Your Partner for Humidity and Flow Sensor Solutions

Humidity & Temperature Sensors

SENSIRION
THE SENSOR COMPANY

Sensirion – Market leader through innovation

Sensirion's humidity and temperature sensors have established themselves as the market standard due to their best-in-class performance, high reliability and miniaturized form factor. The SHT1x was the first digital, calibrated, reflow-solderable humidity sensor (launched in 2001) and marked the beginning of a new category of humidity sensors. Sensirion's latest product innovations have set the market standard and opened up a wide range of new applications.

Sensirion's humidity and temperature as well as temperature-only products are based on Sensirion's CMOSens® Technology, which combines the strengths of standard CMOS production processes and advanced MEMS technology on a single silicon chip. The temperature sensors are based on a silicon bandgap temperature sensor principle. The humidity is sensed using a capacitor. Its dielectric is realized through a polymer, which absorbs or desorbs water depending on the ambient humidity. The electrodes are realized with an interdigitated electrode structure.

Main use drivers for SHTxx

HEALTH & COMFORT

Humidity and temperature significantly affect personal health and comfort; thus, measurement of humidity and temperature in this context can improve personal well-being. Applications include humidifiers, baby monitors and home care respiratory equipment.

ENERGY SAVING

Measurement of humidity and temperature can help optimize processes and thus save energy and costs. Applications include automotive engine control, smart condensation control for refrigerators and optimization of A/C cooling cycles.

QUALITY & RELIABILITY

Humidity and temperature influence the quality and reliability of numerous processes. Humidity and temperature can help improve quality and reliability of such processes. Applications include logistics of sensitive goods, humidity sensing in printers and water intrusion detection in critical electronic devices.

SAFETY

Humidity and temperature may influence the safety of a system, a process or a person; thus, humidity and temperature measurement can help ensure their safety. Applications include automotive windshield anti-fogging, water intrusion detection in battery packs and building supervision for insurance purposes.

Tested and proven worldwide

Our in-house sensor calibration and testing infrastructure enables effective procedures that comply with established quality standards. Each sensor is individually calibrated and tested for quality and accuracy. The high reliability of the sensors has been proven over the past 10 years by the millions of sensors in the field. Additionally, the reliability is demonstrated by a successful qualification based on the AEC-Q100 automotive standard.

Appliance

Consumer Electronics

What we offer

Expert first contact → Fast and easy product evaluation → Design-in support → Lifetime support

1. EXPERT FIRST CONTACT

- Specialized and experienced sales force
- Worldwide presence with a global distribution network

2. FAST AND EASY PRODUCT EVALUATION

- Comprehensive product portfolio
- Easy-to-use evaluation kits for effortless humidity and temperature measurement during sensor evaluation
- Technical documents – data sheets, sample codes, application notes

3. DESIGN-IN SUPPORT

- Assistance in the integration of SHTxx sensors into your application
- Proven best practices to ensure that your production concept accommodates the requirements of SHTxx sensors

4. LIFETIME SUPPORT

- Reliable and flexible production
- Sustainable product innovation roadmap to meet your future needs

Building Technology

Automotive

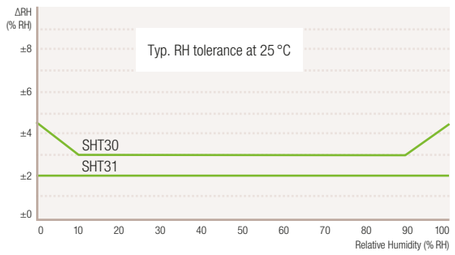
Medical

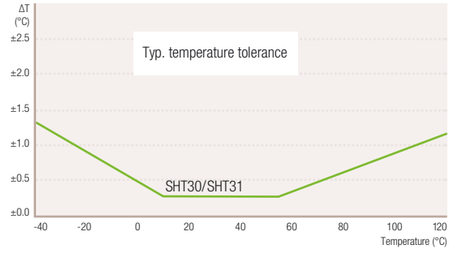
New Generation of Humidity & Temperature Sensors

