SMTA International

VISION | INNOVATION | CLARITY

2020

Not Just Any Virtual Show, A Fully Interactive Experience.

On-Demand Conference & Expo
September 28 - October 23

Live Virtual Exposition
September 28 - 30

EVENT GUIDE

www.smta.org/smtai

SMTA International

SMTA International is the industry's premier conference and exposition that collectively delivers focused technical solutions for today's electronics assembly and manufacturing challenges.

The new virtual format will allow attendees to easily navigate within a simulated conference center environment. Attendees will have access to the exhibit hall and virtual networking opportunities to interact and collaborate with other participants for a fully immersive experience.

The exposition is free to all and the live portion will take place September 28 - September 30. During this time, attendees will be able to roam the virtual show floor, view company products and demo videos, and privately chat with exhibitors 24 hours a day. Attendees will have continued access to the exhibit hall until October 23 without the live chat option.

Attendees who registered for the Technical Conference will have exclusive on-demand access to over 95 technical presentations from September 28 - October 23 as well as the ability to download all papers in the conference proceedings.

Use and search for #smtai2020 on LinkedIn, Twitter, Instagram, and Facebook to connect with your peers and expand your professional circle during SMTA International.

ORGANIZED BY:

SMTA

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Bringing the Industry Together

On-Demand Conference & Expo
September 28 - October 23, 2020

Live Virtual Exposition
September 28 - 30, 2020

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TECHNICAL ADVISORY COMMITTEE

Our Technical Advisory Committee devotes their time, talent, and expertise to assist in the annual creation of the outstanding technical program at SMTA International. They make a difference by recognizing the major knowledge gaps then recommending, recruiting, reviewing, and organizing important research that addresses those issues for the SMTA and the industry at large. We thank them for their contributions and efforts in helping to produce an open forum of knowledge sharing, industry connections, and the advancement of technology.

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Creative Electron, Inc.

Burt Carpenter
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Srinivas Chada, Ph.D.
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Celestica, Inc.

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Sandia National Laboratories

Ray Whittier Jr., CSMTPE
BAE Systems

Charles Woychik, Ph.D.
i3 Electronics

SMTA International

Conference: November 1 - 4, 2021
Exposition: November 3 - 4, 2021

Minneapolis Convention Center
Minneapolis, MN, USA

**Co-located with MD&M Minneapolis*

CALL FOR abstracts

The SMTA invites you to submit an abstract for the annual SMTA International Conference. Share your research and be part of the industry's strongest technical program. Full technical paper is required.

Proposals are also being solicited from individuals interested in teaching professional development courses related to surface mount technology, advanced packaging, and electronics manufacturing.

SMTA International Offers Five Awards

Best of Conference Presentation ($1,000 USD)
1st Place Best of Proceedings Paper ($1,000 USD)
2nd Place Best of Proceedings Paper ($500 USD)
3rd Place Best of Proceedings Paper ($500 USD)
Best Student Presentation ($500 USD)

www.smta.org/smtai

Due Date: March 1, 2021

WELCOME FROM THE CONFERENCE DIRECTOR & VP TECHNICAL PROGRAMS

Due to the continued effects of the global pandemic, SMTA International 2020 has been transformed into an online virtual event. The conference will include over 95 technical papers with all presentations available as an on-demand webcast for the duration of the conference. There are also 10 Professional Development Courses (PDC) planned, instructed live online, and spread over the same time frame as the technical conference. In addition to the technical sessions, the conference will include a Live Virtual Exposition from September 28 to September 30.

Our Technical Advisory Committee (TAC) has worked hard to adapt the event to a virtual format, while maintaining a strong technical program, which will look familiar to those who have attended in the past. The program contains useful and relevant information from subject matter experts covering a wide range of topics, including technical sessions on Advanced Packaging (APT); Flux, Solder, Adhesives (FSA); Harsh Environments (HE), Manufacturing Excellence (MFX), Lead-Free (LF) Soldering Technology with a strong emphasis on Low Temperature Solders (LTS), Substrates (SUB), Technical Innovations (TI), and the Women's Leadership Program.

Our Expo Committee and staff have worked hard to implement an interactive expo experience that is as close to face to face as possible, given the current environment. As you browse through the hallways, take a couple extra minutes to stop in each booth: see what new technologies and products our exhibitors have introduced. You will also notice that many of these exhibitors are offering excellent technical content for you to download, review and discuss live in the group chat, or privately in a one to one video or text chat. In addition, many of our exhibitors are offering scheduled times to meet as well as live demos. This is a fantastic opportunity to see your favorite supplier in their factories. A chance rarely available for many!

