

## HCH-1000 Series

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### Capacitive Humidity Sensor



#### DESCRIPTION

The HCH-1000 series humidity sensor is a capacitive polymer sensor designed for relative humidity measurement. The sensor converts humidity value into capacitance, which can be measured electronically.

Polyimide is used as a humidity sensing material because of its inherent IC (Integrated Circuit) processing compatibility, reduced temperature dependence and enhanced resistance against contamination. The HCH-1000-Series is manufactured using semiconductor technology.

#### FEATURES

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- Polymer sensing offers enhanced resistance against contamination
- Reduced temperature dependence
- Semiconductor fabrication technology
- Uses glass wafer as substrate
- Enhanced sensitivity and accuracy, fast response
- Low hysteresis and long-term stability

The sensor consists of a grid top electrode, a polyimide layer, and a bottom electrode. The grid top electrode on the bottom electrode provides enhanced sensitivity when compared to that of a standard structure.

A cased version, for dust protection, and an uncased version are available.

#### POTENTIAL APPLICATIONS

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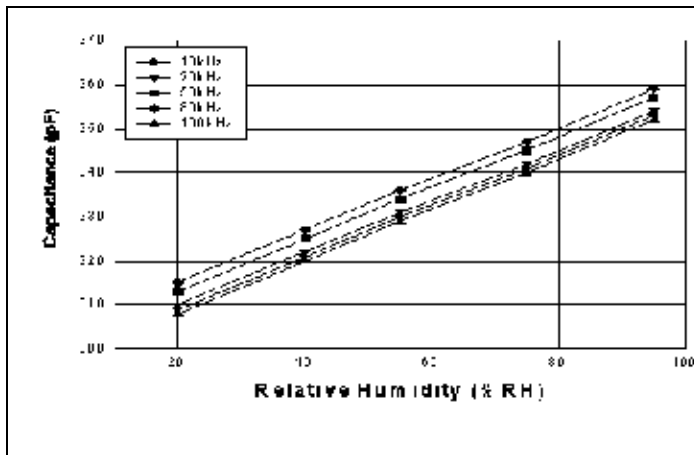
- Hygrometers, consumer goods
- Humidifiers and dehumidifiers
- Medical
- Automotive
- HVAC systems
- Weather stations

# HCH-1000 Series

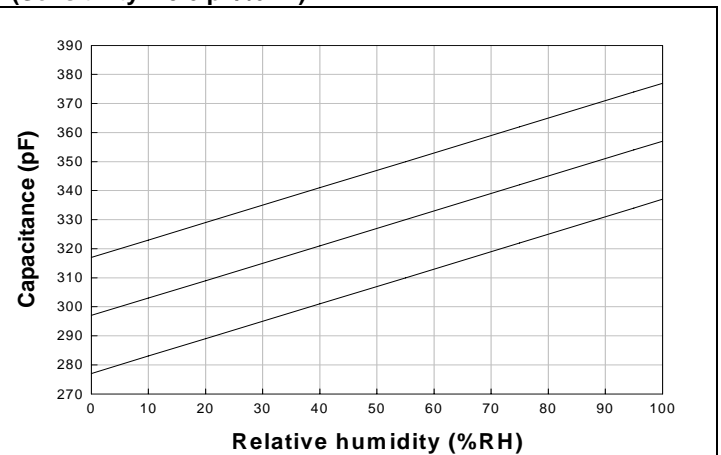
**SPECIFICATIONS** ( $T_A = 25\text{ }^\circ\text{C}$  [77 °F], Input Voltage = 1  $V_{RMS}$ , Frequency = 20 kHz)

Characteristic	Min.	Typ.	Max.	Unit	Note
Normal capacitance	310	330	350	pF	at 55% RH
Sensitivity	0.55	0.60	0.65	pF/%RH	10% RH to 95% RH
Humidity hysteresis	–	$\pm 2$	–	%RH	–
Linearity	–	$\pm 2$	–	%RH	–
Response time	–	15	–	sec	30% RH to 90% RH
Temperature coefficient	0.15	0.16	0.17	pF/°C	5 °C to 70 °C [41 °F to 158 °F]
Long-term stability (drift)	–	0.2	–	%RH/year	–
Operating temperature range	-40 [-40]	–	120 [248]	°C [°F]	–
Operating humidity range	0%	–	100%	RH	–
Operating frequency range	1	–	100	kHz	–

