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FIGURE CAPTIONS

CHAPTER 2

Fig.2-1 Schematically depicts the process flow of the HfO₂ flash memory cell structure.

Fig.2-2 I_{DS}-V_{GS} of the HfO₂ flash memory cell structure.

Fig.2-3 Program characteristics of HfO₂ memory device with different program conditions.

Fig.2-4 Erase characteristics of HfO₂ memory device with different erasing conditions.

Fig.2-5 Endurance characteristics of HfO₂ memory device.

Fig.2-6 Retention characteristics of HfO₂ memory devices at T=25 °C with different tunnel layer thickness.

Fig.2-7 Disturbance characteristics of memory cells

Fig.2-8 Drain disturbance characteristics of the HfO₂ memory cells.

Fig.2-9 Gate disturbance characteristics of the HfO₂ memory cells.

CHAPTER 3

Fig.3-1 Schematically depicts the process flow

Fig.3-2 I_{DS}-V_{GS} characteristics of HfO₂ nanocrystal memory device.

Fig.3-3 Program characteristics of HfO₂ nanocrystal memory device with different programming conditions.

Fig.3-4 Erase characteristics of HfO₂ nanocrystal memory device with different erasing conditions.

Fig.3-5 Endurance characteristics of HfO₂ nanocrystal memory device with different tunneling layer.

Fig.3-6 Retention characteristics of HfO₂ nanocrystal memory devices at T=25°C, 85°C and after 10000 cycles.

Fig.3-7 I_{DS}-V_{GS} curves of the two-bit memory in a cell; forward read and reverse read for programmed bit1 and programmed bit2.

Fig.3-8 Drain disturbance characteristics of the HfO₂ nanocrystal memory cells.

Fig.3-9 Gate disturbance characteristics of the HfO₂ nanocrystal memory cells.

Fig.3-10 Read disturbance characteristics of the HfO₂ nanocrystal memory cells.

CHAPTER 4

Fig.4-1 Band to Band Hot carriers and Channel Hot carriers injections

Fig.4-2 Schematically depicts the process flow of the proposed flash memory.

Fig.4-3 I_{DS} - V_{GS} characteristic of P-Channel HfO_2 nanocrystal memory device.

Fig.4-4 Program characteristics of HfO_2 nanocrystal memory device with different programming conditions.

Fig.4-5 Erase characteristics of HfO_2 nanocrystal memory device with different erasing conditions.

Fig.4-6 Retention characteristics of HfO_2 nanocrystal memory devices at $T=25^\circ C$

Fig.4-7 Drain disturbance characteristics of the HfO_2 nanocrystal memory cells.

Fig.4-8 Gate disturbance characteristics of the HfO_2 nanocrystal memory cells.