We also want to extend our personal thanks to the companies and individuals that continue to sponsor and support SMTA International in these difficult times. This includes the exhibitors, speakers, authors, co-authors, volunteers and the SMTA staff, Chapter officers and Board of Directors. Your support and commitment are what makes SMTA International such an exceptional event.

The Technical Advisory Committee, Expo Committee, staff, and Board of Directors sincerely hope that SMTA International remains a valuable and enjoyable experience for you. Thank you for your participation and support.

To learn more about the conference and expo go to the SMTA website. If you have not already done so, please register for SMTAI 2020 here.



Raiyo Aspandiar, Ph.D.
Conference Director
Intel Corporation



Richard Coyle, Ph.D.
VP Technical Programs
Nokia Bell Labs

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CLICK CONTEST

All attendees are invited to join the fun! Receive points for your activity and engagement throughout the event. Stream technical presentations and explore the exhibit hall and lobby to earn points and a chance to win prizes. See how you compare against other attendees on the contest leaderboard.



1st Place: Win the workout bike that allows you to have a studio-grade workout all from the comfort of your own home! Join the community of riders and world-class trainers! (*App subscription not included)
2nd Place: This watch is so much more than just a great accessory! Create to-do lists & count your steps. The winner can choose between an Apple or Android watch depending on compatible device
3rd Place: Get a wireless home speaker that will fill as many rooms as you want with great-sounding music. The winner will be able to choose between a Sonos or Bose speaker.

STUDENTS AND YOUNG PROFESSIONALS



Jump Start Program
Wednesday, September 30
On Demand | SMTA Virtual Booth | FREE to attend!

Our Jump Start Sessions will be pre-recorded and available On-Demand inside the SMTA virtual booth on the show floor. A great opportunity for young professionals and engineers new to the industry.

Presentations Include:
An Overview of Electronics Fabrication & Assembly Gary Tanel, *Chairman of Electronics Alliance*
Stencil Printing 101: **Chrys Shea,** *President of Shea Engineering Services*
Learning for Earning: **Tom Borkes,** *Founder of The Jefferson Project*
Reflow 101: Kim Flanagan, *Indium*
An Engineer's Journey: Artemis Record, *Vicor*

SPECIAL EVENTS

CHAPTER OFFICER'S MEETING

Tuesday, September 29
12:30pm (US Central) | ZOOM

We won't let a little COVID-19 prevent us from having our Annual Chapter Officer's Meeting during SMTA International! We will meet online this year. Bring ideas, questions, and a sense of FUN (and don't forget your lunch). Miles may separate us, but we can still enjoy and learn in each other's company.

MIXOLOGY CLASS & MIXER

Tuesday, September 29th
6:30pm-8:00pm (US Central) | ZOOM | FREE to attend!

This mixology & mixer class is designed to educate and inspire with the history of alcohol, the origin of drinks, as well as demonstrate the proper techniques of crafting sophisticated cocktails. Join this interactive and hands-on class to learn to make 3 cocktails in a lively environment. Throughout the evening mingle with your SMTA peers in between cocktail instruction.



COMMITTEE MEETINGS (ALL TIMES US CENTRAL)

Membership and Ambassador
Friday, October 2 | 4:00pm

Exhibitor
Monday, October 5 | 11:00am

Marketing and Communication
Tuesday, October 6 | 2:00pm

Chapter Leadership
Wednesday, October 7 | 10:00am

Past Presidents
Tuesday, October 13 | 4:00pm

Training
Wednesday, October 14 | 2:00pm

Technical Advisory
Wednesday, October 21 | 2:00pm



WOMEN'S LEADERSHIP PROGRAM

Wednesday, September 30
3:00pm-5:00pm (US Central)
Free for everyone and all are welcome!

We extend an invitation to everyone to attend the Women's Leadership Program to promote women in engineering fields. Show your support for diversity and inclusion by attending this live online session.

The Women's Leadership Program will continue their annual gathering, hosting the Connection Reception on the evening of Wednesday, September 30th!
Register early for a Road Trip Care Package to be shipped to you, while supplies last.

