SMCBA

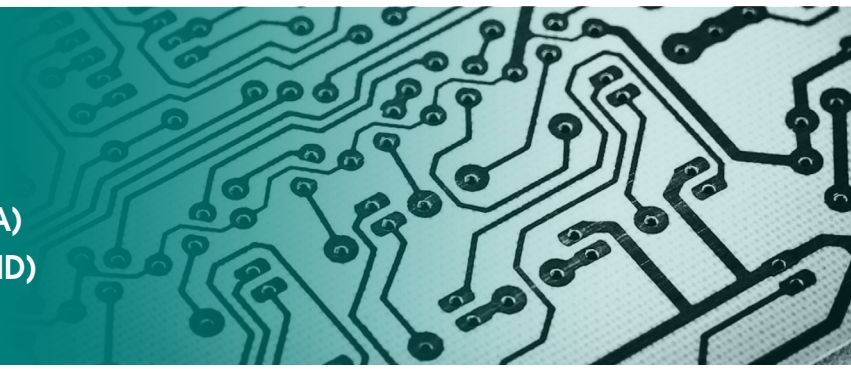
ELECTRONICS DESIGN & MANUFACTURE CONFERENCE 2013

25TH ANNUAL CONFERENCE

TUESDAY 10th TO THURSDAY 12th SEPTEMBER **MELBOURNE PARK FUNCTION CENTRE**

PRESENTERS WILL INCLUDE:

TOM HAUSHERR, PCB LIBRARIES (USA)
MARTIN O'HARA, TRIDATACOM (UK)
DAVE HILLMAN, ROCKWELL-COLLINS (USA)
NEIL DOUGLAS, FORUS LTD (NEW ZEALAND)
PROF JACK SINGH, LATROBE UNIVERSITY



CONFERENCE PRESENTATIONS WILL INCLUDE:

> CAD LIBRARY MANAGEMENT FOR ELECTRONICS DESIGN
> CIRCUIT BOARD AND LAYOUT ISSUES FOR EMC COMPLIANCE
> NEW PRODUCT DEVELOPMENT PROCESS FROM CONCEPTION TO DELIVERY
> ELECTRONICS ASSEMBLY PROCESSES FOR TODAY'S MANUFACTURERS
> LGA AND QFN COMPONENT TECHNOLOGY – IMPLEMENTATION AND RELIABILITY
> PACKAGE ON PACKAGE TECHNOLOGY
> MANUFACTURING CASE STUDIES IN NON CONFORMANCE – UPDATE FOR 2013
> EMBEDDED SYSTEMS - HOW TECHNOLOGY CAN HELP SOLVE COMPLEX CHALLENGES
> STATISTICAL PROCESS CONTROL
> SMT, ESD, DFM – EVERYTHING YOU NEED TO KNOW WHEN YOU START WORK IN THE ELECTRONICS INDUSTRY
> IPC-A-610 ACCEPTABILITY OF ELECTRONIC ASSEMBLIES - THREE DAY TRAINING AND CERTIFICATION PROGRAM

FULL CONFERENCE PROGRAM DOWNLOAD AT http://www.smcba.asn.au/SMCBA2013program.pdf

ALL ENQUIRIES PLEASE CALL +61 3 9571 2200 OR EMAIL: pollocka@smcba.asn.au

ELECTRONEX EXHIBITION WILL BE OPEN ON
WEDNESDAY 11TH SEPTEMBER - 10AM TO 6PM
THURSDAY 12TH SEPTEMBER - 10AM TO 5PM
DON'T MISS THE INDUSTRY'S KEY EXHIBITION!

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electronics design & assembly expo

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SMCBA 2013 ELECTRONICS DESIGN & MANUFACTURE CONFERENCE OVERVIEW

VENUE: MELBOURNE PARK FUNCTION CENTRE

	SESSION	Times	Page No.
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	IPC-A-610 ACCEPTABILITY OF ELECTRONIC ASSEMBLIES – TRAINING & CERTIFICATION PROGRAM *Three Day Workshop*	9.30am–5.00pm	4
	PACKAGE ON PACKAGE (POP) TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY *(1)* *Half Day with Dave Hillman*	9.30am–1.00pm	5
	MANUFACTURING GONE WRONG: CASE STUDIES IN NON-CONFORMANCE *(2)* *Half Day with Dave Hillman*	2.00pm–5.00pm	6
	NEW PRODUCT DEVELOPMENT PROCESS FROM CONCEPTION TO DELIVERY *One Day with Martin O'Hara*	10.00am–5.30pm	4
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	EMBEDDED SYSTEMS - WHAT CAN TECHNOLOGY DO TO HELP IN SOLVING THE WORLD'S BIG AND COMPLEX CHALLENGES - *Professor Jack Singh*	10.00am–12.30pm	6
	SMT, DFM AND ESD CONTROL FOR NEW ENGINEERS & TECHNICIANS *(3)* *Half Day with Neil Douglas*	1.30pm–5.00pm	9
THURSDAY 12 ESPTEMBER	IPC-A-610 ACCEPTABILITY OF ELECTRONIC ASSEMBLIES – TRAINING & CERTIFICATION PROGRAM *Three Day Workshop*	9.00am–4.00pm	4
	LGA & QFN COMPONENT TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY *One Day with Dave Hillman*	9.00am–4.00pm	7
	CIRCUIT BOARD AND LAYOUT ISSUES FOR EMC COMPLIANCE *One Day with Martin O'Hara*	9.00am–4.30pm	8
	STATISTICAL PROCESS CONTROL *One Day with Neil Douglas*	9.00am–4.00pm	9

FINISH TIMES ARE APPROXIMATE
All delegates are provided with tea / coffee breaks and lunch is included, except where indicated above.
(1) Half day workshop fee includes morning tea and lunch.
(2) Half day workshop fee includes afternoon tea but NOT lunch.
(3) Fee for this workshop includes afternoon tea / coffee, but it does NOT include lunch. FREE to students (please attach proof of current enrolment / student card ID.

