2007 International Conference on Electronic Materials and Packaging

Daejeon, Korea
19-22 November 2007

IEEE Catalog Number: CFP07506-PRT
ISBN 13: 978-1-4244-1909-8

Table of Contents

QFN Assembly Dilemma - Solutions 1
Tan Chee Eng, Pan Yen Jeat, Chin Meei Lian, Chin Lap Sin, Geale Fonseka

Reliability Analysis of Copper Interconnection in System-in-package Structure 6
Shih-Ying Chiang, Chan-Yan Chou, Ming-Chih Yew, Kuo-Ning Chiang

Warpage Analysis of an LCD Panel under Thermo-Mechanical and Hygro-Mechanical Stress 11
Tomonori Mizutani, Toru Ikeda, Kiyoshi Miyake, Noriyuki Miyazaki

Warpage Control of Wireless LAN SiP during Manufacturing Process 18
Shan Gao, Jupyo Hong, Jungho Hyun, Seogmoon Choi, Sung Yi

Electrical Conducting Behavior of Hybrid Nanocomposites Containing Carbon Nanotubes and Carbon Black 22
Peng Cheng Ma, Hao Zhang, Sheng Qi Wang, Yiu Kei Wong, Ben Zhong Tang, Soon Hyung Hong, Kyung-Wook Paik, Jang-Kyo Kim

Low Temperature Processing for Integrated Magnetics 26
B. K. Lok, Kyung W. Paik, L. L. Wai, W. Fan, Albert C.W. Lu, Kp. Pramoda

On the Study of MOSFET Micro-Sensors for Electronic Packaging 48
M. I. Yang, Y. C. Chao, K. F. Tseng, H. Chung, C. P. Tang, B. J. Lwo

Thermal Simulation and Power Map Modeling Sensitivity Study for Chipset Silicon 53
Eng Kwong Lee, Dhinesh Sasidaran, Wai Keong Cheang, Song Chin Deo, Kiat Hong Ng, Chee Siong Lee

Enabling Recipe Automation for Non SECS/GEM Semiconductor Assembly Machines. 58
Heong Chee Meng, Amin Mohd Sani

Effects of Aging and Underfills on Mechanical-Drop Tests of SnAgCu PBGA (Plastic Ball Grid Array) Packages on ImAg PCB (Printed Circuit Board) 65
John Lau, Jeffery Lo, Jimmy Lam, Eng-Leong Soon, Woai-Sheng Chow, Ricky Lee

Electrical and Reliability Properties of Isotropic Conductive Adhesives (ICAs) on Immersion Silver Printed Wiring Boards (PWBs) 73
Jeahuck Lee, C.S. Cho, James E. Morris

Transmission property of adhesive interconnect for high frequency applications 77
Jong-Woong Kim, Young-Chul Lee, Jae-Hoon Ko, Wansoo Nah, Seung-Boo Jung

Determination of LED Die Strength 83
C. H. Chen, M. Y. Tsai, J. Y. Tang, W. L. Tsai, T. J. Chen

Characterization of Residual Strains of the EMC in PBGA during Manufacturing and IR Solder Reflow Process 89
M. Y. Tsai, C. W. Ting, C. Y. Huang, Y. S. Lai, Kwei-Shan, Tao-Yuan

Planar Antennas on Flexible Substrate for Wireless Applications 97
Hsien-Chiao Teng, Pei-Ju Lin, Ming-Kun Chen, Yu-Jung Huang, Shen-Li Fu

Study of Contact Degradation in Final Testing for BGA Socket 101
Hsien-Chiao Teng, Ming-Kun Chen, Chia-Hao Yeh, Yu-Jung Huang, Shen-Li Fu

MCM Placement Problem with GASA Multi-objective Optimization Strategy 107
Shih-Jhe Lin, Yu-Jung Huang, Ching-Mai Ko

Tensile Test of Notched Metal Film by Means of Thermal Expansion of Plastics 114
Naoya Tada, Ichiro Shimizu, Kazumasa Uemori

A Nondestructive Evaluation System for Detecting Open Failures of Micro Bump Interconnections in 3D-Stacked Structures 121
Yuki Sato, Hideo Miura

Table of Contents

Intermetallic compound formation and solder joint reliability of Sn-Ag-Cu solder ball on Cu-Zn substrate 127
Hee-Ra Roh, Young-Ho Kim

Investigation of the Thermal Performance of High-Concentration Photovoltaic Solar Cell Package 131
Tsung-Lin Chou, Zun-Hao Shih, Hwen-Fen Hong, Cheng-Nan Han, Kou-Ning Chiang

