Wednesday, April 17

	International Conference Hall (4F)	
10:00 10:40	**Ceremony**	10:00 10:40
10:40 11:40	**Keynote Lecture I** **The Role of Packaging and System Integration in Future Compute Platforms** **Bruno Michel, IBM Research Laboratory / Switzerland** Chairs: Toyohiro Aoki, IBM Japan, Yasumitsu Orii, Nagase	10:40 11:40
11:40 12:40	**Keynote Lecture II** **Technology Trend of Flash Memory and New Memory** **Susumu Yoshikawa, Toshiba Memory Corporation / Japan** Chairs: Kazuya Okamoto, Yamaguchi University, Eiji Higurashi, AIST	11:40 12:40
12:40 13:40	**Lunch**	12:40 13:40
13:40 14:40	**Keynote Lecture III** **GPU: the Key Processor for AI and Supercomputing** **Toru Baji, NVIDIA / Japan** Chairs: Akitsu Shigetou, NIMS, Jun Mizuno, Waseda University	13:40 14:40
14:40 15:40	**Keynote Lecture IV** **Heterogeneous Integration on Fanout Packages** **Shin-Puu Jeng, Taiwan Semiconductor Manufacturing Company, Ltd. / Taiwan** Chairs: Yasumitsu Orii, Nagase, Shigenori Aoki, LINTEC	14:40 15:40
15:40 16:40	**Poster Session / Break (3F)**	15:40 16:40

	Room A (3F)	Room B (3F)	Room C (3F)	Room D (3F)	Room E (3F)	
16:40 18:20	**WA1: iNEMI Session** Chairs: Yoshihiro Tomita, Intel, Kazuya Okamoto, Yamaguchi University **WA1-1** <Session Invited> **Packaging Technology Roadmap and Electronics Manufacturing Challenges and Opportunities** Benowitz Marc, Tsuriya Masahiro, International Electronics Manufacturing Initiative / USA **WA1-2** **Benchmarking of Qualification Methodologies for New Package Technologies and Materials** Curtis Grosskopf[1], Feng Xue[1], David Locker[2], Sven Thomas[3], Jiayu Zheng[1], Masahiro Tsuriya[4], [1]IBM Systems Supply Chain Engineering / USA, Singapore, China, [2]US Defense Department / USA, [3]Heraeus Deutschland GmbH & Co. KG / Germany, [4]iNEMI / Japan **WA1-3** **Inspection / Metrology Evaluation of Fine Pitch Test Vehicles for Advanced Packages** Feng Xue[1], Joe Zou[2], Cindy Han[3], Charles Reynolds[4], Thomas Wassick[4], Glenn Pomerantz[4], Jason Frankel[4], Ravi Bonam[5], Charles Woychik[6], Masahiro Tsuriya[7], [1]IBM Systems Supply Chain Engineering / Singapore, [2]Intel / USA, [3]Wistron Corp. / Taiwan, [4]IBM Systems Packaging Development / USA, [5]IBM Research / USA, [6]I3 Electronics, Inc / USA, [7]iNEMI / Japan **WA1-4** **Molded Electronic Package Warpage Predictive Modelling Methodologies** Ong, Kang Eu[1], Wei Keat Loh[1], Ron W. Kulterman[2], Chih Chung Hsu[3], Jenn An Wang[3], Haley Fu[4], [1]Intel Technology Sdn. Bhd. / Malaysia, [2]Flex Ltd / USA, [3]CoreTech System / Taiwan, [4]iNEMI / China	**WB1: Pan Pacific Micro Electronics Symposium Sponsored Session** Chairs: Charles E. Bauer, TechLead Corporation, Yasumitsu Orii, Nagase **WB1-1** <Special Speech> [50min] **Moore's Law for Packaging to Replace Moore's Law for ICs** Rao R. Tummala, Georgia Institute of Technology / USA **WB1-2** <Session Invited> **Wearables & Implantables: How Technology Transforms Health Care … How Health Care Transforms Technology** Matthew Hudes, bdl Bilologx / USA **WB1-3** <Session Invited> **3D & Printed Electronics Manufacturing Strategies** Chris Bailey, University of Greenwich / United Kingdom	**WC1: Taiwan Session** Chairs: Shoji Uegaki, E-ThermoGentek, Jun Mizuno, Waseda University **WC1-1** <Session Invited> **A Novel Wafer-Level Package for New Wave MEMS** Jeff Kuo, ASE Group / Taiwan **WC1-2** <Session Invited> **Low-Temperature Lead-Free Solders: Phase Equilibria and Interfacial Reactions** Shih-kang Lin, National Cheng Kung University / Taiwan **WC1-3** <Session Invited> **Fabrication of Advanced Microelectronic Interconnections with the Assistance of Light Irradiations** Jenn-Ming Song, National Chung Hsing University / Taiwan **WC1-4** <Session Invited> **Enhancement of Nano-Silver Chip Attachment by Using Transient Liquid Phase Reaction with Indium** C. Robert Kao, National Taiwan University / Taiwan	**WD1: Materials and Processes-1** Chairs: Koichi Hirano, Panasonic, Tetsuya Onishi, Grand Joint Technology **WD1-1** **An Investigation of Compound Machining of Ceramic-LPM Package by Ultrafast Laser** Shih-jeh Wu[1], Hsiang-Chen Hsu[1,2], Wen-Fei Lin[1], Yeh Chang[1], Ching-Pin Yen[1], [1]I-Shou University, [2]St. John's University / Taiwan **WD1-2** **Evaluation and Benchmarking of Cu Pillar Micro-Bumps with Printed Polymer Core** Xing Qiu[1], Jeffery C. C. Lo[1], S. W. Ricky Lee[1], Ying-Hong Liou[2], Peter Chiu[2], [1]Hong Kong University of Science & Technology / Hong Kong, [2]DETEKT, Tu-Cheng District / Taiwan **WD1-3** **Highly Reliable Four-Point Bending Test Using Stealth Dicing Method for Adhesion Evaluation** Yi-Lun Yang[1,2], Jia-Ling Liu[2], Guan Wei Chen[2], Shoichi Kodama[1,3], Kyosuke Kobinata[1,3], Kuan-Neng Chen[1,2], Hiroyuki Ito[1], Young Suk Kim[1,3], Takayuki Ohba[1], [1]Tokyo Institute of Technology / Japan, [2]National Chiao Tung University / Taiwan, [3]DISCO Corporation / Japan **WD1-4** **X-ray Radiolysis-Based Three Dimensional Additive Manufacturing Process** S. Saegusa[1], I. Sakurai[2], I. Okada[2], T. Fukuoka[1], S. Suzuki[1], Y. Utsumi[1], A. Yamaguchi[1], [1]University of Hyogo, [2]Nagoya University / Japan	**WE1: Thermal-Management-1** Chairs: Hitoshi Sakamoto, Huawei Technologies Japan, Tomoyuki Hatakeyama, Toyama Prefectural University **WE1-1** **From Package to System Thermal Characterization and Design of High Power 2.5-D IC** Huang Hung-Hsien, Cheng-Yu Tsai, Jung-Che Tsai, Meng-Kai Shih, David Tang, CP Hung, ASE Inc. / Taiwan **WE1-2** **An Enhanced Vapor Chamber using Dielectric Organic Refrigerant** Mahiro Hachiya, Minoru Yoshikawa, NEC Corporation / Japan **WE1-3** **Heatsink Design Using Spiral-fins Considering Additive Manufacturing** Shingo Otake[1], Yoshihiro Tateishi[1], Hiromichi Gohara[2], Ryoichi Kato[2], Yoshinari Ikeda[2], Victor Parque[1], Muhammed Khairi Faiz[1], Makoto Yoshida[1], Tomoyuki Miyashita[1], [1]Waseda University, [2]Fuji Electric Co., Ltd. / Japan	16:40 18:20
19:00 21:00	**Welcome Reception (Hotel Nikko Niigata 4F)**					19:00 21:00

