

SensorsX SX-GSO2TSA Series

Electrochemical Sulfur Dioxide (SO₂) Gas Sensor

Compact Size | Low Power Consumption | Long Service Life | Cost-effective Design | High Accuracy



0–20 ppm Detection Range	500±100 nA/ppm Sensitivity	<45 s Response Time
-30 to +50°C Operating Temperature	15–90 %RH Humidity Range	2 years Service Life

Sulfur Dioxide Detection | Electrochemical Sensing | Industrial Process | Livestock | Smart Municipal

■ PRODUCT OVERVIEW

The SX-GSO2TSA Series is a potentiostatic electrochemical sulfur dioxide sensor. Sulfur dioxide and oxygen undergo oxidation–reduction reactions at the working electrode and counter electrode, respectively, generating an electrical current. The output current is proportional to the sulfur dioxide concentration, allowing SO₂ concentration to be determined from the measured current.



■ KEY FEATURES

◆ High Accuracy, Long Life	Precise detection with extended operating life
◆ Fast Response, Fast Recovery	Quick response with rapid baseline recovery
◆ Low Power, High Sensitivity	Low power consumption with high sensitivity
◆ Wide Linear Range, High Resistance to Interference	Robust performance across the measurement range
◆ High Repeatability and Stability	Consistent long-term performance

■ TYPICAL APPLICATIONS

- Sulfur dioxide detection instruments
- Industrial on-site sulfur dioxide gas detection
- Livestock-farming sulfur-compound detection
- Smart municipal sulfur dioxide detection
- Atmospheric / ambient sulfur dioxide detection

■ PERFORMANCE SPECIFICATIONS

General

Model	SX-GSO2TSA-540
Detection Principle	Electrochemical, three-electrode
Target Gas	Sulfur Dioxide (SO ₂)
Detection Range	0 – 20 ppm
Maximum Overload Concentration	100 ppm
Accuracy & Response	
Sensitivity	500 ± 100 nA/ppm
Zero Drift	0 – 1 ppm
Resolution	0.1 ppm
Response Time	< 45 s
Repeatability	2% of output signal
Long-Term Stability	< 2% signal / month
Linearity	Linear

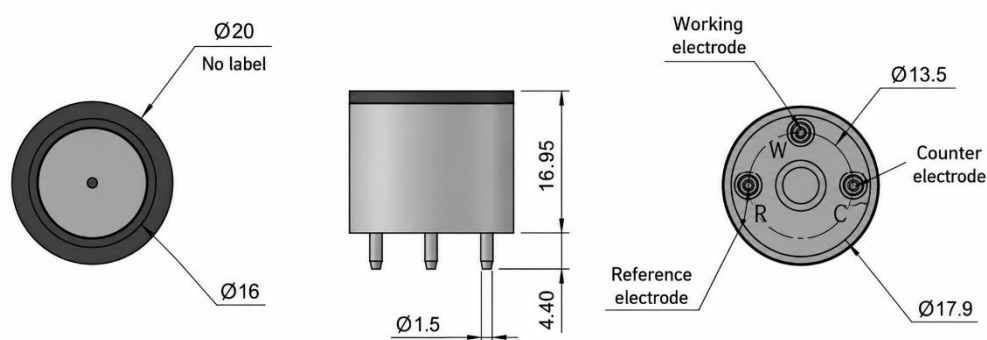
■ ELECTRICAL SPECIFICATIONS

Bias & Load	
Bias Voltage	0
Load Resistance	5 – 30 Ω

■ ENVIRONMENTAL SPECIFICATIONS

Temperature & Humidity	
Operating Temperature	-30 to +50°C (-22 to +122°F)
Operating Humidity	15 – 90% RH (non-condensing)
Other	
Operating Pressure	90 – 110 kPa
Shelf Life	12 months from delivery
Service Life	2 years

