2019 IEEE CPMT Symposium Japan (ICSJ 2019)

Kyoto, Japan 18 – 20 November 2019



IEEE Catalog Number: CFP19PWJ-POD ISBN: 978-1-7281-0979-4

Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number: CFP19PWJ-POD ISBN (Print-On-Demand): 978-1-7281-0979-4 ISBN (Online): 978-1-7281-0978-7

ISSN: 2373-5449

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



Symposium Program

Nover	November 18, 2019 (Monday)			
Hall I				
13:00-1	4:40 Session 1: New Material and Process			
Tome	onori Minegishi (Hitachi Chemical Co., Ltd.), Masahiro Aoyagi (AIST)			
1-01	(Invited) Thermally Stable and Transparent Polyketone Resin			
	Hiroshi Matsutani, Nanako Arima, Youhei Ishikawa, Masahiro Matsunaga and Yutaka Okada (Hitachi Chemical Co., Ltd.)			
1-02	Characterization of thick tin deposits by autocatalytic reaction and electrochemical investigations of autocatalytic			
	tin electrolytes and their reaction mechanisms			
1-03	Reduction and Surface Treatment for Oxidized Copper Electrodes by Water Vapor Plasma			
1 00	Hirokazu Terai, Taichi Hashimoto, Hirohiko Nakano and Osamu Tsuji (Samco Inc.)			
1-04	Release Sheet Integrated Backside Coating Tape Corresponding to Stealth Dicing			
Hall II				
	4:40 Session 2: Photonics 1			
-	enori Aoki (LINTEC Corporation), Lars Brusberg (Corning Research & Development Corporation)			
2-01	(Invited) Market & Industrial Trends of Optical Interconnect			
	Bernard HL Lee			
2.02	(SENKO Advanced Components (HK) Ltd)			
2-02	A platform approach towards hybrid photonic integration and assembly for communications, sensing, and			
	quantum technologies based on a polymer waveguide technology			
2-03	(Invited) Trends in Enhanced Integrated Photonics for Hyperscale Data Centre and 5G Environments			
2-03	Richard Pitwon (Resolute Photonics Ltd.)			
2-04	A 53-Gbit/s/ch Active Optical Cable Utilizing GI Polymer Waveguide for High-density On-board Optical			
	Interconnects			
Room	3			
13:00-1	4:40 Session 3: Bioelectronics · Healthcare & Beauty 1			
	e Hosoda (NIMS), Noboru Asahi (Toray Industries Europe GmbH / Toray Automotive Center Europe)			
3-01	A Fabrication of Whole-dissovable Microneedles Patch in Larger Area for Transdermal Drug Delivery			
3-02	(The University of Tokyo) Porous Microneedle Integrated in Paper based Glucose Sensor for Fluid Channel Interface			
3-02	Hakjae Lee, Kai Takeuchi, Yui Sasaki, Nobuyuki Takama, Tsuyoshi Minami and Beomjoon Kim (The University of Tokyo)			
3-03	Evaluation of Cuffless Blood Pressure Estimation Accuracy of Different Light Colors			

	5:50 Session 4: Advanced Package 1 hi Yamada (Toshiba Corporation), Eiji Higurashi (AIST)
4-01	(Invited) "Photo Mold" the Innovation of Packaging Shuzo Akejima (Rising Technologies Co., Ltd.)
4-02	Assessment of NiPdAuAg Leadframe Rough for Delamination Stable in Electronic Packaging for Automotive 49 Suhaimi Azizan¹ and Ghazali Omar²
4.02	(Corporate R&D ON Semiconductor Malaysia ¹ and Universiti Teknikal Malaysia Melaka ²)
4-03	Dual Side Molding SiP Drop Reliability Analysis
Hall II	
	5:50 Session 5: Photonics 2
Junich	hi Inoue (Kyoto Institute of Technology), Richard Pitwon (Resolute Photonics Ltd.)
5-01	(Invited) Hybrid Photonic Integration and 3D Nano-Printing: Combining Silicon Photonics with Organic Materials Christian Koos (Karlsruhe Institute of Technology)
5-02	Fiber Array Unit with Reduced Clad Fibers for High-Density Fiber-Chip Coupling
5-03	Applicability of the Mosquito method to fabricate fan-in/out device for single-mode multicore fiber
5-04	(Invited) Single-mode glass waveguide substrate for PIC packaging
Room 3	
15:10-16	5:50 Session 6: Thermal
Tomoy	yuki Hatakeyama (Toyama Prefectural University), Kishio Yokouchi (JIS, Kanto Gakuin University)
6-01	(Invited) Temporal and Spatial Modification of Thermal Radiation
	Chih-Ming Wang ¹ , Tzu-Ting Huang ² , Wei-Yi Tsai ² and Din Ping Tsai ²
	(National Dong Hwa University ¹ and Academia Sinica ²)
6-02	(Invited) Vehicle Thermal Management Using Heat Pipes

