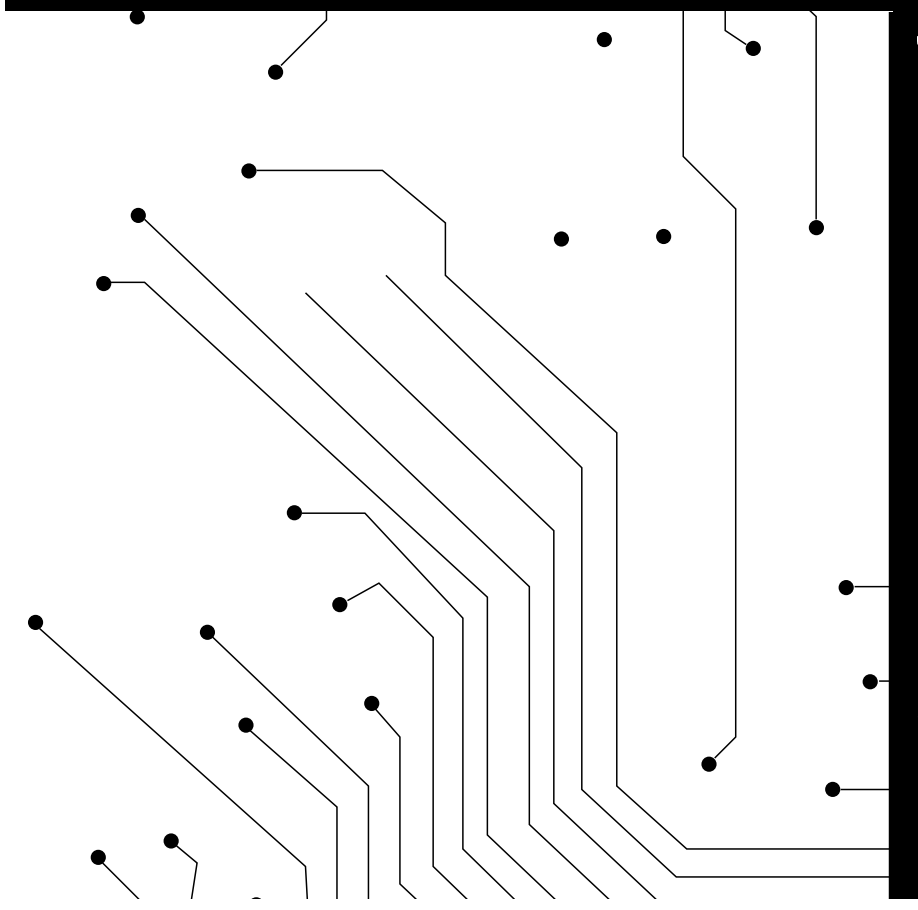
IPC Fifth Annual National Conference on High Density Interconnect Structures (HDIS)

…more and more
in electronics manufacturing,
only the smallest survive!

workshops
technical conference

november 8, 2000
november 9-10, 2000

Tampa Marriott Waterside Hotel
Tampa, Florida



IPC
ASSOCIATION CONNECTING ELECTRONICS INDUSTRIES

Workshops ▪ Wednesday, November 8, 2000 ▪ 8:30am - 4:00pm

Workshop 01

THE NEW MATH... PCB = IC!!!

Perhaps substrates will never equal silicon, but blind and buried microvias, embedded resistance and capacitance technologies are beginning to blur functional distinctions between components and interconnecting structures.

The "new math" makes even more sense when you factor in the complete dependency of the semiconductor upon the substrate... but it isn't simple arithmetic! Manufacturers and product designers face some difficult cost/benefit trade-offs. When do conventional materials and processes work and what must change when you decide to go HDI? What technologies will survive to make a lasting mark on how most electronic products are made?

The two-day IPC Fifth Annual National Conference on High Density Interconnect Structures (HDIS) and four Wednesday workshops will provide in-depth information on laser processes, material alternatives, design considerations, microvia metalization and HDI system-level challenges. Conference participants will receive continental breakfast and lunch on both days, admission to the Thursday evening reception, and proceedings. Whether making microvias or meditating on the subject, make your plans to attend today!

