



IMPACT Official Site



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Plenary Speech	Industrial /Special Session	Packaging Session	PCB Session	Poster Session
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Day 1 – Tuesday December 21, 2021

Room	504			
10:00-10:30	IMPACT 2021 Opening & Awarding Ceremony			
10:30-11:10	Plenary Speech I : Recent Advancement in Organic Interposer Technology Dr. Shin-Puu Jeng, Director, TSMC			
11:10-11:40	Plenary Speech II : SI Traceability for 5G Hardware Authentication Dr. Paul Hale, Chief of the RF Technology Division, NIST			
11:40-12:20	Plenary Speech III : Enabling Technologies for High Performance Memory Solutions in the Age of Data Dr. Akshay Singh, Vice President, Micron			
12:20-13:20	Lunch, The Banquet Hall of THE MENU, 3F			
Room	503	504a	504b	504c
13:20-15:20	【 S1 】 Test, Inspection and Measurement for 5G (iNEMI)	【 S2 】 Emerging Technologies (SPIL)	【 S3 】 Advanced Packaging Technologies -1	【 S4 】 Test, Quality, AOI, Inspection and Reliability
15:20-15:40	Break			
15:40-17:40	【 S5 】 JIEP	【 S6 】 Innovation and Technology (Nanya Plastic)	【 S7 】 Advanced Packaging Technologies -2	【 S8 】 Test & Reliability

Day 2 – Wednesday December 22, 2021

Room	504			
09:50-11:10	【 IEEE-EPS Panel 】 Enabling Technologies from 5G to B5G			
11:00-12:00	【 Poster Session 】 PCB & Packaging			
12:00-13:20	Lunch, The Banquet Hall of THE MENU, 3F			
Room	503	504a	504b	504c
13:20-15:20	【 S9 】 ICEP	【 S10 】 B5G SiP (ASE Group)	【 S11 】 Modeling, Simulation & Design-1	【 S12 】 Advanced and Green Materials and Process
15:20-15:40	Break			
15:40-17:40	【 S13 】 Embedded	【 S14 】 Next Generation Package Substrates to Support HPC (Atotech)	【 S15 】 Advanced Materials, Automatic Process & Assembly	【 S16 】 Electroplating and Electrochemical Processing Technology
18:00-20:00	IMPACT 2021 Welcome Dinner (By Invited)			

Day 3 – Thursday December 23, 2021

Room	504		
09:00-09:40	Plenary Speech IV: The First Quantum Computer Installed in Japan Dr. Shintaro Yamamichi, IBM Japan		
09:40-10:20	Plenary Speech V: 5G AiP (Antenna in Package) and its Related Applications Dr. Hsing-Horng Lee, Unimicron		
Room	503	504a	504b
10:20-12:20	【 S17 】 Market Trend (ChipMos)	【 S18 】 Heterogeneous Integration	【 S19 】 Advanced Packaging Technologies -3
12:20-13:20	Lunch, The Banquet Hall of THE MENU, 3F		
13:20-15:20	【 S20 】 Thermal Management	【 S21 】 Modeling, Simulation & Design-2	【 S22 】 HDI Technology

*The organizer reserves the right to modify the agenda.

The floor plan of the 5th floor includes the following areas and facilities:

- Speaker Preview Room**: Located at the top left.
- Organizer's Office**: Located at the top center.
- Registration**: Located at the top center, adjacent to the Organizer's Office.
- VIP Lounge**: Located at the top right.
- Poster Sessions**: Indicated by yellow and orange blocks in the center.
- Restrooms**: Multiple restrooms are marked with blue icons (men, women, and combined figures).
- WIFI for 5F**: Indicated by a blue '@' icon in the top right corner.
- Room 503**: A purple room located at the bottom left.
- Room 504a**: A purple room located at the bottom center.
- Room 504b**: A purple room located at the bottom center.
- Room 504c**: A purple room located at the bottom center.

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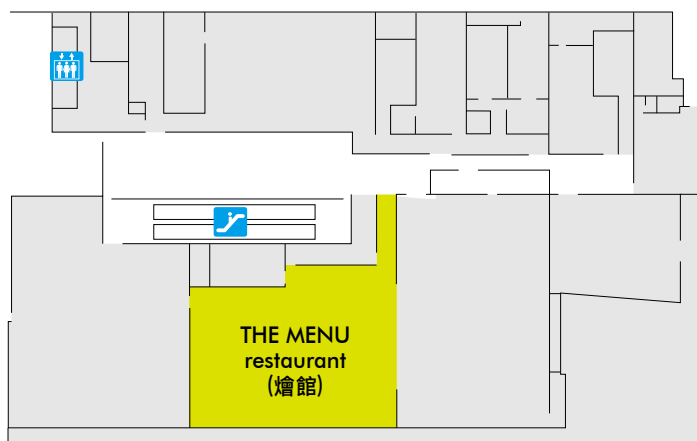
4F

3 F

1F



IMPACT Lunch



TPCA Show

— TAIPEI —

Index

Conference Agenda	Inside Cover
Organizer, Co-Organizer and Sponsor	1
Greeting of Chair	
Welcome Message from Shen-Li Fu, Conference General Chair	3
Welcome Message from Kuo-Ning Chiang, Conference Honorary Chair	4
Welcome Message from Chih-I Wu, Conference Co-Chair	5
Welcome Message from Wei-Chung Lo, Conference Co-Chair	6
Welcome Message from Maurice Lee, Conference Co-Chair	7
Committee Member	8
General Information	
About Conference	12
TPCA Show /Welcome Dinner /IMPACT Best Paper 2020/Identification Badge / Registration Desk / Organizer's Office & Speaker Preview Room / Poster Session / Internet Access / Hotel Information / Guideline for health and safety /Inquiries	12-15
Conference	
Plenary Speeches	16
Sessions	21
Poster session-Packaging	44
Poster session-PCB	46
Note	47
IMPACT Sponsor	
Applied Material	51
ASE Group	52
Atotech	53
ChipMos	54
Dupont	55
SPIL	56
Triallian Corp.	57
Unimicron	60
Pre-Announcement- IMPACT 2022	Inside Back Cover

Organizer



IEEE ELECTRONICS PACKAGING
SOCIETY



台灣國際微電子
暨封裝學會

INTERNATIONAL
MICROELECTRONICS
AND PACKAGING SOCIETY
TAIWAN (IMAPS Taiwan)



ITRI
Industrial Technology
Research Institute

INDUSTRIAL
TECHNOLOGY
RESEARCH INSTITUTE,
TAIWAN (ITRI)

TPCA 台灣電路板協會
Taiwan Printed Circuit Association

TAIWAN PRINTED CIRCUIT
ASSOCIATION (TPCA)

Co-Organizer



國立臺灣大學電信工程學研究所
Graduate Institute of Communication Engineering

Graduate Institute of Communication
Engineering



Feng Chia University (FCU)



International Conference on Electronics
Packaging (ICEP)



International Electronics Manufacturing
Initiative (iNEMI)



I-Shou University (ISU)



Korea Advanced Institute of Science
and Technology (KAIST)



National Tsing Hua University
(NTHU)



Surface Mount Technology
Association (SMTA)



Taiwan Semiconductor
Industry Association (TSIA)



Taiwan Thermal Management
Association (TTMA)

Industrial / Special Session



ASE GROUP
日月光集團

Advanced Semiconductor Engineering Inc.
(ASE)



Atotech Taiwan Limited



ChipMOS Technologies Inc



南亞塑膠工業股份有限公司
NAN YA PLASTICS CORPORATION

Nan Ya Plastics Corporation



Siliconware Precision Industries Co., Ltd
(SPIL)



Sponsor



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DuPont



Eternal Materials Co., Ltd.



Ichia Technologies., INC.



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JSR Corporation



MacDermid Performance Solutions
Taiwan Ltd.

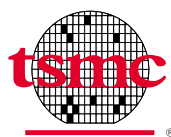


Toray Research Center, Inc.

Toray Research Center, Inc.



Triallian Corp.



Taiwan Semiconductor
Manufacturing Company
Limited (TSMC)



Underwriter Laboratories (UL)



United Microelectronics
Corporation



Unimicon

Media Partner



TechSearch International



Yole Développement

Government Sponsor



Industrial Development Bureau,
Ministry of Economic Affairs



Ministry of Education



Ministry of Science and Technology



Department of Information and
Tourism, Taipei City Government

Welcome Message from Shen-Li Fu, Conference General Chair



Shen-Li Fu, Ph.D.

General Chair of IMPACT 2021

Chair, IEEE EPS – Taipei

Honorary President & Distinguished Chair Professor, I-Shou University

Dear Colleagues and Friends,

On behalf of the Organizing Committee, I'd like to welcome all of you to the 16th International Microsystems Packaging Assembly and Circuits Technology Conference "IMPACT 2021 Conference". All the participants will be benefited from various sessions organized by the Technical Program Committee and the organizers including ITRI, IEEE EPS-Taipei, IMAPS-Taiwan, and TPCA. For grasping the latest trend, the symposium this year highlights the theme "IMPACT on 5G+". With the rapid growth of 5G coverage over the world, the 5G commercial network enables an array of revolutionary technologies such as IoT, artificial intelligence (AI), edge computing and wearable devices.

The organizers dedicated to develop the international conference to bring access to cutting-edge technology trends and international collaboration opportunities. Out of the COVID-19 pandemic, the conference will be carried out in real presentation, but supplement by virtual presentation.

"IMPACT 2021 Conference: brings together the world's leading researchers, engineers, and the industrial experts. It's for sure we will be organizing a successful conference, and the experience with IMPACT 2021 will be fruitful and long lasting.

Best regards,



Shen-Li Fu, Ph.D.

General Chair of IMPACT 2021

Chair, IEEE EPS – Taipei

Honorary President & Distinguished Chair Professor, I-Shou University

Welcome Message from Kuo-Ning Chiang, Conference Honorary Chair



K. N. Chiang, Ph.D.

NTHU Chair Professor

Academician, International Academy of Engineering (IAE) - Russia

Fellow, IEEE / STAM / ASME / iMAPS

Editor-in-Chief, Journal of Mechanics

Senior Area Editor, IEEE Transactions on CPMT

Topical Editor, IEEE Access

Academic Editor, Materials

In the capacity of Honorary Chairman of IMPACT 2021, I would like to extend my sincere appreciation for your attendance in person or virtually at this annual conference. As you know, IMPACT has a long history and a good reputation in the electronic packaging industry, research, and application communities. This year, IMPACT 2021 continues to offer you a comprehensive program covering the most recent trends and emerging technologies in the electronic packaging and PCB fields. IMPACT 2021 will focus on 3D packaging, chiplet packaging, heterogeneous packaging, SiP, fan-out packaging, automotive, 5G, high-performance computing, and AI-related technologies. All of these topics are covered in the plenary speech, panel, industrial, and regular sessions. I am sure that this conference will provide you with an opportunity to learn about electronic packaging/PCB trends, exchange research/development ideas, and share knowledge.