CONFERENCE RECEPTION: Wednesday 11 September, 2013 [6.00pm to 7.30pm approximately]
REGISTRATION FORM & DETAILS: Refer to Page 11

CODE: DES

CAD LIBRARY MANAGEMENT FOR ELECTRONICS DESIGN

Tuesday 10 September 2013
& Wednesday 11 September 2013

TWO DAY WORKSHOP WITH TOM HAUSHERR, PCB LIBRARIES [Tues: 10am–5.30pm & Wed: 9.30am-5pm]

THE WORKSHOP

As PCB design perfection starts in the CAD library this two day workshop will present a practical guide to the many issues facing a design team in establishing and maintaining an effective library structure that is expandable and flexible, yet ensures a discipline of process for establishing procedures, standards and methods of working that are accepted and adopted by all concerned for achieving consistent and reliable results.

Electronic design starts with CAD libraries and if part numbers, footprints, symbols and models are not correct then almost certain project failure will result and that usually leads to delays and extra expense for re-designs to get new boards made and have them assembled with new components.

Unfortunately, many decisions need to be made at the very beginning of establishing a CAD system library and its working methods and many of these decisions are critical to long term success. For example, discovering some time later that two thousand part numbers need to be changed because of an unforeseen requirement in fab, assembly, test or purchasing is no fun and is expensive in time lost and resources tied up.

WHAT YOU WILL LEARN

- ❑ What are the critical decisions to be made at the beginning
  - Types of Libraries
  - Library Structures
  - Library Standards
  - Library Process
  - Interim & approved Library policies
  - Version control
  - Responsibility for Library integrity
- ❑ Why are these decisions so important in the long-term
- ❑ What is the real role of the librarian in a company CAD structure
- ❑ How does the Library impact downstream processes

Further details on topics to be addressed can be downloaded at www.smcba.asn.au/PCBlibraryconsiderations.pdf.

ALSO BEING DISCUSSED

The new IPC-7351C, the IPC land pattern design standard which addresses footprint design and documentation. The discussion will focus on the changes and updates to the standard which also impacts micro-miniature components and a higher round–off resolution for pad sizes and placement.

TOM HAUSHERR

The "PCB Footprint Expert" – a software package based on IPC-7351 to generate footprints that are correct-by-design. The Footprint Expert is CAD neutral and currently supports nineteen (19) CAD tools. It separates library data into two categories, component and preferences which allows for an easy transition from one format to another and library parts entered can easily be adjusted and reprocessed.

"PCB Parts on Demand": this is a project designed by the speaker to provide an internet based repository of library elements that are uploaded once and are then made available for download by multiple users. This means that part numbers are designed and developed once and once only for the industry.

Changes to the IPC-CM-770 Component Mounting Guidelines for Printed Boards will also be discussed. This standard will become IPC-7070 – *Component Mounting Issues and Recommendations.*

For the past 30 years Tom Hausherr has devoted his career to developing, managing and documenting PCB Library parts. The technology is finally here to fully automate PCB Library creation and 3D modelling for electronic packages. Tom is spearheading the effort to create a one world PCB Library solution with the "Parts on Demand" (POD) PCB Library web/tool –based vending machine. POD will introduce a new technology that will be based on Component Dimensions used to automate footprint and 3D model creation, assembly, AOI systems and CAM footprint verification tools. POD ties together the Physical and Logical data for electronic product development automation.

Some of Tom's career highlights:

- ❑ Founder and CEO of PCB Libraries, Inc
- ❑ Mastered CAD tools; ComputerVision, Calay Systems, PADS Layout, AutoCAD and currently learning Altium and SolidWorks
- ❑ Recent employers; Wind River, Mentor Graphics and Lockheed Martin Space Systems.
- ❑ IPC Advanced Certified Designer CID+
- ❑ Helped IPC develop IPC-7351 Land Pattern Calculator, which won 1st place DesignVision Award in 2007 for the best new CAD Software tool in the electronics industry.
- ❑ Won three IPC "Award of Excellence" for contributions to the IPC-7351 Land Pattern standard
- ❑ Owned and operated a service bureau (CADPRO) for 12 years and developed over 2,000 PCB products

SPECIAL OFFER TO ALL ATTENDEES: PCB LIBRARIES ARE ***OFFERING ALL WORKSHOP ATTENDEES A 50% DISCOUNT*** ON ANY PCB LIBRARY EXPERT LICENSE PURCHASED DIRECTLY FROM PCB LIBRARIES FROM **1 JULY TO 31 OCTOBER 2013**. WHEN YOUR REGISTRATION FEES HAVE BEEN PAID YOU WILL BE SENT INFORMATION ON HOW TO CLAIM YOUR DISCOUNT.

WHO SHOULD ATTEND: Anyone involved in making sure electronics design is done in the most efficient, accurate, reliable and consistent manner possible. Designers, Engineers, Technicians, for that matter anyone involved in R&D, product development and reliability should attend.

CODE: NPD

NEW PRODUCT DEVELOPMENT PROCESS FROM CONCEPTION TO DELIVERY

Tuesday 10 September 2013

ONE DAY PROGRAM PRESENTED BY MARTIN O'HARA, TRIDATACOM UK [10.00am–5.30pm]

COURSE OVERVIEW

Martin O'Hara has extensive experience in New Product Development (NPD) and Introduction (NPI) and his presentation will be a personal reflection and demonstration of tools and techniques used by Martin to develop and introduce new electronic products. The content will reflect some of the methods and madness of introducing electronic components, circuits and complete products, what has worked and what can cause issues. The presentation will progress from idea generation, selection of suitable products / project, new product development, new product introduction to manufacturing and where necessary end-of-life considerations and include aspects of project management and milestone monitoring.

