GZP6832A

Pressure Sensor

Analog Output

Datasheet

Version: V1.4

Issued Date:2025.08.01

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Document Revision History

Revision	Description	Date
V1.0	Initial release	2022.05.13
V1.1	Template modifications	2023.03.21
V1.2	Update product description	2023.05.10
V1.3	Modify the application circuit diagram	2023.09.27
V1.4	Update pin definitions, technical specifications, and application circuits	2025.08.01

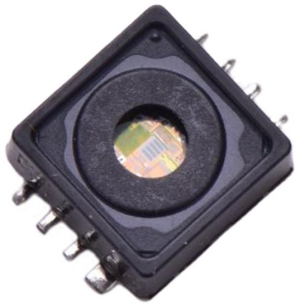
1. Product Description

The GZP6832A pressure sensor, developed by Sencoch for automotive electronics, adopts SOP8 sealing. Its integrated signal conditioning chip digitally compensates for offsets in the MEMS pressure chip's output. Using the supply voltage as a reference, it generates a calibrated, temperature-compensated standard voltage signal.

The GZP6832A pressure sensor is compact and easy to install, and its output signal can be calibrated to meet user requirements.The GZP6832A pressure sensor is small in size and easy to install, and the output signal can be calibrated according to user requirements.

1.1 Product Characteristics

- Multiple range from 0kPa to 700kPa
- Absolute pressure type
- Standard or ratiometric voltage output options
- Moisture- and corrosion-resistant
- Response time ≤ 1ms
- Wide temperature compensation
- Customizable pressure range
- Supports JFET-based overvoltage protection



1.2. Application

- Intake pressure, brake pressure, smart seat pressure, motorcycle electronic fuel injection, and other automotive electronics fields
- Air pumps, pressure switches, pneumatic control systems, and industrial equipment

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.