I hope you enjoy the program and the networking opportunities we provide. Thanks for participating.

A large, stylized handwritten signature in black ink that reads "knchiang". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

K. N. Chiang

NTHU Chair Professor

Academician, International Academy of Engineering (IAE) - Russia

Fellow, IEEE / STAM / ASME / iMAPS

Editor-in-Chief, Journal of Mechanics

Senior Area Editor, IEEE Transactions on CPMT

Topical Editor, IEEE Access

Academic Editor, Materials

Welcome Message from Chih-I Wu , Conference Co-Chair



Chih-I Wu, Ph.D.
Co-Chair of IMPACT 2021
Vice President & General Director, EOSL, ITRI

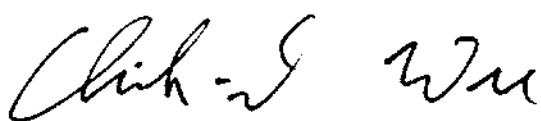
On behalf of the IMPACT committee, it is my great honor and delighted to formally welcome you to the 2021 International Microsystems, Packaging, Assembly and Circuits Technology (IMPACT) to be held on December 21-23 in Taipei, Taiwan.

Since the first IMPACT in 2006, this conference has continuously brought worldwide leading experts and engineers together in sharing state-of-the-art advanced microelectronic packaging and PCB technology each year.

Owing to the rapid growth of 5G, the theme of this year will aim for discussion on "IMPACT On 5G+" exploring the intelligent innovative categories including Emerging Technology, B5G SiP, HPC, Heterogeneous Integration, Embedded, Market Trend, etc. The three-day conference will feature a number of plenary speeches, special sessions, invited talks, sponsored industrial sessions, posters and outstanding paper presentations which are organized tirelessly by our Technical Program Committee and the dedicated team of IEEE EPS-Taipei, iMAPS-Taiwan, TPCA and ITRI.

It is again our great pleasure to welcome you for participating in this conference. We cordially hope that you will enjoy an excellent meeting and the fruitful programs in IMPACT 2021.

Sincerely,



Chih-I Wu, Ph.D.
Co-Chair of IMPACT 2021
Vice President & General Director, ITRI

Welcome Message from Wei-Chung Lo, Conference Co-Chair



Wei-Chung Lo, Ph.D.
Co-Chair of IMPACT 2021
President, IMAPS-Taiwan
Deputy Director, EORL, ITRI

Dear Colleagues and Friends,

Warmly welcome all of you to join this great annual event and meeting. On behalf of the IMPACT committee, I would like to express our gratitude to all of you for taking your time to attend this world-leading IC packaging and PCB conference and exhibition from Dec. 21-23, 2021 in Taipei, Taiwan.

The main theme of the conference this year features highlights the theme "IMPACT on 5G+", highlighting the research, With the rapid growth of 5G coverage over the world, the 5G commercial network enables an array of revolutionary technologies such as IoT, artificial intelligence (AI), edge computing and wearable devices.. To arrange this 3-day conference, our dedicated Program Committee teaming up with TPCA, IEEE EPS-Taipei, and ITRI have been working very closely to organize these rich and various programs, including plenary speeches, invited talks, special and sponsored industrial sessions, outstanding paper and poster presentations.

The purpose of this conference is to gather more and more packaging/PCB professionals from industries, research institutes, and academia to discuss about new trends, technologies, opportunities and challenges. It also provides a great platform for all of you to build the friendships, exchange information, create new ideas, and make new contact for further collaboration. Therefore, it is expected that there will be a lot of interactions, learning and sharing activities going between you and other attendees during the conference.

Amid the outbreak of COVID-19 pandemic, unfortunately, a special prevention measure based on the government regulation will be taken and processed during the conference this year for creating a safe environment for attendees. Under such a safe environment we wish all of you enjoy the wonderful meeting, learn about new knowledge for future innovation and make new friendships during the conference. Finally, we sincerely wish everyone a safe, fruitful and enjoyable stay in Taipei and a successful year ahead.

Best Wishes,

Wei-Chung Lo, Ph.D.
Co-Chair of IMPACT 2021
President, IMAPS-Taiwan
Deputy Director, EORL, ITRI

Welcome Message from Maurice Lee, Conference Co-Chair



Maurice Lee

Co-Chair of IMPACT 2021

Chairman, TPCA

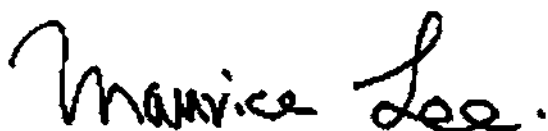
Senior Consultant ,Unimicron Technology Corporation

On behalf of IMPACT organizer, it is my great pleasure to welcome you to join the 16th International Microsystems, Packaging, Assembly, and Circuits Technology Conference. IMPACT aims to bringing the leading experts and scholars over the world together in discussion of inspiring study and latest insight of PCB and Packaging technology. IMPACT 2021 is in conjunction with total 4 exhibitions, includes TPCA show 、TAITRONICS 、AIoT Taiwan and OPTO TAIWAN to build up a platform which combines the leading edge technology in electronic industry to inspire participants and hope to facilitate collaborations from various themes.

Under the challenge of COVID-19, the Program Committee are committed to organize diverse forums with facilitating hybrid conference which involves Heterogeneous integration 、5G SiP 、HPC 、Embedding and innovative technology with marquee plenary speakers from TSMC 、Unimicron 、NIST and IBM Japan. This year, for the first time, IEEE EPS panel is organized which have invited global packaging experts to bring accesses to the cutting-edge trends and international collaboration opportunities. I believe IMPACT 2021 will bring a positive prospect towards state-of-the-art technology.

As TPCA Chairman, I sincerely invite all of our TPCA members to come to Taipei Nangang Exhibition Center and to make the IMPACT 2021 another vigorous, inventive event. We particularly welcome the participation of professionals, leaders and pioneers to join us on the largest annual gathering of PCB & Packaging field.

Best Regards,



Maurice Lee

Co-Chair of IMPACT 2021

Chairman, TPCA

Senior Consultant, Unimicron Technology Corporation

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IEEE-EPST Taiwan

Honorary Chair



Kuo-Ning Chiang
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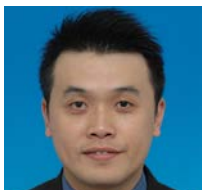


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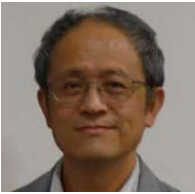


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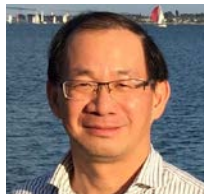


Kuan-Neng Chen
NCTU

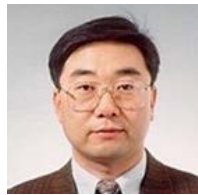
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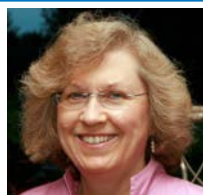
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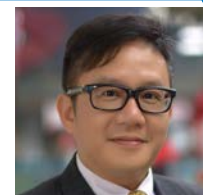
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Harry Yang
MacDermid Performance
Solutions Taiwan



Heinz Lu
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Secretariat

Sophia Huang
Cindy Lee
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TPCA
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TPCA
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Registration & Public Relation

Vivi Hong TPCA

General Information of IMPACT 2021

IMPACT 2021 Conference, organized by IEEE-EPS-Taipei, iMAPS-Taiwan, ITRI and TPCA, is the largest gathering of PCB and packaging professionals in Taiwan. This year will be held on Dec. 21-23 at Taipei Nangang Exhibition Center, in conjunction with TPCA Show 2021. For grasping the latest trend, the symposium this year highlights the theme "IMPACT on 5G+". With the rapid growth of 5G coverage over the world, the 5G commercial network enables an array of revolutionary technologies such as IoT, artificial intelligence (AI), edge computing and wearable devices. Given the foundational infrastructure is advancing along with technologies, 5G brings faster speed and connectivity to those using it.

IMPACT 2021 looks at the cutting-edge technological applications. With the increasing amount of data collected and leverage machine learning and artificial intelligence, may achieve a breakthrough in terms of high security and privacy-preservation, and increased efficiency.

IMPACT 2021 will arrange plenary speeches, special sessions, industrial sessions, invited talks, and outstanding paper and poster presentations. Meanwhile, this conference keeps collaborating with international organizations such as ICEP、JIEP from Japan, KAIST from South Korea, and iNEMI from the USA in this year's gathering.

Due to the COVID-19 pandemic and restriction for cross-country traveling, IMPACT 2021 will run as a hybrid conference which provides an opportunity for remote speakers to share their study as scheduled.

We are pleased to bring you the annual technology gala of packaging, microsystems, assembly, PCB, materials and thermal. Hope you can enjoy the over 170 papers, speeches, posters and discussions. We sincerely pledge this conference can bring you access to meet industrial best practice, to create an opportunity for networking, and to build international collaborations.

About Conference

- **Date:** December 21(Tue) - December 23 (Thur), 2021
- **Venue:** Taipei Nangang Exhibition Center, Taipei
- **Exhibition :** TPCA Show、TAITRONICS、AloT Taiwan、OPTO TAIWAN
- **Theme:** IMPACT 2021 on 5G+

Registration Desk

Reception desk is located on 5th floor of Taipei Nangang Exhibition Center.

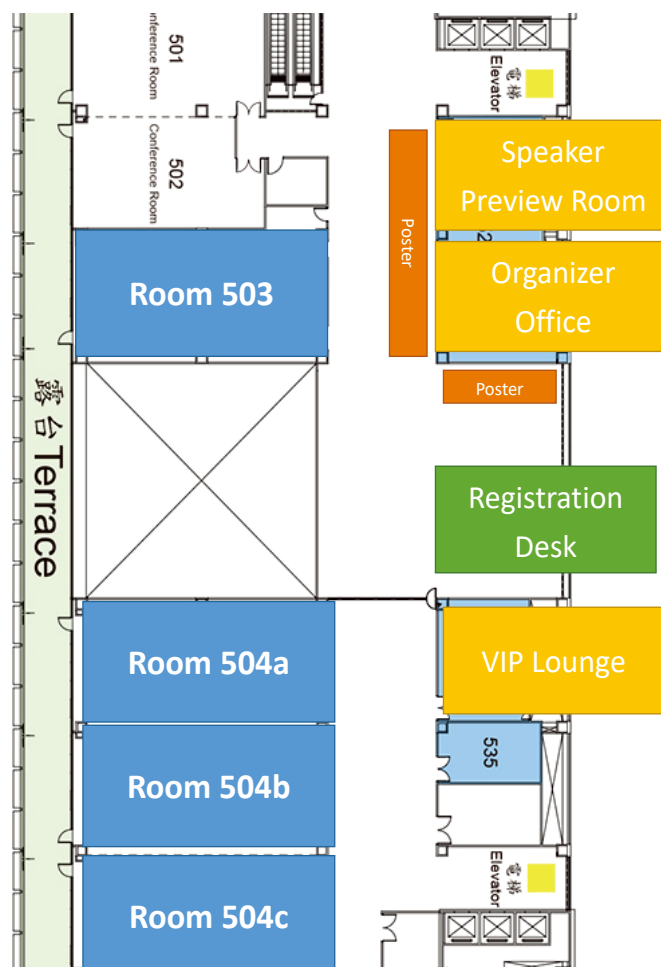
Please check in and get proceeding during the following schedule

Open Hour: 12/21 08:30-16:30
12/22 08:30-16:30
12/23 08:30-15:00

Organizer Office & Speaker Preview Room

Organizer's office on the 5th floor of Taipei Nangang Exhibition Center.

