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Design and Assembly Process Implementation for Bottom Termination SMT Components

Developed by the IPC Bottom Termination Components (BTC) Task Group (5-21h) of the Assembly & Joining Processes Committee (5-20) 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 Bottom Termination Components

1 SCOPE

This document describes the design and assembly challenges for implementing Bottom Termination surface mount Components (BTCs) whose external connections consist of metallized terminations that are an integral part of the component body. Throughout this document the word "BTC" can mean all types and forms of bottom only termination components intended for surface-mounting. This includes such industry descriptive nomenclature as QFN, DFN, SON, LGA, MLP, and MLF, which utilize surface to surface interconnections. The focus of the information contained herein is on critical design, assembly, inspection, repair, and reliability issues associated with BTCs.

1.1 Purpose The target audiences for this document are managers, design and process engineers, and operators and technicians who deal with the electronic design, assembly, inspection, and repair processes. The intent is to provide useful and practical information to those companies who are using or considering tin/lead, lead-free, adhesives or other forms of interconnection processes for assembly of BTC type components.

1.2 Intent This document, although not a complete recipe, identifies many of the characteristics that influence the successful implementation of robust and reliable assembly processes and provides guidance information to component suppliers regarding the issues being faced in the assembly process. The exchange of information between the component supplier, product designer, and assembly personnel about those parameters that influence good assembly practices are more critical with BTC implementation than with many other surface mount parts.

2 APPLICABLE DOCUMENTS

2.1 IPC[1]

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-CH-65 Guidelines for Cleaning of Printed Boards and Assemblies

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

IPC-A-610 Acceptability of Electronic Assemblies

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

IPC-1756 Manufacturing Process Data Management

IPC-2226 Sectional Design Standard for High Density Interconnect (HDI) Printed Boards

IPC-4101 Specification for Base Materials for Rigid and Multilayer Printed Boards

IPC-4761 Design Guide for Protection of Printed Board Via Structures

IPC-6012 Qualification and Performance Specification for Rigid Printed Boards

IPC-7351 Generic Requirements for Surface Mount Design and Land Pattern Standard

IPC-7525 Stencil Design Guidelines

IPC-7526 Stencil and Misprinted Board Cleaning Handbook

IPC-9201 Surface Insulation Resistance Handbook

IPC-9701 Performance Test Methods and Qualification Requirements for Surface Mount Solder Attachments

J-STD-001 Requirements for Soldered Electrical and Electronic Assemblies

J-STD-002 Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires

J-STD-005 Requirements for Soldering Pastes

J-STD-020 Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices

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

1. www.ipc.org