

# HC104-Kxx

xx...humidity calibration point

## Interchangeable SMD Humidity Sensors for Mass Applications

### Typical Applications

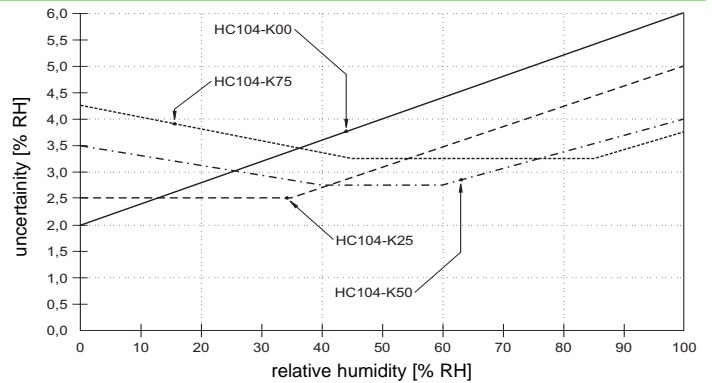
mass appliances  
 photocopy machines  
 automotive - air conditioning

### Features

interchangeable  
 inexpensive, easy humidity calibration  
 best accuracy without calibration  
 SMD compatible  
 outstanding long term stability  
 wettable

### Technical Data

Sensor	HC104-K00	HC104-K25	HC104-K50	HC104-K75
Calibration point	0% RH	25% RH	50% RH	75% RH
Nominal capacity at calibration point [pF]	140	152.5	163.8	175.9
Interchangeability				



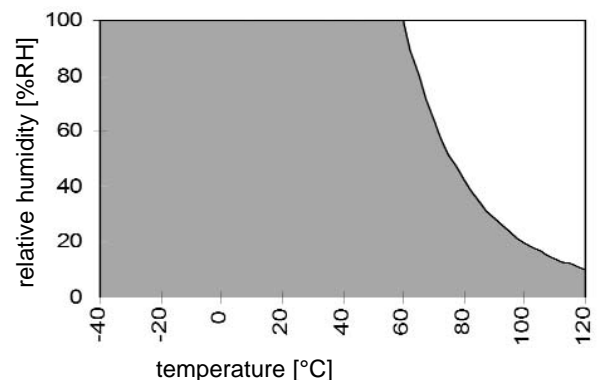
Sensitivity	0.48 pF / % RH
Temperature dependence	$dC = -0.00166 \cdot RH \cdot (T - 30^\circ C)$ [pF]
Working range humidity	0...100% RH
Working range temperature	-40...120°C (-40...248°F)
Linearity error (0 ... 98% RH)	< ± 1.5% RH
Hysteresis	1.7 ± 0.15% RH
Response time $t_{90}$	< 6 s
Long term stability at 20-30°C (68-86°F) / 20-80% RH	drift < 1.5 % / year
Loss tangent	< 0.05 typical
Maximum supply voltage (no DC voltage)	5 V max (Upp)
Maximum DC voltage	< 5 mV
Operating frequency	10...100 kHz, recommended 20kHz
Packaging tray 101.6x101.6 mm (4x4")	240 sensors
Packaging tape and reel	refer to ordering guide

### Working Range

The working range of the humidity sensors HC104-Kxx is shown with regard to the humidity / temperature limits.

Although the sensors would not fail beyond the limits, the specification is guaranteed only within the working range.

In applications with high humidity at high temperatures the time factor shall be considered.



## Characteristics

The average increase of capacitance over the working range is 55pF. For the range of 0–98% RH linear approximation is possible, errors will be lower than ± 1.5% RH.