Welcome Message
Julie Silk, *Keysight Technologies*

A Cruise Through Automotive Safety Systems
Lenora Clark, *MacDermid Alpha Automotive Team*

Quality Requirements Across Industries - More the Same Than Different
Nancy Lange, *Plexus Corp.*

It's Been a Long Day, Come in for a "Fuel Stop" Speed Chats with topics on:
- Unconscious Bias: Real Actions to Overcome
- Keeping Your Balance While Working Effectively From Home
- Relentlessly Reinvent Yourself

AWARD WINNERS

2020 Members of Distinction Awards



Founders
Reza Ghaffarian, *JPL*

L3HARRIS™

SMTA+ Corporate
L3Harris Corporation



Member of Technical Distinction
Lenora Clark, *ESI Automotive*



Excellence in International Leadership
Kong Hui Lee, *Cisco Systems (Malaysia) Sdn. Bhd.*



Excellence in Leadership
Jasbir Bath, *Consultant*

2020 Education Awards



Hutchins Grant
Chidinma Imediegwu, *GA Tech*



Stromberg Scholarship
Sabrina Rosa Ortiz, *University of South Florida*

HEAR FROM ALL THE WINNERS >>

AWARD WINNERS

2019 SMTA International Best Paper Awards

"Best of Proceedings" Papers

1st Place: Chris Gourlay, *Imperial College London*
"Phase Formation and Solid Solubility in High Reliability Pb-Free Solders Containing Bi, Sb, In"
(Co-Authors: S.A. Belyakov, Imperial College London, B. Arfaei Binghamton; Ford Motor Company; C. Johnson, R. Coyle Nokia Bell Labs; K. Howell, Nihon Superior Co., Ltd.)

2nd Place: Richard Coyle, Ph.D., *Nokia Bell Labs*
"Vacuum Reflow Processing of Ball Grid Array Packages for Reduced Solder Joint Voiding and Improved Attachment Reliability"
(Co-Authors: Charmaine Johnson, Richard Popowich, Nokia Bell Labs; Tim Pearson, Dave Hillman, Collins Aerospace; Michael Meilunas, Universal Instruments; Fred Dimock, Bob Bouchard, BTU International; Richard Parker, iNEMI; Keith Howell, Nihon Superior Co., Ltd.; *Jörg Trodler, Dipl.-Ing, Heraeus Electronics; Arvind Karthikeyan, Auburn University; Elizabeth Barr, Iowa State University)

3rd Place: Yoshinori Ejiri, *Hitachi Chemical Co., Ltd.*
"Wire Bonding Reliability of Electroless Ni/Pd/Au Plating Influence of Electroless Pd Deposition Reaction"
(Co-Authors: Takehisa Sakurai, Yoshinori Arayama, Yoshiaki Tsubomatsu, Kiyoshi Hasegawa, Hitachi Chemical Co., Ltd.)

2019 SMTA International Best Paper Awards

"Rich Freiberger Best of Conference" Presentation

Michael Konrad, *Aqueous Technologies*
"IPC's New Cleanliness Testing Standard is Now Active. What's New? What Stays the Same?"

2019 SMTA International Best Student Presentation

Faramarz Hadian, *Binghamton University*
"Study Electromigration in SnBiAg / SAC (305) Mixed Solder Alloy"





PROFESSIONAL DEVELOPMENT COURSES

Each course will be presented LIVE Online at 10:30am - 2:00pm (US Central)

PDC 1: Achieving High Reliability for Lead-Free Solder Joints - Materials Consideration

Tuesday, September 29th | Ning-Cheng, Lee, Ph.D., *Indium Corporation*



This course covers the detailed material considerations required for achieving high reliability for lead-free solder joints. The reliability discussed includes joint mechanical properties, development of type and extent of intermetallic compounds (IMC) under a variety of material combinations and aging conditions and how those IMCs affect the reliability. The failure modes, thermal cycling reliability, and fragility of solder joints as a function of material combination, thermal history, and stress history will be addressed in details, and novel alloys with high reliability and reduced fragility will be presented. Electromigration and tin whisker will also be discussed. The emphasis of this course is placed on the understanding of how the various factors contributing to the failure modes, and how to select proper solder alloys and surface finishes for achieving high reliability.

PDC 2: Cost Conscious Test Strategies for Electronic Products (Including IOT & 5G)

Thursday, October 1st | Robert Hansen, *Consultant*



This tutorial will focus on the main issues of testing today which consists of (a) disciplines of testing the bareboard, (b) testing on the production line for minimum ppm defects, (c) testing for fault detection/fault isolation on the production line using ICT, flying probe and vision for correcting the processes. Finally, at the system level static and dynamic functional test is performed using embedded firmware, boundary SCAN and functional test equipment. However, the reliability of the end item is predicated on strategic testing of all items that defines the system performance.