Challenges for HDI-Microvias: Engineering, Design, Fabrication and Assembly

Happy Holden, Westwood Associates

As ball grid arrays, flip chip and chip scale packages all come into common use, the need for advanced printed wiring boards (PWBs) is essential - both as the board and as the package. This course looks at technologies for ASIC packaging, portable products, high performance computing, telecom and dense multi-chip modules. PWB wiring modeling, design rules, material selection, components, microvia structures and assembly processes will be examined and compared. The program will define how to select breakout patterns, circuit routing guidelines, manufacturing process features, HDI CAD tools and materials.

WHAT YOU WILL LEARN:

- Benefits of High Density Interconnects (HDI)
- Micro packaging density requirements
- Applications of HDI (microvias)
- HDI material selection
- Electrical performance
- Multilayer stack-ups
- PCB layout tools requirements
- Simplifying multilayers
- Selecting the proper design rules
- Designing blind and buried vias
- Fabricator readiness
- Assembly interactions and testability
- Next generation HDI - optical and photonics

WHO SHOULD ATTEND:

Design and packaging engineers, field support personnel, marketing personnel, design, process, failure analysis, and reliability engineers will all benefit from this workshop.

ABOUT THE INSTRUCTOR:

Happy Holden is Manager of Advanced Technologies for Westwood Associates. He is responsible for next generation printed circuit manufacturing technologies, advanced design tools and design consulting. Prior to joining Westwood, he was a consultant with TechLead Corporation and Merix, and formerly managed Hewlett-Packard's application organizations in Taiwan and printed circuits R+D. He has had over 60 technical papers published on automation, printed circuits, advanced packaging, DFM and process engineering.

Workshop 02

High Performance, High Density Base Material Alternatives to FR-4

Doug Sober, Polyclad Laminates

For nearly 15 years, CEM-1 was used for consumer applications, polyimide was the material of choice for military/aerospace and FR-4 was utilized for everything else. Today, with the focus on high density PWBs, new materials are emerging at a rapid pace to satisfy the needs of high density interconnecting systems (HDIS). These constructions use a wide range of traditional and unconventional materials, and may be reinforced or unreinforced. This workshop will focus on the thermal, electrical and mechanical performance characteristics and manufacturing processes of some of these new materials.

WHAT YOU WILL LEARN:

- An overview of options and definitions
- Coated copper foils
- Bismaleimide/triazine
- Polyimide/glass
- Photoimagable dry films
- Photoimagable liquid films
- Nonwoven aramid reinforcements
- Bonding films
- Liquid crystal polymers

WHO SHOULD ATTEND:

This workshop will benefit anyone involved in using, designing, or manufacturing printed boards, including process, design, or quality control engineers, or individuals wanting ready references to base material alternatives.

ABOUT THE INSTRUCTOR:

Doug Sober is Corporate Director of Quality for Polyclad Laminates and has been involved in engineering, quality assurance, and marketing of base materials for over 20 years. Mr. Sober is currently the Chairman for the IPC Base Materials General Committee and the USA delegate to the International Electrotechnical Commission (IEC) for both base materials and test methods.

Workshop 03

Metalization of HDI Substrates and Microvias: Process Overview and Reliability Concerns

Michael Carano, Electrochemicals

This course will provide a thorough understanding of the reliability issues associated with the metalization of microvias and high density PWBs. Various direct plate technologies will be covered and contrasted to electroless copper. The importance of related technologies such as drilling (hole formation) and desmear will be explored. IST testing of reliability will be featured along with other more conventional reliability tests. All major direct metallization (DM) technologies will be presented.

WHAT YOU WILL LEARN:

- An overview of electroless copper and desmear process
- The direct metalization process
- Commercial direct metalization options
- Palladium systems
- Conductive polymer
- Carbon black technology
- Graphite technology
- Electrodeposition of copper
- General comparison of electroless copper to DM systems
- Reliability testing and common problems associated with DM

WHO SHOULD ATTEND:

OEM technologists and suppliers who need a foundation in the technology and anyone involved in PWB fabrication would benefit from this course.