SHT3X SERIES

- Wide supply voltage range
- Superior functionality
- Size: 2.5 x 2.5 x 0.9 mm

Humidity sensor	SHT30	SHT31
Typical accuracy (%RH)	± 3	± 2
Hysteresis (%RH)	± 0.8	± 0.8
Typ. Long term drift (%RH / yr)	< 0.25	< 0.25
Operating range (%RH)	0 to 100	0 to 100
Response time τ63% (s)	8	8
Temperature sensor		
Typical accuracy (°C)	± 0.3	± 0.3
Typ. Long term drift (°C / yr)	< 0.02	< 0.02
Operating range (°C)	-40 to 125	-40 to 125
Response time τ63% (s)[1]	2	2
Electrical		
Interface	I²C, Voltage Out	I²C, Voltage Out
Supply voltage range (V)	2.4 to 5.5	2.4 to 5.5
Measurement duration (high / low) (ms)[2]	13 (high) 3 (low)	13 (high) 3 (low)
Avg. Current consumption (high / low) (µA)[3]	10 (high) 2 (low)	10 (high) 2 (low)
Idle current (µA)	0.2	0.2

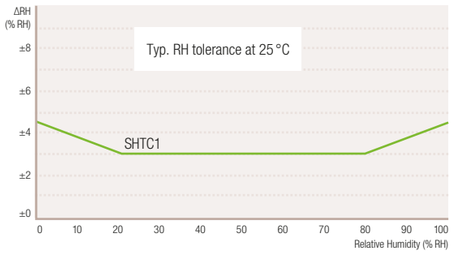


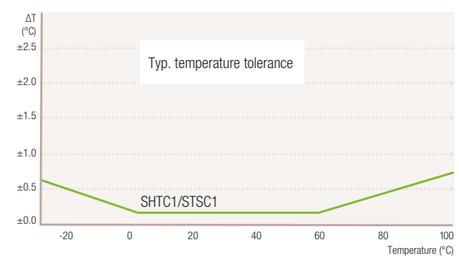


SHTC1 SERIES

- High production volume
- Low power consumption
- Size: 2 x 2 x 0.8 mm

SHTC1	STSC1
± 3	N/A
± 1	N/A
< 0.25	N/A
0 to 100	N/A
8	N/A
± 0.3	± 0.3
< 0.02	< 0.02
-30 to 100	-40 to 125
5 to 30	5 to 30
I²C	I²C
1.62 to 1.98	1.62 to 1.98
10.8 (high) 0.7 (low)	10.8 (high) 0.7 (low)
4.8 (high) 0.9 (low)	4.8 (high) 0.9 (low)
0.7	0.7



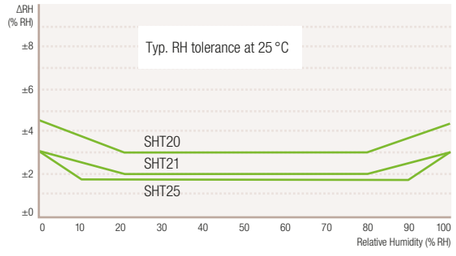


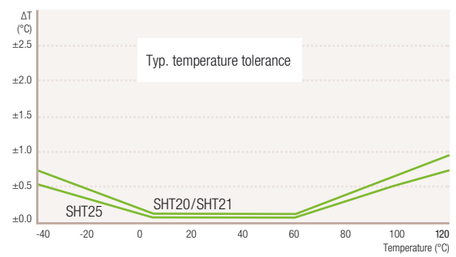
Selection of Sensirion's Humidity & Temperature Sensors

SHT2X SERIES

- Designed for mass production
- Low power consumption
- Size: 3 x 3 x 1.1 mm

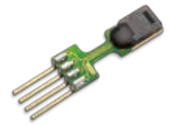
SHT20	SHT21	SHT25
± 3	± 2	± 1.8
± 1	± 1	± 1
< 0.25	< 0.25	< 0.25
0 to 100	0 to 100	0 to 100
8	8	8
± 0.3	± 0.3	± 0.2
< 0.02	< 0.02	< 0.02
-40 to 125	-40 to 125	-40 to 125
5 to 30	5 to 30	5 to 30
I²C, PWM, SDM	I²C, PWM, SDM	I²C
2.1 to 3.6	2.1 to 3.6	2.1 to 3.6
88 (high) 12 (low)	88 (high) 12 (low	88 (high) 12 (low
27 (high) 3.7 (low)	27 (high) 3.7 (low)	27 (high) 3.7 (low)
0.15	0.15	0.15