Thursday, April 18

	International Conference Hall (4F)	
9:00 9:50	**Keynote Lecture V** **Technical Issues on Micro Display with GaN-Based Micro LEDs** **Tohru Honda, Kogakuin University / Japan** Chairs: Atsushi Okuno, Green Planets Co., Ltd., Yoshio Nogami, Toray Engineeing	9:00 9:50
9:50 10:40	**Keynote Lecture VI** **Printing in the Third Dimension; Design, Materials, Equipment & Applications in Electronics** **Charles E. Bauer, TechLead Corporation / USA** Chairs: Osamu Suzuki, NAMICS, Yasumitsu Orii, Nagase	9:50 10:40
10:40 11:00	**Break (3F)**	10:40 11:00

	Room A (3F)	Room B (3F)	Room C (3F)	Room D (3F)	Room E (3F)	
11:00 12:40	**TA1: Advanced Packaging-1** Chairs: Yoshihiro Tomita, Intel, Masahiro Aoyagi, AIST **TA1-1** **Copper-to-Copper Direct Bonding Using Different (111) Surface Ratios of Nanotwinned Copper Films** J. W. Huang, K. C. Shie, H. C. Liu, Y. J. Li, H. Y. Cheng, C. Chen, National Chiao Tung University / Taiwan **TA1-2** **Investigation of Mechanism of Corrosion Resistance of Pd Coated Cu Wire Joint by Pseudo Process** Shunsuke Nemoto[1], Takehiko Maeda[1], Masahiro Miyajima[1], Yasuhiko Akaike[1], Katsuhiko Kitagawa[1], Hideki Ishii[1], Haruo Shimamoto[2], Katsuya Kikuchi[2], [1]Renesas Electronics Corporation, [2]AIST / Japan **TA1-3** **Direct Bonding with Ni-P Finished DBC Substrate with Sinter Ag Micro-sized Particles** Chuantong Chen, Zheng Zhang, Takuya Misaki, Shijo Nagao, Katsuaki Suganuma, Osaka University / Japan **TA1-4** **Development of Stretchable Conductive Adhesive for Flexible Hybrid Electronics (FHE)** Masayoshi Otomo[1], Irma Yolanda Kapoglis[2], Noriyuki Sakai[1], [1]NAMICS Corporation / Japan, [2]Diemat, Inc. / USA	**TB1: High-Speed, Wireless & Components** Chairs: Keiju Yamada, Toshiba, Shuji Sagara, DNP **TB1-1** <Session Invited> **Development of C Band Phased Array Single Element using Multi-material Printing** Susan C. Trulli[1], Alkim Akyurtlu[2], Elicia K. Harper[1], Dmytro Volkov[2], Craig Armiento[1,2], Christopher Laighton[1], [1]Raytheon Integrated Defense Systems, [2]University of Massachusetts / USA **TB1-2** **A High Signal-Integrity PCB-Trace with Embedded Chip Capacitors and Its Design Methodology Using Genetic Algorithm** Moritoshi Yasunaga, Shumpei Matsuoka, Yuya Hoshinor, Takashi Matsumoto, Tetsuya Odaira, University of Tsukuba / Japan **TB1-3** **High-speed High-Density Cost-Effective Cu-Filled Through-Glass-Via Channel for Heterogeneous Chip Integration** Hiroshi Kudo, Miyuki Akazawa, Shouhei Yamada, Masaya Tanaka, Haruo Iida, Jyunya Suzuki, Takamasa Takano, Satoru Kuramochi, DNP Co., Ltd. / Japan **TB1-4** **A Low-Cost Antenna-in-Package Solution for 77GHz Automotive Radar Applications** Cheng-Yu Ho, Sheng-Chi Hsieh, Ming-Fong Jhong, Hung-Chun Kuo, Chun-Yen Ting, Chen-Chao Wang, ASE, Inc. / Taiwan	**TC1: Fan Out Technology-1** Chairs: Toshihisa Nonaka, Hitachi Chemical, Kouichi Hasegawa, JSR **TC1-1** <Session Invited> [50min] **Key Developments in FO-WLP and Emerging Trends in Large Area Processing** Jan Vardaman, TechSearch International, Inc. / USA **TC1-2** <Session Invited> **Panel RDL Substrate for High Density Interconnection** Yu-Hua Chen, Unimicron Technology Corp / Taiwan **TC1-3** **Trace line Layout Design of FO-WLCSP** Yih-Ting Shen, Yu-Hsiang Liu, Kuo-Ning Chiang, National Tsing Hua University / Taiwan	**TD1: Materials and Processes-2** Chairs: Akitsu Shigetou, NIMS, C. Robert Kao, Natinal Taiwan University **TD1-1** **What Happens To Low TCE Copper With Annealing** Kazuo Kondo, Fine Feature Electrodeposition Research Laboratory / Japan **TD1-2** **Effects of Electroless Copper Plating on Crystal Continuity in Via Bottom** Yuhei Kitahara, Joonhaeng Kang, Okuno Chemical Industries Co., Ltd. / Japan **TD1-3** **A Cu-Cu Bonding Method Using Preoxidized Cu Microparticles under Formic Acid Atmosphere** Runhua Gao, Jiahui Li, Yu-An Shen, Hiroshi Nishikawa, Osaka University / Japan **TD1-4** **R2R Nano-Patterning Technology Using 250 mm- Wide Seamless Roller Mold** Kazuma Komatsu[1], Masayuki Abe[1], Naoto Ito[1], Shinji Matsui[2], [1]Asahi Kasei Corporation, [2]University of Hyogo / Japan	**TE1: Thermal Management-2** Chairs: Hitoshi Sakamoto, Huawei Technologies Japan, Tomoyuki Hatakeyama, Toyama Prefectural University **TE1-1** <Session Invited> **Evaluation of Heat Dissipation Performance of PCB Using JPCA Method** Tomoyuki Hatakeyama, Risako Kibushi, Masaru Ishizuka, [1]Toyama Prefectural University, [2]Sanyo-Onoda City University / Japan **TE1-2** **Integration of GaN-SiC and GaN-Diamond by Surface Activated Bonding Methods** Fengwen Mu, Tadatomo Suga, The University of Tokyo / Japan **TE1-3** **How TIM Impacts Thermal Performance of Electronics: A Thermal Point of View Study to Understand Impact of Thermal Interface Material (TIM)** Tejas Manohar Kesarkar, Nitesh Kumar Sardana, Robert Bosch Engineering and Business Solutions Pvt. Ltd. / India	11:00 12:40
