GZP6841A-L0

Pressure Sensor

Analog Output

Datasheet

Version: V1.1

Issued Date:2025.09.12

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Document Revision History

Revision	Description	Date
V1.0	Initial release	2024.12.05
V1.1	Update sensor size, packing info	2025.09.12

1. Product Description

The GZP6841A-L0 pressure sensor is a state-of-the-art MEMS pressure sensor designed particularly for the water level measurement in household appliances applications 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 high level analog output voltage that is proportional to the applied pressure.

1.1 Product Characteristics

- Measuring range:0 ~ 6kPa (Other measurement ranges can be custom
- DIP packaging, Gauge pressure type
- Suitable for non-corrosive gases
- 5V power supply(3.3V is by order)
- Absolute (fixed) voltage or ratio-metric output

1.2. Application

- Water level detection for household appliances such as washing machines and dishwashers etc,.

2. Function Description

This product is made with advanced micro-electromechanical principles, the key technology is the silicon piezoresistive effect based MEMS pressure sensor chip and high performance signal conditioning AISC chip, the silicon micro-piezoresistive MEMS pressure sensor chip is through the Wheatstone bridge composed of four strain sensitive resistors. The output signal is amplified, temperature compensated and linearised by the ASIC chip, and the linearity of the transfer function and temperature compensation is achieved by the digital processing circuitry in the ASIC. High accurate pressure measurement over the full operating temperature range is achieved by a polynomial compensation algorithm and a multi-point pressure calibration technique at multiple temperatures. The transfer function of the pressure sensor is created from the following parameters:

- Minimum and maximum rated pressure
- Output voltage at minimum and maximum rated pressure
- Clamp voltage

All parameters required for the complete calibration algorithm (e.g. offset, gain, temperature coefficients of offset and gain, and linearity parameters) are determined after calibration and stored in the E²PROM inside the ASIC.

2.1 Block Diagram

The block diagram of the sensor function is shown in Figure 1 as shown.

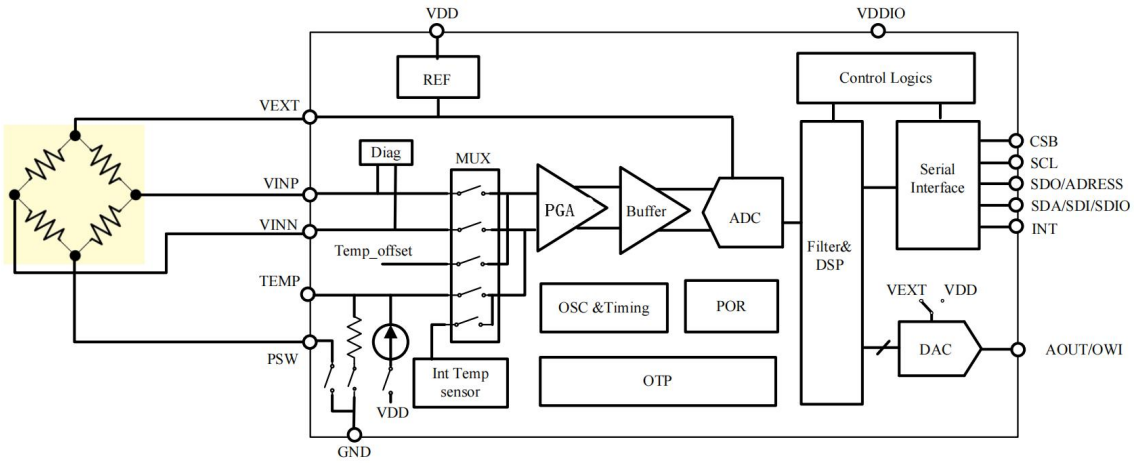


Fig.1 Block diagram

2.2 Pin Definition

The pressure sensor pin is configured as shown in Figure 2.