PDC 3: Preventing Manufacturing Defects and Product Failures

Monday, October 5th | Jennie Hwang, Ph.D., *H-Technologies Group*



Focusing on preventing prevailing production defects and product reliability issues that affect yield, cost and performance through an understanding of potential causes and plausible solutions. The course provides a holistic overview of product reliability including the important roles of materials, processes and testing/service conditions, as well as the crucial principles behind the product reliability. Two selected areas related to product failure (intermetallics and tin whisker) and five selected defects (PCB pad cratering vs. pad lifting, BGA head-on-pillow, open or insufficient solder joints, copper dissolution issue and lead-free through-hole barrel filling) will be discussed. Specific defects associated with the reliability of BTC and PoP assembly will be highlighted. The course summarizes the role of intermetallics at-interface and in-bulk (contributing from the PCB surface finish/component coating) in relation to product reliability, and the difference between SnPb and Pb-free solder joint in terms of intermetallic compounds, which in turn is attributed to production-floor phenomena and the real-word field failure. From practical perspectives, tin whisker with emphasis on risk mitigation through understanding the factors that affect tin whisker growth and its testing challenges will be outlined. The practical tin whisker criteria for reliability implications in the lead-free environment and the relative effectiveness of mitigating measures will be ranked.

PROFESSIONAL DEVELOPMENT COURSES

PDC 4: PCB Designers Guide for Implementing Advanced Semiconductor Package Technologies- Flip-Chip, WLP, FOWLP, FOPLP, 2.5D and 3D

Wednesday, October 7th | Vern Solberg, *Vern Solberg Consulting*



This course addresses the design and assembly challenges for developing and implementing flip-chip and multiple function System-in-Package (SiP) technology. Although integrating several semiconductor functions onto a single die element (System-on-Chip) appears to provide a viable solution for some, development cost and time has often proved to be excessive. On the other hand, many companies have realized that wafer level packaging (WLP, FOWLP, FOPLP) and integrating mature multiple-die elements into a 2D or 3D configured package actually proves to be superior to the multiple function die concepts because it minimizes risk, significantly reduces development time and cost.

PDC 5: Design for Excellence III: The Digital Twin

Friday, October 9th | Dock Brown, CRE, *ANSYS*



Design for Excellence encompasses the standards and activities for the entire product lifecycle. From preliminary concept through to final disposal, designers and managers face increasing pressures and conflicting expectations. Increased competition means designing for technical excellence is no longer sufficient, products must also be designed for manufacturing excellence and field performance excellence as well. There is no universal pre-fabricated path to success; there is however, a toolbox of proven approaches. This course will present the DFX disciplines and how they integrate with Industry 4.0 and IoT.



PROFESSIONAL DEVELOPMENT COURSES

PDC 6&7: Defect Analysis and Process Troubleshooting Part 1&2

Monday, October 12th (Part 1) | Wednesday, October 14th (Part 2) | Jim Hall & Phil Zarrow, *ITM Consulting*





