IHR PARTNER IN DER SENSOR TECHNOLOGIE
E+E ELEKTRONIK® Ges.m.b.H.

Guidelines for Handling of SMD Humidity Sensors Types HC103, HC104, HC105, HC109

1. Temperature range

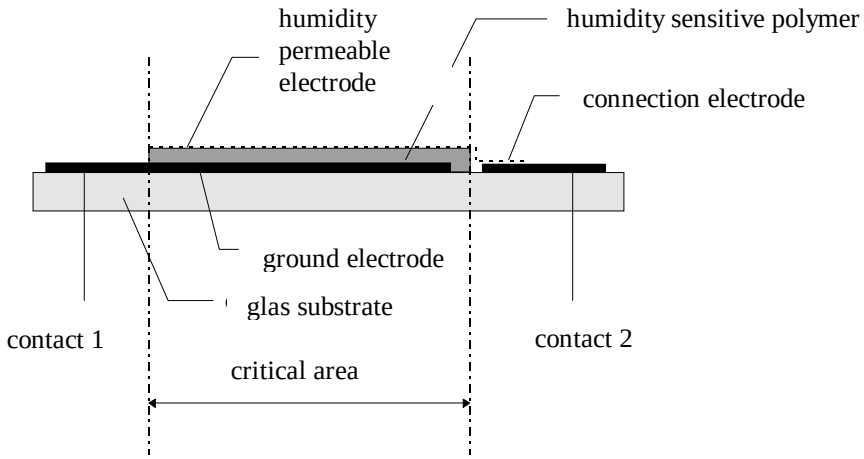
Storage temperature -20°C...+50°C (-4…122°F) *)

Working temperature -40°C...+120°C (-40…248°F)

*) after storage at very low temperatures, before unpacking allow a sufficient amount of time for acclimatization in order to avoid condensation.

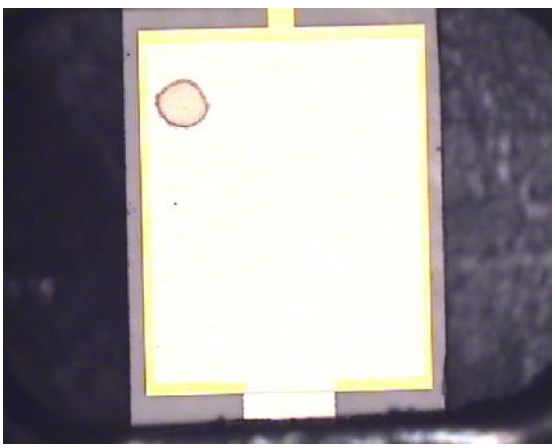
2. Handling

The criteria for usage and permissible contamination are determined by the principle functionality and construction of the sensor element:

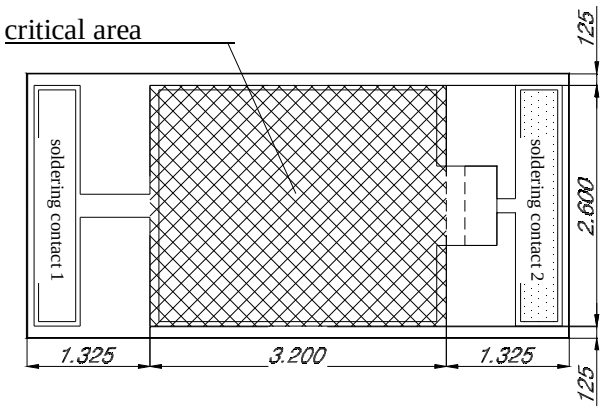


This determines the **critical area** of the active sensor surface, which must be handled with extreme care to avoid **contamination and damage (such as flux residue, solder splashes, scratches, fingerprints, etc)**. Contamination and damage outside of the critical area impair the measurement function only in exceptional cases.

Examples of **non**-permissible contamination

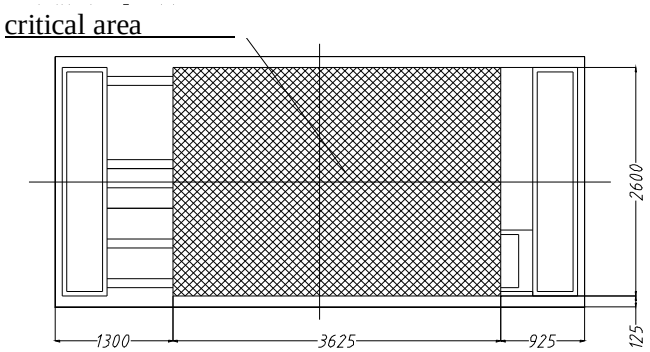


The following critical area applies to the HC103:



