EMPC 2009 www.empc2009.org

Organizing Secretariat:
PRAGMA Congressi - C.so Mazzini, 14 - 27100 Pavia - Italy
Tel. +39 0382 309579 - Fax +39 0382 304892
E-mail: segreteria@empc2009.org

EMPC2009

17th European Microelectronics and Packaging Conference & Exhibition

International Microelectronics
And Packaging Society
Italian Chapter

Official Sponsor:

STMicroelectronics

Ieee components, packaging and manufacuring technology society

Associazione Microelettronica Elettronica, Semiconduttori

International Electronics Manufacturing Initiative

PROGRAMME OVERVIEW

Tutorials, Monday June 15th

AM	Changing Role of Packaging from Packaging of ICs to Packaging of Systems with High Impact Rao Tummala Georgia Tech	Physical and Electrical Design Modelling Prof Flavio Canavero Turin Polytechnic	Electronic Package Reliability N SinnadurAi	Wirebonding Technologies Seminar Part I H&K, ESEC, K&S ASM, F K Delvotec, Palomar
	Lunch			
PM	TSV Technology for 3D Integration Latest developments EMC3D consortium	Advanced materials for power electronics packaging Dr.-Ing Schulz-Harder Mark A. Occhionero, Ph.D. Dr. Ing. Roberto Bellu	Mems and Sensors Applications Ciprian Iliescu A Star Singapore	Wirebonding Seminar Part II H&K, ESEC, K&S, ASM F K Delvotec, Palomar
	Welcome cocktail			

Tuesday, June 16th

	Session 1	Session 2	Session 3	Session 4
9.00	Conference Opening and Welcome			
9.10	Keynote *Overview of Packaging Technologies and Markets* *J.C. Eloy*, Yole			
9.50	Keynote *Automotive Package Reliability* *B. Hauser*, Bosch			
10.30	*Poster session and Coffee Break in the Exhibition Area*			
11.20	Evolution of Current Packaging Technologies: Flip Chip packaging	Materials: Solder Joint Properties and reliability I	Optoelectronic Packaging	
13.00	*Lunch*			
14.00	Evolution of Current Packaging Technologies: Embedded, Pop/Sip packages	Reliability I	Microfluidic, Medical Device Packaging	
15.40	*Coffee Break in the Exhibition Area*			
16.00	Evolution of Current Packaging Technologies Small form Factor	Reliability II	Ceramic Packages Including LTCC	Assembly Technology I: Wirebonding I
	Gala dinner			

PROGRAMME OVERVIEW

Wednesday, June 17th

	Session 1	Session 2	Session 3	Session 4
9.00	Keynote *Power Packaging* *N. Abbate,* STMicroelectronics			
9.40	Keynote *Package Beyond 3D ICs to 3D Systems* *R. Tummala,* Georgia Tech			
10.20	*Poster Session and Coffee Break in the Exhibition Area*			
11.20	Advanced Packaging: wafer level Package I	High Power Packaging Technology	Electrical simulation	
13.00	*Lunch*			
14.00	Advanced Packaging: wafer level Package II	High Power Packaging: Thermal modeling and Management	Sensor Packaging	Materials: Adhesives Properties and reliability I
15.40	*Coffee Break in the Exhibition Area*			
16.00	Advanced Packaging: 3D packaging I	Materials: Solder Joint Properties and reliability II	Assembly Technology II	Substrates and Interconnects

Thursday, June 18th

	Session 1	Session 2	Session 3	Session 4
9.00	Keynote *Mems The future man machine interface* *B. Vigna,* STMicroelectronics			
9.40	Keynote *Heterogeneous Integration for System in Package* *H. Reichl,* Fraunhofer IZM			
10.20	*Coffee Break*			
10.40	Advanced Packaging: 3D packaging II	Mems System Packaging	Materials: Adhesives Properties and Reliability II	IMAPS Global Business Council Photovoltaics
12.30	Technology Knowledge Gaps Projects arising from the iNEMI Technology Roadmap *B. Pfahl, J. Arnold and G. O'Malley,* INEMI			
12.50	Economic Recovery Through Technological Innovation and Creativity *Chuck Bauer*			
13.10	Conference Close and preview ESTC2010 and EMPC2011			

TUESDAY, JUNE 16TH

9.00 Conference Opening and Welcome

9.10 **Overview of Packaging Technologies and Markets**
KEYNOTE SPEECH: *J.C. Eloy,* Yole

9.50 **Automotive Package Reliability**
KEYNOTE SPEECH: *B. Hauser,* Bosch

10.30 *POSTER SESSION AND COFFEE BREAK*

Evolution of Current Packaging Technologies: Flip Chip packaging

11.20 **EMPC37 Advancements In Bumping Technologies for Flip Chip and Wlcsp Packaging**
Dionysios Manessis[1], Rainer Patzelt[1], Andreas Ostmann[2], and Herbert Reichl[2]
[1]Technical University Berlin, [2]Fraunhofer IZM

11.45 **EMPC127 Novel Interconnection Technique for Flip-Chip Packages; Self-Assembly Solder Bonding Technique**
Susumu Sawada, Takashi Kitae, Seiji Karashima, Seiichi Nakatani, Tatsuo Ogawa
Panasonic

12.10 **EMPC57 New Flipchip Technology**
Reinhard Windemuth
Panasonic Industrial Europe GmbH

12.35 **EMPC155 Characterization of oxidation of the electroplated Sn for advanced flip-chip bonding**
W. Zhang, and W. Ruythooren
IMEC

Materials: Solder Joint Properties and reliability I

11.20 **EMPC26 Reliability of 100 µm Bi- and In- Solder Balls**
S. Kemethmüller, R. Dohle, J. Pohlner, Th. Dünne, J. Goßler
Micro Systems Engineering

