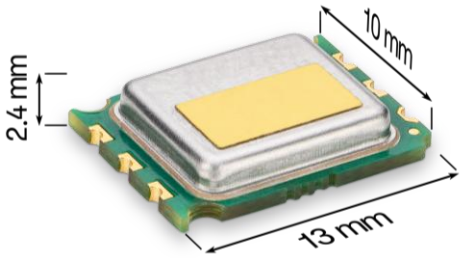
SFA40 Handling Instructions

Miniature Electrochemical Formaldehyde Sensor



Sensirion's SFA40 formaldehyde sensor offers top performance optimized for indoor air quality applications. To ensure optimum performance, it is important to take some precautions during storage, assembly, and packaging. Handling instructions provided in this document must be carefully followed.

Key Instructions

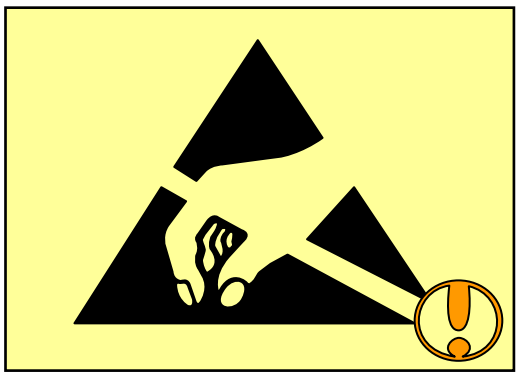
- Protection against electrostatic discharge is mandatory
- Do not use any type of reflow or hot-air soldering
- Carefully follow soldering instructions: Only manual, robotic, and laser soldering are allowed
- Do not cover the sensor membrane with any type of coating
- Do not tamper with or remove the sensor membrane
- Minimize prolonged sensor storage in confined environments together with materials that strongly outgas volatile organic compounds

Contents

1 General

1.1 Electrostatic Discharge (ESD)

The SFA40 sensor is sensitive to and may be damaged by electrostatic discharge (ESD). All handling of the sensor must take place exclusively in ESD protected areas that have been properly set up to minimize the risk of ESD, including a grounded conductive floor. Within the handling area all conductive objects must be grounded, and insulating materials must be excluded. Personnel working with the sensor must be equipped with ESD wrist straps, ESD overcoat and appropriate ESD footwear. When not in use, the sensors must be stored in ESD protective bags or containers.



Instruction 1. Protection against ESD is mandatory.

1.2 Storage

To ensure optimal performance of the sensors, it is recommended to store them in the original sealed ESD bags prior to assembly or use.

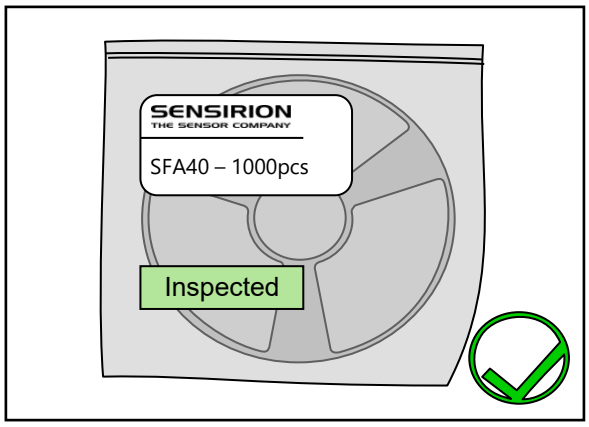
When not in use, it is recommended to store the sensors within the following temperature and humidity ranges:

- Temperature: 10 °C to 30 °C
- Humidity: non-condensing, 30 %RH to 70 %RH

For short-term storage, e.g. during transportation, SFA40 may be exposed to more extreme conditions:

- Temperature: -20 °C to 70 °C
- Humidity: non-condensing, 10 %RH to 95 %RH

Please note that the SFA40 sensor performance or reliability cannot be guaranteed for conditions outside of the limits specified in the SFA40 datasheet.



Instruction 1. Store sensors in original, unopened ESD bag. Place additional stickers only on the outside of the ESD bag.

Avoid glue or adhesive tapes for resealing the sensor bag after opening. Packaging materials that outgas VOCs must be avoided in proximity to the sensor or in closed environments. As a rule, if a material emits a strong odor, it should not be used. Metal-in antistatic shielded ESD bags from Sensirion and paper- or cardboard-based packaging are recommended. Do not use antistatic polyethylene bags, bubble foils, and/or foams in the package.

Instruction 2. Do not use polyethylene antistatic bags (often light blue, pink or rose colored). Do not use glues, foams or adhesive tapes inside packaging.

1.3 Exposure to chemicals

To ensure optimal performance of the sensor, follow these guidelines:

- Avoid high concentrations and long exposures to solvents or other volatile chemicals. Examples include PCB board wash and isopropanol.
- Avoid prolonged direct exposure to acids and bases. Examples include HCl, H_2SO_4 and HNO_3.
- Be aware that certain glues, adhesives, and plastics may outgas VOCs over time, potentially resulting in high local concentrations, especially in enclosed environments.

Please note that the above examples are not an exhaustive list of harmful substances. It is recommended to evaluate the potential impact of the substances in use on the sensor.

