

## 2009 Course Registration

March  September

Name \_\_\_\_\_

Job Title \_\_\_\_\_

Company \_\_\_\_\_

Department \_\_\_\_\_

Mailing Address \_\_\_\_\_

Mail Stop \_\_\_\_\_

City \_\_\_\_\_

Postal Zip Code \_\_\_\_\_

State / Province \_\_\_\_\_

Country \_\_\_\_\_

Tel \_\_\_\_\_

Fax \_\_\_\_\_

Email \_\_\_\_\_

**Course Fee...** USD \$1,800

### Payment Method

check

bank transfer

MasterCard  Visa  American Express

Account # \_\_\_\_\_

Expiration Date \_\_\_\_\_

Cardholder's Signature \_\_\_\_\_

PRINT Cardholder's Name \_\_\_\_\_

Mail or Fax registration to...

**Accelerated Analysis**  
**PMB Q-310**  
**80 N Cabrillo Highway**  
**Half Moon Bay, CA 94019**  
Tel: (1) 650 867-8443  
Fax: (1) 408 241-0547

Accelerated Analysis reserves the right to cancel this seminar due to unforeseen/unavoidable circumstances. In the event of cancellation we will not be responsible for any charges incurred by the registrant due to cancellation of the course, other than the course fee.

## Course Content

### Basic Reliability Concepts

Early, Intrinsic, Wearout Failure  
Freak Distributions  
Stress and Acceleration Factors

### Failure Analysis Procedures

Introduction: Terms and Concepts  
Problem Characterization  
Problem Solving  
Traps and Pitfalls

### Yield and Defect Mechanisms

Latchup, EOS, ESD  
Layout Sensitivities  
Process Induced Charges  
Ionic Charge  
Masking and Etch Issues  
Electrolytic Corrosion

### Electrical Fault Isolation

Semiconductor Parametrics (Test Structures)  
Test Binning, Loop on Problem Vectors  
IDD / IDDQ  
Shmoo Plots  
Curve Tracer Testing

### Physical Fault Localization

SQUID Microscopy  
Optical Microscopy  
Mechanical Probing  
Nanoprobng  
Liquid Crystal Hot Spot Detection  
Fluorescent Microthermal Imaging  
SEM: Basic, Voltage Contrast, EBIC, RBI, CIVA  
Emission Microscopy, IR Thermography  
Laser Stimulation Techniques

### Sample Preparation Techniques

Cross Section / Parallel Polish  
Selected Area Polishing  
Backside Polish (for emission, etc.)  
Chemical Etching / Deprocessing  
Focused Ion Beam (FIB)  
Plasma Etch / RIE  
Laser Ablation

### Analytical Techniques

EDS, Auger, SIMS, ELLS, XPS  
FTIR, Raman  
STM, SPM

### Equipment

In-house / Off-site  
User / Foundry

## Course Description

Semiconductor failure analysis has changed dramatically in the last five years. New technology and higher complexity have challenged traditional methods beyond their limits. New diagnostic tools are expensive and cannot do the job alone.

Causes of failure can begin in design, fabrication, package assembly, board assembly or in the field. The fact that different people and companies may be associated with each aspect complicates matters further. The prime responsibility for failure analysis typically falls on the end user or the semiconductor manufacturer, but contributions from other involved parties are critical.

This seminar addresses failure analysis as it is today. Failure analysis is still the most economical way to understand yield and reliability problems and to identify their causes. Failure analysis steps beyond the results of statistical tools and parametric testing. This comprehensive seminar shows how to attack problems from any origin. Characteristics of failure mechanisms are well explained in the updated text, *Wafer Failure Analysis for Yield Enhancement*. The course addresses all failure sources from design to field application. Unlike other failure analysis courses, this course describes problems from the symptoms they present, not from abstract physics and theory.

This 4 day course (32 contact hours) is designed to give engineers and technicians a comprehensive overview of manufacturing defects and failure mechanisms. Powerful fault location tools are introduced to provide the understanding required for their effective application. Traditional failure analysis techniques, still essential to proceed from symptom diagnosis to conclusion and corrective action, are explained in detail. Case studies illustrate practical techniques for solving real problems. We give the background needed to effectively monitor and support outside services or to perform the analysis "hands on." The seminar is presented by instructors who are experienced in analysis of semiconductor problems. Participants are encouraged to present real problems for discussion.

### Who Should Attend

Anyone working to solve reliability or yield problems in semiconductor products will find this course valuable. Participants will gain insight needed to solve problems more quickly.