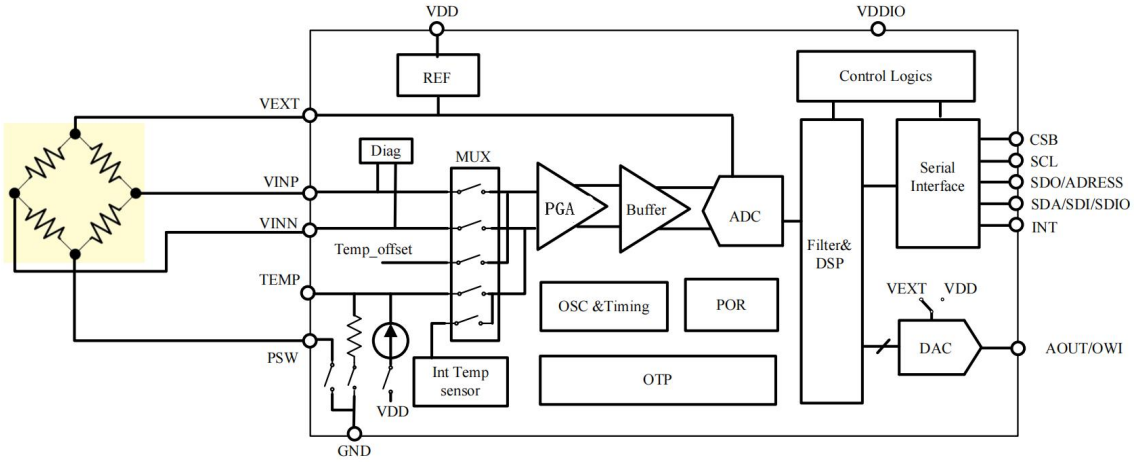


Fig.1 Block Diagram

2.2 Description of Pin Definition

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

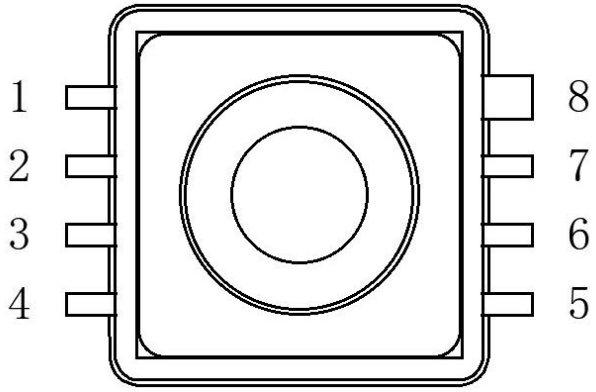


Fig.2 PIN Diagram

Tab.1 Pins Definition

Number	Symbol	Definition
1	NC	No Connection
2	NC	No Connection
3	VDD	Power Input Positive
4	Vgate	When in use, an external MOS is required, and it does not need to be left floating
5	NC	No Connection
6	GND	Power Output Negative
7	VOUT	Signal Output Pin
8	GND	Power Input Negative

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 Sensor Transfer Function

Vout = (K * P + B)/5*VDD @ proportional voltage output; Of which,

Vout : signal output voltage (VDC)

P: Actual pressure (kPa)

P1: Lower limit pressure (kPa) P2: Upper limit pressure (kPa)

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

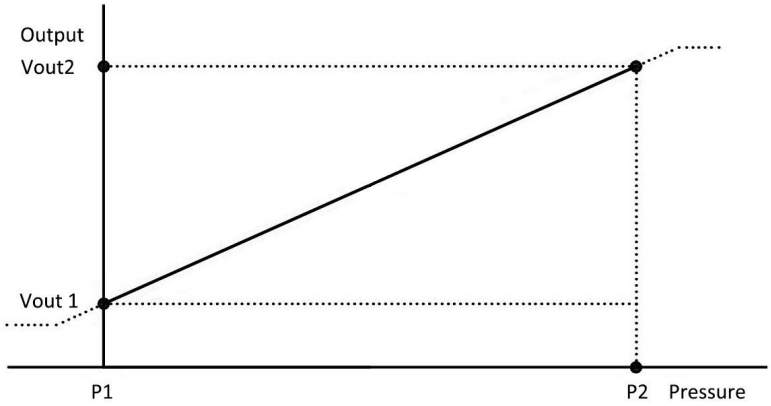


Fig.3 Voltage Output Curve

2.4 Accuracy

The accuracy of the GZP6832A 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.

2.4.1 Overall Accuracy

The combined error factor accounts for various error sources across the measured pressure range and operating temperature range. These error sources primarily include:

Pressure: The deviation between the actual output voltage and the specified output voltage within the specified pressure range.

Temperature: The deviation between the output voltage and the specified output voltage within the specified temperature range.

Aging: The drift of parameters over time.

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

Tab.2 Overall Accuracy

Temperature(°C)	**Overall Error (Fs)**
-40~0	±1.5%
0~85	±1%
85~130	±1.5%

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

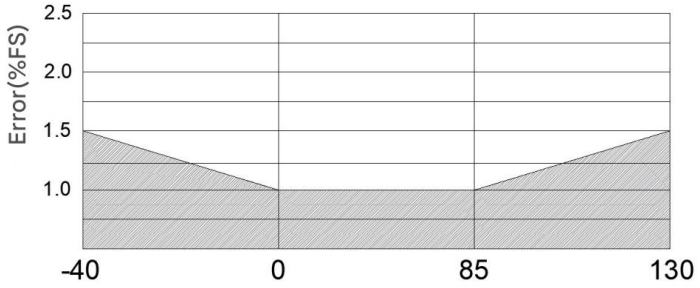


Fig.4 Relationship between overall accuracy and temperature

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	-24		28	V	
ESD Protection			±2	KV	HBM
Storage Temperature	-40		150	°C	
Operating Temperature	-40		130	°C	

3.2 Performance Specification

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

Tab.4 Sensor performance indicators

Parameter	Value	Unit
Pressure range	10 ~ 115/20 ~ 115/0 ~ 1470	kPa
Output signal	0.4-4.65 V (Customizable)	V
Accuracy	±1	%Span
Response Time	≤1	mS
Overload Pressure	2×	Rated
Burst Pressure	3×	
Compensation temperature	-20 ~ 85 (Customizable)	°C

