INTERNATIONAL MICROELECTRONICS ASSEMBLY and PACKAGING SOCIETY
Serving Our Members Since 1967

INDIANA CHAPTER
iMAPS NEWS

NAVSEA WARFARE CENTERS CRANE

Racing To The Future Of Microelectronics

The Indiana Chapter of IMAPS Presents:

ELECTRONICS TECHNOLOGY EXCHANGE and SUPPLIER DISPLAYS

Tuesday, May 9, 2017

0815 - 1600

8:15 AM – 4:00 PM EDT

WestGate Academy

13598 E. WestGate Drive, Odon, IN

(just outside the Crane Gate of NSWC Crane)

SCHEDULE of EVENTS

On-Site Registration	0715 – 0815	7:15 am – 8:15 am
Technical Presentations	0815 – 1500	8:15 am – 3:00 pm
Supplier Displays	1200 – 1600	12:00 pm – 4:00 pm

This seminar is FREE to all attendees.

Pre-registration for the technical presentations is required and must be made by May 1, 2017.

Pre-registration is not required for the supplier displays only.

To register, please email name, company affiliation and contact information to registration@meunierusa.com

A hot buffet luncheon will be available. Cost is $5.00, payable on site (cash or credit).

Description

The Indiana Chapter of IMAPS is presenting a FREE seminar for all engineering and technical people involved in electronics design, procurement and assembly. Fourteen technical papers will be presented on a variety of topics related to the electronics industry on products, components, standards and design. The seminar will also include supplier displays and equipment demonstrations. If you have questions please contact:

- Larry Wallman, Indiana IMAPS President, 317-887-2564, lwallman@sbcglobal.net
- Matt Meunier, Meunier Electronics Supply Indianapolis, matt.meunier@meunierusa.com

Indiana Chapter of IMAPS
Electronics Technology Exchange – Technical Program Main Floor

Time	Presenter	Title
0815 – 830 8:15 – 8:30	Larry Wallman President, Indiana IMAPS	Welcome and Updates
0830 – 0900 8:30 – 9:00	Kathleen Guider Special Agent FBI	Counterintelligence Threat Briefing
0900 – 0930 9:00 – 9:30	Brent Mayfield Taconic	Advancements of Ceramics & Copper Foil in Microwave Substrates
0930 – 1000 9:30 – 10:00	Raymond Baker Macom	Scalable Planar Array (SPAR™) Tiles
1000 – 1015 10:00 – 10:15		Break
1015 – 1045 10:15 – 10:45	Steve Hillerich Samtec	Glass Core Technology
1045 – 1115 10:45 – 11:15	Jack Carney Smart Modular	Latest Technology in Secure & Highly Ruggedized Solid State Drives
1115 – 1145 11:15 – 11:45	Janice Meraglia Applied DNA Sciences	DNA-based Authentication & Trace-ability Solutions for Components
1145 – 1300 11:45 – 13:00	Lunch $5.00 per person (cash or credit) Supplier Displays Open at 1200	
1300 – 1330 1:00 – 1:30	Stan Bentley DivSys International	Supply Chain Risk Management in the Electronics Industry
1330 – 1400 1:30 – 2:00	Tom Bergman Battelle Labs	Battelle Barricade: Electronic Component Authentication Technology
1400 – 1430 2:00 – 2:30	Patrick Kowalyk Vicor Corporation	Maximum Load: The Wrong Specification for Pulsed Power
1430 – 1500 2:30 – 3:00	Stan Bentley DivSys International	Technological Advances in Electronics Assembly
1200 – 1600 12:00 – 4:00	Supplier Displays - Main Floor Refreshments available	

Indiana Chapter of IMAPS
Electronics Technology Exchange – Breakout Sessions
Room 217/218

Time	Presenter	Title
1045 – 1115 10:45 – 11:15	Matt Burkett NSWC Small Business Office	How To Do Business With NSWC Crane
1115 – 1145 11:15 – 11:45	Paul Quintana Microsemi	SEE Activated Trojan
1145 – 1300 11:45 – 13:00	Lunch $5.00 per person (cash or credit) Supplier Displays Open at 1200	
1300 – 1330 1:00 – 1:30	Paul Quintana Microsemi	Microsemi Trusted FPGA Approach
1330 – 1400 1:30 – 2:00	Matt Burkett NSWC Small Business Office	How To Do Business With NSWC Crane
1400 – 1445 2:00 – 2:45	D.H.R. Sarma Purdue University Patent Admin.	What Leads to a Patent
1200 – 1600 12:00 – 4:00	Supplier Displays - Main Floor Refreshments available	