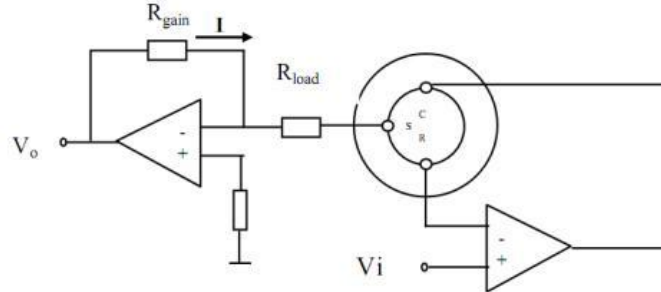
■ MECHANICAL DIMENSIONS



SX-GSO2TSA Sensor Dimensions

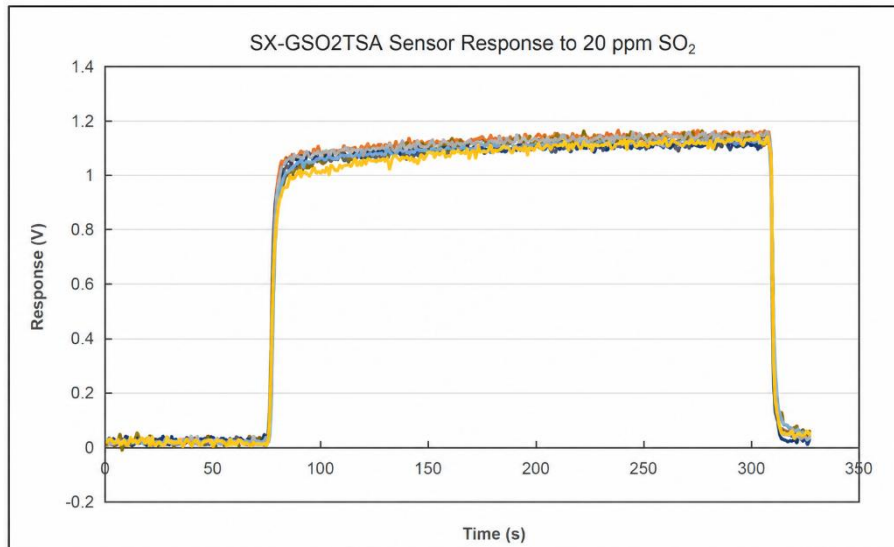
All dimensions in mm unless otherwise noted. Tolerance ± 0.2 mm.

