

# Guangzhou Aosong Electronic Co., Ltd.

Focus on independent R&D and manufacturing of MEMS sensor

Company Profile / Enterprise Advantages / Product Introduction / Application Cases

2022.2



# CONTENTS

**01** Company profile

**02** Advantages

**03** Products

**04** Applications

**05** Future



# 01 Company profile

## Summary



### Founded in 2003

With nearly 20 years of experience in the MEMS industry

### Advanced R&D Enterprise

China's advanced MEMS and smart sensor independent R&D enterprise

### Solution Partner

Provide one-stop smart sensor solutions

### MEMS IDM Enterprise

One of the few MEMS IDM smart sensors companies in the world

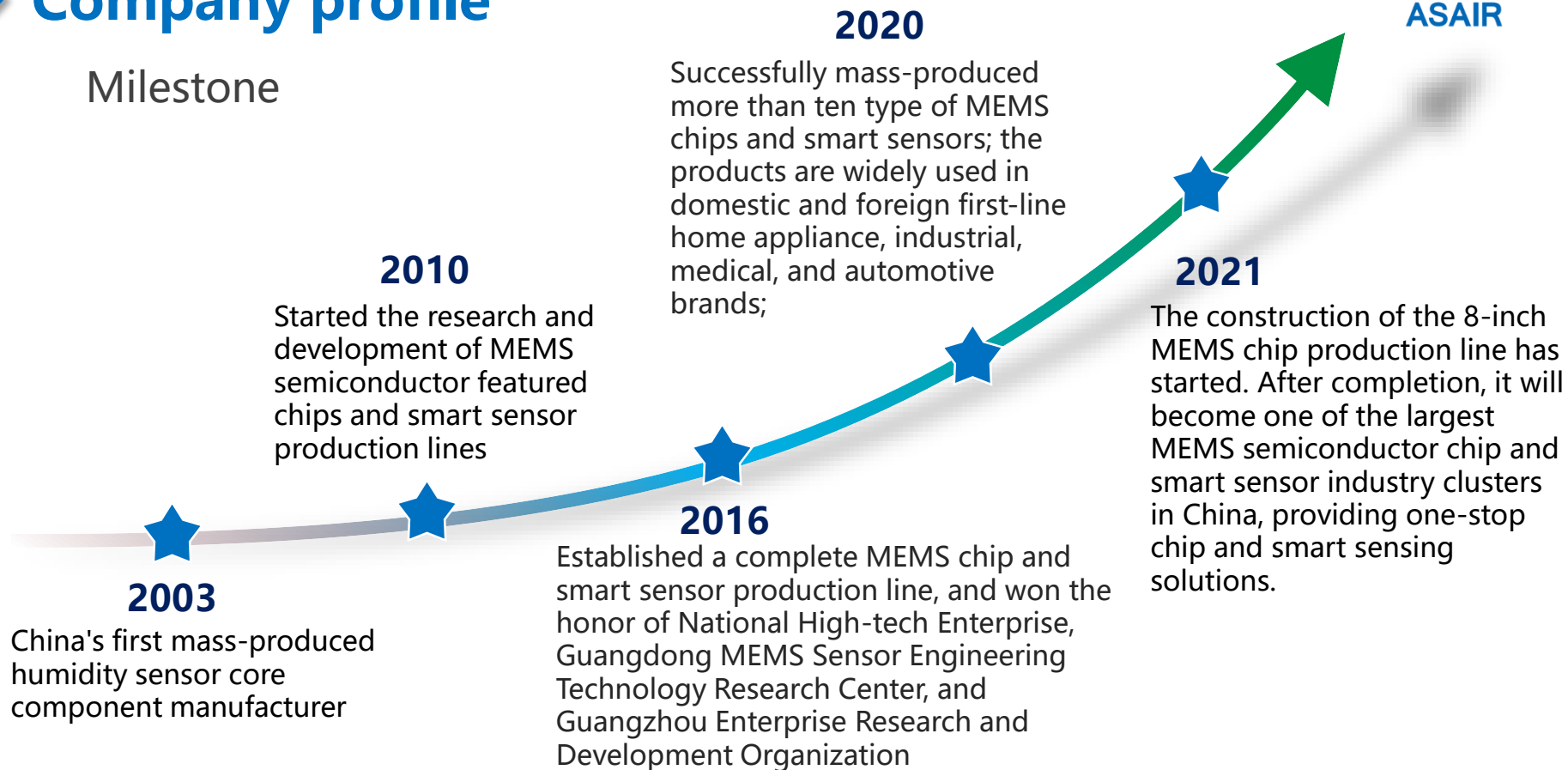
### Chinese high-tech enterprise

Specialized and Special New Enterprise in Guangdong Province

# Company profile

奥松电子  
ASAIR

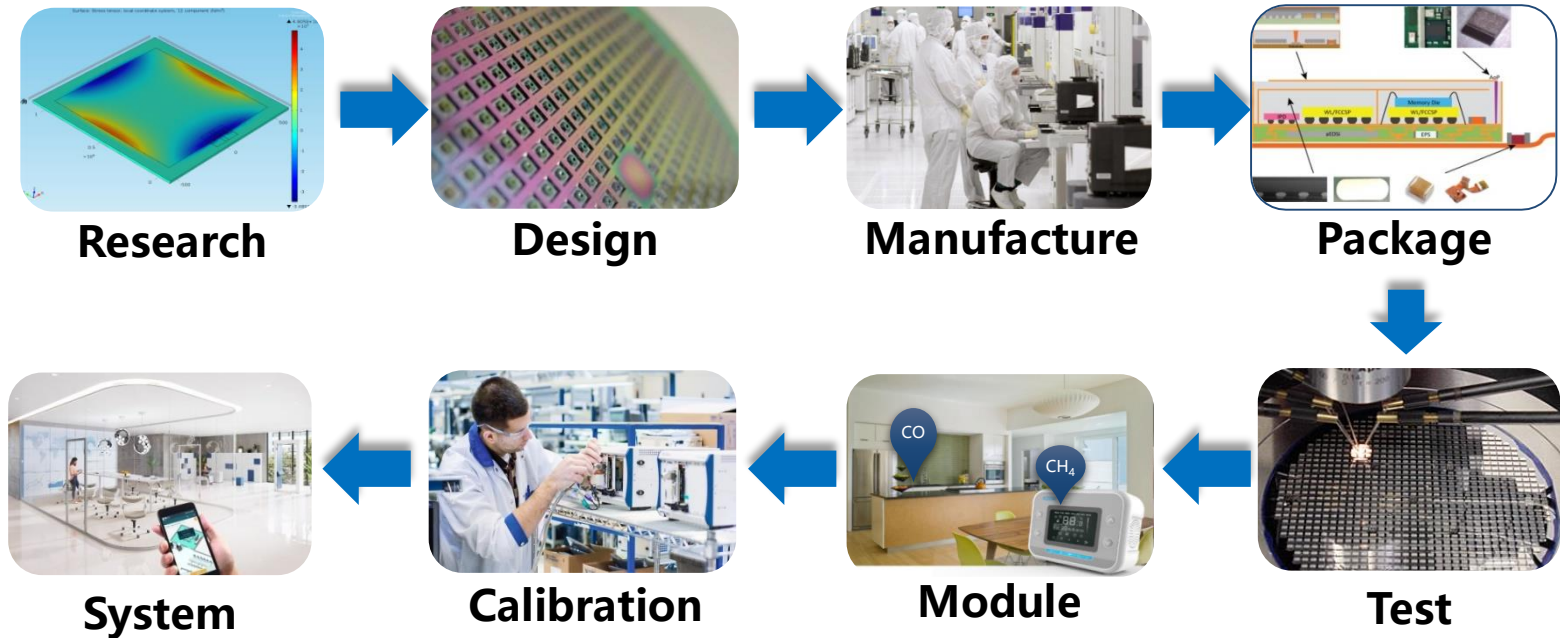
## Milestone



# Company profile

## MEMS IDM

Integrated Device Manufacture. Refers to semiconductor companies with design, production of chips, packaging, module production and sales.



