

ES4-SiH4-50-01

ES4-SiH4-50 Silane Gas Sensor

EC Sense • Silane • Amperometric, 3-electrode

The EC Sense ES4-SiH4-50 is an industrial-grade electrochemical gas sensor for silane detection, with a 0 – 50 ppm range, 0.01 ppm resolution and 60 nA/ppm ± 15 nA/ppm sensitivity, responding in T50 < 25 s and T90 < 90 s. Its standard ABS/PPO package at under 6 g allows easy pin soldering and fast integration into conventional modules, making it suitable for silane leak monitoring in the semiconductor industry and electronics factories. Because silane autoignites at about 21 °C with a flammable range of 1.37% – 96% vol, the engineering approach is to treat it as flammable first and confirm with a ppm-level sensor second. Expected lifetime exceeds 3 years in air, with long-term sensitivity drift under 1% per month. Selection note: silane has an autoignition temperature of about 21 °C and is pyrophoric (NFPA 704 flammability 4), with a flammable range of 1.37% – 96% vol. At a relative density of about 1.12 it is slightly heavier than air, so leaks accumulate low and in trenches or valve boxes; mount detection points near the leak source and low rather than only overhead. The engineering logic should be "treat it as flammable first, then confirm at ppm level." The official cross-sensitivity table shows 100 ppm hydrogen reading about 20 ppm on the silane channel (≈20% positive interference), 1 ppm chlorine reading negative (≈ -0.5 ppm) and 10 ppm sulfur dioxide reading about 1 ppm. In PECVD processes where H₂ is present, always confirm the H₂ background first and subtract at system level or use a separate channel where needed. The ACGIH TLV-TWA is 5 ppm, so this 0 – 50 ppm range covers up to 10× the occupational limit.

Specifications

Part Number	01-ES4-SiH4-50-01
Operating Principle	Amperometric, 3-electrode
Bias Voltage	0 mV
Range	0 – 50 ppm
Maximum Overload	100 ppm
Resolution	0.01 ppm (16-bit ADC)
Sensitivity	60 nA/ppm ± 15 nA/ppm
Zero Current	± 100 nA
Zero Drift in Clean Air	< 2 ppm
Response Time	T50 < 25 s, T90 < 90 s
Repeatability	1%
Linearity	Linear
Recommended Load Resistor	100 Ω
Warm-Up Time	< 60 s
Operating Temperature	-40 °C to +55 °C
Operating Humidity	15 – 95% RH (non-condensing)
Operating Pressure	800 to 1200 hPa
Storage Temperature	0 °C to 20 °C

Long-Term Sensitivity Drift	< 1% / month
Expected Lifetime	> 3 years in air
Storage Life	12 months
Housing Material	PPO
Weight	< 6 g
Warranty	12 months

Key Features

- Direct linearity
- Fast response time
- Non-poisoning
- No electrolyte leakage
- No zero drift
- Long lifetime
- No power consumption (nA-level signal)
- Weight < 6 g
- RoHS compliant

Typical Applications

- Semiconductor Industry
- Electronics Factory
- Silane leak detection (PECVD, silane furnace areas)
- Industrial Safety

Calibration & Cross-Sensitivity

Calibrated with Silane (SiH4) standard gas. Cross-sensitivity to other gases may exist — see the cross-sensitivity table in the datasheet. Every sensor is tested under standard conditions before shipment; refer to the datasheet for the calibration gas and tolerance data.