ABOUT THE INSTRUCTOR:

Michael Carano is Vice President of Technical Operations for Electrochemicals, Inc. He is a member of, and a teacher for, the American Electroplaters and Surface Finishers Society. He has authored over twenty articles in the areas of copper plating, tin plating, PWB technolgies, and analytical control of electroplating baths.

Workshop 04

Laser Materials Processing

Ronald Schaeffer, Photo Machining

Designed to provide essential information for understanding lasers and their uses in the microelectronics industry, this workshop will review basic laser physics and photon/materials interaction as well as basic beam delivery techniques, motion control and part handling. Several applications will be discussed in detail including microvia drilling, flexible circuit dielectric removal, board repair, photoresist removal and patterning, and wire stripping.

WHAT YOU WILL LEARN:

- Differences between laser types for a particular application
- Understanding laser physics and photon/material interaction
- Current laser applications
- Microvia drilling process
- Determining the feasibility of laser processing
- Resources for further study

WHO SHOULD ATTEND:

Anyone implementing or considering the implementation of laser-based equipment into their manufacturing operation. Materials engineers and others in the supply chain can learn the effects of laser technology when used with their products.

ABOUT THE INSTRUCTOR:

Dr. Ronald Schaeffer is the CEO of Photo Machining, Inc. and has been active in the laser industry for 15 years, previously working for companies such as Spectra Physics and Lambda Physik. He has authored or co-authored over 30 publications and is recognized as an industry leader in the field of micromachining. Ron received his Ph.D. in physical chemistry from Lehigh University.

Setting the Standard/Gauging the Market

In conjunction with the conference, IPC will sponsor committee meetings on various HDIS standards.

For information, contact *Chris Jorgensen* at 847/790-5328.

IPC semi-annual A/TMRC meetings will take place at the Marriott Waterside in Tampa the following week.

For information, contact *Nilda Mendez* at 847/790-5384.

IPC Fifth Annual National Conference on High Density Interconnect Structures (HDIS)
Conference Agenda

Thursday, November 9, 2000

8:00 am Conference Registration and Continental Breakfast

9:00 am Introduction
Happy Holden, Westwood Associates, Conference Chair

SESSION ONE: OEM Requirements and Design Issues

Ceferino Gonzalez, DuPont, Session Chair

9:15 am 2000 HDIS Capability Overview
Timothy Estes, Conductor Analysis Technologies

10:00 am Substrates for Portable Products
Motorola (invited)

10:30 am BREAK

10:45 am Designing Large, High Speed HDI Boards - The Third Platform
Happy Holden, Westwood Associates

11:30 am Manufacturability Analysis and Physical Design Verification of HDI Products
Robynne Hanus, Valor Computerized Systems

12:00 pm LUNCH

1:00 pm Data Transfer Issues for HDI
Dieter Bergman, IPC

1:45 pm Assembly-related Challenges with HDI Printed Boards
Jabil Circuits (invited)

2:15 pm BREAK

SESSION TWO: Processes and Materials

Kathleen Nargi-Toth, Enthone, Session Chair

2:30 pm Completely Integrated, Conveyorized, Horizontal SBU-HDI Production from Desmear to Soldermask Application
Jurgen Barthelmes, Atotech

3:15 pm Troubleshooting Wet Processes
Russell Smith, Ciba Specialty Chemicals

4:00 pm Leading Edge Via Fill Techniques for Build-Up PWBs and IC Package Substrates
Stephen Pierce, SGP Ventures

4:30 pm IPC Reception

Friday, November 10, 2000

SESSION TWO: Processes and Materials (cont.)

9:00 am Laser Techniques for High Volume Microvia Formation
Sri Venkat, Coherent

9:45 am Blind Via Fill Plating Technology - What Can We Learn from New Wafer Fabrication Technologies?
Denis Morrissey, Shipley

10:30 am BREAK

10:45 am Micro Drilling Technology
Tamio Otani, Hitachi Via Mechanics

11:15 am HDI Substrates for BGA Attachment
Dieter Bergman, IPC

12:00 pm LUNCH

SESSION THREE: Testing and Reliability

Happy Holden, Westwood Associates, Session Chair

1:00 pm Characterization of Electrophoretic Photoresist for Superior Resolution in High Density Packaging
Patricia Goldman, PPG Industries; and Tim Schmitt, Compunetics

1:30 pm Dimension Controls of High Density Flex Circuits
Dominique Numakura, Parlex

2:00 pm Direct Laser Microvia Formation Using Three Micron Foil
T. Yamamoto, Mitsui Mining

2:30 pm An Update on HDI Standardization Efforts
Chris Jorgensen, IPC

2:45 pm ADJOURN

This educational forum is intended to provide a non-commercial view of technology. In support of this, IPC and its Board of Directors request that hospitality suites and other events of this nature not be held in conjunction with the conference or workshops.

