List of Tables

Table 2.1 Final oxide thicknesses and extracted enhancements for boron diffusivity during wet oxidation at various temperatures, with and without extended defects. D* is the default value for inert boron diffusivity in SUPREM-IV [7]. 11

Table 2.2 Defect parameters used for SUPREM-IV simulations. All parameters except B, B/A, and C_I^* at 900˚C are taken from Griffin et al. [23]. B and B/A are taken from SUPREM-IV [7], and C_I^* at 900˚C is obtained from this work. D_I is the interstitial diffusivity, C_I^* is the equilibrium interstitial concentration, K_S^I is the inert interstitial surface recombination velocity, D_V is the vacancy diffusivity, C_V^* is the equilibrium vacancy concentration, K_S^V is the inert vacancy surface recombination velocity, K_B is the bulk recombination coefficient, K_{rat} is a constant multiplier on K_S^I used for a growing interface, B/A is the Deal-Grove linear rate oxide growth coefficient, and B is the Deal-Grove parabolic rate oxide growth coefficient. 27

Table 2.3 Experimental matrix along with extracted time-averaged enhanced diffusivities. “Open” regions were exposed to the first silicon implant while “Mask” regions were masked from the first implant by a thick oxide. <D> is the time-averaged boron diffusivity, and D* is the default value for inert boron diffusivity in SUPREM-IV. [7] 41

Table 3.1 Experimental matrix along with extracted time-averaged enhanced diffusivities. All of the silicon implant conditions in this table generated complete surface amorphous layers. <D> is the time-averaged boron diffusivity, and D* is the default value for inert boron diffusivity in SUPREM-IV [7]. [1]The anneal condition for this sample was actually a 745˚C, 2 min. RTA. [2]The anneal condition for this sample was actually a 550˚C, 30 min. furnace anneal followed by a 750˚C, 30 min. furnace anneal. 56

Table 3.2 Experimental matrix along with extracted time-averaged enhanced diffusivities. All of the silicon implants in this table were done at an energy of 80 keV. From channeling RBS

measurements, the implants up to the $4x10^{14}$ cm^{-2} dose were below amorphization while $8x10^{14}$ cm^{-2} and $2X10^{15}$ cm^{-2} were above amorphization. <D> is the time-averaged boron diffusivity, and D* is the default value for inert boron diffusivity in SUPREM-IV [7] 56

Table 3.3 Scaling factors for extracted inert boron diffusivities in epitaxially grown silicon and FZ silicon. D^*_{epi} is the inert diffusivity in the epi material, D^*_{FZ} is the inert diffusivity in FZ material, and D^* is the default boron diffusivity in SUPREM-IV [7]. 75

Table 4.1 Common dopants in silicon along with their fractional interstitial components of diffusion. 85

Table 4.2 Parameter set used to simulate short-time IED. D_I is the interstitial diffusivity, C_I^* is the equilibrium interstitial concentration, K_S^I is the inert interstitial surface recombination velocity, D_V is the vacancy diffusivity, C_V^* is the equilibrium vacancy concentration, K_S^V is the inert vacancy surface recombination velocity, K_B is the bulk recombination coefficient. 101