Martin will discuss the processes that he has tried to improve the development cycle, reduce costs and meet release deadlines. He will also look at what the compromises are and where to focus effort when something doesn't go as smoothly as expected in a product development. Issues such as identifying true innovation or technology leaps, how to isolate these against the more easily provable "more of the same" or "me too" products and why there is never enough time or resource to do everything you want.

- ❑ What are the stages of product development?
  - Front End
  - Execution
  - Delivery
- ❑ How is new product development managed?
- ❑ How is the end result achieved? Timeframes

COURSE TOPICS

- ❑ Project Management Principles
  - Measure, monitor, report, react
- ❑ Risk Mitigation and Early Warning
- ❑ Accurate Prioritisation
- ❑ Focusing on the Outcome, not the Input
- ❑ Milestone Monitoring
- ❑ Bill of Materials, Assembly Drawings
- ❑ Suppliers and Data Sheets
- ❑ eMan: Gerber Data, Placement Data, etc.
- ❑ Disassembly / Recycling / Re-use Instructions (ISO14001)
- ❑ Post production support
- ❑ Perception and Actual Project Time

CODE: 610

IPC-A-610 ACCEPTABILITY OF ELECTRONIC ASSEMBLIES – TRAINING & CERTIFICATION PROGRAM

Tuesday 10 September 2013
to Thursday 12 September 2013

THREE DAY COURSE [Tues: 9.30-5pm, Wed: 9am -4.30pm & Thurs: 9am–4pm]

COURSE OVERVIEW

IPC® Training Center

This is your opportunity to attain portable and internationally recognized certification as a Certified IPC Specialist (CIS) or Certified IPC Trainer (CIT) for the A-610 Acceptability of Electronic Assemblies – the most widely used standard published by the IPC with an international reputation as the source for end product acceptance criteria for consumer and high reliability electronic assemblies. This course is to the latest Revision E of the A-610 standard.

Certification will demonstrate your commitment to customer requirements and greatly assist any company dedicated to quality assurance initiatives. The IPC training and certification has immediate recognition, legitimacy and value with thousands worldwide having been trained and certified. The 610 course is modularized, topics include:

- ❑ Purpose and application of the IPC-A-610 standard
- ❑ Hardware installation
- ❑ Soldering criteria including lead free connections
- ❑ Soldered requirements for connecting to terminals
- ❑ Soldered connection requirements for plated-through holes
- ❑ Surface mounting criteria for chip components, leadless and leaded chip carriers
- ❑ Swaged hardware and heat sink requirements of mechanical assemblies
- ❑ Component mounting criteria for DIPs, Socket pins and card edge connectors
- ❑ Jumper wire assembly requirements
- ❑ Solder fillet dimensional criteria for all major SMT component groups
- ❑ Soldering problems such as tombstoning, dewetting, voiding
- ❑ Criteria for component damage, laminate conditions, cleaning and coating

COURSE MODULES

- ❑ M1: Policies & Procedures
- ❑ M2: Purpose & Application of the 610
- ❑ M3: Hardware Installation
- ❑ M4: Soldering
- ❑ M5: Terminal Connections
- ❑ M6: Through-Hole Technology
- ❑ M7: Surface Mount Assemblies
- ❑ M8 Component Damage, PCBs & Assemblies
- ❑ M9: Solderless Wire Wrap

CERTIFIED IPC TRAINER (CIT) CANDIDATES attaining the required pass marks will receive a kit of materials to conduct 610 CIS level training to the current Revision E Course.

610 Course Instructor: This course will be conducted by an SMCBA Master IPC Trainer.

PACKAGE ON PACKAGE (POP) TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY

CODE: POP

Tuesday 10 September 2013

HALF DAY WORKSHOP WITH DAVE HILLMAN

[9.30am–1.00pm]

SPEAKER'S PROFILE

Dave Hillman is a Metallurgical Engineer in the Advanced Operations Engineering Department of Rockwell Collins Inc. in Cedar Rapids, Iowa.

Dave graduated from Iowa State University with a B.S. (1984) and M.S. (2001) in Material Science & Engineering. In his present position he serves as a Consultant to manufacturing on material and processing problems. He served as a Subject Matter Expert (SME) for the Lead-free Manhattan Project in 2009.

He has published numerous technical papers with the 2008 SMTA International Conference on Soldering & Reliability being selected as "Best of Conference".

In 2008 he was the recipient of the SMTA "Member of Technical Distinction" Award. Mr Hillman was awarded the Da Vinci medal as a Rockwell Engineer of the Year for 1994. He serves as the Chairman of the IPC JSTD-002 Solderability Committee.

Dave also served as a Metallurgical Engineer at the Convair Division of General Dynamics with responsibility in material testing and failure analysis prior to joining Rockwell.

He serves as a member of the SMTA Journal and Soldering & Surface Mount Technology Journal Technical Paper Review Committees.

He is a member of the American Society for Metals (ASM), the Minerals, Metals & Materials Society (TMS), and Surface Mount Technology Association (SMTA) and the Institute for Interconnecting and Packaging of Electronic Circuits (IPC).

Dave's presentations at SMCBA2012 in Sydney received outstanding reviews from delegates and we are delighted that he is able to be a headline speaker at SMCBA2013 in September in Melbourne.