Open Hour: 12/21 08:30-17:30
12/22 08:30-17:30
12/23 08:30-15:30



Welcome Dinner (By invitation only)

Time: Dec. 22nd, 2021 (18:00-20:00)

Venue: SIANG SIANG Nangang (享鮮南港)

Address: 2F., No. 188, Jingmao 2nd Rd., Nangang Dist., Taipei City 115, Taiwan (中國信託金融園區B棟)

TEL: 02-2782-5577

Invited Guest: Plenary Speakers, Invited speakers, Sponsors, VIP, Committee members

Gathering Time: 5:45pm

Gathering Site: In front of IMPACT registration desk

Poster Session Activity

Poster session will be located at foyer area, 5th floor of Taipei Nangang Exhibition Center

Time: Dec. 22nd, 2021 (11:00-12:00 am)

Each attendee will get one voting paper at registration desk
Welcome to vote for your BEST POSTER of IMPACT 2021

Internet Access

Wireless internet is provided on 5th floor of Taipei Nangang Exhibition Center for free.

Lunch

Organizer will arrange lunch for every registered attendee. (Use badge as identification)

Date: Dec. 21-23, 2021 noon Time

Suggested lunch time.

12/21 11:30-13:30

12/22 11:30-13:30

12/23 11:30-13:30

Identification of Badges

Badges are required for admittance to all sessions, lunch and access to TPCA Show. Please bring it with you all the times.

Conference Venue

Conference rooms will be located on the 5th floor of Taipei Nangang Exhibition Center.

Conference Venue Map



Contact: Ms. Cindy Lee / Tel: +886-3- 3815659#407 / Email: cindy@tpca.org.tw

IMPACT-EMAP 2020 Best Paper

IMPACT 2020 received over 150 papers, and we have conducted the 3 stage paper review process including abstract, full paper and onsite oral presentation. Thanks to the IMPACT Technical Program Committees, paper reviewers, and session chairs' great support, we are delighted to announce those papers which have been selected as the IMPACT 2020 Paper Award.



Award Category	Paper Code	Paper Title	Affiliation	Author List
Packaging - Best Paper Award	TW0039	Analysis of Underfill-Polymer Interfacial Adhesive Strength by Combined Experimental and Modeling Approaches	TSMC	Chia-Kuei Hsu
	EU0040	Room Temperature Interconnection Technology for Bonding Fine Pitch Bumps Using NanoWiring, KlettWelding, KlettSintering and KlettGlueing	NanoWired GmbH	Olav Birlem
	TW0060	Low loss interconnection Solutions of Chip-to-Antenna for millimeter-wave Antenna-in-Package application	ASE Group	Chia Ching Chu
Packaging - Best Student Award	TW0020	Effects of Isothermal Heat Treatment on Microstructure Evolution of Microfluidic Electroless Ni-P Interconnection Structure	National Taiwan University	HAN TANG HUNG
	TW0068	Process and Thermal Effects on Warpage of Flip Chip Package on Packaging	Feng Chia University	Yi-Huang Chen
Packaging- Best Poster Award	TW0095	Research of mechanical properties of Copper foils with low temperature annealing.	National Chiao Tung University	Chuan-Yu Fang
PCB-Best Paper Award	EU0065	The Development of a new oxide replacement process to meet the high process cleanliness requirements of mSAP Production	Atotech Deutschland GmbH	Thomas Thomas
PCB-Best Student Award	TW0070	Reliability of Instant Bonding of Cu-Cu joints: Thermal Cycling and Electromigration Tests	National Chiao Tung University	Kai-Cheng Shie
PCB-Best Poster Award	TW0067	WLCSP Solder Joint Reliability Assessment for High Temperature Stress Test	TSMC	Stephen Chen

Hotel Information

Here are the suggested hotels for your stay in Taipei, please book your hotel right away and make further followup confirmation with the hotel.

Hotel	Information
The Evergreen Laurel Hotel Taipei 台北長榮桂冠酒店 Tel: +886-2-2501-9988	Taiwan Taoyuan International Airport—35mins by airport shuttle bus Taipei Songshan Airport—15mins by taxi MRT—5 mins by walk (Songjiang nanjing) *Near Xingtian Temple
The Place Taipei 南港老爺行旅 Tel: +886-2-7750-0588	Taiwan Taoyuan International Airport—45mins by taxi Taipei Songshan Airport—20 mins by taxi MRT —5 mins by walk (Gangang Software Park) *Near Nangang Exhibition Center
Caesar Park 台北凱薩大飯店 Tel: +886-2-2311-5151	Taiwan Taoyuan International Airport—40 mins by Taoyuan Airport MRT Taipei Songshan Airport—15 mins by taxi MRT —3 mins by walk (Taipei Main) *Near Taipei Main Station
Courtyard Taipei 六福萬怡酒店 Tel:886-2-2171-6565	Taiwan Taoyuan International Airport—45 mins by taxi Taipei Songshan Airport—20 mins by taxi MRT —2 mins by walk (Nangang) *Near Nangang Exhibition Center

Guideline for health and safety



Body Temperature Check



Wear a Face Mask



Register with contact information



Keep your hand clean



Keep social distance while dining

Inquiries

Requests for information about the Conference should be directed to:

Secretariat- Taiwan Printed Circuit Association
TPCA-Cindy Lee

No. 147, Sec. 2, Gaotie N. Rd., Dayuan, Taoyuan
33743, Taiwan

Tel: +886-3-3815659 Ext. 407

Fax: +886-3-3815150

E-mail: service@impact.org.tw

Website: www.impact.org.tw

PLENARY SPEECH

Tuesday, Dec. 21st, 10:30-11:10



Dr. Shin-Puu Jeng

Director, Advanced Packaging Technology and Service
Taiwan Semiconductor Manufacturing Co., Ltd.

Topic: Recent Advancement in Organic Interposer Technology

Room 504

Outline

Recent advancements in organic interposer technology will be presented from the perspectives of connectivity, SI/PI performance, reliability, complexity, package size and derivatives

Bio

Dr. Shin-Puu Jeng is a director in TSMC. He was the recipient of National Industrial Innovation Award from the Ministry of Economic Affairs of ROC, Outstanding Engineer Award from Chinese Institute of Engineers, as well as TSMC Prolific Inventor and Best Disclosure Awards. He also received the best paper and outstanding paper awards from the IMPACT and ECTC conferences, respectively. He was the general chair of IITC and the executive co-chair of IMPACT. He works on advanced package technology, including far-backend, CPI, Si interposer, 3DIC, TSV and fanout packages. He was the program managers for CoWoS and InFO PoP. Recently, he focuses on the development of organic interposer technology. He received his Ph.D degree from University of Florida in Gainesville, and conducted his post-doctoral studies at Yale University.

Tuesday, Dec. 21st, 11:10-11:40

Dr. Paul Hale

Chief of the RF Technology Division
The National Institute of Standards and Technology (NIST)

Topic: SI Traceability for 5G Hardware Authentication

Room 504

Outline/Abstract

The presentation will review NIST waveform metrology and over-the-air test technologies for microwave and millimeter wave frequency applications, such as 5G and beyond. Ways in which these technologies might be applied to securing the supply chain for microelectronics and advanced wireless communications equipment will be proposed. Lessons learned from the NIST workshop on Securing the 5G Supply Chain through Measurement will be summarized.

Bio

Dr. Paul Hale is Chief of the RF Technology Division at the National Institute of Standards in Boulder, CO. During Dr. Hale's career at NIST, his work has focused on providing NIST traceability that supports the microwave, high-speed electronics, and optoelectronics industries, including the development of seven NIST measurement services in those areas. Dr. Hale was also the technical co-lead on the National Advanced Spectrum and Communication Test Network (NASCTN) 3.5 GHz radar waveform measurements in 2016 and was technical lead on the NASCTN test plan development for measuring the user equipment (UE) aggregate long term evolution (LTE) emissions in the AWS-3 Band in 2017.

Dr. Hale is a Fellow of the IEEE and was an Associate Editor of Optoelectronics/ Integrated optics for the IEEE Journal of Lightwave Technology from June 2001 until March 2007. He has authored or coauthored over 100 technical publications (i10-index=68, Google Scholar, 2/19/2021) and received the Department of Commerce Bronze, Silver, and Gold Awards, the Allen V. Astin Measurement Science Award, two ARFTG Best Paper Awards, and the NIST Electrical Engineering Laboratory's Outstanding Paper Award. Paul Hale received a Bachelor of Science degree in Engineering Physics and Doctor of Philosophy degree in Applied Physics, both from the Colorado School of Mines, Golden, CO.



Tuesday, Dec. 21st, 11:40-12:20



Dr. Akshay Singh

Vice President of Advanced Packaging Technology Dep,
Micron Technology, Inc.

**Topic: Enabling Technologies for High Performance
Memory Solutions in the Age of Data**

Room 504

Bio

Education:

- Master and doctoral degrees in mechanical engineering from Louisiana State University, USA
- Bachelor degree in mechanical engineering from Maharaja Sayajirao University, India

Experience:

- Dr. Akshay Singh is Vice President of Advanced Packaging Technology Development at Micron. He joined Micron in 2006. He leads a global team that is responsible for delivering advanced memory packaging solutions for compute, storage, mobile and embedded markets. Prior to joining Micron, Akshay worked at a startup developing actuators and sensors based on novel electroactive polymers. Akshay holds master and doctoral degrees in mechanical engineering from Louisiana State University in US and bachelor degree in mechanical engineering from Maharaja Sayajirao University in India.

Thursday, December 23rd, 09:00-09:40

Dr. Shintaro Yamamichi

Senior Manager
IBM Japan

Topic: The First Quantum Computer Installed in Japan

Room 504

Outline

The quantum computer system having 27 qubit device, named IBM Quantum System One, was successfully installed in July of 2021 for the first time, and has been stably operated in Kawasaki Sozo-no-Mori research park. The application research using the system, as well as education for young "quantum-native" generation, started together with the University of Tokyo, Keio University and several Japanese industry partners. A test bed system was also installed in the University of Tokyo campus in order to develop necessary devices for future quantum computers. The plenary speech will cover the current status of quantum computing, technology roadmap, and the record of system installation.

