

## Relative Humidity Sensors EE Elektronik HC201 and HC1000

**Function:** The HC201 and HC1000 are capacitive sensor elements using thin film technology. Both sensors are suitable for measuring relative humidity in the range 0 to 100% RH. Both the HC201 and the HC1000 sensors have one electrode etched on to a metallised glass substrate and the sensitive polymer dielectric layer is spin coated onto this. The top electrode consists of a moisture permeable metallic film which sits over the polymer. The dielectric constant of the polymer varies with the amount of water absorbed corresponding to the relative humidity.

The main difference between the HC201 and the HC1000 sensors lies in the linearity of the sensors. The HC201 has a linearity of  $\pm 2\%$  RH across the range 20 to 90% RH whereas the HC1000 has a linearity of  $\pm 1.5\%$  over the range 0 to 98% RH.

### SPECIFICATIONS

	HC201	HC1000
<b>Operating Humidity Range</b>	10 to 95% RH	0 to 100% RH
<b>Operating Temperature Range</b>	-40 to +110°C	-40 to +120°C
<b>Temperature Coefficient</b>	$< \pm 0.02\%$ RH/°C	$< \pm 0.02\%$ RH/°C
<b>Nominal Capacitance at 76% RH</b>	200pF $\pm 20\%$	500pF $\pm 10\%$
<b>Average Sensitivity</b>	0.6pF per % RH	1.45pF per % RH
<b>Linearity</b>		
<b>HC201 (20 to 90% RH)</b>	$\pm 2\%$ RH	
<b>HC1000 (0 to 98% RH)</b>		$\pm 1.5\%$ RH
<b>Hysteresis</b>	2.0 $\pm$ 0.3% RH	$\pm 1.0\%$ RH
<b>Loss Tangent</b>	$< 0.1$ typical	$< 0.05$ typical
<b>Maximum applied voltage</b>	5 Volts	5 Volts
<b>Operating Frequency Recommended</b>	10 to 100kHz 20kHz	30 to 300kHz 100kHz
<b>Response Time to reach 90% of final value in a 95% Step Change</b>	$< 15$ secs	$< 10$ secs

### DEFINITIONS:

#### Operating Range

The operating range is defined as maximum range for humidity and temperature wherein basic data and tolerances are valid. Users have to take into consideration the interdependency of humidity and temperature.

#### Temperature Coefficient

The temperature coefficient is defined as deviation in % RH per °C at 33% RH.

#### Nominal Capacitance

Nominal capacitance is given as basic value at 76% RH, valid at 20°C and operating frequency of 100kHz.

#### Hysteresis

Hysteresis is defined as the maximum difference between two cycles 10 to 80% RH and 80 to 10% RH. Cycling is performed in steps of 10% RH with a stabilisation time of 30 minutes after each step.

#### Loss Tangent

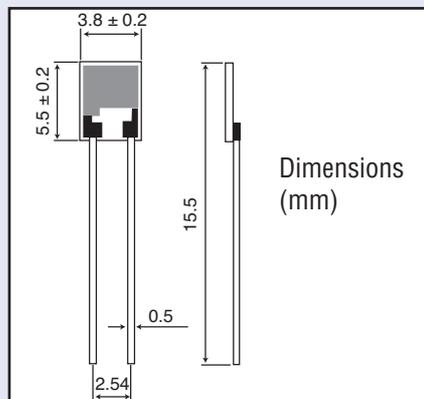
Loss tangent is given to quantify the resistive value of the impedance. It is measured at 25°C, 76% RH and operating frequency of 20kHz.

#### Maximum Applied Voltage

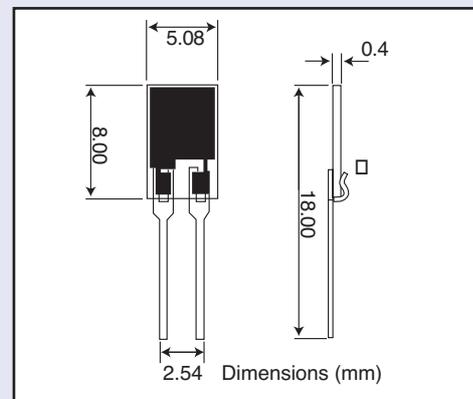
Limits are given as peak to peak voltage. Take care to avoid any DC voltage on the sensing elements.

### MECHANICAL DETAILS

#### HC201



#### HC1000



### ORDERING DETAILS

(a) Specify sensor type and quantity