

SensorsX SX-GNH3TSA Series

Electrochemical Ammonia (NH₃) Gas Sensor

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



■ PRODUCT OVERVIEW

The SX-GNH3TSA Series is a potentiostatic electrochemical ammonia sensor. Ammonia 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 ammonia concentration, allowing NH₃ concentration to be determined from the measured current.



■ KEY FEATURES

◆ High Accuracy, Long Life	◆ Fast Response, Fast Return-to-Zero
◆ Low Power Consumption, High Sensitivity	◆ Wide Linear Range, Strong Interference Resistance
◆ High Repeatability and Stability	

■ TYPICAL APPLICATIONS

- Ammonia gas alarm instruments
- Smart municipal ammonia detection
- Industrial on-site ammonia gas detection
- Atmospheric / ambient ammonia detection
- Agriculture and livestock-farming ammonia detection

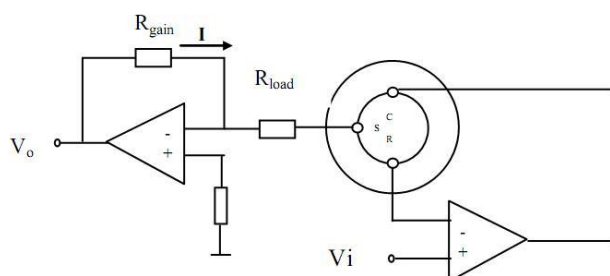
■ PERFORMANCE SPECIFICATIONS

Model	SX-GNH3TSA-340
Detection Principle	Electrochemical, three-electrode
Target Gas	NH ₃ (Ammonia)
Detection Range	0 – 100 ppm
Maximum Overload Concentration	200 ppm
Sensitivity	160 ± 40 nA/ppm
Zero Drift	0 – 1 ppm
Resolution	1 ppm
Response Time	< 90 s
Repeatability	2% of output signal
Long-Term Stability	< 2% signal / month
Linearity	Linear
Shelf Life	12 months after delivery
Operating Life	2 years

■ ELECTRICAL SPECIFICATIONS

Bias Voltage	0 V
Load Resistance	5 – 30 Ω

Basic Measurement Circuit

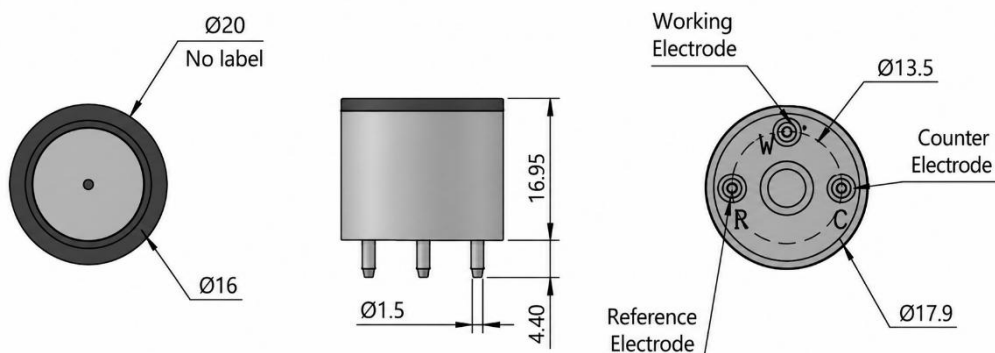


Basic test circuit for the SX-GNH3TSA ammonia sensor

■ ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-30 to +50°C (-22 to +122°F)
Operating Humidity	15 – 90% RH, non-condensing
Operating Pressure	90 – 110 kPa (13.1 – 16.0 psi)

