EC Sense
Easy Gas Sensors

Oxygen Gas Sensor Module
TB600 Datasheet

TB600-O_2-25

Easy Gas Sensor Module Solutions
Easy to Use

Overview

The TB600 series is an intelligent digital gas sensor module using a smart microprocessor combining high-reliability solid polymer electrochemical gas sensor technology and intelligent algorithm calculation. The TB600 Gas Sensor Module is suitable for indoor and outdoor industrial applications. It detects gas, temperature and humidity and receives all data simultaneously. The data is output through the transmission command, which makes it easy and convenient to recognize the right time for maintenance and replacement. Each sensor module has been professionally calibrated with the gas, and the calibration information is stored in the flash chip. The sensor module has an I^2C or a UART (TTL 3.3V) output interface, which can be easily integrated with different devices and systems.

Key Features

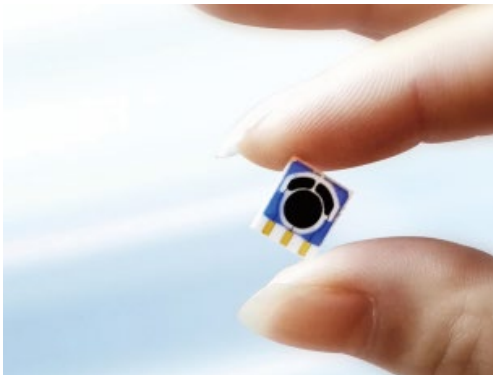
- Excellent accuracy
- Detects gas, temperature and humidity
- Detects with high selectivity a wide variety of gases
- Digital signal UART (TTL 3.3V) or I^2C output
- Low power consumption and sleep mode (suitable for battery and IoT applications)
- Long lifetime > 3 years
- No-poisoning
- Typical warm-up time in seconds
- Fast response time
- Linear output
- No zero line drift
- Wide temperature range of -40 °C to +55 °C
- No leakage
- RoHS approved

Applications

- Industrial Safety
- Leakage Detection
- Gas Manufacturing Process Monitoring
- Emission Monitoring
- Sewage/Water Treatment Plant
- Biogas
- Power Transformer
- Food Industry
- Tobacco Storage Environmental Monitoring
- Warehouse Logistics Monitoring
- Medical & Health Care

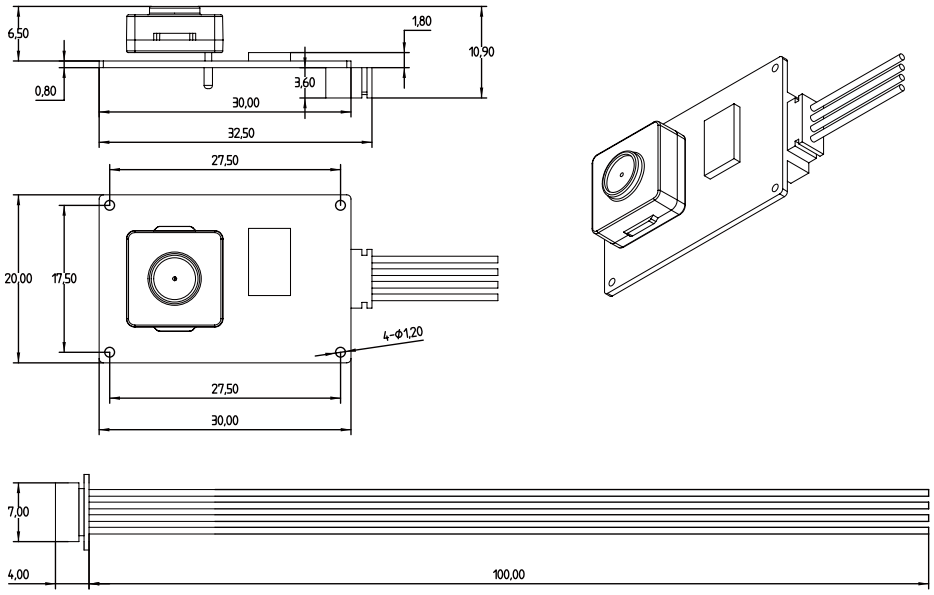
Principle

The EC Sense solid polymer electrochemical technology is a revolutionary innovation in the field of electrochemical detection. This technology is based on the principle of electrochemical catalytic reaction, detecting the output signals of the electrochemical reactions of different gases and accurately measuring the gas concentration through the signal.
The sensor is composed of three electrodes in contact with the electrolyte. A typical electrode consists of a large surface area of noble metal and other materials. The electrode, electrolyte and the surrounding air are in contact and the gas diffuses into the working electrode. Here the gas will be oxidized, this causes a current, which is proportional to the gas concentration.



