Abstract Submitted
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Investigations of Wafer Scale Etching with Xenon Difluoride K.N. CHEN, N. HOIVIK, C.Y. (BLAKE) LIN, A. YOUNG, M. IEONG, G. SHAHIDI, IBM T. J. Watson Research Center, Yorktown Heights, NY 10598, USA — A good and uniform bulk silicon wafer etching method can be applied to the wafer thinning process in MEMS and 3D applications. In this study, the use of a Xenon Difluoride (XeF2) gas-phase etching system, operating at room temperature, has been investigated for bulk silicon wafer thinning. We investigated the Si-wafer surface morphology and profile following each XeF2 etching process cycle. Theoretical results are used to compare with the experimental results as well. A clean wafer surface by proper surface treatments is significant to achieve a uniform surface profile and morphology for XeF2 etching. A proper design of etching cycle with nitrogen ambient during etching is necessary to achieve the fastest and uniform silicon etching rate. The silicon etching rate is reported as a function of etching pressure, nitrogen pressure, and etching duration.

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