



Plastic Package Pressure Sensor

(Model: WPAS12)

Manual

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Zhengzhou Winsen Electronic Technology Co., Ltd

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Please keep the manual properly, in order to get help if you have questions during the usage in the future.

Zhengzhou Winsen Electronics Technology CO., LTD

WPAS12 Plastic Package Pressure Sensor

Product description:

The WPAS12 plastic pressure sensor is an integrated analogue output pressure sensor with compact size, high accuracy, high sensitivity and high reliability. WPAS12 converts the pressure signal into an analogue output signal and the voltage output is proportional to the supply voltage. Linearly calibrated and temperature compensated, the analogue output ranges from 0.18V to 4.65V over the pressure range of 15KPa to 115KPa absolute. This pressure sensor is available in a RoHS compliant SOP8-7070 package for easy installation. It is primarily used to measure engine intake manifold pressure, but can also be used in other automotive applications, industrial and consumer applications.



Characteristics

- Independent intellectual property rights sensor design
- Pressure range 15~115Kpa (customisable)
- Proportional analogue output
- High precision pressure monitoring
- Wide temperature range (-40°C~125°C)
- Eco-grade SMD package for easy installation

Main Application:

- Automotive Electronics: Manifold Air Pressure Measurement
- Industrial Control
- Healthcare Applications
- Consumer applications
- Weather Stations
- Altimeter

Technical Datasheet:

| Parameters | Symbolic | Min. value | Typical value | Max. value | Unit |
|--|-------------|------------|---------------|------------|------|
| Working Temperature | T_a | -40 | - | 125 | °C |
| Supply Voltage | V_{DD} | 4.5 | 5 | 5.5 | V |
| Detection range (customizable) | P_{amb} | 15 | - | 115 | kPa |
| Output Voltage Range (customizable) | V_{OUT-R} | 0.1 | - | 4.85 | V |
| Working Current | I_s | - | 1.2 | 1.8 | Ma |
| Accuracy (0~85°C) | ACUp | - | - | ±1 | %FS |
| Accuracy (125°C) | ACUp | - | - | ±2 | %FS |
| Accuracy (-40°C) | ACUp | - | - | ±3 | %FS |
| Long Term Stability | STBp | - | - | ±0.05 | %FS |

Extreme working conditions:

| Parameters | Symbolic | Min. value | Typical value | Max. value | Unit |
|---------------------|---------------|------------|---------------|----------------|------|
| Supply Voltage | V_{DD-MAX} | -0.3 | - | 6 | V |
| Output Voltage | V_{OUT} | -0.3 | - | $V_{DD} + 0.3$ | V |
| Storage temperature | T_s | -60 | - | 150 | She |
| Maximum pressure | $P_{amb-max}$ | 10 | - | 300 | |

NOTE: Pressures greater than maximum may cause permanent damage to the device. Prolonged exposure to extreme operating conditions may affect device reliability.

Terminology:

- **Pressure Range** is the range of pressure usage that guarantees the specifications of the pressure sensor.
- **Minimum Pressure Offset** is the output voltage of the chip at the minimum pressure within the pressure range of the pressure sensor.
- **Full Range Output** is the output voltage of the pressure sensor at the maximum working pressure within the pressure range of the pressure sensor.
- **Accuracy** refers to the combined error of linearity, pressure hysteresis, temperature hysteresis, zero temperature drift, full scale temperature drift, etc.
- **Long-term stability** refers to the voltage output offset of the pressure sensor after one year.

