

Incorporating a Metallized Die for Stable Wirebonding Configuration

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I. OVERVIEW

- Wirebonding is a process under integrated circuit assembly responsible in attaching a semiconductor wire from the bond pads of the silicon die to the metal pads of the carrier.
- This process uses thermo-compression method to form the inter-metallic layer between metals, wire-bond pads and wire-metal pads.
- Metals such as gold, silver, copper and aluminum are the most common material used for wirebonding.

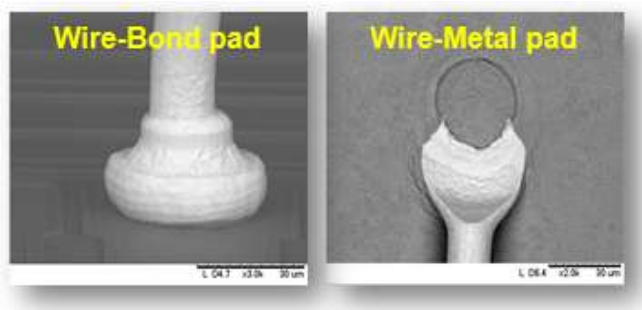


Fig. 1. Wirebonding

II. PROBLEM IDENTIFICATION

- Wire bond diagram is the defined lay-out of interconnection route during semiconductor assembly.
- There are circumstances that a complex wiring connection is evident on the lay-out wherein it can be a potential cause for gross rejection and functional reject.

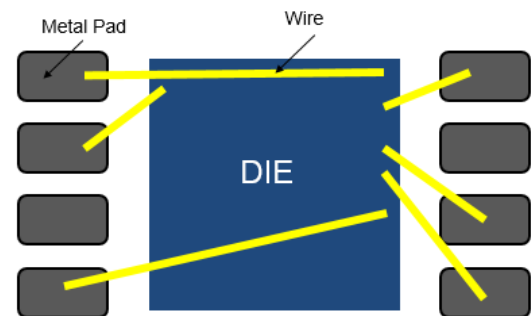


Fig. 2. Complex wire lay-out

- Long wire connection may sag on the succeeding stations that may produce a “wire shorting” rejection.

III. DESIGN SOLUTION AND IMPROVEMENT

- A metallized silicon die can be incorporated on the wiring diagram wherein it can re-route the connection to a more stable system.
- The metallized silicon die will be bonded between the bond and metal pads.

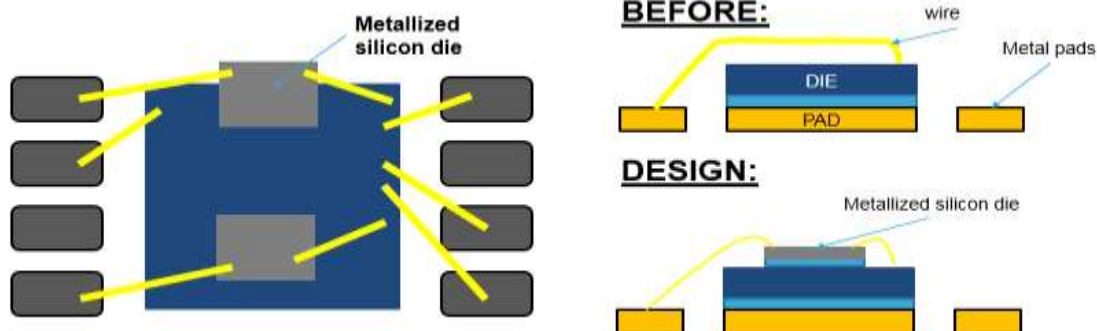


Fig. 3. Wirebonding with metallized die

- A non-conductive film or paste can be used to bond the metallized die to the silicon die.
- The position of the metallized silicon die can be integrated within the die itself or “over-hanged”.
- The size and dimension of the metallized die may also differ according to the available space inside the package.