11.45 **EMPC76 Effect of microstructure design on reliability of FBGA lead-free solder joints**
F.X. Che, J.E. Luan
STMicroelectronics

12.10 **EMPC25 Investigation of Compliant Interconnect for Ball Grid Array (BGA)**
Rolf Johannessen, Frøydis Oldervoll, Maaike V. Taklo, Helge Kristiansen, Hallvard Tyldum, Hoang-Vu Nguyen, Knut Aasmundtveit
SINTEF ICT, Conpart AS, Norwegian University of Sciences and Technology (NTNU), Vestfold University College

12.35 **EMPC199 Addressing Opportunities and Risks of Pb-Free Solder Alloy Alternatives**
Gregory Henshall (Hewlett Packard), *Robert Healey, Ranjit S. Pandher* (Cookson Electronics), *Keith Sweatman, Keith Howell* (Nihon Superior), *Richard Coyle, Joe Smetana* (Alcatel Lucent), *Thilo Sack, Polina Snugovsky* (Celestica), *Stephen Tisdale, Fay Hua* (Intel) *and Grace O'Malley* (iNEMI)

Optoelectronic Packaging

11.20 **EMPC52 Roll-To-Roll Manufacturing of Organic Photovoltaic Modules**
M. Tuomikoski, P. Kopola, H. Jin, M. Ylikunnari, J. Hiitola-Keinänen, and J. Hast
VTT Technical Research Centre of Finland

11.45 **EMPC67 Fully embedded optical and electrical interconnections in flexible foils**
E. Bosman, G. Van Steenberge, P. Geerinck, J. Vanfleteren and P. Van Daele
Ghent University

12.10 **EMPC34 Process Development for a Very Precise Placement of a Lens for Micro-Optics Based Components**
Danilo Caccioli, Luca Maggi
PGT Photonics

12.35 **EMPC144 Packaging of silicon photonics devices: grating structures for high efficiency coupling and a solution for standard**
Jose Vicente Galan, Amadeu Griol, Juan Hurtado, Javier Marti', Giovan Battista Preve, Pablo Sanchis
NTC Universidad Politecnica Valencia

13.00 *LUNCH*

Evolution of Current Packaging Technologies: Embedded, Pop/Sip packages

14.00 **EMPC50 Joint project for mechanical qualification of next generation high density package-on-package (PoP) with through mold via technology**
Didier Campos, Eric Saugier, Moody Dreiza, Jin Seong Kim, Lee Smith, Pauli Jarvinen
ST Microelectronics, Amkor Technology, Nokia

14.25 **EMPC133 A Study of Thermal Performance for Chip-in-Substrate Package on Package**
Tuan-Yu Hung[1], Ming-Chih Yew[1], Chan-Yen Chou[1] and Kuo-Ning Chiang[2]
National Tsing Hua University of Taiwan

14.50 **EMPC171 3D integration of ultra-thin functional devices inside standard multilayer flex laminates**
W. Christiaens, T. Torfs, W. Huwel, C. Van Hoof, J. Vanfleteren
CMST (Ghent University - IMEC)

15.15 **EMPC192 Miniaturization of Printed Wiring Board Assemblies into System in a Package (SiP)**
Steven G. Rosser, Irving Memis and Harry Von Hofen
Endicott Interconnect Technologies

Reliability I

14.00 **EMPC123 Thermo-mechanical Stress Analysis**
Katrin Niehoff, Thomas Schreier-Alt, Florian Schindler-Saefkow, Hartmut Kittel
Fraunhofer IZM, Robert Bosch GmbH

14.25 **EMPC1 In-mould Integration of Electronics into Mechanics and Reliability of Overmoulded Electronic and Optoelectronic Components**
Teemu Alajoki, Matti Koponen, Eveliina Juntunen, Jarno Petäjä, Mikko Heikkinen, Jyrki Ollila, Aila Sitomaniemi, Topi Kosonen, Janne Aikio and Jukka-Tapani Mäkinen
VTT Technical Research Centre of Finland

14.50 **EMPC38 Assembly - Chip Interactions leading to PPM-level Failures in Microelectronic Packages**
A. Mavinkurve, H. Cobussen, W.D. van Driel, M. van Dort and L. Endrinal
NXP Semiconductors

15.15 **EMPC163 Creep Mechanism Fractography Analysis on Sn-Pb Eutectic Solder Joint Failure**
C. M. Oh[1], C. W. Han[1], N. C. Park[1], S. B. Song[1], B. J. Kang[2], W. H. Kang[2] and W. S. Hong[1]
[1]Korea Electronic Technology Institute, [2]Samsung Electronics, Republic of Korea

Microfluidic, Medical Device Packaging

14.00 **EMPC145 Advanced Microfluidic Packaging for Molecular Diagnostics**
Michele Palmieri
ST Microelectronics

14.25 **EMPC137 Processes for Integration of Microfluidic Based Devices**
D.P. Webb, P.P. Conway, D.A. Hutt, B.J. Knauf and C. Liu
Loughborough University

14.50 **EMPC194 System packaging & integration for a swallowable capsule using a direct access sensor**
Pio Jesudoss, Alan Mathewson, Bill Wright, Colm McCaffrey, Vladimir Ogurtsov, Karen Twomey and Frank Stam
Tyndall National Institute Cork Ireland

15.15 **EMPC170 Screen-Printed Polymer-Based Microfluidic And Micromechanical Devices Based On Evaporable Compounds**
Nathalie Serra[1], Thomas Maeder, Caroline Jacq, Yannick Fournier, Peter Ryser
Ecole Polytechnique Fédérale de Lausanne

15.40 *Coffee Break in the Exhibition Area*

Evolution of Current Packaging Technologies Small form Factor

16.00 **EMPC3 Trends in IC Packaging**
Caroline Beelen-Hendrikx
NXP Semiconductors

