



4th International IEEE Workshop on Low Temperature Bonding for 3D Integration

# **2014 4th IEEE International Workshop on Low Temperature Bonding for 3D Integration**

**LTB-3D 2014**

<http://www.3dwb.org/index.html>

**July 15-16 2014, Tokyo**

# LTB-3D 2014

## 4th IEEE International Workshop on Low Temperature Bonding for 3D Integration

July 15, Tuesday		
8:30	REGISTRATION	
9:00-9:20	Opening Remarks	T. Suga, The University of Tokyo
9:20-10:10	Low-temperature bonding process for 3D Integration	<b>[Keynote]</b> Three Dimensional Dynamic Random Access Memory; T. Kirihata, IBM
COFFEE BRAEK		
10:30-11:20	Low-temperature bonding process for 3D Integration	<b>[Keynote]</b> 3DIC Technology – CoWoS as an Example; Shin-Puu Jeng, TSMC
11:20-11:40		Process Development for 3D Integration: Conductive wafer bonding for high density inter-chip interconnection; Wenqi Zhang, Chinese Academy of Sciences
11:40-12:00		Brick-Like Based KGDs Self-Assembly and Connection Technologies for 3DIC Integration; Yu-Cheng Fan, National Taipei University of Technology
12:00-12:20		Copper-to-Dielectric Heterogeneous Bonding for 3D Integration, Wei Lin, IBM
12:20-13:20	LUNCH	
13:20-13:40	Low-temperature bonding process for 3D Integration	Scaling of 3D interconnect technology incorporating metal-metal bonds to pitches of 10 microns and below for infrared focal plane array applications; Dorota S. Temple, RTI International
13:40-14:00		3D Integration Applications for Low Temperature Direct Bond Technology; Paul Enquist, Ziptronix, Inc.
14:00-14:20		Low Temperature Wafer Bonding for Wafer-Level 3D Integration; B. Rebhan, EV Group
14:20-15:10		<b>[Keynote]</b> Nanobonding - A Key Technology for Emerging Applications in Health and Environment; M. Jamal Deen, Macmaster University
SHORT PRESENTAION		
15:25-17:00	3D Integration Process	Mechanical Grinding of Au/SiO2 Hybrid-bonded Substrates for 3D Integrated Image Sensors; K. Hagiwara, NHK
		Cu/dielectric Hybrid Bonding Using Surface-Activated Bonding (SAB) Technologies for 3D Integration; Ran He, The University of Tokyo
		Via-Last/Backside-Via 3D Integration Using a Visible-Light Laser Debonding Technique; T. Fukushima, Tohoku University


		Highly Thermoresistant Temporary Bonding/Debonding System without Organic Adhesives for 3D Integration; H. Hashiguchi, Tohoku University Surface-Tension Driven Self-Assembly for VCSEL Chip Bonding to Achieve 3D and Hetero Integration; Y. Ito, Tohoku University
15:25-17:00	Photonic Applications of Low-temperature Bonding	Coupling Efficiency between Laser Diode and Optical Isolator Integrated by Photosensitive Adhesive Bonding; D. Tamura, Shibaura Institute of Technology
		Investigation of High Temperature Process for III-V/SOI Hybrid Photonic Devices with AlInAs Oxidation Current Confinement Layer; Y. Hayashi, Tokyo Institute of Technology
	InAs/GaAs Quantum Dot Lasers Metal-Stripe-Bonded onto SOI Substrate; Yuan-Hsuan Jhang, The University of Tokyo	
	Fabrication of Walk-Off Compensating Wavelength-Conversion Devices with Stacks of Multiple Plates by Use of Room-Temperature Bonding; Y. Ariga, Chuo University	
Layer Transfer	Light Propagation Properties of Si Waveguides after Removing III-V Layer on a III-V/SOI Wafer Fabricated by Plasma Activated Bonding; J. Suzuki, Tokyo Institute of Technology	
	Epitaxial growth of GaInAsP system on wafer-bonded InP/Si substrate; J. Kishikawa, Sophia University	
Surface Activated Bonding: Recent Developments	Large-scale Ge-on-Insulator wafers using low-temperature bonding and Epitaxial Lift-Off (ELO) technique; E. Mieda, AIST	
	Carbon Nanotube Bump Interconnect for Flexible Multilayer Substrates; M. Fujino, The University of Tokyo	
	Room temperature direct bonding of Si wafers smoothed by Ne beam irradiation; Y. Kurashima, AIST	
	Room temperature bonding of electroplated Au patterns with atomically smooth surface prepared by a replication process using a sacrificial layer; Y. Kurashima, AIST	
New Material and Device Structure	Room-Temperature Wafer Bonding With Smooth Au Thin Film in Ambient Air Using Ar RF Plasma Activation; K. Okumura, The University of Tokyo	
	Room Temperature Bonding of Sapphire with Sapphire or Metal Substrates in Air using Au Films; M. Ishii, Namiki Precision Jewel Co., Ltd.	
		Room Temperature Bonding of Wafers in Air using Au-Ag Alloy Films; H. Kon, Tohoku University
17:00-17:50	Poster Session	
18:00	Leaving to Reception (Bus to Tokyo Bay Cruise)	