Mechanical Drawing

Unit: mm



Order Information

Product	Partnumber	Range	Resolution	Output
Ozone Gas Sensor Module	04-TB600-O_2-25%-01	0-25% vol.	0.01% vol.	UART TTL 3.3V
4Pin Cable	02-MOD-CABLE-4PIN-01			

Technology Specifications

Principle	Solid Polymer Electrochemical Sensing Technology
Detection of Gas	Oxygen Gas
Full-Scale Accuracy Error	± 5% F.S
Warm-Up Time	Stored in clean air for the first power on < 20 minutes
	Note: Exposure to harsh chemicals, high concentrations of alcohol, acetone, and ethanol gas during storage may lead to extended warm-up time
Response Time	T50: < 5 seconds; T90: < 10 seconds
Time to Zero	< 30 seconds
	Note: The time when the module leaves the oxygen-enriched or hypoxic environment, and the indication value returns (20.9 ± 0.1)% vol. In clean air
Calibration Substance	99.99% Nitrogen as standard gas calibration zero, Clean air calibration 20.9% vol. Sensitivity
	Note: users are not recommended to use over-range
Expected Sensor Lifetime	More than three years in relatively clean air, temperature 0-25 ℃ , humidity 30-70% (Sensor life will be reduced if often exposed to corrosive gas, high temperature environment and < 20% low humidity environment)
Relative Temperature Error	± 0.2 ℃
Relative Humidity Error	± 2%
Output	3.3V UART digital signal (see below for communication protocol)
	Interface definition: VCC- red, GND- black, RX- yellow, TX- green;
	Baud rate: 9600 Data bits: 8 bits Stop bits: 1 bit;
Get Data Command	Communication has active upload and Q & A mode. The default mode is Q & A mode after power-on. You can use instructions to switch between the two modes.
	Or Q & A mode is restored by power off or switch power mode
Supply Voltage	3.3 to 5.5V DC, Recommended 5V DC
Supply Current	9.5mA @ 5VDC
Current (Switch off LED lamp)	8.7mA @ 5V DC
Peak Current	11mA @ 5V DC
Sleep Mode Current	0.85mA @ 5V DC
Power Consumption	40mW @ 5V DC
Working Voltage	3.3 to 5.5V DC
Working Current	< 5mA
Power Consumption	Ad sleeping mode power consumption 25mW @ 5V ad Q&A mode power consumption
Repeatability	Full range ± 1% is the normal range
Working Temperature	0 ℃ to 40 ℃ , suitable for indoor use. -40 ℃ to +55 ℃ , need for temperature compensation
Optimal Working Temperature	20 ℃ to 35 ℃
Working Humidity	15% - 95% RH. (Non-condensing)
Optimum Working Humidity	50% RH.
Working Pressure	Atm ± 10%
Board Size	23 x 25.5 x 10.2 mm (with sensor)
Board Size	23 x 25.5 x 4.85 mm (without sensor)
Weight	3.1 g
Signal Cable	The standard length is shown in the structure diagram and can be customized if there are special requirements.

Disclaimer

The EC Sense performance data stated above is based on data obtained under test conditions using the EC Sense gas distribution system and AQS test software. In the interest of continuous product improvement, EC Sense reserves the right to change design features and specifications without notice. We are not responsible for any loss, injury or damage caused by this. EC Sense assumes no responsibility for any indirect loss, injury or damage resulting from the use of this document, the information contained therein or any omissions or errors herein. This document does not constitute an offer to sell. The data it contains are for informational purposes only and cannot be considered a guarantee. Any use of the given data must be evaluated and determined by the user to comply with federal, state and local laws and regulations. All specifications outlined are subject to change without notice.

Warning

EC Sense sensors are designed for use in a variety of environmental conditions. However, due to the principles and characteristics of solid polymer electrochemical sensors and to ensure normal use, users must strictly follow this article during storage, assembly and operation of the module. Avoid cleaning the sensors with alcohol, acetone or other strong solvents. General-purpose PCB circuit board application methods and illegal applications or violation of the application will not be covered by the warranty. Although our products are highly reliable, we recommend checking the module's response to the target gas prior to utilization to ensure on-site use. At the end of the product's service life, please do not discard any electronics in the domestic waste, instead follow the local governments electronic waste recycling regulations for disposal.

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