16.25 **EMPC110 Realisation of embedded-chip QFP packages Technological challenges and achievements**
A.Ostmann[1], D. Manessis[2], L. Boettcher[1], S. Karaszkiewicz[1], and H. Reichl[2]
[1]Fraunhofer Institute for Reliability and Microintegration (IZM), [2]Technical University of Berlin

16.50 **EMPC36 WPLGA: new package family for medium pin count with design flexibility**
Pierangelo Magni, Giovanni Graziosi, Claudio-Maria Villa, Roberto Tiziani
STMicroelectonics

17.15 **EMPC158 DreamPak-Small Form Factor Package**
L.A. Lim; Ramkumar Malliah
ASM Pacific Pte Ltd

17.40 **EMPC54 Next Generation Leadless RF Packages Utilizing 1st Level Low Cost Flip Chip Interconnect Technology**
S. Walczyk, P. Dijkstra, N. Kramer, J. Verspeek
NXP Semiconductors

Reliability II

16.00 **EMPC72 The necessity of corrosion protection for solderable pure tin deposits on IC outer leads**
Paolo Crema, Jürgen Barthelmes
ST Microelectronics, Atotech

16.25 **EMPC118 Accelerating the Temperature Cycling Tests of FBGA Memory Components with Lead-free Solder Joints without Changing the Damage Mechanism**
Jan Reichelt, Przemyslaw Gromala, Sven Rzepka
Qimonda Dresden GmbH & Co.

16.50 **EMPC27 Hydrolysis testing of ACF joined flip chip components with conformal coating**
Kati Kokko, Hanna Harjunpää, Pekka Heino, and Minna Kellomäki
Tampere University of Technology

17.15 **EMPC196 New packaging technology enabling integration of Magnetics and Semiconductors in one component**
Abel Pot, Dr. Horst Roehm, Rinus v.d. Berg, Dr. Tamim P. Sidiki
DSM Engineering Plastics, NXP Semiconductors

17.40 **EMPC40 X-ray nanoCT of interconnections in IC packages: Visualizing of internal 3D-Structures with Submicrometer Resolution**
Jens Luebbehuesen, Oliver Brunke, Holger Roth
GE Sensing & Inspection Technologies GmbH

Ceramic Packages Including LTCC

16.00 **EMPC200 A Comprehensive Overview on Today's Ceramic Substrate Technologies**
Franz Bechtold
Via Electronic

16.25 **EMPC33 Structuration of zero-shrinkage self-constraining LTCC using mineral sacrificial materials**
Thomas Maeder, Yannick Fournier, Caroline Jacq and Peter Ryser
Ecole Polytechnique Fédérale de Lausanne (EPFL)

16.50 **EMPC80 Robust LTCC/PZT Sensor-Actuator-Module for Aluminium Die Casting**
M. Flössel(1), U. Scheithauer(1), S. Gebhardt(2), A. Schönecker(2), A. Michaelis(1)
(1)Technische Universität Dresden, (2)Fraunhofer Institut für Keramische Technologien und Systeme, Germany

17.15 **EMPC176 3D Integration Technologies for Ceramic Substrates in a SHM Application**
Samuel Hildebrandt, Klaus-Jürgen Wolter
Dresden University of Technology

17.40 **EMPC156 Miniaturisation of a LTCC High-Frequency Rat-Race-Ring by using 3-dimensional integrated Passives and embedded High-K Capacitors**
Rubén Perrone[1], Jens Müller[1], Polina Kapitanova[2], Dmitry Kholodnyak[2], Irina Vendik[2], Stefan Humbla[1], Matthias Hein[1]
[1]Ilmenau University of Technology, Germany, [2]Saint-Petersburg Electrotechnical University

Assembly Technology I: Wirebonding I

16.00 **EMPC10 Aluminum Ribbon on Power Device**
Giuseppe Cristaldi, Giuseppe Malgioglio, Emanuele Scorfani
ST Microelectronics

16.25 **EMPC75 Mechanical properties and microstructure of heavy aluminum bonding wires for power applications**
C. Dresbach1), F. Naumann1), M. Mittag1), M. Petzold1), T. Müller2)
1)Fraunhofer Institute for Mechanics of Materials, Germany 2)W. C. Heraeus

16.50 **EMPC131 Surface-Enhanced Copper Bonding Wire for LSI and its Bond Reliability under Humid Environment**
Tomohiro Uno
Nippon Steel Corporation

17.15 **EMPC122 Kirkendall voiding in Au ball bond interconnects on Al chip metallization at elevated temperatures from 100 - 200°C after optimizing intermetallic phase coverage**
M. Schneider-Ramelow, St. Schmitz*, B. Schuch**, W. Grübl***
*Fraunhofer IZM, Germany, **Conti Temic microelectronic GmbH

17.40 **EMPC41 Cu Wire Bonding: Reliability Improvement for High Temperature in Plastic Packages**
C. Passagrilli, B. Vitali, R. Tiziani, C. Azzopardi
ST Microelectronics

WEDNESDAY, JUNE 17TH

9.00 **Power Packaging**
KEYNOTE: *N. Abbate,* STMicroelectronics

9.40 **Package Beyond 3D ICs to 3D Systems**
KEYNOTE: *R. Tummala,* Georgia Tech

10.20 *POSTER SESSION AND COFFEE BREAK IN THE EXHIBITION AREA*

Advanced Packaging: wafer level Package I

11.20 **EMPC82 Processing and Properties of AL-X Polymer Dielectric for Flip Chip and Wafer Level Packaging Applications**
Phil Garrou, Alan Huffman, Jeff Piascik
Microelectronic Consultants of NC, RTI International

11.45 **EMPC91 Wafer Post-Processing for a Reconfigurable Wafer-Scale Circuit Board**
Ricardo Izquierdo(1), Moufid Radji(3), Olivier Valorge(2), Yves Blaquière(1), Richard Norman, Yvon Savaria(2)
Université du Québec à Montréal(1), École Polytechnique de Montréal(2); McGill University Montréal, Canada