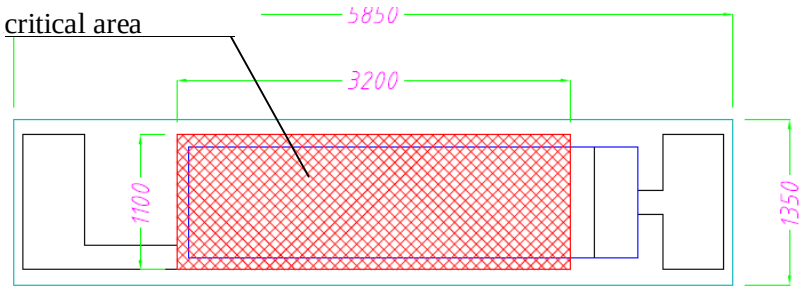
Dimensions in µm

The following critical area applies to the HC104:



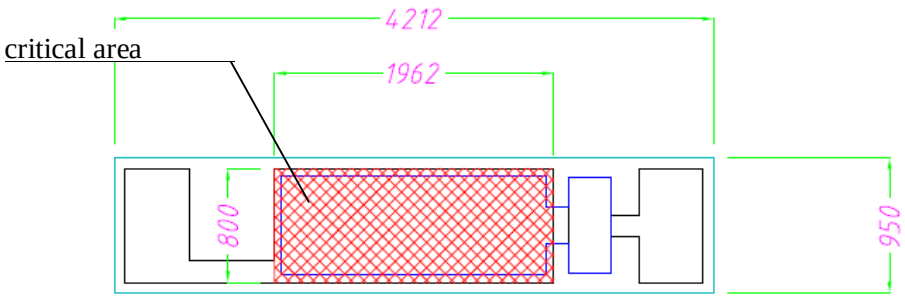
Dimensions in µm

The following critical area applies to the HC105:



Dimensions in µm

The following critical area applies to the HC109:



Dimensions in µm

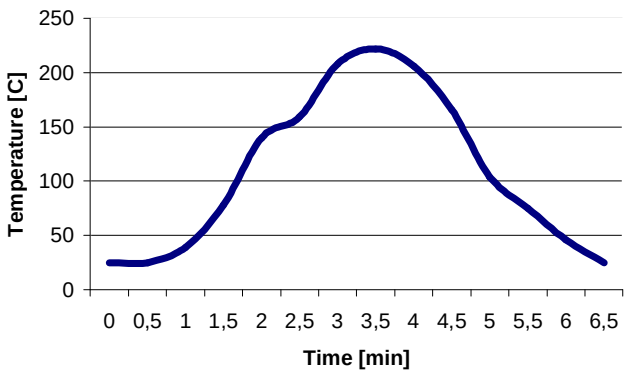
Please note the following handling guidelines:

- Any damage or contamination of the critical area of the sensor surface should be avoided. Certain contamination like greases, fingerprints, flux, etc is not allowed. This should be considered as well when shipping printed circuit boards (e.g. no damping foam, boards stacked on top of each other, etc).
- Handling systems may **only** suction-hold the sensors on the backside, on the contact pads, or on the outside edges.
- Loose sitting dust particles are allowed (can be blown off using e.g. oil-free compressed air).
- Slight discolourations in the active electrode of the sensor are production conditional and uncritical.
- Remaining soldering flux in other sensor areas is not critical.
- The sensors have to be stored in the original trays or original tapes. It has to be taken into account that the parts should always be covered with an empty tray or with the top foil. This prevents contamination of the sensors.
- It is recommended to fit the sensors so that the contact pad which is on the side of the feedthrough lies on the same potential (e.g. GND) like the metallization of the circuit board opening over which the sensor is placed.

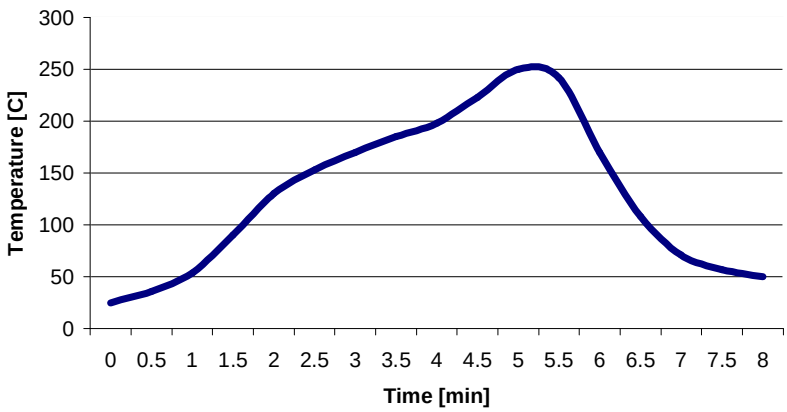
3. Recommended temperature profile for processing

The images shown below illustrate a typical reflow temperature soldering profile

Leaded



Lead free



The exact profile must be optimized to the corresponding SMD soldering system. Make sure that the maximum temperature of 250°C (482°F) is not exceeded for more than 3 minutes, and that the specified time is generally adhered to. The entire time duration for soldering is not allowed to exceed 10 minutes at temperatures > than 180°C (356°F).