Bio

Shintaro Yamamichi receive his M.E. and Ph.D degrees in electrical engineering from Kyoto University, Japan, in 1989 and 2002, respectively. He was involved in both semiconductor and packaging technologies in his career, and was a Visiting Industrial Fellow at University of California, Berkeley, in 1997. He joined IBM Research -Tokyo in 2013, and since 2016, he has been the senior manager of the Science & Technology team, leading research projects including quantum computing, AI hardware and material informatics.

Thursday, December 23rd, 09:40-10:20



Dr. Hsing-Horng Lee

Vice Chief Strategy Officer
Unimicron

Topic: 5G AiP (Antenna in Package) and its Related Applications

Room 504

Outline

As the developments in 5G are boosting rapidly, the demands of faster speed and higher frequency applications are required. Tracing back to the era before 5G (e.g. 2G, 3G, and 4G), it's easy to manufacture the antennas on the PCB or outside a system without such high frequency requirements. However, the process variation for antenna size is gone with revolutionary changes. Due to the significantly smaller antennas accompanied with 5G or sub 6G and millimeter wave, It's necessary to integrate the antennas into the system. Since it can't be achieved by what we applied for so far, what we're focused on is to adopt the semiconductor process tool to fulfill the goal. From the design and manufacturing perspective, there are some possible solutions among silicon, organic and PCB. The cost-effective solution for deploying the antennas on the substrate is merging the whole antenna structure into a package- Antenna in Package (AiP). It'll transform the way of the existing semiconductor supply chain and keep moving on for the next generation- 6G, 7G... etc. In short, AiP applications are expected to have great impacts from the industries to our daily life in the future.

Bio

Dr. Daniel HH Lee received the Ph.D. Degree in Electrical Engineering National Chiao Tung University in 1998, Master Degree in Physic Institute National Tsing Hua University, Taiwan, R.O.C., in 1991 and Bachelor degree in National central University in 1989. He brings over 20 years of IC design and process experiences in various industries. He has extensive experiences in not only IC designs but also Mass Production test engineering including Transceiver RFIC, multiple chip PA modules and 5G antenna in packages (AiP). He holds various engineer and management positions in international companies such as HiSilicon, SPIL, Etron and MediaTek Inc and UMC. Among of all, he made it happen to fulfil the 1st transceiver IC mass production in MediaTek Taiwan.

Since 2020 Sep, he joins Unimicron as the Vice Chief Strategy Officer to lead AiP process developing and high frequency testing of the best quality products for customers.

SESSION INTRODUCTION

Opening Ceremony & Best Paper Award Ceremony

Time: 10:00-10:30, Tuesday, Dec. 21, 2021

Room: R504, Taipei Nangang Exhibition Center

Symposium Chair: Shen- Li Fu, Ph.D.

General Chair of IMPACT 2021

Chair, IEEE EPS – Taipei

Honorary President & Distinguished Chair Professor, I-Shou University

ORAL PRESENTATION





SESSION 1: Test, Inspection and Measurement for 5G+

Time: 13:20-15:20, Tuesday, Dec. 21, 2021

Chair: Haley Fu, iNEMI

Jeffrey Lee, IST

Room: 503

Time	Topic	Lead Author	Affiliation
13:20-13:50	Reliability & Loss Properties of Copper Foils for 5G Applications Live	 Ed Kelley	Isola Group
13:50-14:20	Importance of Materials Characteristics for 5G and Beyond Live	 Say Phommakesone	Keysight Technologies
14:20-14:50	5G/mmWave Material Characterization	 Chang-Sheng Chen	Industrial Technology Research Institute
14:50-15:20	Fine Pitch Designed Substrate Inspection / Metrology for Advanced Packages	 Alison Lin	Unimicron Technology Corp.




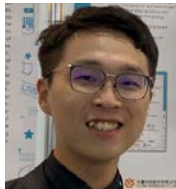
SESSION 2: Emerging Technologies

Time: 13:20-15:20, Tuesday, Dec. 21, 2021

Chair: Yu-Po Wang, SPIL

Kuo-Ming Chen, UMC

Room: 504a

Time	Topic	Lead Author	Affiliation
13:20-13:50	Fan out Package innovations for future	 Benson Lin	Mediatek
13:50-14:20	Advanced Package with Memory Integration Solution	 Nicholas Kao	SPIL
14:20-14:50	Implementation of 5G mmWave from module to system integration	 Li-Cheng Shen	USI
14:50-15:20	Machine learning for materials design in electronic packaging applications	 Yu-Chen Liu	National Cheng Kung University


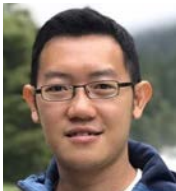

SESSION 3: Advanced Packaging Technologies -1

Time: 13:20-15:20, Tuesday, Dec. 21, 2021

Chair: Lih-Shan Chen, I-Shou University

Hung-Yin Tsai, National Tsing Hua University

Room: 504b

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50 	Invited	PVD Solutions For Packaging System Interconnect Scaling Pre-recorded video	 Clinton Goh	Applied Materials
13:50-14:05	TW0077	Research on bonding strength of two-step direct-bonded nanotwinned Cu films	Ching-Yu Tang	National Yang Ming Chiao Tung University
14:05-14:20 	EU0073	Optimizing the NanoWiring and KlettSintering parameters for low-temperature die to DCB attach of power electronic chips Pre-recorded video	David Strahringer	NanoWired GmbH
14:20-14:35	TW0072	Study on interfacial void ripening in nanotwinned Cu-Cu bonding	Hung-Che Liu	National Yang Ming Chiao Tung University
14:35-14:50	TW0040	Low Temperature Cu-Cu Direct Bonding with Passivation Layer	Yi-Chieh Tsai	National Yang Ming Chiao Tung University
14:50-15:05	TW0062	Next Generation Fan Out Assembly Technology in Chiplet Packaging to Improve Power Loss and Routability	Feng Kao	SPIL
15:05-15:20	TW0058	Improvement of bonding strength via anisotropic grain growth in Cu-Cu bonds	Huai-En Lin	National Yang Ming Chiao Tung University

* Scan the QR code and submit your question to the speaker


SESSION 4: Test, Quality, AOI, Inspection and Reliability

Time: 13:20-15:20, Tuesday, Dec. 21, 2021

Chair: Ben-Je Lwo, National Defense University

Irving Lee, UL LLC

Room: 504c

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50	Invited	Printed Circuited Reliability for 5G Application	 Irving Lee	UL LLC
13:50-14:05	TW0063	Robotic Measurement System for High-speed PCB Electrical Characterization	Fred Chou	MPI Corporation
14:05-14:20	TW0061	3D X-ray Microscope (XRM) Applied to Semiconductor Embedded in Substrate Defect Analysis	Cheng-Hsin Liu	ASE Group
14:20-14:35	TW0055	Upon Human's Unknown, Can AI Help to Address Uncertainty? A Practice on Package Substrate AOI Defect Detection	Wong-Shian Huang	ASE GROUP
14:35-14:50	TW0053	Capacitance enhancement of metal-insulator-metal capacitor with ITO layer between electrode and dielectrics	Chia-Yueh Chou	National Central University
14:50-15:05	TW0037	Anti-Corrosion Capacity Validation for Anti-Sulfur Type Electronic Passive Components by Way of Various Flower-of-Sulfur (FoS) Methodologies	Dem Lee	Integrated Service Technology, Inc.
15:05-15:20	AS0003	The impact of carbonization on CAF in UV laser cutting prepreg <div>Pre-recorded video</div>	Chenxi Xie	Chin-Poon (Changshu) Electronics Co.,Ltd



* Scan the QR code and submit your question to the speaker








SESSION 5: JIEP

Time: 15:40-17:45, Tuesday, Dec. 21, 2021

Chair: Takeyasu SAITO, Osaka Prefecture University

Andy Tsai, NAGASE Taiwan CO., LTD.

Room: 503

Time	Topic	Lead Author	Affiliation
15:40-16:05 	Review of Development of Epoxy Film: Potential of Epoxy Resins as Materials for Printed, Thermally Stable, Transparent, Flexible, Stretchable, and Low-loss Electronic Products Pre-recorded video	 Iori Doi	Mitsubishi Chemical
16:05-16:30 	Unclonable Plasmonic Nanotags for Smart Medicine Pre-recorded video	 Takao Fukuoka	Kyoto University
16:30-16:55 	Distributed Antigen Test System Utilizing Microfluidics Reaction Technologies in Times of Crisis (COVID-19) Pre-recorded video	 Kazuyoshi Horii	Sysmex
16:55-17:20 	An application of surface modification using vacuum ultraviolet light for semiconductor packaging process. Pre-recorded video	 Shinichi Endo	Ushio Inc.
17:20-17:45	Introduction of Integrated Process Equipment (Inspection, Repair, and High-speed Bonding) for Micro LED Display Manufacturing	 Yasuyuki Sakamoto	Toray Engineering Co.,Ltd. Taiwan Branch

* Scan the QR code and submit your question to the speaker




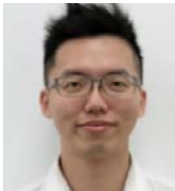




SESSION 6: Innovation and Technology

Time: 15:40-17:40, Tuesday, Dec. 21, 2021

Room: 504a

Chair: Gorden Lee, Nanya Plastic

Time	Topic	Lead Author	Affiliation
15:40-16:00	Fiber Weave Study with Different Glass Structure CCL Materials	 Chia-Chieh Hsiao	Nanya Plastic
16:00-16:20	High Tg and Low Dk Substrate For HDI Application	 Yu-Ting Lin	Nanya Plastic
16:20-16:40	Next generation high speed Server Halogen free ultra low loss materials develop	 Shiau-peng Hung	Nanya Plastic
16:40-17:00	Copper Foil for High-Speed and High-Frequency PCB Application	 Ting-Yu Chou	Nanya Plastic
17:00-17:20	High Frequency CCL Materials for 5G and Millimeter Wave Applications	 Jui-Hsiang Yen	Nanya Plastic
17:20-17:40	Novel Low Dk/Df Epoxy Resin for 5G laminate	 Chen-Hua Wu	Nanya Plastic



南亞塑膠工業股份有限公司
NAN YA PLASTICS CORPORATION

SESSION 7: Advanced Packaging Technologies -2

Time: 15:40-17:40, Tuesday, Dec. 21, 2021

Chair: Kuan-Neng Chen, National Chiao Tung University

Yu-chen Liu, National Cheng Kung University

Room: 504b

Time	Paper Code	Topic	Lead Author	Affiliation
15:40-16:10	Invited	Low Temperature Cu-Cu Bonding and Platform Development	 Kuan-Neng Chen	National Yang Ming Chiao Tung University
16:10-16:25	TW0048	PSO-based Modified Convolution Neural Network on Fan-Out Panel Level Package Prediction	Bo-Sheng Wang	National Tsing Hua University
16:25-16:40	TW0065	Process-induced Warpage Prediction of Flip Chip Chip Scale Package Using Deep Learning	Yan-Cheng Liu	Feng Chia University
16:40-16:55	TW0039	The effect of data distribution in Ensemble Learning Algorithms on WLCSP reliability Prediction	Chang Hung Min	National Tsing Hua University
16:55-17:10	AS0036	A Machine Learning based Polynomial Regression model used for Predict Reliability life of wafer Level Package	Sunil Kumar Panigrahy	National Tsing Hua University
17:10-17:25	TW0004	Descum Treatment for Robust Interface Adhesion of Wafer Level Packaging	Wei Wei Liu	ASE Group





