HUMIDITY

TEMPERATURE

FLOW

CONDUCTIVITY

P14-SMD

Capacitive Humidity Sensor

For various humidity applications

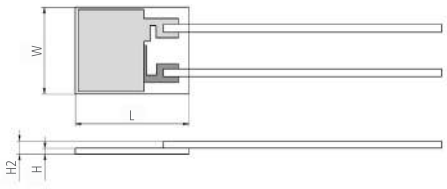
INNOVATIVE SENSOR TECHNOLOGY

Benefits & Characteristics

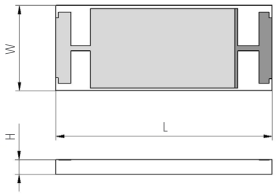
- High chemical resistance
- Wide temperature range
- Resistance to condensation
- Fast recovery time
- Very low drift
- High humidity stability
- Customer specific sensor available upon request

Illustration[1)]

Wired



SMD



1) For actual size, see dimensions

Technical Data

	Wired	SMD
Dimensions (L x W x H / H2 in mm):	5 x 3.81 x 0.4 / 0.8	6.35 x 2.54 x 0.4
Capacitance at 30 % RH and +23 °C (C_{30}):*	150 pF ±50 pF	180 pF ±50 pF
Sensitivity at C_{30} = 150 pF/ 180 pF (15 % RH to 90 % RH):	0.25 pF/% RH	0.3 pF/% RH

Operating humidity range:	0 % RH to 100 % RH (maximal dew point +85 °C)	
Operating temperature range:	-50 °C to +150 °C	
Loss factor:	< 0.01 (at +23 °C, at 10 kHz, at 90 % RH)	
Linearity error:	< 1.5 % RH (15 % RH to 90 % RH at +23 °C after one point calibration)	
Hysteresis:	< 1.5 % RH	
Response time t_{63}:	< 5 s (50 % RH to 0 % RH at +23 °C)	
Temperature dependence (nominal):	Δ % RH = (B1 x % RH + B2) x T [°C] + (B3 x % RH + B4)	
	B1 = 0.0014 [1/ °C]	B2 = 0.1325 [% RH/ °C]
	B3 = -0.0317	B4 = -3.0876 [% RH]
Measurement frequency:	1 kHz to 100 kHz (recommended 10 kHz)	
Maximal supply voltage:	< 12 V_{pp} AC	
Signal form:	alternating signal without DC bias	
Connections:*	CuP-SIL-wire post-plated with Sn, 10 mm or Au/Cu-wire, Ø 0.4 mm, 10 mm, or SMD, automatic assembly compatible	

* Customer specific alternatives available

The calibration of the sensor must be done 5 days after soldering at the earliest.