# Company profile

Client (Part)





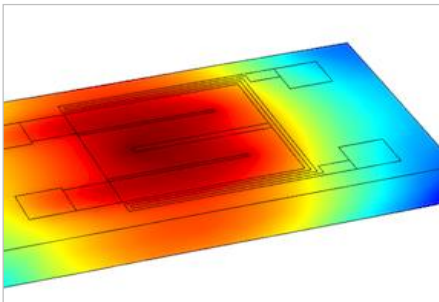


## 02 Advantages

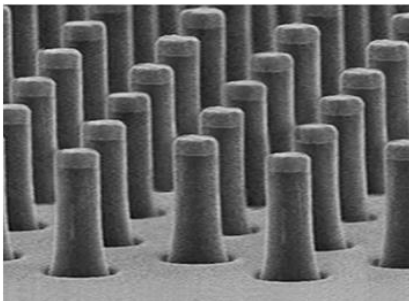


# Advantages

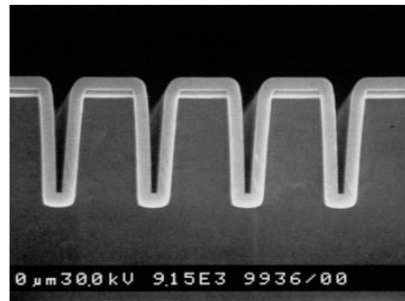
## Featured technology and production capacity



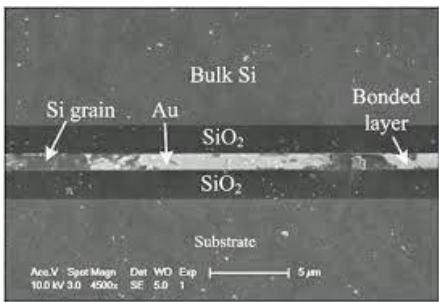
Multiphysics



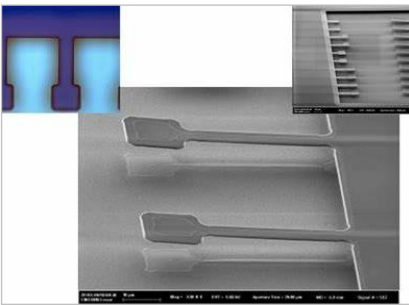
STS HRM



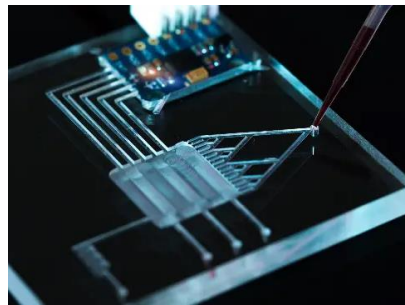
ALD



Wafer bonding



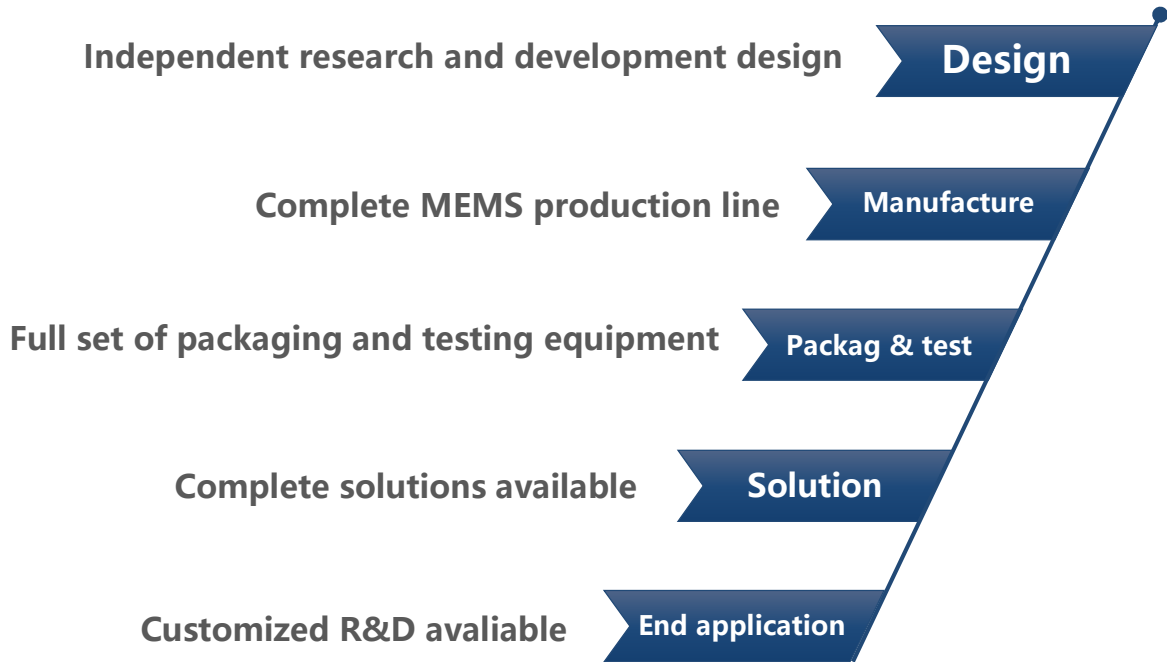
Silicon bulk micromachining



Microfluidic machining

# Advantages

With the core MEMS production line, we can develop and produce products in different fields to achieve sustainable development