Dave will also present three other workshops at this year's conference:

Manufacturing Gone Wrong: Case Studies in Non Conformance (see page 6)

Electronics Assembly Processes for Today's Manufacturers (see page 7)

LGA & QFN Component Technology Manufacturing Implementation and Solder Joint Reliability (see page 7)

DAVE HILLMAN

COURSE OVERVIEW

This course will discuss essentials for successfully implementing package on package (POP) component technology including both manufacturing implementation topics of stencil printing thru underfilling and POP solder joint reliability in terms of thermal cycling, vibration and drop shock Under IPC Class 3 High Performance product testing.

COURSE TOPICS

- ❑ POP background
- ❑ Manufacturing Implementation
  - POP Assembly Flow Options
  - Stenciling and Solder Dipping
  - Head on Pillow Issues
  - Reflow
  - Cleaning
  - Underfilling
- ❑ Solder Joint Reliability
  - Drop Shock
  - Test Vehicle
  - Test Conditions
  - Results
- ❑ Vibration
  - Test Vehicle
  - Test Conditions
  - Results
- ❑ Thermal Cycle
  - Test Vehicle
  - Test Conditions
  - Results
- ❑ BGA Voids
  - Reliability Impact

WHO SHOULD ATTEND: This course is designed to introduce the Package on Package component technology for two thrust areas:
(1) the implementation of POP Technology in the surface mount assembly environment
(2) the reliability of POP component technology from a product design perspective. Product Design Engineers, Process Engineers / Technicians, and Product Reliability / Safety Engineers are the target audience.

CODE: MFG

MANUFACTURING GONE WRONG: CASE STUDIES IN NON-CONFORMANCE

Tuesday 10 September 2013

HALF DAY WORKSHOP WITH DAVE HILLMAN

[2.00pm–5.00pm]

A series of real life case studies of manufacturing issues that have gone haywire when assembling products will be presented. Dave will cover a variety of "oops" such as plating finish, adhesives, soldering problems. "Experience is what you get right after you need it" and these case studies will detail various aspects from mistakes to the Law of Unintended Consequences.

Dave presented some of this information at SMCBA2012 last year and he has updated and included further examples of SMCBA2013.

WHO SHOULD ATTEND: This workshop is intended for Product Design Engineers, Assembly Operators, Process Engineers/ Technicians and personnel whose job function is the production and design of electronic assemblies.

- ❑ Case Study 1: But It's Just Packaging
- ❑ Case Study 2: Look At The Pretty Finish!
- ❑ Case Study 3: Stupid Coupons
- ❑ Case Study 4: Never Trust the Salesman
- ❑ Case Study 5: White Residues
- ❑ Case Study 6: Barney Boards
- ❑ Case Study 7: Sanitizers, Lotions & Bears Oh My!
- ❑ Case Study 8: Curse of the Pearl Pink Eraser!
- ❑ Case Study 9: What's Tin Whisker?
- ❑ Case Study 10: The Bigger the Glob, the better the job!
- ❑ Case Study 11: Fried Connectors

CODE: EMB

EMBEDDED SYSTEMS: WHAT CAN TECHNOLOGY DO TO HELP IN SOLVING THE WORLD'S BIG AND COMPLEX CHALLENGES? - Professor Jack Singh

Wednesday 11 September 2013

[10.00am–12.30pm]

PROF JACK SINGH

In an increasingly technological world, engineers are assuming an increasingly prominent role in addressing global challenges. Engineering solutions will be critical for meeting the demands of a growing population and ensuring a high quality of life for all. What can technology do to help in solving the world's big and complex challenges related to energy, transport, health food and space?

Prof Singh will address the use of **Information and Communications Technologies** (wireless, micro/nanotechnology, sensor and embedded technologies) as an enabler in addressing challenges in:

Transport System: Population increases have put considerable strain on transport infrastructure and management resulting in large social, environmental and economic costs. Cooperative Intelligent Transport Systems (ITS) can help address problems associated with traffic management, infrastructure and security, as well as enhanced driver safety and logistics support for transport operations. The presentation will include the $5.5m Government & industry funded multi-modal Cooperative Intelligent Transport Systems based solution that has been designed and implemented as a more efficient and effective approach to prevent and potentially eliminate accidents/collisions at road/rail crossing.

Energy: Research and Proof-of Concept projects in Smart Grid and Energy Management area. Some of these include an innovative and award winning Smart Energy Management technology that has already been deployed in Australia's first Zero Emission House (AusZEH); the Goldfields Solar Hubs project based around data collection, processing and analysis of up to 1000 solar PV installations and the Smart Power project based on high data rate broadband over powerline (BPL) communication technology.

Food: The most pressing issues relating to food supply are quality, safety & security. Driven by consumer demands for minimally processed foods containing fewer preservatives, increased regulatory requirements, market globalisation, food safety concerns and the threat of bioterrorism; there is growing need for novel technologies to enable tracking, tracing and quality monitoring of food products. The effective use of food resources by extending shelf-life and reducing waste will become increasingly important. Innovative packaging solutions with enhanced functions will play a key role in addressing these issues.

Space: The requirements for wireless systems for sensor applications to have reduced size, better performance and low power consumption have pushed RFIC research into innovative techniques and architectures and mixed technology integration. Prof Singh will discuss the design techniques and architectures for high performance mixed technology implementation including case studies for a very low power, wide bandwidth LNA for SKA Radio Telescope.

Jack Singh is a Research Professor (Microtechnology / Nanoelectronics) at La Trobe University. He is also the Director of the Centre for Technology Infusion, a research and product realisation centre with the vision to be a driver in the knowledge-based economy by creating a lively and state-of-art environment for academic and commercially relevant research, innovation and product development targeted towards high impact and strategic growth areas. Prof Singh has been involved in research, education and industry development projects of national/international significance for number of years including Australian Telecommunications Cooperative Research Centre projects, One-Chip Radio Project, Smart Sensor Project, Radio Telescope SKA project, Advanced Automotive Technology Cooperative Research Centre, Chipskills project, National Networked TeleTest facility, and more. His research focus is in wireless, smart sensors, ITS, RF/Analogue, embedded technologies and ICT.

