Datasheet Filter Cap SF1
For Humidity and Temperature Sensor

- Protection against dust and particles
- Protection against water immersion
- Designed to match on SHT1x SMD type sensors
- Optimized on response time of sensor

Product Summary

The Filter Cap SF1 protects SHT1x humidity and temperature sensors against dust, water immersion and consequent condensation, as well as against contamination by particles. The cavity inside is made such that the volume between membrane and sensor is kept minimal and hence the impact on response time for humidity measurements is reduced to a minimum. The Filter Cap is available in white color.

The Filter Cap is made of a single piece of Polypropylene (PP) and a filter membrane welded to the single piece. The Filter Cap is designed to be mounted after soldering by sticking two pins into holes in the PCB and welding it from back side. Together with the sensor it provides a compact entity which may serve as an adaptor to the device housing. Adding adhesive for seal to PCB and using an O-ring it provides a waterproof mounting solution.
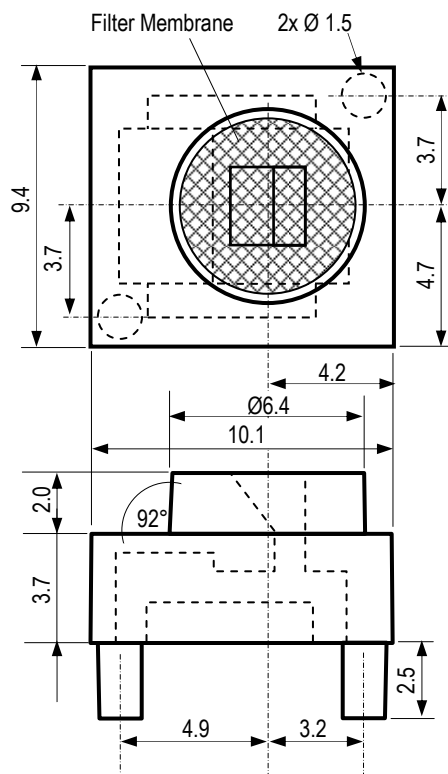
Dimensions

Figure 1: Drawing of Filter Cap SF1. Dimensions are given in mm (1mm = 0.039inch), tolerances are ±0.1mm for dimensions <6mm and ±0.2mm for dimensions >6mm. Cavity inside the cap fits perfectly to SHT1x sensors. Additional cavities for solder joints are left open at each side.

Technical Specifications

Parameter	Value
Body material	Poly Propylene (PP)
Filter material	PTFE with polyester scrim
Color	White
Operating Range	-40 … 100°C
Filter pore size	1.5µm
Filtration efficiency [1]	99.99%
Oleophobic Rating [2]	6 (Scale from 1 – 10)
Mullen Hydrostatic	70kPa, 7m water column
RoHS	Compliant

Packaging

Filter Caps SF1 are supplied in stackable plastic trays at 100 units per tray. 4 trays are packed into a bag.

Product	Packaging	Quantity	Order Number
Filter Cap SF1	Plastic Trays	100	1-100188-01

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[1] 0.1µm particles at 0.05m/s air flow.
[2] Repellence of oil and hydrocarbons according to AATCC standard. Rating 6 means n-Decane is repelled.

User's Guide Filter Cap SF1

Mounting Instruction

The Filter Cap SF1 is mounted to the PCB after soldering SHT1x sensor by sticking the two pins into two openings in the PCB. The Filter Cap may be fixed by adhesive or by melting the pins from the back side by heating them up to at least 160°C by a hot iron or equivalent – compare Figure 2.
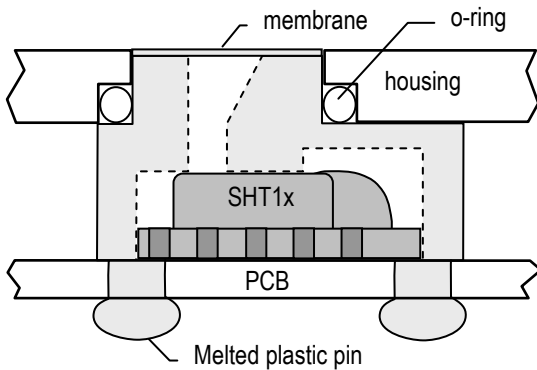

Figure 2: Side view of SF1 Filter Cap mounted between PCB and housing wall. Volume below membrane is kept minimal.

Dimension and arrangement of the openings in the PCB are given in Figure 3. Please note that openings must be wider than pins of cap to compensate for placing tolerance of sensor.
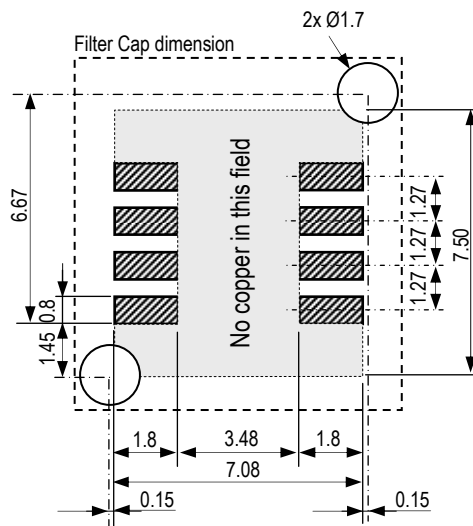

Figure 3: PCB layout of SHT1x and Filter Cap SF1. Dimensions are given in mm (1mm = 0.039 inch). Active pads are the ones on the left side – right side pads may be left floating.

