GZP191

Pressure Sensor

Analog Output(mV Trimmed&Compensated)

Datasheet

Version: V1.4

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Table of Contents

Document Revision History

Revision	Description	Date
V1.0	Initial Version	2021.07.01
V1.1	Template Revision	2021.09.28
V1.2	Updated electrical performance & housing dimensions	2022.05.07
V1.3	Updated leadform dimensions, added packaging information	2023.01.13
V1.4	Updated template	2023.06.17

The company reserves the right to make changes in the specifications contained herein without further notice.

1 Production Description

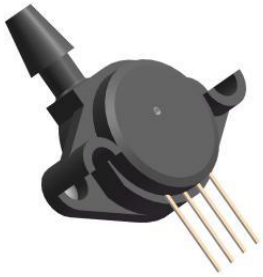
The GZP191 piezoresistive pressure sensor chip is designed for applications in biomedical engineering, industrial control, IoT, and other fields. Its core component is a silicon piezoresistive pressure sensing chip fabricated using MEMS technology. The chip is laser trimmed for precise span and offset calibration and temperature compensation and provide a highly accurate and linear voltage output directly proportional to the applied pressure.

The GZP191 pressure sensor chip features a standard through-hole package for easy installation. The barbed inlet nozzle design enhances the retention of the intake hose.

Note: The GZP191 pressure sensor chip is compatible only with non-corrosive media such as air.

1.1 Feature

- Main Pressure Range: 0 ~ 10/50/100/200kPa
- MEMS Technology
- Gauge Pressure Type
- Calibrated Analog mV signal
- Temperature Compensated
- Barbed Inlet Pipe
- Ratiometric to Supply Voltage



1.2 Application

- Medical Devices: Diagnostics instruments, ventilators, oxygen concentrators, patient monitors, air mattresses etc.
- Industrial Control: Pressure instruments, pneumatic system monitoring,Robotics, HVAC etc,.

2 Production Description

This product is made with advanced micro-electromechanical principles. 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. The user can amplify, compensate for temperature and linearize this signal to obtain an output voltage that is in a prescribed relationship with the applied pressure.

2.1 Electrical Connections

Take constant voltage power supply as an example:

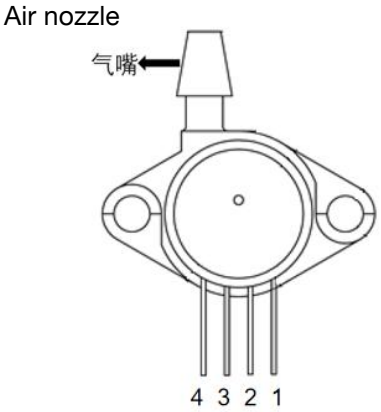


Fig.1 Pin Definition

The pin correspondence is shown in Table 1.

Tab.1 Pin correspondence table

Pin. No.	Description	Remark
1	GND	Power Input Negative
2	VOUT+	Output Positive
3	VDD	Power Input Positive
4	VOUT-	Output Negative

3 Technical Specifications

The following technical indicators of the pressure sensing core were all measured under the following conditions:

Measurement medium: Air

Medium temperature: (25 ± 1) °C

Environmental temperature: (25 ± 1) °C

Humidity: (50% ± 10%) RH

Power supply: (10 ± 0.005) V DC

3.1 Electrical Characteristics

Tab.2 Electrical Performance

Parameter	Min.	Typical Value	Max.	Unit
Constant voltage power supply		10	16	V
Power supply current (@10V power supply)		0.5	1	mA
Input impedance	12		32	kΩ
Output impedance	4.5		5.5	kΩ

3.2 Temperature Characteristics

Tab.3 Electrical Performance

Parameter	Min.	Typical Value	Max.	Unit
Working Temperature	-20		+85	°C
Storage temperature	-30		+125	°C
Zero point temperature coefficient	-20		+20	uV/°C
Sensitivity temperature coefficient	-20		+20	uV/°C

3.3 Mechanical Properties

Tab.4 Mechanical Properties

Parameter	Min.	Typical Value	Max.	Unit
Range	0 ~ 10/0 ~ 50/0 ~ 100/0 ~ 200			kPaG
Zero output	-1	0	1	mV
Full-scale output	38.5	40	41.5	mV
Overload Pressure	2X			Rate
Bursting Pressure	3X			Rate
Nonlinearity	-0.5	±0.2	+0.5	%FS

Note: 0 ~ 10kPa full scale output 25mV can be customized.

4 Appearance Structure

The external dimensions of the pressure sensor are shown in Figure 2. (If tolerance is unspecified , it shall be in accordance with GB/T1804-M).

