



# 11th IEEE CPMT Symposium Japan (ICSJ2022)

The Leading International Components, Packaging and Manufacturing Technology Symposium

November 9-11, 2022

A Hybrid Event of On-site and Virtual Meetings

On-site Venue: Kyoto Univ. Clock Tower Centennial Hall, Kyoto, Japan



## Advanced Program

Last update: November 15, 2022

### November 9, 2022 (Wednesday)

	Hall I & II	Room III	Room IV
	Remote discussion via interactive voice	Remote discussion via chat	Remote discussion via chat
9:00		Registration	
10:40		Opening Remark (General Chair)	
10:55		Award Ceremony	
11:10-12:00	Hall I & II Chairperson Takaaki Ishigure (Keio University) & Hideyuki Nasu (Furukawa Electric Co., Ltd) Plenary Speech I		
11:10	Plenary Speech I: Electronic-Photonic Integration Brad Booth (Technology evangelist (Formerly Microsoft))		P-05
12:00	Lunch (free time)		
13:00-14:55	Session 1: Co-Packaged Optics Chairperson Takaaki Ishigure (Keio University) Hidetoshi Numata (IBM Research - Tokyo)	Session 2: Advanced PKG I Chairperson Kiyokazu Yasuda (Osaka University) Taiji Sakai (FICT LIMITED)	
13:00	56-Gb/s PAM4 x 8-channel VCSEL-Based Optical Transceiver for Co-Packaged Optics  Wataru Yoshida, Yuta Ishige, Kazuya Nagashima, Hideyuki Nasu (Furukawa Electric Co., Ltd)	38 Targeted Sample Preparation and Analysis of Advanced Packaging using Correlated X-Ray Microscopy and Laser FIB  Vignesh Viswanathan <sup>1</sup> , Etsuo Maeda <sup>2</sup> , Chisato Yamamoto <sup>2</sup> , Takehide Oda <sup>2</sup> , Longan Jiao <sup>3</sup> 1) Carl Zeiss Pte Ltd., 2) Carl Zeiss Co. Ltd. 3) Carl Zeiss (Shanghai) Co. Ltd.	5
13:25	Testing station using a 0.3-mm-pitch LGA interface for a 25-Gbaud x 16-channel CPO transceiver  Yuta Ishige, Kazuya Nagashima, Wataru Yoshida, Hideyuki Nasu (Furukawa Electric Co., Ltd)	34 PCB Embedding Technology for the Miniaturization of complex electronic Systems  Thomas Löher <sup>1</sup> , David Schütze <sup>2</sup> , Malte Spanier <sup>2</sup> , Andreas Ostmann <sup>1</sup> , Martin Schneider-Ramelow <sup>2</sup> 1) Fraunhofer IZM 2) Technische Universität Berlin	21
13:50	Novel Packaging Structure Using VCSEL Array and Multi-Core Fiber for Co-Packaged Optics  Takatoshi Yagisawa, Makoto Miyoshi, Jumpei Miike, Tomonori Azuma, Yoshiyuki Harada, Satoshi Ide, Ken Morito (Fujitsu Optical Components Limited)	36 Low Temperature Fluxless Cu Bonding with Cu Micropillar Array  Han Jiang, Ligu Zhao, Changqing Liu, Zhaoxia Zhou (Loughborough University)	9
14:15	Design of CPO Daughter Board with FPGA and 25-Gbaud x 16-Channel Ultra-Compact Optical Transceivers  Kei Takahashi <sup>1</sup> , Kensuke Miura <sup>1</sup> , Hikaru Nakajima <sup>1</sup> , Naoki Soya <sup>1</sup> , Satoru Torimitsu <sup>1</sup> , Yuta Ishige <sup>1</sup> , Kazuya Nagashima <sup>1</sup> , Hideyuki Nasu <sup>1</sup> , Shoji Fukutomi <sup>2</sup> 1) Furukawa Electric Co., Ltd 2) Furukawa Network Solutions Corporation	48 Low-temperature and rapid direct bonding through nano-Ag coating for high-temperature and high-power density electronics packaging  Canyu Liu, Allan Liu, Zhaoxia Zhou, Changqing Liu (Loughborough University)	14
14:40	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition	Interview with the Authors (Discussion after the session)	
14:55	Coffee break + Sponsor's Exhibition		
15:05-17:00	Session 3: Bioelectronics Chairperson Beomjoon Kim (The University of Tokyo) Shigenori Aoki (LINTEC Corporation)	Session 4: Optical Waveguide technology Chairperson Hideyuki Nasu (Furukawa Electric Co., Ltd) Hideyuki Nawata (Nissan Chemical Corporation)	
15:05	(Invited) Chemical sensors based on organic field-effect transistors for real-sample analysis  Tsuyoshi Minami (The University of Tokyo)	I-07 Design and Fabrication of Three-dimensional Polymer Optical Waveguide-based Fan-in/out Device for Multicore Fibers  Yuto Yamaguchi, Sho Yakabe, Takaaki Ishigure (Keio University)	17
15:30	(Invited) Rubber-like stretchable electronics for skin-conformable wearable devices  Naoji Matsuhisa (The University of Tokyo)	I-08 Fabrication for Y-branched Polymer Optical Waveguide Using the Imprint Method and Its Application for Mode Division Multiplexing Devices  Shinnosuke Ono, Takaaki Ishigure (Keio University)	20
15:55	Microfluidic technology for making strings made of cells  Katsuo Mogi, Hiroyuki Kimura, Naoki Takada (Tokyo Denki University)	30 Optical polymer waveguides with precise core location by mechanical planarization of bottom clad layer for efficient and uniform optical coupling  Taro Itatani, Takeru Amano (AIST)	47
16:20		(Invited) Optical coupling structures printed with Two-Photon-Polymerization  Jörg Smolenski (Nanoscribe GmbH & Co. KG)	I-12
16:45	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition	Interview with the Authors (Discussion after the session)	
17:00	Coffee break + Sponsor's Exhibition		
17:10-18:00	Hall I & II Chairperson Beomjoon Kim (The University of Tokyo) & Takaaki Ishigure (Keio University) Plenary Speech II		
17:10	Plenary Speech II: Microfabricated Optical Probes for Neuromodulation Chang-Hyeon Ji (Ewha Womans University)		P-02
19:00	Welcome Reception		
21:00	Close		