SESSION 8: Test & Reliability

Time: 15:40-17:40, Tuesday, Dec. 21, 2021

Chair: Vincent Wei, arQana Technologies

Jeffrey Lee, IST

Room: 504c

Time	Paper Code	Topic	Lead Author	Affiliation
15:40-16:10 	Invited	Towards Cu-Cu Direct Bonding: Controlled Crystal Growth of Copper Deposits for Minimization of Interface Formation During Bonding Pre-recorded video	 Ralf Schmidt	Atotech
16:10-16:25 	EU0075	Hybrid bonding enhancement system for ultra-low signal loss PCB manufacturing Pre-recorded video	Thomas Thomas	Atotech Deutschland GmbH
16:25-16:40	TW0128	Machanical Reliability Enhancement of Laser-sintered Copper Films through Surface Modification of Polymer Substrate by Plasma Bombardment	Cing-Wun Jheng	National Chung Hsing University
16:40-16:55	TW0112	Reliability Improvement for Next Generation SAP Electroless Copper Process	Vincent Hsu	DUPONT
16:55-17:10	TW0099 ☆	Reliability Enhancement of Cu-Cu joints by Two-step Bonding Process	Jia Juen Ong	National Chiao Tung University
17:10-17:25	TW0094	Electromigration reliability study of copper-copper joints by instant bonding	Hsiang Hou Tseng	National Yang Ming Chiao Tung University
17:25-17:40 	AS0002	Research on Reliability of Non-Flow Prepreg Filling in Automotive R-F PCB Pre-recorded video	Chenxi Xie	Chin-Poon (Changshu) Electronics Co.,Ltd

* Scan the QR code and submit your question to the speaker







☆ PCB Student Best Paper

IEEE EPS Panel: Enabling Technologies from 5G to B5G

Time: 09:50-11:10, Wednesday, Dec. 22, 2021

Room: 504ab

Chair: CP Hung, ASE Group

Time	Topic	Lead Author	Affiliation
09:50-09:55	Opening	 CP Hung	ASE Group
09:55-10:00	Welcome Remark Live	 Chris Balley	IEEE EPS
10:00-10:10	5G+ Technology and Design Outlook Live	 Madhavan Swaminathan	Georgia Tech
10:10-10:20	5G and Beyond Mobile Solution Live	 Chidi Chidambaram	Qualcomm
10:20-10:30	Compound Semiconductor Solutions for B5G	 Chuck Huang	WIN Semi
10:30-11:10	Panel Discussion Madhavan Swaminathan, Professor, Georgia Tech Chidi Chidambaram, Vice President, Qualcomm Chuck Huang, AVP, WIN Semi	 Moderator: Sam Karikalan	VP, Conferences, IEEE EPS

SESSION 9: ICEP Session : Introduction on the roadmap developed by JIEP




Optical packaging technology

Time: 13:20-15:20, Wednesday, Dec. 22, 2021

Room: 503

Chair: Yasumitsu Orii, NAGASE & CO., LTD.

Andy Tsai, NAGASE TAIWAN CO., LTD.

Time	Topic	Lead Author	Affiliation
13:20-13:35	Overview of JIEP OPT roadmap 2019 Live	 Tsuyoshi Aoki	PETRA
13:35-13:50	Footprint requirements and electrical interfaces for CPO transceivers Live	 Hideyuki Nasu	Furukawa Electric
13:50-14:05	Requirement of optical connection technology for co-package Live	 Motohito Takezaki	Hakusan
14:05-14:20	Trends and issues in high-speed electrical interconnect for next generation intra-rack data transmission Live	 Naohiro Kohmu	Hitachi
14:20-15:20	Panel Discussion : Outlook of Co-packaged Optics: How the Asia-Pacific area countries contribute to and lead this field? Tsuyoshi Aoki, PETRA Hideyuki Nasu, Furukawa Electric Motohito Takezaki, Hakusan Naohiro Kohmu, Hitachi Richard Pitwon, Resolute Photonics KF Tsi, entera Photonics Live	 Moderator: Takaaki Ishigure	Professor, Keio University







SESSION 10: B5G SiP

Time: 13:20-15:25, Wednesday, Dec. 22, 2021

Chair: David Tarng, ASE Group

Henry Lin, ASE Group

Room: 504a

Time	Topic	Lead Author	Affiliation
13:20-13:45	Advanced Packaging Market and Technology Trends  Pre-recorded video	 Favier Shoo	Yole Développement
13:45-14:10	Envisioning B5G Case Scenarios and the Enabling Hardware Technologies	 Lih-Tyng Hwang	NSYSU
14:10-14:35	Materials Development for High-speed and High-frequency Applications in 5G Era	 Kuo-Chan Chiou	ITRI
14:35-15:00	Millimeter-Wave Antenna Design in System-in-Package	 Wayne SW Lu	ASE Group
15:00-15:25	Radar Sensor in IoT Development	 George Hung	Richwave, Inc.

* Scan the QR code and submit your question to the speaker


SESSION 11: Modeling, Simulation & Design -1

Time: 13:20-15:20, Wednesday, Dec. 22, 2021

Chair: Yu-Jung Huang, I-Shou University

Chang-Chun Lee, National Tsing Hua University

Room: 504b

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50	Invited	WBG Power Module Technology	 Hsueh-Kuo Liao	Delta Electronics, Inc.
13:50-14:05	EU0090	Low ESL Multi-terminal Capacitor Modeling Pre-recorded video	Yves AUBRY	Murata Integrated Passive Solutions
14:05-14:20	AS0076	Predictive Modelling Methodologies for Organic Package Warpage Pre-recorded video	Kang Eu Ong	Intel Technology Sdn Bhd
14:20-14:35	TW0132	Post Mold Cure Process Analysis of IC Packages with or without External Load	Sheng-Jye Hwang	National Cheng Kung University
14:35-14:50	AS0057	Integrating Parallel Computation Technique to State-Space Dynamic Neural Network Modeling of Optical Pre-recorded video	Zohreh Naghibi	Hamedan University of Technology
14:50-15:05	AS0056	Parallelizing Time-Delay Recurrent Neural Network Modeling Technique on Multi-Core Architectures Pre-recorded video	Zohreh Naghibi	Hamedan University of Technology
15:05-15:20	TW0123	The effect of viscoelastic behavior on the debonding of underfill-silicon interface	Tz-Cheng Chiu	National Cheng Kung University

* Scan the QR code and submit your question to the speaker




SESSION 12: Advanced and Green Materials and Process

Time: 13:20-15:20, Wednesday, Dec. 22, 2021

Chair: Jenn-Ming Song, National Chung Hsing University

Room: 504c

Ting-Li Yang, National Yang Ming Chiao Tung University

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50 	Invited	Solder Materials Desired for 5G Era Pre-recorded video	 Ning-Cheng Lee	
13:50-14:05	TW0115	Advanced Development of Liquid Photo-resist on Galvanic Thick Gold Plating For Edge Emitting Laser(EEL) Ceramic Sub-mount Applications	Dei-Cheng Liu	Tong Hsing
14:05-14:20	TW0104	Enhancing Strength-Ductility of Cu Foils with Slanted Nanotwinned Microstructure	DinhPhuc Tran	National Yang Ming Chiao Tung University
14:20-14:35	TW0100	Cu-Cu Direct Bonding with Different Grain Size Cu Films	Yu Min-Hsun	National Yang Ming Chiao Tung University
14:35-14:50	TW0087	Low Thermal Budget Hybrid Bonding with Polyimide and Highly <111>-oriented Nanotwinned Cu	Pin-Syuan He	National Yang Ming Chiao Tung University
14:50-15:05 	EU0029	Autocatalytic tin – opening new application opportunities for tin surface finishes Pre-recorded video	Britta Schafstetter	Atotech Deutschland GmbH
15:05-15:20	TW0014	Significantly Improving the High-frequency Transmission Characteristics through Morphological Modification of Cu Interconnects	Cheng-En Ho	Yuan Ze University

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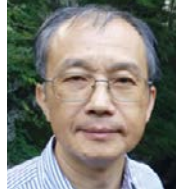






SESSION 13: Embedded Session

Time: 15:40-17:40, Wednesday, Dec. 22, 2021

Chair: Hisao KASUGA, International Jisso Centre

Ray-Min Tain, Unimicron

Room: 503

Time	Topic	Lead Author	Affiliation
15:40-16:10	Latest development status of EC2AMTM	 Chinmin (Jimmy) Hu	Unimicron Taiwan/Japan
16:10-16:40	Fine pitch 3D embedding substrate with cavity structure  Pre-recorded video	 Hyunho Kim	KPIA-JKC/Korea
16:40-17:10	System Level Co-Design Platform for 3D SiP & 3D electronic module  Pre-recorded video	 Masaomi Suzuki	Zuken Inc.
17:10-17:40	Activities of International Standards for embedded device at IEC  Pre-recorded video	 Yoshihisa Kato	FUKUOKA-University


* Scan the QR code and submit your question to the speaker

SESSION 14: Next generation package substrates to support HPC

Time: 15:40-17:40, Wednesday, Dec. 22, 2021

Room: 504a

Chair: Eddy Chen, Atotech

Time	Topic	Lead Author	Affiliation
15:40-16:10 	Advanced Packaging Technologies for Heterogenous Integration: Challenges & Opportunities Pre-recorded video	 Rahul Manepalli	Intel
16:10-16:40 	Drivers for High Performance Packaging: Risk, Challenges, and Opportunities Pre-recorded video	 E. Jan Vardaman	TechSearch International, Inc.
16:40-17:10 	Advanced Substrate Technologies for High Performance Computing Pre-recorded video	 Markus Leitgeb	AT&S
17:10-17:40 	Meeting the challenges in IC substrate scaling with next generation process technologies for advanced HPC packaging. Pre-recorded video	 Kuldip Johal	Atotech
		 Jobert van Eysden	Atotech

