

HC104-Kxx

Interchangeable SMD Humidity Sensors for Mass Applications

xx...humidity calibration point

Typical Applications

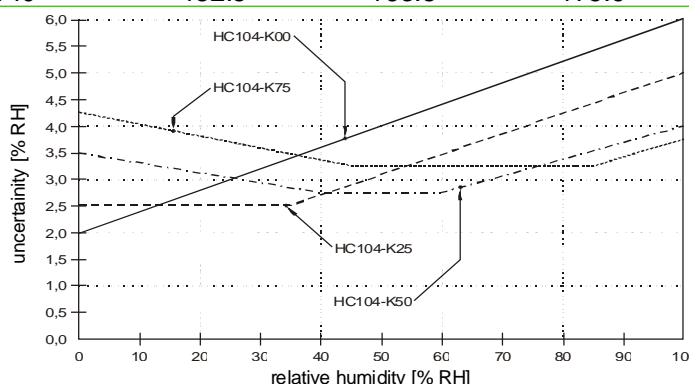
mass appliances
 photocopy machines
 automotive - air conditioning

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				



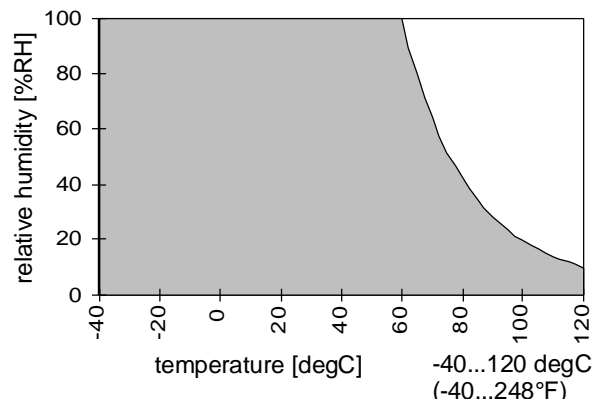
Sensitivity	0.48 pF / % RH
Temperature dependence	dC = -0.00166*RH*(T-30 degC) [pF]
Working range humidity	0...100% RH
Working range temperature	-40...120 degC (-40...248°F)
Linearity error (0 ... 98% RH)	< ± 1.5% RH
Hysteresis	1.7 ± 0.15% RH
Response time t ₉₀	< 6 s
Long term stability at 20-30 degC (68-86°F) / 20-80% RH	drift < 1.5 % / year
Loss tangent	< 0.05 typical
Maximum supply voltage (no DC voltage)	5 V max (U _{pp})
Maximum DC voltage	< 5 mV
Operating frequency	10...100 kHz, recommended 20kHz
Packaging	tray 101.6 x 101.6mm (4 x 4 inch) with 240 sensors

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.



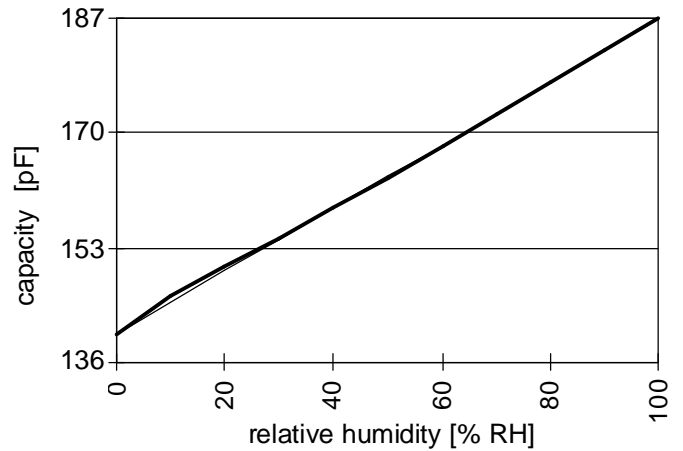
Characteristics

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 $HC_0 = 3420 \pm 191$ 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 inch / 1 inch = 25.4 mm

Mounting Instructions

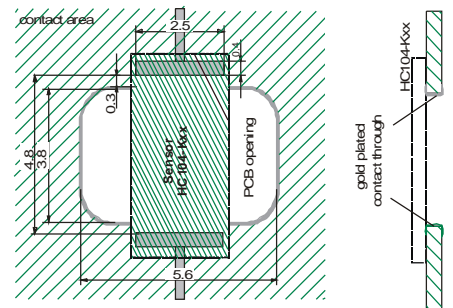
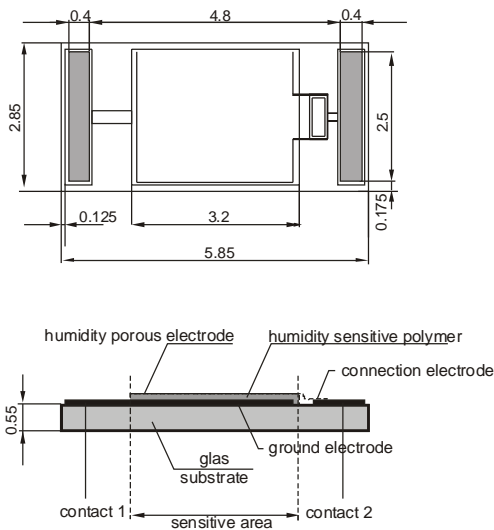


Fig.1

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

MODEL	TYPE	
HC	Interchangeable capacitive humidity sensor 140 pF, calibration point 0% RH	(104-K00)
	Interchangeable capacitive humidity sensor 152.5 pF, calibration point 25% RH	(104-K25)
	Interchangeable capacitive humidity sensor 163.8 pF, calibration point 50% RH	(104-K50)
	Interchangeable capacitive humidity sensor 175.9 pF, calibration point 75% RH	(104-K75)
HC		