Electronics Technology Exchange – Abstracts

What Leads to a Patent

D.H.R. Sarma, Ph.D, Technology Manager and USPTO Registered Patent Agent, Purdue Research Foundation

Patents are a measure of innovation for an academic or industry entity and are a component of its competitive posture in the area of intellectual property. Every year, millions of dollars are spent in preparing, filing and prosecuting patent applications. Patent applications and issued patents have become a measure of performance for development engineers and R&D departments. For start-up companies, patents represent a tangible asset as well as a strong case for the investors.

This presentation gives a clear understanding of a patent and addresses the essential elements needed to obtain a patent. Questions surrounding patents, legal as well as logistical, will be addressed with simple examples. The format of the presentation will be a Q&A town-hall style meeting, fielding questions from the audience. Please bring your patent questions and participate in the lively discussion. (Disclaimer: This presentation does not constitute legal advice.)

Electronics Technology Exchange – Abstracts

Counterintelligence Threat Briefing

Kathleen Guider, Special Agent FBI

Special Agent Guider will focus on the following three major points during her presentation:
Who – Insider Threats What – Theft of Trade Secrets How - Social Networking

---

Advancement of Ceramics and Copper Foil Technologies in Microwave and Millimeter Wave Substrates

…and How PTFE Laminate Technologies Are Addressing High Data Rate Requirements in Digital Signal Processing

Brent Mayfield, Taconic

Whether driven by lower insertion loss requirements, higher power, lower passive intermodulation (PIM) or ever increasing frequencies, the need for continuing advancements in laminate performance is driving changes in ceramics and copper foils used to manufacture laminates. Crushed ceramic particles are old laminate technology that is being replaced. New copper foil technologies are providing lower insertion loss than traditional foils, including rolled-annealed copper. The expansion of the GaN device market and the resulting increases in power are driving ceramics choice toward higher thermal conductivity.

The progressive changes in laminate and prepreg technologies have resulted in systems that achieve high performance at millimeter wave frequencies. These systems have been shown capable of higher layer counts often found in high speed digital designs and would allow designers to consider longer signal paths at data rates of 56 Gbps and beyond. The prepregs have also been modified for flexible circuit applications to allow for high speed flex cables using easy to process thermoset resins.

GCT: Optimized, Miniaturized Substrates and Components

Steve Hillierich, Samtec

Glass Core technology (GCT) is a proprietary process that leverages the performance benefits of glass by creating small diameter, fine-pitch, through-hole glass vias (metalized and hermetically sealed), and the formation of circuits on glass via a unique thin-film redistribution layer process. The result is a performance-optimized, ultra-miniaturized substrate, ideal for next generation IC packaging.

Latest Technology in Secure & Highly Ruggedized Solid State Drives

Jack Carney, Smart Modular

SMART High Reliability Solution designs, develops and manufactures secure and highly ruggedized solid state drives (SSDs) for the Military and Defense market. Our technology utilizes state of the art controller and flash technology that is backed by our proven world-class support. HRS understands and solves customer's key technical requirements and leverages a 30 year history in the Mil/Defense business.

Topics discussed will include: Parameters when using SSD's in Military applications; Differences between SLC and MIL drives; Threats to Reliability which include shock/ vibration, humidity, dust/chemicals, and temperature; US Government Sanitation and Quick Erase protocols; Opal 2.0 and FIP 197 compliance; and that not all SSD mfg. use the same Controllers.

Electronics Technology Exchange – Abstracts

DNA-Based Authentication and Traceability Solutions for Components

Janice Meraglia, Applied DNA Sciences

Traceability to an original component manufacturer (OCM) ensures device integrity and provides proof of authenticity. A microcircuit travels through a complex supply chain. Hard-copy documentation has been the mechanism for tracking and authenticating electronic components. The pitfalls of relying on a paper-trail process are numerous. Documents are easily and often separated from parts. Parts are often co-mingled in bins. In limited cases, electronic components are procured by contractors from sources outside the OCM authorized supply-chain. Recently published SAE counterfeit mitigation standards for test labs, as well as new detection technologies are all huge steps in the right direction. However, a gap remains: once a component is tested and verified, it is placed back into a bin or shipped to another location. Once again, the test and verification paperwork becomes separated. To tackle this challenge intelligent, interoperable and highly-scable coding solutions are needed.