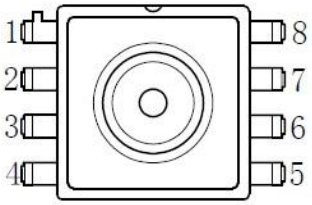


Fig.2 PIN diagram

Tab.1 Pins definition

Number	Symbol	Definition
1/5/6/7/8	NC	No Connection
2	VDD	Power input positive
3	GND	Power input negative
4	OUT	Signal output

2.3 Pressure Function

The pressure sensor is calibrated at the factory and the output signal of the sensor has a linear transfer relationship with the applied pressure as shown below.

Pressure Transducer Transfer Function: Vout = K*P+B, where,

Vout = signal output voltage (V)

P = actual pressure (kPa) P1 = lower pressure limit (kPa) P2 = upper pressure limit (kPa)

Vout1 = Lower pressure limit output (V) Vout2 = Upper pressure limit output (V)

K = (Vout2 - Vout1) / (P2 - P1)

B = (Vout1*P2- Vout2*P1) / (P2 - P1)

The transfer characteristics of the pressure sensor are shown in Figure 3 below:

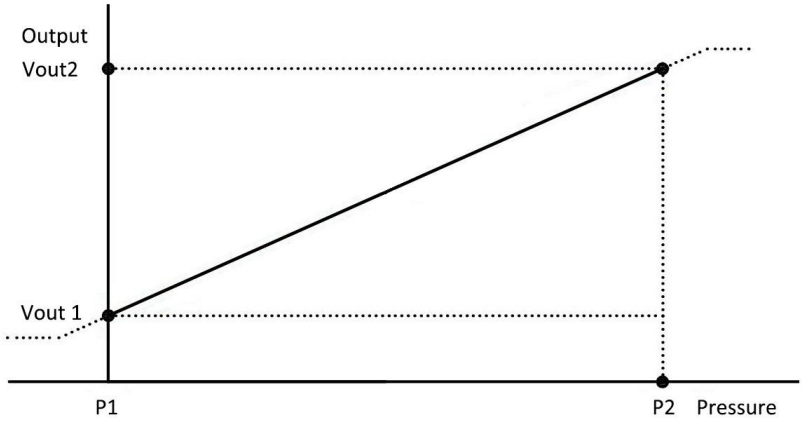


Fig.3 Voltage output curve

2.4 Accuracy

The accuracy of the GZP6841A-L0 pressure sensor consists of the error in its linearity, repeatability, and hysteresis. The value calculated with the transfer function is the specified and theoretical value of the sensor. The error of the sensor is equal to the difference between the actual output value of the sensor at the specified input pressure and the specified output value.

Overall Accuracy

Overall accuracy includes more error apart from the product's accuracy:

Pressure drift: The output deviation between the actual output voltage and the specified output voltage at zero and full scale over a specified pressure range.

Temperature effect: Output deviation between zero and full scale at different temperatures over a temperature range.

The overall accuracy is expressed in terms of error bands, and the data are shown in Figure. 4 and Table 2.

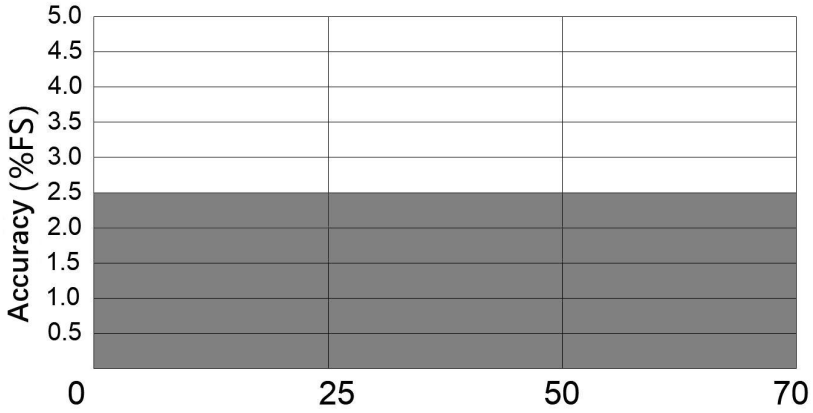


Fig.4 Relationship between overall accuracy and temperature

Tab.2 Overall accuracy

Temperature(°C)	**Overall Error (Fs)**
0~70	±2.5%

*Different pressure range may have different overall error, please consult Sencoch for more details.

