JEDEC STANDARD

Flip Chip Tensile Pull

JESD22-B109B

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JEDEC SOLID STATE TECHNOLOGY ASSOCIATION

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TEST METHOD B109B
FLIP CHIP TENSILE PULL

Foreword

This test is performed assess the integrity of the solder bump interconnection between the flip chip die and the substrate. Flip chip tensile pull is a destructive test.

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FLIP CHIP TENSILE PULL

(From JEDEC Board Ballot JCB-14-28, formulated under the cognizance of the JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices.)

1 Scope

This test method is applicable to flip chip die after the die and substrate solder joint is formed, but prior to application of underfill or other materials that increase the apparent bond strength**.** It should be used to assess the consistency and quality of the chip join process and solder joint integrity across a given flip chip die. This method covers both Pb and Pb-free solder bumps.

NOTE Considering that this is a destructive test, it may be not suitable for qualification or process development where medium to high volume sampling might be necessary. In manufacturing, this test can be used to compare to original baseline results.

2 Terms and definitions

2.1 backside of flip chip die: The surface of the device opposite the face to which the solder bump interconnections are attached.

2.2 crosshead: The pulling jig on the tensile pull tool.

2.3 delamination: A failure found during tensile pull of flip chip solder joints wherein the solder bump interconnection metallurgy is at least partially removed from either the substrate or die, with the solder bump remaining continuous.

2.4 die fracture: A failure found during tensile pull of flip chip solder joints wherein the body of the die is fractured and damaged before all the solder bumps are separated.

2.5 die-pad fracture: A fracture in the die far-back-end-of-line (FBEOL) die structure.

2.6 flip chip die: An unpackaged die whose interconnection to a substrate is formed through solder joints.

2.7 interconnect: The resulting solder connection between device and substrate after reflow.

2.8 intermetallic fracture: A failure found during tensile pull of flip chip solder joints wherein any portion of the fracture surface occurs at an intermetallic formed between the solder and the device or substrate metallurgy.