## The most advanced sensor chip production line in Guangdong-Hong Kong-Macao Greater Bay Area



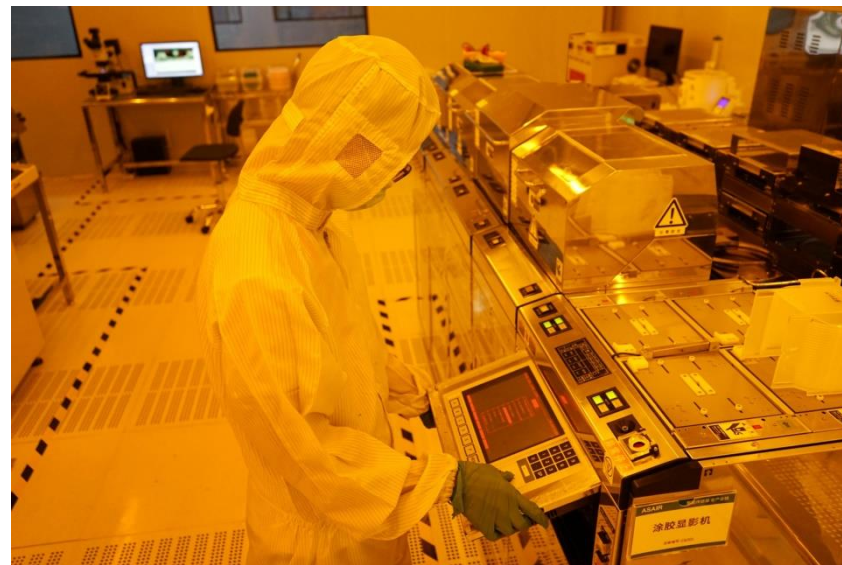
**MEMS production line**



**R&D laboratory**



**Calibration line**



Semiconductor photo area

# Advantages

## Precision Machining Workshop



Product shell / Plastic parts / Mold making and production

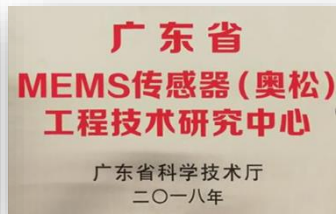


# Advantages

- 2016: Guangzhou Enterprise Research and Development Institute
- 2018: MEMS Sensor Engineering Technology Research Center
- 2019: National high-tech enterprise review certification
- 2020: Most Influential IoT Sensing Enterprise Award
- 2020: Specialized, advanced enterprises in Guangdong Province
- 2020: Guangdong famous high-tech products
- 2021: For two years, Guangdong Province has been honored as a contract-abiding and credit-worthy enterprise

## Intellectual property

- Invention patent application: 132
- Patent: 43
- Utility model patents: 37
- Design patent: 52
- Software copyright: 11