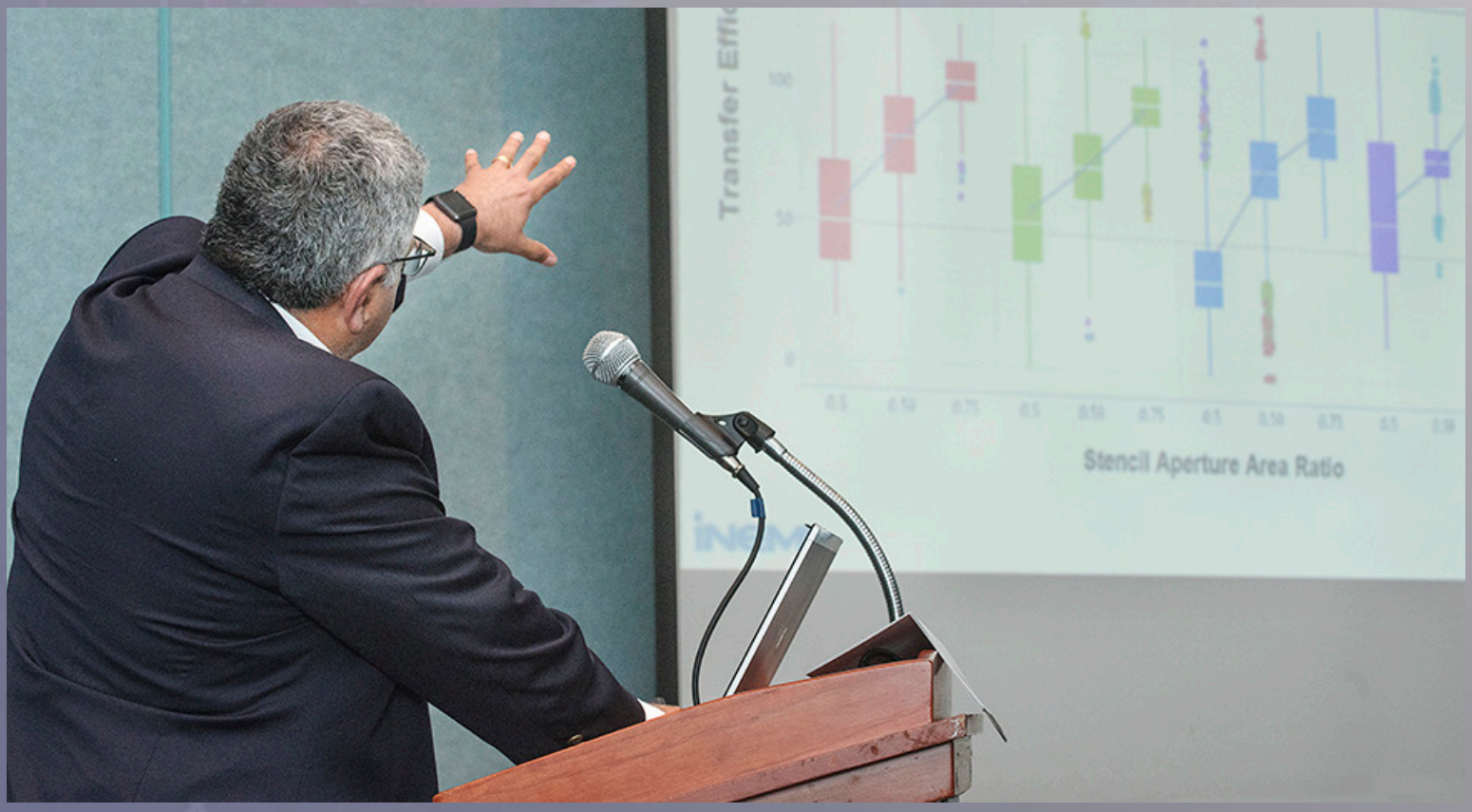
We don't assemble electronics in "perfect world". Defects happen! This course examines Failure and Root Cause analysis of PCBA defects. Detection and determination methodologies and procedures will be discussed. Cause and effect of defects relative to specific processes and equipment centers as well as materials are presented. This methodology is then applied to the most "common" types of defects occurring in electronic products, with a comprehensive and detailed example of the "solder bridge" or "short". Key causes of assembly problems and low yields are identified and resolved. Presented by Jim Hall and Phil Zarrow of ITM Consulting, industry experts on SMT Processes and Troubleshooting who have been there, done that, and own the ripped tee-shirts!

PDC 8: Tips and Tricks for Cleaning Circuit Assemblies

Friday, October 16th | Michael Konrad, *Aqueous Technologies*



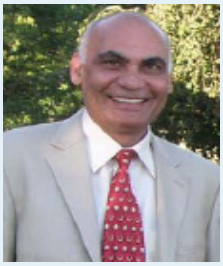
Tips and Tricks for Cleaning Circuit Assemblies. This presentation will present various methods for effectively cleaning circuit assemblies. There is more to cleaning than just removing contamination. Cost per cleaned assembly, cleaning methods, environmental mitigation, chemical selection, throughput requirements, and operator safety will be discussed.



PROFESSIONAL DEVELOPMENT COURSES

PDC 9: Design and Assembly Process Challenges for Bottom Terminations Components (BTCs) such as QFN, DFN and MLF in Tin-Lead & Lead Free World

Tuesday, October 20th | Ray Prasad, *Ray Prasad Consulting*

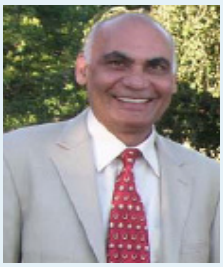


Bottom Termination surface mount Components (BTCs) go by various names such as QFN, DFN, SON, LGA, MLP, and MLF, which utilize surface to surface interconnections. BTCs are like BGAs which also have hidden terminations, but they are also very different. BTCs do not have spheres but rather metallized terminations or pads underneath the package. This minor difference in the physical I/O shape makes all the difference in design, assembly and rework between BTCs and BGAs.

