

Wirebond Top Plate with Convertible Insert Design

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I. BACKGROUND OF THE STUDY

- Flexibility in any ways during assembly manufacturing has become increasingly recommended as it offers many advantages
- Wirebond top plate is used to hold the carrier of the package, either lead frame or substrate, using vacuum
- Top plate or process plate is being replaced on every package conversion and is specifically designed on one package only



Fig. 1. Standard process plate for wirebond process.

II. PROBLEM IDENTIFICATION

- Product robustness is one critical factor, affected by frequent mechanical changes on the wirebonder machine, resulting to possible smashed ball due to uneven wirebond ball height



Fig. 2. Uneven wirebond ball height.

- Long conversion time of wirebonder machines occurs due to planarity check after switching of top plates for different package size

III. PROCESS DESIGN SOLUTION

- The multi-configuration top plate can be used in two or more different substrate package and/or leadframe package sizes, offering great flexibility with an additional functionality of convertible or replaceable insert
- No need to change top plates during wirebonder machine conversion from one package to another, as it will accommodate several semiconductor package configurations

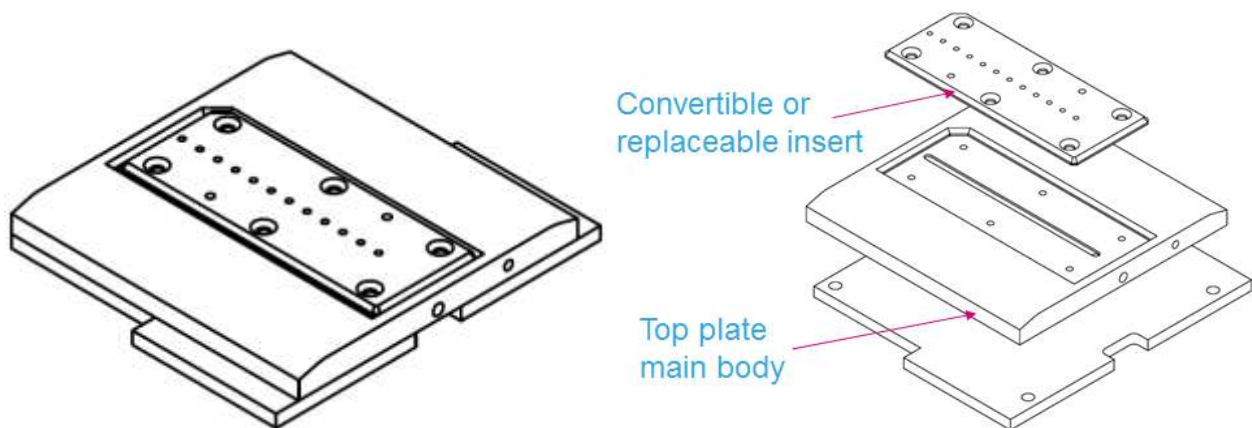


Fig. 3. Multi-configuration top plate with convertible insert design.

- The improved and specialized top plate design will eliminate the frequent calibration and the time-consuming conversion of wirebond top plates, as well as reducing the high cost of top plate fabrication
- The multi-configuration top plate secures the integrity of the semiconductor product during wirebonding process due to less mechanical conversion