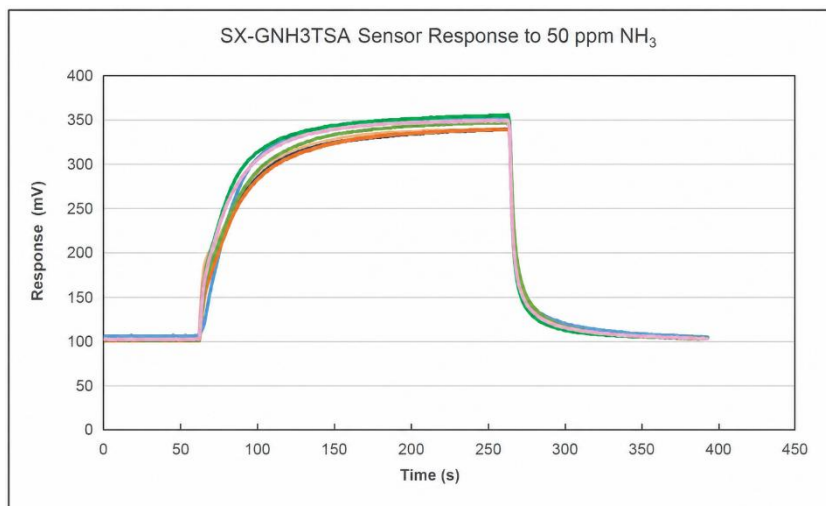
■ MECHANICAL DIMENSIONS



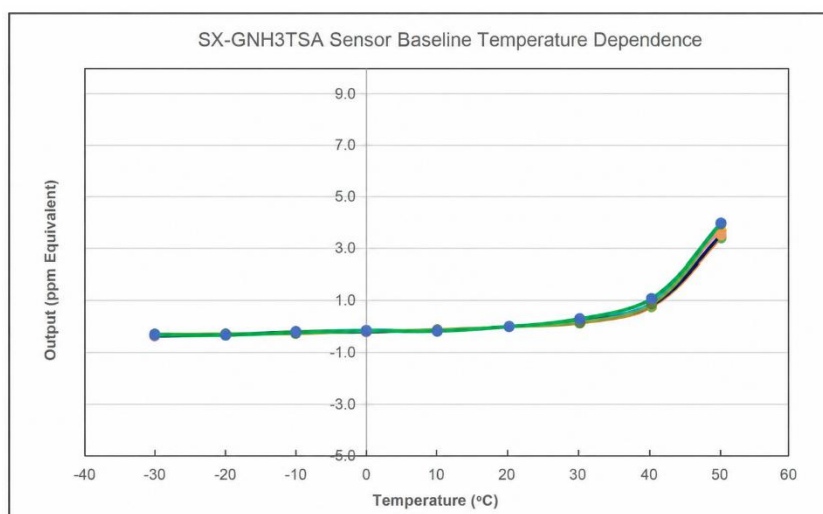
SX-GNH3TSA sensor outline dimensions

Note: All dimensions in mm, unless otherwise specified. All tolerances are ± 0.2 mm (± 0.008 in).

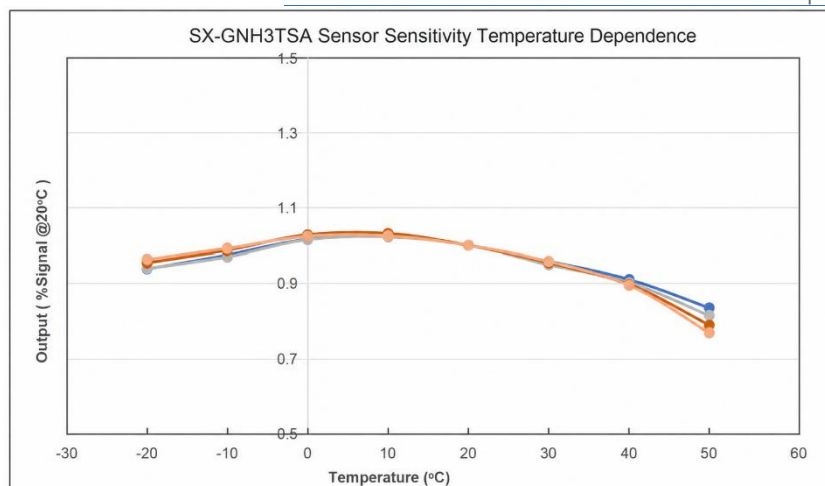
■ SENSOR CHARACTERISTICS



Response / recovery curve at 50 ppm NH₃



Baseline temperature dependence



Sensitivity temperature dependence

■ CROSS-INTERFERENCE

The SX-GNH3TSA sensor also responds to gases other than the target gas. The table below lists typical responses to several common interferent gases at the given concentrations, for reference only.

Interferent Gas	Concentration Used (ppm)	Displayed Reading (ppm NH ₃)
CO	75	0
CO ₂	100	0
H ₂ S	50	35
H ₂	1000	0
C ₄ H ₈ (Butene)	100	0

■ NOTES / PRECAUTIONS

1. Sensor pins must be connected via a PCB socket; soldering will damage the sensor. Do not bend the pins.
2. When stored, the working electrode and reference electrode should be kept short-circuited.
3. Avoid exposing the sensor to organic solvents, alcohol, paints, oils, and high-concentration gases, including silicone and other adhesives.
4. 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.
5. The sensor must not be used for extended periods in environments containing corrosive gases, as corrosive gases will damage the sensor.
6. 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.
7. When calibrating or testing the sensor, do so in clean air while maintaining a steady, gentle gas flow to simulate natural gas diffusion. Blowing directly and forcefully at the sensor, or an unstable gas flow, will not produce satisfactory calibration or reproducible test results.
8. 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.
9. Non-standard test methods are not recommended — e.g., placing the sensor directly over concentrated ammonia solution, spraying smoke at the sensor, holding a lit lighter near the sensor, breathing on the sensor, or placing the sensor near alcohol — because the local concentration from evaporating liquid ammonia or alcohol can reach tens of

thousands of ppm, and human breath can contain CO₂ concentrations as high as 40,000 ppm, either of which will damage the sensor. The correct test method uses the target gas with air as the background gas.

* Violating the above conditions will degrade sensor performance.

■ ORDERING INFORMATION

Complete model number example: **SX-GNH3TSA-340**

Gas Detection Range Code	
6	0 – 10 ppm
2	0 – 1000 ppm
3	0 – 100 ppm
4	0 – 200 ppm
7	0 – 5000 ppm
F	0 – 50 ppm
H	0 – 500 ppm
J	0 – 2000 ppm
K	0 – 10000 ppm
Zero Drift	
4	0 – 1 ppm
Sensitivity Code	
0	160 ± 40 nA/ppm
Customized	
D	Customized — specify requirements when ordering