# November 10, 2022 (Thursday)

	Hall I & II	Room III	Room IV	
	Remote discussion via interactive voice	Remote discussion via chat	Remote discussion via chat	
9:00	Registration			
9:20-10:10	<b>Hall I &amp; II</b> Chairperson Eiji Higurashi (Tohoku University) & Shinya Takyu (Lintec corporation) <b>Plenary Speech III</b>			
9:20	<b>Plenary Speech III: Semiconductor Packaging - The Future is Now!</b> <b>Madhavan Swaminathan (Georgia Institute of Technology)</b>			
10:10-11:00	<b>Hall I &amp; II</b> Chairperson Taiji Sakai (FICT LIMITED) & Kazuyuki Nakagawa (Renesas Electronics Corporation) <b>Plenary Speech IV</b>			
10:10	<b>Plenary Speech IV: Heterogenous Package Integration for Consumer and Automotive Sensor</b> <b>Adrian Arcedera (Amkor Technology, Inc.)</b>			
11:00	Coffee break + Sponsor's Exhibition			
11:10-12:40	<b>Session 5: Advanced PKG II</b> Chairperson Kenji Takahashi (AIST) Chinami Marushima (IBM Japan, Ltd.)	<b>Session 6: Silicon Photonics Transceivers &amp; Laser Sources</b> Chairperson Junichi Inoue (Kyoto Institute of Technology) Hidetoshi Numata (IBM Research - Tokyo)		
11:10	Surface Activated Bonding of ALD Al2O3 films  Junsha Wang <sup>1</sup> , Ryo Takigawa <sup>2</sup> , Tadatomo Suga <sup>1</sup> 1) Meisei University, 2) Kyushu University	41 (Invited) Packaging technologies for high-bandwidth silicon photonic datacom transceivers  Hiren Thacker (Cisco Systems, Inc.)	I-10	
11:35	Control of Adsorbed Water on Wafers for Surface Activated Bonding  Kai Takeuchi <sup>1</sup> , Junsha Wang <sup>1</sup> , Akira Yamauchi <sup>2</sup> , Tadatomo Suga <sup>1</sup> 1) Meisei University, 2) Bondtec. Co. Ltd.	46 8-channel CWDM TOSA for CPO External Laser Sources  Taketsugu Sawamura <sup>1</sup> , Kazuhiko Kashima <sup>1</sup> , Kyoko Nagai <sup>1</sup> , Nitidet Thudsalingkamsaku <sup>2</sup> , Rattanaorn Suksomboon <sup>2</sup> , Sanguan Anantathanasarn <sup>2</sup> , Hideyuki Nasu <sup>1</sup> 1) Furukawa Electric Co., Ltd 2) Furukawa FITEL (Thailand) Co.,Ltd	19	
12:00		Low-loss, polarization-independent spot-size converter manufacturable with a 0.18 μm CMOS process  Reona Motoji, Hirota Uemura, Naoki Matsui, Dan Maeda, Tomoya Sugita (KYOCERA Corporation)	22	
12:25	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition			
12:40-13:00	Platinum Sponsors' Seminar (with a light meal) @Hall I & II Title: Introduction of SHINKO Core Technology and Semiconductor Package Trends (Shinko Electric Industries Co., Ltd.)			
13:10-13:25	Platinum Sponsors' Seminar (with a light meal) @Hall I & II Title: PacTech's Automatic Laser Soldering Technologies (Nagase & Co., Ltd.)			
13:40-15:10	<b>Session 7: Automotive</b> Chairperson Yutaka Uematsu (Hitachi, Ltd.) Masayoshi Yamamoto (Nagoya University)	<b>Session 8: Emerging process</b> Chairperson Shinya Takyu (LINTEC Corporation) Naoko Araki (Daicel Corporation)		
13:40	(Invited) Trends in reverb chamber Testing  Garth D'Abreu (ETS-Lindgren)	(Invited) Artifact Metrics-Based Supply Chain Integrity: New Trends in Object Authentication and Tracking  Tutomu Matsumoto (Yokohama National University)	I-02	
14:05	Electromagnetic Noise Evaluation of Transceiver IC and Communication Modules in CAN-FD Communication  Shohei Nishida, Yuki Fukumoto, Tohlu Matsushima (Kyushu Institute of Technology)	33 New die bonding material with PSQ as a main agent having high heat dissipation for LED device application  Yoshiki Furukawa, Manabu Miyawaki, Susumu Miura, Hironori Shizuhata, Naoya Saiki (Lintec corporation)	3	