12:40 13:40	**Lunch Time**					12:40 13:40
13:40 15:20	**TA2: Power Electronics Integration-1** Chairs: Tetsuya Onishi, Grand Joint Technology, Yoshitaka Nishimura, Fuji Electric **TA2-1** **Processing and Characterization of Die-attach on Uncoated Copper by Pressure-less Silver Sintering and Low-pressure-assisted Copper Sintering** Meiyu Wang[1], Yanliang Shan[1], Yunhui Mei[1], Xin Li[1], Guo-Quan Lu[1,2], [1]Tianjin University / China, [2]Virginia Tech / USA **TA2-2** **Heat Resistant Cu-Sn based Joint Paste for less than 30μm joint thickness** Hiroaki Ikeda, Shigenobu Sekine, Ryuji Kimura, Koichi Shimokawa, Keiji Okada, Hiroaki Shindo, Tatsuya Ooi, Rei Tamaki, Napra Corporation / Japan **TA2-3** **Direct Power Board Bonding Technology for 3D Power Module Package.** Hidetoshi Ishibashi, Hiroshi Yoshida, Daisuke Murata, Shota Morisaki, Hodaka Rokubuichi, Ayumi Minamide, Nobuhiro Asaji, Mitsubishi Electric Corporation / Japan	**TB2: Emerging Technologies-1** Chairs: Nobuaki Hashimoto, Suwa University of Science, Yu Kondo, OLYMPUS **TB2-1** **Room Temperature Bonding of Smooth Au Surface of Electroformed Cu Substrate in Atmospheric Air** Takashi Matsumae[1], Michitaka Yamamoto[2], Yuichi Kurashima[1], Eiji Higurashi[1], Hideki Takagi[1], [1]AIST, [2]The University of Tokyo / Japan **TB2-2** **A Single Process for Homogeneous and Heterogeneous Bonding in Flexible Electronics Ethanol-Assisted Vacuum Ultraviolet (E-VUV) Irradiation Process** T. H. Yang[1,2], C. Y. Yang[1], A. Shigetou[2], C. R. Kao[1], [1]National Taiwan University / Taiwan, [2]NIMS / Japan **TB2-3** **Over-Voltage Protection Epoxy-CNT Composites** Paul Czubarow[1], Yoshitaka Kamata[2], Toshiyuki Sato[2], Howard Katz[3], [1]eM-TECH, Inc. / USA, [2]NAMICS Corporation / Japan,3Johns Hopkins University / USA **TB2-4** **Interconnect Fabrication Using Copper Oxide Particles by Photonic-sintering** Po-Hsiang Chiu, Jenn-Ming Song, National Chung Hsing University / Taiwan	**TC2: Fan Out Technlogy-2** Chairs: Toshihisa Nonaka, Hitachi Chemical, Yoichiro Sato, AGC **TC2-1** <Session Invited> **Pre Treatment Method Modification with Linear Ion Source for Fan Out Panel Level Packaging** Tetsushi Fujinaga, ULVAC Inc. / Japan **TC2-2** <Session Invited> **Liquid Photolithographic Material Application Technique for FO-PLP in SCREEN FT Co.,Ltd.** Koichi Jono, SCREEN Finetech Solutions Co., Ltd. / Japan **TC2-3** <Session Invited> [50min] **FOCoS (Fanout Chip on Substrate) Solution for ASIC+ASIC and ASIC+HBM** Teck Lee, ASE Group / Taiwan	**TD2: Materials and Processes-3** Chairs: Kiyokazu Yasuda, Osaka University, Hiroshi Nishikawa, Osaka University **TD2-1** **Analysis of Bonding Interfaces of Pressureless-Sintered Cu on Metallization Layers** Dai Ishikawa[1], Bao Ngoc An[2], Matthias Mail[2], Helge Wurst[2], Benjamin Leyrer[2], Thomas Blank[2], Marc Weber[2], Suguru Ueda[1], Hideo Nakako[1], Yuki Kawana[1], [1]Hitachi Chemical Co., Ltd. / Japan, [2]Karlsruhe Institute of Technology / Germany **TD2-2** **Novel Silver-Seed Semi-Additive Process for High Quality Circuit Formation** Norimasa Fukazawa, Akira Murakawa, Wataru Fujikawa, Jun Shirakami, DIC Corporation / Japan **TD2-3** **Microstructural and Electrical Characteristics of Sintered Ag Interconnections through Different Reduction Methods** Jen-Hsiang Liu, Yan-Jie Li, Jenn-Ming Song, National Chung Hsing University / Taiwan **TD2-4** **Development of Low-Temperature Sintering Materials for Bare Cu Lead-frame** Kazuki Fukazawa, Noritsuka Mizumura, Satoshi Saito, Koji Sasaki, NAMICS Corporation / Japan	**TE2: Interconnections-1** Chairs: Hiroshi Yamada, Toshiba, Kenji Takahashi, AIST **TE2-1** **Cu-Cu Quasi-Direct Bonding with Atomically Thin-Au and Pt Intermediate Layer Using Atomic Layer Deposition** Hiroyuki Kuwae[1], Kosuke Yamada[1], Wataru Momose[2], Shuichi Shoji[1], Jun Mizuno[1,3], [1]Waseda University, [2]ALD Japan, Inc. / Japan, [3]Soochow University / China **TE2-2** **Low Resistance and High Reliable Cu-to-Cu Joints Using Highly (111)-Oriented Nano-Twinned Copper** Jing Ye Juang[1], Kai Cheng Shie[1], Yu Jin Li[1], K N Tu[1,2], Chih Chen[1], [1]National Chiao Tung University / Taiwan, [2]University of California at Los Angeles / USA **TE2-3** **Influence of Grain Refinement on Direct Bonding for Electrodeposited Copper** Zong-Yu Xie[1], I-You Yu[1], Jenn-Ming Song[1], David Tarng[2], Chih-Pin Hung[2], [1]National Chung Hsing University, ASE Group / Taiwan **TE2-4** **Bonding of Copper Pillars Using Electroless Cu Plating** L. Y. Kao[1], H. T. Hung[1], Y. H. Chen[2], C. R. Kao[1], [1]National Taiwan University, [2]Unimicron Corp. / Taiwan	13:40 15:20
15:20 16:10	**Poster Session / Break (3F)**					15:20 16:10