Prof Singh is also a board/advisory council member on number of organisations including the Australian Industry Group (Ai Group), Australian Microelectronic Network, International Network of Engineering Education and Research, Micro and Nanotechnology Commercialization Foundation, Melbourne Centre for Nanofabrication, National Panel on Nano-Engineering (Engineers Australia), Australian Research Council Communications Research Network, Australian Nanotechnology Network (ANN) & the National Networked Teletest Facility for Integrated Systems.

ELECTRONICS ASSEMBLY PROCESSES FOR TODAY'S MANUFACTURERS

CODE: EAP

Wednesday 11 September 2013

ONE DAY PROGRAM PRESENTED BY DAVE HILLMAN

[9.00am–4.30pm]

COURSE OVERVIEW

This presentation will address the many issues faced and to be considered in the manufacture of electronic products. The problems encountered, the root causes and solutions to eliminate or mitigate these problems will be discussed.

The 5 Boogiemen of Lead-Free Soldering Processes:

As lead-free soldering processes achieve maturity, primary materials are established and process issues are uncovered solutions to these issues are needed. Dave Hillman will look at the root cause of five key areas and present solutions developed from his extensive experience in this field.

- ❑ Head on Pillow (HOP)
  - Non-Wet Opens (a close cousin)
- ❑ Pad Cratering
- ❑ Mixed Metallurgy
- ❑ Copper Dissolution
- ❑ Tin Whiskers
  - Mitigations that you Do and Don't Control
  - Current Industry Investigations
  - Tin Whisker Mitigation Plan Basic Tenets

PCB ASSEMBLY MATERIAL PHENOMENON AND DEFECTS

Some of the things to avoid in Electronic Products

Dave Hillman will discuss a variety of Material Phenomenon and Defects associated with a number of metals and coatings commonly found in electronic products. He will explain the intrinsic causes of each phenomenon/defect including their creation, elimination and avoidance through design and assembly best practice.

- ❑ Tin Pest
- ❑ Gold Embrittlement
- ❑ Silver Corrosion
- ❑ Plating Defects
- ❑ Palladium Embrittlement
- ❑ Conformal Coating Under Components
- ❑ Flux Induced Corrosion
- ❑ Copper / Tin Intermetallics
- ❑ Lead-free Solder Solidification Issues
- ❑ PCB Surface Finishes
  - The options and their properties
  - Design and Manufacturing considerations for selection

LGA & QFN COMPONENT TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY

CODE: LGA

Thursday 12 September 2013

ONE DAY WORKSHOP WITH DAVE HILLMAN

[9.00am–4.00pm]

COURSE OVERVIEW

This workshop will discuss the essentials for successfully implementing two Bottom Terminated Component (BTC) technologies – LGAs and QFNs.

The course will include both manufacturing implementation aspects of stencil printing thru cleaning and solder joint reliability in terms of a variety of test formats for High Performance product test criteria.

COURSE TOPICS

- ❑ LGA Package Background
- ❑ QFN Package Background
- ❑ IPC-7093 Standard
- ❑ Pad Design Impacts / Influences
- ❑ Manufacturing Implementation – Stenciling – Reflow – Cleaning
- ❑ Solder Joint Reliability
  - Thermal Cycle
  - Drop Shock
  - Vibration
  - Mechanical Stock

WHO SHOULD ATTEND: This course is designed to introduce LGA and QFN component technologies for two thrust areas:
(1) the implementation of LGA and QFN technology in the surface mount assembly environment
(2) the reliability of LGA / QFN component technology from a product design perspective Product Design Engineers, Process Engineers / Technicians, and Product Reliability / Safety Engineers are the target audience.

CODE: EMC

CIRCUIT BOARD AND LAYOUT ISSUES FOR EMC COMPLIANCE

Thursday 12 September 2013

ONE DAY WORKSHOP WITH MARTIN O'HARA, UK

[9.00am–4.30pm]

SPEAKER'S PROFILE

Martin O'Hara, EMC expert and author of *"EMC at Component and PCB Level",* will present his renowned workshop "Circuit Board & Layout Issues for EMC Compliance". During this workshop Martin will provide essential background knowledge and best design practices for improving the EMC performance of any circuit design.

With many years of industry experience Martin will demonstrate how with the use of available PCB technology, layout and component selection you can improve all aspects of EMC performance and achieve compliance early in the design process. The techniques are presented in an easy to understand and use format, without resorting to complex mathematics or an in-depth knowledge of electromagnetics. His no-cost methods have led him to achieve almost 100% first-time compliance in every design he has been involved with.

Martin has been a leading figure in the EMC arena for many years and in addition to his widely acclaimed textbook he has written numerous technical papers on Automotive Electronics, Circuit Stimulation as well as EMC.

He is a Durham University Graduate with a Masters Degree from Manchester Metropolitan University and is a Chartered Electrical Engineer. His real-world expertise is evidenced by having worked for Ferranti, GEC-Marconi, Newport Components, Motorola, Trafficmaster and Danfoss. He is currently Head of Product Development at Chargemaster (UK).

