

Assembly of SMD Packages

For SHTxx and STSxx Sensirion Humidity and Temperature Sensors

Preface

The open cavity SMD Packages of Sensirion humidity and temperature sensors are designed for high volume applications and therefore they are compatible with standard assembly and soldering processes. Nevertheless, a humidity sensor is not a normal electronic

component and some care has to be taken in to ensure proper and reliable operation of the sensor. This document contains information on soldering process and handling of SHTxx and STSxx sensors in a production environment.

1 Soldering Instructions

For soldering, standard reflow soldering ovens may be used. The sensors are designed to withstand soldering profile according to IPC/JEDEC J-STD-020 with peak temperatures at 260°C during up to 30sec for Pb-free assembly in IR/Convection reflow ovens (see Figure 1).

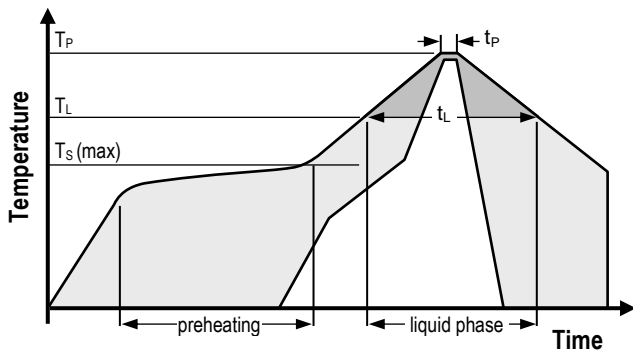


Figure 1 Soldering profile according to JEDEC standard. $T_P \leq 260^\circ\text{C}$ and $t_P \leq 30\text{sec}$ above 255°C for Pb-free assembly. $T_L < 220^\circ\text{C}$ and $t_L < 150\text{sec}$. Ramp-up rate $< 3^\circ\text{C}$ and ramp-down rate $< 6^\circ\text{C}/\text{sec}$ for temperatures $> T_L$.

The use of “no clean” type 3 solder paste² is recommended. An appropriate amount of solder paste shall be used, to result in a stand-off height (clearance between the package body and any part of the substrate) of 50µm to 75µm. Please consult the appropriate sensor data sheet for device specific information on the metal land pattern and recommendations on solder paste printing stencils.

Standard pick & place equipment and vacuum nozzles for standard QFN packages may be used for assembly of SHTxx and STSxx sensors.

No board wash shall be applied to SHTxx humidity sensors. Therefore, and as mentioned above, it is strongly recommended to use “no-clean” solder paste.

For manual soldering contact time must be limited to 5 seconds at up to 350°C.

Immediately after the exposure to high temperatures SHTxx humidity sensors may temporarily read a negative humidity offset (typ. -1 to -2 %RH after reflow soldering). This offset slowly disappears again by itself when the sensor is exposed to ambient conditions (typ. within 1-3 days). If RH testing is performed immediately after reflow soldering, this offset should be considered when defining the test limits.

It is important to note that the diced edge or side faces of the I/O pads may oxidise over time, therefore a solder fillet may or may not form. Hence there is no guarantee for solder joint fillet heights of any kind.

2 Storage Conditions and Handling Instructions

It is of great importance to understand that a SHTxx humidity sensor is not a standard electronic component and needs to be handled with care. Chemical vapors at high concentration in combination with long exposure times may offset the sensor reading.

In manufacturing, transport and operation the sensors shall be prevented of high concentration of chemical solvents and long exposure times. Out-gassing of glues, adhesive tapes and stickers or out-gassing packaging material such as bubble foils, foams, etc. shall be avoided. Manufacturing area shall be well ventilated.

For more detailed information please consult the document “*Handling Instructions*” or contact Sensirion.

² Solder types are related to the solder particle size in the paste: Type 3 covers the size range of 25 – 45 µm as specified in IPC J-STD-005A.

Revision History

Date	Version	Page(s)	Changes
26. May 2014	1	all	Initial version

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