

Abstract Submitted
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Development of Nano-Contact Etch Process Using New Gas Chemistry. JONG-WOO SUN, CHUL-HO SHIN, GYUNG-JIN MIN, CHANG-JIN KANG, HANKU CHO, JOO-TAE MOON, Samsung Electronics Co., Ltd. — As device feature size shrinks to sub- $0.1\mu\text{m}$, oxide contact etching has become difficult to satisfy the process requirements. Especially, the aspect ratio of device has become higher and the mask thickness thinner. These trends require the ability to etch with high selectivity against mask and better profile control. In this paper, development of oxide contact etch process using new gas chemistry($\text{C}_x\text{F}_y\text{H}_z$) is investigated. It has already been proposed that the reactive gas mixture contain polymer and etchant gases. However, with current gas species, we have some limitations to meet process specification for next generation device. Compared to other common polymer former gases, it is found that our new additive gas has significant effect to increase selectivity against mask and to control feature profile. From the experiments, the selectivity of oxide over mask is enhanced up to 30% and it provides some potential possibility for profile control compared to other gases. These effects have also been analyzed by QMS (Quadrupole Mass Spectrometer).

Jong-Woo Sun
Samsung Electronics Co., Ltd.

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