16:10 17:50	**TA3: Power Electronics Integration-2** Chairs: Toyohiro Aoki, IBM Japan, Yoshinari Ikeda, Fuji Electric **TA3-1** **3.3kV Power Module for Electric Distribution Equipment with SiC Trench-Gate MOSFET** R. Takayanagi, K. Taniguchi, M. Hoya, N. Kanai, T. Tsuji, M. Hori, Y. Ikeda, K. Maruyama, I. Kawamura, Fuji Electric Co., Ltd / Japan **TA3-2** **Study of Gate Bias Voltage for Preventing Threshold Shift of SiC–MOSFET Body Diode during Transient Temperature Measurements** Fumiki Kato[1], Shinji Sato[1], Kenichi Koui[1,2], Hidekazu Tanisawa[1,3], Hiroshi Hozoji[1], Hiroshi Yamaguchi[1], [1]AIST, [2]Calsonic Kansei Corporation, [3]Sanken Electric Co., Ltd. / Japan **TA3-3** **GaAs Diode Rectifier Power Module in Mixed Ag- and Large Area Cu-Sintering Technology for Ultra-Fast and Wireless Electric Vehicle Battery Charging** Thomas Blank[1], Volker Dudek[2], Matthias Luh[1], Bao Ngoc An[1], Helge Wurst[1], Benjamin Leyrer[1], Dai Ishikawa[3], Marc Weber[1], [1]Karlsruhe Institute of Technology, [2]3-5 Power Electronics GmbH / Germany, [3]Hitachi Chemical Co., Ltd. / Japan	**TB3: Emerging Technologies-2** Chairs: Yu Kondo, OLYMPUS, Nobuaki Hashimoto, Suwa University of Science **TB3-1** **Development of Compact and High-Efficient Simple CPW Rectenna for RF Energy Harvesting** Mohamed M. Mansour[1,2], H. Kanaya[1], [1]Kyushu University / Japan, [2]Electronics Research Institute / Egypt **TB3-2** **Electroencephalogram Measurement in Adapting Process to Inverse Vision** Takeshi Onomoto, Y. Yoshida, N. Miki, Keio University / Japan **TB3-3** **Development of a Helmet-Type Wearable Device Capable of Measuring Perspiration During Various Activities** Tsukasa Kosuda[1], Yoshiaki Nakajo[1], Konosuke Sasagawa[1], Yuto Nishikai[2], Shunji Shimizu[1], Yoshinori Kumita[3], Toshihiko Kondo[4], Nobuaki Hashimoto[1], [1]Suwa University of Science, [2]Japan System Development Co., Ltd., [3]Fujita Corporation, [4]Kokankyo Engineering Corporation / Japan **TB3-4** **Long-Term in Vivo Experiment Protocol Using SD Rats** Takahiro Ito, Y. Koya, N. Miki, Keio University / Japan	**TC3: Embedded Technology** Chairs: Toshihisa Nonaka, Hitachi Chemical, Kouichi Hasegawa, JSR **TC3-1** <Session Invited> [50min] **AiOP- The Packaging Solution of The Future?** Markus Leitgeb, AT&S AG / Austria **TC3-2** <Session Invited> [50min] **Embedded Camera Module and System for Application of Automotive** Hyunho Kim, Korea Jisso Industry Council / Korea	**TD3: Materials and Processes-4** Chairs: Kiyokazu Yasuda, Osaka University, Hiroshi Ozaki, Sony Semiconductor Solutions **TD3-1** <Session Invited> **Friction Process and Microstructure Formation in Ultrasonic Bonding** Tomohiro Sasaki, Niigata University / Japan **TD3-2** **Development of Electroless Ni-P Plating Film for Power Modules** Norihiko Hasegawa, Kei Hashizume, Toshiya Murata, Okuno Chemical Industries Co., Ltd / Japan **TD3-3** **Barrier Properties of Electroless Deposit of Co-W-P Alloy** Sho Kanzaki, Toshiaki Shibata, Seigo Kurosaka, Yukinori Oda, Shigeo Hashimoto, C.Uyemura & Co., Ltd. / Japan **TD3-4** **Surface Analyses of Oxidized Cu-Fe-Zn-P Lead Frames** Shih-Chieh Chao[1], Jen-Hsiang Liu[1], Wei-Chen Huang[1], Jenn-Ming Song[1], Po-Yen Shen[2],Chi-Lin Huang[2], Lung-Tang Hung[2], Chin-Huang Chang[2], [1]National Chung Hsing University, [2]Siliconware Precision Industries Co., Ltd. / Taiwan	**TE3: Interconnections-2** Chairs: Jenn Ming Song, National Chung Hsing University, Masahisa Fujino, AIST **TE3-1** **Inhibition of Cracking in Cu_6Sn_5 Intermetallic Compounds at the Interface of Lead-Free Solder Joint by Controlling the Reflow Cooling Conditions** Flora Somidin[1,2], Stuart D. McDonald[1], Xiaozou Ye[1], Dongdong Qu[1], Keith Sweatman[3], Tetsuya Akaiwa[3], Tetsuro Nishimura[3], Kazuhiro Nogita[1], [1]The University of Queensland / Australia, [2]Universiti Malaysia Perlis (UniMAP) / Malaysia, [3]Nihon Superior Co. Ltd. / Japan **TE3-2** **Optimization of Ag-Ag Direct Bonding for Wafer- Level Power Electronics Packaging via Design of Experiments** Zechun Yu[1,2], Shize Wang[1,2], Sebastian Letz[1,2], Christoph Friedrich Bayer[1,2], Felix Häußler[2], Andreas Schletz[1], Katsuaki Suganuma[3], [1]Fraunhofer IISB, [2]Friedrich-Alexander University / Germany, [3]Osaka University / Japan **TE3-3** **Role of Bi, Sb and In in Microstructure Formation and Properties of Sn-0.7Cu-0.05Ni-X BGA Interconnections** S. A. Belyakov[1], T. Nishimura[2], T. Akaiwa[2], K. Sweatman[2], K. Nogita[3], C. M. Gourlay[1], [1]Imperial College London / UK, [2]Nihon Superior Co., Ltd / Japan, [3]University of Queensland / Australia **TE3-4** **A Novel TLP Bonding Based on Sub-micron Ga Particles** Shih-kang Lin, Hseng-ming Liao, Che-yu Yeh, Chih-han Yang, National Cheng Kung University / Taiwan	16:10 17:50
18:30 20:30	**International Reception (Hotel Nikko Niigata 31F) (Invite only)**					18:30 20:30

