

Solder Land Pad Augmentation for Screen Printing Process Improvement

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I. OVERVIEW

- Emerging technology on semiconductor packaging offers leadframe packages with one connection layer comparable to a substrate, as shown in Fig.1 with a one-panel or one-map strip design

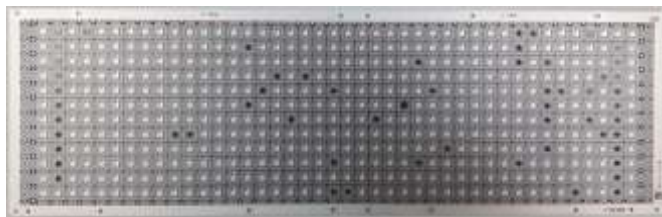


Fig. 1. Leadframe package with solder land pads.

- In its basic form, the augmented leadframe package is a combination of deposited metal with the spaces around them (within its thickness) occupied by a mold material
- The augmented leadframe package offers routable interconnection, extending the input-output (I/O) pin capability

II. PROBLEM IDENTIFICATION

- The technology of having a molding compound as a binder offers significant difference in terms of coefficient of thermal expansion, thus susceptible to strip warpage and eventual off-centered solder bumps
- Defect manifestations are shown in Fig. 2, with half-cured solder bumps and lower heat transfer efficiency



Fig. 2. Package defect manifestation.

III. SEMICONDUCTOR PACKAGE DESIGN SOLUTION

- The semiconductor package is augmented with trench on its solder land pads, as depicted in Fig. 3
- Solder land pad with the trench would help to achieve undeviating solder bump placement after screen printing process or solder bumping process

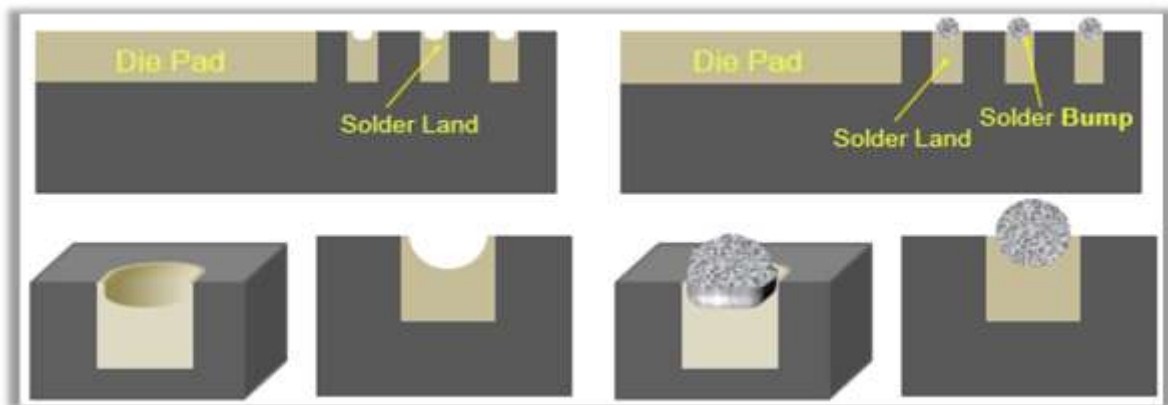


Fig. 3. Augmented solder land pad with trench design.

- With the improved configuration, the trench would increase the interconnecting mechanism of integrated circuit (IC) interface to the electronic board surface and increase the package strength when external force is applied