12.10 **EMPC21 Multifunctional Coatings for Wafer-Level Chip Scale Packaging**
Candice Brannen, Russell Stapleton, Paul Hough
LORD Corporation, LORD Germany

12.35 **EMPC17 Wafer Level Packaging Fan Out thermal management: is smaller always hotter?**
Donata Gualandris, Claudio M. Villa
STMicroelectronics

High Power packaging Technology

11.20 **EMPC47 Green high power density devices: challenges in materials science**
Antonino Scandurra[a], Giuseppe Francesco Indelli[a], Roberto Zafarana[b], Angelo Cavallaro[b], Emanuele Scrofani[b], Jean Paul Girìb and Salvatore Pignataro[a,c]
[a]Consorzio Catania Ricerche, c/o STMicroelectronics, Catania, [b]STMicroelectronics, [c]Dip. Scienze Chimiche Università di Catania

11.45 **EMPC39 Small Size LTCC FlipChip-Package for RF-Power Applications**
Jens Müller[1], Markus Noren[2], Matthias Mach[1], Sebastian Brunner[2], Christian Hoffmann[2]
[1]TU Ilmenau, Germany, [2]EPCOS OHG

12.10 **EMPC96 Development of Matrix Clip Assembly for Power MOSFET packages**
Martien Kengen[1], Wil Peels[1], David Heyes[2]
[1]NXP Semiconductors, the Netherlands - [2]NXP Semiconductors, England

12.35 **EMPC88 Reliability Studies on the high current power MODULES with parallel MOSFETs**
G H Sarma et al. - Kaushik Mehta et al.
Si2Microsystems Bangalore India - Si2 Microsytems SanJose USA

Electrical simulation

11.20 **EMPC175 Electrical Modeling and Analysis of the Impact of Slits on Microstrip Lines in Thin Film Polymer Layers**
Ivan Ndip[1], Michael Töpper[1], Karl-Friedrich Becker[1], Matthias Hirte[1], Ines Eidner[1], Thorsten Fischer[1], Jörg Bauer[1], Wolfgang Scheel[1], Stephan Guttowski[1], Herbert Reichl[1, 2]
[1]Fraunhofer Institute IZM, [2]Technische Universität Berlin

11.45 **EMPC105 Impact of Package Parasitics on the EMC Performance of Smart Power SoCs**
Marco Merlin[†], Franco Fiori[‡]
[†]Istituto Superiore M. Boella, Torino, Politecnico di Torino

12.10 **EMPC13 Advanced Modeling Techniques for System-level Power Integrity Analysis**
Giovanni Graziosi[†], Patrice Joubert Doriol[†], Yamarita Villavicencio[‡], Cristiano Forzan[†], Mario Rotigni[†], and Davide Pandini[†]
[†]STMicroelectronics, [‡]Politecnico di Torino

12.35 **EMPC166 Modelling of electrostatic coupling in 3D-IC architecture**
M. Rousseau[1,3,4], O. Rozeau[2], G. Le Carval[2], M.-A. Jaud[2], P. Leduc[2]
[1]STMicroelectronics, [2]CEA-LETI/MINATEC, [3]CNRS LAAS France, [4]Université de Toulouse

13.00 *LUNCH*

Advanced Packaging: wafer level Package II

14.00 **EMPC190 Reliability comparison of Aluminum Redistribution based WLCSP Designs**
Umesh Sharma, Phil Holland, and Harry Gee
California Micro Devices

14.25 **EMPC201 The Third Dimension of eWLB**
T. Meyer[1], A. Bahr[2], G. Ofner[1], R. Fürst[3], X. Baraton[4], Y. Seung Wook[5]
[1]Infineon Technologies Regensburg, Germany - [2]Infineon Technologies Singapore
[3]Infineon Technologies Neubiberg, Germany - [4]STMicroelectronics, Singapore
[5]STATS ChipPAC, Singapore

14.25 **EMPC160 Thin Hermetic Borosilicate Glass Layers for Highly Reliable Chip-Passivations in Wafer-Level-Packaging**
Ulli Hansen, Jürgen Leib, Simon Maus, Oliver Gyenge, Michael Töpper
MSG Lithoglas, Fraunhofer IZM

15.15 **EMPC146 Encapsulation Challenges for Wafer Level Packaging**
Eric Kuah, Hao Ji Yuan (PhD), Li Qiu Fang, Ding Jia Pei (PhD), Chan Wei Ling, & SC Ho
ASM Technology Singapore Pte Ltd Encapsulation Solution Group (ESG)

High Power Packaging: Thermal modeling and Management

14.00 **EMPC109 Development of space grade power hybrid for Reaction Wheel drive electronics: Challenges and criticalities**
Krishnamohan Nutheti, Prabhu Dass, GR Joshi, Vedprakash and Vinod S Chippalkatti
K.S. Mani*, K.P. Lilly*, M. Suresh*, T.R. Haridas* and Robert Devasahayam*
Centum Electronics Limited, *ISRO Inertial systems unit

14.25 **EMPC143 Passive Phase Change Tower Heat Sink & Pumped Coolant Technologies for Next Generation CPU Module Thermal Designs**
M. Vogel, D. Copeland, A. Masto, S. Kang, B. Whitney, G. Upadhya M. Connors, J. Marsala
Sun Microsystems - Aavid Thermalloy - Cooligy - Thermacore - Thermal Form and Function

14.50 **EMPC103 A new methodology for multi-level thermal characterization of complex electronic systems : from die to board level**
Martins Olivier[1], Peltier Nicolas[2], Guedon Stéphane[2], Kaiser Sylvian[2], Marechal Yves[1], and Avenas Yvan[1]
[1]G2ELAB, INPG-UJF-CNRS, France - [2]DOCEA Power, France