14:30	Improving traffic participant safety using connected active safety techniques and cooperative perception  Robert Gee (Continental Automotive Systems, Inc.)	31		
14:55	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition			
15:10	Coffee break + Sponsor's Exhibition			
15:20-16:10	<b>Hall I &amp; II</b> Chairperson Masayoshi Yamamoto (Nagoya University) & Yutaka Uematsu (Hitachi, Ltd.) <b>Plenary Speech VI</b>			
15:20	<b>Plenary Speech VI: Dynamic Wireless Power Transfer to accelerate carbon neutrality ~Latest Trends in Japan and the world~</b> <b>Kaori Takahashi (Mitsubishi Research Institute, Inc.)</b>			
16:10-17:05	<b>Hall I &amp; II</b> Chairperson Shinya Takyu (LINTEC Corporation) & Eiji Higurashi (Tohoku University) <b>IEEE EPS Special Speech I &amp; II</b>			
16:10	<b>IEEE EPS Special Speech I: EPS Welcome</b> <b>Kitty Pearsall (Boss Precision, Inc.)</b>			
16:25	<b>IEEE EPS Special Speech II: Materials and Modelling Challenges for High Reliability Packaging</b> <b>Chris Bailey (University of Greenwich)</b>			
17:05-18:00	<b>Early Career Researcher's (ECR) Session - On-demand viewing available</b> On-site/ on-demand poster presentation			
	Micro-displacement sensing technique using Fabry-Pérot interferometer with a relay optical fiber  Yuya Mori, Takeru Fukahori, Ryo Nagase  (Chiba Institute of Technology)	7 Study on electrical characterization of hexagonal-BN  Riki Yamanishi <sup>1</sup> , Soshi Motoda <sup>1</sup> , Satoko Shinkai <sup>1</sup> , Satoshi matsumoto <sup>1</sup> , Masataka Hasegawa <sup>2</sup>  1) Graduate School of Kyushu Institute of Technology 2) National Institute of Advanced Industrial Science and technology	10 Polymer Tapered Pillar Grown from SMF Core for Silicon-photonics Chip Coupling  Taiga Kurisawa <sup>1</sup> , Yoshiki Kamiura <sup>1</sup> , Chiemi Fujikawa <sup>1</sup> , Osamu Mikami <sup>2</sup>  1) Tokai University 2) Universiti Teknologi Malaysia	24
	Miniaturization of Polymer Spot Size Expander for Silicon Photonics Chip and Optical Fiber Coupling  Yoshiki Kamiura <sup>1</sup> , Taiga Kurisawa <sup>1</sup> , Chiemi Fujikawa <sup>1</sup> , Osamu Mikami <sup>2</sup> 1) Tokai University 2) Universiti Teknologi Malaysia	25 Driver's Sleepiness Estimation Using Millimeter Wave Radar and Camera  Katsuki Kubo, Toshio Ito  (Shibaura Institute of Technology)	26 Self-localization with Omnidirectional Camera using Colored Point Cloud  Shell Yamauchi, Toshio Ito  (Shibaura Institute of Technology)	28
	Fabrication for low-loss polymer optical waveguide with vertically 90° bent core  Daiki Suemori, Maho Ishi, Naohiro Kohm, Takaaki Ishigure (Keio University)	32 Investigation of fabrication conditions for Y-branched polymer optical waveguides using the Mosquito method  Kentaro Sekitani, Ryosuke Hatai, Takaaki Ishigure (Keio University)	35 Research on Implementing of Human Ethics in Automated Driving Using Driver's Choice Behavior  Kaito Kusakari, Toshio Ito (Shibaura Institute of Technology)	40
	Detectability of Open Defects at Interconnects between Dies in 3D Stacked ICs with Relaxation Oscillators  Masao Ohmatsu <sup>1</sup> , Fumiya Sako <sup>1</sup> , Yuki Ikiri <sup>1</sup> , Hiroyuki Yotsuyanagi <sup>1</sup> , Shyue-Kung Lu <sup>2</sup> , Masaki Hashizume <sup>1</sup> 1) Tokushima University 2) National Taiwan University	44		
18:10	Close			