■ WIRING DIAGRAM

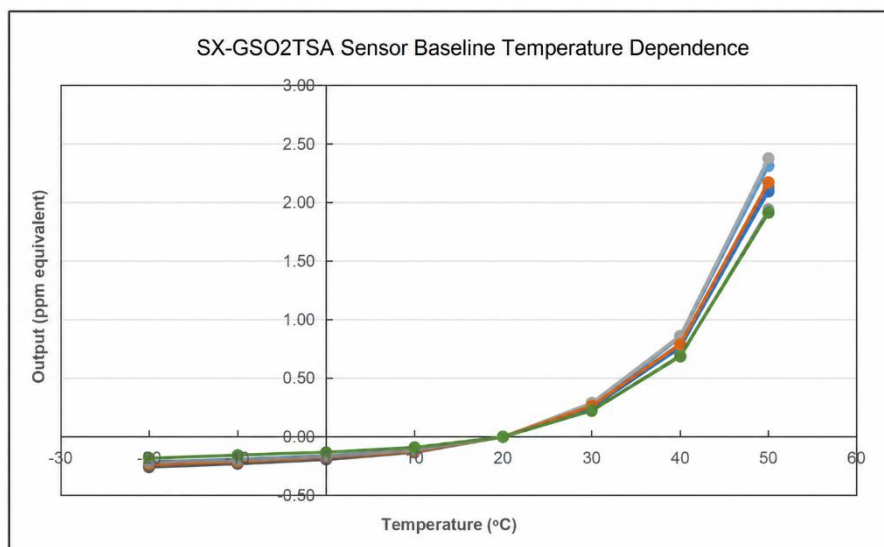


Basic Test Circuit for the SX-GSO2TSA Series Sensor

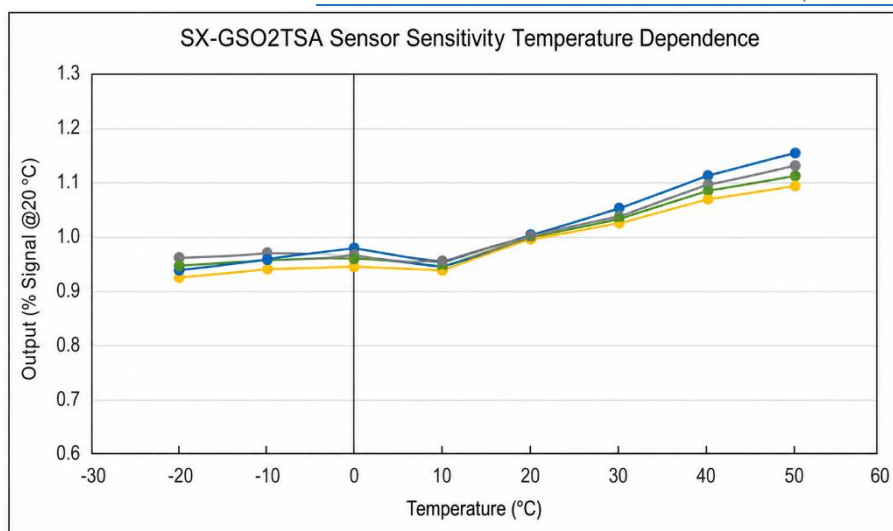
■ SENSOR CHARACTERISTICS



SX-GSO2TSA Sensor Response to 20 ppm SO₂



SX-GSO2TSA Sensor Baseline Temperature Dependence



SX-GSO2TSA Sensor Sensitivity Temperature Dependence

■ CROSS-INTERFERENCE

The SX-GSO2TSA Series sensor also responds to gases other than the target gas. The table below lists the sensor's typical response to several common interfering gases at the given concentrations, for reference.

Interfering Gas	Test Concentration (ppm)	Reading (ppm SO ₂)
CO	500	1
H ₂ S	25	0
NH ₃	100	0
H ₂	1000	1
NO	20	0
NO ₂	20	-24
Cl ₂	20	-5

■ NOTES / PRECAUTIONS

- Sensor pins must be connected via a PCB socket; soldering will damage the sensor. Do not bend the pins.
- When stored, the working electrode and reference electrode should be kept short-circuited.
- Avoid exposing the sensor to organic solvents, alcohol, paints, oils, and high-concentration gases, including silicone and other adhesives.
- Electrochemical sensors with positive output current (e.g., CO, H₂S, SO₂, NH₃) require oxygen to participate in the reaction. Calibrate and test using a standard gas with air as the background gas; otherwise sensor performance will be degraded.
- The sensor must not be used for extended periods in environments containing corrosive gases, as corrosive gases will damage the sensor.
- If the circuit board malfunctions — e.g., due to circuit design issues, faulty op-amps or other components, short/open circuits, poor pin contact, moisture, corrosion, leakage, power-supply noise, noise feedback, or electromagnetic interference — the alarm may fail to respond, drift, or show unstable readings, and may even cause the sensor to undergo electrolytic reactions and become damaged.
- When calibrating or testing the sensor, use clean air and maintain a steady, gentle gas flow to simulate natural diffusion. Blowing directly and forcefully at the sensor, or an unstable flow rate, will not give satisfactory calibration or measurement accuracy and repeatability.
- Calibration with the target gas is recommended. Cross-sensitivity can vary by +30%; calibrating with a cross-sensitive gas does not guarantee calibration or measurement accuracy.
- Non-standard test methods are not recommended — e.g., placing the sensor directly over concentrated ammonia solution, spraying cigarette smoke at the sensor, bringing a lit lighter near the sensor, breathing on the sensor, or bringing the sensor close to alcohol — because the local concentration from evaporating ammonia solution or alcohol can reach tens

of thousands of ppm, and human breath contains CO₂ at concentrations up to 40,000 ppm, both of which can damage the sensor. The correct test method is to use the target gas with air as the background gas.

***Violation of the above conditions of use will degrade sensor performance.**

■ ORDERING INFORMATION

Complete model number example: **SX-GSO2TSA-540**

Gas Range	
6	0 – 10 ppm
5	0 – 20 ppm
2	0 – 1000 ppm
3	0 – 100 ppm
4	0 – 200 ppm
G	0 – 300 ppm
7	0 – 5000 ppm
F	0 – 50 ppm
H	0 – 500 ppm
J	0 – 2000 ppm
N	0 – 3000 ppm
P	0 – 4000 ppm
Zero Drift	
4	0 – 1 ppm
Output	
0	500 ± 100 nA/ppm
Customized	
D	Customized — specify requirements when ordering