Since there are no leads or balls in BTCs to take up any slack from package or board warpage, you essentially need perfection in design and assembly process. When was the last time you saw everything perfect on any manufacturing floor?

PDC 10: Principles and Practice of Developing Soldering Profiles

Thursday, October 22nd | Ray Prasad, *Ray Prasad Consulting*



This course is based on IPC 7530 Guidelines for Temperature Profiling for Mass Soldering Processes chaired by Ray Prasad. IPC 7530 was released in February 20, 2017. The focus of this course is to focus on dos and don'ts of developing thermal profiles for widely used soldering processes in order to reduce soldering defects and improve quality and reliability. This course is based on IPC 7530 Guidelines for Temperature Profiling for Mass Soldering Processes chaired by Ray Prasad. IPC 7530 was released in February 20, 2017. The focus of this course is to focus on dos and don'ts of developing thermal profiles for widely used soldering processes in order to reduce soldering defects and improve quality and reliability. During soldering it is critical that all solder joints reach the minimum soldering temperature. But what is that minimum temperature and most importantly how do you measure it? And how do make sure that those temperatures remain valid over the life of that product in production. There are many alloys in both tin-lead and lead free including low temperature soldering processes that are being used today and being soldered by various soldering methods. But it is surprising how many companies use incorrect profiles. Even those who may think they are using correct soldering profiles are using wrong profiles since they measure and monitor those profiles incorrectly. Incorrect thermal profiles can damage or warp components and boards. The problem becomes even more complex when you have a board with components of different size and thermal mass and even of different soldering alloy combinations – all on the same board to be soldered at the same time. For example, the biggest challenge for the person responsible for developing profile is that all components even though their thermal masses are different, they all must meet the same minimum and maximum temperature requirements. So, developing a thermal profile of an assembly populated with very large thermal mass components (such as a large BGA) and small thermal mass components (such as 0201 or even smaller chip resistors and capacitors) is a balancing act indeed. Additional complexity is added because different heating and cooling rates have different impact on different types of defects. For example, slower heating rate will help in reduction of voids in a BGA but it will increase the potential for head on pillow in the same BGA.

WHAT YOU NEED TO KNOW



On September 28th at 8:00am (US Central), you will receive access to Virtual SMTA International! Visit the event website: https://smtai.org/. Click on Login, input your email address and password that you used to register for the event, to gain access to the platform.

When you enter the Virtual Environment, you will be able to see the event's 'Lobby.' Then navigate into different parts of the platform for an interactive experience!

Once you are logged in, you will see a navigation tab at the top of your screen that looks like this:



- **Lobby**: This is the home page you will see when you first log in.
- **Exhibit Hall**: This is where you will see all of the exhibitors, and you can click on the booths that interest you.
- **Video Vault**: This is where you can search through all of the exhibitors uploaded video content.
- **Resources**: This is where you can search through all of the documents uploaded by exhibitors.
- **Briefcase**: You may download documents that exhibitors have available in their booths. These resources will be saved for you in the Briefcase section.
- **Conference**: View over 95 on-demand presentations as well as any live presentations. This is only accessible to individuals who have registered for the "Full Conference Package".
- **Leaderboard**: This is where you can find the live leaderboard points for the click contest and view prizes!



Beginning on page 17, presentations are categorized by track. Each presentation has been assigned a number for easy referencing in our Open Discussion Forum powered by Discord. You'll have the ability to participate in digital conversations with speakers and other attendees in each discussion room and video chat directly through the community voice channels.

ADVANCED PACKAGING TECHNOLOGIES (APT)

#150

10micron Pitch Wiring and Bump on Substrate Formed by Imprinting Technology to Apply Low Temperature Flip Chip Bonding

Hiroshi Komatsu, *CONNECTEC JAPAN Corporation*

VIEW ABSTRACT

#151

3D Integration Using Heterogeneous System-In-Package (HSIP) Technology

Charles Woychik, Ph.D., i3 Microsystems

VIEW ABSTRACT

#152

A Case Study: The Influence of QFN Package Construction on Solder Joint Durability

Dave Hillman, Collins Aerospace

VIEW ABSTRACT

#153

CBGA and CCGA Field Reliability Predictions Confirmed?

Jennifer Bennet, P.E., IBM Corporation

VIEW ABSTRACT

#154

Cu Paste for Molded Interconnect Devices

Yoshinori Ejiri, Hitachi Chemical Co.