荣获多项专利



获得多项软件著作权

# Advantages

Certification



IATF16949:2016

ISO9001、ISO14001、ISO45001



CE、REACH、RoHS







# 03 Products

## Main product areas



Temperature  
and humidity



Air flow



Gas detection



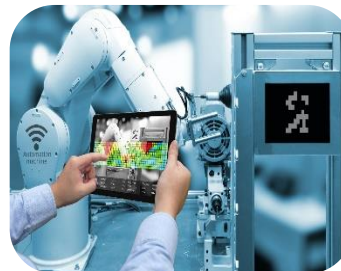
Liquid flow



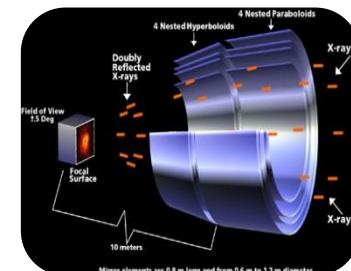
Steam



Pressure



Magnetic sensor

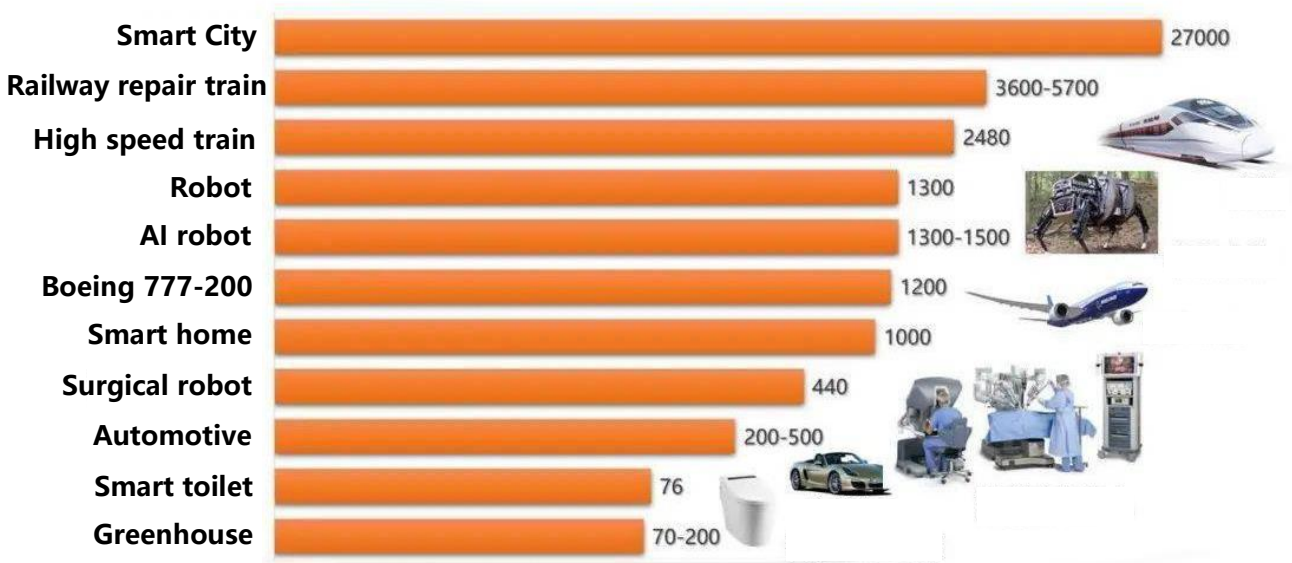


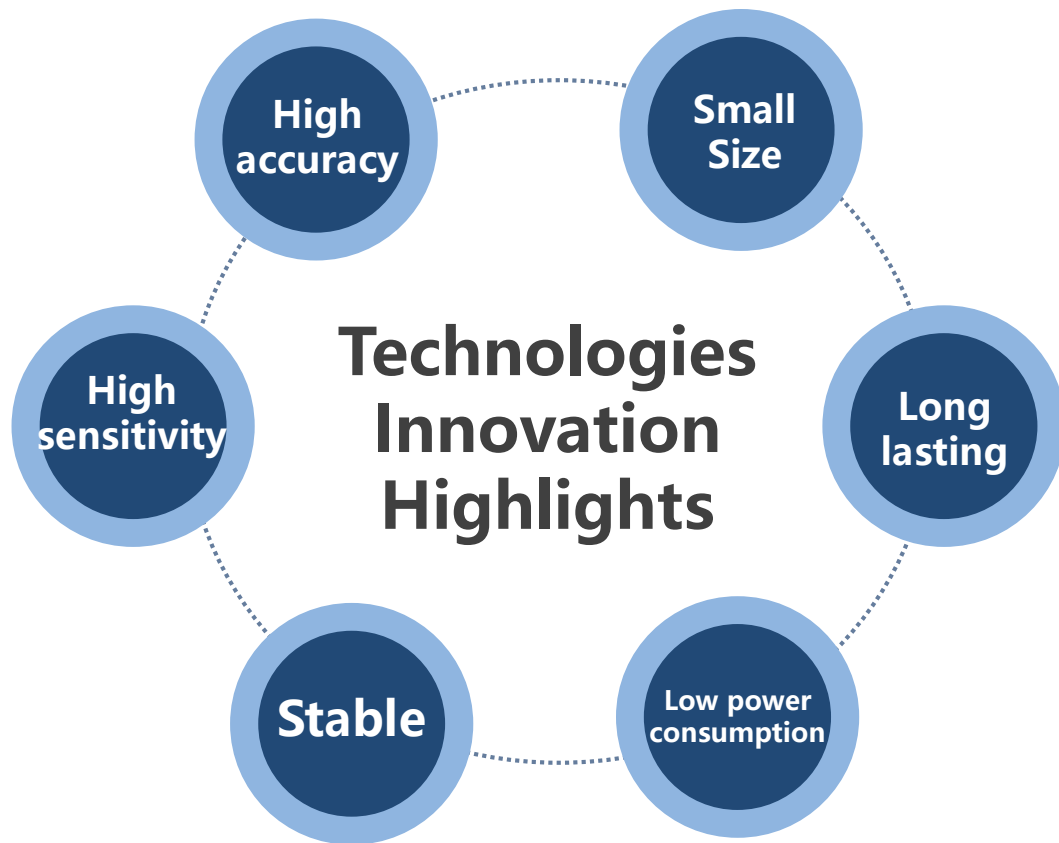
X-ray

# Products — The importance of sensors

## Sensors are everywhere

A mobile phone has at least a dozen sensors, a luxury car has 200+ sensors, an airplane has 1,000+ sensors, high speed train can have 2,000+ sensors.





# Products advantages: Temperature and humidity

✓ **Self-developed**

Independent intellectual property rights, mass production, easy cost control

✓ **High accuracy**

Temperature  $\pm 0.3 \sim \pm 0.5^{\circ}\text{C}$ ;  
Humidity  $\pm 2\% \sim \pm 3\% \text{RH}$

✓ **High consistency**

Repeatability  $\pm 0.1\% \text{HR}$ ;  
 $\pm 0.1^{\circ}\text{C}$ ;

✓ **Small Size**

Utilize MEMS technology and small packaging process to achieve high sensor integration and small footprint

✓ **Certification**

EU RoHS, REACH; IATF16949, CE certification

✓ **Excellent long-term stability**

Product can maintain stable performance in harsh environments

✓ **Cost-effective**

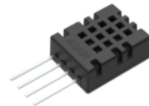
High product compatibility and affordable price

✓ **Low power consumption**

Optimum operation with low power consumption of 3.2mW during measurement

✓ **Rich product styles and various signal outputs**

IIC, analog voltage, single bus, etc. are optional, which is convenient for users to connect to the host



# Products advantages: Electrochemical sensor

✓ **Full range measurement**

Part of oxygen sensors can achieve a detection range of 0~100% O<sub>2</sub>

✓ **Fast respond**

Response time (T90) < 15s

✓ **High accuracy**

Provides repeatable, accurate target gas readings

✓ **Good compatibility**

Compatible with a variety of devices on the market

✓ **High reliability**

Small baseline drift and good long-term stability

✓ **Cost-effective**

High product compatibility and affordable price

✓ **Strong anti-interference ability**

Can detect a specific gas

✓ **Customized optional**

Can be customized and mass produced according to customer needs



# Products advantages: Non-electrochemical gas sensor

✓ **High accuracy**

High measurement accuracy, effective detection of gas concentration

✓ **Long lasting**

Long service life, extending customer product life cycle

✓ **Small size**

Utilize MEMS technology and small packaging process to achieve high sensor integration and small footprint

✓ **Strong anti-interference ability**

Quick response to target gas, sensitive response

✓ **Self-developed**

key components are completely self-developed, and the technology is controllable

✓ **Cost-effective**

Self-R&D, cost-effective, helping customers reduce cost

✓ **Rich product styles and various signal outputs**

IIC, UART, RS485, PWM etc. are optional, which is convenient for users to connect to the host





# Products advantages: Flow sensors

✓ **Self-developed**

Independent intellectual property rights, mass production, easy cost control

✓ **High accuracy**

Accurate and reliable measurement

✓ **Certification**

EU RoHS, REACH, CE certification

✓ **Gas detection**

Can detect single or multiple mixed non-corrosive gases

✓ **Wide measurement range**

Covering different stages of micro, small, medium and high ranges, which can be customized according to customer needs

✓ **Cost-effective**

Self-R&D, cost-effective, helping customers reduce cost

✓ **Wide operating temperature range**

Operating temperature range up to -10~+60°C, customized optional

✓ **Rich product styles and various signal outputs**

IIC, NPN(2), RS485, PWM, RTU etc. are optional, convenient for users to connect to the host



# Products advantages: Differential pressure sensor

✓ **High accuracy**

Measurement accuracy up to 3%; excellent accuracy even at low dropout

✓ **Small size**

Utilize MEMS technology and small packaging process to achieve high sensor integration and small footprint

✓ **Self-developed**

Independent intellectual property rights, mass production, easy cost control

✓ **Cost-effective**

Self-R&D, cost-effective, helping customers reduce cost

✓ **Customized optional**

Can be customized and mass produced according to customer needs

✓ **Wide measurement range**

-500~+500Pa



# Products advantages: Dew point meter series

✓ **International RH&T standards**

Optical chilled mirror principle, direct measurement of ambient humidity is more intuitive and accurate

✓ **Cost-effective**

Self-R&D, cost-effective, helping customers reduce cost

✓ **High measurement accuracy**

Measurement with precision platinum resistance

✓ **Small size, smart**

Converting the originally expensive and bulky chilled mirror dew point meter into a sensor form, the cost and ease of use are greatly optimized

✓ **Excellent long-term stability**

Product can maintain stable performance in harsh environments

✓ **Corrosion resistance, pollution resistance, scratch resistance, high and low temperature resistance**

✓ **Excellent repeatability**

Repeatability reach  $\pm 0.05^{\circ}\text{C}$





# 04 Applications

# Applications: Main application areas



## Smart medical

Respiratory masks, handheld virus detectors, infusion flow monitoring, hydrogen-oxygen integrated machines, hemodialysis machines, intensive care unit environmental monitoring, anesthesia machines, etc.

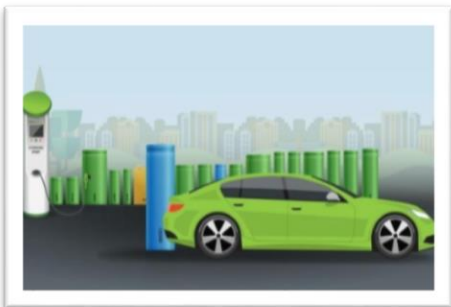


## Smart home

Air conditioners, fresh air systems, refrigerators, range hoods, air purifiers, humidifiers/dehumidifiers, washing machines, dishwashers, etc.

## Automobile

Intelligent cockpit, hydrogen energy vehicle, car front defogging, lithium battery anti-condensation, in-car air quality detector, air filter, in-car air purification equipment, etc.



## Industry

Building, computer room, factory process automation, coal, chemical, pharmaceutical, natural gas, power supply, metallurgy and other industries.



# Applications: Smart Medical Solutions

In the future, smart terminals can easily connect various diagnosis and treatment instruments, and transmit detection data to doctors and their families in real time, which will help medical staff to keep abreast of patients' medical record information and the latest diagnosis and treatment reports, quickly formulate diagnosis and treatment plans, and realize 24-hour remote monitoring. Enable patients to receive consistent care anywhere.



# Applications: Smart Medical Solutions

## Medical ventilator, nebulizer

Innovative use of smart sensors to accurately monitor the gas flow and temperature and humidity input to the human body by ventilators, nebulizers and other equipment to help patients relieve breathing problems and treat respiratory diseases.