1. The 0.4~4.65V output voltage is based on 5V power supply proportional output(8% to 93% VDD) or optional 0.5~4.5V output. The output can be customized to other voltage range by order.
2. The different pressure range may have different accuracy, overload and burst pressure , please consult Sencoch for more details

3.3 Electrical Characteristics

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

Tab.5 The electrical characteristics of the sensor

Parameter	Min.	Typ.	Max.	Unit	Remarks
Supply Voltage	2.5	5	5.5	V	
Operating current		3	10	mA	
Filter capacitor		100		nF	
PSRR		60		dB	
Output current load			5	mA	
Short-circuit current limit	15	20	25	mA	
Upper clamp voltage	3/4		1	VDD	
Lower clamp voltage	0		1/4	VDD	

4. Applied Circuit

The recommended application circuit is shown in Figure 5.

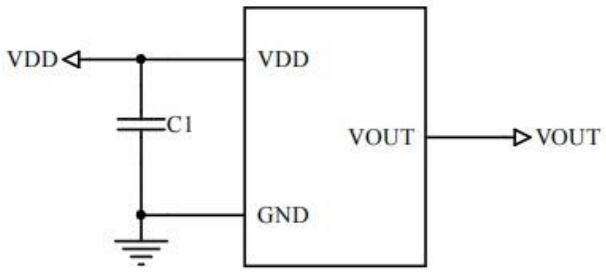


Fig.5 Application circuit

Note: The recommended value of C1 is 100nF.

The product recommends external JFET with protection application interface circuit as shown in Figure 6.

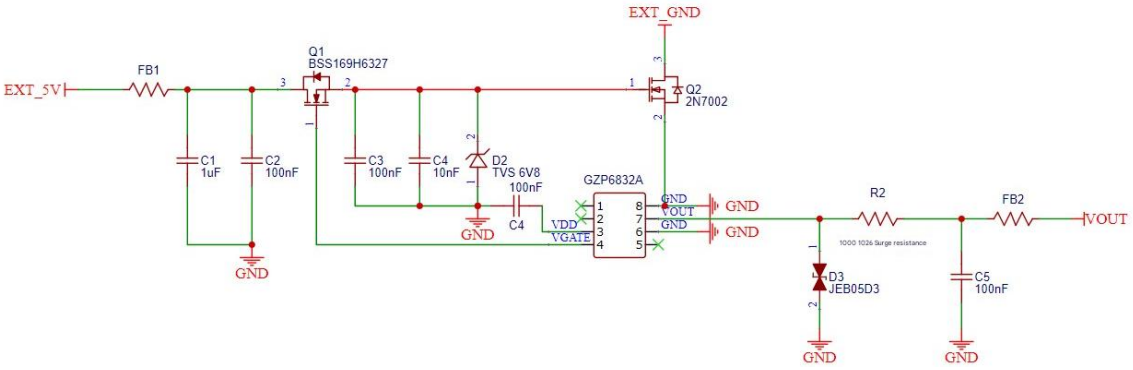


Fig.6 The sensor recommends external JFET with protection application interface circuit

5. Appearance and Structure (Unit: mm)

Refer to Figure 7 for sensor dimensions and recommended PCB pad dimensions, unit: mm (error ±0.2mm if not specified).