## November 11, 2022 (Friday)

	Hall I & II	Room III	Room IV
	Remote discussion via interactive voice	Remote discussion via chat	Remote discussion via chat
9:00		Registration	
9:20		ECR Award Ceremony	
9:30-10:10	Hall I & II Chairperson Shinya Takyu (LINTEC Corporation) & Shigenori Aoki (LINTEC Corporation) IEEE EPS Special Speech III		
9:30	<b>IEEE EPS Special Speech III Material Needs for meeting Next Generation Advanced Packaging Challenges</b> <b>Sam Karikalan (Broadcom Inc.)</b>		S-01
10:10-10:50	Hall I & II Chairperson Takaaki Ishigure (Keio University) & Taiji Sakai (FICT LIMITED) Special Speech		
10:10	<b>Heterogeneous Integration Special Speech: Heterogeneous Integration Enabling High Performance AI Hardware</b> <b>Takashi Hisada (IBM Research-Tokyo)</b>		S-04
10:50	Coffee break + Sponsor's Exhibition		
11:00-12:55	Session 9: Novel materials Chairperson Kei Murayama (SHINKO ELECTRIC INDUSTRIES CO., LTD.) Satomi Kawamoto (Namics Corporation)	Session 10: Bioelectronics Chairperson Yoshio Nogami (Nogami Inter Connect Co.Ltd.) Beomjoon Kim (The University of Tokyo)	Session 11: High-Speed Electrical Interconnect Chairperson Yoichiro Kurita (Tokyo Institute of Technology) Ryo Sakamaki (AIST)
11:00	(Invited) Development of oxide glass-ceramic derived all-solid-state Na battery  Tsuyoshi Honma  (Nagaoka University of Technology)	I-03 Development of a simple glucose sensor patch using low melting-point polymer's porous microneedles for pre-diabetic patients Yosuke Koma <sup>1</sup> , Yuku Tsuruma <sup>1</sup> , Jongho Park <sup>2</sup> , Shigenori Aoki <sup>1</sup> , Shinya Takyu <sup>1</sup> , Beomjoon Kim <sup>2</sup> 1) LINTEC Corporation 2) The University of Tokyo	12 (Invited) AI-Accelerator Proof of Concept by a Multi-IP Chip Project  Shin-ichi O'uchi  (AIST)
11:25	(Invited) Advanced Insulation Materials for Next IC Package Shiro Tatsumi  (Ajinomoto Co., Inc.)	I-04 Fabrication for circular cross-sectional microchannels and their application for on-off valves Kaori Uehara, Yutaka Hori, Takaaki Ishigure  (Keio University)	18 A Study on Alternative Substrate for FCBGA  Li-Chieh Hung <sup>1</sup> , PO-I Wu <sup>1</sup> , Hung-Chun Kuo <sup>1</sup> , Ming-Fong Jhong <sup>1</sup> , Chen-Chao Wang <sup>1</sup> , Si Min Wang <sup>2</sup> 1) ASE 2) Fengjia Chia University
11:50		An Oxytocin sensor based on an organic field-effect transistor functionalized with a molecularly imprinted polymer Qi Zhou, Tsuyoshi Minami  (The University of Tokyo)	42 A housing design to optimize heat dissipation and reduced noise for LTE card module in communication terminal  Atsushi Nakamura <sup>1</sup> , Takashi Yajima <sup>1</sup> , Hideki Osaka <sup>1</sup> , Daisuke Tsugane <sup>2</sup> , Hiroshi Sugita <sup>2</sup> 1) Ultimate Technologies Inc. 2) KDDI CORPORATION
