



**THE 24th INTERNATIONAL SYMPOSIUM  
ON SEMICONDUCTOR MANUFACTURING**  
December 12-13, 2016 (in conjunction with SEMICON Japan 2016)  
KFC Hall, Ryogoku, Tokyo, Japan  
**CALL FOR PAPERS**

**<EXTENDED> ABSTRACT DEADLINE: Friday, September 23, 2016 <PDT 8:00 AM>**

Since its start in 1992 in Japan, ISSM has been providing unique opportunities to share semiconductor manufacturing technology "best practices" for the benefit of professionals worldwide. The symposium had been held in Japan and U.S. alternately until 2010, then, with partnership of TSIA and e-Manufacturing & Design Collaboration Symposium (eMDC), ISSM has been placed in Japan and Taiwan since 2011 up to now.

The symposium has been contributing the semiconductor value chain by inspiring breakthrough trends of semiconductor manufacturing technologies through proactive discussion among professionals gathered from all over the world. The global semiconductor industry is facing with a giant wave of consolidation from management views. The advance technology development based on Moore's Law has been diversified responding to the birth of emerging quick-to-market applications. The semiconductor devices are evolving to keep pace with system requirements such as automatic driving, medical appliances, IoT, big data, artificial intelligence, "smart" infrastructure.

This trend changes drastically the way semiconductor devices are designed, manufactured, packaged, measured, and tested. The semiconductor industry is expected to provide the solutions to meet the demands from new requirements such as 3-dimensions architecture, IoT devices, new device physical structure, emerging materials, and evolutionary packaging architectures and to ensure higher reliabilities. For legacy fab such as 6 and 8 inch wafer production lines, it is expected to install with new concept manufacturing.

ISSM continues to contribute to the growth of the semiconductor industry through its infrastructure for networking, discussion, and information sharing among the world's professionals. We invite you to share your professional experiences at the 24th annual International Symposium on Semiconductor Manufacturing.

#### Areas of Interest

Abstract will be accepted for each of following areas of interest. See reverse for further.

##### **Fab Management**

- \* Factory Design & Automated Material Handling (FD)
- \* Manufacturing Strategy and Operation Management (MS)
- \* Manufacturing Control and Execution (MC)
- \* Environment, Safety and Health (ES)

##### **Process Integration**

- \* Process and Material Optimization (PO)
- \* Yield Enhancement Methodology (YE)
- \* Contamination Control and Ultraclean Technology (UC)
- \* Process Control and Monitoring (PC)
- \* Process and Metrology Equipment (PE)
- \* Design for Manufacturing (DM)

##### **Final Manufacturing**

- \* Final Manufacturing (FM)
  - Printed Electronics
  - 3DIC / Modules

#### ISSM Best Papers for IEEE/TSM

Best papers for ISSM will have the chance to submit full papers for IEEE/TSM (Transactions on Semiconductor Manufacturing) which is published quarterly for worldwide distribution. About ten papers are annually selected and reported in ISSM/TSM special session.

#### ISSM Awards

The following ISSM Awards to be presented to the excellent papers;

- ISSM 2016 Best Paper Awards
- ISSM 2016 Best of the Best Paper Award
- ISSM 2016 Student Paper Awards

For detail, please see ISSM website.

#### Highlighted Theme

Papers on the topics of special interests will be rearranged and will be programmed as a special session for highlight themes. Papers on the following topics are especially welcome. See information on the reverse side.

##### **High reliability device process technology for automotive and medical applications**

- Technology for an effective screening.
- Technology for an Outlier screening.
- Rapid failure analysis for an incident.

##### **IoT and Big Data Solution**

- Big Data Application
- Big Data and Sensing Technology
- Big Data and Artificial Intelligence

##### **3D-Architecture and Modules**

- Technology for Wafer on Wafer
- Technology for FOWLP (Fan Out Wafer Level Package)
- Technology for Camera Module
- Technology for MEMS and Sensors
- Technology for WiFi and Bluetooth modules

##### **Power Devices**

- Performance Improvement Technology
- Break-through Technology
- SiC Manufacturing Technology

##### **Production Innovation in 200-mm Fabs**

- Optimization of legacy fab
- Fab management and utilization of 200mm fab

##### **<Extended>**

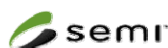
Abstract Submission Due: **Fri., Sep. 23, 2016**

Notification of Paper Acceptance: **Thu. Oct. 13, 2016**

#### e-Manufacturing & Design Collaboration

ISSM 2016 addresses the approach from design perspective to manufacturing through our collaboration

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## Details for the highlight Theme

### **High reliability device process technology for automotive and medical applications**

Semiconductor industry considers automotive and medical devices as growing markets. These markets require superior reliability, which makes improving device reliability essential.

Semiconductor manufacturing technology for highly reliable devices shall be the key to revive semiconductor industry. ISSM would like to share the cases of process and testing technology and discuss how to achieve the goal for highly reliable devices.

#### **Topics may includes :**

- Technology for an effective screening.
- Technology for an Outlier screening.
- Rapid failure analysis for an incident.