Friday, April 19

International Conference Hall (4F)

9:00–9:25

IEEE EPS Special Speech
Heterogeneous Integration Roadmap
Chris Bailey, University of Greenwich / United Kingdom
Chairs: Osamu Suzuki, NAMICS, Yasumitsu Orii, Nagase

9:25–9:50

Emerging Technology Special Speech
Neuromorphic Computing with Semiconductor Non-Volatile Memory
Chung H Lam, Jiangsu Advanced Memory Technology / China
Chairs: Kiyokazu Yasuda, Osaka University, Yasumitsu Orii, Nagase

9:50–10:10 Break (3F)

10:10–11:50

Room A (3F)

FA1: Fan Out Technology-3
Chairs: Yoichiro Sato, AGC, Kouichi Hasegawa, JSR

FA1-1
Warpage and Simulation Analysis of Panel Level FO-WLCSP Using Equivalent CTE
Shih-Wei Liu, Chia-Han Tsai, Kuo-Ning Chiang, National Tsing Hua University / Taiwan

FA1-2
Surface-Modification Technology by Using Radical Shower Treatment (RST) Process in Submicron Interposer for Fan-out Packaging Applications.
Takahide Murayama, Toshiyuki Sakuishi, Yasuhiro Morikawa , ULVAC, Inc. / Japan

FA1-3
High-Toughness (111) Nano-Twinned Copper Lines for Fan-Out Wafer-Level Packaging
Yu-Jin Li[1], Wei-Yu Hsu[1], Benson Lin[2], Chia Cheng Chang[2], Chih Chen[1], [1]National Chiao Tung University, [2]PT, MediaTek Inc. / Taiwan

FA1-4
High Speed Panel Level Metallization Technology
Herbert Ötzlinger, Claudia Landstorfer, Tetsuya Onishi, Christian Dunkel, Raoul Schröder, Semsysco GmbH / Austria

Room B (3F)

FB1: Emerging Technologies-3
Chairs: Yasuhiro Morikawa, ULVAC, Noriyuki Fujimori, OLYMPUS

FB1-1
Mechanical Characterization of FOWLP Based Flexible Hybrid Electronics (FHE) for Biomedical Sensor Application
Yuki Susumago[1], Achille Jacquemond[1,2], Noriyuki Takahashi[1], Hisashi Kino[1], Tetsu Tanaka[1], Takafumi Fukushima[1], [1]Tohoku University / Japan, [2]INSA Lyon / France

FB1-2
Optimization of Wafer Thinning Process by Reducing Thickness Variation of Temporary Adhesive Layer for Medical Device
Ken Yamamoto, Takuro Suyama, Noriyuki Fujimori, Olympus / Japan

FB1-3
Programming and Evaluation of a Multi-Axis/Multi-Process Manufacturing System for Mechatronic Integrated Devices
Markus Ankenbrand, Y. Eiche, J. Franke, Friedrich-Alexander University / Germany

FB1-4
Gel-Integrated Mercury-Plated Microelectrode Arrays for Trace Metal Detection
Zhi Cao[1,2], Haiping Shang[2], Yinghui Wang[1,2], Shengkai Wang[1,2], Weibing Wang[1,2], [1]University of Chinese Academy of Sciences, [2]Chinese Academy of Science / China

Room C (3F)

FC1: Flexible Hybrid Devices
Chairs: Takashi Kasahara, Hosei University, Nobuaki Hashimoto, Suwa University of Science

FC1-1 <Session Invited>
Silicone Based Dielectric Elastomer Transducers and Robots
Jun Shintake, The University of Electro-Communicat / Japan

FC1-2 <Session Invited>
The Ultra-Flexible Organic Electronics
Tomoyuki Yokota, Takao Someya, The University of Tokyo / Japan

FC1-3 <Session Invited>
Self-Healing Metal Interconnect for Flexible Electronic Device
Tomoya Koshi1 , Eiji Iwase2, 1AIST,2Waseda University / Japan

FC1-4 <Session Invited>
Portable Analytical Detection Systems Based on Light Emitting Devices
Ryoichi Ishimatsu, Kyushu University / Japan

Room D (3F)

FD1: Optoelectronics
Chairs: Shigenori Aoki, LINTEC, Yasuhiro Ando, ABI Giken

FD1-1 <Session Invited>
Optical Transceiver Modules and Their Packaging Technologies for Data Center Applications
Hideyuki Nasu, Furukawa Electric Co., Ltd.