3. Technical Specifications

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

3.1 Maximum Rated Parameters

The maximum sensor rating parameter is shown in the Table 3 as shown.

Tab.3 The maximum rated parameters

Parameter	**Min.**	**Typ.**	**Max.**	**Unit**	**Remarks**
Power Supply			6.5	V	
Overload Pressure	3X			Rate	
Bursting Pressure	5X			Rate	
Output Current Load			5	mA	
ESD Protection		±2		KV	HBM

*Long exposure at the specified limits may cause degradation to the device.

3.2 Performance Specification

Sensor performance specification are shown in the Table 4 as shown.

Tab.4 Sensor performance indicators

Parameter	Value	Unit	Remark
Pressure Range	0 ~ 6	kPa	Customizable
Power Supply	5.0	V	3.3V Customizable
Output Signal①	0.265~4.865V	V	Customizable
Accuracy②	±1.0	%Span	
Compensated Temperature	0 ~ 70	°C	Customizable
Working Temperature	-20 ~ 85	°C	
Storage Temperature	-35 ~ 100	°C	

① The output 0.265~4.865V base on 5V power supply voltage with ratio-metric voltage output. The output voltage can be customized.

② Please note different pressure range may have different accuracy, please consult Sencoch for more details.

4. Application Circuit

The recommended application circuit is shown in Figure 5.

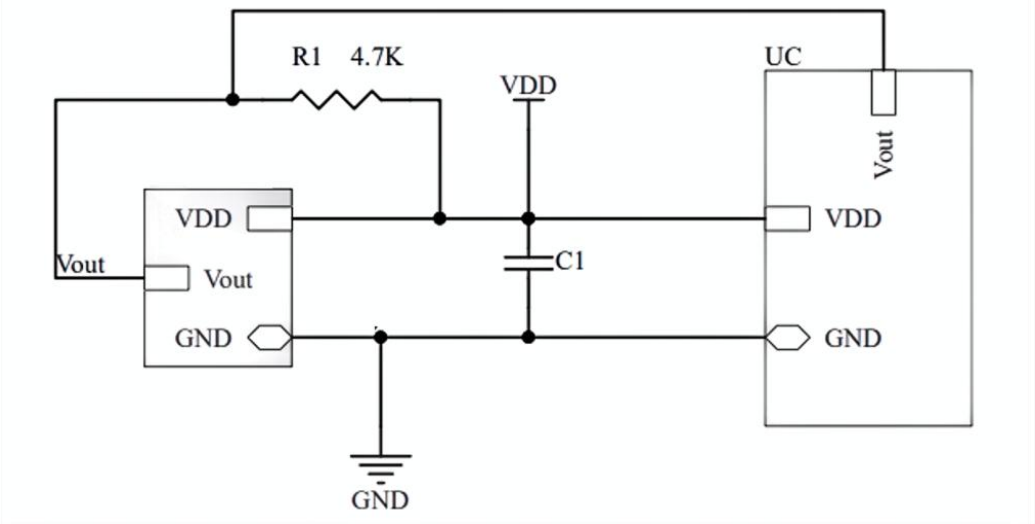


Fig.5 Application Circuit

Pay Attention :

- Please confirm the electrical definition before soldering.
- NC feet do not have any electrical connection, otherwise it may cause the product function failure.
- Performing anti-static protection in the welding process
- Overload voltage (6.5Vdc) may burn the circuit chip.
- Please add 0.1uf capacitor between VDD and GND.
- This product has no reverse connection protection, please pay attention to the polarity of the power supply during assembly.

5. Structure (Unit: mm)

Refer to Figure 6 for sensor dimensions (Tolerance ±0.5mm).