15.15 **EMPC102 Thermal Design Considerations on Wirebond-Packages**
M. Mach, Dr. J. Müller
BMBF Center for Innovation Competence MacroNano®, TU Ilmenau

Sensor Packaging

14.00 **EMPC189 Low energy consumption thick-film pressure sensors**
Darko Belavič[1], Marina Santo Zarnik[1], Matej Možek[4], Sandi Kocjan[3], Marko Hrovat[2], Janez Holc[2], Mitja Jerlah[3], Srečko Maček[2]
[1]HIPOT-RR, Slovenia - [2]Jožef Stefan Institute, Slovenia - [3]HYB, Slovenia - [4]Faculty of Electrical Engineering, Slovenia

14.25 **EMPC63 The Design and Improvement of LTCC-based Capacitive Pressure Sensors employing Finite Element Analysis**
C. Ionescu[a], P.Svasta[a], C. Marghescua, M. Santo Zarnik[b], D. Belavič[b]
[a]University "Politehnica" of Bucharest, UPB-CETTI - [b]HIPOT-RR, Slovenia

14.50 **EMPC95 Evaluation of Printed Electronics Manufacturing Line with Sensor Platform Application**
Kimmo Kaija, Eerik Halonen, Ville Pekkanen, and Matti Mäntysalo
Tampere University of Technology, Finland

15.15 **EMPC81 SMD Pressure and Flow Sensors for Industrial Compressed Air in LTCC Technology**
Yannick Fournier, Aurélie Barras, Thomas Maeder, Peter Ryser
Laboratoire de Production Microtechnique Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Materials: Adhesives Properties and reliability I

14.00 **EMPC4 Temporary adhesives for wafer bonding: Deep reactive ion etching application**
Djaffar BELHARET[1,2], Pascal DUBREUIL[1,2], David COLIN[1,2], Laurent MAZENQ[1,2], Hugues GRANIER[1,2]
CNRS; LAAS; [2]Université de Toulouse; UPS, INSA, INP, ISAE; LAAS

14.25 **EMPC45 Experimental study of polymers as encapsulating materials for photovoltaic modules**
Simone Sala, Marco Campaniello, Alessandro Bailini
PV Laboratory, SEM S.r.l

14.50 **EMPC87 Process Characterization of DuPont MXAdvance 140 Dry Film Photoresist for High Resolution Application**
Hao Yun and Chester Balut, Alan Huffman
DuPont Electronic Technologies, RTI International

15.15 **EMPC62 Fracture Toughness Assessment of ACF Flip-chip packages under High Moisture Condition with Moire Interferometry**
Jin-Hyoung Park, Kyung-Woon Jang, Kyung-Wook Paik, and Soon-Bok Lee
Department of Mechanical Engineering KAIST, Korea

15.40 *Coffee Break in the Exhibition Area*

Advanced Packaging: 3D packaging I

16.00 **EMPC71 3D packaging and supply chain management**
Paul Collander

16.25 **EMPC86 3DIC products using TSV for mobile phone applications: An industrial perspective**
Yann Guillou, Anne-Marie Dutron
ST-NXP Wireless

16.50 **EMPC121 3D Integration with AC coupling for Wafer-Level Assembly**
M. Scandiuzzo[a], L. Perugini[a], R. Cardu[b], M. Innocenti[a], R. Canegallo[a]
[a]STMicroelectronics, [b]University of Bologna

17.15 **EMPC164 Direct interconnection of chemical mechanical polishing (CMP)-Cu thin films at 150°C in ambient air**
Akitsu Shigetou1, and Tadatomo Suga2
1National Institute for Materials Science, Japan, 2The University of Tokyo

17.40 **EMPC51 Introduction of a unified equipment platform for UV initiated processes in conjunction with the application of electrostatic carriers as thin wafer handling solution**
Dletrich Tönnies, Markus Gabriel, Barbara Neubert, Ran Ji, Ralph Zoberbier, Margarete Zoberbier, Reinhard Völkel, Michael Töpper, Tobias Baumgartner, Ingo Gräding, Roland Raschke, Ira Balaj
SUSS MicroTec, Fraunhofer IZM, Protec Carrier Systems

Materials: Solder Joint Properties and reliability II

16.00 **EMPC147 Mechanical behaviour of SAC-lead free solder alloys with regard to the size effect and the crystal orientation**
Villain, Juergen; Mueller, Wolfgang; Saeed, Usman Weippert
University of Applied Sciences, Germany

16.25 **EMPC148 NanoBond® Assembly - A Rapid, Room Temperature Soldering Process**
Greg Caswell
Reactive Nano Technologies

16.50 **EMPC79 New developments in high performance solder products for power die assemblies**
Mike Fenner
Indium Corporation

17.15 **EMPC185 Au-Sn SLID bonding: Fluxless bonding with high temperature stability, to above 350oC.**
Knut Aasmundtveit[a], Kaiying Wang[a], Nils Hoivik[a], Joachim Moe Graff[b], Anders Elfving[c]
[a]Vestfold University College, Norway, [b]SINTEF Materials and Chemistry, cInfineon Technologies SensoNor AS

17.40 **EMPC100 Long Term Joint Reliability of SiC Power Devices at 330**
Fengqun Lang[1], Satoshi Tanimoto[2,3], Yusuke Hayashi[1], Hiromichi Ohashi[1], Hiroshi Yamaguchi[1]
[1]Institute of Advanced Industrial Science and Technology (AIST), Japan
[2]Research and Development Association for Future Electron Devices (FED), Japan
[3]Nissan Motor Co. Ltd

Assembly Technology II

16.00 **EMPC124 Simulation and experimental analysis of substrate overmolding**
Thomas Schreier-Alt
Fraunhofer IZM

