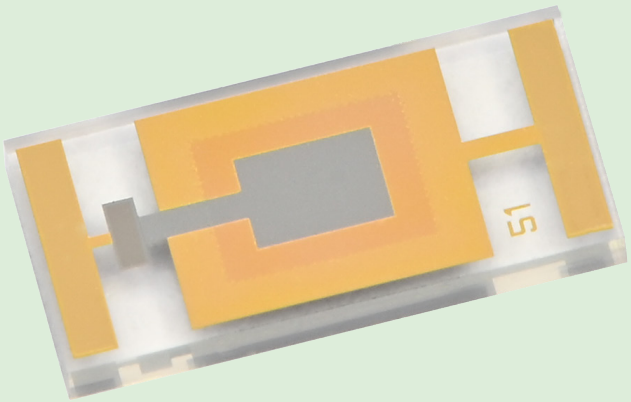
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Datasheet HC103M2

Very Fast Humidity Sensor for Radiosondes



www.epluse.com

HC103M2

Very Fast Humidity Sensor for Radiosondes

HC103M2 is a capacitive humidity sensor with very short response time even at very low temperature. This makes the sensor ideal for accurate humidity measurements in the upper atmosphere using radiosondes and weather balloons.
The sensor is manufactured using state-of-the-art thin-film technology and is appropriate for SMD assembly. The design and material selection provide excellent linearity, high sensitivity and reproducible temperature dependence, significantly simplifying the overall design.
HC103M2 is supplied on tape and reel appropriate for standard SMD assembly machines.

Typical Applications

- Radiosondes
- Weather observation

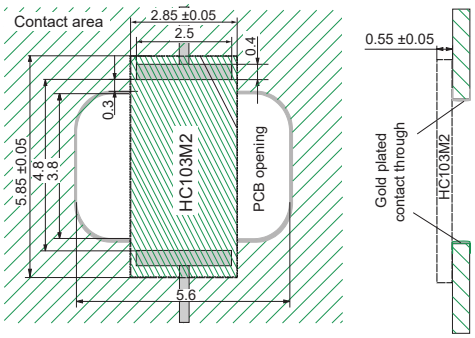
Features

- Very short response time
- High sensitivity and outstanding linearity
- Reproducible temperature dependence

Dimensions and Mounting Instructions

Values in mm

1 mm = 0.03937"
1" = 25.4 mm



- When mounting the HC103M2 on a printed circuit board (PCB), position it over a PCB opening to allow sufficient air circulation around the sensor and achieve the shortest response time.
- For optimum accuracy, avoid moisture accumulation, for example at the edge of the PCB, by using a suitable PCB material or by gold-plating the edge of the opening.

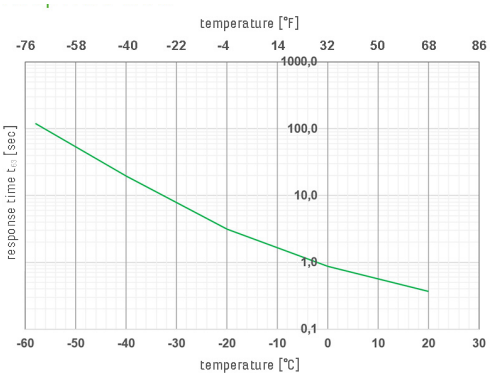
Assembling and Soldering

HC103M2 is an SMD (surface mounted device) sensor, appropriate for automatic assembling with subsequent reflow soldering. Please refer to the HC103M2 Handling Instructions at www.epluse.com/hc103m2.

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Technical Data

Humidity Sensor

Nominal capacitance C_0 @ 30 °C (86 °F)		160 ±40 pF
Sensitivity		0.55 pF / %RH
Working range	**Humidity** **Temperature**	0...100 %RH -80...+60 °C (-112...+140 °F)
Linearity error	**(0...98 % RH)**	< ±2 %RH
Hysteresis		1.9 ±0.25 %RH
Response time RH t_{63}		
Temperature dependence[1)]		dC = -0.0019*RH*(T-30 °C) [pF]
Loss tangent		<0.05
Maximum supply voltage		5 V max (V_{PP})
Maximum DC voltage		<5 mV
Operating frequency		10...100 kHz, recommended 20 kHz

1) More details for t < -20 °C (-4 °F) on request.

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Sensor Characteristics

The average capacitance increase over the working range is approximately 55 pF.

The following linear approximation of the characteristic over the range 0...98 %RH leads to errors lower than < ±2 %RH.

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

where:

HC_0 = 3420 ±250 ppm / %RH

For high accuracy requirements, the characteristic is described by the following polynomial:

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

where:

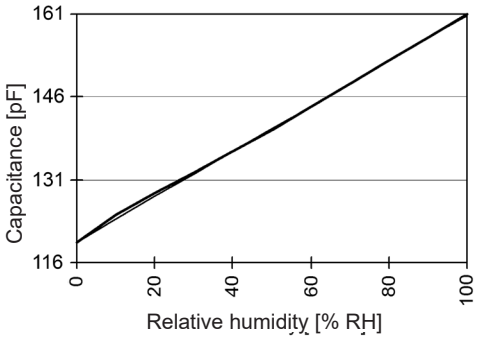
$K(RH) = A_1 * RH + A_2 * RH^{1.5} + A_3 * RH^2 + A_4 * RH^{2.5}$

$A_1 = 2.6657 * 10^{-3}$

$A_2 = -9.6134 * 10^{-4}$

$A_3 = 1.1272 * 10^{-4}$

$A_4 = -4.3 * 10^{-6}$



Ordering Guide

	Feature	Description	Code
Hardware	Type	Very Fast Humidity Sensor for Radiosondes	HC103M2
	Tape and reel packaging	500 sensors	TR0,5
		1000 sensors	TR1
		2500 sensors	TR2,5

Order Example

HC103M2-TR1

Feature	Code	Description
Type	HC103M2	Very Fast Humidity Sensor for Radiosondes
Tape and reel packaging	TR1	1000 sensors per reel

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