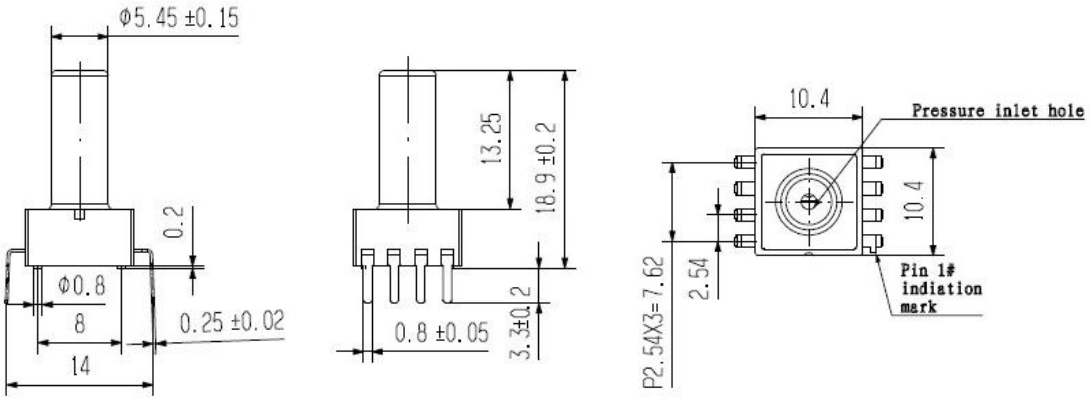


Fig.6 Sensor dimensions

Recommended Footprint Layout refer to Figure 7.

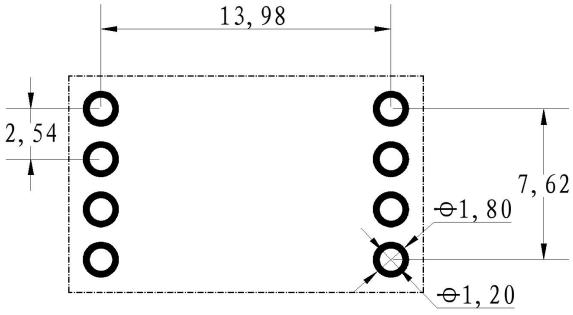


Fig.7 Recommended footprint

6. Order Guide

GZP6841A-L0-006KPP 50E F01 WX

Tab.6 Order guide

GZP	Pressure Sensor Series
6841	Product Series
A	Output type A: Analog output D: IIC interface
L0	Housing Structure L0: Long inlet nozzle
006KPP	Pressure Range: 006 Indicates the measured pressure value including 0~6，-6~0，-6~6 Pressure unit: KP: KPa MP: MPa PS: PSI BA: Bar Pressure type: P: Positive pressure (e.g.0~6) N: Negative pressure (e.g. -6~0) W: Negative pressure to positive pressure (e.g.-6~6) 006KPP indicate from 0KPA to 6kPa measured pressure
50	Power Supply 50: 5Vdc; 33:3.3Vdc
E	Output: K:0.5-4.5V Z:0.2-2.7V E: Ratio-metric voltage output
F01	Packing Method F01: Plastic tube
WX	Company interior code

7. Model Example

Tab.7 Models example

Pressure Range	**Part Number**
0 ~ 6kPa	GZP6841AL0006KPP50E F01WX

*For more customized ranges and special parameter part numbers, please consult the manufacturer.

8. Instructions for Use

8.1 Soldering

Since this product has a small structure with low heat capacity, please minimize the influence of heat from the outside. Otherwise, it may be damaged due to thermal deformation and cause changes in characteristics. Please use non-corrosive rosin type flux . In addition, since the product is exposed to the outside, please be careful not to allow flux to penetrate into the inside.

(1) Manual soldering

- Please use a soldering iron with a head temperature of 260 to 300°C (30 W) and perform the work within 5 seconds.
- When soldering with a load applied to the terminals, please be careful as the output may change.
- Please keep the soldering iron tip clean.

