



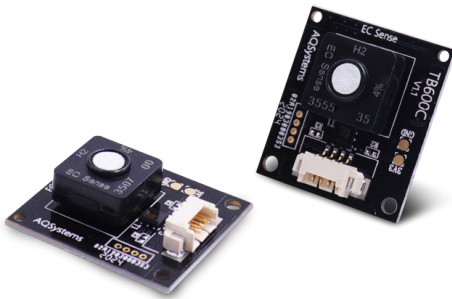
Hydrogen Gas Module 0~2%vol

TB600C-H₂-2%

Technical Specification

» Product Overview

The TB600C-Series Hydrogen Gas Module is the perfect combination of a state-of-the-art high-precision sensing device with a sophisticated circuit board. The sensor module uses EC Sense’s small-in-size solid polymer electrochemical sensor, which accurately detects very low concentrations of gases. It replaces our nose to reliably sniff out the gas concentration and enables precise gas detection. The TB600C module serves an UART digital output for ease-of-use, eliminating the need for customers to understand the sensor application and the tedious work of calibration.



» Features

- ☞ High precision environmental monitoring application
- ☞ Independent temperature and humidity digital sensors output, combined with intelligent algorithms, stronger environmental adaptability
- ☞ Fast response, fast return to zero, plug and play
- ☞ Easy to use, UART digital signal output, zero drift
- ☞ Durable and reliable, long lifetime and stable detection
- ☞ New microcircuit design, strong anti-electromagnetic interference ability, good anti-toxicity
- ☞ With fixed mounting holes for easy installation
- ☞ Low power consumption and sleeping mode (suitable for and IoT applications)
- ☞ RoHS approved eco-friendly design

» Application

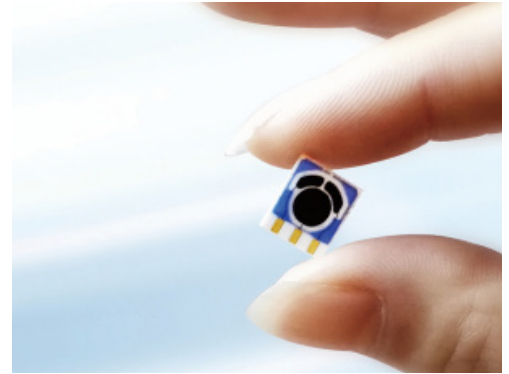
- ☞ Hydrogen leakage monitoring for hydrogen energy vehicles
- ☞ Hydrogen safety monitoring in industrial production process
- ☞ Environmental safety monitoring of hydrogen energy storage and transportation
- ☞ Petroleum and petrochemical industry monitoring applications
- ☞ Metallurgy, food processing, electronic industry process applications



» 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.

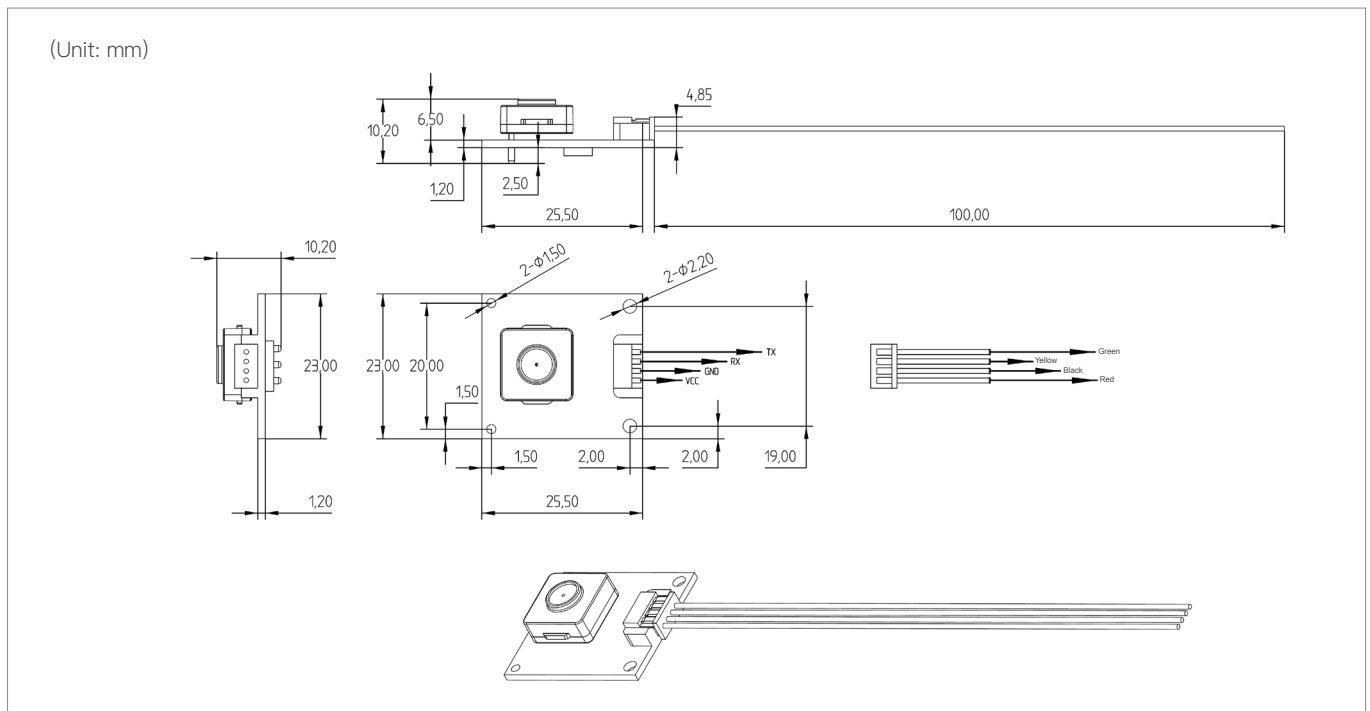
The sensor is composed of three electrodes in contact with the electrolyte. A typical electrode consists of a large surface area of noble metal and other materials. The electrode, electrolyte and the surrounding air are in contact and the gas diffuses into the working electrode. Here the gas will be oxidized, this causes a current, which is proportional to the gas concentration.