FD1-2 <Session Invited>
Polymer Materials for Photonic Integrated Circuit
Hideyuki Nawata, Nissan Chemical Corporation / Japan

FD1-3 <Session Invited>
Packaging Technologies for Chip-scale Silicon Photonic Transceivers
Koichi Takemura[1], Kazuhiko Kurata[2], [1]PETRA, [2]AIO Core Co., Ltd. / Japan

FD1-4 <Session Invited>
Planar Optical Circuits using Slab Optical Waveguide on SOI Substrate
Takeo Maruyama, Kanazawa University / Japan

Room E (3F)

FE1: Design, Modeling, and Reliability-1
Chairs: Hitoshi Sakamoto, Huawei Technologies Japan, Masahiro Aoyagi, AIST

FE1-1
Design Demonstration of Band-Pass-Filter Characteristics with Integrated Passive Device on Glass Interposer
Masaya Tanaka, Takamasa Takano, Yumi Okazaki, Dai-Nippon Printing Co., Ltd. / Japan

FE1-2
Gait Pattern Generation of Hexapod-Type Microrobot Using Interstitial Cell Model Based Hardware Neural Networks IC
Mika Kurosawa, Takuro Sasaki, Masaya Ohara, Taisuke Tanaka, Yuichiro Hayakawa, Minami Kaneko, Fumio Uchikoba, Katsutoshi Saeki, Ken Saito, Nihon University / Japan

FE1-3
Correlation between Insertion Loss and Interface Relative Conductivity
Taiga Fukumori, Tomoyuki Akahoshi, Daisuke Mizutani, Seiki Sakuyama, Fujitsu Laboratories ltd. / Japan

FE1-4
Construction and Verification of Novel Insulation Defect Location System with High Space Resolution for Next Generation Power Module
Junya Maki[1], Takakazu Matsuzoe[1], Masahiro Kozako[1], Masayuki Hikita[1] Yoko Nakamura[2], Katsumi Taniguchi[2], Yoshinari Ikeda[2], Kenji Okamoto[2], [1]Kyushu Institute of Technology, [2]Fuji Electric Co., Ltd / Japan

11:50–12:50 Lunch Time

12:50–14:30

Room A (3F)

FA2: Power Electronics Integration-3
Chairs: Hiroshi Houzouji, AIST, Kenji Okamoto, Fuji Electric

FA2-1 <Session Invited>
Advanced Power Packaging Technology for High Power, High Frequency WBG Devices
Yoshikazu Takahashi, Tetsuo Endoh, Tohoku University / Japan

FA2-2 <Session Invited>
Development of Highly Reliable Bonding Technologies and Its Application
Yoshiiyuki Nagatomo, Mitsubishi Materials Corporation / Japan

FA2-3 <Session Invited>
Recent Progress of SiC Power Devices and Their Futures
Noriyuki Iwamuro, University of Tsukuba / Japan

FA2-4 <Session Invited>
Potential of Non-Equilibrium Oxides of Ga_2O_3 and Ir_2O_3 for Power Device Applications
Kentaro Kaneko[1], Takashi Shinohe[2], Shizuo Fujita[1], [1]Kyoto University, [2]FLOSFIA INC. / Japan

Room B (3F)

FB2: Emerging Technologies-4
Chairs: Yasuhiro Morikawa, ULVAC, Jun Mizuno, Waseda University

FB2-1 <Session Invited>
A Catch-and-Release drive MEMS Gyroscope for Low-Power Applications
Yasushi Tomizawa, Ryunosuke Gando, Etsuji Ogawa, Kei Masunishi, Akiko Yuzawa, Tetsuro Itakura, Akihide Sai, Tamio Ikehashi, Toshiba Corporation / Japan

FB2-2
Selective Removal by Laser Processing for the Sensor Mold
Ryuta Ikoma, Kazuaki Mawatari, Koji Hashimoto, Junichi Sato, Nobuyoshi Wakasugi, Denso Corporation / Japan

FB2-3
Integrated laser Doppler blood flowmeter combining optical contact force
Hirofumi Nogami, Kosuke Komatsutani, Tomoki Hirata , Renshi Sawada, Kyushu University / Japan

Room C (3F)

FC2: Flexible Electronics-1
Chairs: Akitsu Shigetou, NIMS, Jenn-Ming Song, National Chung Hsing University

FC2-1 <Session Invited>
Ultraflexible Organic Differential Amplifier for Low-Noise Biosignal Monitoring
Takafumi Uemura, Osaka University / Japan

FC2-2 <Session Invited>
Printing of Flexible Electronics for Wearable Applications
Takeo Minari[1,2], Xuying Liu[1], Qingqing Sun[1], Wanli Li[1], Akitsu Shigetou[1,2], Masayuki Kanehara[2,3], [1]NIMS, [2]Priways Co., Ltd., [3]C-INK Co., Ltd. / Japan

FC2-3
Homogeneous Dewetting on Large-Scale Microdroplet Arrays for Solution-Processing Electronics
Qingqing Sun[1], Wanli Li[1], Xu-Ying Liu[1,2], Masayuki Kanehara[3], Takeo Minari[1], [1]NIMS, [2]C-Ink. Co., Ltd / Japan, [3]Zhengzhou University / China

FC2-4
Air-stable Cu Complex Inks for Printed Electronics with High Conductivity and High Reliability
Wanli Li[1], Qingqing Sun[1], Xu-Ying Liu[1], Katsuaki Suganuma[2], Takeo Minari[1], [1]NIMS, [2]Osaka University / Japan

Room D (3F)

FD2: Korea Session-1
Chairs: Jun Shintake, The University of Electro- Communications, Shoji Uegaki, E-ThermoGentek

FD2-1 <Session Invited>
The Effects of Electrochemical Parameters on The Physical Properties of Ni Alloy Electroplating for MEMS Probe Card
Jae-Ho Lee, Yong-Su Lee, Hong-Wook Chun, Hongik University / Korea

FD2-2 <Session Invited>
Stretchable and Self-Healable Electrode Comprising Silver Nanowires and Diels-Alder Sdducts
Jong-Woong Kim, Chonbuk National University / Korea