(2) Reflow soldering (SMD terminal type)

The recommended reflow oven temperature setting conditions are show:

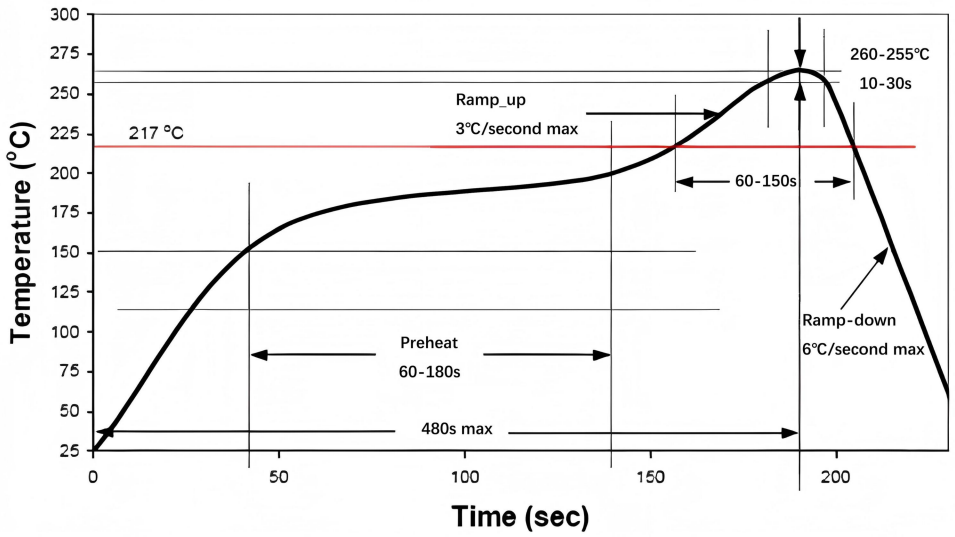


Fig.8 Reflow soldering

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

(4) When cutting and bending the substrate after mounting the sensor, be careful not to cause stress on the soldered parts .

(5) Since the sensor terminals are exposed, if metal pieces touch the terminals, abnormal output may occur. Be careful not to touch them with metal pieces or your hands.

(6) When coating is applied after soldering to prevent insulation degradation of the substrate, be careful not to allow chemicals to adhere to the sensor surface.

8.2 Cleaning requirements

Since this product is an open type, be careful not to allow cleaning fluid to enter the interior. Please avoid using ultrasonic cleaning as it may cause product failure.

8.3 Storage and transportation

(1) This product is not drip- proof, so do not use it in locations where it may be splashed with water.
(2) Do not use the product in an environment where condensation occurs. If moisture attached to the sensor chip freezes, it may cause a change in sensor output or damage the sensor.
(3) Due to the structure of the pressure sensor chip, the output will change when it is exposed to light. Especially when applying pressure through a transparent cover, etc., please avoid light from reaching the sensor chip.
(4) Normally packaged pressure sensors can be transported by ordinary transportation tools. Please note: The product should be protected from moisture, impact, sunburn and pressure during transportation.

8.4 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 media that can be used directly are air and non-corrosive gases. Other media, especially corrosive media or media containing foreign matter, may cause malfunctions and damage, so please avoid using it in the above environments.
(4) A pressure sensor chip is located inside the pressure inlet. If a needle or other foreign object is inserted into the pressure inlet, the chip may be damaged or the inlet may be blocked, so please avoid such operations. Also, please avoid blocking the air inlet 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 be careful to ground charged objects on the table and workers when using it to safely discharge static electricity in the surrounding area.
(7) Please pay full attention to the fixing and selection of the product, sleeve, and introduction tube according to the pressure used.
(8) Since this specification is for a single product, in order to improve reliability during actual use, please confirm the performance and quality under actual use conditions.