VIEW ABSTRACT

#155

Design for Sustained High Temperature Operation of FCBGAs Based on Process-Performance Relationships

Pradeep Lall, Ph.D., Auburn University

VIEW ABSTRACT

ADVANCED PACKAGING TECHNOLOGIES (APT)

#156

Enhancing the Reliability of 3D Package by Analyzing Crack Behavior on TSV Through Structural Optimization and Comparing Material Properties of the Package

Mehzabeen Kabir, The University of Texas at Arlington

VIEW ABSTRACT





#157

LFF BGA SMT and Rework Learnings

Hemant Shah, Ph.D., Intel Corporation

VIEW ABSTRACT

#158

Metallic Corrosion Potential During the Cleaning Process

David Lober, KYZEN Corporation

VIEW ABSTRACT

#159

Miniaturized Stacked Die QFN for Tire Pressure Monitoring System Applications

Andrew Mawer & Vishrudh Sriramprasad, NXP Semiconductors

VIEW ABSTRACT

ADVANCED PACKAGING TECHNOLOGIES (APT)

#160

Plasma Treatment Study of Copper Heatsink for Improved Adhesion of Thermally Conductive Adhesive

Swagatika Patra, SMART Modular Technologies

VIEW ABSTRACT

#161

Power Subsystem Quality Improvement - an E2E Approach

Eric Swenson, IBM Corporation

VIEW ABSTRACT

#162

Process Development Challenges and DOE Study to Control Bondline Thickness During Heat Sink Attachment Using Thermally Conductive Adhesive

Raghabendra Rout, SMART

VIEW ABSTRACT

#163

Versatile TIM Solution with Chain Network Solder Composite

Ning-Cheng Lee, Ph.D., Indium Corporation

VIEW ABSTRACT

#164

Updates on the Industry Standards for SMT Moisture/Reflow Sensitive Devices

Mumtaz Bora & Steve Martell, pSemi & Nordson ES - Sonoscan

VIEW ABSTRACT



Did you miss the 42nd EOS/ESD SYMPOSIUM AND EXHIBITS? Now is YOUR chance to see what you missed.

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Year-in-Review

Symposium On-Demand is available for 30 days

IEEE EMC SOCIETY

Education Symposium

Co-sponsored by IEEE, EMC Society, The Electron Devices Society, and Reliability Society.

FLUX, SOLDER, ADHESIVES (FSA)





#250

Advanced SIR Testing for Trapped Solder Paste Flux Residue

Karen Tellefsen, Ph.D., MacDermid Alpha

VIEW ABSTRACT

#251

Designing a Cleanliness Risk Profile on Leadless & Near Chip Scale Packages

Mike Bixenman, MBA, DBA, Magnalytix

VIEW ABSTRACT

#252

Effect of Microstructure on Fracture Load Prediction of Solder Joints

Mostafa Mohammadiamiri, Sharif University of Technology

VIEW ABSTRACT

#253

Fine Powder Investigation for Optimum Imperial 008004 Solder Paste Printing: Part I

Adam Murling, Indium Corporation

VIEW ABSTRACT

#254

Flux and Flux Management in a Nitrogen Reflow Oven

Fred Dimock, BTU International

VIEW ABSTRACT

FLUX, SOLDER, ADHESIVES (FSA)

#255

Intermetallic Compounds Growth Analysis with Two Methods: X-Ray Diffraction Compared to the Combination of X-Ray Fluorescence (XRF) and Coulometric Stripping (CS)

Jose Servin, Ph.D., Vitesco Technologies

VIEW ABSTRACT

#256

Nickel-Free Surface Finish Solution for 5G, RF, Microwave, High-Frequency-HDI PCB Applications-Relibility in Focus