* Scan the QR code and submit your question to the speaker







SESSION 15: Advanced Materials, Automatic Process & Assembly

Time: 15:40-17:40, Wednesday, Dec. 22, 2021

Chair: Alex King, Taimide

Kuo-Chan Chiou, ITRI

Room: 504b

Time	Paper Code	Topic	Lead Author	Affiliation
15:40-16:10 	Invited	Newly developed high-speed materials for 5G Pre-recorded video	 Hirofumi Matsumoto	FlexLink Technology Co., Ltd.
16:10-16:25 	AS0126	Materials Design Using Chelating Agents for Copper-filled Electrically Conductive Adhesives Pre-recorded video	Masahiro Inoue	Gunma University
16:25-16:40 	AS0116	Surface Stability and Surface Plasma Treatment of Different Cu Surfaces for Leadframe-to-Mold Adhesion Improvement Pre-recorded video	Matthew Fernandez	Ampleon Philippines, Inc.
16:40-16:55 	AS0079	Optimization of Epoxy Molding Compound for Cu wire HTRB Robustness Pre-recorded video	April Joy Garete	Nexperia
16:55-17:10	TW0069	New Solder Paste Solution for FCCSP with Embedded Trace Substrate to Increase the Component Stand-off Height	Pin-Jing Su	Siliconware Precision Industries Co., Ltd. (SPIL)
17:10-17:25	EU0026	Copper Recrystallisation and Nanovoid Classification in Blind Micro Vias	Roger Massey	Atotech UK
17:25-17:40 	US0013	A Novel Lead-Free Low-Temperature Solder with Excellent Drop Shock Resistance Pre-recorded video	Hongwen Zhang	Indium Corporation

* Scan the QR code and submit your question to the speaker

SESSION 16: Electroplating and Electrochemical Processing Technology

Time: 15:40-17:10, Wednesday, Dec. 22, 2021

Chair: Yu-Hwa Chen, Unimicron

Room: 504c

John Liu, TPCA

Time	Paper Code	Topic	Lead Author	Affiliation
15:40-15:55	TW0011 ☆	Microstructure Modification of Copper Interconnects and Their Transmission Losses at 1–40 GHz	Cheng Yu Lee	Yuan Ze University
15:55-16:10	TW0114	Integrated Pt Layer underneath AuSn Solder to Achieve Precise Eutectic Ratio Control and Anti-Over Wetting Design.	Chun Chieh Liao	Tong Hsing Electronic Industries, Ltd.
16:10-16:25	TW0103	Tuning microstructures in nanotwinned Cu films for low temperature Cu-Cu bonding	Ka Man SO	National Yang Ming Chiao Tung University
16:25-16:40	TW0089	Electro-epitaxial growth of Ni on Cu substrate in electrolytes containing sulfate or chloride ions	Nai-Ying Shih	National Sun Yat-Sen University
16:40-16:55	TW0019 ☆	Crystal Coherency between Electroplated Cu Fillings and Substrate in A Stacked-via Structure	Yu Ming Lin	Yuan Ze University
16:55-17:10	TW0120	Electrochemical analysis of surface oxide layers on copper surface in microelectronics	Chi Hsuan Lin	National Chung Hsing University

☆ PCB Student Best Paper







SESSION 17: Market Trend

Time: 10:20-12:20, Thursday, Dec. 23, 2021

Chair: Albert Lan, Applied Material

Yu-Jung Huang, I-Shou University

Room: 503

Time	Topic	Lead Author	Affiliation
10:20-10:50	Global Economic Perspective & Uncertainty	 Jiann-Chyuan Wang	CIER
10:50-11:20	AI Application Development and Its Impacts on Substrate and PCB Market  Pre-recorded video	 Shih-Kao Chiang	Prismark
11:20-11:50	Wide-Bandgap Compound Semiconductors-Trends and Dynamics	 Ray Yang	ISTI, ITRI
11:50-12:20	Market & Technology trends of advanced packaging with focus on the 5G and hybrid bonding  Pre-recorded video	 Santosh Kumar	Yole Développement

* Scan the QR code and submit your question to the speaker









SESSION 18: Heterogeneous Integration

Time: 10:20-12:25, Thursday, Dec. 23, 2021

Chair: Shin-Puu Jeng, TSMC

Wei-Chung Lo, ITRI

Room: 504a

Time	Topic	Lead Author	Affiliation
10:20-10:45	Innovative Packaging Process & Tool Solutions on Panel Fan Out and Advanced Substrates	 Albert Lan	Applied Materials
10:45-11:10	Opportunities and Challenges for 3D IC  Pre-recorded video	 E. Jan Vardaman	TechSearch
11:10-11:35	Photonics role in enabling heterogeneous integration  Pre-recorded video	 Amr S. Helmy	University of Toronto
11:35-12:00	The New Driver of Innovation and Growth  Pre-recorded video	 Rozalia Beica	AT&S
12:00-12:25	Thermal Challenges of HPC Heterogeneous Packages	 Kathy Wei Yan	TSMC

* Scan the QR code and submit your question to the speaker



SESSION 19: Advanced Packaging Technologies -3

Time: 10:20-12:20, Thursday, Dec. 23, 2021

Chair: Joshua Chao, C & C Business and Technology Ltd

Ting-Li Yang, National Yang Ming Chiao Tung University

Room: 504c

Time	Paper Code	Topic	Lead Author	Affiliation
10:20-10:50 	Invited TW0016	Robotic System with Intel® Automatic In-Board Characterization for Customer Board Design Quality Check Pre-recorded video	 Jimmy Hsu	Intel Corporation
10:50-11:05	TW0071	Mechanical Modeling Approaches with on Fan-Out Panel-Level Packaging for Warpage Estimation	ChiWei Wang	National Tsing Hua University
11:05-11:20	TW0042	Development and Validation of a Semi-Analytical Model for Predicting Asymmetric Warpage of Fan-Out Reconstituting Packaging	Yu-Chin Lee	National Cheng Kung University
11:20-11:35	TW0054	Establishment and Accuracy Assessment of Structural Equivalence of Fan-out Reconstitute Wafer for Asymmetric Warpage Prediction	Chia Yu Chen	National Cheng Kung University
11:35-11:50	TW0068	Corner Analysis of Manufacturing Tolerances of 5G mmWave Antenna in Package/Module (AiP/AiM)	Chia Ching Chu	ASE Group
11:50-12:05	TW0041	Simulation and Measurement Work for 28GHz AiP Design of 5G Communication Application	Chu Fuchen	ASE Group
12:05-12:20	TW0067	Analysis and Optimization of a Multilayer Organic Substrate for mmWave Antenna in Package/Module Application	Hong-Sheng Huang	ASE Group


* Scan the QR code and submit your question to the speaker

SESSION 20: Thermal Management

Time: 13:20-15:20, Thursday, Dec. 23, 2021

Chair: Chi-Chuan Wang, National Yang Ming Chiao Tung University
CY Yang, National Central University

Room: 503

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50	Invited	Thermal Management for Immersion Cooling	 Chi-Chuan Wang	National Yang Ming Chiao Tung University
13:50-14:05	TW0127	Surface Modification Effect on Ultrasonic Bonding for Aluminum Pad Arrays	Chao Wei Ting	National Chung Hsing University
14:05-14:20	TW0121	Geometrical effects on ultrasonic Al bump direct bonding for microsystem integration	Yuan-Kuan Chen	National Chung Hsing University Materials Science and Engineering
14:20-14:35	TW0107	On Electromagnetic-Electro-Thermal Coupled Behavior of Power MOSFET Inverter During Load Cycles	Yan-Cheng Liu	Feng Chia University
14:35-14:50	TW0101	Effects of Thermal Characteristics of Power Module on Electric Vehicle Inverter	Chun-Kai Liu	Industrial Technology Research Institute
14:50-15:05	TW0109	Measurement of Thermally-Induced Warpages of Flip-Chip Package by Strain Gauge in Comparison with Shadow Moiré and FEM Simulation	Yu Wen Wang	Chang Gung University
15:05-15:20	TW0096	Thermal Cycling Tests of Highly (111)-Oriented Nanotwinned Cu-Cu Joints	Shih-Chi Yang	National Yang Ming Chiao Tung University

SESSION 21: Modeling, Simulation & Design -2

Time: 13:20-15:05, Thursday, Dec. 23, 2021

Chair: Tz-Cheng Chiu, National Cheng Kung University
Ming-Yi Tsai, Chang Gung University

Room: 504a

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:35	TW0051	Electrical characteristics of conductor surface roughness effect in the 112Gbps high-speed networking package.	Ho Chuan Lin	Siliconware Precision Industries Co. Ltd.
13:35-13:50	TW0028	Study of Shear Locking Effect on 3D Solder Joint Reliability Analysis	Yu-wei Huang	National Tsing Hua University
13:50-14:05	TW0018	How the Type of Glass Fiber Cloth Affects PCB Insertion Loss	Jerry Syue	ITEQ Corporation
14:05-14:20	TW0043	Performance Prediction for Miniaturized VCSEL Package by ANSYS Simulation	Willy Su	Tong Hsing Electronic Industries, Ltd.
14:20-14:35	TW0108	Equations for Correcting Bending Strength of Thin Silicon Dies in Four-Point Bending Test Due to Geometric Nonlinear Effect	Ming-Yi Tsai	Chang Gung University
14:35-14:50	TW0091	Millimeter Wave Receiver of Radar And LiDAR Detection with Deep Neural Network for Edge Electromobility	Wen-Cheng Lai	National Yunlin University of Science and Technology
14:50-15:05	TW0106	Advanced Copper Integrated Ceramic Package by Make Use of High Reliable DPC Ceramic Technology For UVC-LED Applications	Jhih Wei Lai	Tong Hsing Electronic Industries, Ltd.


SESSION 22: HDI Technology

Time: 13:20-15:05, Thursday, Dec. 23, 2021

Chair: Dyi-Chung Hu, SiPlus Co.

C.E. Ho, Yuan Ze University

Room: 504b

Time	Paper Code	Topic	Lead Author	Affiliation
13:20-13:50	Invited	Integrated Substrate Solutions for Heterogeneous Integration	 Dyi-Chung Hu	SiPlus Co.
13:50-14:05	TW0035	High Flexibility and transparency of OMO Thin Film ZnO/Ag/ZnO on PET grown by sputtering for Transparent Electrode of Optoelectronic Devices	Bao-Jhen Li	National Central University
14:05-14:20	US0025	RDL and Pillar Fabrication from a Versatile Copper Plating Process	Kesheng Feng	MacDermidAlpha Inc
14:20-14:35	TW0111	Novel Electrolytic Plating Solution for RDL in Advanced Packaging Applications	Renay Su	DUPONT
14:35-14:50	TW0110	Next Generation Dry Film Photoresist for Advanced IC Substrate Applications	Alfred Lin	DUPONT
14:50-15:05	TW0010	3D Electromagnetic Simulation and VNA Measurements of Signal Transmission Loss of Cu Interconnects at 1–100 GHz: Surface Finish Effect	Chun-Jou Yu	Yuan Ze University