12:15		Porosity control of polylactic acid porous microneedles using microfluidic technology Boyu Qin, Jongho Park, Heyi Jing, Leilei Bao, Beomjoon Kim  (The University of Tokyo)	45 Sum of Squares Partial Fractions: Application in Modeling of Interconnects in Heterogeneous Integration Francisco Coronado, Arif Engin  (San Diego State University)
12:40	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition		Interview with the Authors (Discussion after the session)
12:55	Lunch (free time)		
13:55-15:50	Session 12: Power Electronics Chairperson Kentaro Kaneko (Ritsumeikan University) Masafumi Yokoyama (SUMITOMO CHEMICAL Co., Ltd.)	Session 13: Integrated Photonics technology Chairperson Shigenori Aoki (LINTEC Corporation) Hideyuki Nawata (Nissan Chemical Corporation)	
13:55	(Invited) Application of SiC power devices to ultra-high voltage equipment  Takashi Nakamura (NexFi Technology Inc., Osaka University)	I-06 (Invited) Novel solder-reflow resistant thermoplastic polyetherimides for co-packaged optical applications  Gabrie Hoogland (SABIC)	I-11
14:20	Evaluation of electrical and thermal properties of POL-kw by simulation and actual measurement  Youichi Nishihara, Shingo Hayashibe, Bando Koji (SHINKO ELECTRIC INDUSTRIES CO., LTD.)	39 International standards to enable the exploitation of emerging integrated photonic technologies for future hyperscale data centres Richard Pitwon <sup>1,2</sup> , Bernard Lee <sup>3</sup> , Liam O'Faolain <sup>4,5</sup> 1) Resolute Photonics Ltd 2) University of St Andrews 3) SENKO Advanced Components 4) Munster Technological University 5) Tyndall National Institute	43
14:45	A LOAD VARIABLE NOISE-SOURCE EQUIVALENT CIRCUIT MODEL FOR DC-DC CONVERTER BASED ON CUBIC SPLINE INTERPOLATION METHOD  Shuqi Zhang, Kengo Iokibe, Yoshitaka Toyota  (Okayama University)	16 Demonstration of small-aperture cavity-resonator-integrated guided-mode resonance mirror with grating apodization for vertical-external-cavity surface-mounted laser Akari Watanabe <sup>1</sup> , Keisuke Ozawa <sup>1</sup> , Shunsuke Teranishi <sup>1</sup> , Aika Taniguchi <sup>1</sup> , Junichi Inoue <sup>1</sup> , Kenji Kintaka <sup>2</sup> , Shogo Ura <sup>1</sup> 1) Kyoto Institute of Technology 2) National Institute of Advanced Industrial Science and Technology	23
15:10	(Invited) Material Solutions for High-reliability and High-temperature Power Electronics  Aarief Syed-Khaja (Heraeus Germany GmbH & Co. KG)	I-05 Time of flight three-dimensional imaging camera using compressive sampling technique with sparse frequency intensity modulation light source Quang Duc Pham <sup>1</sup> , Yoshio Hayasaki <sup>2</sup> 1) Vietnam National University 2) Utsunomiya University	13
15:35	Interview with the Authors (Discussion after the session) + Sponsor's Exhibition		Interview with the Authors (Discussion after the session)
15:50	Close		