Kunal Shah, Ph.D., Lilotree

VIEW ABSTRACT

#257

Process Control Plan to Monitor Acceptable Levels of Flux and Other Residues

William Capen, Honeywell FM&T

VIEW ABSTRACT

#258

Quality Control of Solder Paste Utilizing Electrochemical Impedance Spectroscopy

Dennis Barbini, Ph.D., Insituware

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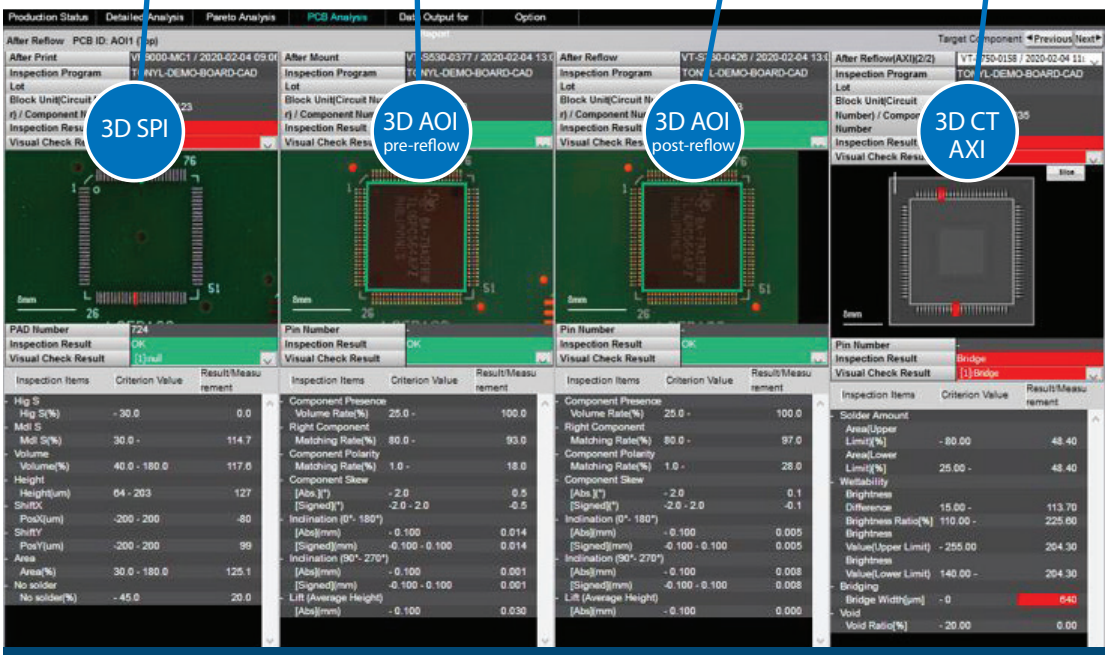
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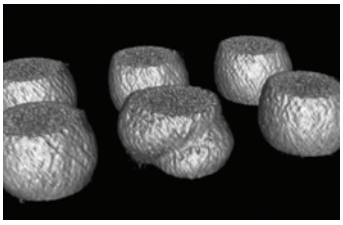
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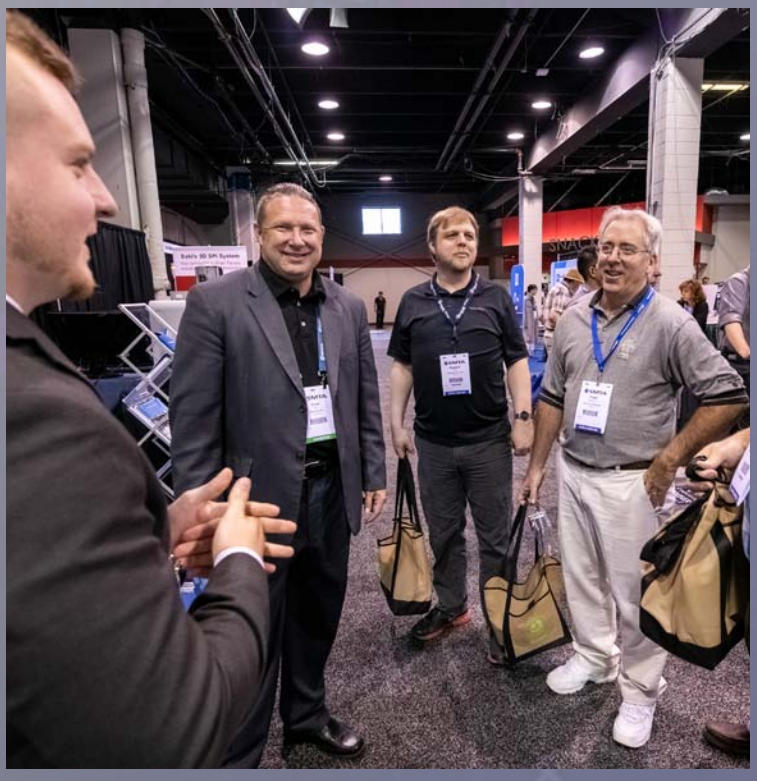
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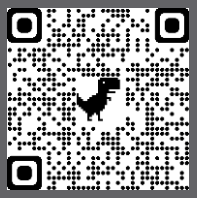
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