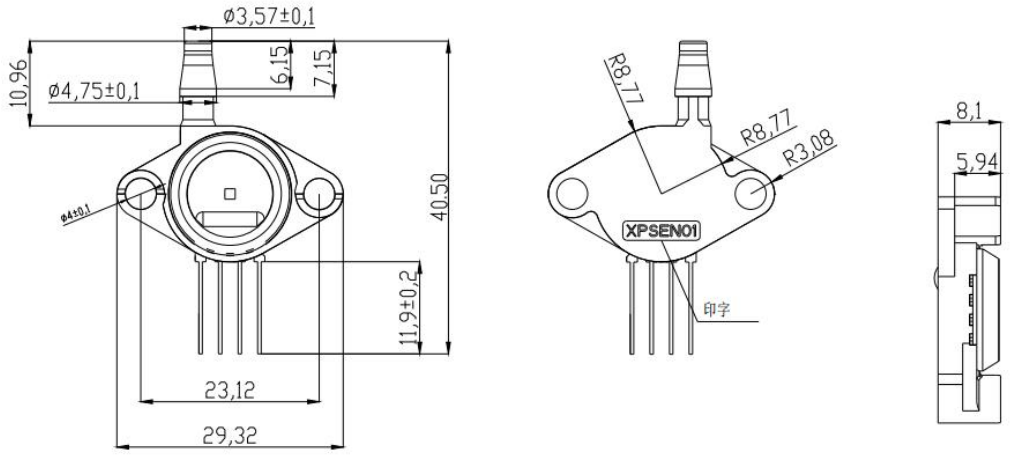


Fig.2 Appearance structure

5 Order Guide

GZP 191 - 010 G B02

Tab.5 Order guide

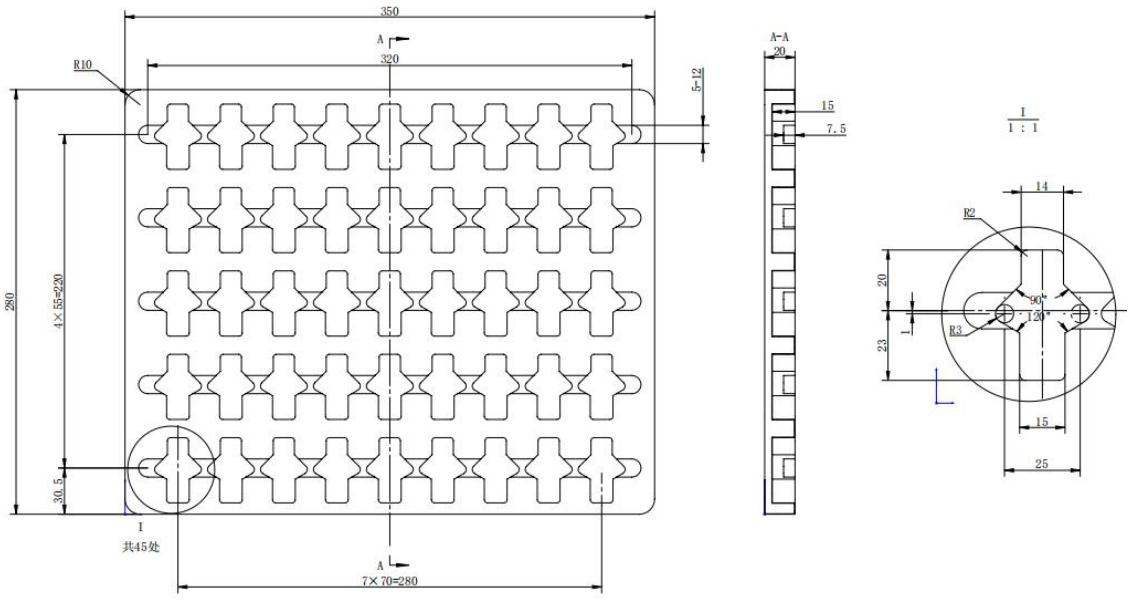
GZP	Core Sense Intelligence
191	Product Categories
010	Pressure range 010: 10kPa ; 050: 50kPa; 101: 100kPa; 201: 200kPa
G	Pressure type G: Gauge pressure
L (optional)	Customized full scale output is 25mV(Only for 0~10kPa)
B02	Packaging method B02: tray
WX	Company interior code

Selection Tips

- Some models do not include all the ranges mentioned above.
- For more information, please contact CoreSense Customer Service.

6 Packaging information

Blister tray (unit: mm), quantity per box: 45 PCS.



(350mm x 280mm x20mm, 45PCS)

Fig.3 Tray schematic diagram

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) Hand welding

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

· When soldering with a load applied to the terminals, the output may change, so please be careful.

Please keep the soldering iron tip clean .

