



# HYGROCHIP

## DIGITAL HUMIDITY SENSOR HYT-271



### Characteristic Features

- ▶ **Measuring range 0 ... 100% rH, -40 ... 125°C**
- ▶ **Low drift**
- ▶ **Stable at high humidity**
- ▶ **I<sup>2</sup>C protocol for humidity and temperature**  
(address 0x28 or alternative address)
- ▶ **Accuracy ±1.8% rH, ±0.2°C**
- ▶ **Temperature compensated**

The module is precisely calibrated by the manufacturer and is therefore fully interchangeable without adjustment. Both the linearity error as well as temperature drift are corrected "OnChip" through computation resulting in an outstanding accuracy over a wide range of applications. The high chemical resistance, dew formation resistant design and an excellent long-term stability speaks for itself.

### Typical Areas of Application

- ▶ **Handheld measurement instruments**
- ▶ **Humidity transmitters**
- ▶ **Industrial applications**
- ▶ **Measuring Technology**
- ▶ **HVAC**

Further variants and the full spectrum of the HYGROCHIP product series can be found at: <http://www.hydrochip.com>

### Features

#### **HYT 271 – the powerful all-round talent of the HYGROCHIP product series**

Mechanically robust, chemical resistant and dew formation resistant, the digital humidity sensor with only 10.2 x 5.1 x 1.8mm size offers the widest application window and an optimal price performance ratio. Precisely calibrated, the HYT 271 delivers an accuracy of ±1.8% rH and ±0.2°C - ideal for sophisticated mass applications, industrial handheld devices and precise humidity transmitters. Like all representatives of the HYGROCHIP family, the sensor combines the advantages of a precise, capacitive polymer humidity sensor with the high integration density and functionality of an ASIC. The signal processing integrated in the sensor completely processes the measured data and directly delivers the physical parameters of relative humidity and temperature over the I<sup>2</sup>C compatible interface as digital values.



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# HYGROCHIP

## DIGITAL HUMIDITY SENSOR HYT-271

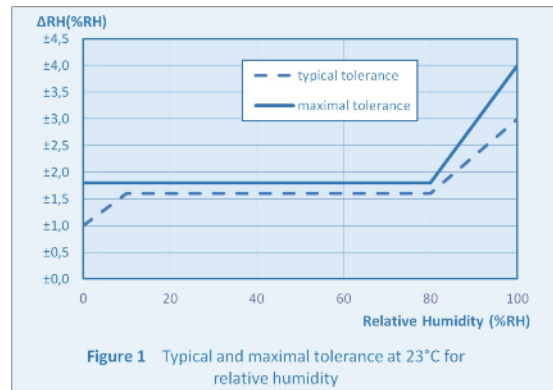
### Technical Data

Humidity Measurement	
Humidity measuring range <sup>(1)</sup>	0 ... 100% rH see Figure 3
Humidity accuracy <sup>(2)</sup> (Maximum tolerance)	±1.8% rH (0 ... 80% rH) see Figure 1
Accuracy humidity 0 ... 10% RH (0 ... 50 ° C) (Typical tolerance)	±(1% rH + 8% a <sub>w</sub> ) a <sub>w</sub> = rH / 100%
Reproducibility <sup>(3)</sup>	±0.2% rH
Hysteresis	< ±1% rH
Humidity resolution	0.03% rH
Linearity error	< ±1% rH
Response time t <sub>63</sub>	< 4 sec
Tk Residual error	0.05% rH / K (0 ... 60°C)
Long term drift	< 0.5% rH / a
Measuring principle	Capacitive polymer humidity sensor

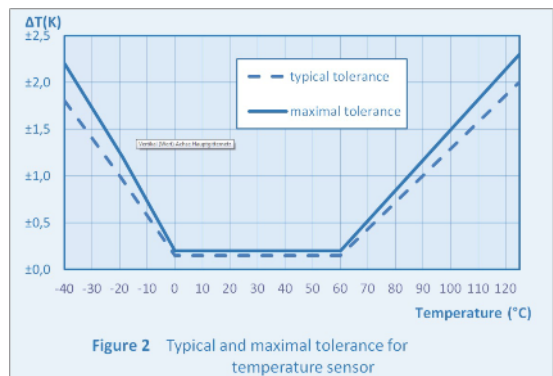
Temperature Measurement	
Temperature measuring range	- 40 ... +125°C
Temperature accuracy	±0.2K (0 ... 60°C) see Figure 2
Reproducibility	±0.1K
Temperature resolution	0.015°C
Response time t <sub>63</sub>	< 5 sec
Long term drift	< 0.05K / a
Measuring principle	PTAT (integrated)

- (1) The maximum dew point is limited to 80°C.
- (2) The accuracy is tested at 23°C and 3.3V operating voltage in the direction of rising humidity. The accuracy does not include Tk-Residual error, residual linearity error or hysteresis effect.
- (3) The repeatability is measured in the same direction and does not consider the hysteresis effect.