9. Packing Information

Tube Packing

Packing	Plastic Tube	Inner Box
Quantity	48PCS per tube	672pcs (14pcs tube)

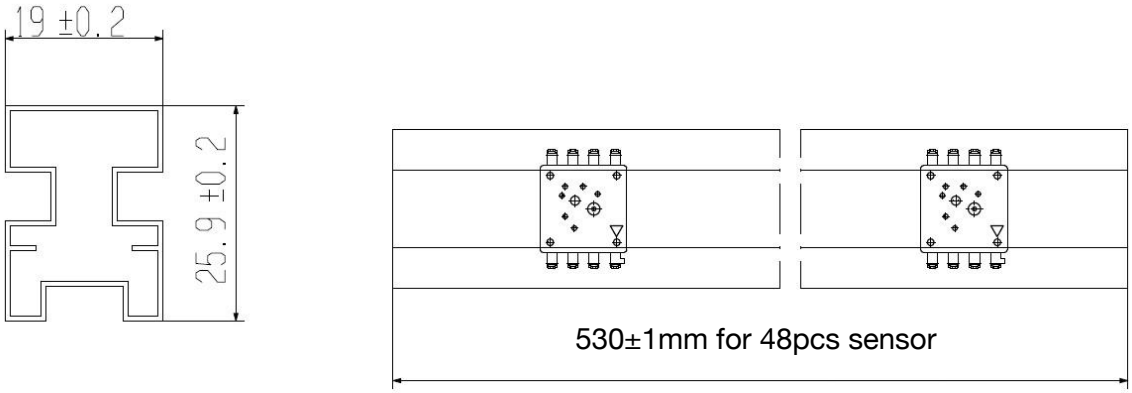
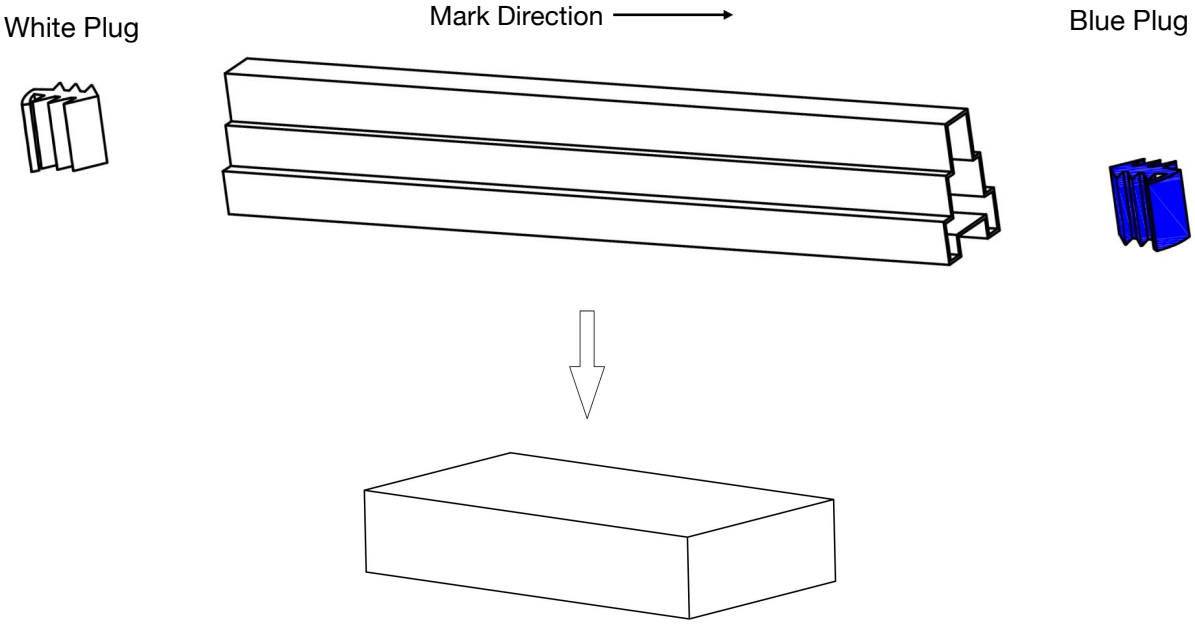


Fig.8 Section schematic diagram（Unit:mm）



(560mm×65mm×150mm, 672PCS)

Fig.9 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 .

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