4 Section Schematic Diagram

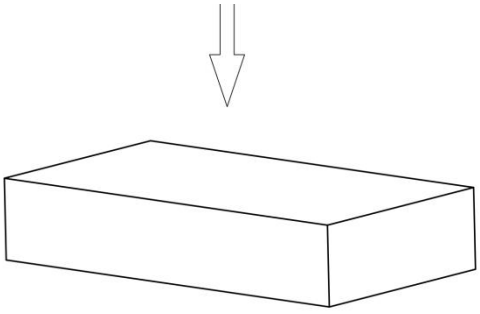
White Plug

Mark Direction ⟶

Blue Plug



(520mm×12.3mm×7mm, 68PCS)



(530mm×145mm×53mm, 5236PCS)

Fig.5 Outer Packing

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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