



Humidity Sensors

Experts for Smart Sensor Solutions

SENSIRION
THE SENSOR COMPANY

Sensirion – Market leader through innovation

Sensirion's humidity and temperature sensors are established as the market standard due to their best-in-class performance, high reliability and technology leadership. 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 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 capacitive element is designed as interdigitated electrodes.

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. Measuring 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 our sensors has been proven by several hundreds of million sensors in the field over more than ten years. Additionally, the reliability is demonstrated by qualification based on the AEC-Q100 automotive standard.

What we offer



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 – datasheets, 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

Wearables

Building Technology

Automotive

Medical

Smart Home

Appliances

IoT

Consumer Electronics



Humidity Sensors



SHTW2

- RH&T sensor in chip-scale package
- Ultra-small package size
- Size: 1.3x0.7x0.5 mm³



SHTC1

- High production volume
- Low power consumption
- Size: 2x2x0.75 mm³

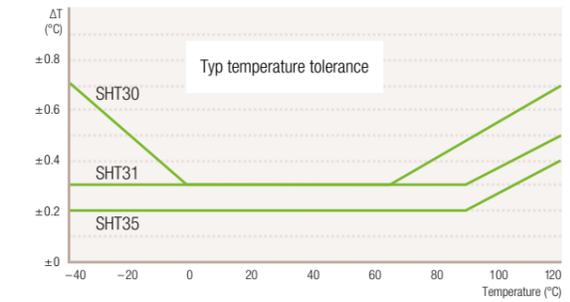
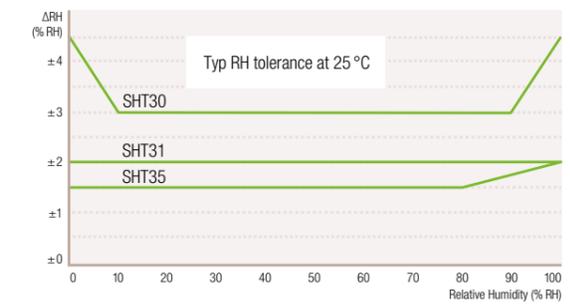
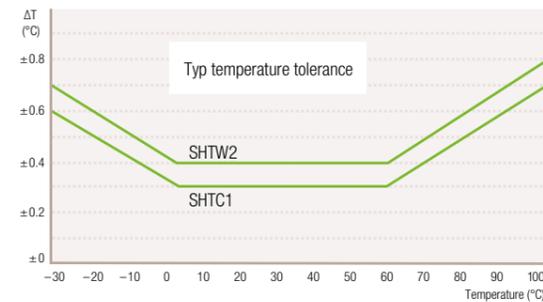
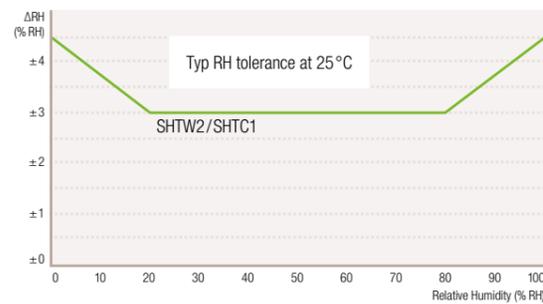


SHT3x SERIES

- Wide supply voltage range
- Superior functionality
- Size: 2.5x2.5x0.9 mm³

Humidity sensor	SHTW2	SHTC1
Typical accuracy (% RH)	± 3	± 3
Hysteresis (% RH)	± 1	± 1
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)	± 0.4	± 0.3
Typ long term drift (°C / yr)	< 0.02	< 0.02
Operating range (°C)	-30 to 100	-30 to 100
Response time τ63% (s)¹	5 to 30	5 to 30
Electrical		
Interface	I ² C	I ² C
Supply voltage range (V)	1.62 to 1.98	1.62 to 1.98
Measurement duration² (ms) (high / low)	10.8 (high) 0.7 (low)	10.8 (high) 0.7 (low)
Avg current consumption³ (μA) (high / low)	4.8 (high) 0.9 (low)	4.8 (high) 0.9 (low)
Idle current (μA)	0.7	0.7