» Order Information

Product	Part Number	Range	Resolution
Hydrogen Gas Module	04-TB600C-H ₂ -2%-01	0-2%vol	0.01%vol
4Pin Cable	02-MOD-CABLE-4PIN-01		

» Structure Diagram



» Specification

Principle	Solid Polymer Electrochemical Sensing Technology
Order Number	04-TB600C-H ₂ -2%-01
Detection of Gas	H ₂ Hydrogen Gas
Detection Range	0 - 2%vol; Display resolution: 0.01%vol
Lowest Detection Limit	0.01%vol
Full-Scale Accuracy Error	± 5% F.S
Warm-Up Time	Stored in clean air for the first power on < 120 seconds Stored in non-clean air for the first power on < 180 seconds (except in the presence of high concentrations of polluted gas)
Response Time	< 3 seconds (T50: < 40 seconds; T90: < 80 seconds; T100: < 180 seconds;)
Calibration Substance	2%vol measurement range: 1%vol is H ₂ gas calibration; Note: The smaller the range, the higher the detection accuracy. It is not recommended for users to use it beyond the range.
Expected Sensor Lifetime	More than three years in relatively clean air, temperature 0-25°C , 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°C
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
Working Voltage	3.3 - 5.5V DC
Working Current	< 5mA
Power Consumption	Ad sleeping mode power consumption 25mW @ 5V ad Q&A mode power consumption
Repeatability	Full range 2%vol ± 1% is the normal range
Working Temperature	-40°C to +55°C
Optimal Working Temperature	20°C to 35°C
Working Humidity	15% - 95% RH. (Non-condensing)
Optimum Working Humidity	50% RH.
Working Pressure	Atm ± 10%
Board Size	23 x 25.5 x 10.2mm (with sensor)
Board Size	23 x 25.5 x 4.85mm (without sensor)
Weight	3.1g
Signal Cable	The standard length is shown in the structure diagram and can be customized if there are special requirements.

» Cross Sensitivity

Gas	Molecules Formula	Concentration (ppm)	Response (ppm)
Ammonia	NH ₃	50	0
Carbon Dioxide	CO ₂	1000	0
Carbon Monoxide	CO	200	1000
Chlorine	Cl ₂	5	0
Methane	CH ₄	1%vol	0
Hydrogen Cyanide	HCN	10	0
Isopropanol	C ₃ H ₈ O	1000	0
Nitric Oxide	NO	25	0
Nitrogen Dioxide	NO ₂	10	0
Hydrogen Chloride	HCl	20	0
Hydrogen Fluoride	HF	3	0
Hydrogen Sulphide	H ₂ S	10	0
Silane	SiH ₄	5	0
Sulfur Dioxide	SO ₂	10	0

Note: 1) The above interference factors may vary due to different sensors and service life. Please refer to the actual test results.
 2) This table is not complete for all gases, and the sensor may be sensitive to other gases.

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. General-purpose PCB circuit board application methods and illegal applications / 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 products 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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