# KB8001 Assembly Guidelines

A Matterhorn Application Note

v1.2 ADVANCE

# Contents

## Document Scope

This application note describes the assembly guidelines for KB8001 including MSL3 handing guidelines and is an *ADVANCE* specification for a device under development by Kandou Bus SA.

- Do not use this document as a basis for a final design without written authorization from Kandou Bus SA.
- Specifications in this document are subject to change and will be superseded by future documents.

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## Referenced Documents

**Note:** Users may require authorization for online access. Contact us for more details.

KB8001 Datasheet (https://docs.kandou.com/matterhorn/kb8001-ds)

## Terms and Conditions

See the online environment for the most up-to-date Terms and Conditions.

# 1 Assembly Guidelines

This section provides more information on the correct handling and assembly of the KB8001 to prevent unnecessary damage to the product. Failure to follow these guidelines may impact performance and/or reliability of the product and, therefore, invalidate any warranties or guarantees.

## 1.1 Assembly Environment

Consider the following restrictions considered within the assembly environment:

- Ambient temperature: 5°C to 30°C.
- Ambient humidity: 5% to 60% RH, non-condensing.

Avoid exposure to:

- Silicone vapors from sources such as silicone adhesives, silicone rubber, silicone sealant, silicone gel, HMDS, oils including hair gels and oils.
- Corrosive gases and vapors such as chlorine, hydrochloric acid, sulfur oxides for example some flux vapors.
- Acids, solvents and other liquids, including water, especially where the water contains ionic contamination such as salts.
- Particulates and dust.
- Long term extremes, for example high humidity and/or temperature extremes for extended periods.
- Vibration, for example ultrasonic, pneumatic tools.
- Mechanical or thermal shocks.

## 1.2 Assembly Process

We provide the KB8001 in a 4x4mm FCCSP package designed for high volume pick and place type processing. Users must:

- Manage the environment in accordance with the above criteria.
- Manage the process in accordance with the below criteria.

The assembly line shall make the following provisions:

- Fluxes must be sufficiently dried to prevent significant out-gassing.
- Tape feeders must avoid excessive vibration.

- Pick up tools shall avoid excessive force, sudden mechanical shock and excessive vacuum.
- Automated reflow (for example infrared oven, vapor phase system etc.) is recommended using a lead-free reflow profile as indicated in the next section.
- The part shall be subjected to a maximum of 3x reflow profiles.
- Flux cleans shall be avoided.
- High pressure air cleans shall be avoided.
- Ultrasonic bonding shall be avoided.
- Appropriate ESD precautions must be taken.

## 1.3 Typical Lead Free Reflow Profile

The following profile is given by way of example and the exact conditions will vary depending on the SMT materials and equipment but maximums must not be exceeded.

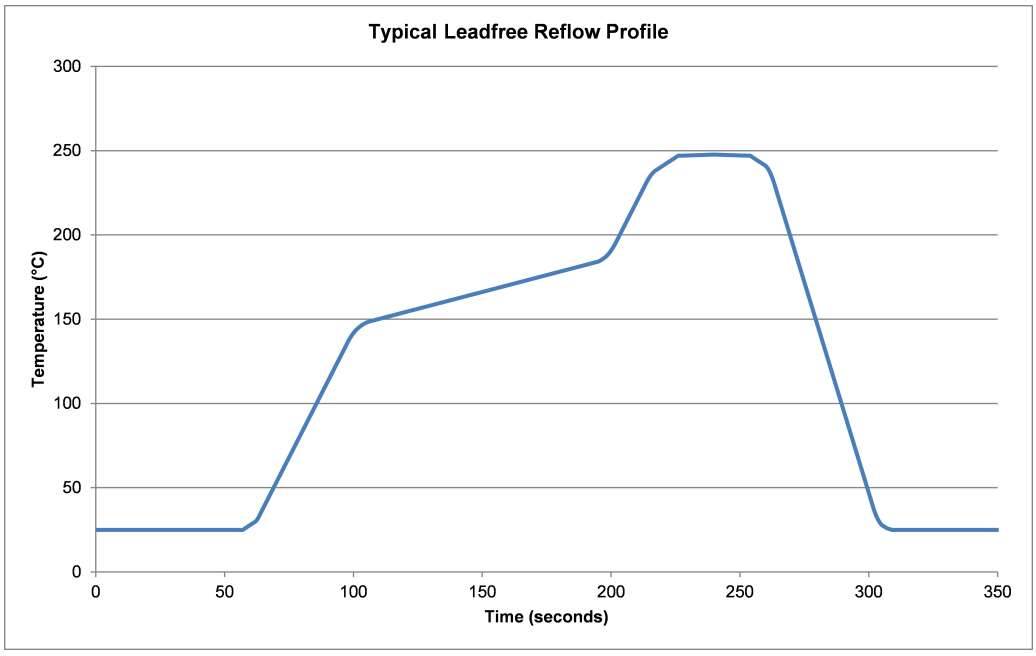


Fig. 1.1: Typical reflow profile

Table 1.1: Profile Conditions

| Item | Specification |
|---|---|
| Initial Ramp | <3°C/sec to 150°C ± 5°C |
| First soak | 150~190°C for 60~120 seconds |
| Second Ramp | <3°C/sec to peak |
| Time above liquidus (217°C) | 40~90 seconds |
| Peak temperature | 250°C ± 5°C |
| Cool rate | <6°C/sec |

## 1.4 MSL3 Handling Guidelines

KB8001 is available in a 4x4mm FCCSP package with a Moisture Sensitivity Level 3 (MSL3) rating. Kandou recommends the following handling guidelines to avoid damage from moisture absorption and solder reflow temperatures that can result in yield and reliability degradation.

### 1.4.1 During PCB Assembly

- Devices are baked and dry-packaged before shipment. The packing uses a Moisture Barrier Bag (MBB) with a Humidity Indicator Card (HIC) and drying desiccant included inside the MBB. An MSL 3 label is attached to caution that the bag contains moisture sensitive devices.
- Shelf-life of devices in a sealed bag is 12months at <40°C and <90% room humidity (RH).
- Upon opening of the MBB, the HIC must be checked immediately; devices require baking before PCB assembly if the HIC is >10% when read at 23°C ±5°C.
- After MBB is opened, devices must go through reflow for board assembly within 48 hours in assembly conditions of <30°C / 60% RH, or stored at <10% RH. If both of these conditions are not met, baking is required before board mounting.
- If baking is required, devices must be baked for a minimum of 8hrs at 125°C.

### 1.4.2 Handling Unused Devices

- Any unused devices after the MBB has been opened for more than 48 hours or not stored at <10% RH, must be baked before any subsequent reflow and board assembly.
- Re-baking must be done for a minimum of 8 hours at 125°C

- Unused devices can either be baked and dry-packed first before storage but we recommend they are baked just before the next board assembly.

### 1.4.3 Reworking a Device on a PCB

- Before a device is removed from the PCB, the PCB must be baked for a minimum of 8 hours at 125°C.
- During removal, we recommend localized heating to be used and the maximum body temperature of the device must not exceed 200°C.