16.25 **EMPC74 Local hardening behavior of free air balls and heat affected zones of thermosonic wire bond interconnections**
C. Dresbach[1)], G. Lorenz[1)], M. Mittag[1)], M. Petzold[1)], T. Müller[1)]
Fraunhofer Institute for Mechanics of Materials[2)] W. C. Heraeus

16.50 **EMPC202 Compression Molding solutions for various high end Package applications and cost savings for standard Package applications**
Hideaki Matsutani
Towa Corporation

17.15 **EMPC173 Advanced Failure Analysis Methods and Microstructural Investigations of Wire Bond Contacts for Current Microelectronic System Integration**
R. Klengel, S. Bennemann, M. Krause, Chr. Schmidt, M. Petzold
Fraunhofer Institute for Mechanics of Materials

17.40 **EMPC203 Advanced Solutions for Ultra-thin Wafers and Packaging**
Gerald Klug
Disco

Substrates and Interconnects

16.00 **EMPC138 High Linearity and Broadband WiMAX Power Amplifier Design Using Board Level Integration Technology**
Wei-Ting Chen, Kuo-Chiang Chin, Cheng-Hua Tsai, Li-Chi Chang, Yung-Chung Chang, and Chang-Chih Liu
Industrial Technology Research Institute (ITRI), Taiwan

16.25 **EMPC8 Packaging and wired interconnections for insertion of miniaturized chips in smart fabrics**
Jean Brun, Dominique Vicard, Bruno Mourey
CEA-LETI

16.50 **EMPC67 Fully embedded optical and electrical interconnections in flexible foils**
E. Bosman, G. Van Steenberge, P. Geerinck, J. Vanfleteren and P. Van Daele
Ghent University

17.15 **EMPC197 Large panel, highly flexible multilayer thin film boards**
Hans Burkard, Wolfgang Kapischke, Josef Link
Hightec MC AG, Lenzburg, Switzerland

17.40 **EMPC180 A new low cost, elastic and conformable electronic technology for soft and stretchable electronic devices**
Frederick Bossuyt
University of Ghent

THURSDAY, JUNE 18TH

9.00 **Mems the future man machine interface**
KEYNOTE: *B. Vigna,* STMicroelectronics

9.40 **Heterogeneous Integration for System in Package**
KEYNOTE: *H. Reichl,* Fraunhofer IZM

10.20 *COFFEE BREAK IN THE EXHIBITION AREA*

Advanced Packaging: 3D packaging II

10.40 **EMPC101 Chip to Chip bonding using micro-Cu bumps with Sn capping layers**
Jin Soo Lee and Young-Ho Kim
Hanyang University, Korea

11.05 **EMPC172 3D integration process flow for set-top box application: description of technology and electrical results**
S. Cheramy[(1)], D. Henry[(1)], A. Astier[(1)], J. Charbonnier[(1)], P. Chausse[(1)], M. Neyret[(1)], C. Brunet-Manquat[(1)], S. Verrun[(1)], N. Sillon[(1)], L. Bonnot[(2)], X. Gagnard[(2)], J. Vittu[(3)]
[(1)]CEA Léti - MINATEC, [(2)]STMicroelectronics, [(3)]STMicroelectronics

11.30 **EMPC161 Modeling and Quantification of Conventional and Coax-TSVs for RF Applications**
Ivan Ndip[1], Brian Curran[1], Stephan Guttowski[1], Herbert Reichl[1,2]
[1]Fraunhofer Institute IZM, [2]Technische Universität Berlin

11.55 **EMPC162 Stacking of Full Rebuilt Wafers for Sip and Abandoned Sensors / Applications**
Christian Val, Pascal Couderc, Nadia Boulay Jean-Charles Souriau
3D Plus, CEA-LETI Minatec

Mems System Packaging

10.40 **EMPC2 A 3-D packaging concept for cost effective packaging of MEMS and ASIC on wafer level**
Tobias Baumgartner, Michael Töpper, Matthias Klein, Bernhard Schmid, Heikki Kuisma, Sami Nurmi, Hannu Kattelus, James Dekker, Ralph Schachler
Fraunhofer-Institut

11.05 **EMPC53 Encapsulation of the Next Generation advanced Mems& Sensor Microsystems**
Ton van Weelden
Boschman Technologies B.V.

11.30 **EMPC55 BCB-based wafer-level packaging of integrated CMOS/SOI piezoresistive accelerometer**
Dominik Weiland, Aboubacar Chaehoi*, Diarmuid O'Connell*, Mark Begbie*, Changhai Wang**, Shona Ray****
*Institute for System Level Integration, Livingston, **Heriot Watt University, Edinburgh, ***Semefab Ltd

11.55 **EMPC168 Versatile MEMS and MEMS integration technology platforms for cost effective MEMS development**
Philip Pieters
IMEC

Materials: Adhesives Properties and Reliability II

10.40 **EMPC184 Thermo Mechanical Characterization of Packaging Polymers**
Bjoern Boehme1, K.M.B. Jansen2, Sven Rzepka3, Klaus-Juergen Wolter1
1)Technische Universitât Dresden - 2)Delft University of Technology - 3)Qimonda Dresden

11.05 **EMPC106 Characteristics of Electrically Conductive Adhesives filled with Copper Nanoparticles with Organic Layer**
LiNgee Ho, Hiroshi Nishikawa*, Tadashi Takemoto*, Yukiyasu Kashiwagi**, Mari Yamamoto**, Masami Nakamoto***
*Osaka University, **Osaka Municipal Technical Research Institute

11.30 **EMPC22 Highly Conductive Adhesives via Novel Heterogeneous Structures**
T.D. Fornes, P.W. Hough
LORD Corporation, LORD Germany GmbH

11.55 **EMPC182 Comparison between Die Attach Film (DAF) and Film Overover Wire (FOW) on Stack-die CSP Application**
C.L. Chung, C.W. Ku, H.C. Hsu and S. L. Fu
I-SHOU University, Taiwan

