

Tape and Reel Punch Hole Augmentation for Machine Detection Improvement

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I. OVERVIEW

- Tape and reel process is one of the new technologies in semiconductor industry, with one key challenge in die attach process because of the reject hole on the tape
- Illustrated in Fig. 1 is the typical assembly process flow for tape and reel process, specific for the micromodule device with applications namely security devices, automated teller machines, and sim cards



Fig. 1. Typical assembly process flow for tape and reel.

II. PROBLEM IDENTIFICATION

- Punch hole for reject inspection and detection is not visible by the machine in its search range
- The machine detection search range is further set to the maximum range in Fig. 2, but still the reject punch hole could not be seen

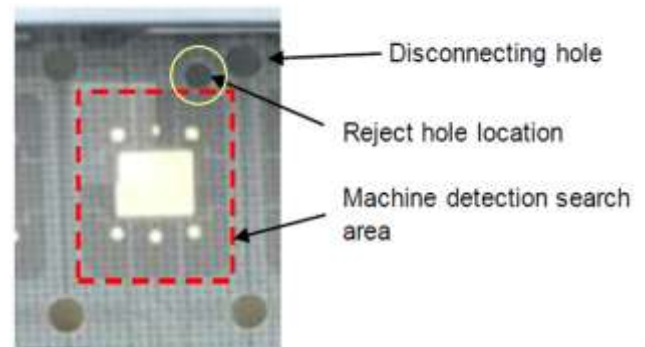


Fig. 2. Actual hole location for reject, and machine detection search range.

III. PACKAGE DESIGN SOLUTION AND PROCESS IMPROVEMENT

- The tape and reel punch hole is augmented in Fig. 3, with the improved and corrected relocation of the punch hole in accordance to the machine detection range

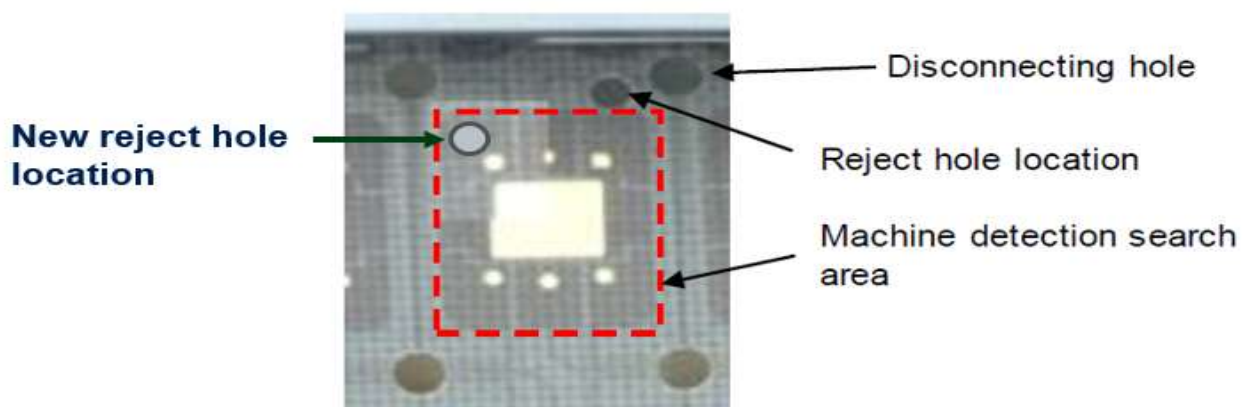


Fig. 3. Punch hole design augmentation of micromodule device.

- The new hole location for reject inspection and detection could now be easily detected by the machine because it is now within the search range of the machine
- With the improved tape and reel punch hole design, the reject or defective micromodule unit will be automatically skipped during dispense and die bonding, increasing the unit per hour (UPH) and process cycle time performance