Foundry users, designers, and assembly personnel will benefit from understanding failure mechanisms and the failure analysis process.

Failure analysts will gain perspective as well as an understanding of specific powerful techniques.

Effective analysis depends on addressing the right questions. In today's complex environment of shared problems, accurate observations from various places in the manufacturing chain make a tremendous difference. This course will benefit companies and people having a role in the problem solving process.

## Course Instructors / Authors.

### DAVID BURGESS, owner, Accelerated Analysis

Dave Burgess is the principal instructor for this course. He has worked in failure analysis since earning BEE and MSEE degrees from Rensselaer Polytechnic Institute and San Jose State University respectively. As the Hewlett-Packard corporate reliability physicist for nearly 15 years, he was responsible for training and development of company wide failure analysis capability.

He is co-author of *Wafer Failure Analysis for Yield Enhancement* published by Accelerated Analysis. His analysis tools are in worldwide use. He has authored papers and has served active roles at both ISTFA (International Symposium for Testing and Failure Analysis) and at IRPS (International Reliability Physics Symposium). He is a Senior Member of IEEE and past general chairman of IRPS. He is a charter member of EDFAS, the Electronic Device Failure Analysis Society.

### RICHARD A. BLANCHARD, Ph.D., Consultant

Dr. Blanchard is co-author of the course text, *Wafer Failure Analysis for Yield Enhancement*. He is a specialist in semiconductor devices, processing, and failure analysis. He gained experience at Fairchild, Supertex (co-founder), Siliconix, IXYS, and Failure Analysis Associates. He has taught at the university level and in industry.

He holds more than 200 U.S. patents, has written more than 20 articles, and co-authored 6 books. He is a member of IEEE, American Vacuum Society, Electrochemical Society, and IMAPS.

## Course Location & Hours

Participants should report to the seminar site by 8 am on Monday. Classes will run from 8:30 am to no later than 5 pm daily. Details & maps will be sent when registration is confirmed.

### Why Orlando, Florida...

Orlando has many attractions. Consider bringing the family.

### Why Glasgow, Scotland...

Glasgow, Scotland is easily reached from many European and USA cities direct to the International Airport in Glasgow. The taxi to Glasgow City Center will take about 20 minutes.

By train, two main stations serve Glasgow. The Queen Street Station is adjacent to George Square, the city center; Central Station is a short taxi ride away.

The Visitor Information Bureau is located at George Square.

After class there is much to see and do. Many excellent restaurants are within a short walk; others can be reached by subway or taxi. Glasgow was named the 1990 European City of Culture. Nearby are the world famous Burrell Collection, Kelvingrove Museum, Paisley Museum, Charles Rennie Mackintosh architecture, Glasgow School of Art, and the Royal Concert Hall.

# 2009 Engineering Training Course

## Failure Analysis for Yield Enhancement

Orlando, FL

March 9-12

Glasgow, Scotland

September 14-17

### Failure & Yield Analysis Tools and Supplies directly available from Accelerated Analysis

Accelerated Analysis' liquid crystal solutions are designed specifically for and preferred by analysts for hot spot detection.

GREEN™ wet nitride etch is a safe, easy to use alternative to expensive plasma etching for nitride passivation removal.

FMI Solution is a ready to use Europium III solution for Stabilized Fluorescence Micro-thermal Imaging.

Manual cross section and parallel polishing fixtures use sample mounts compatible with state of the art FESEMs.

Comparative shopping will show Accelerated Analysis is an economical source for diamond, alumina, and SiC grinding and lapping films.

See [www.AcceleratedAnalysis.com](http://www.AcceleratedAnalysis.com) for further details or specific technical assistance.

## Accelerated Analysis

[www.AcceleratedAnalysis.com](http://www.AcceleratedAnalysis.com)



### Failure Analysis Seminar 2009 Schedule

March 9-12                      Orlando, Florida  
September 14-17            Glasgow, Scotland

[davidburgess@AcceleratedAnalysis.com](mailto:davidburgess@AcceleratedAnalysis.com)  
(650) 867-8443

presented by Accelerated Analysis

Tel: (1) 650 867-8443

Fax: (1) 408 241-0547

<http://www.acceleratedanalysis.com>

in Scotland, in association with Silicon Glen Technology Ltd

Tel: +44 01698 307070

Fax: +44 01698 327979

<http://www.sgtsiliconglen.com>