Transfer Function:

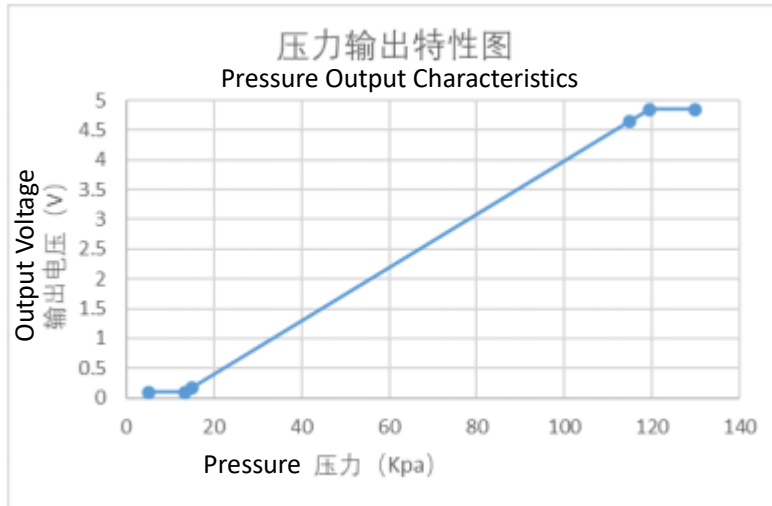
The WPAS12 pressure transducer is factory calibrated and has a linear transfer function between pressure and voltage output as follows:

$$V_{OUT} = V_{DD} \times (a \times P + b)$$

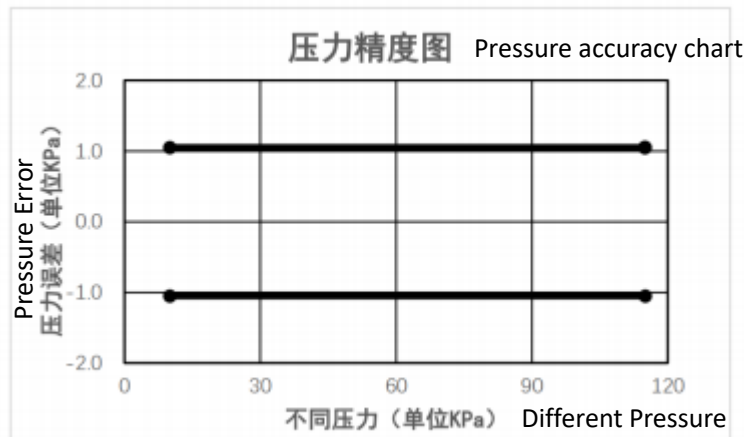
Voltage output is proportional

| Pressure | | | Voltage Output | | | Offset Gain | | |
|-----------|-------|------|----------------|-------|------|-------------|----------|-------|
| Symbolic | Value | Unit | Symbolic | Value | Unit | Symbolic | Value | Unit |
| P_{min} | 20 | KPA | V_{min} | 0.4 | V | a | 0.00895 | 1/kpa |
| P_{max} | 115 | KPA | V_{max} | 4.65 | V | b | -0.09895 | |

Pressure output characteristics (Output pressure range can be customized):

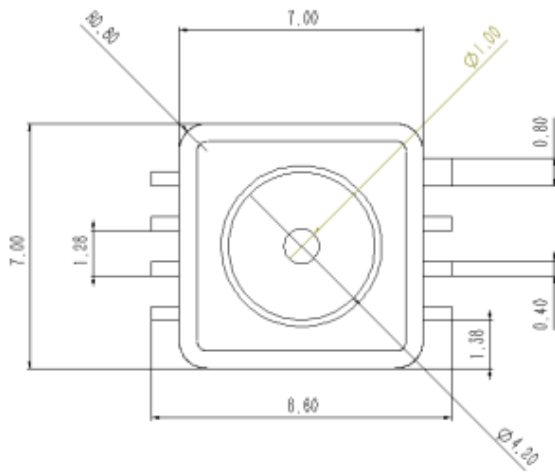


Pressure output accuracy:

