Nanometer Patterning using ma-N 2400 Series DUV Negative Photoresist and Electron Beam Lithography

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Abstract

The continual rapid growth of the information and communication technologies demands the development of more sophisticated lithographic tools and the search for new high performance resist materials. Results of nanometer patterning by means of electron beam lithography using ma-N 2400 series photoresist are presented. The ma-N 2400 series is a DUV sensitive negative tone photoresist composed of a phenolic resin (novolak) as polymeric binder and a bisazide as photoactive compound (PAC) dissolved in safer solvents. This resist works without chemical amplification consequently its processing does not comprise any critical steps. The resist is developed in aqueous-alkaline developers. 80 nm patterns with excellent steep side walls are achieved. The resist offers good wet and plasma etch resistance.

Conclusions

• ma-N 2400 resist series is easily - no critical steps, a wide process latitude.
• The exposure doses range from 60 to 120 µC/cm².
• Developing times can be varied in a wide range without loss of pattern width and height.
• 80 nm are obtained at film thickness of 0.3 µm.
• Aspect ratio > 3.

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