**Mass flow sensor**  
Check ventilation



**Differential pressure sensor**  
Determine breathing state



**Temperature and humidity sensor**  
Detect changes in air temperature and humidity





# Applications: Smart Medical Solutions

## Disposable breathing mask

The temperature and humidity sensor is applied to the respiratory mask. When the respiratory mask is used, the moist air exhaled from the lungs will condense on the mask. The temperature and humidity sensor can be used to monitor the temperature and humidity environment of the mask to judge the patient's breathing state and health status.



### Temperature and humidity sensors

Monitor the temperature and humidity environment of the mask



# Applications: Smart Medical Solutions

## Virus detector

The gas sensor is used to detect whether the gas molecules (such as ethyl butyrate, butyraldehyde, isopropanol, etc.) exhaled by the human body contain the metabolic process caused by the virus to determine whether the infection is not.



### Gas sensor (AGS10 & ET)

Detection of trace gas molecules exhaled by the human body



# Applications: Smart Medical Solutions

## Flow monitoring

The precision liquid flow sensor can sensitively detect the flow rate information of the liquid. In the process of intravenous infusion treatment, both the infuser and the medical staff can grasp the flow rate and flow information at any time, quantify and visualize the infusion rate and infusion dose.



**Precision Liquid Flow Sensor**  
Monitor liquid velocity flow information



# Applications: Smart Medical Solutions

## Hydrogen and oxygen machine

Use smart sensors to monitor the hydrogen, oxygen concentration and flow rate output by the hydrogen-oxygen integrated machine to help patients make adjustments according to their own needs.



### Hydrogen sensor

Detect the gas concentration of hydrogen



### Oxygen sensor

Detect the concentration of oxygen



### Flow sensor

Check ventilation



# Applications: Smart Medical Solutions

## Monitoring room environment

Smart sensors make the medical environment more comfortable by measuring changes in the surrounding environment and converting input data into electronic data to monitor ambient temperature and humidity, PM2.5, TVOC, CO2, CO, O2, etc.



**Temperature and humidity sensors**



**Oxygen sensor**



**Negative ion generator**



**Environmental detection Model**  
Monitoring of medical environmental indicators (PM2.5, TVOC, CO2, O2, etc.)



# Applications: Smart Bathroom Solutions

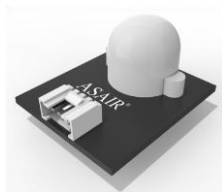
Generally speaking, there seems to be nothing else in the bathroom other than the toilet, shower, washing machine, sink. However, with the development of science and technology, intelligence and network elements have gradually penetrated into the bathroom, and many traditional bathroom products have begun to use sensors to make the bathroom more and more high-tech, making our lives more comfortable and convenient, and making us more Value our health and life.



# Applications: Smart Bathroom Solutions

## Smart toilet

The smart toilet originated in the United States and was used in medical and elderly care. It was originally equipped with a warm water washing function. Since then, various functions such as automatic flipping, flushing, toilet cover heating, warm water washing, warm air drying, and sterilization have been realized through sensor technology.



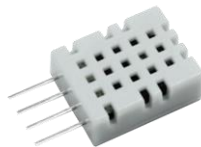
### Human Inductor

Human intelligent induction, automatic flip, automatic flushing



### Turbidity sensor

By measuring the turbidity of toilet water, automatic flushing, control of flushing volume, etc.



### VOC sensor:

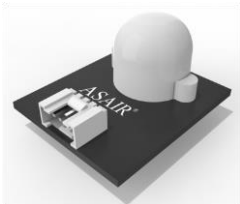
Measure toilet odor, realize automatic flushing and eliminate odor



# Applications: Smart Bathroom Solutions

## Smart mirror

Smart Mirror is a smart and efficient mirror that uses interactive touch screen, voice control, behavioral control and other ways to interact, allowing you to experience your home life in a whole new way.



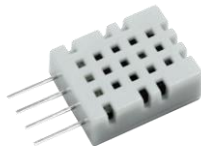
### Human Inductor

Human intelligent induction,  
automatic screen brightening



### Temperature and humidity sensor

Ambient temperature and humidity display,  
automatic defogging



### VOC Sensor:

Bathroom odor monitoring, ventilation  
and deodorization

# Applications: Smart Bathroom Solutions

## Smart Bathroom Master



### Co2 sensor

Monitoring the carbon dioxide concentration in the bathroom, circulating ventilation



### Oxygen sensor

Detect oxygen concentration in bathroom, health alarm



### Negative ion generator

Air purification, deodorization



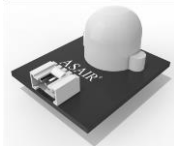
### Temperature and humidity sensor

Bathroom temperature and humidity monitoring, temperature and humidity control



### VOC sensor

Bathroom air quality, ventilation and deodorization

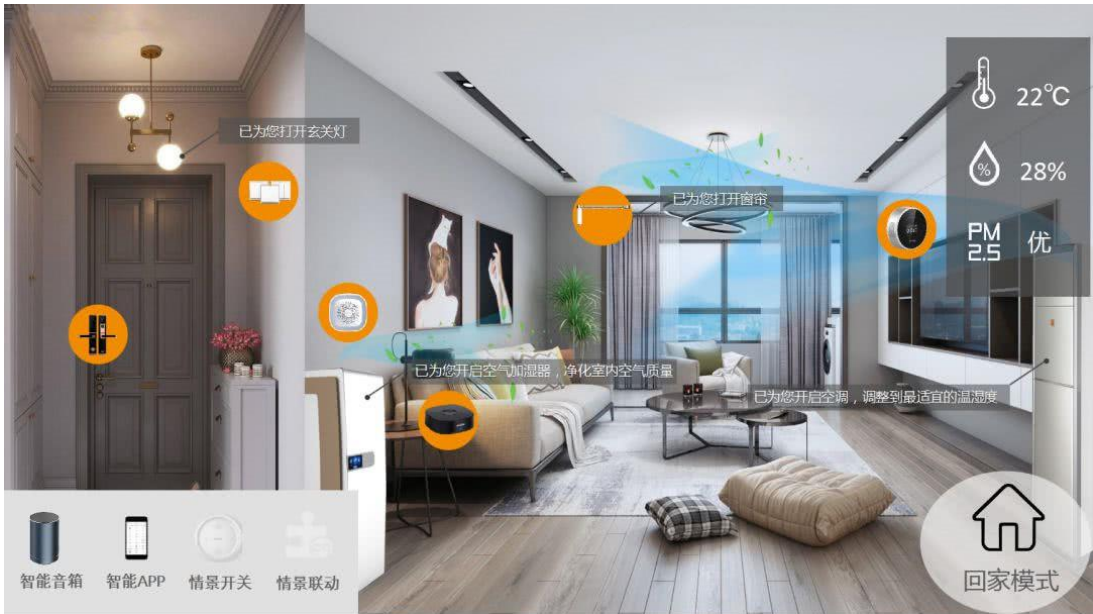


### Human Inductor

Automatic switch

# Applications: Smart Home Solutions

When you are still on the road, you can remotely start various household appliances at home. When you return home, you will be waiting for a comfortable and warm indoor environment and fragrant rice. This is a smooth and intelligent scene experience brought by smart home. Safe home environment. A smart home is the smallest unit of a smart city, and it will eventually be interconnected with hospitals, schools, etc.



