

IMAPS Nordic Annual Conference 2015

**Helsingor, Denmark
8 – 9 June 2015**

Editors:

J. Kutilainen

ISBN: 978-1-5108-0813-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2015) by International Microelectronics and Packaging Society, Nordic (IMAPS – Nordic)
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact IMAPS – Nordic
at the address below.

IMAPS – Nordic
Pekantie 2, FI-90900
Oulu Finland

Phone: 358 400 687 261

info@imapsnordic.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

INDEX OF PAPERS AND PRESENTERS

OPENING SESSIONS AND KEYNOTE PRESENTATIONS

Danish hearing aid industries and packaging requirements (Presentation) 1
Jørgen Skindhøj, Senior Director for Hardware Development, Oticon, Denmark

EV/HEV power electronics: Market and Technology Trends (Abstract) 27
Jérôme Azemar, Yole, France

SESSION MP-A1: UNDERFILL, FLIP CHIPS & ADVANCED PACKAGING

Development of Thermosonic Assisted Solder Sphere Transfer (TASST) 31
Mattias Lindgren, ÅAC Microtec AB, Sweden

Practical Technology Overview for Capillary Underfill Dispensing 35
Akira Morita, Nordson Asymtek, The Netherlands

Semiconductor Underfill Innovations (Presentation) 40
Jan Wijgaerts, Henkel Electronic Materials, Belgium

Establishment of Design Methods for High Thermal Conductive UF for FCPKG 59
Toshiaki Enomoto, NAMICS Corp., Japan

SESSION MP-B1: RELIABILITY & HARSH ENVIRONMENTS

Corrosion reliability of electronics: Prediction, Prevention, and Control (Abstract) 68
Prof. Rajan Ambat, Technical University, Denmark

Possibilities of Corrosion Simulation in Microelectronic Packages and Assemblies 69
Dr.-Ing Kirsten Weide-Zaage, Leibniz Universität Hannover, Germany

Feed-Throughs with Polymers – Water Transport and Interfaces (Abstract) 74
Allan Hjarbæk Holm, GRUNDFOS Holding A/S, Denmark

Humidity evolution (breathing effect) in enclosures with electronics 75
Morten Arnfeldt Hygum, Aalborg University, Denmark

**SESSION MP-A2:
POWER MODULE PACKAGING
– MATERIALS, TECHNOLOGIES & APPLICATIONS**

Thermal characteristics and investigations of a novel power module technology using organic insulators 80

Aylin Bicakci, Fachhochschule Kiel, Klaus Olesen, Danfoss Silicon Power, Germany

Packaging for Fast Switching Power Semiconductors (Presentation) 87

Andreas Ostmann, TU Berlin, Germany

Simulations and Fabrication of a SiC-Based Power Module With Double Sided Cooling 98

Klas Brinkfeldt, Swerea, Sweden

**SESSION MP-B2:
RELIABILITY & HARSH ENVIRONMENTS**

Modeling of humidity-related reliability in enclosures with electronics 106

Morten Arnfeldt Hygum, Aalborg University, Denmark

Experimental study of humidity and temperature profile into electronic enclosure exposed to high humidity and thermal cycles 111

Helene Conseil, Technical University of Denmark

Reliability of scaled Modern Integrated Circuits in Harsh Environments 118

Dr. Hans Danielsson, Mikroelektronik konsult AB, Sweden

**SESSION TA-A1:
POWER MODULE PACKAGING
– MATERIALS, TECHNOLOGIES & APPLICATIONS**

Wide Band Gap power module packaging Market and technologies trends (Abstract) 123

Jérôme Azémar, Yole, France

Thermomechanical comparison of novel embedded high power package using FEM-simulations 126

Michael Unger, Vienna University of Technology, VUT, Austria

**SESSION TA-B1:
LTCC & RF APPLICATIONS**

Multilayered Spiral Coils with Air Core in LTCC technology 134

Pero Krivic, Vienna University of Technology, Austria

Compact 1-Stage 4-Way Wilkinson Power Divider at Ka-Band Utilising LTCC Technology 139

Steffen Spira, Technische Universität Ilmenau, Germany

**SESSION TA-A2:
JOINING TECHNOLOGIES – MATERIALS & TRENDS**

Stability and properties of PET Films under Harsh Environments 144

Laura Frisk, Tampere University of Technology, Finland

Reliability of Anisotropic Electrically Conductive Adhesive Attachments on Flexible PI Substrates under Harsh Conditions 150

Masoud Najari, Tampere University of Technology, Finland

Novel compliant fine pitch interconnect using Metal Coated Polymer Spheres 156

Daniel Nilsen Wright, SINTEF ICT Instrumentation Dept., Norway

Japan new material & packaging technology trend (Presentation) 164

T. Onishi, Grand Joint Technology Ltd., Hong Kong

**SESSION TA-B2:
MEMS, SENSOR & PRINTED ELECTRONICS
– MATERIALS AND ENCAPSULATION**

Printable piezoelectric films – acoustic transducers, energy harvesting and flexible sensors (Abstract) 172

Tomasz Zawada, Louise Møller Borregaard, Michele Guizzetti, Ruichao Xu, Konstantin Astafiev & Erling Ringgaard, Meggitt Sensing Systems, Denmark

A New Technology for Rigid 2.5D Free-Form Circuits (Abstract) 173

Jan Vanfleteren, IMEC and Ghent University, Belgium

Thermomechanical Properties of overmold epoxies in MEMS packaging 175

Mohammad Ali Fard Sanei, Tampere University of Technology, Finland

Encapsulation of the Next Generation advanced Mems & Sensor Microsystems 180
Ton van Weelden, Boschman Technologies/APC, The Netherlands

**SESSION TP-A1:
SUBSTRATE TECHNOLOGIES – FLEX, PCB, LTCC**

Embedded Chip-Stack Package 186
Koji Munakata, Fujikura Ltd., Japan

System Integration Based on Embedded Component Technology (Abstract) 190
Jürgen Wolf, Würth Elektronik GmbH & Co., Germany

Characterization of Printed Circuit Board Material & Manufacturing Technology for High Frequency 191
Erich Schlaffer, AT&S, Austria

Flip Chip & CSP LED Packaging Trends (Presentation) 197
T. Onishi, Grand Joint Technology Ltd., Hong Kong

**SESSION TP-A2:
UNDERFILLS FLIP CHIPS & ADVANCED PACKAGING**

Fine Pitch Substrate using Embedded Trace Technology for Flip Chip Package (Presentation) 206
Kay Essig, ASE (Europe), Germany

Important Parameters to Control in High Reliability Applications 219
Dr. Hans Danielsson, MIKROELEKTRONIK KONSULT AB, Sweden

Glass Interposer Technology Trend (Presentation) 226
Dr. S. Denda, T. Onishi, Japan EPTA