SHT30	SHT31	SHT35
± 3	± 2	± 1.5
± 0.8	± 0.8	± 0.8
< 0.25	< 0.25	< 0.25
0 to 100	0 to 100	0 to 100
8	8	8
Temperature sensor		
± 0.3	± 0.3	± 0.2
< 0.03	< 0.03	< 0.03
-40 to 125	-40 to 125	-40 to 125
> 2	> 2	> 2
Electrical		
I ² C, Voltage Out	I ² C, Voltage Out	I ² C, Voltage Out
2.4 to 5.5	2.4 to 5.5	2.4 to 5.5
13 (high)	13 (high)	13 (high)
3 (low)	3 (low)	3 (low)
10 (high)	10 (high)	10 (high)
2 (low)	2 (low)	2 (low)
0.2	0.2	0.2



Please note that above values are of indicative nature only. For detailed information please consult the respective datasheet.

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 = 1.8 V (for SHTC1/SHTW2) or VDD = 3 V; different measurement modes possible (differing either in resolution or repeatability).

Humidity Sensors



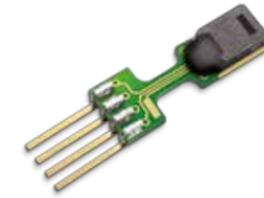
SHT2x SERIES

- Designed for mass production
- Low power consumption
- Size: 3x3x1.1 mm³



SHT1x SERIES

- Wide supply voltage range
- Suitable for mass production
- Size: 7.5x4.9x2.6 mm³



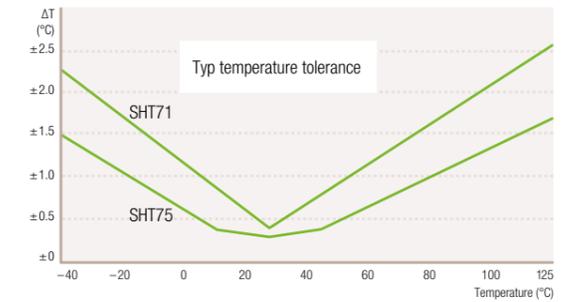
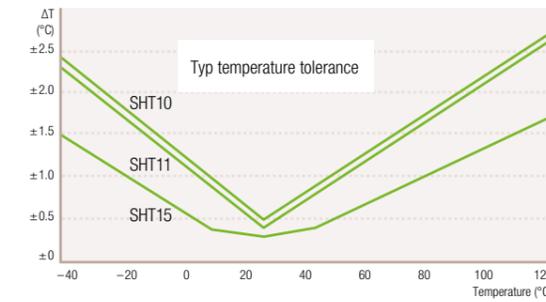
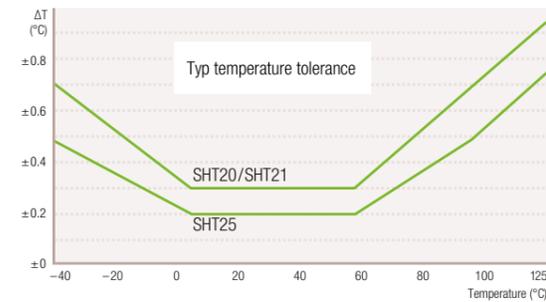
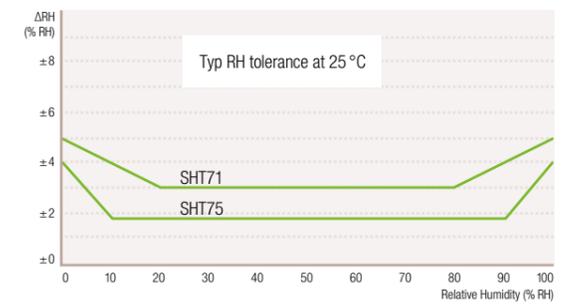
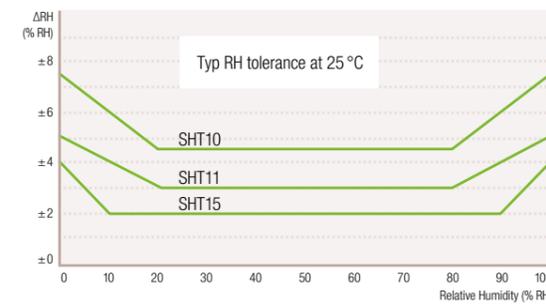
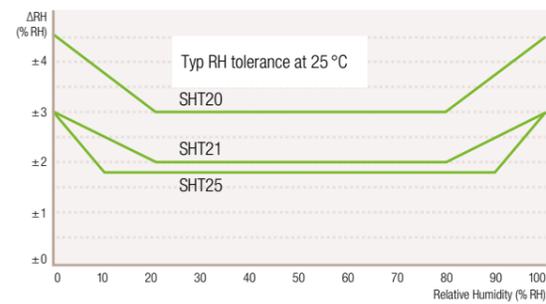
SHT7x SERIES