WORKSHOP SECTIONS

- The EMC Environment at the PCB Level
- Component Selection for EMC
- Input-Output Circuit Protection and Filtering
- PCB Layout for EMC
- PCB Layout for High Speed Design
- Embedded Programming for EMC
- EMC Design Risk Assessment

WORKSHOP TOPICS

MARTIN O'HARA

- **Cost Implications** – Fixing EMC problems at different stages of product design can give vastly different cost implications
- **De-Coupling and by-pass capacitors** – using L-C Filters, reservoir and de-coupling capacitors
- **Ground Techniques** – Including the use of ground planes, copper fills and gridded (or matrix) grounds
- **Tracking** – Exploring un-connected metallised areas, orthogonal routing and stub lines
- **High-speed design** – Signal integrity, low noise circuits and material dielectrics
- **Stack assignment** – The importance of layer stack-up using 4-layer and 6-layer examples
- **Transmission lines** – Crosstalk, impedance and via parasitics with examples of transmission lines
- **Termination techniques** – Series, parallel, RC, Tehevenin and diode termination techniques
- **Trends in embedded systems** – One of the least documented areas of EMC; the effects of software are described
- **Risk Assessment** – Methods of assessing the EMC effect of design changes

WHO SHOULD ATTEND: PCB design professionals, all those involved with PCB design and/or layout, engineers and managers with responsibility for EMC Compliance

CODE: SMT

SMT, DFM AND ESD CONTROL FOR NEW ENGINEERS & TECHNICIANS

Wednesday 11 September 2013

HALF DAY COURSE WITH NEIL DOUGLAS

1.30pm–5.00pm

COURSE OVERVIEW

This session will provide Engineers and Technicians newly employed in the electronics industry or students about to venture in to the industry with a valuable grounding in Surface Mount Technology, Design for Manufacturability and ESD Control in the workplace. It would also be suitable for new designers who are inexperienced in manufacturing processes.

The surface mount manufacturing process will be discussed including the key areas of screen printing, component placement, soldering and inspection.

Design for Manufacture principles and guidelines will be addressed together with details of tools and activities that can be utilised during the design phase to support manufacturability.

A number of general design guidelines have been established to achieve higher quality, lower cost, improved application of automation and better maintainability. Examples of these DFM guidelines will be provided.

In addition to these guidelines, designers need to understand more about their company's production system, i.e., its capabilities and limitations, in order to establish company specific design rules to further guide and optimise their product design to their company's production system. For example, they need to understand the tolerance limitations of certain manufacturing processes.

Aspects of ESD and what it means -the effects both long-term and short-term on products and how it can be prevented and avoided will be covered.

All attendees are encouraged to attend the Electronex Exhibition in the morning before this session or after the workshop.

THIS IS A LOW COST PROGRAM AND IT IS ALSO FREE TO STUDENTS CURRENTLY ENROLLED IN AN ELECTRONICS RELATED COURSE AT ANY TERTIARY LEVEL OR INSTITUTION.

CODE: SPC

STATISTICAL PROCESS CONTROL

Thursday 12 September 2013

ONE DAY WORKSHOP WITH NEIL DOUGLAS

9.00am–4.00pm

SPEAKER'S PROFILE

Neil Douglas has 25 years manufacturing experience within a SMT manufacturing environment, spending 6 years at Matsushita in the UK, where he set up and managed their high volume cellular telephone manufacturing plant and was responsible for all production and manufacturing engineering processes in a plant producing 21,000 telephones a week. After immigrating to New Zealand in 1994 he began working at Tait Electronics where he became manufacturing engineering manager, responsible for developing new manufacturing processes to meet the new product design cycle. Neil was one of the founders of SMS ltd, a company that provides surface mount programming and optimization software and until recently was the technical representative for the region with the SMTA based in the US.During the last 8 years Neil spent time at Hamjet running their manufacturing plant introducing new manufacturing methods such as Lean and 5S. Most recently Neil has been involved in the development, manufacture and installation of Variable Rate Irrigation systems, which is a combination of electronic hardware and web based software.

This course will provide the attendee with the basic overview of SPC, what you must have in place prior to using SPC and how, when used effectively ,SPC can be a tool to reduce waste, defects and improve quality, productivity and efficiency.

During the course Neil will cover the fundamentals of data capture, what to look for, how to collate the information and then evaluate the results to provide the methods of improvement.

The course will cover capability index of both machine and process and the impacts these can have on a company's ability to reliably produce products.

Following on from this, the course will demonstrate how to maintain and improve a process utilizing the tools of SPC, how to interpret trends in a process and look for signals that show change or variation in the process.

COURSE OVERVIEW

- ❑ SQC and SPC
- ❑ Statistical Process Control Techniques
- ❑ Simple Rules
- ❑ Real time applications
- ❑ Tools and how to use them
- ❑ Cause & Affect Analysis
- ❑ Data Collection & Control Charts
  - Variable Data
  - Attributes Data
- ❑ Troubleshooting & Corrective Action
- ❑ Case studies

