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Test Methods for Characterization of Printed Board Assembly Pad Cratering

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Developed by the SMT Attachment Reliability Test Methods Task Group (6-10d) of the Product Reliability Committee (6-10) of IPC

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

Contact:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, Illinois
60015-1249
Tel 847615.7100
Fax 847615.7105

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Product Reliability Committee

Chair
Reza Ghaffarian, Ph.D.
Jet Propulsion Laboratory

Vice-Chair
Werner Engelmaier
Engelmaier Associates, L.C.

SMT Attachment Reliability Test Methods Task Group

Chair
Reza Ghaffarian, Ph.D.
Jet Propulsion Laboratory

Vice-Chair
Werner Engelmaier
Engelmaier Associates, L.C.

Technical Liaisons of the IPC Board of Directors

Peter Bigelow
IMI Inc.

Sammy Yi
Flextronics International

SMT Attachment Reliability Test Methods Task Group

Mudasir Ahmad, Cisco Systems Inc.

Patricia J. Amick, Boeing - Integrated Defense Systems

Michael Azarian, University of Maryland

Roger L. Bell, Space Systems/Loral

Elizabeth Benedetto, Hewlett-Packard Company

Trevor Bowers, Adtran Inc.

Jennifer Burlingame, Cisco Systems Inc.

Nicole Butel, Avago Technologies

Fritz Byle, Astronautics Corp. of America

Beverley Christian, Research In Motion Limited

Glenn Dody, Dody Consulting

Harold Ellison, Quantum Corporation

Dennis Fritz, MacDermid, Inc.

Mahendra Gandhi, Northrop Grumman Aerospace Systems

Phil Geng, Intel Corporation

David D. Hillman, Rockwell Collins

Christopher Hunt, National Physical Laboratory

Terry Kocour, Nexus Corp.

Frank Liang, Intel Corporation

Jaime Llinas, Hewlett-Packard Company

Anne Lomonte, Draeger Medical Systems, Inc.

Wesley Malewicz, Draeger Medical Systems, Inc.

Alan McAllister, Intel Corporation

David Nelson, Raytheon Company

Keith Newman, Oracle America, Inc.

Deepak Pai, General Dynamics Info. Sys., Inc

Satish Parupalli, Intel Corporation

John Radman, Trace Laboratories - Denver

Paul Reid, PWB Interconnect Solutions Inc.

Rosa Reinosa, Hewlett-Packard Company

Martin Scionti, Raytheon Missile Systems

Russell S. Shepherd, Microtek Laboratories

Julie Silk, Agilent Technologies

Mark Trahan, Texas Instruments Inc.

Vasu Vasudevan, Intel Corporation

Bill Vuono, Raytheon Company

Anthony Wong, National Semiconductor Corp.

Xiang Zhao, Huawei Technologies Co., Ltd.

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Test Methods for Characterization of Printed Board Assembly Pad Cratering

1 SCOPE

This document provides test methods to evaluate the susceptibility of printed board assembly (PBA) materials and designs to cohesive dielectric failure underneath surface mount technology (SMT) attach pads. The test methods can be used to rank order and compare different printed board materials and design parameters, but do not define acceptance criteria.

1.1 Performance Classification This test method guideline recognizes that surface mount assemblies (SMAs) will be subject to variations in performance requirements based on end use. While performance classes are defined in IPC-6011, these performance classifications are not specific as to the required reliability. As of the publication of this standard, the acceptance criteria needs to be established as agreed between user and supplier (AABUS).

1.2 Definition of Terms The definition of all terms used herein **shall** be as specified in IPC-T-50, except as otherwise specified in 1.2.1 through 1.2.4.

1.2.1 BGA Ball Grid Array package.

1.2.2 Component Packaged semiconductor device.

1.2.3 Solder Joint/Ball The solder interconnection between a component and PBA.

1.2.4 Pad Cratering The formation of a cohesive (or adhesive) dielectric crack or fracture underneath the pad of a surface mount component, most commonly BGA packages.

1.3 Interpretation **"Shall"** is used throughout this specification whenever a requirement is intended to express a provision that is mandatory; deviation may be considered if sufficient data is supplied to justify the exception.

The words "should" and "may" are used whenever it is necessary to express non-mandatory provisions. "Will" is used to express a declaration of purpose. To assist the reader, the word "**shall**" is presented in bold characters.

2 APPLICABLE DOCUMENTS

The following documents are applicable and constitute a part of this specification to the extent specified herein. Sub-sequent issues of, or amendments to, these documents will become a part of this specification. Documents are grouped under categories such as IPC, Joint Industry Standard, and others depending on the source.

2.1 IPC[1]

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

IPC-6011 Qualification and Performance Specification for Printed Boards

2.2 Joint Electron Device Engineering Council[2]

JESD22-B117A BGA Ball Shear

JESD22-B115 Solder Ball Pull

1. www.ipc.org
2. www.jedec.org

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