2) DIP soldering (DIP terminal type)

· The process should be performed within 5 seconds in a DIP solder bath at a temperature below 260°C.

When mounting on a substrate with a small thermal capacity, thermal deformation may occur, so pay attention to the DIP soldering temperature.

3) Reflow soldering (SMD terminal type)

The recommended reflow oven temperature setting conditions are as follows:

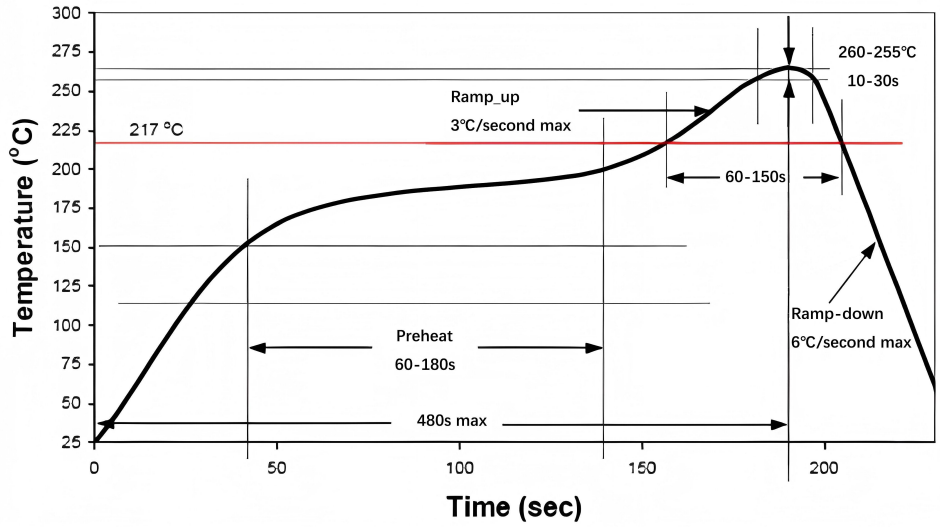


Fig.4 Reflow soldering

Since self-calibration is not possible, please carefully align the terminals and wiring.

The set temperature is the value measured on the printed circuit board near the terminal.

Due to factors such as the device and conditions, the tip of the pressure inlet may melt or deform due to high temperatures. Please be sure to perform confirmation tests under actual mounting conditions.

4) Correction of welding parts

Please complete the corrections at one time.

When correcting a lap soldering, use a soldering iron with a smoother tip and do not apply additional flux.

Regarding the temperature of the soldering iron tip, please use a soldering iron that is below the temperature specified in the specification sheet.

5) Applying excessive force to the terminals may cause deformation and impair solderability, so avoid dropping the product or performing rough handling.

6) After installing the sensor, be careful not to generate stress on the soldered parts when cutting and bending the substrate.

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

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

7.2 Cleaning requirements

1) Since the product is open type, be careful not to allow cleaning fluid to enter the interior.

2) Avoid using ultrasonic cleaning as it may cause product failure.

7.3 Storage and transportation

1) This product is not drip-proof, so do not use it in places where it may be splashed with water.

2) o not use in an environment where condensation occurs. In addition, if moisture attached to the sensor chip freezes, it may cause fluctuations in sensor output or damage.

3) 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, please avoid light from reaching the sensor chip.

4) 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) Incorrect installation methods may cause accidents, 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 medium that can be used directly is dry , non-corrosive gas . Other media, especially corrosive media or media containing moisture or foreign matter, may cause malfunction and damage. Therefore, please avoid using it in the above environment .

4) The pressure inlet port houses a pressure sensor chip. Inserting a needle or other foreign object into the pressure inlet port can damage the chip and clog the port, so absolutely avoid such an action. Also, avoid blocking the atmospheric inlet port during use.

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 pay attention to the following matters when using.

Please ground the charged objects and workers on the table to allow the surrounding static electricity to discharge safely.

Please pay careful attention to the product's fixing, the sleeve, and the guide tube's fixing and selection according to the pressure used. If you have any questions, please contact us.

Safety Precautions

This product is made using semiconductor components for general electronic equipment (communication equipment, measuring equipment, machine tools, etc.). Products using these semiconductor components may malfunction or fail due to external interference and surges, so please confirm the performance and quality under actual use. To be on the safe side, please implement safety design on the device (installation of protection circuits such as fuses and circuit breakers, multiple devices, etc.) so that even if a malfunction occurs, it will not harm life, body, property, etc. To prevent injuries and accidents, please be sure to observe the following:

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

Please follow the electrical specifications for wiring . In particular, please be careful as reverse connection of the power supply may cause heat, smoke, fire, and other circuit damage, leading to accidents.

Please be careful when fixing the product and connecting the pressure inlet.

Warranty and Disclaimer

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