SigNature DNA, a forensic botanical-based taggant, is the foundation of an authentication platform whereby a unique and un-copyable DNA mark is bound to a rapid read optical array. A host of supply chain security tools have been and continue to be developed, validated and piloted. The Office of Secretary of Defense awarded ADNAS a competitive development contract on behalf of the US Defense Logistics Agency to prevent counterfeit escapes in a range of high-risk federal supply groups. The Missile Defense Agency awarded ADNAS a Phase II SBIR contract to expand the SigNature DNA Marking technology platform established in Phase I with a continued focus on DNA marking of microcircuits.

Supply Chain Risk Management in the Electronics Industry

Stan Bentley, DivSys International

A global supply chain creates many challenges for managing the three pillars of Supply Management: Quality/Value, Delivery/Service and Intellectual Property. These are discussed with an emphasis on utilizing an Asian Supply Chain.

Battelle Barricade: An Electronic Component Authentication Technology

Tom Bergman, Battelle Labs

Battelle has developed a technology to nondestructively classify electronic components as authentic or counterfeit. Counterfeit, cloned, and malicious devices have traditionally been detected via imaging based inspection or destructive analysis techniques. As the quality of counterfeit packaging has continued to increase, this detection method is becoming inadequate. Currently, effective detection methods require exhaustive testing of component functionality, destructive analysis of test devices, or use of specialized imaging techniques. The Barricade technology does not require integrated circuit design modifications, physical alterations to existing inventory, or any changes to electronic component manufacturing processes to perform the classification process. The Barricade system contains a flexible, reconfigurable interface with the device under test, configuration is managed by the hardware within the Barricade system. The Barricade technology uses a method that differentiates classes of devices from data acquired from their power consumption waveforms. The Barricade system is based on the concept of side channel power analysis, a technique which has been developed and involves collecting unintentional or side channel emissions from a device. The collected data files are loaded into the Barricade classifier algorithm that performs the electronic component classification. Battelle will be presenting details on the continued development of the system including presenting data collected on authentic digital components and detection of counterfeit and cloned components.

Electronics Technology Exchange – Abstracts

Maximum Load: The Wrong Specification for Pulsed Power

Patrick Kowalyk, Vicor Corporation

Many applications, such as pulsed amplifiers, present pulsed loads, where energy is drawn in short bursts. Conventional design approaches demand that the power system is designed around the maximum required power, rather than the average, which increases size, weight, and cost. Power averaging is an approach that uses a power chain designed to supply the average current the load requires, coupled to a large capacitor to deliver the energy in pulses. This technique requires a power supply that can supply a highly capacitive load: something that is not possible with most existing products. Unlike conventional power supplies, our power components are designed to deliver power efficiently in pulsed load applications. Vicor components such as the DCM do not need external circuitry to ensure stability when used with a large amount of capacitance at their outputs to deliver the peaks in current. Additionally, they will not enter current limit conditions that can also cause significant reductions in system reliability.

SEE Activated Trojan

Paul Quintana, Microsemi

With the semiconductor value-chain residing primarily offshore, access to Trusted leading-edge Integrated Circuits (IC) are an increasing challenge for US Department of Defense acquisitions. Many studies have investigated methods of securing the global semiconductor supply chain using a variety of methods, including controlled manufacturing, device reverse engineering and various fingerprinting technologies. In each case, the goal is to maintain IC integrity, confidentiality, reliability and availability as the product transitions through the global supply chain to the end user. Maintaining these Trust characteristics throughout the supply chain includes eliminating the malicious injection of hardware and/or software Trojans. One class of Trojan, which has not received much attention, is a Single Event Effect (SEE)-triggered hardware Trojan. While Single Event Latch-up (SEL) circuit testing is routinely performed on space qualified semiconductors, the use of SEE sensitive circuits may represent a latent and remotely-triggered hardware Trojan which would be extremely difficult to detect.