### **IoT and Big Data Solution**

IoT, "Big Data", Industry 4.0 have been studied in various industries recently. The semiconductor fabs have been recognized as one of the most heavily instrumented factories among the entire industries. Because of its heavily dependence on highly advanced control technologies, there have been huge research and development done on utilizing "big data" collected from equipment and sensors through local area network. Semiconductor industry spearheads other industries in "big data" and Industry 4.0. ISSM 2016 will features "big data" as one of the highlighted keywords and reviews its application and solutions in semiconductor manufacturing. The unique concept of combining "big data", artificial intelligence, and machine learning for semiconductor manufacturing will be discussed. The highlighted session provides perfect understandings about "big data" to not only semiconductor industries, but also to other industries.

#### **Topics may includes :**

- Big Data Application
- Big Data and Sensing Technology
- Big Data and Artificial Intelligence

### **3D-Architecture and Modules**

#### **Topics may includes :**

- Technology for Wafer on Wafer
- Technology for FOWLP (Fan Out Wafer Level Package)
- Technology for Camera Module
- Technology for MEMS and Sensors
- Technology for WiFi and Bluetooth modules

### **Power Devices**

Power devices covers manufacturing technologies related to rectifier diode, power MOSFET, IGBT(Insulated Gate Bipolar Transistor), thyristor, GTO(Gate Turn-Off thyristor) and triac.

#### **Topics may includes :**

- Performance Improvement Technology.
- Large current capacity, Response time, Miniaturization, Low power dissipation, Energy saving, Lower calorific value, Low gate control electric power, High ruggedness, etc.
- Break-through Technology
- IEGT(Injection Enhanced Gate Transistor), Super junction, Floating Island MOS, Vacuum micro emitter(VME), Wide band-gap semiconductor, etc.
- SiC Manufacturing Technology
- Large diameter SiC single-crystal, Monocrystalline SiC bulk crystal growth, High quality epitaxial growth, Micropipe defect, Low - angle grain boundary, etc.

### **Production Innovation in 200-mm Fabs**

As a production platform for emerging IoT devices, an effective usage of 200 mm facilities has been paid attention. To strengthen device competitiveness, it is essential to pursue economics in 200 mm fabs and to boost productivity. Toward efficient fabs, many strategies and issues of capital equipment will be discussed, including effective usage of 200 mm fabs including usage of foundries, ideas for higher productivity with effective cost, usage of second-hand facilities.

#### **Topics may includes :**

- Directions and strategies for effective fab usage
- Methodologies, ideas, and case studies for higher productivity with cost effectiveness
- Directions and issues of capital investment, and re-use directions of second-hand equipment

## Details for the Areas of Interest

### **Fab Management**

#### **FD: Factory Design & Automated Material Handling**

This area focuses on fab design and its key enablers to meet the flexibility, extensibility, and scalability needs of a cost-effective leading-edge fab.

#### **MS: Manufacturing Strategy and Operation Management**

This area focuses on strategy and concepts for more functional fab, and its operation management to meet rapidly changing complex business requirements.

#### **MC: Manufacturing Control and Execution**

This area includes manufacturing execution and decision support systems, factory scheduling, control of equipment/materials handling systems and queue time management.

#### **ES: Environment, Safety and Health**

This area focuses on suppression of energy and materials consumption, recycling and reuse of materials from the standpoint of the environmental management in a semiconductor factory.

### **Process Integration**

#### **PO: Process and Material Optimization**

This area focuses on process and material optimization from the standpoint of high reliability, cost reduction and environment. The breakthrough technology to improve the productivity of legacy process is contained.

#### **YE: Yield Enhancement Methodology**

This area focuses on probe yield enhancement and its stabilization technology including inspection, analysis and reduction of defects and particles. Reports for the Zero-Defect process would be especially attractive.

#### **UC: Contamination Control and Ultraclean Technology**

This area focuses new technology on damage-less particle removal, contamination control of wafer backside and bevel, surface cleaning for new materials and fine structure. Energy saving cleaning and molecular level contamination control in advanced wafer fab will be included.

#### **PC: Process Control and Monitoring**

This area focuses on tighter process control for advanced production as well as mature fab, to achieve higher productivity, higher uptime, quality enhancement by advanced equipment control/advanced process control (AEC/APC), FDC, e-diagnostics and new sensors. This area also covers accuracy enhancement and smart process control using virtual metrology for advanced nanoscale device manufacturing, 3D profile/high aspect ratio structure control and excursion control for stable equipment operation.

#### **PE: Process and Metrology Equipment**

This area focuses on finer pattern delineation/control. The application of equipment control and engineering system will be highlighted.

#### **DM: Design for Manufacturing**

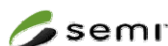
This area focuses in the collaboration between manufacturing and design including RET, OPC, systematic defects, and other approach to improve productivity from design.

### **Final Manufacturing**

#### **FM: Final Manufacturing**

This area focuses on the technologies for "3DIC such as Wafer on Wafer and chip on wafer", "FOWLP = Fan Out Wafer Level Package", "Modules such as Camera, WiFi, Bluetooth", "Sensors such as gyroscope and MEMS"

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