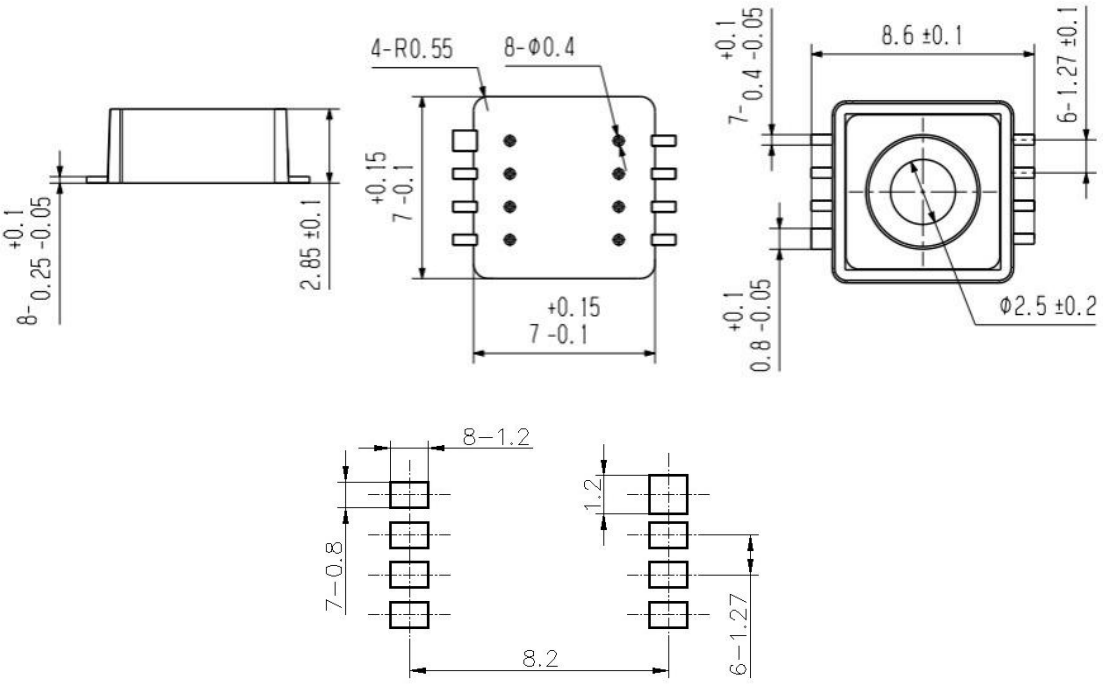


Fig.7 Sensor dimensions and recommended PCB pad dimensions

6. Order Guide

GZP 6832 A - 10115KPA 50T F01 WX

Tab.6 Order Guide

GZP	Sencoch
6841	Product Series
A	Output type A: Analog output
10115KPA	Pressure range: 10115 represents the minimum (10) and maximum (115) pressures measured Pressure unit: KP: KPa MP: MPa PS: PSi BA: Bar Pressure type: A: Absolute pressure Thus, 10115KPA represents an absolute pressure range of 10KPA to 115KPA
50	Power Supply 50: 5Vdc; 33:3.3Vdc
T	Output K: 0.5-4.5V Z: 0.2-2.7V H: 0.2-4.7V E: Proportional voltage output (please note the output voltage range after the model number) T: Custom output (please note the output voltage range after the model number, e.g., T04465 means 0.4-4.65V)
F01	Packing Method F01: Plastic tube
WX	Company interior code

7. Model Example

Tab.7 Models Example

Pressure Range	Part Number	Power supply/output/packaging
10 ~ 115kPa	GZP6832A10115KPA50T04465 F01WX	5.0V/0.4~4.65V*/Tube packaging
20 ~ 115kPa	GZP6832A20115KPA50T04465 F01WX	5.0V/0.4~4.65V*/Tube packaging
0 ~ 1470kPa	GZP6832A10115KPA50K F01WX	5.0V/0.5~4.5V*/Tube packaging

* 5.0V/0.4~4.65V including upper clamp 4.7±0.06V/lower clamp 0.3±0.06V.* 5.0V/0.4~4.65V including upper clamp 4.7±0.06V/lower clamp 0.3±0.06V.