IMAPS Global Business Council Photovoltaics

10.40 **APOLLON: the Large Integrated European Project of FP7 on Concentrating Photovoltaic, target objectives on technology and cost**
Gianluca Timo
CESI RICERCA

11.05 **Crystalline Si Solar Cells: Markets and Technology**
Andy London
Hereaus

11.30 **Photovoltaic Present and Future - The Si potentialities**
Domenico Sartore
Estelux S.p.a

11.55 **TBA**

12.30 **Technology Knowledge Gaps Projects arising from the iNEMI Technology Roadmap**
B. Pfahl, J. Arnold and G. O'Malley, INEMI

12.50 **Economic Recovery Through Technological Innovation and Creativity**
Chuck Bauer

13.10 **Conference Close and preview ESTC2010 and EMPC2011**

TUESDAY, JUNE 16TH 10.30 - 11.20
WEDNESDAY, JUNE 17TH 10.20 - 11.20

Poster Session

EMPC5 Integrated LTCC-glass microreactor and μTAS with thermal stabilization for biological application
Pawel Bembnowicz, Dorota Nowakowska, Leszek J.
Wroclaw University of Technology, Poland

EMPC6 Fabrication & characterization of S-band power amplifier MMIC (GaAs Die) implemented in hybrid fixture.
Bhatti Nadeem Shahzad
National Engineering & Scientific Commission (Nescom), Islamabad

EMPC7 High speed packaging solutions for LiNbO3 electro-optical modulator
Stefano Bonino, Roberto Galeotti, Luigi Gobbi
Avanex

EMPC14 MEMS Pressure sensors - new LGA Packagings
Lorenzo Baldo,Mark Azzopardi,** Fulvio Fontana***, Selma Gatt ***
*ST MEMS & Healthcare, **ST Microelectronics Corporate Packaging and Automation
***ST Microelectronics Corporate Packaging and Automation

EMPC23 Application of 3D modeling tools for advanced packaging on a broad range of industrial applications
Yvon IMBS[1], Laurent MARECHAL[1], David AUCHERE[1], Giovanni GRAZIOSI[2], Jason DEBONO[3]
STMicroelectronics Grenoble[1], Agrate[2], Kirkop[3]

EMPC24 Experimental Characterization Of Thermo-Mechanical Properties Of Lead-Based Solders For Power Electronics Packaging Reliability Applications
S. JACQUES[(a)(b)], J. ROUBION[(c)], N. BATUT[(b)], R. LEROY[(c)], L. GONTHIER[(a)(b)(a)]
[(a)]STMicroelectronics - [(b)]"Laboratoire de Microélectronique de Puissance (LMP)", University of Tours, France - [(c)]"Laboratoire de Mécanique et Rhéologie (LMR)", University of Tours

EMPC31 Package design for alleviating stress in materials embedded with electronic systems
Maryna Lishchynska, Kieran Delaney
Cork Institute of Technology

EMPC32 Development of low-firing lead-free thick-film materials for piezoresistive sensors on steel substrates
Caroline Jacq, Thomas Maeder, and Peter Ryser
Ecole Polytechnique Fédérale de Lausanne

EMPC35 Electromagnetic Simulations For The Packaging Design Of Telecommunication Component
L. Maggi, G. Ticozzi
PGT PHOTONICS SpA

EMPC42 Size and Microstructure Effects on the Stress-Strain Behaviour of Lead Free Solder Joints
Pradeep Hegde, David C. Whalley and Vadim V. Silberschmidt
Loughborough University, UK

EMPC46 Fine D.A. Delamination analysis by Acoustic Microscope
G. Santospirito, A. Terzoli
ST Microelectronics

EMPC49 Modeling of Flip Chip Bump Patterns to minimize Crosstalk on a BU-BGA package design
Pierre Brunet, Keith Sheach, Gordon Xiang
High Speed Package Design, Ottawa Design Center, STMicroelectronics

EMPC58 Latest Plasma Cleaning Technology
Reinhard Windemuth
Panasonic Industrial Europe GmbH

EMPC59 A Study on High-density High-speed SerDes Design in Buildup Flip Chip Ball Grid Array Packages
Gordon Xiang, Pierre Brunet, Keith Sheach
High Speed Package Design, Ottawa Design Center, STMicroelectronics

EMPC60 Novel methodology for analyzing variation risk introduced by the manufacturing and/or assembly process in Microsystems
Yunfei Sun[1], Clifford R Fowkes[2], Nabil Gindy[1]
[1]University of Nottingham, UK - [2]Knowledge Transfer Network,UK

EMPC61 Deposition and characterization of electroless Ni-Co-P alloy for diffusion barrier applications
Anuj Kumar, Mukesh Kumar, Dinesh Kumar*
Kurukshetra University

EMPC64 Investigation of Solder Joints by Thermographical Analysis
P. Svasta[a], C. Ionescu[a], N.D. Codreanu[a], D. Bonfert[b]
[a)]University "Politehnica" of Bucharest - [b)]PS, Fraunhofer Institute Reliability and Microintegration / IZM-M

EMPC70 Metal Trace Impact Life Prediction Model for Stress-Buffer-Enhanced Package
Chan-Yen Chou, Chao-Jen Huang, Masafumi Sano, and Kuo-Ning Chiang
National Tsing Hua University, HsinChu, Taiwan

EMPC73 Pot Life Improvement of Low Temperature and High-speed Curable Anisotropic Conductive Adhesive
Jong-Hyun Lee, Ju-Hyung Kim, Chang-Yong Hyun*
Seoul National University of Technology

EMPC77 Thermoelastic Properties of Printed Circuit Boards II: Effect of Copper Trace
Hu Guojun, Goh Kim Yong, Luan Jing-en, Lim Wee Chin and Xavier Baraton
STMicroelectronics

EMPC84 Experimental analysis on the mechanism of moisture induced interface weakening in ACF package
Gi-Dong Sim
KAIST - Korea