6-03

6-04

Cheong Chiang Ng and Torsten Hauck

(Fujitsu Advanced Technologies Limited)

 $(NXP\ Semiconductors)$

Jie Wei

Novem Hall I	ber 19, 2019 (Tuesday)
	25 C 7. A. l 1 D l 2
	:35 Session 7: Advanced Package 2
	hisa Nonaka (Hitachi Chemical Co., Ltd.), Shoji Uegaki (E-ThermoGentek Co., Ltd.)
7-01	(Invited) Panel Level Packaging – From Idea to Industrialization
	(Fraunhofer Institute for Reliability and Microintegration and Technical University Berlin ²)
7-02	Neural Network Assisted Speed Up of High Fidelity Warpage Simulations towards Design for Reliability in
	Ultra-Thin Packages
	Cheryl Selvanayagam ^{1,2} , Rathin Mandal ¹ , Pham Luu Trung Duong ² and Nagarajan Raghavan ²
	(Advanced Micro Devices, Inc. (AMD) ¹ and Singapore University of Technology and Design ²)
7-03	High-Resolution Structural Analysis of Multilayer Package Substrate with Open-Source Parallel FE Software
	FrontISTR99
	Shinji Nakazawa ¹ , Naoki Iwasaki ¹ , Ryuichi Matsuki ¹ , Gaku Hashimoto ² and Hiroshi Okuda ² (SHINKO Electric Industries Co., Ltd. ¹ and The University of Tokyo ²)
7-04	X-ray Inspection Methodology on QFN and BGA99
	Jui Ang Tan and Chong Seng Foo (Intel Products)
Hall II	25 Sandan P. Andamadina
	5:35 Session 8: Automotive
	a Uematsu (Hitachi, Ltd.), Daisuke Iguchi (Fuji Xerox Co., Ltd.)
8-01	(Invited) High Efficiency MIMD-Based Vector Processor for Automotive AI Applications
	Teppei Hirotsu
8-02	(NSITEXE, Inc.) (Invited) Inductors for modern Power over Signal applications in automotive
8-02	Felipe Jerez
	(Product Development TDK Electronics AG)
8-03	(Invited) Physical Layer Simulation Technology for Automotive Ethernet
0 03	Takehiro Kawauchi ¹ , Akihito Iwata ¹ , Hirofumi Urayama ¹ , Tatsuya Izumi ¹ , Koichi Takayama ¹ and Takeshi Hagihara ² (Sumitomo Electric Industries, LTD. ¹ and AutoNetworks Technologies, LTD. ²)
8-04	(Invited) Automotive Ethernet System level Signal Integrity Test'000000000000000000000000000000000000
	Darshan Mehta
	(Tektronix, Inc.)
Room 3	
	:35 Session 9: Bioelectronics · Healthcare & Beauty 2
-	azu Yasuda (Osaka University), Yoshio Nogami (Toray Engineering Co., Ltd.)
9-01	(Invited) Development of Tangible Controller for Ikebana Training System
	(Ochanomizu University / Aoyama Gakuin University ¹ , Independent ² and Ochanomizu University ³)
9-02	Conformable Electronics: Integration of electronic functions into static and dynamic free form surfaces
	Thomas Löher, Manuel Seckel, Julian Haberland, Joao Marques, Malte von Krshiwoblozki, Christine Kallmayer and Andreas Ostmann (Fraunhofer IZM and Technische Universität Berlin)
9-03	Fabrication for polymer microchannels with circular cross-section using photo-curable PDMS
9-03	Ryota Nakazawa and Takaaki Ishigure (Keio University)
9-04	A biodegradable microneedles - trapezoidal micropatterned patch in the LED therapy
	Xiaobin Wu, Nobuyuki Takama and Beomjoon Kim (The University of Tokyo)

Hall III

17:00-18:30 Early Career Researcher's (ECR) Session (Open Forum with Beer)