Filling of Very Fine Via Holes for Three Dimensional Packaging by Using Ionized Metal Plasma Sputtering and Electroplating 137
Byeong-Hoon Cho, Jae-Jin Yun, Won-Jong Lee

Local Distribution of Residual Strain in 3-D Stacked Flip Chips Measured by Strain Sensor Chips with 2-.m long Piezoresistive gauges 140
Takuya Sasaki, Nobuki Ueta, Hideo Miura

Accuracy Improvement of Full-field Displacement Measurement Using Digital Image Correlation for Images Obtained with a Laser Scanning Confocal Microscope 146
Nobuyuki Shishido, Toru Ikeda, Noriyuki Miyazaki

Numerical simulations for the Transmission Characteristics of Polymer-based Optical Wave-guide 151
Masaki Omiya, Akira Shinozaki, Kikuo Kishimoto

Geometric and Compaction Dependence of Printed Polymer-Based RFID Tag Antenna Performance 166
S Y Y Leung, D C C Lam

Parametric Analysis and Design of Ultra Fine Assembly of Micro Dies 173
S Y Y Leung, D C C Lam

Formation of Sn-Multiwalled Carbon Nanotube Composite Layer for the Application of Thermal Interface Materials 179
Jung-Sub Lee, Sivakumar Vaidyanathan, Duk Young Jeon

Study on Fatigue Strength Characteristics for Solder Joints 185
Daisuke Kaneko, Hirotsugu Inoue, Kikuo Kishimoto, Masaki Omiya, Masazumi Amagai

The Effect Of Bonding Conditions On The Electrical Properties Of Solder Joints Fabricated By Mechanical Caulking Using Reflowed SnBumps 189
Ju-Heonyang, Young-Ho Kim, Koreajae-Seung Moon, Won-Jong Lee

The Reliability of 30 . pitch COG joints fabricated using Sn/Cu bumps and non-conductive adhesive 222
Byeung-Gee Kim, Sang-Mok Lee, Young-Ho Kim

Fundamental research for the horizontal plane drive of an injection-molding pantograph mechanism for grasping and assembling a small object within a fixed view 225
Mikio Horie, Koutaro Yamaura, Daiki Kamiya, Masaharu Kouno, Masato Nakamura

Development of Lamination Process for Chip-in-Substrates 229
Jong Woon Kim, Hwa Sun Park, Sang Chul Lee, Yul Kyo Chung, Seog Moon Choi, Sung Yi

Wafer Level Encapsulation Process for LED Array Packaging 235
Rong Zhang, Shi-Wei Ricky Lee

Effect of Surface Conditions on Interfacial Adhesion between PCB and EMC 243
Dongkil Shin, Hyunkyung Han, Donghun Lee, Younghee Song, Jay Im

Thermal Stability at the Anisotropic Conductive Films (ACFs) / Organic Solderability Preservatives (OSPs) Interface 248
Il Kim, Hyoung-Joon Kim, Kyung-Wook Paik

Structural Design of Three-dimensionally Stacked Silicon Chips for Minimizing Their Residual Stress 253
Nobuki Ueta, Hideo Miura

Transient Current Modeling & Power Delivery Analysis for Next Gen Chipset Core 259
Fern Nee Tan, Aissa Chai, Sze Geat Pang, Dhinesh Sasidaran, Kiat Hong Ng, Song Chin Deo, Chee Siong Lee, Jin Sean Lim, Poey Ling Ooi, Chee Ngai Loke, Meng Chong Lim

Table of Contents

Thermal Cycling Reliability of Cu/SnAg Double-Bump Flip-chip Assemblies for 100um Pitch Applications 282
Ho-Young Son, Il-Ho Kim, Soon-Bok Lee, Gi-Jo Jung, Byung-Jin Park, Kyung-Wook Paik

Theoretical Prediction and Experimental Measurement of the Degree-of-Cure of Anisotropic Conductive Film (ACF) for Chip-On-Flex (COF) applications 289
Chang-Kyu Chung, Yong-Min Kwon, Il Kim, Ho-Young Son, Kyo-Sung Choo, Sung-Jin Kim, Kyung-Wook Paik

Room Temperature ACF Bonding Process using Ultrasonic Vibration For Chip-On-Board and Flex-On-Board Applications 297
Kiwon Lee, Hyoung-Joon Kim, Kyung-Wook Paik