The sensor characteristic is determined by the following linear formula:

$$C(RH) = C_0 * [1 + HC_0 * RH]$$

with  $HC_0 = 3420 \pm 191 \text{ ppm / \% RH}$

For high accuracy requirements, the sensitivity is determined by the following polynomial:

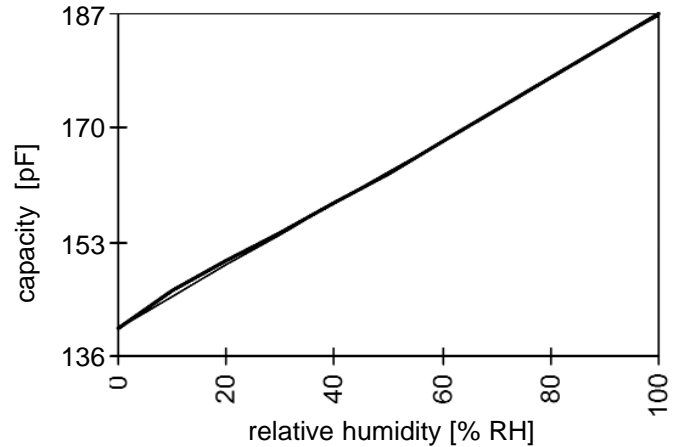
$$C(RH) = C_0 * [1 + FK_0 * r.F. + K(RH)]$$

whereby:

$$K(RH) = A_1 * RH + A_2 * RH^{1.5} + A_3 * RH^2 + A_4 * RH^{2.5}$$

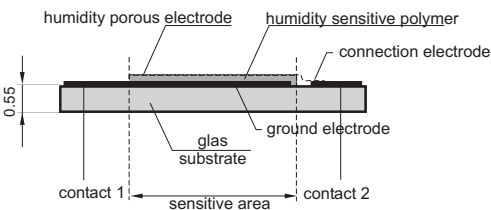
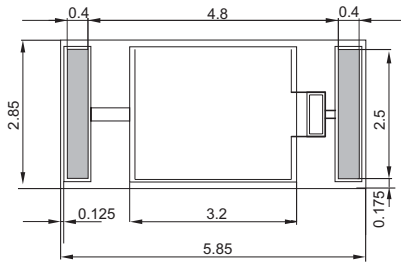
$$A_1 = 2,6657E^{-3} \quad A_2 = -9,6134E^{-4}$$

$$A_3 = 1,1272E^{-4} \quad A_4 = -4,3E^{-6}$$



## Dimensions (mm)

1 mm = 0.03937" / 1" = 25.4 mm



## Mounting Instructions

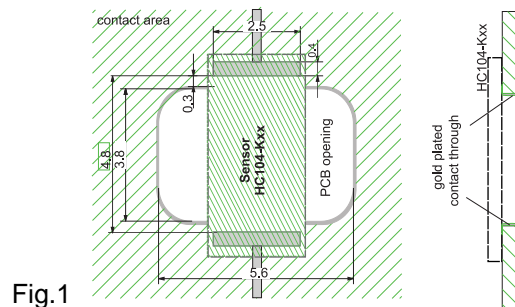


Fig.1

To allow full access of the air, the humidity sensor should be positioned over an opening in the printed circuit board (PCB). - Fig.1

False readings because of humidity assimilation at the front side of the PCB should be avoided as much as possible by using gold-plated-through holes.

## Ordering Guide

TYPE		PACKAGING	
Interchangeable capacitive humidity sensor 140 pF, calibration point 0% RH	(104-K00)	tray (240 sensors)	(no code)
Interchangeable capacitive humidity sensor 152.5 pF, calibration point 25% RH	(104-K25)	500 sensors per reel	(TR0,5)
Interchangeable capacitive humidity sensor 163.8 pF, calibration point 50% RH	(104-K50)	1000 sensors per reel	(TR1)
Interchangeable capacitive humidity sensor 175.9 pF, calibration point 75% RH	(104-K75)	2500 sensors per reel	(TR2,5)
		10000 sensors per reel	(TR10)
<b>HC</b>			

## Order Example

**HC104-K50TR2,5**  
 SMD Humidity Sensor

Type: HC104-K50  
 Packaging: 2500 sensors per reel

HC104-Kxx