ECR-01	Study on the reduction of computational complexity and sound analysis of the modified Gabor wavelet127
	Miyori Shirasuna, Yuya Nakade and Masaru Nakagawa
	(Toyohashi University of Technology)
ECR-02	Research on Solder Joint Intermittent Fault Reproduction Based on Sweep Frequency Vibration Test
	Huakang Li, Kehong Lyu, Yong Zhang, Peng Yang, Jing Qiu and Guanjun Liu
	(National University of Defense Technology)
ECR-03	MMF Exciter Composed of Graded-Index Core Polymer Optical Waveguide Fabricated Applying the Mosquito
	Method and the Imprint Method
	Ryosuke Hatai, Fukino Nakazaki, Tomoki Nakayama and Takaaki Ishigure
	(Keio University)
ECR-04	Utrasonic Joining of Carbon Fiber Reinforced Thermoplastic and Magnesium Alloy
	Kohei Kawakami and Kiyokazu Yasuda
	(Osaka University)
ECR-05	Compact 77 GHz 4x4 Patch Array Design Using Backside Metal Grounded GaAs-based IPD Technology139
	Ta-Yeh Lin ¹ , Shuw-Guann Lin ¹ , Yin-Cheng Chang ¹ , Chaoping Hsieh ¹ , Da-Chiang Chang ¹ and Tzung-Hsien Chen ²
	(Taiwan Semiconductor Research Institute ¹ and Bureau of Standards, Metrology and Inspection ²)
ECR-06	Research on Intermittent Fault Dynamic Characteristic based on Electrical Connector
	Xianzhe Cheng, Kehong Lyu, Peng Yang, Yong Zhang, Guanjun Liu and Jing Qiu
	(National University of Defense Technology)
ECR-07	Simulation of refractive index profile formed in polymer optical waveguides fabricated using the Mosquito
	method
	Yoji Sakaguchi and Takaaki Ishigure
	(Keio University)
ECR-08	Study on Loss Variation Measurement of Branched Fibers
	Kentaro Matsuda, Ryota Kuramochi, Takaaki Endo and Ryo Nagase
EGD 00	(Chiba Institute of Technology)
ECR-09	Millimeter-Wave TRL Calibration Technique with the Demonstration of An IPD Antenna
	Ta-Yeh Lin ¹ , Shuw-Guann Lin ¹ , Yin-Cheng Chang ¹ , Chaoping Hsieh ¹ , Da-Chiang Chang ¹ and Ming-Kun Hsieh ²
EGE 40	(Taiwan Semiconductor Research Institute ¹ and Bureau of Standards, Metrology and Inspection ²)
ECR-10	Si (100)-GaN/Si (111) low temperature wafer bonding process for 3D power supply on chip
	Ryuki Ishito, Kota Ono and Satoshi Matsumoto
EGD 11	(Kyushu Institute Technology)
ECR-11	Polymer Optical Coupling Device with Single Mode Fiber for Silicon Photonics
	Ryo Sato ¹ , Chiemi Fujikawa ¹ , Osamu Mikami ¹ , Takayuki Inayama ² , Kazuya Ohashi ² and Kazuto Noguchi ²
	(Tokai University ¹ and Ehime University ²)
ECR-12	Effect of several surfactants for enhancing electrical conductivity development through silver fillers in an
	epoxy-based binder
	Shiho Nakazawa and Masahiro Inoue
ECD 12	(Gunna University) Discrete 10 Probe by Using File Chin IPD Posiston and Applifon for Inspecting FMI of a Posisson IC.
ECK-13	Discrete 1Ω Probe by Using Flip-Chip IPD Resistor and Amplifier for Inspecting EMI of a Packaged IC163
	Yin-Cheng Chang ¹ , Ta-Yeh Lin ¹ , Chaoping Hsieh ¹ , Da-Chiang Chang ¹ , Mao-Hsu Yen ² , Shawn S. H. Hsu ³ and
	Jian-Li Dong ⁴
	(Taiwan Semiconductor Research Institute ¹ , National Taiwan Ocean University ² , National Tsing Hua University ³ and
T CT 44	Bureau of Standards, Metrology and Inspection ⁴)
ECR-14	Design of cavity-resonator-integrated guided-mode resonance narrowband-pass filter
	Ryo Asai ¹ , Junichi Inoue ¹ , Shogo Ura ¹ and Kenji Kintaka ²
	(Kyoto Institute of Technology ¹ and National Institute of Advanced Industrial Science and Technology ²)
ECR-15	Fabrication and Evaluation for Polymer Waveguide Optical Amplifier Incorporated with Rare Earth-Metal
	Polymer Composite
	Toshifumi Horie ¹ , Toshimi Fukui ² and Takaaki Ishigure ¹
	(Keio University ¹ and KRI, Inc. ²)