Measures for higher protection

For hermetic seal, adhesive must be added between Filter Cap, sensor housing and PCB. Such seal provides higher security against water leakage, condensation inside the housing, and corrosion of the soldering pads of the sensor. Apply the adhesive on the FR4 substrate of the sensor around the black cap and on the PCB around the sensor before mounting the Filter Cap. Make sure environment is well ventilated while adhesive is curing. Adhesive must be of high viscosity to prevent it from entering the sensor protection cap.

If corrosion of the solder contacts is a potential problem then cover the solder joints well with adhesive.

Mounting against housing wall

The Filter Cap SF1 not only protects against dust, water immersion and large organic molecules, it also helps to mount the sensor to the housing wall. If mounted to a housing wall towards the outside, the sensor is perfectly exposed to the environment of which humidity and temperature shall be measured.

In order to protect the inside of the device housing against water immersion it is recommended to place an o-ring between Filter Cap and housing wall – compare Figure 2. Please make sure that the housing provides an open rim for the o-ring; however, specify it tightly to guarantee hermetic seal.

For such o-rings Sensirion recommends the following specifications:

- Inner diameter: 6mm
- Cross section: 1mm
- Material: NBR

O-rings are provided for example by Busak & Shamban – part number OR1000600.

Important: Please ensure that the air path to the measured volume is not blocked by another membrane. This may increase response time of the sensor dramatically.

Labeling of the shipment

Each shipment is labeled with product and tracking information – compare Figure 4.

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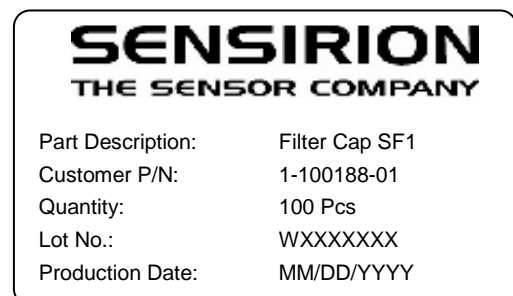| Part Description:	Filter Cap SF1
Customer P/N:	1-100188-01
Quantity:	100 Pcs
Lot No.:	WXXXXXXX
Production Date:	MM/DD/YYYY

Figure 4: Label on shipment packaging: Customer P/N refers to the Sensirion product number, Lot No. refers to suppliers tracking information. Production Date is given as MM = month, DD = day, YYYY = year.

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Revision History

Date	Version	Page(s)	Changes
September 2003	1.0	1 – 5	Initial Release
October 2006	1.1	1 – 5	Add information for seal and o-ring plus sourcing information
January 2009	2.0	1 – 3	New release, rework of datasheet (no changes made to product)

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. 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 shall purchase or use 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 shall be 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 warrants solely to the original purchaser of this product for a period of 12 months (one year) from the date of delivery that this product shall be 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 repair and/or replace this product, in SENSIRION's discretion, 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 design, 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.

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Headquarter and Sales Offices

Headquarter
SENSIRION AG
Laubisruetistr. 50
CH-8712 Staefa ZH
Switzerland

Phone: +41 44 306 40 00
Fax: +41 44 306 40 30
info@sensirion.com
http://www.sensirion.com/

Sales Office USA:
SENSIRION Inc.
2801 Townsgate Rd., Suite 240
Westlake Village, CA 91361
USA

Phone: +1 805 409 4900
Fax: +1 805 435 0467
michael.karst@sensirion.com
http://www.sensirion.com/

Sales Office Japan:
SENSIRION JAPAN Co. Ltd.
Postal Code: 108-0074
Shinagawa Station Bldg. 7F,
4-23-5, Takanawa, Minato-ku
Tokyo, Japan

Phone: +81 3 3444 4940
Fax: +81 3 3444 4939
info@sensirion.co.jp
http://www.sensirion.co.jp

Sales Office Korea:
SENSIRION KOREA Co. Ltd.
#1414, Anyang Construction Tower B/D,
1112-1, Bisan-dong, Anyang-city
Gyeonggi-Province
South Korea

Phone: +82 31 440 9925~27
Fax: +82 31 440 9927
info@sensirion.co.kr
http://www.sensirion.co.kr

Sales Office China:
Sensirion China Co. Ltd.
Room 2411, Main Tower
Jin Zhong Huan Business Building,
Futian District, Shenzhen,
Postal Code 518048
PR China

phone: +86 755 8252 1501
fax: +86 755 8252 1580
info@sensirion.com.cn
www.sensirion.com.cn

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