International Research Journal of Advanced Engineering and Science
ISSN (Online): 2455-9024

Specialized Rubbertip and Holder Design for Thin Die Applications

Rennier S. Rodriguez, Frederick Ray I. Gomez
Central Engineering & Development NPI, Back-End Manufacturing & Technology, STMicroelectronics, Inc.
Calamba City, Laguna, Philippines 4027

Keywords— *Rubbertip; rubbertip holder; die attach; process improvement; thin die.*

I. Background

- Die attach process is one of the key process steps in semiconductor integrated circuits (IC) assembly that is responsible in picking and bonding of individually sawn die from the wafer tape to a carrier
- A rubbertip in Fig. 1 attached to a pick-up tool holder is a standard material used in pick and bond process of silicon die

Fig. 1. Rubbertip allocation per die attach processes.

II. Problem Identification

- Die crack is a critical assembly reject in die attach process attributed to the pick-up process, as illustrated in Fig. 2
- As the silicon material becomes thinner, the risk of having die crack rejection increases
- The design of the rubbertip has a major effect in terms of die crack defect occurrence

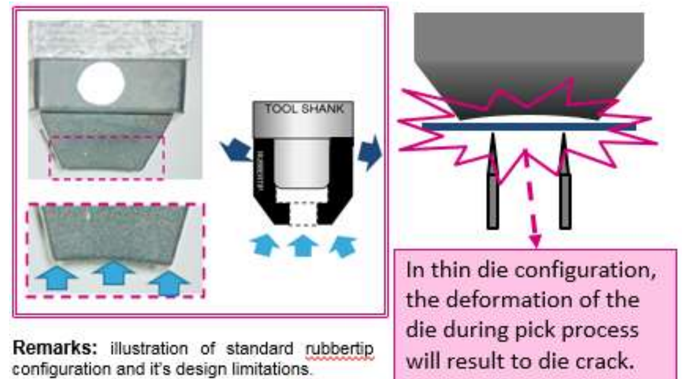

Fig. 2. Die crack illustration induced by the rubbertip condition.

III. Process Design Improvement

- A specialized design of rubbertip and rubbertip holder in Fig. 3 for thin die applications improves the contact surface flatness or the part in the rubbertip with direct contact to the silicon die

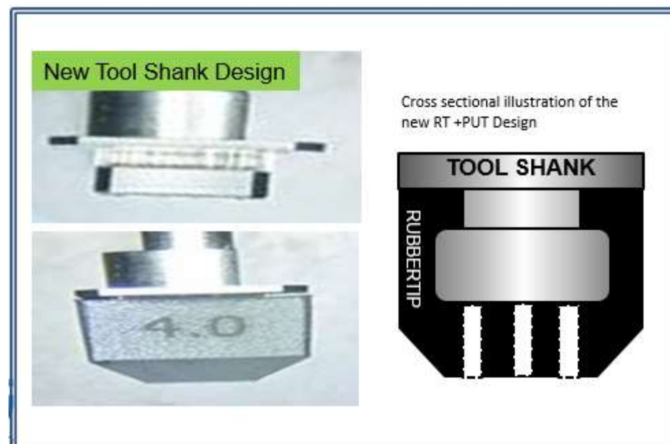

Fig. 3. Augmented and improved rubbertip and rubbertip holder design.

- Through improvement in the contact surface, the deformation of the silicon die during pick-up is eliminated