# Applications: Smart Home Solutions

## Air conditioning, fresh air system

Intelligence and automation are the development trends of home appliances such as air conditioners and fresh air systems. Intelligent sensors can automatically detect ambient temperature and humidity, monitor various indoor environmental indicators, and link with control switches to automatically perform air conditioning, fresh air systems and other equipment. Intelligent adjustment to create a comfortable and healthy living environment.



Air intake

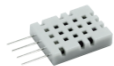


Control Panel



### RH&T sensor

Provide temperature and humidity data



### VOC sensor

Test indoor air quality



### Co2 sensor

Provides indoor carbon dioxide values



### PM2.5 sensor

Monitor indoor PM2.5 particulate matter



### Negative ion generator

Purify air, deodorize

# Applications: Smart Home Solutions

## Refrigerator

Smart sensors can make traditional refrigerators intelligent, and can automatically switch on and off through human sense. Temperature and humidity sensors can control the temperature and humidity in the refrigerator, so that the ingredients can be kept fresh. Through gas sensors, peculiar smells in the refrigerator can be detected in real time. And automatically eliminate odor; the negative ion generator can purify the air, sterilize, improve the freshness of food, and prolong the freshness period.



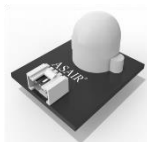
### RH&T sensor

Measure ambient humidity to prevent condensation on vertical beams



### RH&T sensor

Control the humidity in the box, intelligently keep food fresh



### Human Inductor

Intelligent induction, energy saving and power saving



### Odor sensor

Test the odor in the box to remind the food to spoil



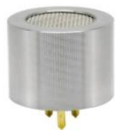
### Negative ion generator

Sterilization and preservation

# Applications: Smart Home Solutions

## Range hood

The gas sensor realizes flammable gas monitoring and triggers an alarm when the gas leaks; the VOC gas sensor detects the air quality in the kitchen, and automatically adjusts the wind power to improve the safety of the kitchen when toxic or dangerous gas leaks, or when the concentration of kitchen fumes exceeds the standard.



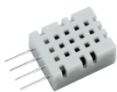
### Gas sensor

Flammable gas monitoring, triggering an alarm when gas leaks



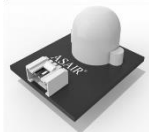
### PM2.5 sensor

Monitor PM2.5 particulate matter concentration in kitchen fumes



### VOC sensor

Test kitchen air quality to prevent toxic, dangerous gas leaks



### Human Inductor

Intelligent somatosensory interaction, both hands are 'remote control'



# Applications: Smart Home Solutions

## Micro-wave oven

In smart kitchen appliances, water vapor sensors and differential pressure sensors can be applied to kitchen equipment such as microwave ovens, ovens, and air fryers to intelligently control temperature and humidity, realize automatic cooking functions, and make cooking food easier.



### Steam sensor

Test the change of steam, so as to realize automatic cooking, intelligent temperature control, one-key steaming, energy saving and time saving.



### Differential pressure sensor

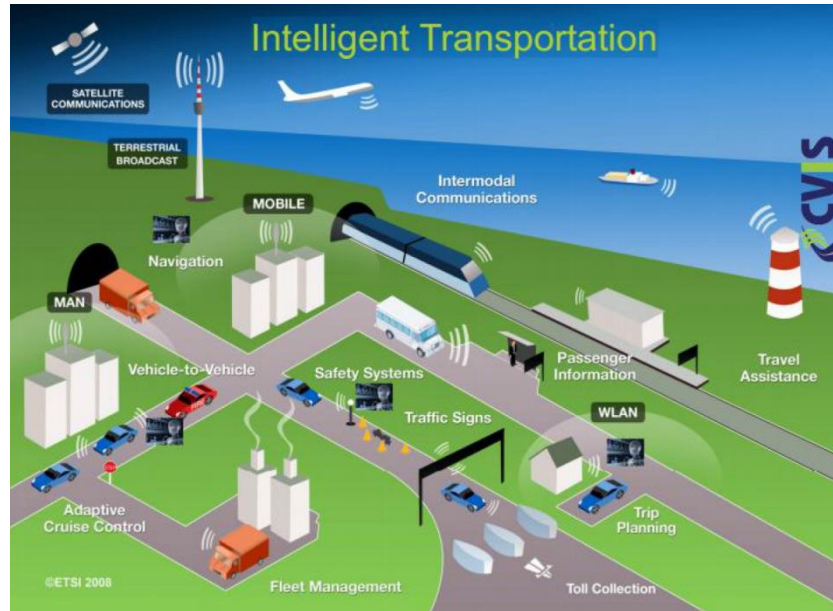
For pressurized microwave ovens





# Applications: Smart Vehicle/Smart Transportation Solutions

Many kinds of sensors are installed inside the smart car to transmit various real-time data of the vehicle itself and the road conditions during driving to the traffic safety management platform in the cloud, so as to provide early warning and reduce the occurrence of traffic accidents. Smart transportation processes, analyzes and stores the massive traffic data generated by the city every day, provides the public with more accurate and comprehensive road condition information services, and escorts intelligent driving. It covers all aspects of transportation such as the Internet of Vehicles, making our travel safer and more Convenient.





# Applications: Automobile

## Inside the car

Automobile cockpit is developing towards the trend of intelligence and automation. The all-in-one sensor module can monitor various environmental indicators inside the car. Negative ions play the role of sterilization, deodorization and air purification, and can be linked with the control switch. Make the car automatically adjust the air conditioner, purifier and other equipment intelligently to create a comfortable and healthy environment for the driver. In addition, installing an alcohol sensor in the car can effectively reduce the risk of drinking and driving.



### Environmental detection Model

Monitoring of in-vehicle environmental indicators (temperature and humidity, PM2.5, TVOC, CO2, O2, etc.)



### Negative ion generator

Sterilize and deodorize, purify the air



### Alcohol sensor

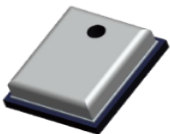
Detect the concentration of alcohol



# Applications: Automobile

## Hydrogen vehicles

Hydrogen energy vehicles can effectively reduce air pollution, but hydrogen leakage is still one of the technical bottlenecks currently encountered. Hydrogen is flammable and explosive. In order to be safe to use, hydrogen sensors can be used to sense and quickly monitor the concentration of hydrogen to avoid fires caused by hydrogen leakage.



**MEMS Hydrogen sensor**  
Detect hydrogen leaks



# Applications: Automobile

## Anti-fogging

When the temperature difference between the inside and outside of the car is large, the windshield will fog up. When the temperature and humidity sensor is linked with the control switch of the on-board air conditioner, the air conditioner can be intelligently adjusted according to the temperature and humidity in the car to prevent the generation of fog and ensure driving safety.