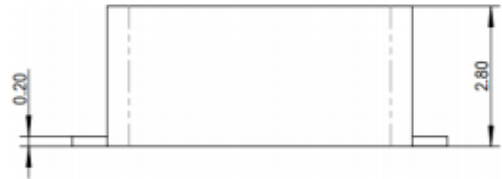


0~85°C

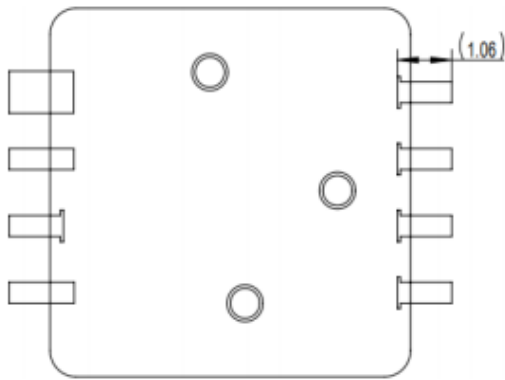
External Dimension:



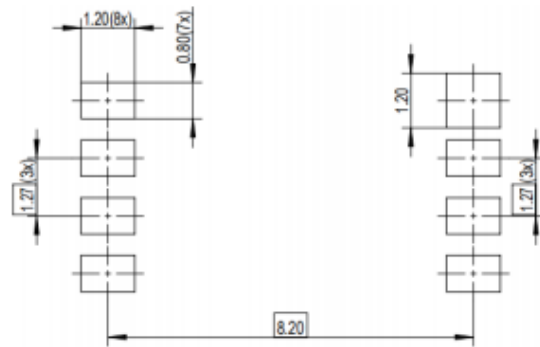
俯视图
Top View



侧视图
Side View



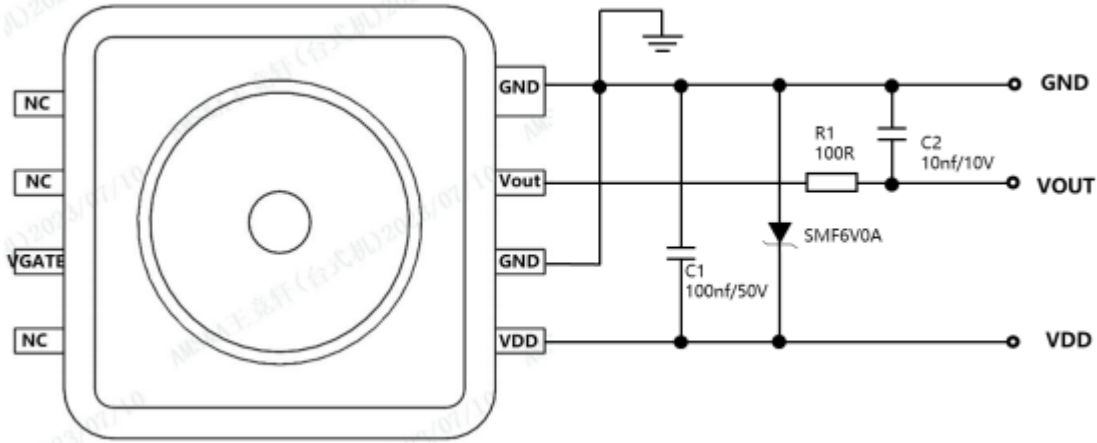
背视图
Back view



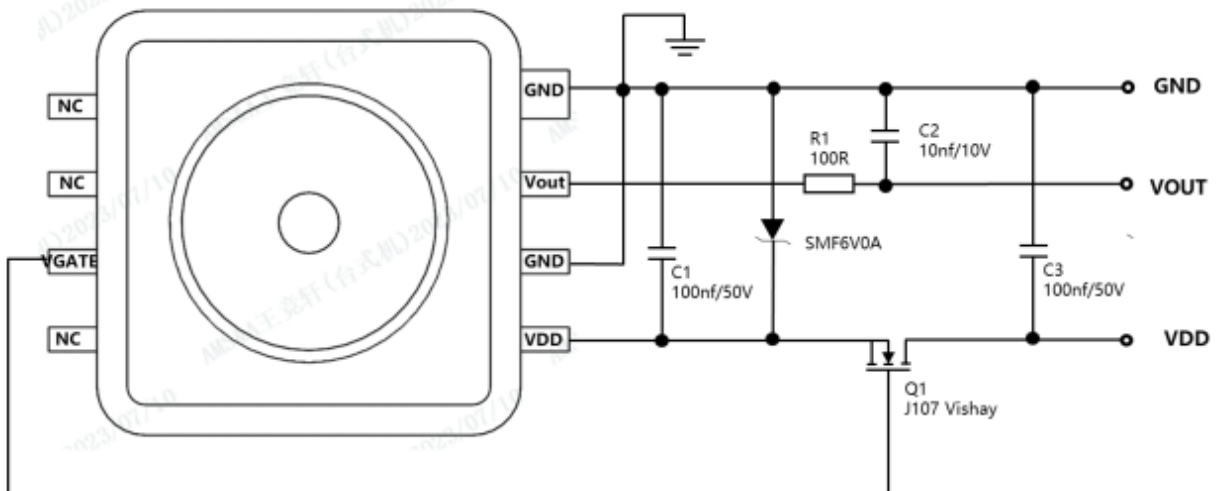
建议PCB图
Suggested PCB Diagram

Application circuit example:

External voltage regulator diode SMF6V0A can effectively ensure that the input voltage is less than 6V

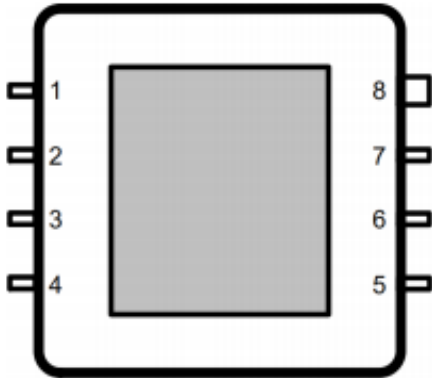


4.5 ~ 5.5V power supply application circuit



Application circuits with overvoltage protection

Pin Definition:



Pin Definition Table

