

Contents :

Front Matter

- Preface
- Symposium Organization
- Conference Committee
- Contributors

Invited and Overview Papers

Rapid Thermal Processing: How Well Is It Doing and Where Is It Going?

T. O. Sedgwick

Rapid Thermal Processing — A User's Perspective

R. T. Fulks

These papers review:

- Development of RTP technology
- Comparison with conventional furnace processing
- Industrial implementation
- Future directions in semiconductor manufacturing

Temperature Measurement and Process Control

Temperature Measurement and Control in a Rapid Thermal Processor

Topics covered:

- Optical pyrometry
- Thermocouple calibration
- Temperature uniformity
- Closed-loop control systems
- Wafer temperature monitoring
- Process reproducibility

Rapid Thermal Annealing of Silicon

Representative papers include studies of:

Dopant Incorporation of Boron Implanted Silicon During Rapid Thermal Annealing

Additional topics:

- Implant damage recovery

- Dopant activation
- Junction-depth control
- Arsenic, phosphorus, and boron activation
- Electrical characterization
- Diffusion suppression

Rapid Thermal Oxidation and Dielectrics

Papers discussing:

- Rapid thermal oxidation (RTO)
- Gate-oxide formation
- Thin oxide growth kinetics
- Oxide quality
- Oxide reliability
- Silicon surface preparation
- Nitridation processes

Silicides and Metallization

Research contributions on:

- Titanium silicide formation
- Cobalt silicide processing
- Tungsten silicide reactions
- Contact resistance reduction
- Self-aligned silicide technology
- Metallization processes
- Refractory metal interactions

Polysilicon Processing

Secondary Grain Growth During Rapid Thermal Annealing of Doped Polysilicon Films

Additional topics:

- Polysilicon recrystallization
- Grain growth mechanisms
- Film microstructure
- Sheet resistance reduction
- Device applications

Defects, Stress and Wafer Integrity

Slip Free Rapid Thermal Processing

Papers covering:

- Thermal stress

- Slip generation
- Wafer deformation
- Defect formation
- Crystal damage
- Process optimization

Compound Semiconductor Applications

Rapid Thermal Processing for High-Speed III-V Compound Devices

Topics include:

- Gallium arsenide (GaAs)
- Indium phosphide (InP)
- Implant activation
- Surface stability
- Compound semiconductor device fabrication
- High-speed electronic devices

Equipment and Reactor Design

Papers on:

- RTP reactor configurations
- Lamp-heated systems
- Single-wafer processing
- Chamber design
- Process automation
- Throughput considerations
- Manufacturing equipment

Manufacturing Applications

Research papers discussing:

- VLSI fabrication
- CMOS process integration
- Production-line implementation
- Yield enhancement
- Cost reduction
- Reliability studies
- Advanced semiconductor processing

Additional Technical Contributions

The remaining papers address:

- Rapid thermal chemical reactions
- Annealing kinetics

- Silicon defect engineering
- Surface cleaning processes
- Thin-film reactions
- Contact technology
- Advanced semiconductor materials
- Process modeling
- RTP equipment characterization
- Device-performance optimization

Back Matter

- Author Index
- Subject Index