FD2-3 <Session Invited>
IoT-Tag Module Development for LPWA Application.
Gu-Sung Kim, EPRC / Korea

FD2-4 <Session Invited>
Organic-Based Silica Composite Aerogel with Ultralow Dielectric Constant and Thermal Conductivity
Hyung-Ho Park, Yonsei University / Korea

Room E (3F)

FE2: Design, Modeling, and Reliability-2
Chairs: Hitoshi Sakamoto, Huawei Technologies Japan, Rickey Lee, Hong Kong University of Sci &Tech

FE2-1
Reliability Assessment of WLCSP Using Energy Based Model with Inelastic Strain Energy Density
Yu-Chen Lee, K. N. Chiang, National Tsing Hua University / Taiwan

FE2-2
The Study of Sn-45Bi-2.6Zn Alloy Before and After Thermal Aging
Shiqi Zhou[1], Chih-han Yang[2], Yu-An Shen[1], Shih-kang Lin[2], Hiroshi Nishikawa[1], [1]Osaka University / Japan, [2]National Cheng Kung University / Taiwan

FE2-3
Materials Informatics Technique for Designing Strong-Adhesion Interfaces in Electronics Devices
Tomio Iwasaki, Hitachi, Ltd / Japan

14:30–14:40 Break (3F)

14:40–16:45

Room B (3F)

FB3: LED
Chairs: Yoshio Nogami, Toray Engineeing, Eiji Higurashi, AIST

FB3-1 <Session Invited>
LED Device Packaging Trend X-rays View
Tetsuya Onishi, Grand Joint Technology Ltd. / China

FB3-2 <Session Invited>
Development and Manufacturing of The Near-Sunlight white LED Light Source using a Human-Friendly Violet LED
Masaichi Kumikawa, Soraa / Japan

FB3-3 <Session Invited>
Unique Packaging Technology of High Bright LED, microLED, miniLED and UV LED using VPES
Atsushi Okuno, Green Planets Co., Ltd / Japan

FB3-4 <Session Invited>
The Development of Micro-LED Technology in ITRI
Yen-Hsiang Fang, Industrial Technology Research Institute / Taiwan

FB3-5 <Session Invited>
Introduction of AOI Machine using PL(Photoluminescence) and Laser Micro Trimming Machine for Micro LED
Ayaka Okabe, Toray Engineering / Japan

Room C (3F)

FC3: Flexible Electronics-2
Chairs: Akitsu Shigetou, NIMS, Jenn-Ming Song, National Chung Hsing University

FC3-1 <Session Invited>
Molecular Design of Highly Reliable Low Dielectric Loss Materials
Masao Tomikawa, Toray Industries Inc. / Japan

FC3-2 <Session Invited>
High-Performance Printed Carbon Nanotube TFTs and Circuits on Flexible Substrates
Jianwen Zhao, Chinese Academy of Sciences / China

FC3-3 <Session Invited>
Solution-Synthesized p-Type Copper(I) Iodide Semiconductors for Transparent Thin-Film Transistors and Complementary Electronics
Yong-Young Noh, POSTECH / Korea

FC3-4
Room-Temperature Printing of CNTs-based Flexible TFTs with high Performance
Qingqing Sun[1], Wanli Li[1], Xuying Liu[1,3], Masayuki Kanehara[2], Jianwen Zhao[4], Takeo Minari[1], [1]NIMS, [2]Colloidal Ink. Co., Ltd. / Japan, [3]Zhengzhou University, [4]Chinese Academy of Sciences / China

Room D (3F)

FD3: Korea Session-2
Chairs: Hiroshi Yamaguchi, NAMICS, Shoji Uegaki, E-ThermoGentek

FD3-1 <Session Invited>
Fabrication of Ag-Based Hybrid/NanoComposite Pastes and Their Characteristics
Choong-JaeLee, Kwang-Ho Jung, Bum-Geun Park, Seung-boo Jung, Sungkyunkwan university / Korea

FD3-2 <Session Invited>
Warpage Analysis of Flexible Electronics
Taek-Soo Kim, KAIST / Korea

Room E (3F)

FE3: Health, Beauty and Technology
Chairs: Yasumitsu Orii, Nagase, Shigenori Aoki, LINTEC

FE3-1 <Session Invited> [50min]
Do Chemical Reactions of Electronics Technologies and Cosmetics Occur?
Yasuo Kato, Keio University / Japan

FE3-2 <Session Invited>
Innovations in Research and Development, Now and the Future-With a Focus on the Story Behind the Development of Wrinkle Shot Medical Serum-
Hirotaka Takeuchi, POLA Chemical Industries, Inc. / Japan

FE3-3 <Session Invited>
Possibility of Fusion: Cosmetic Research and Electronics
Yukiko Ishitsuka, KOSE Corporation / Japan

Poster Session

Poster sessions will be held from 15:40-16:40 on April 17 and from 15:20-16:10 on April 18.

P01 **Effect Analysis of Application of Energy Band Gap to Electrostatic Discharge Protection**
Hong-Yin Hsieh, Jheng-Yuan Ruan, Min-Jun Guo, Wei-Chiao Wang, Sheng-Wei Guan, Sung-Mao Wu, National University of Kaohsiung / Taiwan

P02 **Au–Sn Soldering Using a Micro-heater to Restrain Excess Temperature Rise Inside the Package**
Hideaki Mizusaki, Toshiro Sato, Makoto Sonehara, Shinshu University / Japan

P03 **Thermo-Mechanical Process Emulation and Sensitivity Analysis of Wafer Warpage after Reconstitution in Fan-out Packaging**
Cheng-Ying Yang, Kuo-Shen Chen, Tian-Shiang Yang, Tz-Cheng Chiu, Ching-Jenq Ho, National Cheng-Kung University / Taiwan

P04 **Wafer-Scale Au-Au Surface Activated Bonding Using Atmospheric-pressure Plasma**
Michitaka Yamamoto[1,2], Takashi Matsumae[2], Yuichi Kurashima[2], Hideki Takagi[2], Toshihiro Miyake[3], Tadatomo Suga[1], Toshihiro Itoh[1], Eiji Higurashi[1,2], [1]The University of Tokyo, [2]AIST, [3]DENSO Corporation / Japan

