

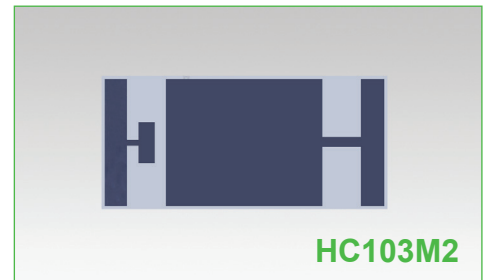
HC103M2

Very Fast Humidity Sensor for Radiosondes

HC103M2 is a capacitive humidity sensor with very short response time even at very low temperature. By this, the sensor is ideal for accurate measurement in the upper atmosphere with radiosondes and weather balloons.

The sensor is manufactured in state of the art thin film technology and is appropriate for SMD assembly. The design and the choice of materials lead to excellent linearity, high sensitivity and reproducible temperature dependence, which facilitate considerably the design in.

HC103M2 is supplied on tape and reel appropriate for standard SMD assembly machines.



Typical Applications

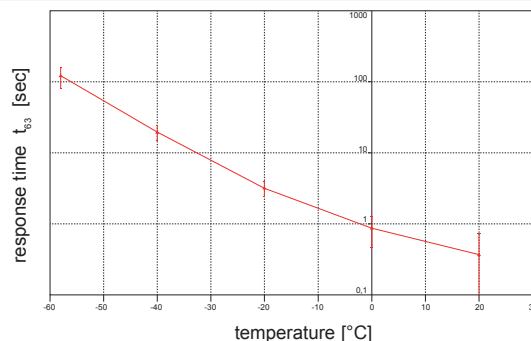
Radiosondes
 Weather observation

Features

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

Technical Data

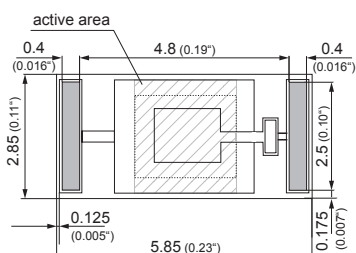
Nominal capacitance C_0 (at 30 °C / 86°F)	160 ± 40 pF
Sensitivity	0.55 pF / % RH
Working range humidity	0...100 % RH
temperature	-80...60 °C (-112...140 °F)
Linearity error (0...98 % RH)	< ± 2 % RH
Hysteresis	1.9 ± 0.25 % RH
Response time RH t_{63}	



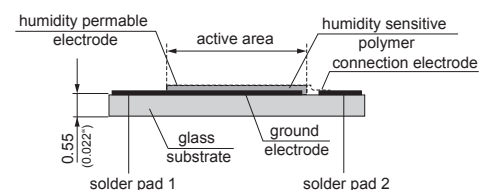
Temperature dependence ¹⁾	$dC = -0.0019 \cdot RH \cdot (T - 30 \text{ °C})$ [pF]
Loss tangent	< 0.05
Maximum supply voltage	5 V max (UPP)
Maximum DC voltage	< 5 mV
Operating frequency	10...100 kHz, recommended 20 kHz

1) more details for $t < -20 \text{ °C}$ (68 °F) on request

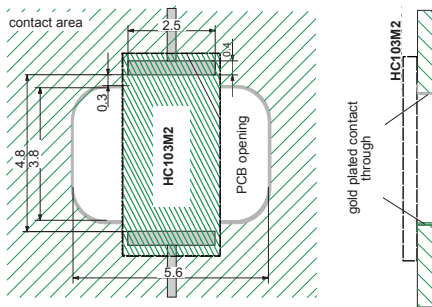
Dimensions (mm/inch)



Construction



Mounting instructions



For shortest response time, in case of mounting onto a printed circuit board (PCB), HC103M2 shall be positioned over an opening to allow enough air circulation around the sensor. For best accuracy it is important to avoid moisture accumulation such as at the edge of the PCB by selecting appropriate board material or gold-plating the edge of the opening.

Please refer to the HC103M2 Handling Instructions at www.epluse.com.

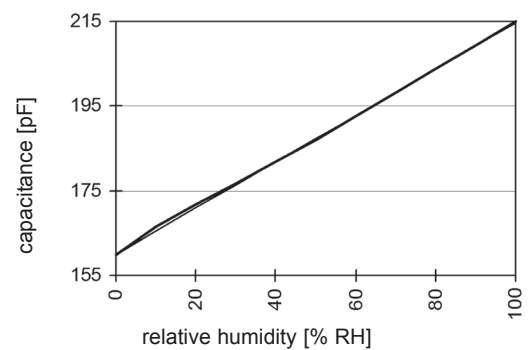
Sensor Characteristic

The average capacitance increases over the working range is around 55 pF.

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

$$C(\text{RH}) = C_0 * [1 + \text{HC}_0 * \text{RH}]$$

with $\text{HC}_0 = 3420 \pm 250 \text{ ppm / \% RH}$



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

$$C(\text{RH}) = C_0 * [1 + \text{HC}_0 * \text{RH} + K(\text{RH})]$$

whereby:

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

$$A_1 = 2.6657E^{-3} \quad A_2 = -9.6134E^{-4}$$

$$A_3 = 1.1272E^{-4} \quad A_4 = -4.3E^{-6}$$

Ordering Guide

TYPE		TAPE AND REEL PACKAGING	
HC103M2	(HC103M2)	500 sensors	(TR0,5)
		1000 sensors	(TR1)
		2500 sensors	(TR2,5)
		10000 sensors	(TR10)

Order Example

HC103M2TR1

Type: HC103M2
Packaging: 1000 sensors