| No. | Definition | instruction |
|-------|------------|-------------|
| 1.2.4 | NC | Empty |
| 3 | VGATE | JFET |
| 5 | VDD | IN+ |
| 6 | GND | GND |
| 7 | Vout | OUT |
| 8 | GND | GND |

Cautions:

A. Setting

Please use printed board pads so that the product can be adequately secured.

B. Soldering

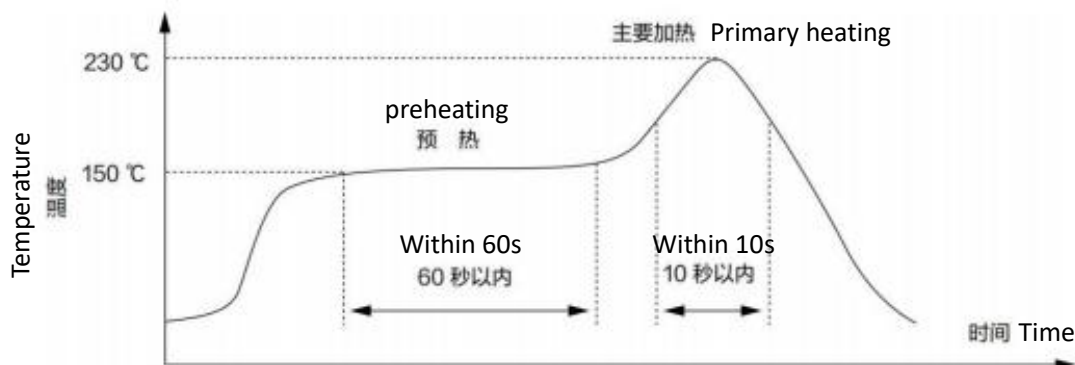
Since this sensor is a small structure with low thermal capacity, please minimise the influence of heat from the outside, otherwise it may be broken due to thermal deformation and the characteristics may be affected. Please use a non-corrosive rosin-type flux and be careful not to let the flux get inside the sensor.