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July 16, Wednesday		
8:30-8:50	Layer Transfer	Micromechanical View of Heterointegration by Wafer Bonding and Layer Splitting; H. Baumgart, Old Dominion University.
8:50-9:10		GaN-on-hBN technology for release and transfer of nitride devices; M. Hiroki, NTT Corp.
9:10-9:30		Integration of III-V Materials and Si-CMOS through Double Layer Transfer Process; Kwang Hong Lee, Singapore-MIT Alliance for Research and Technology (SMART)
9:30-9:50	MEMS Applications	Heterogeneous Integration by Wafer-to-Wafer Transfer Technology; S. Tanaka, Tohoku Univ.
9:50-10:10		Low-temperature bonding technologies for MEMS and 3D-IC; M.M.V.Taklo, SINTEF
10:10-10:30		Thermal activation of Au/Ti by interdiffusion for getter film integration in wafer-level vacuum packaging; A. Bosseboeuf, Université Paris Sud
<i>COFFEE BREAK</i>		
<i>SHORT PRESENTATION</i>		
10:45-12:30	MEMS Applications	Fabrication of Miniaturized Polarization Sensors Using Flip-Chip Bonding With Atmospheric-Pressure Plasma Activation; S. Ikeda, The University of Tokyo
		Thermocouples Fabricated on Microfluidic Trench Sidewall Capped with Film; M. Shibata, Toyota Technological Institute
		Surface Activated Bonding Method Applied in MEMS Pressure Sensor with TSV structures; Zijian Wu, Tsinghua University
		Wafer-Level Packaging for Harsh Environment Application; C. Jia, Carinthian Tech Research AG,
	Low-temperature Metal Bonding Processes	Cu/Cu Direct Bonding by Metal Salt Generation Bonding Technique with Organic Acid and its Persistence of Reformed Layer; S. Koyama, Gunma University
		Real Time FTIR Spectroscopic and Kinetic Studies of Cu Surface Reduction by Using Formic Acid Vapor; Chia-Chen Kuo, National Chung Hsing University
		Microstructural change of Ag nanoporous bonding joint and interdiffusion of Cu /Ag during thermal aging; Min-Su Kim, Osaka University
		The effect of Cu particle additions on the microstructure and melting point of Sn-Bi solder for die attachment; O. Mokhtari, Osaka University
		Room-temperature vacuum packaging using ultrasonic bonding with Cu compliant rim; R. Takigawa, Kyushu University
		In-Situ Observation of Ultrasonic Bonding Using High Speed Camera; T. Shuto, Kyushu University
Nanoporous Gold as a Versatile Bonding Intermediate; Y. -C. Lin, Tohoku University		
Low temperature and low pressure bump bonding realized by single-micrometer Ag-nanoparticle bumps; Weixin Fu, Waseda University		

10:45-12:30	Low-temperature Metal Bonding Processes	Fine-Pitch Interconnection by Hybrid Cu/Sn-Adhesive Bonding for 3D Integration; M. Ohvama, Waseda University New Bonding Material for Power Devices with High Bonding Strength for Operating High Temperature; S. Sekine, Napra Corporation
	Surface Activated Bonding: Electronic Properties	Directly bonded Ge/GaAs by surface activated bonding for high efficiency III-V multi-junction solar cells; G. Kono, The University of Tokyo
		Effects of Annealing on GaAs/Si Bonding Interfaces for Hybrid Tandem Solar Cells; L. Chai, Osaka City University
	Surface activated Bonding: Power Applications	Annealing temperature dependence of SAB based Si/Si junctions; M.Morimoto, Osaka City University
Investigation on the effects of annealing process on the electrical properties of n+-Si/n-SiC junctions; J. Liang, Osaka City University		
12:30-14:00		Annealing Characteristics of p+-Si/n-4H-SiC Junctions by Using Surface-Activated Bonding; S. Nishida, Osaka City University
		SiC wafer bonding by modified surface activated bonding method; Fengwen Mu, The University of Tokyo
<i>LUNCH: Poster Session</i>		
14:00-14:50	Solar Cells	<b>[Keynote]</b> Wafer Bonding Technologies for Photovoltaic and Other Energy Applications; M. S. Goorsky, University of California, Los Angeles
14:50-15:40	Power Applications	<b>[Keynote]</b> Reliability of Bonding Technologies for Power Electronics Modules; C. Bailey, University of Greenwich
15:40-16:00		Low temperature metal bonding for 3D and power device packaging; L. Di Cioccio, CEA, LETI
<i>COFFEE BRAEK</i>		
16:20-16:40	Low-temperature Metal Bonding Processes	Metal-Assisted Hermetic Wafer-Level Packaging; Oussama Moutanabbir, École Polytechnique de Montréal
16:40-17:00		Nanoporous Gold Bumps for Thermocompression Bonding; R. Aschenbrenner, Fraunhofer IZM
17:00-17:20		Solid Liquid Inter-Diffusion Bonding at Low Temperature; J. Froemel, Fraunhofer ENAS
17:20-17:40		Direct Bonding for Dissimilar Metals Assisted by Carboxylic Acid Vapor; Shang-Kun Huang, National Chung Hsing University
17:40	<i>Awards</i>	
18:00	<i>Closing Remarks</i>	



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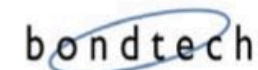
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Tadatomo Suga, Conference Chair

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