*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:

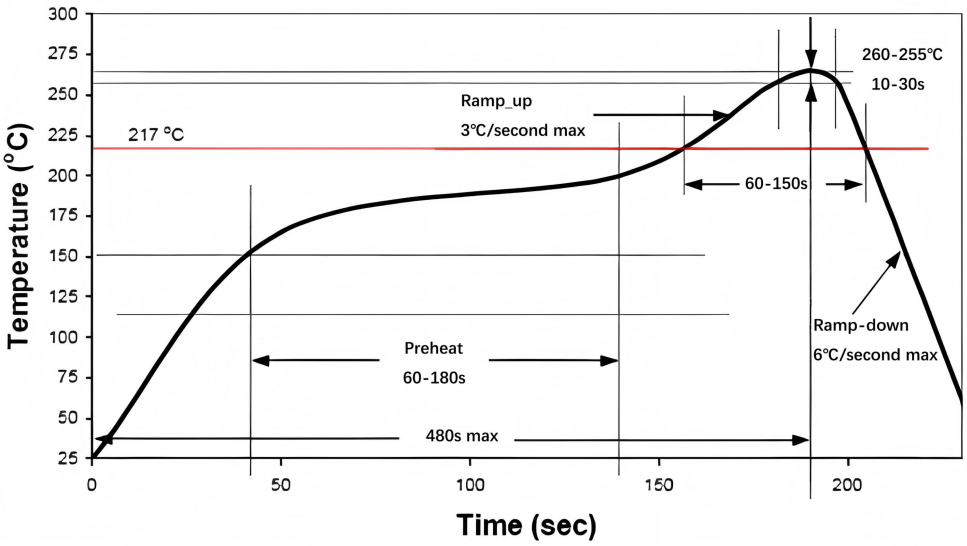


Fig.8 Reflow soldering

(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

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

(2) 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 medium that can be used directly is non-corrosive gas 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 environment.

(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 Information (unit: mm)

Quantity per tube: 70 PCS

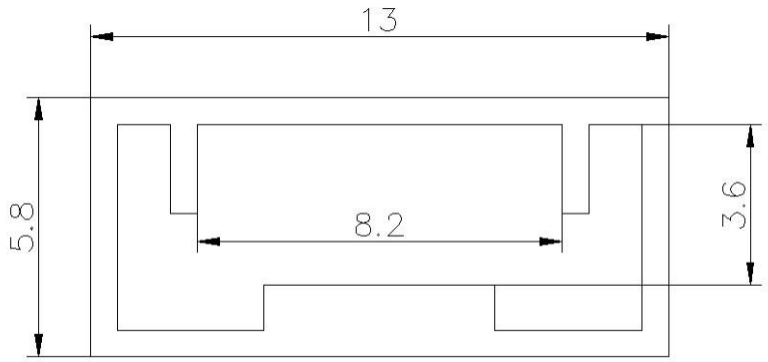
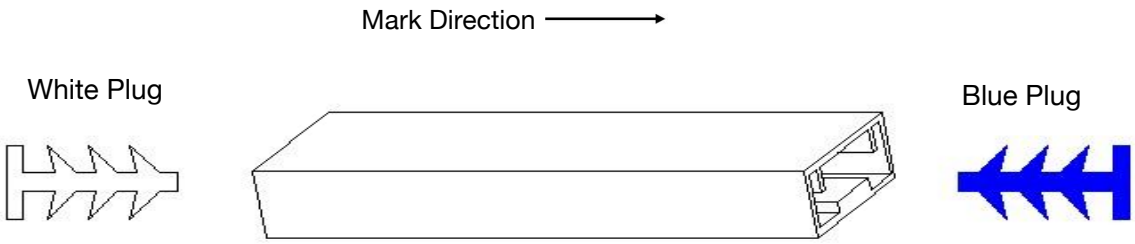
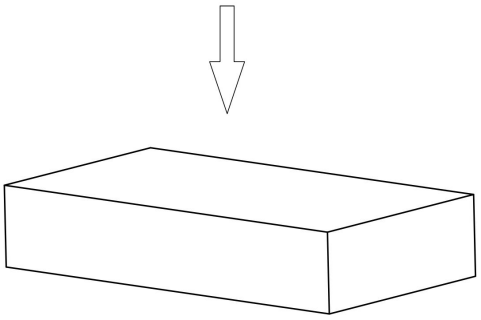


Fig.9 Schematic diagram of the cross section of the material tube



(520mm x 13mm x 5.8mm，70PCS)



(Carton: 545mm x 152mm x 58mm, 6930 PCS)

Fig.10 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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