Poster session-Packaging

Time: 11:00-12:00, Wednesday, Dec. 22, 2021

Chair: Hsien-Chie Cheng, Feng Chia University

Chih Hang Tung, TSMC

John Liu, TPCA

Paper Code	Topic	Lead Author	Affiliation
TW0001	Noninvasive inspection for Laser Processing of 5G Material with Multiphoton microscopy	Hsin Yu Chang	ITRI
TW0009	Warpage Reduction on a Typical Fan-out Wafer Level Process by an Encircling Silicon Ring	Ben-Je Lwo	National Defense University
TW0017	Polymer Direct Bonding Characterization in Wafer Level Packaging for 3D Integration	Tsung Yu Ou Yang	ITRI
TW0020	Solder Void Improvement Beyond Process Flow	Chunchi Chiu	Universal Global Scientific Industrial Co., LTD
TW0021	Deep Learning Techniques Implement Circuit board inspection in Smart Industrial	Chao-Ting Chu	CHT
TW0022	High-Power Wireless Module Implement in Industrial Internet of Things Field	Chao-Ting Chu	CHT
TW0027	Power Noise Coupling to High Speed Signals and its Impact on System Performance	Patt Chang	Intel
TW0030	Temperature Control and Improvement of MOCVD in 5G Chip Process based on Quatre Algorithm	Chang Kuo-Chi	Fujian University of Technology
TW0032	Machine Vision Welding Defect Detection Based on FPGA	Chang Kuo-Chi	Fujian University of Technology
TW0049	Enhanced Thermomechanical Properties of Liquid Crystalline Epoxy Composites Filled with SiO ₂ /AlN Hybrids for Semiconductor Encapsulation Materials	Hsu-Feng Kuo	National Taipei University of Technology
TW0050	Copper Foil Characterization for High Performance Stack-up Design	Russell Chang	EMC
TW0052	Analysis of variable resistance and stress of interconnect for stretchable substrate by using a variable resistivity model	Hung-Hsien Ko	Industrial Technology Research Institute(ITRI)
TW0060	Functional RDL Interposer by Using Panel Level Thin Film Filter for 5G Application	Tzu-Yang Ting	Industrial Technology Research Institute (ITRI)
TW0080	The Cu Redistribution Layer (RDL) with High Thickness Uniformity by Using the Simulation and Verification under the Substrate Size at 510 * 510 mm ²	Ting-Yu Ko	Industrial Technology Research Institute
TW0084	Impedance Mismatch Detection Method for High-Speed Signaling	Denis Chen	Intel Corporation

Paper Code	Topic	Lead Author	Affiliation
TW0086	aM-Series with SAC Solder Doping Bi Elements under Board Level Reliability Test	Chih Jyun Ying	ASE Group
TW0088	Suitable for 2.45GHz and 5G Compact Dipole Rotating Antenna	Hu Qingyue	DaYeh University
TW0098	Contactless Capacitive Electromyography Using Flexible Hybrid Electronics	Yu-Hua Chung	ITRI
TW0105	Novel Resins with Low Dielectric Properties for High Frequency Semiconductor Packaging Application	Meei-Yu Hsu	Industrial Technology Research Institute
TW0113	Power Module Wire Bond Design for Reliability	Jiun Hsiang Chen	Delta Electronic,Inc
TW0117	Risk Assessment of Interface Delamination in FOCoS Package by Using Molecular Dynamics and Finite Element Method	Chung-Ting Wang	ASE Group
TW0118	Die-stacking Placement for Heterogeneous integration Architecture	Yu-Jung Huang	I-Shou University
TW0124	Testing Algorithm Parameter and Device Area Effect in HfO2 OX-RRAM	Ching Hua Chen	Powerchip
TW0129	Board-level Validation Methodology to Cross Regulation for Core Power Design	Patt Chang	Intel
TW0133	Cell Oxide Tddb (Time Dependent Dielectric Breakdown) in Saddle FinFET	Ching Hua Chen	Powerchip

Poster session-PCB

Time: 11:00-12:00, Wednesday, Dec. 22, 2021

Chair: Hsien-Chie Cheng, Feng Chia University

Chih Hang Tung, TSMC

John Liu, TPCA

Paper Code	Topic	Lead Author	Affiliation
TW0005	An Upgrade of PVS Control System Applied to Panasonic CM Mounters	Kuang-Wei Chuang	Universal Scientific Industrial Co., Ltd.
TW0006	Nitrogen Plasma Treatment on Titanium Dioxide Films Applied in Self-cleaning Glass	Chan Huang-Tian	Kun Shan University
TW0033	High Precision Battery Management System Printed Circuit Board Assembly Calibration and Test System	Yungchen Wang	Industrial Technology Research Institute
AS0046	Application Practice to Reduce Labor Hour and Machine Hour	Jinbiao Xu	Universal Scientific Industrial Co., Ltd.
TW0047	Optimization of High-Gravity Mechanical Shock Profile and Reliability Analysis	Hsu Li-Ping	ASE Group
TW0070	Novel film heater electrode design applied to In-Molded Electronic structure using design of experiment and simulation method.	Hsu Yulin	Industrial Technology Research Institute (ITRI)
TW0078	Using spectroscopic reflectometer with FFT method to measure film thickness on glass wafer of fan-out package	Sunghua Zhong	SPIL
TW0081	Advanced Measurement Method for Thermal Interface Material Thickness of Flip Chip Package	Shih Ping Chang	Siliconware Precision Industries Co.
AS0082	Investigation and Optimization of Mold Flow Impact to Leadless SMD Package Delamination	Zhiwen Li	Nexperia
TW0083	Using ion chromatography for flux residue detection of integrated circuit package	Shih Ping Chang	Siliconware Precision Industries Co.
TW0093	Quality Management and Analysis for the Power Circuit Design of Embedded Digital System	Hsing-Jen Lee	Kun Shan University
TW0097	Development of a Low Cost and Raspberry-based Thermal Imaging System for Monitoring Human body Temperature	Cheng-Tiao Hsieh	Ming Chi University of Technology

Vote for Your Best Poster !!

Time: 11:00-12:00, Dec. 22


Location: Foyer Area, 5F

Each attendee will get one voting paper at the registration desk

Feel free to interact with poster presenters during the session

And vote for your top 3 posters in mind

The result will be included into the evaluation of Best Poster Award


Vote for the Best Poster!

Poster session: 12/22 11:00am-12:00pm
Write down three paper ID for the best poster of IMPACT 2021

Paper ID	Paper ID	Paper ID

Note



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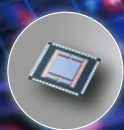


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Heterogeneous Integration 異質整合



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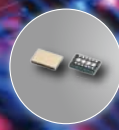
Copper Pillar



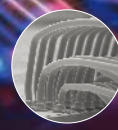
Flip Chip



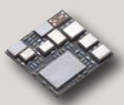
MEMS



Embedded



Wirebond



SiP
系統級封裝



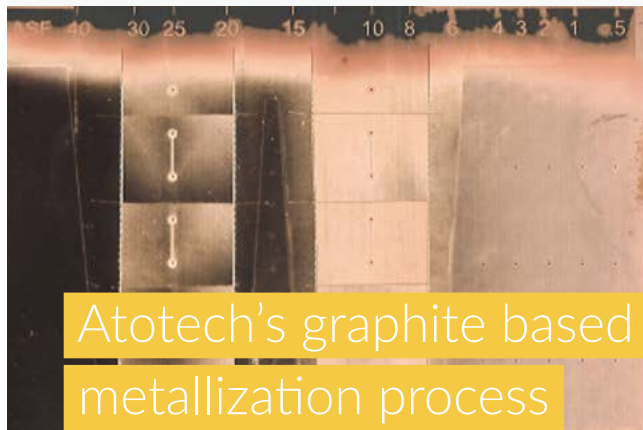
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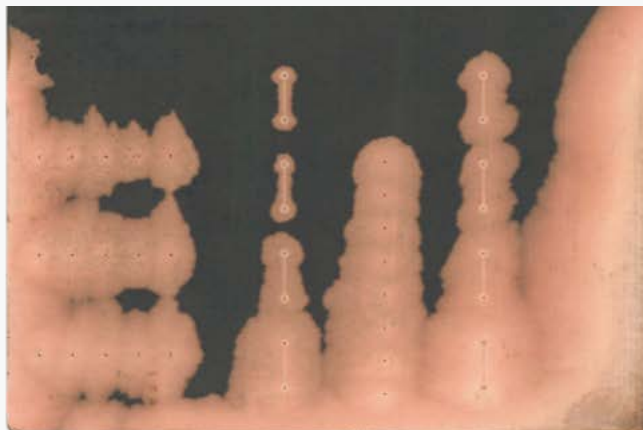
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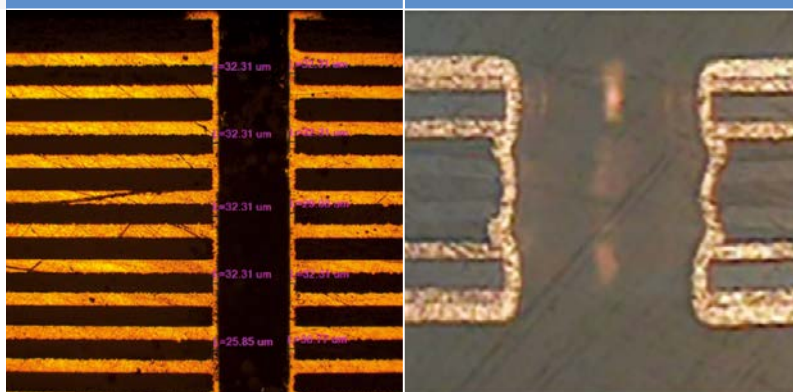
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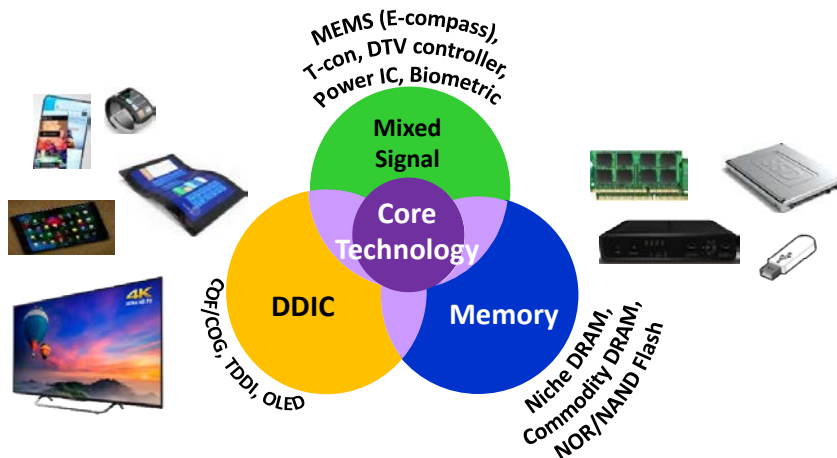


