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Advanced Etch Technology for Nanopatterning II

**Ying Zhang
Gottlieb S. Oehrlein
Qinghuang Lin**
Editors

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Introduction

During the last few decades of tremendous success of the semiconductor industry, plasma etch-based pattern transfer technology has played the key role, along with lithography technology, as the main enabling techniques behind the continuous growth of component density in integrated circuits defined by Moore's Law. Within the new era of mobile devices and other emerging applications, a new pace of a new generation every year instead of every two years has taken place. Semiconductor device shrinkage has shown a trend faster than the pace defined by the Moore's Law. With the delay of EUV Lithography for High Volume Manufacturing (HVM) and optical lithography technologies, such as 193 nm immersion lithography technology, having reached limits for single exposure patterning, a variety of multiple patterning technologies with mixtures of optical lithography and plasma etching, such as Double Patterning and Pitch-Splitting (DP/PS), or Self-aligned Spacer Double Patterning, has emerged. These are rapidly becoming the dominant approaches for 32nm, 22nm, and 14nm technology nodes. Alternative lithography technologies, such as Directed Self-Assembly (DSA), have also quickly attracted more attention and are being considered as possible alternatives for 10nm node and beyond. Pitch shrinking, resist mask layer thickness thinning, Line Edge Roughness (LER), Line Width Roughness (LWR) increasing mask stack complexity and mask material changes, emerging alternative lithographic approaches provide major challenges for plasma etch patterning.

This proceedings volume collects selected papers presented at the second Advanced Etch Technology for Nanopatterning Conference (AETNC II), held February 25-26th, 2013 as part of the SPIE Advanced Lithography Symposium 2013. There were 6 sessions in the AETNC II.

- Session 1: Litho and Plasma Etching Interaction
- Session 2: Plasma/Resist Interaction and LER
- Session 3: Plasma Etching for Advanced Technology Nodes
- Session 4: Memory Patterning
- Session 5: New Plasma Sources and New Etching Technologies
- Session 6: Emerging Patterning Technology

We would like to take this opportunity to thank all members of the SPIE 2013 Advanced Lithography Symposium Committee for their help in organizing another very successful SPIE Advanced Etch Technology for Nanopatterning Conference. The dedication, enthusiasm, and efforts of many volunteers, keynote speakers, invited speakers, and authors of contributed papers of AETNC II were essential for the success of the conference. We like to thank everyone, along with members and volunteers of the SPIE community for their support and efforts.

Ying Zhang
Gottlieb Oehrlein
Qinghuang Lin