Handling Instructions

For the Digital Humidity and Temperature Sensors HTEx

your partner
in sensor
technology.

1 Introduction

This document provides handling instructions for the digital humidity and temperature sensor HTEx.

2 Processing Information

2.1 Storage Instructions

The digital HTEx series are highly accurate humidity and temperature sensors. Therefore the storage instructions should be precisely followed. Pursuant to IPC/JEDEC J-STD-020 the Moisture Sensitivity Level (MSL) is 1. At the same time, it is recommended to further process the sensors within 1 year after date of delivery. Please also note that highly concentrated chemical vapors and long exposure times can influence the characteristic of the sensor.

It is advisable to keep the sensor package in the original manufacturing packaging. If it is necessary to remove the packaging, ESD trays made from PS (Polystyrol) are recommended, keeping the storage temperature in the range of 0...+55 °C. In addition, sealed ESD bags are recommended.

2.2 Soldering Instructions

For mechanical as well as electrical connection the pads have to be soldered to the PCB. The center pad (die pad) may be left floating, anyway it is recommended to connect it to the PCB for accurate measurement results.

For the exact dimensions of the land pattern, please see the product datasheet.

For soldering, a standard convection reflow soldering oven may be used (no vapour phase and no wave soldering). For this purpose, a lead-free, air and nitrogen reflowable no-clean type 3 solder paste, which meets the requirements of the RoHS Directives 2011/65/EU and (EU) 2015/863, as well as the standards by J STD 004 is recommended. Figure 1 below shows a typical soldering profile.

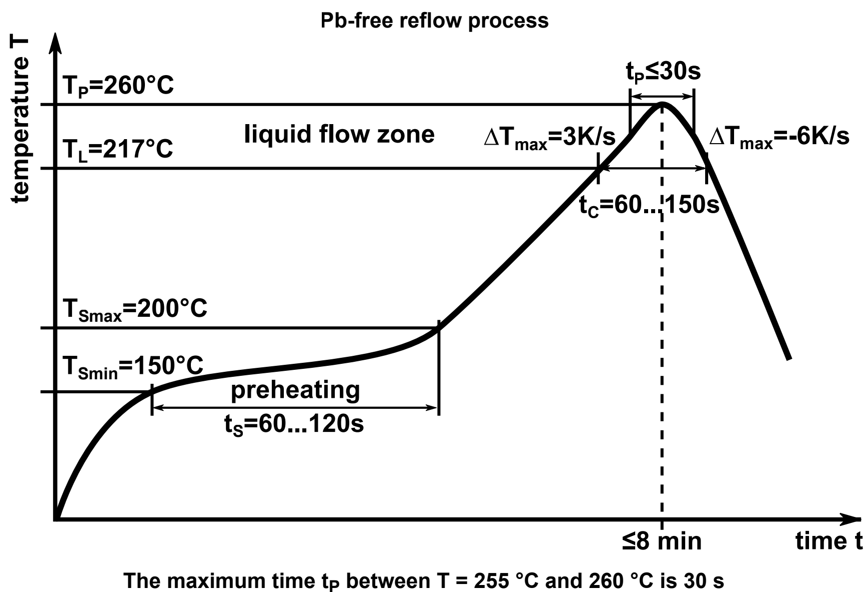

Fig. 1 Recommended reflow profile using a standard reflow soldering oven

NOTICE

- Please ensure that if there is more than 1 soldering cycle, the sensor is soldered in the last one to avoid contamination of the active surface.
  If this is not possible (e.g., selective soldering after the reflow soldering process), the humidity sensor must be covered in a way that no liquid or gaseous fluxing agents can get onto the humidity sensor.
- The sensor is rated MSL 1 according to JEDEC J-STD-020.

PLEASE NOTE

Please note that the sensor package itself is qualified to withstand the profile given in JEDEC J STD-020 for lead-free soldering with a peak temperature of +260 °C and a time in the critical zone above (T_{peak} - 5 °C) of up to 30 seconds. The packages passed the tests according to: J-STD-002[1)], AEC Q100, method AEC- Q005[2)], IEC 60068-2-58[3)], MIL-202 M210[4)] and IEC 60068-2-21[5)], respectively.

1) Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires: Tests B1 and S1.
2) Wearout reliability tests, Table 2: Qualification Test Methods, Test E12: lead- (Pb-) free.
3) Environmental testing – Part 2-58: Test Td: Test methods for solderability, resistance to dissolution of metallisation and to soldering heat of surface mounting devices (SMD) – Test Td1 (group 3), Td2 (group 3).
4) Resistance to soldering heat –Test conditions B and K.
5) Environmental testing – Part 2-21: Tests – test U: Robustness of terminations and integral mounting devices - Tests Ue2 and Ue3.

NOTICE

The sensor is assigned a process sensitivity level (PSL) according to EIA/IPC/JEDEC J-STD-075. The PSL is R4Y: The E+E proprietary coating in the sensor opening must not be exposed to flux. The sensors must not be submerged in a cleaning solution.

2.3 Post Reflow Treatment

We strongly recommend high humidity storage of the boards including the sensor packages after reflow soldering. 4...6 hours at 90 %RH (room temperature) is advisable (see also “moistening” in chapter 2.4.4). Measurement should be done after a short further rest (>1 hour) at room conditions.

2.4 General Information

During the whole transportation and manufacturing process it should be avoided to expose the sensor to high concentrations of chemical solvents for extended periods of time. Otherwise, the reconditioning procedure (see chapter 2.4.3) must be followed.

Furthermore, the instructions given in chapter 2.4.1 and 2.4.2 shall be considered. It must be ensured that the sensor is processed according to state of the art electronic manufacturing services.

2.4.1 Recommended Packaging Materials

The best packaging is the original manufacturer packaging. If the sensor has to be removed from this packaging ESD trays made from PS (Polystyrol) or sealed ESD bags are recommended.

2.4.2 Forbidden Packaging Materials

The use of certain outgassing packaging materials such as foams (e.g. Type MOS 2200) glues, adhesive tapes and foils shall be avoided since it may change the sensor characteristics.

2.4.3 Reconditioning Procedure

After exposure to extreme conditions, chemical solvents or storage time of several months, the sensor characteristic curve may offset. Exposure to higher temperature will reset the offset (e.g. +125 °C, >6 hours). For further instructions, see chapter 2.4.4.

If heating up to +125 °C is not possible, the following is suggested:

Store the sensor at +70 ±5 °C, +75 ±5 %RH for minimum 8 hours to complete the reconditioning process.

Measurements should be done after a short further rest (>1 hour) at room conditions.

2.4.4 Performance Measurement

In order to obtain precise, repeatable and meaningful measurement results, it is absolutely necessary to subject the test samples to a defined procedure consisting of a defined heating and reconditioning step before a characteristic curve can be measured. The following procedure must be followed:

1. Heat the sensor from room temperature to +125 °C
2. Store them at +125 °C ±5 °C for at least 6 hours
3. Allow the sensor to cool down to room conditions
4. Moistening:
   a. Store sensor at +23 °C and 90 %RH between 4 and 6 hours
   b. Take 2 measurements at +23 °C and relative humidity between 15 %RH and 95 %RH
5. Perform your characteristic curve measurement

E+E Elektronik Ges.m.b.H.
Langwiesen 7
4209 Engerwitzdorf | Austria
T +43 7235 605-0
F +43 7235 605-8
info@epluse.com
www.epluse.com

 All rights reserved