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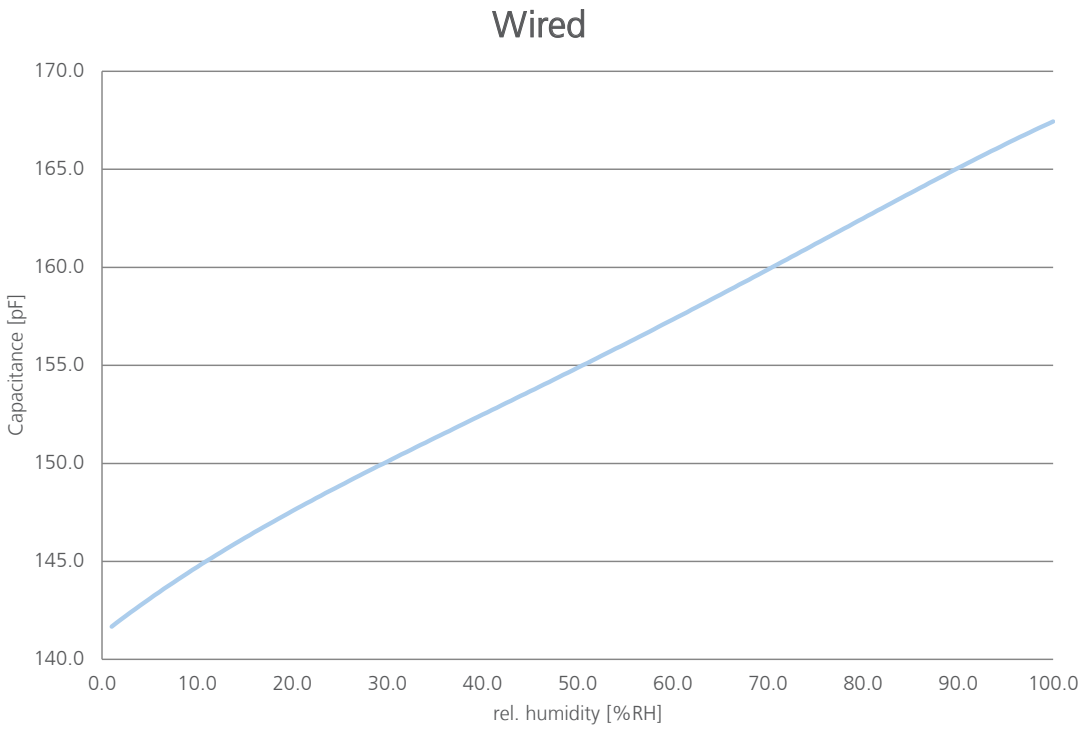
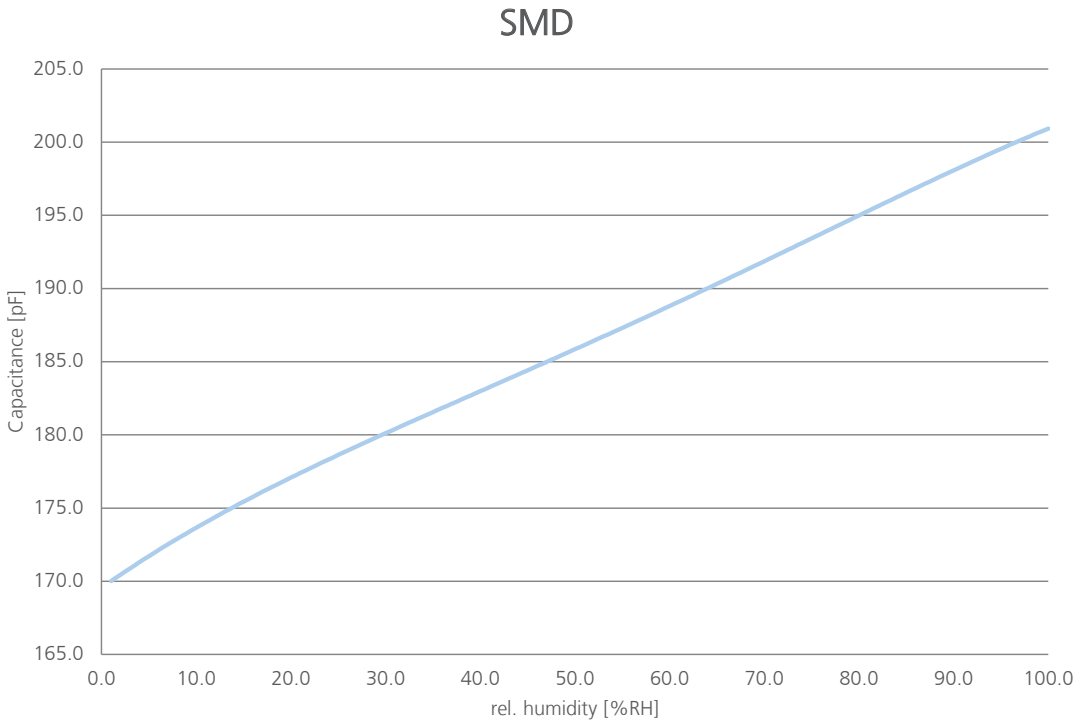
Characteristic Curve





P14-W
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INNOVATIVE SENSOR TECHNOLOGY

Order Information - SIL (CuP-SIL-wire post-plated with Sn, 10 mm)