2 Assembly

It is recommended to design the sensor's land pattern according to the PCB design and soldering specifications in IPC-7351b-14-11. There must be no electrically conductive material directly underneath the sensor, except at the soldering pads. Electrical connection between the round pads at the back of the PCB must be avoided, as it may lead to short circuits. For reference, the land pattern recommendation is given in **Figure 1**.

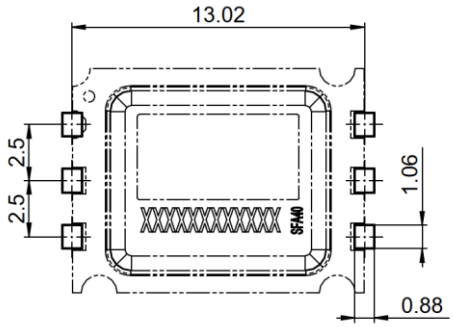
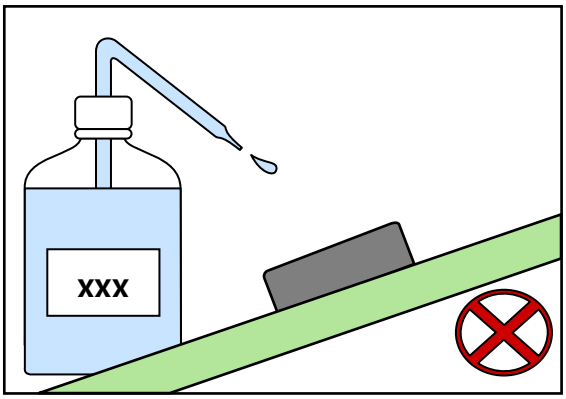


Figure 1. Recommended land pattern (all dimensions in mm). There must be no conductive material underneath the sensor other than at the soldering pads.

Avoid using board wash at any time during the sensor assembly.



Instruction 4. Do not apply board wash.

Minimize mechanical force during soldering. If force is unavoidable, apply it uniformly across the metal cap. Do not apply force directly to the membrane.

2.1 Soldering and desoldering instructions

The sensor is designed for manual soldering and automated soldering with a soldering robot. The sensor **must not** be reflow soldered or vapor phase soldered. Exposure to very high temperatures, as they occur in standard (high-temperature), low-temperature reflow soldering or vapor phase soldering, may severely impact the performance of SFA40 and must be avoided.

Shorts between metal cap and castellations, between different castellations and between pads at the backside of the PCB must be avoided. The metal cap protects the electronic components from mechanical and ESD damage and is connected to ground.

When a soldering iron is used to solder devices to a PCB the following conditions must be observed:

1. Use a soldering iron with temperature control at the tip (30 – 80 W soldering iron recommended). The soldering iron tip temperature must not exceed 310 °C.
2. Apply the solder to land pattern before pulling the liquid solder to the castellations.
3. The soldering period for each castellation must not exceed 5 seconds.

Robot soldering may also be used, if the soldering period for each castellation does not exceed 5 seconds.

If desoldering of the SFA40 from the PCB is required, it is recommended to use desoldering tweezers. Alternatively, use a soldering iron to remove the solder from each castellation individually. Heating the full PCB with the SFA40 on a hot plate must be avoided, as it may irreversibly damage the sensor.

3 Revision History

Date	Revision	Pages	Changes
June 2026	1.0	all	Initial release

Important Notices

Warning, Personal Injury

Do not use this product as safety or emergency stop devices or in any other application where failure of the product could result in personal injury (including death). Do not use this product for applications other than its intended and authorized use. Before installing, handling, using or servicing this product, please consult the data sheet and application notes. Failure to comply with these instructions could result in death or serious injury.

If the Buyer purchases or uses SENSIRION products for any unintended or unauthorized application, Buyer shall defend, indemnify and hold harmless SENSIRION and its officers, employees, subsidiaries, affiliates and distributors against all claims, costs, damages and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if SENSIRION is allegedly negligent with respect to the design or the manufacture of the product.

ESD Precautions

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation, take customary and statutory ESD precautions when handling this product. See application note "ESD, Latchup and EMC" for more information.

Warranty

SENSIRION solely warrants to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product is of the quality, material and workmanship defined in SENSIRION's published specifications of the product. Within such period, if proven to be defective, SENSIRION shall as sole and exclusive remedy, in SENSIRION's discretion, repair this product or send a replacement product, free of charge to the Buyer, provided that:

- notice in writing describing the defects shall be given to SENSIRION within fourteen (14) days after their appearance;
- such defects shall be found, to SENSIRION's reasonable satisfaction, to have arisen from SENSIRION's faulty material or workmanship;
- the defective product shall be returned to SENSIRION's factory at the Buyer's expense; and
- the warranty period for any repaired or replaced product shall be limited to the unexpired portion of the original period.

The Buyer shall at its own expense arrange for any dismantling and reassembly that is necessary to repair or replace the defective product. This warranty does not apply to any product which has not been installed or used within the specifications recommended by SENSIRION. EXCEPT FOR THE WARRANTIES EXPRESSLY SET FORTH HEREIN, SENSIRION MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE PRODUCT. ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY EXCLUDED AND DECLINED.

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SENSIRION reserves the right, without further notice, (i) to change the product specifications and/or the information in this document and (ii) to improve reliability, functions and design of this product.

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