### Relative Humidity Accuracy



### Temperature Measurement Accuracy



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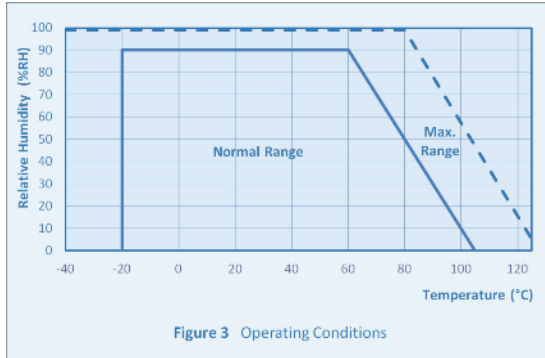


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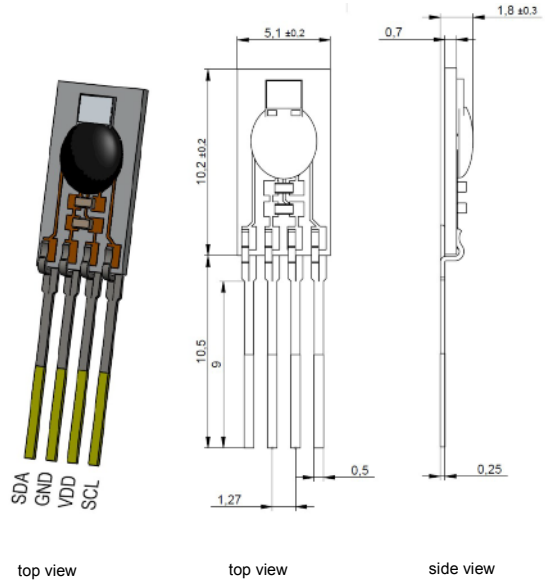
## DIGITAL HUMIDITY SENSOR HYT-271



### Humidity Application Range



### Mechanical Dimensions



Operating Data	
Operating voltage	2.7 ... 5.5V
Current consumption (Nominal)	< 22µA at 1Hz measuring rate 850µA maximum
Current consumption (Sleep)	< 1µA
Application temperature	-40°C ... 125°C
Humidity application range	0 ... 100% rH
Digital Interface	I <sup>2</sup> C, address 0x28 or alternative address

Limits	
Operating voltage	-0.3 ... 6.0V
Storage temperature	-20°C ... 80°C



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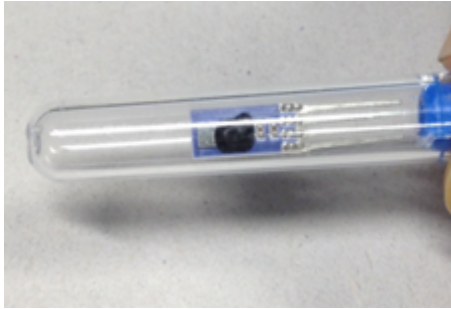
## DIGITAL HUMIDITY SENSOR HYT-271

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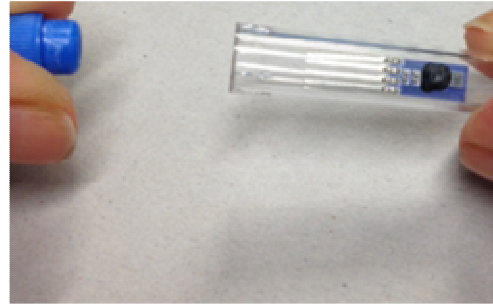
### Packaging

The digital humidity sensor HYT 271 is packaged in a plastic tube. Be careful when opening the plastic tube to avoid damaging the sensor.

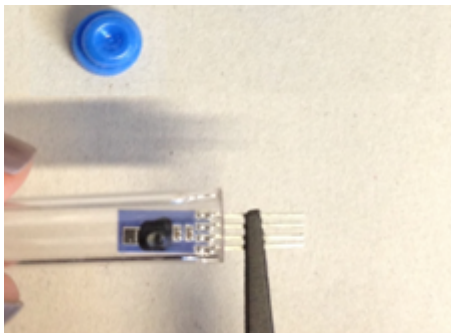
To avoid damages handle as follows:



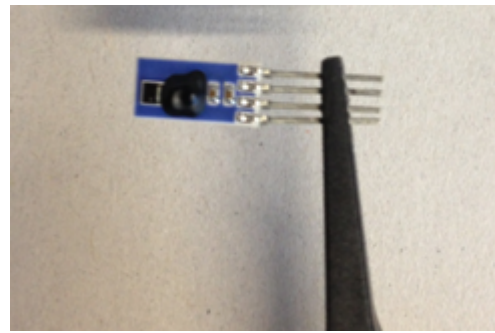
1. Digital humidity sensor delivered in plastic tube



2. Open the plastic tube carefully



3. Take the sensor from the tube with plastic tweezers



4. Use plastic tweezers only to handle the sensor

**Assembly in ESD protected environment only!**

### Storage Temperature

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The digital humidity sensor HYT 271 has to be stored in the original plastic tube only.