EMPC90 Solder Process Optimization: Influence of Heating and Cooling Rate on the Thermo-Mechanical Stress Generated in Components
Michael Hertl, Diane Weidmann, Jean-Claude Lecomte
INSIDIX

EMPC99 Electrostatic wafer handling for thin wafer processing
Christof Landesberger, Robert Wieland, Armin Klumpp, Peter Ramm, Andreas Drost, Ulrich Schaber, Detlef Bonfert, Karlheinz Bock
Fraunhofer-Institute for Reliability and Microintegration IZM

EMPC108 Design and Fabrication of Corrosion and Humidity Sensors for Performance Evaluation of Chip Scale Hermetic Packages for Biomedical Implantable Devices
Nooshin Saeidi
University College London

EMPC111 Far-End Maximum Crosstalk for Coupled Lines as a Function of Load
Amir Owzar, Ralph Stephan, Wesley Petersen, Markus Helfenstein
ST-Wireless

EMPC113 Optimization of thermomechnical reliability of WLCSP packages
AMIR R PAKDEL
PMC-SIERRA INC.

EMPC114 Effects of test conditions on bending impact of lead free solder
JAIHYUN PARK
RIST - South korea

EMPC115 Connector reliability testing using salt spray
A. Parviainen, J. Perälä, S. Kuusiluoma, and L. Frisk
Tampere University of Technology

EMPC119 Bisected thermodynamic sensor as the power AC/DC transmitter
Řezníček Michal[(1)], Szendiuch Ivan[(1)], Řezníček Zdeněk, Jr.[(2)], Řezníček Zdeněk, Sr.[(3)],
[(1)]Department of Microelectronics, Brno University of Technology - [(2)]Department of Radio Electronics, Brno University of Technology - [(3)]HIT Ltd, Czech Republic

EMPC125 Mechanical and Microstructural Properties of SiC-Mixed Sn-Bi Solder Bump
Chang-Woo Lee, Yue-Seon Shin, Sehyung Lee, Sehoon Yoo
Korea Institute of Industrial Technology

EMPC128 New Facts from Lead-free Solders Reliability Investigation
Ivan Szendiuch, Jaroslav Jankovsky
Brno University of Technology

EMPC134 Novel interconnection processes for low cost PEN/PET substrates
Jeroen van den Brand[1], Roel Kusters[1,2], Henri Fledderus[1], Eric-Jan Rubingh[1], Tomas Podprocky[3], Andreas Dietzel[1]
[1]Holst Centre/TNO - Netherlands Organisation for Applied Scientific Research, [2]TNO Science and Industry - Netherlands Organisation for Applied Scientific Research, [3]Imec

EMPC135 Characterization of PTC resistor pastes applied in LTCC technology
J. Vanek, W. Smetana[1)], I. Szendiuch
Brno University of Technology, Brno, Czech Republic - [1)]Vienna University of Technology

EMPC139 Influence of the Fabrication Errors on Multilayer Thick Film Circuits
Wesam Ali[1], Chunwei Min, Nurul Osman[2], and Charles Free[2]
[1]College of Technological Studies, Kuwait - [2]University of Surrey

EMPC142 Investigation of the Relationship between Material Selections and Moisture Sensitivity Levels of Quad Flat No-lead (QFN) Packages
Minshu Zhang and S. W. Ricky Lee
Hong Kong University of Science and Technology, Clear Water Bay

EMPC150 Solder Materials for IGBT Usage
Mike Fenner
Indium Corporation

EMPC154 Moisture Sensitivity Level One(1) And Green Packaging Solution For A Nickel-Palladium-Gold (Nipdau) Pre-Plated Frames
Alvin B. Denoyo
Cypress Manufacturing Ltd

EMPC159 Fatigue Life Prediction of Plated Through Holes(PTH) under Thermal Cycling
No-Chang Park, Chul-Min Oh, Byeong-Suk Song, Chang-Woon Han, Won-Sik Hong
Korea Electronics Technology Institute

EMPC165 Damage Risk Assessment of Under-Pad Structures in Vertical Wafer Probe Technology
Torsten Hauck, Ilko Schmadlak*, Wolfgang H. Müller***
*Freescale Halbleiter Deutschland GmbH - **Technische Universität Berlin

EMPC169 Reliability Testing of Frequency Converters with Salt Spray and Temperature Humidity Tests
Janne Kiilunen, Laura Frisk
Tampere University of Technology

EMPC174 Effects of Defects on the Thermal and Optical Performance of High Brightness Light Emitting Diodes
*Liuxi Tan[1,2], Jia Li[1,2], Kai Wang[1,3], Sheng Liu[1,2,3]**
[1]Huazhong University, China - [2]School of Mechanical Engineering, Huazhong University, China - [3]School of Optoelectronics Science and Engineering, Huazhong University, China

EMPC178 Modeling of hygrothermal behavior of enclosed device: Effects of mechanics and materials
Galkin Timo
Nokia Siemens Networks

EMPC183 A Novel Thermo-Mechanical Method of Fatigue Characterization of Real Solder Joints
R. Metasch, M. Röllig**, K.-J. Wolter*
*TU-Dresden - **Fraunhofer Institut für Zerstörungsfreie Prüfverfahren

EMPC187 Optimization of Flip-chip Laser Soldering for Low Temperature Stability Substrate
Tamás Hurtony, Bálint Balogh, Péter Gordon
Budapest University of Technology and Economics

EMPC193 Long Term Stability of Polymer Based Resistors Tested by Noise, Non-Linearity and Electro-Ultrasonic Spectroscopy
V. Sedlakova, P. Tofel, J. Sikula
Brno University of Technology

EMPC195 Interface Resistance between Polymer Based Conducting and Resistive Layers
V. Sedlakova, P. Tofel, M. Chvatal, J. Sikula
Brno University of Technology