Effect of electoless Ni/Au UBM thickness on mechanical and electromigration relibility of Pb-free solder joints 305
Yong-Min Kwon, Kyung-Wook Paik

Effects of Anisotropic Conductive Film (ACF) Viscosity on ACF Fillet and Moisture-Related Reliability for Flip-Chip-On-Board (FCOB) Packages 310
Kyung-Woon Jang, Kyung-Wook Paik

Effect of Sb Addition in Sn-Ag-Cu Solder Balls on the Drop Test Reliability of BGA Packages with Electroless Nickel Immersion Gold (ENIG) Surface Finish 317
Yong-Sung Park, Yong-Min Kwon, Ho-Young Son, Jeong-Tak Moon, Byung-Wook Jeong, Kyung-In Kang , Kyung-Wook Paik

Fabrication and characterization of Epoxy/BaTiO3 composite capacitor films for high frequency behaviors 322
Jin-Gul Hyun, Sangyong Lee, Kyung-Wook Paik

Effects of annealing and electromigrationon intermetallic compound formation of Cu pillar bump 330
Byoung-Joon Kim, Gi-Tae Lim, Jang-Hee Lee, Jaedong Kim, Kiwook Lee, Young-Bae Park, Young-Chang Joo

Process Characterization Of Aluminum Ribbon Bond 349
Fy Lim, Wo Low, Cc Lee, Bob Rizal

EXPERIMENTAL AND NUMERICAL INVESTIGATIONS OF TWO INLINE PLCC PACKAGES HORIZONTAL MOUNTED 354
Z. Mohd Ali, S. Yusoff, M. Z. Abdullah

Natural Convection of Discrete Heating in a Cavity Filled by Porous Media for Different Aspect Ratio 362
M. Z. Abdullah, Y. Yaakob, F. Idrus, M. K. Abdullah

Torsional Fatigue Life Prediction Method for DRAM Module 373
Yeo Hoon Yoon, Yong Ho Ko, Ho Jung Moon, Se Young Yang

New Simplified Measuring Method for Birefringence Distribution 379
Kenji Gomia, Tomoyuki Suzukib, Kensuke Ichinosea, Yasushi Niitsuc

Dynamic Finite Element Analysis on Underlay Microstructure of Cu/low-K Wafer during Bonding Process 383
Hsiang-Chen Hsu, Wei-Yaw Chang, Shen-Li Fu, Chang-Lin Yeh, Yi-Shao Lai

Solder Joint Reliability with Variations Of Solder Ball Land Design 389
Young Hy Jung

The Availability of the Thermal Resistance Model in Flip-chip Packages 410
Woong Sun Lee, Kwang Yoo Byun

Effect of In Addition on the Reaction and Mechanical Properties in Sn-Ag-Cu-In Solder Alloy 415
A Mi Yu, Chang-Woo Lee, Jeong-Han Kim, Mok-Soon Kim, Jong-Hyun Lee

MEMS packaging technology using a cavity structure for mass production 419
J. S. Lee, F. Faheem, J. T. Kim, J. D. Jung, J. Y. Kim, J. D. Kim, C. H. Lee

Table of Contents

Interfacial reactions and drop reliabilities of lead-free solder joints with electrolytic Cu metallizations. 425
Young Kun Jee, Jong Yeon Kim, Jin Yu, Taek Yeong Lee

Electrical Characterization of Trough Silicon Via (TSV) depending on Structural and Material Parameters based on 3D Full Wave Simulation 432
Jun So Pak, Chunghyun Ryu, Joungho Kim

Thermal behavior of Snnanowiresfor nano-interconnection 438
Hosun Shin, Jaeyong Song, Jin Yu

Board Level Reliability Assessments of Package on Package 454
Tae-Kyung Hwang, Eun-Sook Sohn, Won-Joon Kang, Se-Woong Cha, Joon-Yeob Lee, Chan-Ha Hwang, Choon-Heung Lee

A study on early degradation phenomena in Au-Al ball bonds 461
Jong-Soo Cho, Jin-Yong Kim, Jeong-Tak Moon, Eun-Kyu Her, Kyu-Hwan Oh

High resolution AFM Moiré technique for the detection of defects in nano structure 477
Jin-Hyoung Park, Soon-Bok Lee

UNDERFILL FLOW PERFORMANCE ASSESSMENT 481
Yewchoon Chia, K. S. Chian, S. Yi

Effects of W addition in Ni(P) UBM on the solder joint reliability 485
D. M. Jang, Jin Yu