

## Information note

**Topic** JODY-W1 reflow mounted upside down  
UBX-18021974 C1-Public  
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## 1 Affected products

Product name	Ordering Code	Type No	Firmware	Remarks
JODY-W163-A	All active order codes	All active type numbers	N/A	
JODY-W164-A	All active order codes	All active type numbers	N/A	
JODY-W167-A	All active order codes	All active type numbers	N/A	

## 2 Type

- Hardware modification
- Firmware update
- Documentation update
- Others

## 3 Description

Two custom test panels, each comprising 27 x JODY-W1 modules, have been built and tested for the sole purpose of identifying any potential problems that can occur when exposing the modules to three soldering reflow cycles during the manufacturing process. In particular, the impact of mounting the panels upside-down to solder the modules has been investigated. This report describes the results of the testing.



Any subsequent impact of this testing on the application board is not included in the scope of this document.

### 3.1 Test objectives

Investigate potential problems that might occur as a result of exposing JODY-W1 to three reflows cycles – the last of which is conducted with the modules hanging upside-down.

### 3.2 Control

X-ray (AXI) before and after the initial reflow cycle(s), plus normal production tests. See also [Test workflows](#).

### 3.3 Module package size

13.8 x 19.8 x 2.5 mm

### 3.4 Module under test (MUT)

Tests performed with JODY-W164-07A-01 (2 panels comprising 27 pieces).

### 3.5 Validity

Other than the additional LTE filter on the MUT (JODY-W164-07A) and other minor exceptions shown in the data sheet [1], all JODY-W1 module variants are built with identical components and undergo the same testing in the same production flow and production line. Consequently, u-blox are confident that the results reported in this document are valid for all JODY-W1 variants shown as “affected products” in this document.

### 3.6 Component changes

The testing described in this document was conducted with an earlier module version that included a temperature-compensated crystal oscillator (TCXO). As the availability of this component is now scarce, the TCXO has since been substituted with a standard crystal XTAL.

Acknowledging this component substitution, the crystal supplier has provided assurances that the standard XTAL -now used in all JODY-W1 variants – can withstand three reflow cycles without any impact on operating performance. Consequently, the results obtained from the testing of the JODY-W164-07A-01 can be confidently extended to all JODY-W1 modules.

## 4 Test workflows

The module testing was conducted in accordance with the following protocols:

### 4.1 Test workflow A (two reflows)

1. Initial reflow cycle. Standard reflow process in which two panels comprising 27 x JODY-W164-07A-01 modules are soldered.
2. Automatic X-ray Inspection (AXI) of MUT – used as test benchmark
3. Second, upside-down reflow. Turn the panel upside-down and run a reflow cycle. This simulates the customer soldering process, where the modules are hanging upside-down on their carrier.
4. Automatic X-ray Inspection (AXI) of MUT to identify potential defects against benchmark
5. Separation (laser cutting). Cut out all 27 modules from each panel.
6. Run normal module production test
7. Open the shield and visually inspect all failing modules - or just three if less than three fail

### 4.2 Test workflow B (three reflows)

1. Initial reflow cycle. Standard reflow process in which two panels comprising 27 x JODY-W164-07A-01 modules are soldered
2. Extra reflow. One extra reflow to simulates the first reflow in the customer production line
3. Automatic X-ray Inspection (AXI) of MUT – used as test benchmark
4. Third, upside-down reflow. Turn the panel upside-down and run a reflow cycle. This simulates the customer soldering process, where the modules when hanging upside down on their carrier.
5. Automatic X-ray Inspection (AXI) of MUT to identify potential defects against benchmark
6. Separation (laser cutting). Cut out all 27 modules from each panel.
7. Run normal production test
8. Open the shield and visually inspect all failing modules - or just three if less than three fail

## 5 Customer impact and recommended action

- In the sample production run, no component became detached from the panel and no problems related to upside-down reflow soldering of the module were identified during the AXI or subsequent production test.
- Based on the results of two test workflows (A and B), u-blox do not anticipate any production issues arising from reflows where the module is mounted upside down.
- As the limited testing described in this document was bound by the prevailing conditions at the test facility, u-blox under no circumstances guarantee that manufacturing failures will not occur as a result of the reflow soldering process. Different soldering profiles and variable carrier board conditions can also affect the result and quality of the manufacturing reflow process.

## 6 Related documentation

- [1] JODY-W1 data sheet, [UBX-16013635](#)
- [2] JODY-W1 system integration manual, [UBX-16012621](#)

## 7 Revision history

Revision	Date	Name	Comments
R01	2-July-2018	than	Initial release.
R02	28-May-2021	frca	Restructured content and added JODY-W1 variants for which this note is applicable.