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Figure Captions

Chapter 1

Fig. 1-1 The exaggerated thickness variation as a function of position on wafer for O₂ and N₂O-grown gate dielectrics.

Fig. 1-2 V_{FB} as a function of position on wafer for (a) O₂ and (b) N₂O-grown gate dielectrics with gate electrodes implanted and annealed as indicated. The thickness nonuniformity illustrated in Fig. 1-1 results in a large V_{FB} variation on those samples with substantial boron penetration.

Fig. 1-3 Nitrogen AES depth profiles of 8-nm-thick oxides nitrated at 950, 1050, and 1150°C for 60 s. The arrow indicates the position of the Si/SiO₂ interface. The nitrogen concentration increases monotonically as nitridation proceeds.

Fig. 1-4 Hydrogen SIMS depth profiles of 8-nm-thick oxide nitrated at 950 and 1150°C for 60 s. The arrow indicates the position of the Si/SiO₂ interface. The hydrogen concentration increases monotonically as nitridation proceeds.

Fig. 1-5 Nitrogen concentration near the Si-SiO₂ interface [N]_{int} versus nitridation time for oxides nitrated at 900, 950, 1050, and 1150°C. [N]_{int} increases monotonically as nitridation proceeds.

Fig. 1-6 Hydrogen concentration [H] versus nitridation time for oxides nitrated at 900, 950, 1050, and 1150°C. The dashed arrow and • in the figure indicate the effect of re-oxidation at 1150°C for 60 s following a nitridation at 950°C for 60 s.

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Chapter 2

Fig. 2-1 Experimental Flow.

Fig. 2-2 nMOSFET structure.

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