Hall I 11:25-12:15 Session 10: Power Electronics Yoshikazu Takahashi (Tohoku University), Kentaro Kaneko (Kyoto University) (Invited) Mapping of Metal/Semiconductor and Semiconductor/Semiconductor Interfaces Using Scanning Kenji Shiojima (University of Fukui) 10-02 Takuto Igawa (FLOSFIA Inc.) 10-03 Kazuhiro Kikuchi^{1,2}, Yasunori Karasawa¹, Yasutaka Watanabe¹, Takashi Sugino¹ and Tadashi Suetsugu² (LINTEC Corporation¹ and Fukuoka University²) Hall II 11:25-12:15 Session 11: Photonics 3 Hidetoshi Numata (IBM Research - Tokyo), Bernard HL Lee (SENKO Advanced Components (HK) Ltd) Yoshie Morimoto, Hitomi Matsui, Makoto Hikita and Takaaki Ishigure (Keio University) 11-02 Ying Shi, Lin Ma and Zuyuan He (Shanghai Jiao Tong University) Room 3 11:25-12:15 Session 12: SI/PI/RF 1 Kazuyuki Nakagawa (Renesas Electronics Corp.), Masahiro Aoyagi (AIST) Mustafa Özkök, Sven Lamprecht, Eckart Klusmann and Henning Hübner (Atotech Deutschland GmbH) 12-02 Bo Zhou, Xiuxian Li, Changkun Li, Li Qian and Zhikuang Cai (Nanjing University of Posts and Telecommunications) Hall I 13:50-15:30 Session 13: Advanced Package 3 Shinya Takyu (LINTEC Corporation), Naoko Araki (Daicel Corporation) Yi-Hao Laio, Wei Hsiang Chen and Ming Chang Shih (National University of Kaohsiung) 13-04 Ming-Han Wang, KarenYu Chen, Guan-Han Lin, Frank Cheng, Meng-Kai Shih and Shiu-Fang Yen (Advanced Semiconductor Engineering, Inc.) Hall II 13:50-15:30 Session 14: Photonics 4 Hideyuki Nasu (Furukawa Electric Co., Ltd.), Christian Koos (Karlsruhe Institute of Technology) (Invited) 53.5625 Gb/sX4-ch Optical Interconnect Module Based on Silicon Interposer for Data Center Chin-Ta Chen, Hsiao-Chin Lan, Po-Kuan Shen, Hsin-Chieh Wu, Yu-Chun Wang and Chien-Chen Hsieh (Centera Photonics Inc.) 14-02 Design Modifications to an Existing High-Density Mid-Board Optical Engine For Liquid Immersion Cooling . . 213 Kevin Burt, Louis LaCroix and Raymond Lee (Samtec, Inc.) 14-03 (Invited) Holistic Transformation to Enable the Mass Manufacturing of Tb/s Transceivers Bogdan Sirbu

November 20, 2019 (Wednesday)

(Fraunhofer IZM)

Room 3

13:50-15:30	Session	15:	SI/PI	/RF	2

Masa	hiro Aoyagi (AIST), Kazuyuki Nakagawa (Renesas Electronics Corp.)
15-01	High Density IO Fan-out Design Optimization with Signal and Power Integrity217
	Keng Tuan Chang, Chih Yi Huang, Hung Chun Kuo, Ming Fong Jhong, Tsun Lung Hsieh, Mi Chun Hung and
	Chen Chao Wang
	(Advanced Semiconductor Engineering (ASE), Inc.)
15-02	AI-based Design Methodology for High-speed Transmission Line in PCB
	Moritoshi Yasunaga, Shumpei Matsuoka, Yuya Hoshinor, Takashi Matsumoto and Tetsuya Odaira
	(University of Tsukuba)
15-03	Power Channel Design and Verification for Automotive Chipset with Multi-Core Processor
	Nansen Chen
	(MediaTek Inc.)
15-04	Feasibility Study on Polyethylene as a Printed Wiring Board Material for High-Frequency Signal Transmission
	Around 50 GHz
	Kaoru Hashimoto and Kanji Otsuka
	(Meisei University)