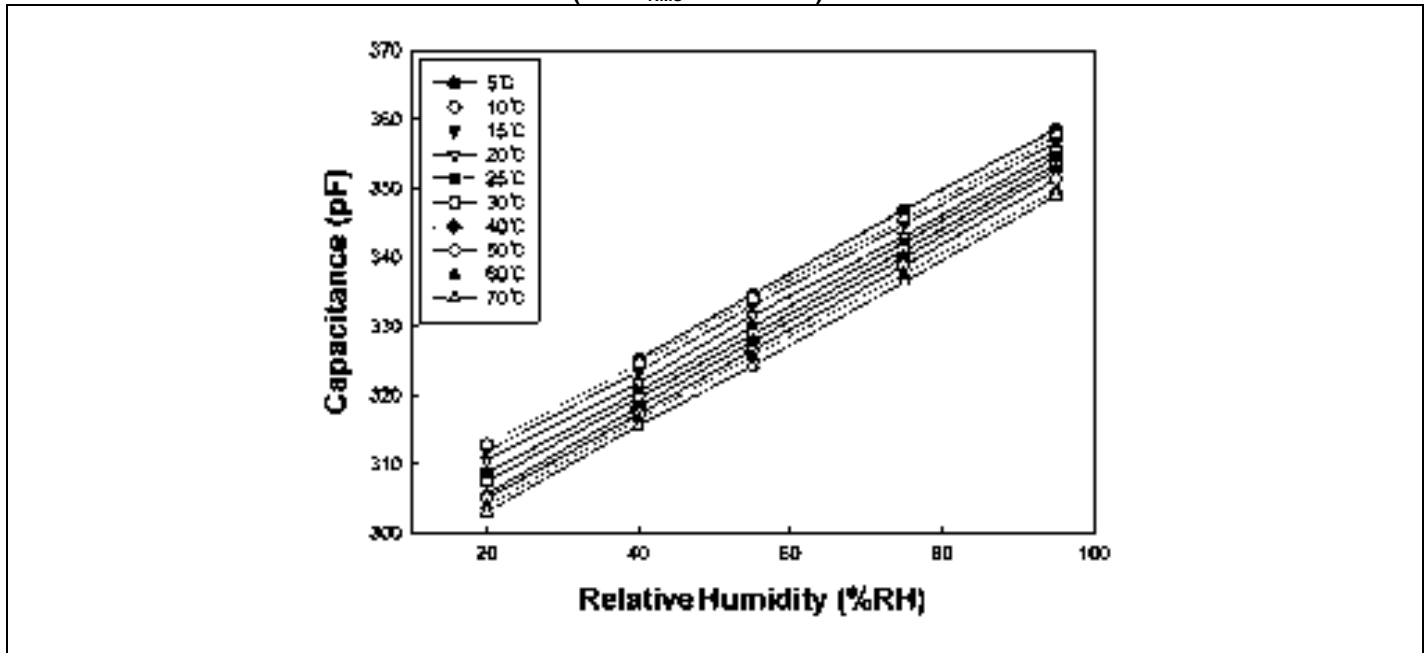
**FIGURE 1: FREQUENCY CHARACTERISTICS**



**FIGURE 2: TYPICAL HUMIDITY RESPONSE**  
(Sensitivity = 0.6 pF/%RH)

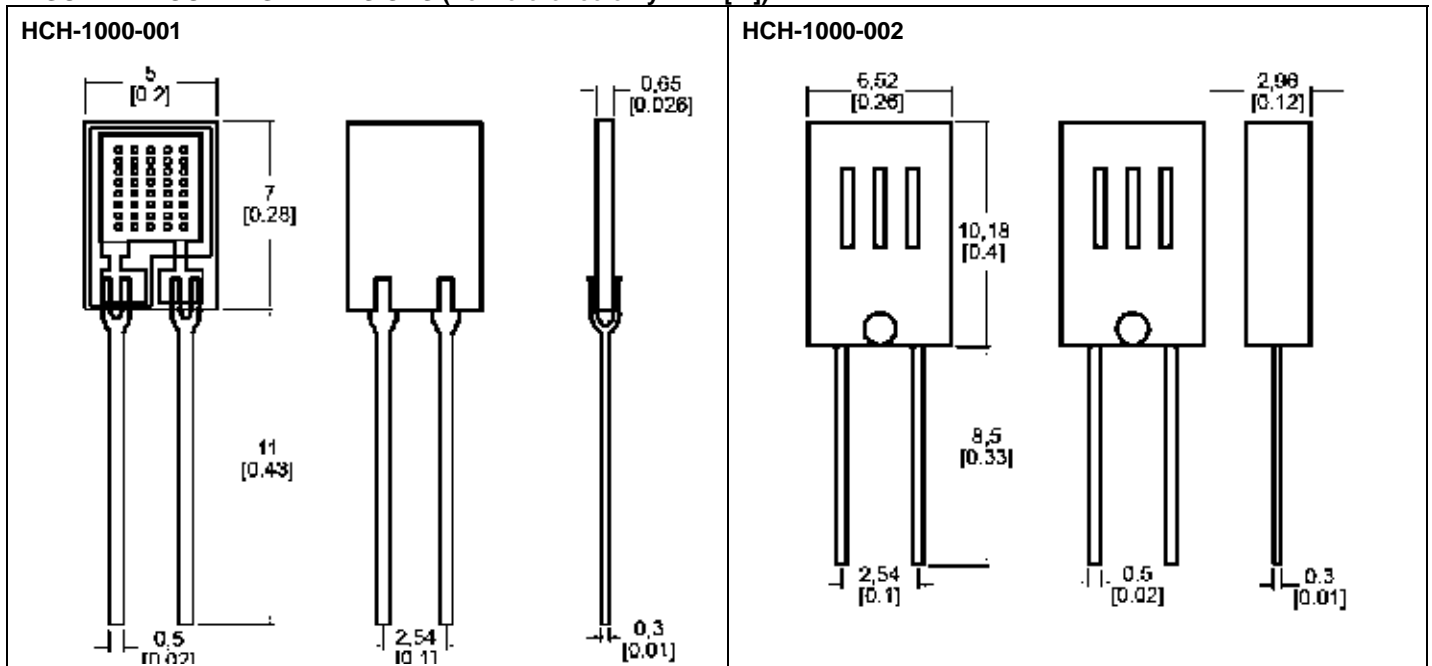


**FIGURE 3: TEMPERATURE CHARACTERISTICS** (At 1  $V_{RMS}$  and 20 kHz)



# Capacitive Humidity Sensors

FIGURE 4: MOUNTING DIMENSIONS (For reference only: mm [in])



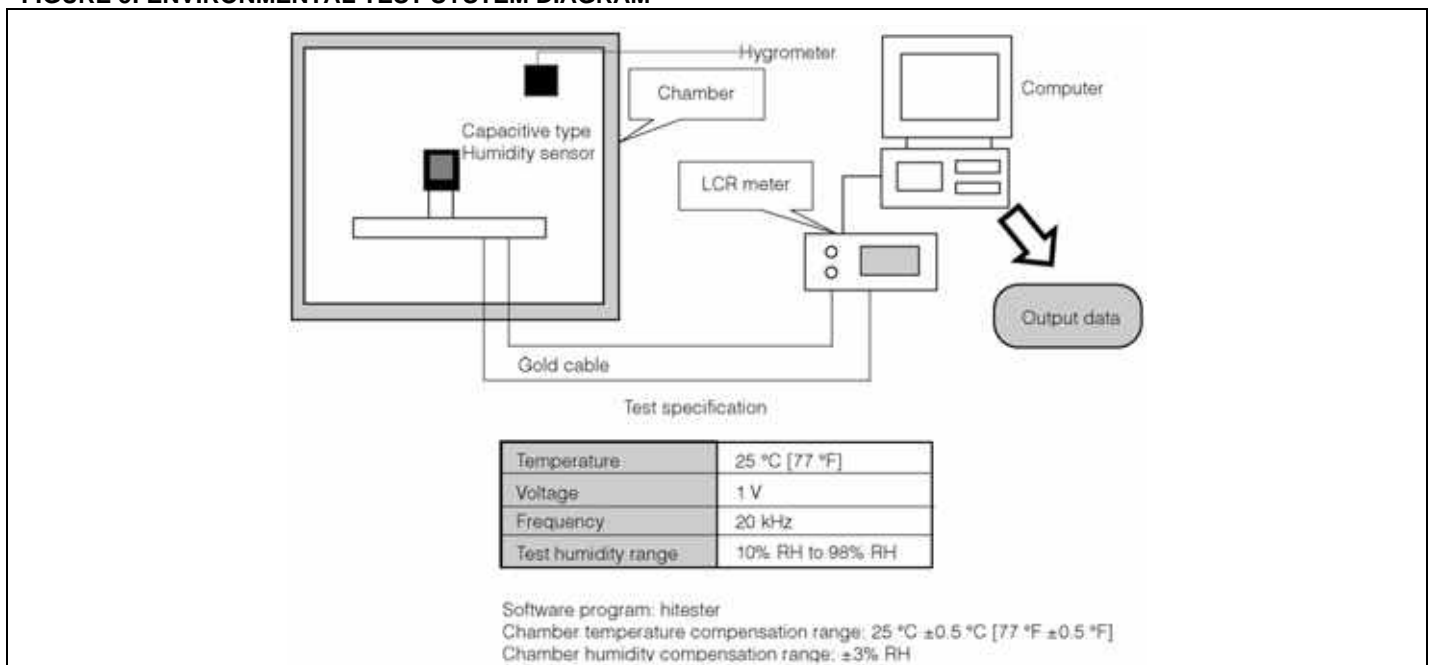
## ENVIRONMENTAL TEST SYSTEM

Figure 5 depicts environmental testing. The devices are characterized at 25 °C [77 °F] between 20% RH and 95% RH. The meter is set to measure capacitance at 1 V and 20 kHz.

For a precise measurement, a hygrometer is compared with the humidity of the temperature-humidity chamber.

The data output indicates the effect of sensor characterization before/after environmental tests.

FIGURE 5: ENVIRONMENTAL TEST SYSTEM DIAGRAM



## ORDER GUIDE

Catalog Listing	Description
HCH-1000-001	HCH Series capacitive polymer humidity sensor, 2,54 mm [0.100 in] lead pitch SIP
HCH-1000-002	HCH Series capacitive polymer humidity sensor, 2,54 mm [0.100 in] lead pitch SIP, cased version

### **WARNING**

#### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

#### **WARRANTY/REMEDY**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

### **WARNING**

#### **MISUSE OF DOCUMENTATION**

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**

#### **SALES AND SERVICE**

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