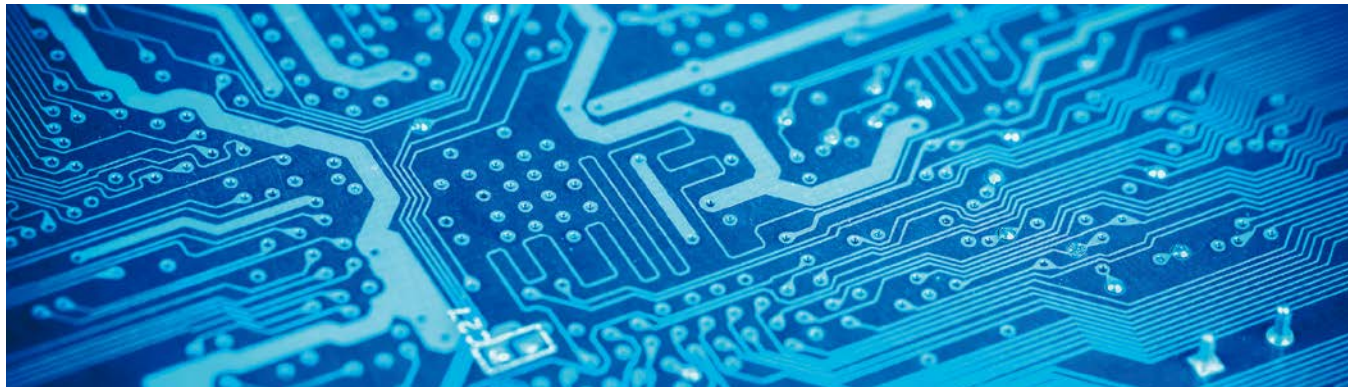
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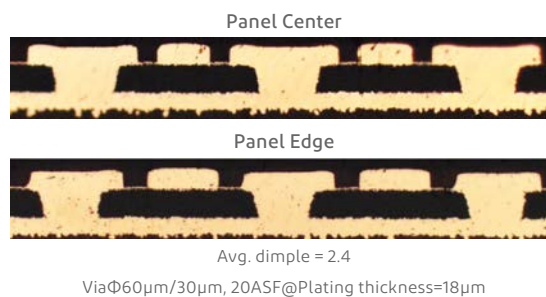
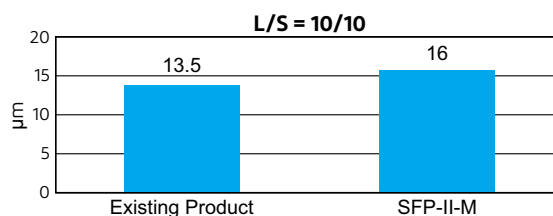
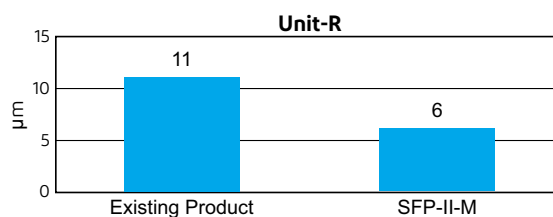
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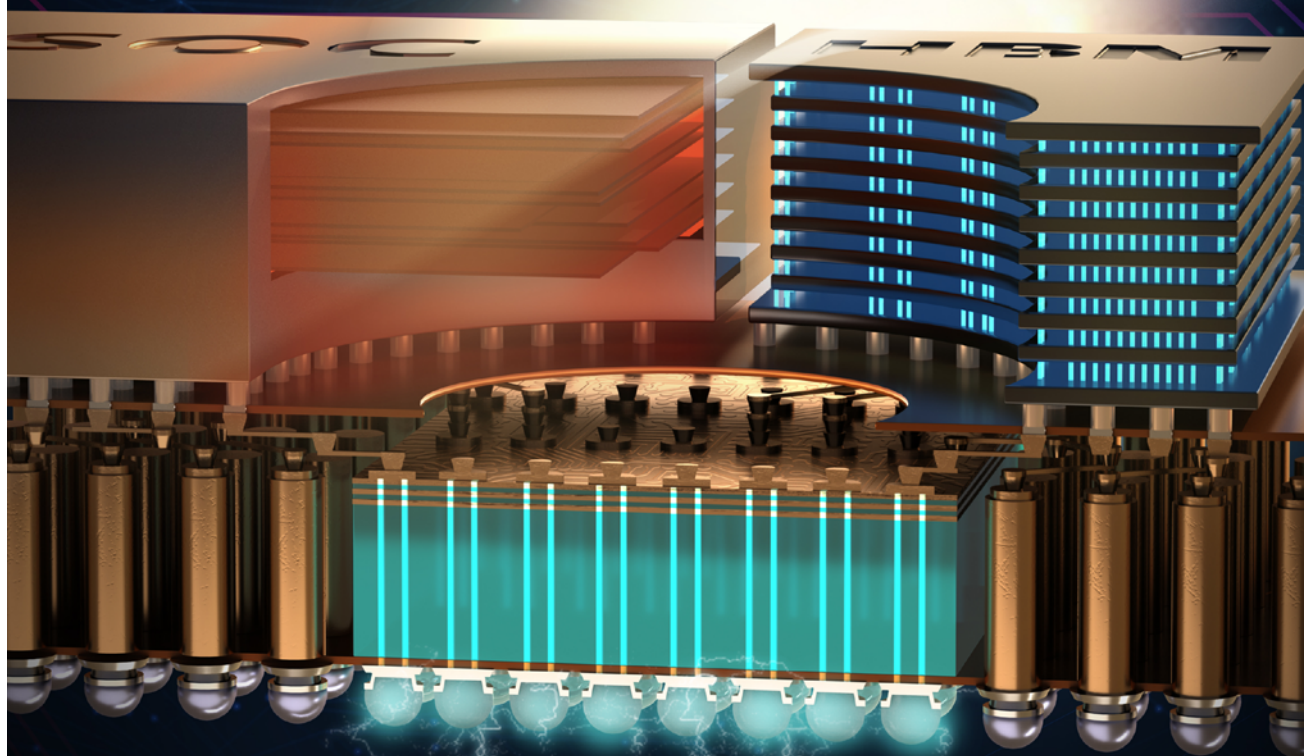
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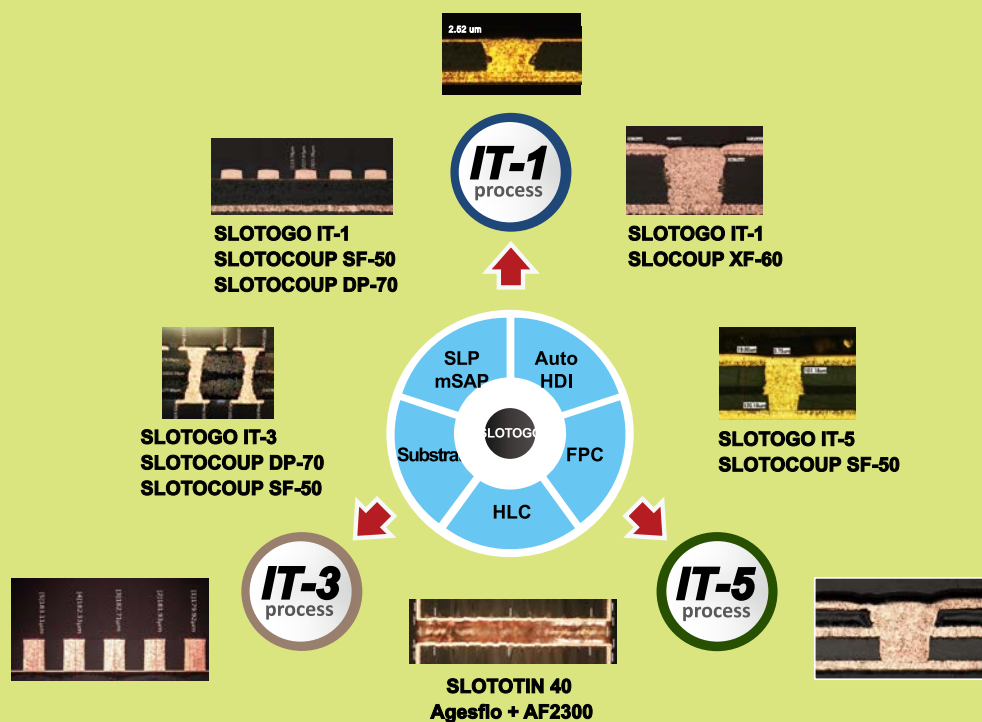


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2022 新產品發表會

顛覆傳統製程之新選擇 -SLOTOGO-IT



- 1 SLOTOGO IT-1**
 運用於超薄填孔/深大盲孔/mSAP各式製程之新視野
 12/21(二) 11:00-11:40 南港展覽館 1F, NPI Room, K-1226
- 2 SLOTOGO IT-5**
 還原氧化石墨烯金屬化於先進製程之運用
 12/22(三) 14:00-14:40 南港展覽館 1F, NPI Room, K-1226
- 3 SLOTOCOUP DP-70**
 mSAP/SAP 圖形電鍍之新觀念
 12/23(四) 14:00-14:40 南港展覽館 1F, NPI Room, K-1226

歡迎蒞臨各主題發表會及展會研討! 1F, Booth No: K-0306

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IC Substrate (Flip Chip BGA)

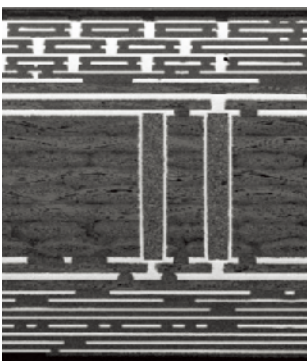
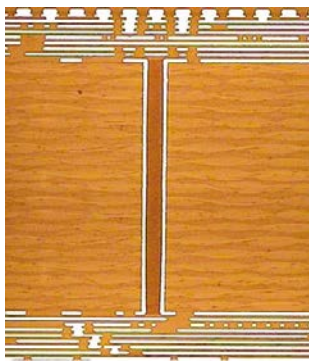
FC BGA Technology Roadmap

Unit : μm

Time Frame		2021		2022	2023
Feature (Unit : um)		Production	NPI		
Structure		9/2/9	10/n/10	11/n/11	
Max. Body Size (mm)		77.5x77.5	110x110		115x115
Bump Area	Bump Pitch	110	90		80
	SRO	50	45		40
Build up Layer	Line/Space	9/12	8/8		5/5
	Min. Via/Land Diameter	55/80	40/65	30/60	30/55
Core Layer	Line/Space	25/25	20/25		
High Speed Dielectric Material Loss Tangent		0.0036 (5.8GHZ)	0.0022 (5.8GHZ)	0.0020 (5.8GHZ)	
Low Roughness Cu Treatment		CZ8201	CZ8401		

New Product / Technology

Heterogeneous Integration Substrate

Structure	Product Information
 	<ul style="list-style-type: none"> • Large package size for multiple chips integration ($\sim 110 \times 110 \text{ mm}$) • High layers structure for complex design routing ($\sim 10/\text{n}/10$) • Apply for advanced 2.5D package
Advantage	Applications
<ul style="list-style-type: none"> • High Integration Density • High electrical performance 	<ul style="list-style-type: none"> • High Performance Computing, AI, Server/Switch • 5G Networking Infrastructure

IMPACT 2022

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Assembly and Circuits Technology conference

Oct. 26-28 Taipei, Taiwan



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