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Semiconductor QFN IC Package with Refined Leads for Thin Die Applications

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I. Overview

- Contact print is used during screen print process on semiconductor quad flat no-leads (QFN) integrated circuit (IC) leadframe package, wherein adhesive glue is deposited on top of diepad through direct contact between the diepad surface and the stencil

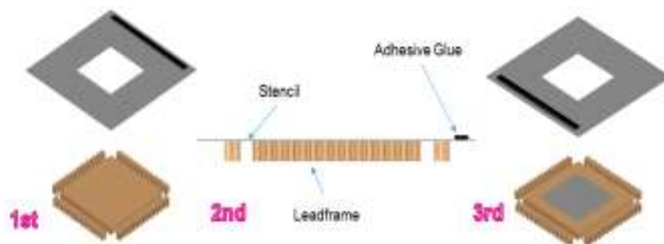

Fig. 1. Stencil printing process flow.

II. Problem Identification

- Direct contact increases the chance of having contamination on leads where wire will be connected
- Contamination can cause assembly defects namely non-stick on pad, lifted stich, fish tail, delamination

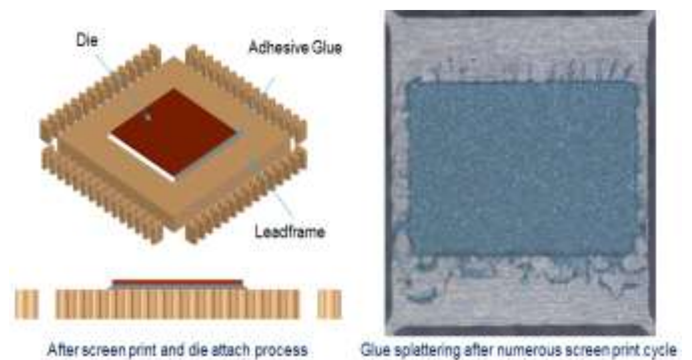

Fig. 2. Package contamination due to glue splattering.

III. Package Design Solution

- The design is based on the package construction and outline of an existing semiconductor QFN leadframe package, but this time with refined leads, by reducing the height of the leads versus the diepad such that there will be no direct contact during screen printing process
- This package design improvement is designed for emerging thin die applications

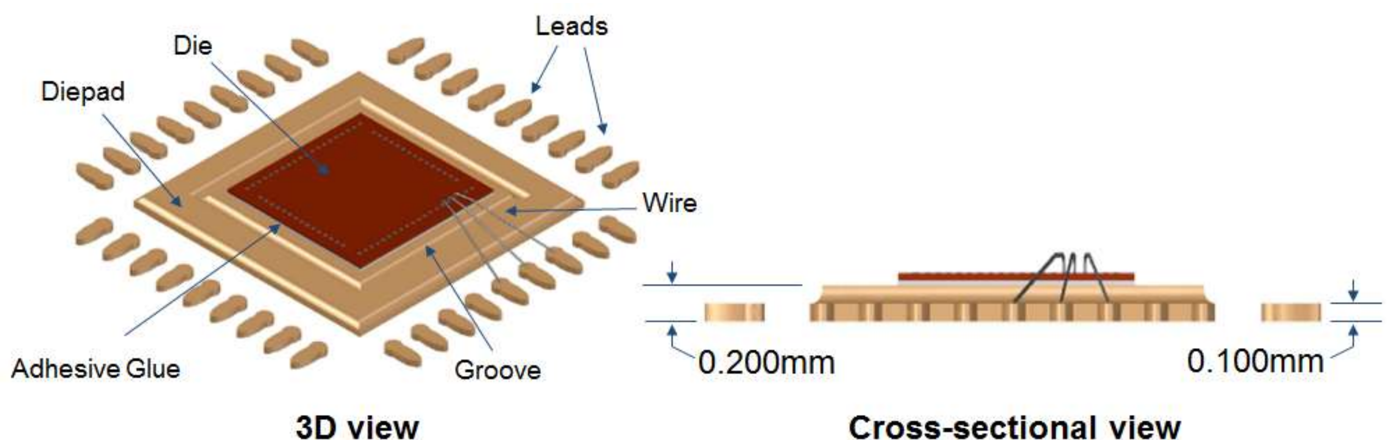

Fig. 3. Semiconductor QFN IC package design with refined leads.

- With the application of groove design on the diepad surface, additional room for glue splattering has been provided
- Reducing the height of the leads make it easier for wire to form a good loop
- Thermal and electrical conductivity could also be improved due to thinner package design
- By refining the semiconductor QFN IC leadframe design, defects caused by assembly processes could be eliminated, creating an error-proof process