GZP168

Pressure Sensor

mV Signal Output

Datasheet

Version: V1.5

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Document Revision History

Revision	Description	Date
V1.0	Initial version	2021.05.10
V1.1	Increase the range	2021.05.19
V1.2	Add the cover and table of contents	2021.12.04
V1.3	Update address	2022.08.29
V1.4	Update the drawings and templates	2025.04.30
V1.5	Update the solder pad size diagram	2025.09.22

The company reserves the right to make changes to the specifications contained herein without further notice.
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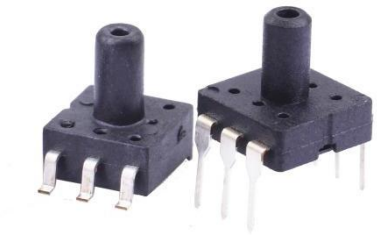
1 Product Description

The The GZP168 pressure sensor chip is packaged in standard SOP6 and DIP6 forms, making it easy for users to install it using surface mount or dual in-line methods. It features excellent linearity, repeatability and stability, with high sensitivity, facilitating users to calibrate and compensate for output and temperature drift.

1.1 Feature

- Pressure range 1/3kPa or 1000kPa
- MEMS technology
- Gauge pressure type
- SOP or DIP package
- Suitable for non-corrosive gases
- Driven by constant voltage or constant current
- Low cost for mass production



1.2 Applications

- Electronic blood pressure monitors, ventilators, oxygen concentrators, monitors and other medical fields
- Tire pressure gauge, MAP, power steering, braking assistance, etc. in the automotive electronics field
- Massagers, massage chairs, air mattresses and other sports and fitness equipment
- Vacuum packaging machine, vacuum mixer, vacuum wall breaker, vacuum fresh-keeping box, vacuum pump and other vacuum negative pressure fields
- Washing machines, beer machines, coffee machines, vacuum cleaners, water purifiers, water heaters and other home appliance

2 Function Description

The GZP168 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

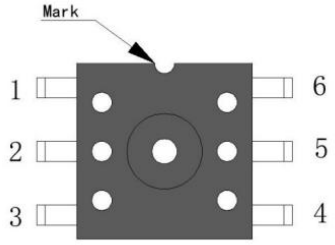


Fig.1 Pin Definition

The pin correspondence is shown in Table 1.

Tab.1 Pin correspondence table

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

2.2 Block Diagram

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

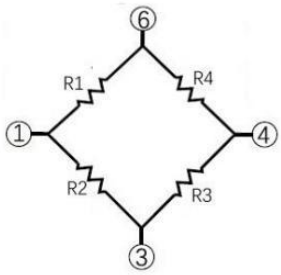


Fig.2 Schematic diagram

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

Measured at a power supply of (5±0.25)V DC and a temperature of 25°C.

4.1 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		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 constant current power supply	-0.05	±0.02	0.05	%FS/°C
Full-scale temperature coefficient constant current power supply	-0.05	±0.02	0.05	%FS/°C

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	1、3、1000			kPa
Zero output	-10		+10	mV
Full scale output 1kPa	15	20	25	mV
Full scale output 3kPa	25	35	45	mV
Full scale output 1000kPa	80	110	140	mV
Overload Pressure (pressure range 1 or 3kPa)	10X			Rated
Overload Pressure (1000kPa)	1.5X			Rated
Non-linearity	-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 transmission type are shown in Figures 3, 4 and 5 (Without tolerance marking, it is in accordance with GB/T1804-M) and the recommended footprint.

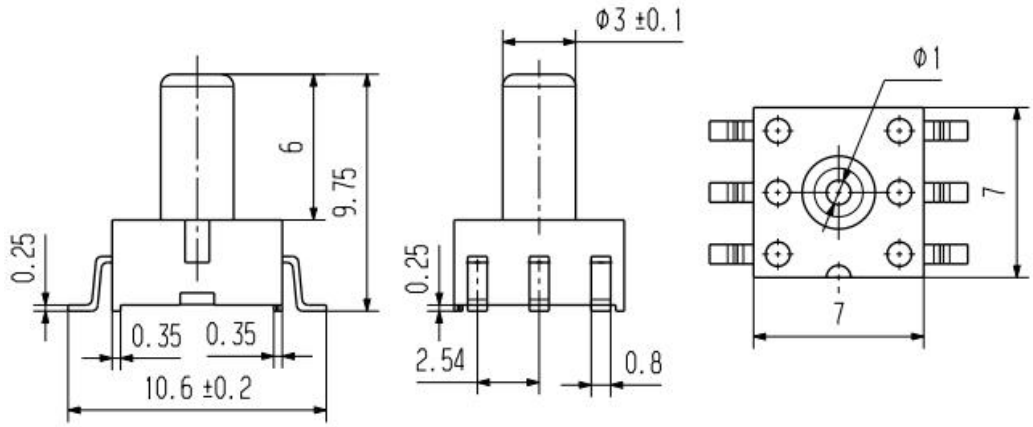


Fig.3 Appearance structure (SOP package)