SMCBA MEMBERS SAVE ON REGISTRATION FEES

– PLEASE CONTACT US FOR MEMBERSHIP INFORMATION

EMAIL: pollocka@smcba.asn.au OR CALL **03 9571 2200 (INT'L +61 3 9571 2200)**

SMCBA 2013 ELECTRONICS DESIGN & MANUFACTURE CONFERENCE OVERVIEW

VENUE: MELBOURNE PARK FUNCTION CENTRE

SESSION TIMELINE

TUESDAY 10 SEPTEMBER	WEDNESDAY 11 SEPTEMBER	THURSDAY 12 SEPTEMBER
CAD LIBRARY MANAGEMENT FOR ELECTRONICS DESIGN (pg. 3) [Tues: 10.00am–5.30pm] [Wed: 9.30am–5.00pm] *Two Day Workshop with Tom Hausherr*		
IPC-A-610 ACCEPTABILITY OF ELECTRONIC ASSEMBLIES – TRAINING & CERTIFICATION PROGRAM (pg. 4) [Tues: 9.30am–5.00pm] [Wed: 9.00am–4.30pm] [Thurs: 9.00am-4.00pm] *Three Day Workshop*		
PACKAGE ON PACKAGE (POP) TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY[1] (pg. 5) [9.30am–1.00pm] *Half Day with Dave Hillman*	**ELECTRONICS ASSEMBLY PROCESSES FOR TODAY'S MANUFACTURERS** (pg. 7) [9.00am–4.30pm] *One Day with Dave Hillman*	**LGA & QFN COMPONENT TECHNOLOGY MANUFACTURING IMPLEMENTATION & SOLDER JOINT RELIABILITY** (pg. 7) [9.00am–4.00pm] *One Day with Dave Hillman*
MANUFACTURING GONE WRONG: CASE STUDIES IN NON-CONFORMANCE[2] (pg. 6) [2.00pm–5.00pm] *Half Day with Dave Hillman*	**EMBEDDED SYSTEMS –** WHAT CAN TECHNOLOGY DO TO HELP IN SOLVING THE WORLD'S BIG AND COMPLEX CHALLENGES? (pg. 6) [10.00am–12.30pm] *With Professor Jack Singh*	**CIRCUIT BOARD AND LAYOUT ISSUES FOR EMC COMPLIANCE** (pg. 8) [9.00am–4.30pm] *One Day with Martin O'Hara*
NEW PRODUCT DEVELOPMENT PROCESS FROM CONCEPTION TO DELIVERY (pg. 4) [10.00am–5.30pm] *One Day with Martin O'Hara*	**SMT, DFM AND ESD CONTROL FOR NEW ENGINEERS & TECHNICIANS**[3] (pg. 9) [1.30pm–5.00pm] *Half Day with Neil Douglas*	**STATISTICAL PROCESS CONTROL** (pg. 9) [9.00am–4.00pm] *One Day with Neil Douglas*

All delegates are provided with tea / coffee breaks and lunch is included, except where indicated above.

[1] Half day workshop fee includes morning tea and lunch.

[2] Half day workshop fee includes afternoon tea but NOT lunch.

[3] Fee for this workshop includes afternoon tea / coffee, but it does NOT include lunch. FREE to students (please attach proof of current enrolment / student card ID.

CONFERENCE RECEPTION: WEDNESDAY 11 SEPTEMBER, 2013 [6.00pm to 7.30pm approximately]

SMCBA
ELECTRONICS DESIGN & MANUFACTURE
CONFERENCE 2013

CONFERENCE REGISTRATION

ALL ENQUIRIES - TO 03 9571 2200 (61 3 9571 2200)

To register, please complete this form and return to SMCBA by:

Fax: 03 9571 3300 (Australia) , +61 3 9571 3300 (International)
Email: pollocka@smcba.asn.au
Post: P O Box 3140, MURRUMBEENA VIC 3163, Australia

NAME: _____ **POSITION:** _____

COMPANY: _____

ADDRESS: _____

_____

EMAIL: _____

PHONE: _____ **FACSIMILE:** _____

If you have any questions please contact SMCBA on 03 9571 2200 (Australia) or +61 3 9571 2200 (International).

TICK BOX	CONFERENCE SESSIONS	MEMBER RATES		NON MEMBER RATES	
		Fee	GST	Fee	GST
TUESDAY 10 SEPTEMBER 2013					
☐ 610S	CIS Level – IPC-A-610 (3 day program)	$900	$90	$1,100	$110
☐ 610T	CIT Level – IPC-A-610 (3 day program)	$2,600	$260	$2,850	$285
☐ DES	CAD Library Management for Electronics Design (2 days)	$700	$70	$1,100	$110
☐ NPD	New Product Development	$350	$35	$550	$55
☐ POP	Package on Package Technology (1)	$200	$20	$350	$35
☐ MFG	Manufacturing Wrong: Case Studies (2)	$150	$15	$200	$20
WEDNESDAY 11 SEPTEMBER 2013					
☐ EAP	Electronics Assembly Processes for Today's Manufacturer	$350	$35	$550	$55
☐ EMB	Embedded Systems Session (includes lunch)	$150	$15	$200	$20
☐ SMT	SMT, ESD, DFM for Newcomers (3)	$100	$10	$150	$15
THURSDAY 12 SEPTEMBER 2013					
☐ EMC	Circuit Board & Layout for EMC Compliance	$350	$35	$550	$55
☐ LGA	LGA and QFN Component Technology	$350	$35	$550	$55
☐ SPC	Statistical Process Control	$350	$35	$550	$55

(1) Half day workshop fee includes morning tea and lunch.
(2) Half day workshop fee includes afternoon tea but NOT lunch.

(3) Fee for this workshop includes afternoon tea / coffee, but it does NOT include lunch. FREE to students (please attach proof of current enrolment / student card ID.

☐ Conference and Electronex Reception at 6.00 pm – no cost to delegates but registration is required.

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Fee Payable (A$)	
Plus 10% GST (A$)	
TOTAL (A$)	

All delegates are provided with tea / coffee breaks and lunch is included, except where indicated above.

ELECTRONEX REGISTRATION: All delegates are automatically registered to attend the Electronex Exhibition – separate registration is NOT required.

PAYMENT: On receipt of your registration you will be sent a confirmation together with a Tax Invoice requiring payment within 7 days. Payment methods will be detailed on invoice.