4. Cleaning

Permitted cleaning methods:

- Blowing with oil-free, filtered compressed air, hydrocarbon-free air or nitrogen
- 0.5 min ultrasonic rinse in isopropanol at 23°C (73.4°F)
- Any contact with the critical area of the sensor is not allowed)

5. Sensor adhesiveness

After the sensor has been mounted on the circuit board, the soldered points of the humidity sensor are no longer visible and the adhesiveness cannot visually be assessed. Therefore, a destructive tear-off test on dummy parts is recommended. The tear-off force must be at least 20N (HC103, HC104) / 5N (HC105) / 2.5N (HC109) to guarantee quality adhesion.

6. Subsequent handling

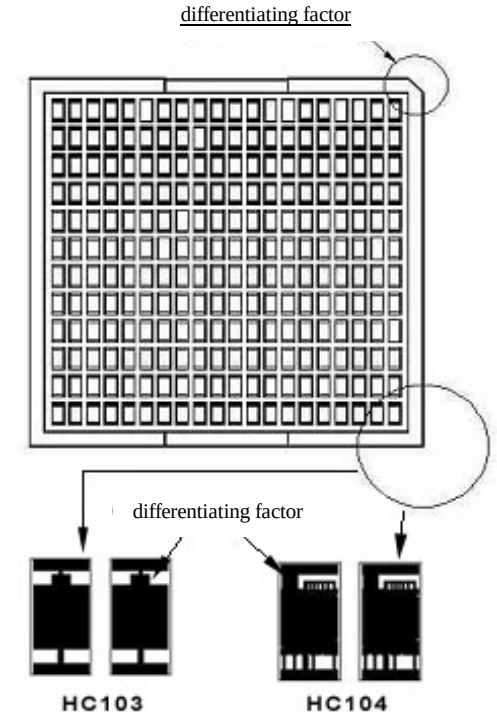
A humidity sensor should no longer be used after it is unsoldered from the circuit board. When soldering a new sensor to the circuit board, the same handling guidelines as described in section 2 must be followed. Generally, the solder from the previous soldering should be removed, as best as possible and only minimal soldering paste should be applied.

7. Packaging

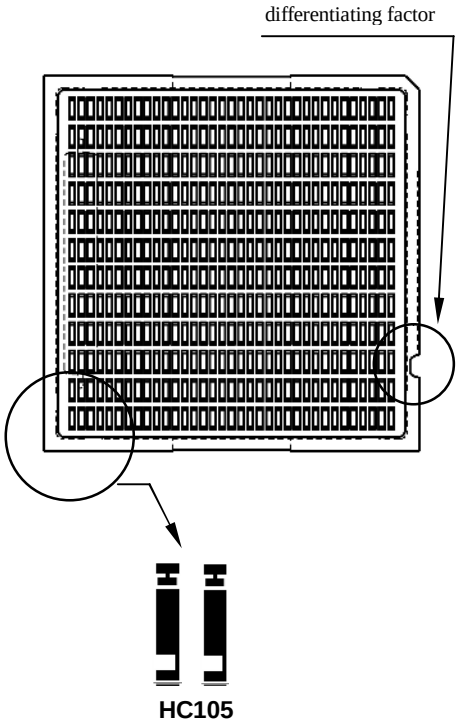
7.1. Trays

Packaging is in 4"x 4" chip trays, each with a capacity of 240 sensors (HC103, HC104) or 420 sensors (HC105). (There is no tray packaging for HC109.) When opening the tray, make sure that the package is held on the side to prevent the sensors from falling out. Repacking components in the trays is not allowed! The sensors are placed in the trays with the backside facing upwards. The package is designed for automatic component insertion systems. The sensor orientation is shown in the following diagram:

HC103, HC104 sensor orientation



HC105 sensor orientation



7.2. Tape and Reel

The packaging in tape is according to norm IEC 60286-3. Putting back of parts into the tape is not permitted! The sensors are placed in the tape with the backside up. The packing is designed for automatic pick and place machines. The sensor orientation is represented in the following drawing: