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SMTA Surface Mount Technology Association

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A SPECIAL TWO-DAY TECHNICAL SYMPOSIUM

2012 Medical Electronics Symposium / Day Two

Medical Electronics Technology, Personal Health and the Economy

Thursday, September 27

Arizona State University • Tempe Campus • Tempe, Arizona

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- American Electronic Resource, Inc.
- DfR Solutions
- Charles Stark Draper Laboratory, Inc.
- Fraunhofer IZM
- iNEMI
- Kyzen Corporation
- Medtronic, Inc.
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MEDICAL ELECTRONICS SYMPOSIUM

VITAL TECHNOLOGIES FOR HEALTH

Day Two: Thursday, September 27th, 2012

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BIOGRAPHIES

SYMPOSIUM CO-CHAIRS AND SESSION CHAIRS

Dale Lee is a DFX Process Engineer with Plexus Corporation primarily involved with DFX analysis and definition/correlation of design, process, legislative and tooling impacts on assembly processes and manufacturing yields. Dale has been involved in surface mount design, package and process development and production for over 20 years in various technical and managerial positions. These activities have included research, development and implementation of advanced manufacturing technologies and interconnect techniques, design and development of CSP and BGA packages, PCB and PCBA support, DFX analysis of flex and rigid PCB/PCBA's including supply chain, process qualification and new process introduction for domestic and foreign low, medium and high volume production applications. Dale is an active member of the SMTA and served on the Board of Directors.

Ronald J. Molnar is currently the Executive Director of AZ Tech Direct, LLC, an electronics resource network, offering consulting services in the electronics industry. He is an industry veteran and has enjoyed a distinguished career in the fields of Optoelectronics, ASIC, Bipolar Logic & Memory, Contract IC Assembly and Test, Equipment Automation, Sales Representation, and Consulting over the last 35 years. He's held VP of Engineering positions with Amkor Technology, Abpac, and Tiros. Mr. Molnar has traveled extensively and worked with numerous offshore IC assembly facilities and suppliers across Asia. He has been awarded 3 patents and has written many articles and technical papers. He is an active member of IEEE, IMAPS, SMTA, and MEPTEC industry groups. He received his BSEE from U.C. Berkeley in 1973.

SESSION CHAIRS

Donald Banks has more than 25 years experience in electronic packaging and substrate technologies at IBM, Motorola, W.L. Gore, 3M and most recently with St. Jude Medical. At St. Jude Medical in Sylmar, California, Don is a Hardware Development Manager in the company's Cardiac Rhythm Management Division. His responsibilities include printed circuit board products and processes for hybrid microelectronic assemblies in support of the company's pacemaker and implantable cardiac defibrillator devices. Don also participates in strategic technology, process development and cost reduction activities.

At W.L. Gore and Associates in Eau Claire, Wisconsin, Don led assembly development and provided engineering support for flip chip and wire bond substrates. He established a microelectronics packaging laboratory to provide customers with product integrity information. His team defined fatigue failure modes and optimized design features for assembly and reliability robustness. When the Gore facility was acquired by 3M in October, 2000, Don transitioned to a technical marketing role defining new business opportunities. He also served as project manager on next-generation flip chip carrier and wafer level test board product launches.

At Motorola in Austin, Texas Don was an engineering manager in a packaging process development group. Key projects included die bond, over molding, BGA ball attach, rework, and cleaning processes for wire bond and flip chip components. At IBM in Austin, Texas and in Endicott, New York, he was a technical contributor, bringing new electronic packaging technologies to IBM's manufacturing sites and OEM customers. The group qualified IBM's first ceramic BGA packages. Don has a BS in Metallurgical Engineering from Montana Tech and an MS in Metallurgical Engineering and Materials Science from University of Notre Dame. Over the years, Don has been an active participant in technical organizations including iNEMI, ECTC and SMTA.

Dale Lee is a DFX Process Engineer with Plexus Corporation primarily involved with DFX analysis and definition/correlation of design, process, legislative and tooling impacts on assembly processes and manufacturing yields. Dale has been involved in surface mount design, package and process development and production for over 20 years in various technical and managerial positions. These activities have included research, development and implementation of advanced manufacturing technologies and interconnect techniques, design and development of CSP and BGA packages, PCB and PCBA support, DFX analysis of flex and rigid PCB/PCBA's including supply chain, process qualification and new process introduction for domestic and foreign low, medium and high volume production applications. Dale is an active member of the SMTA and served on the Board of Directors.

DAY 2 KEYNOTE SPEAKER

Livia Racz is the Division Leader of Microsystems Technologies at the Charles Stark Draper Laboratory in Cambridge, Massachusetts. In this capacity, she is responsible for delivering first-of-a-kind microfabricated sensors and systems in the areas of bioMEMS, inertial instruments, miniature low power electronic systems, and others. Dr. Racz has over 50 publications, patents, and awards in these areas, including being named *Woman To Watch* by the Mass. High Tech Business Journal in 2010 and winning the Draper Best Patent Award in 2011. She has over 19 years of materials process development, technical leadership, and design-to-pilot manufacturing experience in microelectronics and photonics packaging. She has worked in start-up companies as well as on the faculty of the Tufts University Mechanical Engineering Department before joining Draper Laboratory, where she still guest lectures and advises students. She received her S.B. (1989) and Ph.D. (1993) degrees in Materials Science and Engineering from MIT and was the winner of an Alexander von Humboldt Research Fellowship in 1994. As a Humboldt Fellow, Dr. Racz worked at the Institute for Space Simulation in Cologne, Germany on a materials processing experiment that flew on a 1995 Space Shuttle mission.

PRESENTERS

Bill Birch is President of PWB Interconnect Solutions Inc., a supplier of Reliability Test Equipment and Test Services to all segments of the electronics industry. Bill has been involved the PWB manufacturing industry for over 30 years, he has been responsible for developing the principles of Interconnect Stress Testing (IST) for the past 20 years, receiving multiple patents. He has worked diligently to establish IST technology as the industry standard for the assessment of PWB substrate reliability. IST equipment is now installed at every major PWB manufacturer throughout North America, Europe and Asia and is recognized as an effective tool for measuring both process capability and product reliability.

Mike Bixenman, DBA., is one of the joint founders and CTO of Kyzen Corporation. He is an active researcher and innovator in the precision cleaning field. Mike chaired the IPC Cleaning & Alternatives Handbook, IPC Stencil Cleaning Handbook, and two IPC/SMTA Cleaning and Conformal Coating Conferences. Mike has published over 100 technical papers and received a number of awards in his field of expertise. Mike holds four earned degrees, including a

Doctorate of Business Administration from the University Of Phoenix School of Advanced Studies.

Lisa Bobich recently joined the Cardiac Rhythm Disease Management division of Medtronic, Inc. as a Product Engineer in the Sourcing Continuity department. In this role, she is responsible for working with suppliers to ensure their procedures, testing methods and processes will produce acceptable and consistent materials and components to support downstream manufacturing customers. Her work also includes supplier audits and leading cross-functional teams to drive root cause and final resolution of supplier related issues. Lisa received a B.S. in Biomedical Engineering from the University of Rochester and her M.S. and Ph.D. in Bioengineering from Arizona State University. She is a member of the Biomedical Engineering Society and Society of Women Engineers.

Krista Crotty founder of Alberi EcoTech, holds a BS in Mechanical Engineer and a MS in Production andOperations Management. She is the Chief EcoGeek and managing partner of Alberi EcoTech located in Las Vegas, NV, USA. Krista spent several years with working for IBM in multiple divisions: Storage Systems (hard disk drives), Microelectronics (ceramic substrate manufacturing), and Corporate Procurement (electronic components). In Corporate Procurement at IBM from 2003-2005, Krista specifically focused on IBM's compliance program for EU RoHS. She has assisted companies with product environmental compliance globally for over ten (10) years by teaching workshops, working in companies and speaking at conferences.

Patrick Gormally is Applications Engineer and Product Manager responsible for Medical Electronics for Vishay Intertechnology, Inc.
Patrick graduated from New Jersey Institute of Technology, where he received his Bachelor of Science degree in Electrical Engineering.

Joining the General Electric Company, he undertook rotating technical and marketing assignments as a participant in GE's Technical Marketing Program. He held various management positions for GE's Electronic Components division, and graduated from Advanced Marketing Management, Harvard Business School, sponsored by General Electric.

In 1991 he took on responsibilities for Product Marketing for Vishay Intertechnology. Later he was promoted to Director of Marketing. He is an author of many technical publications related to Medical electronics applications. At CARTS '08 Patrick was voted best technical paper award.

Jay Hamlin is a Principal Engineer and Electrostatic Discharge (ESD) Program Manager for Medtronic in Tempe Arizona. Jay is a Certified ESD Engineer by the International Association for Radio, Telecommunications and Electromagnetics.

Robb Hammond is the President and CEO of AERI. He established the company in 1994 with the goal of bringing professionalism to the Independent Electronic Component Distribution industry. His interest and passion in battling the proliferation of counterfeit electronic components has led him to take a significant role in leading the industry towards safe practices.

Robb's company is a founding member of IDEA, a previous member of ERAI's counterfeit committee, and an active participant of SAE's G19 committee, which developed the AS5553 and AS6081 documents on Counterfeit Electronic Components; Avoidance, Detection, Mitigation, and Disposition. He has previously presented at NASA's supplier conferences, CALCE Counterfeit Symposiums, the UK's Component Obsolescence Group conference, DMSMS/DoD conferences, and CTI's Components Obsolescence Workshops.

Erik Jung has a background in “physics”, “physical chemistry” and “technology in medicine”, he joined Fraunhofer IZM in 1994. Heading the group Advanced Microsystem Assembly, he developed processes in flip chip and chip embedding technologies eventually expanding his research field into the MEMS/NEMS packaging.

Staying from 2007 to 2008 as a research delegate at the University of Utah he was involved in the packaging of a wireless brain computer interface. He is heading the TC MEMS of IEEE/CPMT since 2002 and participating in activities of DGBMT and iNEMI on meeting the miniaturization challenges for the medical industry.

Since 2008 he is responsible for the field of “Medical Microsystems” at IZM, developing IZM´s business area on the use of micro devices in the medical field.

Dr. Rakesh Kumar is currently the Vice President of Technology for Specialty Coating Systems,
Inc., where he leads the R&D group and manages Parylene research and development activities worldwide. His prior work experience includes technical and management positions with Getty Conservation Institute, United Panel, Inc., Lucent Technologies, OptronX, Inc. He has more than 20 years of extensive experience in the development of polymeric materials and their applications in the medical, electronics and semiconductors areas. He is currently involved with the application of Parylene coatings in the field of medical including medical devices, electronics, MEMS, and nanotechnology. Dr. Kumar earned his undergraduate, graduate and doctoral degrees in Chemistry from Gorakhpur University in India, and completed his postdoctorate work in polymer chemistry at the University College London, U.K. He is co-author of a book and has authored several published papers and patents.

Randy Schueller received his Ph.D. in materials science engineering in 1992 and began working in the electronics industry with 3M where he led a team in the development of many IC packaging products. This was followed by 4 years as Director of IC Packaging and Engineering at Extreme Devices. Randy then moved to Dell in 2003. As Sr. Manager of Dell’s Component Engineering and Failure Analysis Groups where he helped drive lead-free solutions across all of Dell’s product lines. In 2008 Randy moved to Minneapolis and accepted a position with DfR Solutions as a Sr. Member of Technical Staff. Randy has 15 patents and has authored and presented over 40 papers for the electronics industry.

Michael Sorger is the Director of Engineering at Optiprint AG in Berneck, Switzerland. Michael has worked at Optiprint since 1997, where he spent the first 3 years as a production engineer, and the next 6 years as a member of the manufacturing management team. Michael attended the College of Electronics and Communications Engineering, as well as the University of Applied Sciences where he studied automation and control technology. He will be presenting on “Innovative PCB Solutions Used in Medical and Other devices”

Chuck Richardson is the iNEMI Director of Roadmapping and facilitates the development of the bi-annual “iNEMI Roadmap” as well as the resulting, and subsequently developed, “Technical Plan” and “Research Priorities” documents. Chuck received the BSEE degree and spent about 7 years in various analog and digital design roles before transitioning to Manufacturing Engineering Management. Prior to his role at iNEMI he worked at several OEM and EMS companies including: SCI Systems as Corporate Engineering Manager, Intergraph as Senior Manager of Manufacturing Engineering, Micro Industries as Vice President of Business Development/Operations, Cooper Industries as Director of Electronic Operations and Scientific Columbus as Vice President of Manufacturing. Chuck is an “IEEE Life Member” a founding member of the SMTA and served as a board member for 9 years. He has been an active speaker at various venues.

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VITAL TECHNOLOGIES FOR HEALTH

KEYNOTE PRESENTATION

Trends in 3D Micro-Packaging for Emerging Implantable Applications

Presented by
Livia Racz, Ph.D., Draper Laboratory

Implantable medical device applications continue to grow as technologies improve and opportunities emerge for better therapies and improved long-term outcomes. Implants are increasing in complexity and sophistication, with a corresponding increase in the need for data processing power. At the same time, there is a drive to make implants as small and long-lived as possible, while maintaining and improving safety and efficacy.

In some application areas, such as neurostimulation, small size is much more than an opportunity to squeeze in more battery. Neural implant devices are designed according to the type of nerve that is being stimulated, e.g. central nervous system or peripheral, and the specifics of the application drive implant footprint and overall device package size requirements. The size and importance of this market, projected to be $2.8B by 2014, will be an important driver of microsystems integration technology for the broader medical device industry.

As of now, miniaturization approaches have not yet caught up to industry needs. Most FDA approved implantable devices still rely on some form of conventional printed-circuit board technology, using ASIC design as their primary miniaturization tool. Accordingly, significant opportunities exist to reduce active electronics volume and enable more sophisticated data processing.

There is ongoing work in this field by a number of players, developing approaches ranging from ceramic multichip modules to full 3D wafer-level integration. Draper Laboratory, for example, has established a unique Miniature Low Power Systems capability over the last 15 years, a key part of which is a silicon- and alumina-based packaging platform that enables active and passive integrated circuit components to be co-packaged with analog sensors into ultra-thin systems. Typical delivered electronics modules are about the size and thickness of a postage stamp. This capability is now being extended to high-reliability medical applications with high-density hermetic feed-throughs. Ultimately, advances in 3D micro-packaging of hermetic systems could lead to ‘injectable’ implants produced at the wafer scale, enabling a host of new prosthetic applications.

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Session 5

Medical Standards, Regulatory & Compliance –
Meeting Global Requirements
Session Chair: Erik Jung, Fraunhofer IZM

From strategies and best practices for gaining and maintaining compliance with global and customer requirements, to lessons learned by companies when working towards compliance, this session will speak to quality engineers, compliance engineers, as well as all levels of management. Issues within the industry which are seen while working on these issues will also be discussed in this session.

Key topics: Government and Industry Standards updates; counterfeit parts; audit requirements, outcomes; Environmental Compliance Updates.

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First Line of Defense Against Counterfeits

Robb Hammond, American Electronic Resource, Inc.

One of the electronic medical equipment manufacturing industries greatest challenges is component obsolescence. Manufacturers of electronic components are shortening the lifecycle of their parts leaving medical manufacturers in the difficult position of having to re-design, which means they have to go through the FDA approval process, or purchase obsolete parts from the unauthorized supply chain. This presentation will take you through a case study in which a medical equipment manufacturer, unsuspectingly, found themselves in a situation where their products had been compromised by the introduction of counterfeit electronic components. As they found, many of the counterfeits in the market may function at a lower level or for a certain period of time, but they are ticking time bombs. After sharing the case study, I will share an outline of how to purchase components safely in the unauthorized supply chain. The presentation will give an overview of the worldwide counterfeit problem including how they are created followed by a detailed counterfeit avoidance process. The process will include a combination of purchasing, inspection, and test to keep manufacturers from finding themselves in a similar situation to the company described in this case study.

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RoHS Recast – Medical Devices are in Scope

Krista Crotty, Alberi EcoTech

Published in June 2011, the RoHS Recast now includes medical devices – category 8. From the use of the CE mark to mandatory declaration of conformity to open scope, there are several changes to the way companies, including medical device manufacturers, approach EU RoHS. Medical devices must now comply by July 2014 and July 2016, depending on their specific functions. The presentation will discuss how medical device companies are using information from enforcement actions and electronics' industry best practices to ensure compliance.

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Leveraging Existing Market Knowledge to Ensure a Successful Transition to Pb-Free Medical Products

Greg Casewell, DfR Solutions

The first Restriction of Hazardous Substance (RoHS) legislation out of Europe, in 2006, provided an exemption for medical electronics. However, a second version that modifies this exemption has been released. Medical devices will be covered as of 2014, in vitro diagnostic equipment as of 2016, and industrial monitoring and control instruments as of 2017. The importance of planning for lead-free products is evident, especially considering the high reliability requirements, long development, and product run times in the medical device field. Many products being developed today will be sold beyond 2014.

Fortunately, the medical electronics industry can benefit from experience gained by other industries that have eliminated lead over the past several years. There are difficulties and risks associated with this significant change, but they can be managed. Experience from the consumer electronics industry shows that it is important to dedicate resources to the lead-free transition effort and to support it from the top down within an organization. Some companies have also used the opportunity to implement other best practices, such as improved process control and more thorough reliability testing. Eliminating lead also provides the chance to clean house and remove old test procedures that are no longer relevant.

This presentation addresses the reliability testing aspects of a lead-free conversion and provides a foundation for developing a lead-free reliability test plan.

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Session 6

Integrating Process Excellence into Design Control
Session Chair: Dale Lee, Plexus

Medical electronic design breadth from pill size short duration diagnostic/treatment disposable systems to large multi-year installation diagnostic and patient care systems involves partnerships between design, materials, assembly, quality and reliability organizations to meet customer expectations for functionality and operational life expectancies. This session will present lessons learned to industry best practices and design methodologies to ensure reliability, manufacturability and functionality of electronic medical devices.

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Moving Towards Supplier-Owned Quality

Lisa Bobich, Medtronic

In the past, Medtronic received components from suppliers, performed inspection of those components in the incoming/receiving area, and then delivered acceptable components to the manufacturing floor. In April 2011, our facility became a “no rework” campus. As part of this initiative, we have been pushing component inspection back to suppliers as well as striving to achieve a higher level of quality from our suppliers – supplier owned quality. The first steps have been to implement an electronic system where suppliers can convey inspection results to Medtronic. Before utilizing this system, appropriate Measurement System Analyses are performed to ensure repeatability & reproducibility of measurements/acceptance criteria. For features where variable data is uploaded, we analyze the capability and evaluate the supplier’s level of quality. For most suppliers, components are accepted based on pass/fail to specifications. The next level of quality is to accept components based on k-values for features/specifications with variable data, which suggests a moderate level of capability for each lot. A high level of quality is to accept components based on control limits; this takes into account the historical measurements of a feature and gives a high level of confidence in the capability of each feature. In order to achieve the highest level of quality, a supplier would monitor their own feature-level data within narrower control limits and take pre-emptive action to mitigate any trends toward out-of-control.

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Cleaning Medical Electronic Assemblies

Mike Bixenman, Kyzen Corporation

The density of medical electronic designs is needed to achieve the desired functionality. As devices decrease in size, contamination can lead to unavoidable and unwanted malfunctions. Contamination trapped under components can result in electro-chemical migration, leakage currents and stray capacitance in an electronic circuit due to high voltage and frequency.

From a cleaning perspective, many designers have poor insight into factors that assure a cleanable design. Variables such as solder paste, reflow conditions, component placement, component clearance (standoff), cleaning agent and cleaning equipment are important factors. Collaboration between process engineers, assembly designers, solder materials, cleaning agent and cleaning equipment experts can improve integration of the circuit design and assembly.

Circuit board design plays an important role when cleaning is required. Factors such as the density of components, component layout, thermal heat requirements, and standoff height/clearance are key considerations. From a cleanability perspective, bottom termination component (BTC) selection, solder mask definition, placement and layout influence the clearance gaps. The purpose of this research uses a BTC test vehicle for studying factors related to the cleaning process. The designed experiment will present design considerations for medical assemblers who require that all contamination be removed from device hardware

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Statically Charged Printed Wiring Board Electrostatic Discharge Events

Jay Hamlin, Medtronic

It was once believed that electrostatic sensitive electronic components and integrated circuits were safe against the ravages of electrostatic discharge damage once they were attached to printed circuit boards (PCBs). This presentation will discuss research that has been performed demonstrating that this is not true. In fact, the extent of damage of electronic components and integrated circuits from static discharges while these components are attached to PCBs can be much greater than in their individual form. This presentation will include details on the research that has been completed, and methods to control these charged device or charged board type electrostatic discharges while assembling high reliability medical PCBs and devices.

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Session 7

Advanced Medical Electronics Packaging Technology

Session Chair: Don Banks, St. Jude Medical

Medical electronics applications continue to evolve to meet customer expectations. Products are shrinking in size even as features are added and performance is improved. The reliability requirements for medical electronics are a given. In today's health care environment, medical manufacturers must respond as never before to price pressures using superior design, as well as efficient product and process development. This session will cover packaging technology solutions that support the special needs of medical electronics.

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Reliability Testing of Electronic Circuits using IST

Bill Birch, PWB Interconnect

Reliability in medical electronics is required due to the nature of medical devices. The problem is how to test the reliability of the printed wire board or flex circuits before committing those circuits to assembly and potential rework. One method of reliability testing is thermal cycling testing. One of the most useful methods for thermal cycle testing is Interconnect Stress Test (IST). The IST method tests the circuit's electrical and material integrity by testing representative coupons. These coupons are fabricated on the production panel beside the circuit board. IST tests the circuit's interconnections using thermal cycling of the interconnections while monitoring the resistance of circuits. It also tests the material integrity by measuring changes in capacitance. There are two new developments in the IST test protocol that include Pulse testing and Conductive Anodic Filament (CAF) testing. Pulse testing is performed by inducing a pulse of electrical power down a circuit and looking for damage. This is useful in testing the circuit reliability in handling the electrical current generated by defibrillators. A tendency to have CAF is found in circuits that are in humid environments. IST CAF coupons are used to determine a propensity for a circuit to produce CAF type of failures. This paper is a review of the latest methods using IST, materials, Pulse and CAF testing.

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Antimicrobial Parylene Technology for Medical Electronics and other Devices

Rakesh Kumar, Specialty Coating Systems

The demand for antimicrobial surfaces for medical devices is growing due to increases in healthcare associated infections (HAI's). Among the various potential options, applying an effective antimicrobial coating on medical electronics and other device surfaces is most desirable to address the issue without sacrificing the effectiveness of the device. Parylenes (vapor phase deposited organic coatings) are playing a significant role in packaging and protection of many medical devices, enhancing their overall reliability. However, in their current form, they are not able to provide protection from microbial infections.

Although work continues to develop technologies to provide an effective antimicrobial barrier on many surfaces, a significant breakthrough has recently been achieved through the development of antimicrobial Parylene technology. This paper presents a new antimicrobial Parylene coating technology that destroys various microorganisms, including E. coli, S. aureus, P. aeruginosa, and C. albicans, and prevents their further growth while maintaining all attributes of the Parylene coating. In addition, this paper highlights benefits of using vapor phase antimicrobial Parylene for miniaturized medical electronics and other devices.

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Innovative PCB Solutions Used In Medical and Other Devices

Michael Sorger, Optiprint

Driven by the customers need for smaller and more compact applications, the challenge to achieve 40µ lines/space in flex-multilayer-pcb manufacturing is evident. Especially in combination with thin base material substrates, it is important to have the suitable processes and equipment installed, to be ready for these demands. LDI (laser direct imaging), laser structuring (drilling and cutting) and the newest photo-resist technology are the key factors as well as advanced cu-plating processes. The presentation will focus on the interaction of these processes to meet the target. In particular the advanced cuplating technologies enables the pcb manufacturer to create innovative pcb solutions together with his customers. Based on a few product samples we would like to show some of our unique capabilities and creative pcb solutions.

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Session 8

The Future of Medical Electronics Systems
Session Chair: Krista Crotty, Alberi EcoTech

Electronics will continue to play a large role in diagnosing, treating, and monitoring many medical conditions. Systems and instrumentation will require such features as advanced sensors, flexible interconnects, portability, wireless communication, fail safe control, data collection and feedback, power management, remote operation, accuracy, and miniaturization. This session will look at what the future may hold for medical electronics systems and discuss a few of the promising technologies.

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Compact Antenna for Medical Wireless Communications Applications

Patrick Gormally, Daniel Fraimorice, Vishay Intertechnology Inc

Implantable pacemakers, defibrillators and other medical electronic devices require a mobile wireless communications strategy to send or receive vital information. Wireless communication provides a convenient method for monitoring and controlling systems and providing real time data as needed for the application. The antenna design plays a major role in how wireless communications of data is handled.

A new compact wide band antenna suitable for wireless medical applications in the Medical Communications Service (MICS) band and in the Wireless Medical Telemetry Service (WMTS) band is introduced. The antenna is ceramic SMD construction and has capability to cover data transmission and reception for the entire UHF band and up to 1.1GHZ.The paper will discuss the operation and tuning techniques of the antenna.

Important performance criteria are discussed, such as; reducing interference and the need for retransmission, and optimizing the ground plane for the antenna and telemetry system

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Microtechnology for the HighTec Medical Industry

Erik Jung, Fraunhofer IZM

Recent developments in the field of microtechnology and microintegration had pushed – again the envelope for novel medical devices. We can expect now a significant higher degree of functionality, a better network connectivity, smaller form factors and novel applications enabled by both micro and nano innovations. Providing insight in recent advances in Nanotechnology and Advanced Packaging, the presentation will show how the advent of through silicon vias, wafer level packaging, chip to chip integration, nano modifications of sensor surfaces –covering the component level and possibilities offered by the system level integration using microfluidics and rapid prototyping techniques are leveraged for next gen medical devices which will improve the quality of life of patiens with various degrees of health issues.

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Closing Technology Gaps for the Medical Electronics Industry

Chuck Richardson , iNEMI

Every two years, iNEMI brings together industry leaders to create a series of technology roadmaps that look out ten years. In addition to roadmapping twenty one technologies, the roadmap also does a comprehensive assessment of the unique requirements of six market segments of the electronics industry – including medical electronics. From this extensive knowledge base, iNEMI develops a collaborative agenda that brings segments of the industry together to work on common challenges that are best addressed cooperatively.

This presentation will provide a summary of the iNEMI roadmap medical electronics product needs. In addition, details of the project formation teams will be highlighted and we will describe the progress to date in defining scopes of work as well as identifying the critical players needed at the table. Specific challenges faced by teams will also be discussed.

About MEPTEC

MEPTEC (MicroElectronics Packaging and Test Engineering Council) is a trade association of semiconductor suppliers, manufacturers, and vendors concerned exclusively with packaging, assembly, and testing, and is committed to enhancing the competitiveness of the back-end portion of the semiconductor industry. Since its inception over 30 years ago, MEPTEC has provided a forum for semiconductor packaging and test professionals to learn and exchange ideas that relate to packaging, assembly, test and handling. Through our monthly luncheons, and one-day symposiums, and an Advisory Board consisting of individuals from all segments of the semiconductor industry, MEPTEC continuously strives to improve and elevate the roles of assembly and test professionals in the industry. For more information about MEPTEC events and membership visit www.meptec.org.

About SMTA

The SMTA (Surface Mount Technology Association) membership is an international network of professionals who build skills, share practical experience and develop solutions in electronic assembly technologies, including microsystems, emerging technologies, and related business operations. For more information about SMTA events and membership visit www.smta.org.

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