REGISTRATION INFORMATION

The fee for any one-day workshop is $375 for IPC Members and $475 for nonmembers and includes all workshop materials, continental breakfast, refreshments and lunch. The two-day conference fee is $450 for IPC members and $550 for nonmembers and includes the conference proceedings, continental breakfast, refreshments, lunch on both days, and admission to the reception on November 9, 2000. A Super Package, which includes conference registration and one workshop is $650 for IPC members and $825 for nonmembers.

Advance registration is strongly recommended. Please fax to 847/509-9798 or mail the registration form below by November 3, 2000. A registration form can be printed from the IPC web site at www.ipc.org. For more information or if the registration deadline has passed, please contact the IPC registration department at 847/790-5361. For group discount information, contact John Riley at 847/790-5308.

LOCATION, TIMES AND HOTEL ACCOMMODATIONS

All events will take place at the Tampa Marriott Waterside Hotel, 700 South Florida Avenue, Tampa, FL. Workshops will take place on Wednesday, November 8, 2000, from 8:30am to 4:00pm, with on-site registration and sign-in beginning at 8:00am. The technical conference will be held on Thursday and Friday, November 9-10, 2000, with on-site registration and sign-in beginning at 8:00am on Thursday (see tentative agenda).

Sleeping rooms are available at the Marriott for the special IPC meeting rate of $145 (single/double) per night by calling the hotel at 888/268-1616 or 813/221-4900 for reservations. Rooms and rate are subject to availability after October 23, 2000.

CANCELLATION POLICY: Cancellations received before November 8, 2000 will be refunded in full. Refunds will not be issued after the start of the program. Individuals failing to cancel will be billed for the registration fee. If the workshops or conference are cancelled, registrants will receive a full refund. Substitutions are acceptable.

REGISTRATION FORM – IPC Fifth Annual National Conference and Workshops on HDIS, Tampa, FL – November 8-10, 2000

WORKSHOP REGISTRATION November 8, 2000

I am registering for a workshop only (choose one):

WORKSHOPS - $375 (MB) or $475 (NM)

___W-01 Challenges for HDI-Microvias
___W-02 High Density, Base Material Alternatives to FR-4
___W-03 Metalization of HDI Substrates and Microvias
___W-04 Laser Materials Processing

CONFERENCE REGISTRATION November 9-10, 2000

___Conference - $450 (MB) or $550 (NM)
I am registering for the conference only.

SUPER PACKAGE REGISTRATION November 8-10, 2000

___Conference and workshop - $650 (MB) or $825 (NM)
I am registering for the conference and workshop:___
(choose one workshop from list at left)

MY TOTAL COST is $ _____ Please check appropriate box: ❑ I am a member of IPC (MB) ❑ I am not a member (NM)

METHOD OF PAYMENT:

❑ Check enclosed and made payable to IPC
❑ Bill P.O. number_____ (IPC Members only)
❑ Charge my credit card (check one): ❑ Amex ❑ MasterCard ❑ Visa ❑ Diners Club

Cardholder Name: _____ Card Number: _____
Signature: _____ Expiration Date: _____
Billing Address: _____

PLEASE NOTE: Your credit card account will be debited for your registration fee. No receipt will be sent.

REGISTRANT'S NAME MAIL STOP/TITLE

COMPANY

MAILING ADDRESS CITY/STATE/ZIP

AREA CODE PHONE EXT. FAX

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FAX to: 847/509-9798 MAIL to: IPC, Dept. 77-3491, Chicago, IL 60678-3491 Code 300-30133/MTGTYP-2000

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