- Suitable for manual assembly
- Wide supply voltage range
- Size: 19.5x5.08x3.1 mm³

Humidity sensor	SHT20	SHT21	SHT25
Typical accuracy (% RH)	± 3	± 2	± 1.8
Hysteresis (% RH)	± 1	± 1	± 1
Typ long term drift (% RH / yr)	< 0.25	< 0.25	< 0.25
Operating range (% RH)	0 to 100	0 to 100	0 to 100
Response time τ63% (s)	8	8	8
Temperature sensor			
Typical accuracy (°C)	± 0.3	± 0.3	± 0.2
Typ long term drift (°C / yr)	< 0.02	< 0.02	< 0.02
Operating range (°C)	-40 to 125	-40 to 125	-40 to 125
Response time τ63% (s)¹	5 to 30	5 to 30	5 to 30
Electrical			
Interface	I ² C, PWM, SDM	I ² C, PWM, SDM	I ² C
Supply voltage range (V)	2.1 to 3.6	2.1 to 3.6	2.1 to 3.6
Measurement duration² (ms)	88 (high)	88 (high)	88 (high)
(high / low)	12 (low)	12 (low)	12 (low)
Avg current consumption³ (μA)	27 (high)	27 (high)	27 (high)
(high / low)	3.7 (low)	3.7 (low)	3.7 (low)
Idle current (μA)	0.15	0.15	0.15

SHT10	SHT11	SHT15
± 4.5	± 3	± 2
± 1	± 1	± 1
< 0.5	< 0.5	< 0.5
0 to 100	0 to 100	0 to 100
8	8	8
Temperature sensor		
± 0.5	± 0.4	± 0.3
< 0.04	< 0.04	< 0.04
-40 to 123.8	-40 to 123.8	-40 to 123.8
5 to 30	5 to 30	5 to 30
Electrical		
SBus	SBus	SBus
2.4 to 5.5	2.4 to 5.5	2.4 to 5.5
400 (high)	400 (high)	400 (high)
100 (low)	100 (low)	100 (low)
220 (high)	220 (high)	220 (high)
55 (low)	55 (low)	55 (low)
0.6	0.6	0.6

SHT71	SHT75
± 3	± 1.8
± 1	± 1
< 0.5	< 0.5
0 to 100	0 to 100
8	8
Temperature sensor	
± 0.4	± 0.3
< 0.04	< 0.04
-40 to 123.8	-40 to 123.8
5 to 30	5 to 30
Electrical	
SBus	SBus
2.4 to 5.5	2.4 to 5.5
400 (high)	400 (high)
100 (low)	100 (low)
220 (high)	220 (high)
55 (low)	55 (low)
0.6	0.6



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Sensing. Anytime. Anywhere.

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