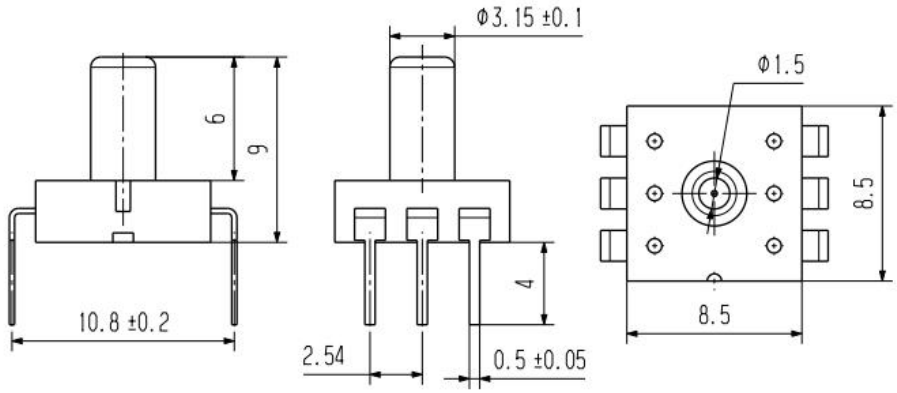


Fig.4 Appearance structure (DIP package - R type)

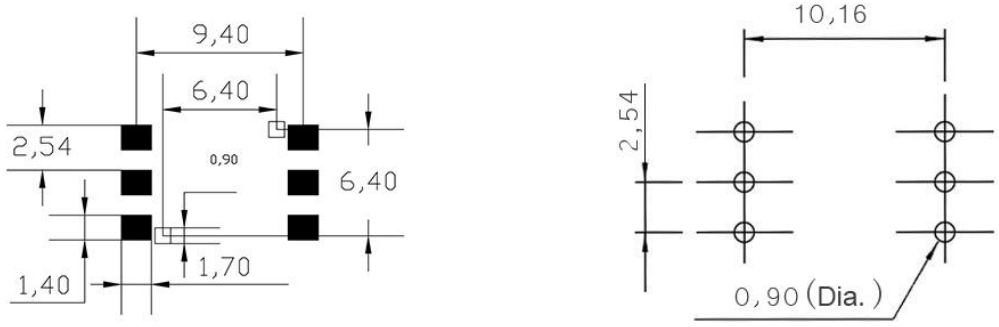


Fig.6 Recommended footprint

6 Order Guide

GZP 168 - 040 S F01 - WX

GZP	Pressure Sensor Series
168	Product Series
040	Pressure range 040: 40kPa, can measure from -40 to 40kPa
S	Appearance type S: SOP
R(Only for DIP Type)	R: Pin direction is opposite with inlet F:Pin direction is parallel with inlet
F01	Packing method F01: Tube B01: Reel&Tape(Unavailable for DIP Type)
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) Reflow soldering (SMD terminal type)

■ The recommended reflow oven temperature setting conditions are shown in Figure 6.

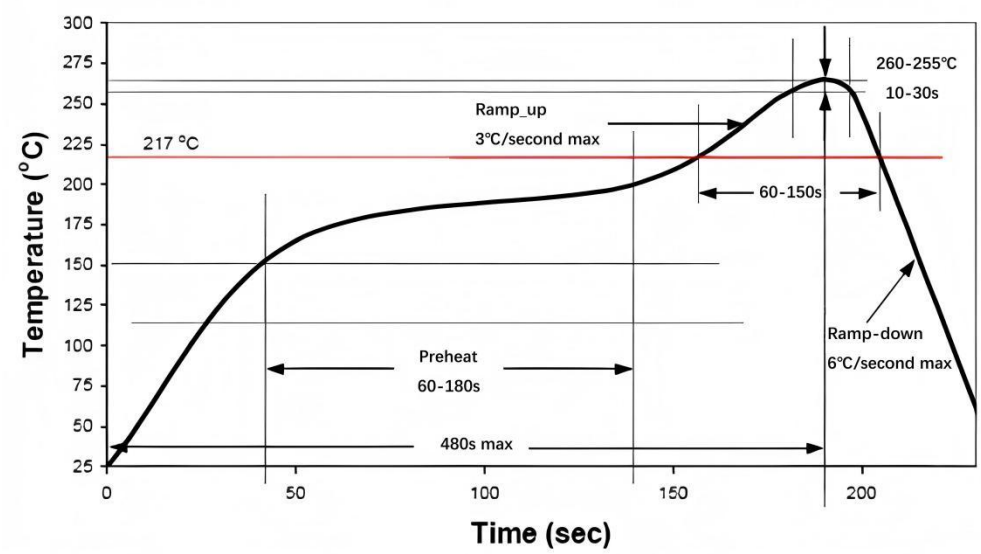


Fig.6 Reflow soldering temperature setting conditions

(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 air and non-corrosive gases. 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.

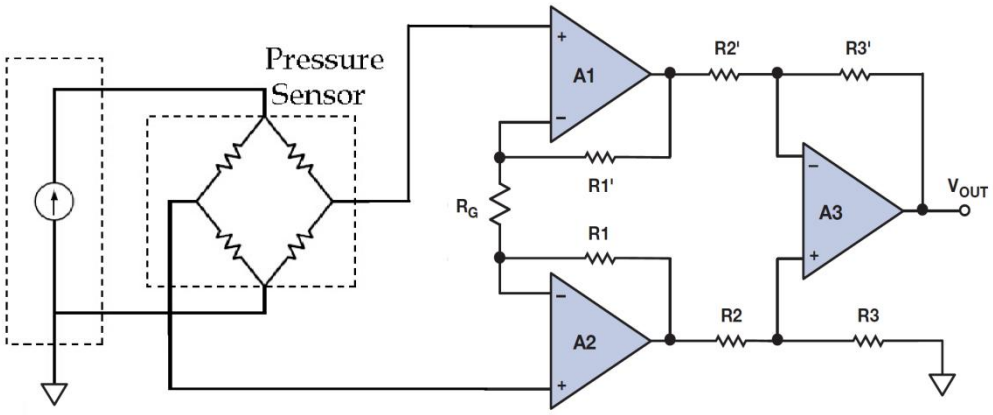


Fig.8 Amplifier circuit example

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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