SHT1X SERIES

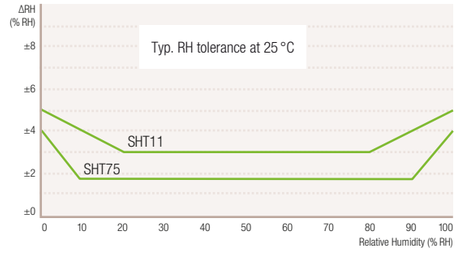
- Wide supply voltage range
- Suitable for mass production
- Size: 7.5 x 4.9 x 2.6 mm

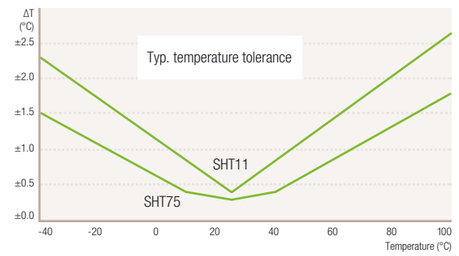


SHT7X SERIES

- Suitable for manual assembly
- Wide supply voltage range
- Size: 19.5 x 5.08 x 3.1 mm

SHT11	SHT75
± 3	± 1.8
± 1	± 1
< 0.5	< 0.5
0 to 100	0 to 100
8	8
± 0.4	± 0.3
< 0.04	< 0.04
-40 to 123.8	-40 to 123.8
5 to 30	5 to 30
S-bus	S-bus
2.4 to 5.5	2.4 to 5.5
400 (high) 100 (low)	400 (high) 100 (low)
220 (high) 55 (low)	220 (high) 55 (low)
0.6	0.6





Please note that above values are of indicatory value only. For detailed information please consult the respective datasheets.

[1] Temperature response times very much depend on thermal conductivity of substrate material of the sensor.

[2] Combined RH & T measurement. Different measurement modes possible (differing either in resolution or repeatability).
"High" indicates a measurement with the highest precision/power mode (highest resolution, best repeatability), "low" indicates a measurement with the lowest precision/power mode (lowest resolution, least repeatability).

[3] Values for one RH & T measurement per second at VDD = 1.8V (for SHTC1/STSC1) or VDD = 3V different measurement modes possible (differing either in resolution or repeatability).

150115-E-HT

Sensing. Anytime. Anywhere.

SWITZERLAND
Sensirion AG
Laubisruetistrasse 50
8712 Staefa
Switzerland
Phone +41 44 306 40 00
Fax +41 44 306 40 30
info@sensirion.com
www.sensirion.com

USA
Sensirion Inc.
2801 Townsgate Road, Suite 204
Westlake Village, CA 91361
United States
Phone +1 805 409 4900
Fax +1 805 435 0467
info_us@sensirion.com
www.sensirion.com

CHINA
Sensirion China Co. Ltd.
14A Times Fortune Building, Southeast CBD
Futian District, Shenzhen 518026
P. R. China
Phone +86 755 8252 1501
Fax +86 755 8252 1580
info@sensirion.com.cn
www.sensirion.com.cn

JAPAN
Sensirion Japan Co. Ltd.
Takanawa Kaneo Bldg. 4F
3-25-22, Takanawa, Minato-ku, Tokyo
108-0074 Japan
Phone +81 3 3444 4940
Fax +81 3 3444 4939
info-jp@sensirion.com
www.sensirion.co.jp

KOREA
Sensirion Korea Co. Ltd.
431-810, Keumkang Penterium Bldg. A
#1809-13, Gwanyang-Dong 810,
Dongan-Gu, Anyang-Si, Gyeonggi-Do,
South Korea
Phone +82 31 337 7700~3
Fax +82 31 337 7704
info-kr@sensirion.com
www.sensirion.co.kr

TAIWAN
Sensirion Taiwan Co. Ltd.
5F, No 6-1, Dusing Road
Hsinchu Science Park
Hsinchu City Taiwan 30078, ROC
info@sensirion.com
www.sensirion.com

SENSIRION
THE SENSOR COMPANY