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Design and Assembly Process Implementation for Flip Chip and Die Size Components

Developed by the Flip Chip Mounting Strategy Task Group of the Assembly & Joining Processes Committee of IPC

Users of this publication are encouraged to participate in the development of future revisions.

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Design and Assembly Process Implementation for Flip Chip and Die Size Components

1 SCOPE

This document describes the design and assembly challenges for implementing flip chip technology in a direct chip attach (DCA) assembly. The effect of bare die or die size components in a flip chip format has an impact on current component characteristics and dictates the appropriate assembly methodology. The focus on the information contained herein is on design, assembly methodology, critical inspection, repair, and reliability issues associated with flip chip, and die size package technologies (including wafer level BGA).

1.1 Purpose The target audiences for this document are managers, design and process engineers, and operators and technicians who deal with the electronic assembly, inspection, and repair processes. The intent is to provide useful and practical information to those who are mounting bare die or die size components in a DCA assembly or those who are considering flip chip process implementation.

2 APPLICABLE DOCUMENTS

2.1 IPC[1]

J-STD-012 Implementation of Flip Chip and Chip Scale Technology (historical reference)

J-STD-013 Implementation of Ball Grid Array and other High Density Technology (historical reference)

J-STD-020 Handling Requirements for Moisture Sensitive Components

J-STD-029 Test Methods for Flip Chip or Chip Scale Products

J-STD-030 Guideline for Selection and Application of Underfill Material for Flip Chip and Other Micropackages

J-STD-032 Performance Standard for Ball Grid Array Balls

J-STD-033 Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices

IPC-T-50 Terms and Definitions for Printed Boards and Printed Board Assemblies

IPC-D-279 Design Guidelines for Reliable Surface Mount Technology Printed Board Assemblies

IPC-D-325 Documentation Requirements for Printed Boards

IPC-D-350 Printed Board Description in Digital Form

IPC-D-356 Bare Substrate Electrical Test Information in Digital Form

IPC-HM-860 Specification for Multilayer Hybrid Circuits

IPC-SM-785 Guidelines for Accelerated Reliability Testing of Surface Mount Attachments

IPC-2221 Generic Standard on Printed Board Design

IPC-2225 Sectional Design Standard for Organic Multichip Modules (MCM-L) and MCM-L Assemblies

IPC-2226 Design Standard for High Density Array or Peripheral Leaded Component Mounting Structures

IPC-2511 Generic Requirements for Implementation of Product Manufacturing Description Data and Transfer

IPC-2581 Generic Requirements for Printed Board Assembly Products Manufacturing Description Data and Transfer Methodology

IPC-6011 Generic Performance Specification for Printed Boards

IPC-6015 Qualification and Performance Requirements for Organic Multichip Module (MCM-L) Mounting and Interconnecting Structures

IPC-6016 Qualification and Performance Specification for High Density Interconnect (HDI) Layers or Boards

IPC-7071 Generic Requirements for Component Mounting

IPC-7075 Sectional Requirements for High Pin Count Area Array Component Mounting

IPC-7076 Sectional Requirements for Chip Scale and Chip Size Component Mounting

IPC-7077 Sectional Requirements for Wire Bonding Bare Chip Component Mounting (Chip on Board)

1. www.ipc.org