Microsemi Trusted FPGA Approach

Paul Quintana, Microsemi

The availability of Trusted foundry options at leading-edge CMOS silicon nodes is becoming a serious challenge for US Department of Defense acquisitions. Compounding these dynamics is global industry consolidation moving advanced silicon manufacturing technology offshore and under foreign ownership. This limited availability of leading-edge Application Specific Integrated Circuits (ASICs) containing Critical Program Information (CPI) is pushing system developers more and more toward the use of Field Programmable Gate Arrays (FPGA's), as no CPI is ever released to the foundry. Microsemi, working with Defense Microelectronics Activity (DMEA) and the silicon manufacturing ecosystem has developed a Trusted FPGA manufacturing flow including technologies and processes to enable a Trusted leading-edge technology flow through commercial foundries, while maintaining a Trusted and verifiable Supply Chain Risk Management (SCRM) system throughout the manufacturing flow that is compliant with the goals of the US Department of Defense Instruction (DoDI) 5200, even for these non-CPI products.

Note To Attendees: Refreshments will be available all day.

Electronics Technology Exchange – Abstracts

Technological Advances in Electronic Assembly

Stan Bentley, DivSys International

The OEM is under a never-ending push from their customers for smaller, faster and cheaper devices with the latest innovations. They pressure the EMS suppliers to develop new techniques, add advanced capability equipment, improve inventory methods and reduce delivery cycles. Three of these EMS techniques are discussed: Solder paste dispensing, vapor phase soldering and selective soldering.

Scalable Planar Array (SPAR™) Tiles

Raymond Baker, Macom

Scalable **P**lanar **AR**ray (SPAR™) Tiles are RF assemblies containing antenna elements, GaAs amd GaN semiconductors, transmit and receive modules and RF and power distribution networks. When combined with additional signal generation and receive and control electronics, the composite assembly forms the building block for the MPAR planar active electronically scanned antenna (AESA) for the radar system.

MACOM offers a broad portfolio of advanced technologies and products for the complete spectrum of radar applications; from the highest power GaN power transistors for commercial air traffic control to highly integrated GaAs multi-function MMIC's for military phased array radar. MACOM offers semiconductor technology for each functional element within a radar's system.

Directions to WestGate Academy

13598 E. WestGate Drive, Odon, Indiana

Directions from the North to this event are shown below.

- From Indianapolis, take Highway 37 from I-465 to just south of Bloomington.
- At this point, pick-up the new I-69 South.
- Take I-69 South 21 miles to Exit 87/Highway 231.
- Turn left and proceed 1.5 miles to Highway 558.
- Turn left and proceed .5 miles. Take the first left onto E 1650 North.
- In 0.09 miles take the first left onto E WestGate Drive.
- Proceed .26 miles to WestGate Academy.

Hot Buffet Lunch Menu

- Choice of one entrée:
  - Almond Baked Chicken
  - Roast Beef
- Garden Tossed Salad
- Green Beans and Glazed Carrots
- Au Gratin Potatoes
- Breads and Rolls
- Lemonade, Sweet and Unsweetened Tea

INDIANA IMAPS OFFICERS AND CHAIRPERSONS

President: Larry Wallman 317-887-2564

Vice-President: Neal Thomas 313-506-5985

Secretary: John Hart 765-452-3634

Treasurer: Keith Magiera 219-781-7881

Program Chair: Ray Fairchild 765-451-1068

Advertising & Vendor's Day: Larry Wallman 317-887-2564

Publicity Chair/Newsletter: Terry Baum 513-573-6425

IMAPS Headquarters: Shelby Moirano 919-293-5000

The Indiana Chapter of IMAPS Presents:

ELECTRONICS TECHNOLOGY EXCHANGE and SUPPLIER DISPLAYS

Tuesday, May 9, 2017

0815 - 1600

8:15 AM – 4:00 PM EDT

WestGate Academy

13598 E. WestGate Drive, Odon, IN

(just outside the Crane Gate of NSWC Crane)

This event is FREE to all attendees.

Registration and schedule information are enclosed.

IMAPS
911 FRONT ROYAL DRIVE
INDIANAPOLIS, IN 46227-2775