	P14 (150pF ±50pF)
Order code	040.00191

Order Information - SMD

	P14 SMD-G (180pF ±50pF)
Order code	040.00109

Order Information - Au/Cu-wire, Ø 0.4 mm, 10 mm

	P14-W (150pF ±50pF)
Order code	040.00174

Order Information - Cu/Ag-wire, 18 mm, AWG26, PTFE, insulated 8 mm

	P14.S-W (150pF ±50pF)
Order code	040.00184

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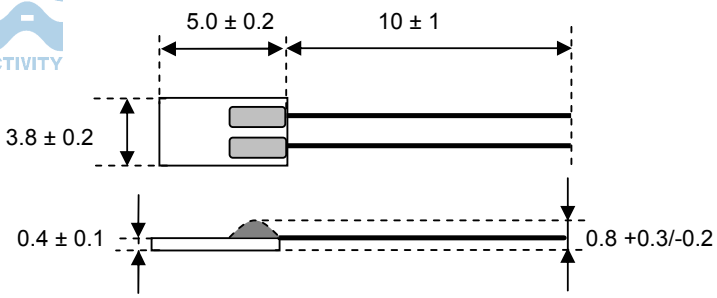
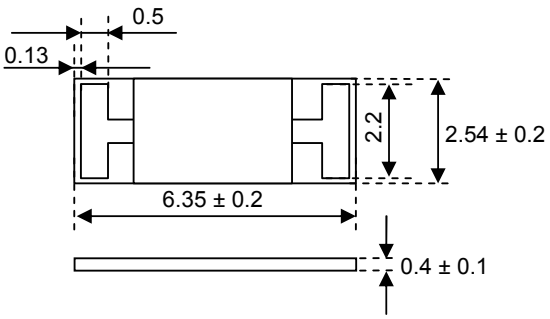
Construction Sizes

Wired (in mm)

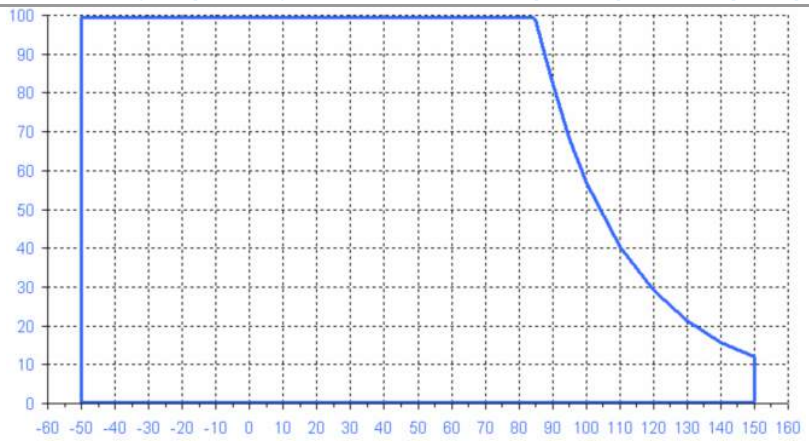


SMD (in mm)



Allowed Humidity-Temperature Range, operating conditions at atmospheric pressure (1 bar)

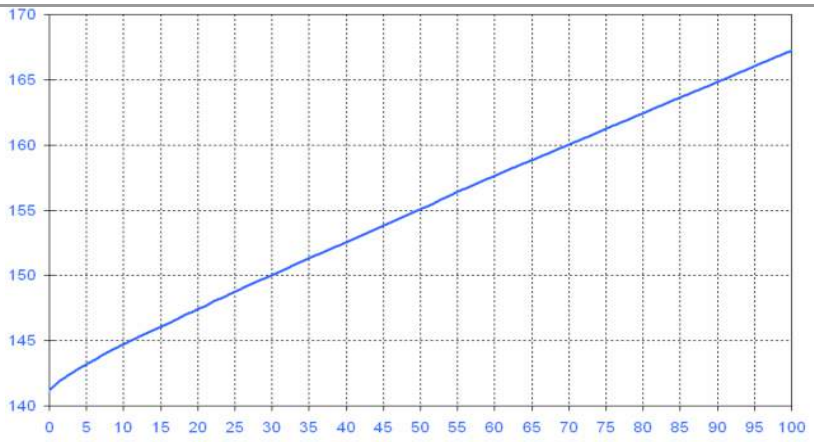
Relative Humidity [%]



Temperature [°C]

Sensor Characteristic

Capacitance [pF]



Relative Humidity [%]

ISO 9001

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email info@ist-ag.com, www.ist-ag.com

P14-SMD
Capacitive Humidity Sensor
Handling guideline

Packaging

Type:	Delivery packaging:
P14 SMD	Tray (448 pieces)
P14 Femtocap	Tray (400 pieces)

The sensors in the trays are covered with a dummy tray. Therefore, please consider careful handling while opening the trays. The active sensor area is faced down.