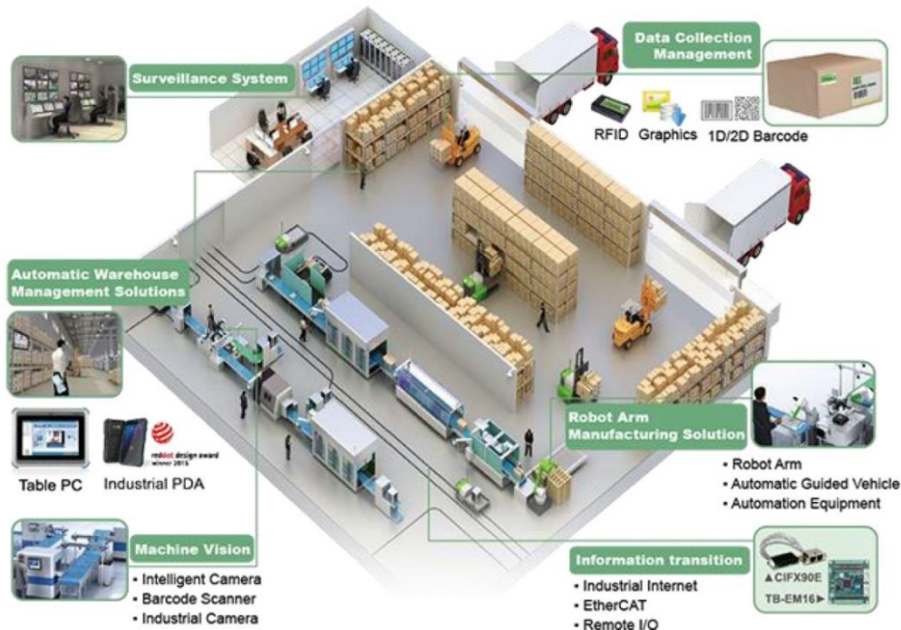
### RH&T sensor

Measure the relative humidity on the windshield surface or inside the cabin to intelligently control the air conditioning to prevent fogging before the driver realizes the visibility is reduced.



# Applications: Smart Industrial Solutions

Real-time data of equipment and environment is collected in time through sensors, and uploaded to the data center management platform for analysis and processing. Based on artificial intelligence, Internet of Things and other technologies, intelligent collaboration of massive industrial physical equipment and intelligent management and control of the entire industrial manufacturing process are realized. and operation and maintenance to improve production efficiency and quality, reduce energy consumption, and ensure production safety.



# Applications: Smart Industrial Solutions

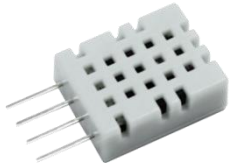
## BMS: Power management system

The intelligent power management system uses VOC sensors to detect the content of VOC volatile organic compounds in the air inside the power supply, and automatically alarms when the limit is exceeded, so as to achieve the safety of power supply use; intelligent temperature and humidity control is realized through temperature and humidity sensors, which prolongs the service life of the power supply. Monitor the status of the power supply.



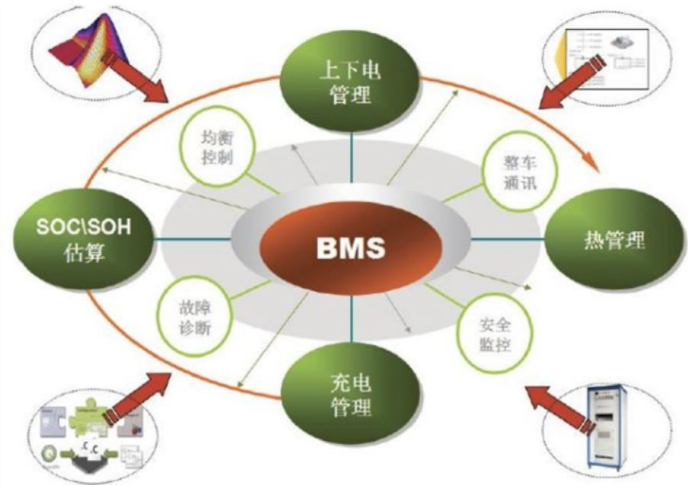
### RH&T sensor

Temperature and humidity monitoring, recording, etc., control the power supply environment to maintain a suitable range to ensure the life of the equipment



### VOC sensor

Test the content of VOC volatile organic compounds in the air inside the power supply (such as thick smoke, high temperature odor, etc.), safety detection, over-limit alarm



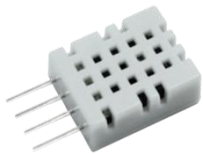
Suitable for energy storage power station, backup power supply, computer room, charging pile, automobile power supply, lithium battery energy storage, etc.

# Applications: Smart Industrial Solutions

## Controller



Co2 sensor



VOC sensor



Oxygen sensor



RH&T probe



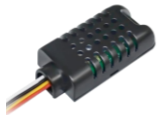
PM2.5 sensor





# Applications: Smart Industrial Solutions

Drying and dehumidification  
equipment



## RH&T Sensor

Measuring temperature and humidity data to automatically control the drying process

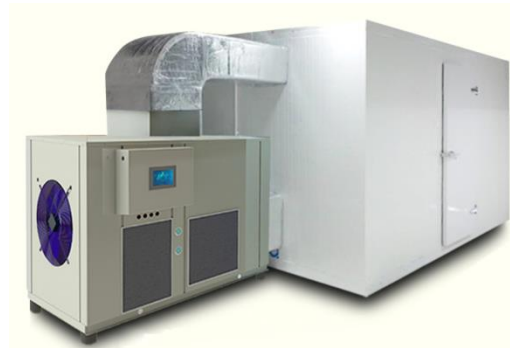


## Steam sensor

Test the change of humidity and automatically control the drying process



Industrial oven



Industrial dryers



Industrial  
Dehumidifier

# Applications: Smart Industrial Solutions

## Industrial oxygen generator



**Oxygen sensor**  
Oxygen generator control device, measuring oxygen concentration



**Flow sensor**  
For oxygen concentrators to measure oxygen flow



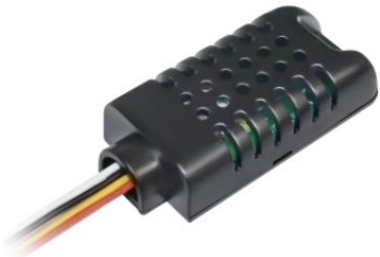
**Differential pressure sensor**  
Oxygen fluid pressure measurement for oxygen concentrators





# Applications: Smart Industrial Solutions

## Industrial mixer



### RH&T sensor

Measure the temperature and humidity inside the mixer, dry and stir

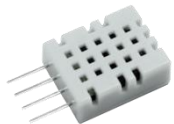


# Applications: Smart Industrial Solutions

## Meter



RH&T sensor



VOC sensor



Co2 sensor



Measuring instruments,  
transmitters, recorders, etc.



PM2.5 sensor



4-in-1 environmental  
monitoring box

# Applications: Smart Industrial Solutions

## Hazardous Chemical Spill Monitoring

Many hazardous chemicals contain volatile organic chemicals, which are toxic and harmful, and pose a greater threat to health. The chemical leak monitoring sensor is a sensor specially developed for the monitoring of chemicals and other gases, and triggers an alarm when chemicals leak.