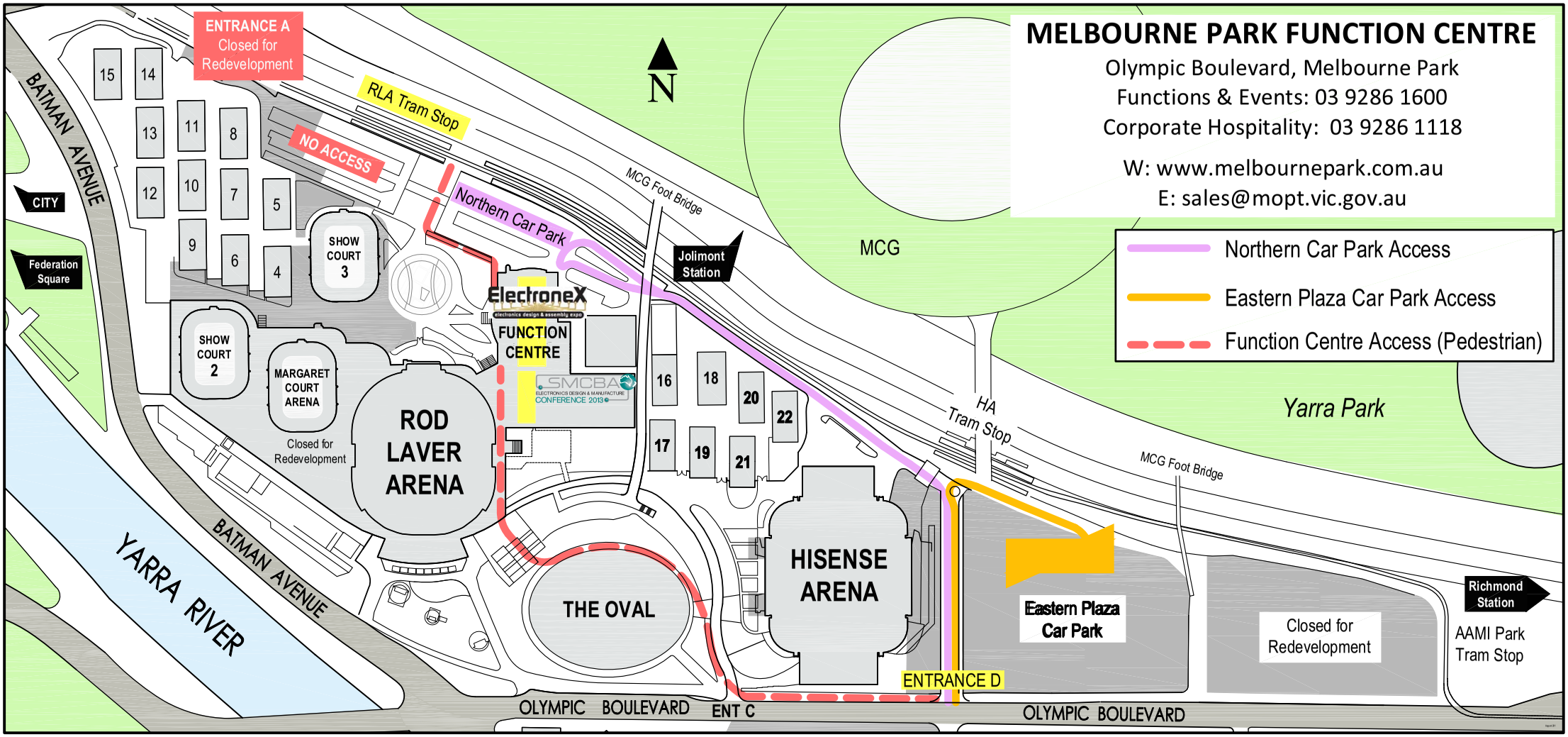
CANCELLATION POLICY: Cancellations made before 26-Aug-2013 will incur a $50 cancellation fee. Cancellation on or after 26-Aug-2013 will incur $110 cancellation fee (includes proceedings).

TRANSFER: You can transfer your registration to another party without any penalties.

CONFIRMATION: Confirmation of registration requires acceptance of the above cancellation policy.

Please sign and date below to complete your **Conference Registration**.

Signature (Person Registering) _____ **Date:** _____



MELBOURNE PARK FUNCTION CENTRE

Olympic Boulevard, Melbourne Park
Functions & Events: 03 9286 1600
Corporate Hospitality: 03 9286 1118

W: www.melbournepark.com.au
E: sales@mopt.vic.gov.au

PUBLIC TRANSPORT

Tram (Route 70, City - Wattle Park)
Catch a tram from Flinders Street, Spenser Street or Richmond Station to the Rod Laver Arena Tram Stop. Enter through gates at Garden Square and along ramp to your left to proceed up to the Function Centre.

Train
Richmond Station just a few minutes walk, east of Hisense Arena along Olympic Boulevard. Alternatively, Jolimont Station through Yarra Park/ MCG for Epping & Hurstbridge lines.

Taxi
Taxi Rank & drop-off zone on Olympic Boulevard. Walk through front gates and up stairs to Rod Laver Arena.

Walk
From Federation Square, take a short riverside walk through the parklands of Birrarung Marr. Walk through front gates and up the stairs to Rod Laver Arena. Follow concourse level around to the right.

PARKING

Northern & Eastern Plaza Car Park via Entrance D only off Olympic Boulevard (Swan St) $15 flat rate (cash on arrival only. Car Park rates subject to change without notice). Northern Car Park, enter through gates at Garden Square and along ramp to your left and proceed up to the Function Centre. Eastern Plaza Car Park, proceed along Olympic Boulevard to 'The Oval' & across to the stairs near RLA. Continue North to the Function Centre.

Drop off/ Disabled Access
Northern Car Park
Entrance D off Olympic Boulevard
Entry to car park allows 15 mins turnaround without charge. Disabled parking bays and ramp access to Function Centre. Follow concourse level around to the right.