Storage

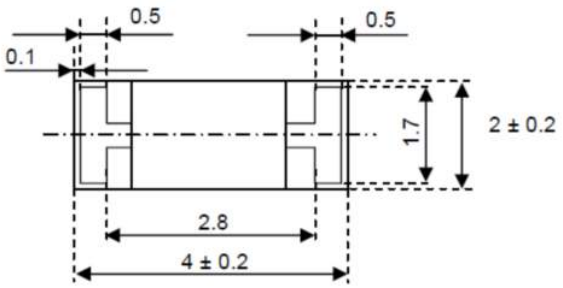
Storage temperature	-20°C...+50°C (-4...122°F)

The sensors must be stored in the original trays only.

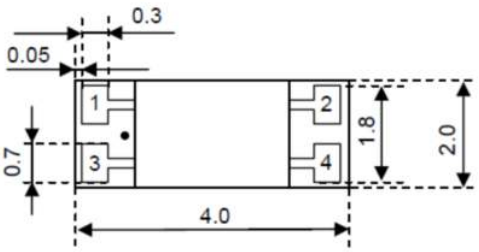
Layout geometry

The following information is all in mm.

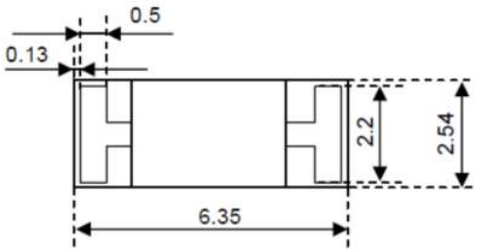
P14 Femtocap



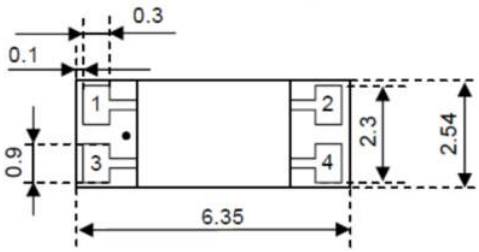
P14 Femto Thermo



P14 SMD



P14 SMD Thermo



Please consider position and size of the SMD soldering pads on the PCB to be similar to the rectangular part outside of the connecting pads on the chip.

P14-SMD
Capacitive Humidity Sensor
Handling guideline

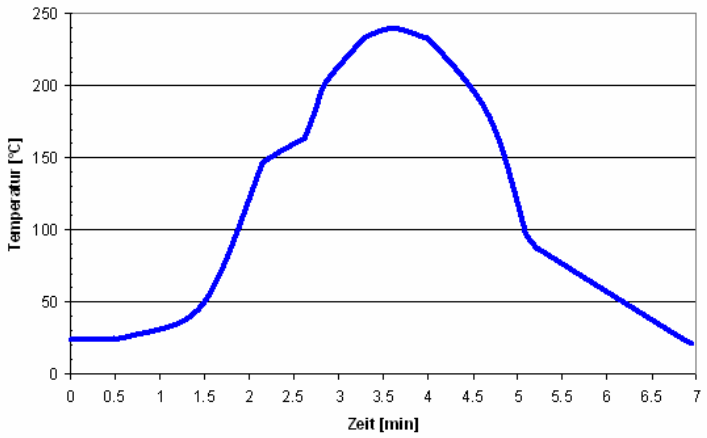
Sensor handling

- The sensitive area must not be touched, damaged or scratched. While soldering, no flux or solder must touch the sensitive area.
- The sensor must not be exposed to mechanical stress, e.g. bending or touching with sharp-edged objects.
- The transport of the sensor is only possible using a suction tool at its backside, at the contact pads or its outer run.

Soldering profile

- The soldering profile depends on the applied soldering paste and the reflow oven. The profiles are to be requested from the solder paste manufacturer.
- Unless otherwise identified in the documents of the manufacturer, it is generally to be considered to not exceed 1 to 2 minutes with a maximum allowed temperature of **240°C**.
- The calibration of the sensors has to been done **5 days after soldering at earliest**. This time is needed to provide a relaxation after the heat induces during the soldering process.
- Recommended solder paste: SAC305 (96.5Sn / 3.0Ag / 0.5Cu)
  Supplier: Indium Corporation

Typical reflow-temperature soldering-profile (lead free):



Soldering by hand

- Up to **320°C** briefly (< 10 s) and only in the soldering pads area.

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Handling guideline

Cleaning of the sensor

- The sensor can be cleaned in isopropanol at 23°C only. Followed by drying.
- The sensor cannot be cleaned mechanically with cotton swabs for instance.
- It is possible to clean the sensor with oil free and filtered clean air, e.g. to remove dust particles.

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