### Chemical Gas Sensor

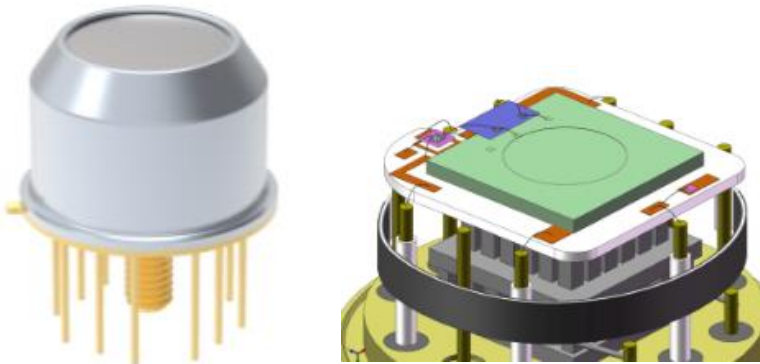
Chemical gas monitoring, triggering an alarm when chemicals are leaking.



# Applications: Smart Agriculture

## X-ray detector

X-ray detectors can be used in the environmental protection industry to detect heavy metal content in soil, detect heavy metal residues in food, and ensure food safety. At the same time, it can also be used in gold exploration, three-way catalytic converter recovery and other fields. It can detect the content of heavy metal components with one click, and provide users with efficient and accurate data information.



**X-ray detector**  
Detection of heavy metal residues in food



# Applications: Smart City Solutions

Smart cities will realize the interconnection of smart homes, smart transportation, smart medical care, smart industry and smart energy. The concept of smart city is to equip sensors to various objects in urban life to form the Internet of Things, and realize the integration of the Internet of Things through supercomputers and cloud computing, so as to realize the integration of digital cities and urban systems. Through the smart city, the smart management and service of the city can be realized. Sensors are at the heart of the entire smart city.





# Applications: Smart City Solutions

## Environmental Monitoring Station

Smart environmental monitoring stations are distributed in all corners of the city. Through environmental sensing equipment, more than ten environments such as temperature and humidity, PM2.5, PM10, CO, CO2, VOC, wind speed, rainfall, light, ultraviolet rays, noise, and wind direction can be realized. Data collection to achieve the purpose of monitoring environmental pollution and eliminating potential safety hazards.



PM2.5 sensor



RH&T sensor



Co2 sensor



TVOC sensor



Co sensor

# Applications: Smart City Solutions

## Fire control

The differential pressure sensor is used in the fire residual pressure control system to detect the air pressure difference in the front room, corridor and stairwell of high-rise buildings, so as to prevent the fire smoke from entering the stairwell without affecting the normal opening of the fire door. Safety of fire evacuation routes.



### Differential pressure sensor

Detection of air pressure differences in front rooms, corridors and stairwells of high-rise buildings





## Applications: Co-innovation with customers

Aosong will cooperate with corporate customers and partners from all walks of life to achieve joint innovation through deepening cooperation, providing services for biomedical, smart home appliances, new energy vehicles, industrial automation, smart agriculture, as well as artificial intelligence, Internet of Things, smart wear, information communication and other social sectors. It provides one-stop smart sensor solutions and technical support to create greater social value and promote the intelligent development of society.

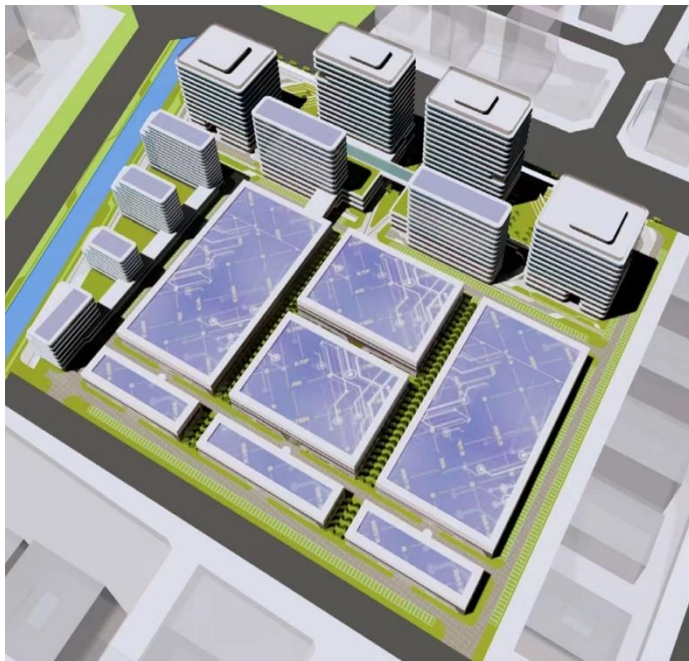
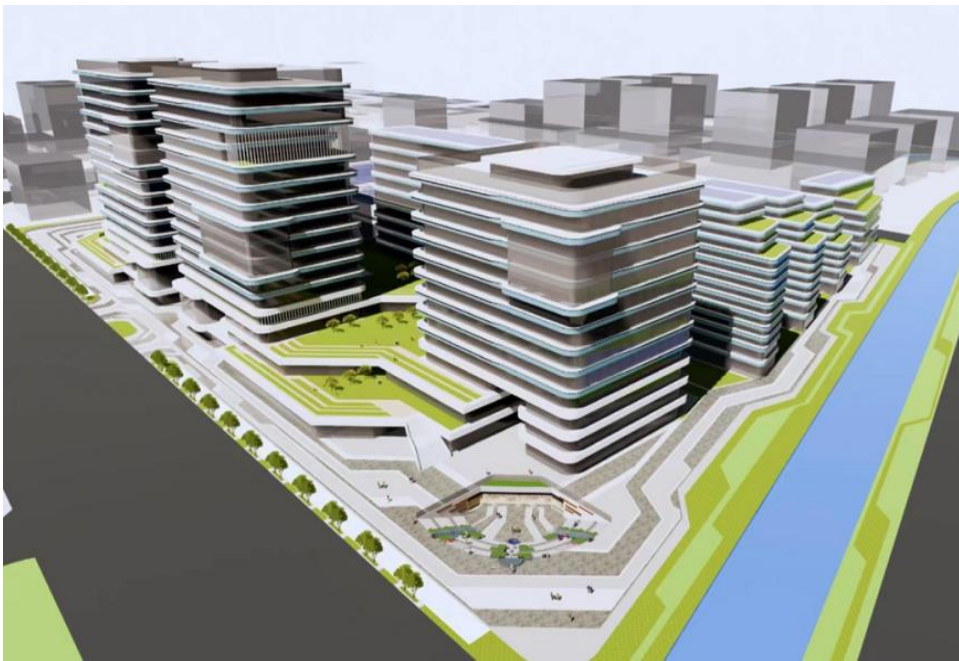




# 05 Future

# Future

Aosong Electronics' 8-inch MEMS feature chip production line has started construction; upon completion, it will become one of the largest MEMS semiconductor feature chips and smart sensor industry clusters in China, providing one-stop feature chips and smart sensing solutions.





# Future



# Thanks

**Guangzhou Aosong Electronic Co., Ltd**

Address: No. 17, Yunjun Road, Huangpu District, 510530  
Guangzhou, China

Tel: 020-89850036

Email: [inquiry@aosong.com](mailto:inquiry@aosong.com)

[www.aosong.com](http://www.aosong.com) / [asairsensors.com](http://asairsensors.com)