P05 **Nano-Cu Paste Sintering in Pt-Catalyzed Formic Acid Vapor for Cu Bonding at a Low Temperature**
Fengwen Mu[1], Hui Ren[2], Lei Liu[2], Yinghui Wang[3], Guisheng Zou[2], Tadatomo Suga[1], [1]the University of Tokyo / Japan, [2]Tsinghua University, [3]University of Chinese Academy of Sciences / China

P06 **Development of Sn-Bi-In-Ga Quaternary low- Temperature Solders**
Chih-han Yang[1], Shiqi Zhou[2], Shih-kang Lin[1], Hiroshi Nishikawa[2], [1]National Cheng Kung University / Taiwan, [2]Osaka University / Japan

P07 **Advanced Materials for Pathogenic Bacterial Sensing**
Dung Quang Nguyen, Kengo Ishiki, Maki Saito, Kota Iwamoto, Hiroshi Shiigi, Osaka Prefecture University / Japan

P08 **QFN Multi-Level Pin Routing:Innovative Design Approach Enabling Complex Wire Bonding Layout**
Dolores B. Milo, Texas Instruments Philippines / Philippines

P09 **Two-Faced Bondable Leadframe Design: Maximizing Leadframe Usage and Purpose**
Ernesto P. Rafael Jr., Dolores Babaran-Milo, Texas Instrument Philippines / Philippines

P10 **Mixed Mode Tension Test of Underfills**
Hiroshi Yamaguchi, Toshiaki Enomoto, NAMICS Coporation / Japan

P11 **Influence of Module Structure on Reliability of Silicon Solar Cells**
Taeko Semba[1], Genki Saito[1], Shuichi Asao[2], Katsuhiko Shirasawa[2], Hidetaka Takato[2], [1]NAMICS Corporation / Japan, [2]AIST / Japan

P12 **Characteristics of Nickel Thin Film Electroplated by Supercritical CO_2 Emulsion Assisted with Ultrasonic Agitation**
H. C. Chuang[1], C. H. Huang[1], A. H. Liao[2], [1]National Taipei University of Technology, [2]National Taiwan University of Science and Technology / Taiwan

P13 **Electromechanical Reliability of Flexible Transparent Electrode of Gravure Offset Printed Invisible Silver-Grid Laminated with Conductive Polymer**
Masato Ohsawa, Natsuki Hashimoto, ULVAC, Inc. / Japan

P14 **High Thermal Conductivity Composite Resin Sheet Filled with Large Diameter Aluminum Nitride and Aggregated Boron Nitride**
I. Masada, S. Fujii, S. Imazumi, K. Fujinami, Y. Kanechika, T. Nawata, M. Ueda, Tokuyama Corporation / Japan

P15 **Preparation of Si-Ti Based Nanofibers and Thin Film by Single-Needle Electrospinning**
Wen-Yu Wang, Huai-You Lee, Cho-Liang Chung, I-Shou University / Taiwan

P16 **A Hollow Nanostructure of Silicon-Based Can be Produced by Using Electrospinning Process**
Chun-Yi Chen, Jun-Wei Zheng, Kai-Po Hsu, Cho-Liang Chung, I-Shou University / Taiwan

P17 **New Adhesive Design and Evaluation for Bumpless Interconnects and Wafer-On-Wafer (WOW) Integration**
S. Maetani[1,2], N. Araki[1,2], Y. S. Kim[1,3], S. Kodama[1,3], T. Ohba[1], [1]Tokyo Institute of Technology / Japan,[2]DAICEL Corp. / Japan, [3]DISCO Corp. / Japan

P18 **Study of Low-Residual Stress Amorphous Film Deposition Method for $LiTaO_3$/Quartz or $LiNbO_3$/Quartz Bonding toward 5G Surface Acoustic Wave Devices**
Ami Tezuka[1], Hiroyuki Kuwae[1], Kosuke Yamada[1], Shuichi Shoji[1], Shoji Kakio[2], Jun Mizuno[1,3], [1]Waseda University, [2]Yamanashi University / Japan, [3]Soochow University / China

P19 **Result of High Accelerated Stress Test of Organic Substrate Made by Integrated Dry Process.**
Shinichi Endo[1], Shintaro Yabu[2], Tomoyuki Habu[1], [1]Ushio Inc. / Japan, [2]Ushio America Inc. / USA

P20 **Electrodeposition of Cu Doped ZnS and Evaluation of Its Photocatalytic Property**
Naohiro Matsuda, Naoki Okamoto, Takeyasu Saito, Osaka Prefecture University / Japan

P21 **Comparison of Low Temperature Sinterability of Silver Micro-particles in Epoxy-based Binders Containing Several Mercaptocarboxylates**
Shiho Nakazawa, Masahiro Inoue, Gunma University / Japan

P22 **Bonding Strength of Cu-to-Cu Joints Using Cu Cold Spray Deposition by an Oxidation and Reduction Process for Power Device Package**
Juncai Hou[1,2], Chengxin Li[3], Sijie Huang[2], Hiroshi Nishikawa[2], [1]ShaanXi University of Technology / China, [2]Osaka University / Japan, [3]Xi'an Jiaotong University / China

P23 **Suppression of Backside Damage in Stealth Dicing**
Natsuki Suzuki[1,2,3], Takayuki Ohba[1], [1]Tokyo Institute of Technology, [2]Hamamatsu Photonics K.K., [3]The Graduate School for the Creation of New Photonics Industries / Japan

P24 **Structural Analysis and Electric Double Layer Capacitor of Furfural Resin -Based Active Carbon with Different Particle Size**
Kanade Hokari[1], Shinichiro Suzuki[1], Naoki Okamoto[1], Takeyasu Saito[1], Isamu Ide[2], Masanobu Nishikawa[2], Yoshikazu Onishi[2], [1]Osaka Prefecture University, [2]LIGNYTE. CO., LTD. / Japan

P25 **High Temperature Dielectric Property of Silicon Nitride Insulating Substrate for Next Generation Power Module up to 350 Degrees Celsius.**
Tsuyoshi Abe, Yasutaka Nishigaki, Masahiro Kozako, Masayuki Hikita, Kyushu Institute of technology / Japan

P26 **Characterization of Thermal-Electric Performance of Silicon Power MOSFET Inverter Using Coupled Field Analysis**
Y.-S. Liao[1], Y.-H. Shen[1], H.-C. Cheng[2], W.-H. Chen[1], [1]National Tsing Hua University, [2]Feng Chia University / Taiwan