Storage temperature (limited by the plastic tube)

-20°C...+80°C

### Active Sensor Area

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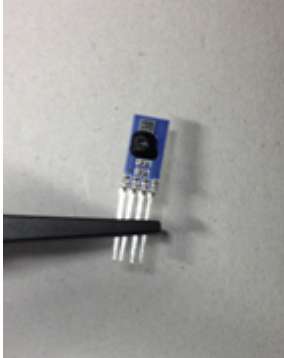
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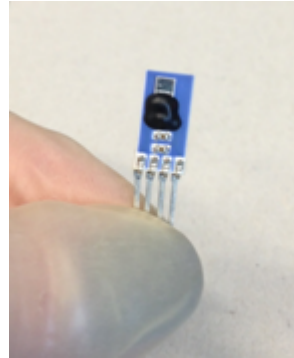
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### Sensor Handling

Hold the sensor with plastic tweezers or with gloves on the wires only

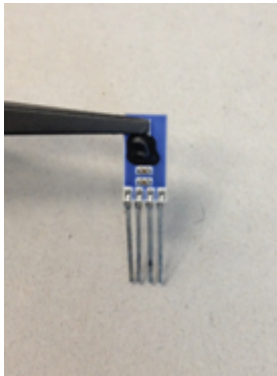


Sensor held with plastic tweezers on the wires only

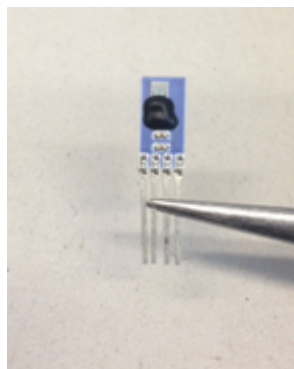


Sensor held with gloves on the wires only

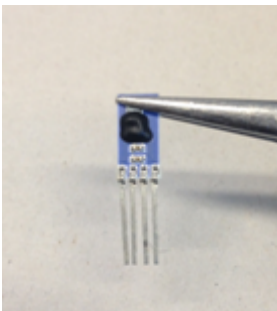
### Examples of prohibited handling



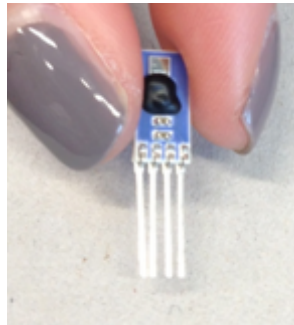
Sensor picked on the active area



Sensor picked on the wires with metal tweezers



Sensor picked on the active area with metal tweezers



Sensor held with fingers without gloves

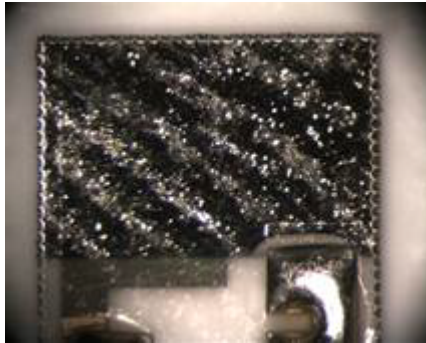


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## DIGITAL HUMIDITY SENSOR HYT-271



Active sensor area with contaminations



Active sensor area with a scratch

- Avoid mechanical stress to the sensor, e.g. bending or touching the sensor with sharp objects
- Hold the sensor with plastic tweezers on the wires and side edges only
- Do not touch or scratch the active area of the sensor. Scratches and contaminations degrade the sensor characteristic

### Soldering of the Sensor

- The 320°C maximum temperature of the soldering iron may not be exceeded. Maximum heat applied to the iron or solder wave cannot exceed 10 seconds and only at the very end of the connecting wires
- Avoid soldering flux residues caused by the soldering process or any other contaminations inside the active area of the sensor
- Soldering flux residues on the outside of the active sensor area are not critical
- If the sensor is mounted with glue, baking the sensor at 80 °C for 1 hour after the gluing process is recommended

### Cleaning of the Sensor

- Residues can be removed with isopropanol at room temperature. Applying low ultrasonic energy could improve the cleaning process. The sensor must be dried after the cleaning process
- The sensor cannot be cleaned mechanically with cotton swabs
- It is possible to clean the sensor with oil free and filtered clean air, e.g. to remove dust particles



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