1) Soldering iron

- Please use a soldering iron with a temperature of 260~300 °C to complete the work within 5 seconds.
- After soldering on the pins, it should be left for a period of time before use.
- Clean the tip of the soldering iron frequently and keep it clean.

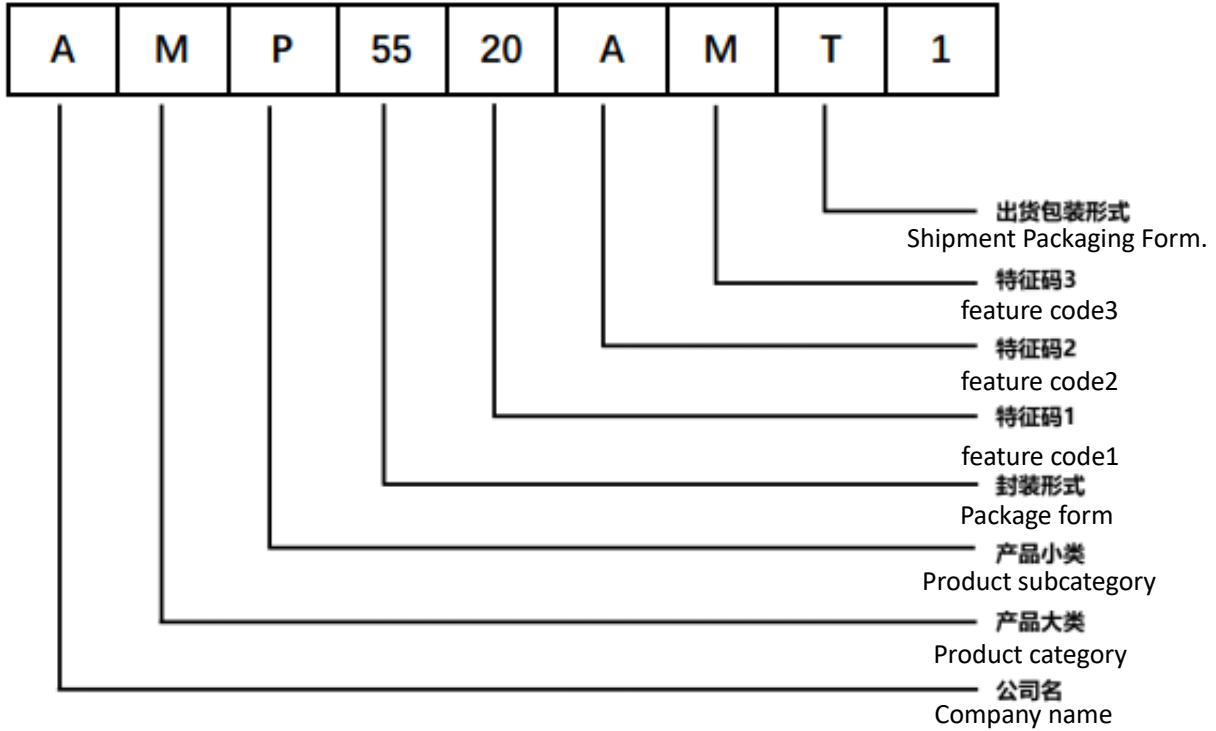
2) Reflow soldering

The recommended setting conditions for the reflow soldering method are as follows:



- 3) Excessive force on the pins can cause deformation and damage, so avoid dropping the sensor or using it in a complicated manner.
- 4) Try to keep the warpage of the PCB below 0.05mm with respect to the entire sensor.

Selection Guide:



- For technical specifications or questions, please contact us.
- Please contact us for technical parameters or questions. If you have special requirements for the performance parameters, functions and styles of the sensors, please contact us.

Zhengzhou Winsen Electronics Technology Co., Ltd
Add: No.299, Jinsuo Road, National Hi-Tech Zone, Zhengzhou 450001 China
Tel: +86-371-67169097/67169670
Fax: +86-371-60932988
E-mail: sales@winsensor.com
Website: www.winsen-sensor.com

