Supporting Information:

Title: **Flash memory based on solution processed hafnium dioxide charge trapping layer**

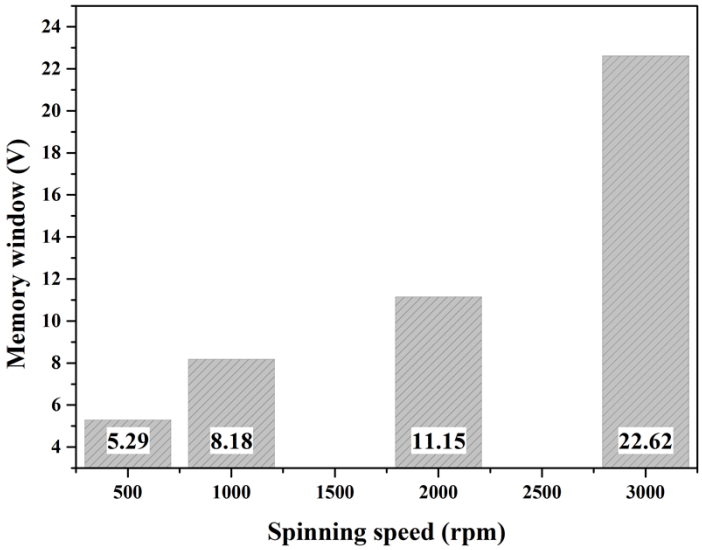

Fig. S1. Memory window of devices with HfO_2 layer spin-coated at various spinning speed of 500, 1000, 2000 and 3000 rpm for 30 s, respectively.

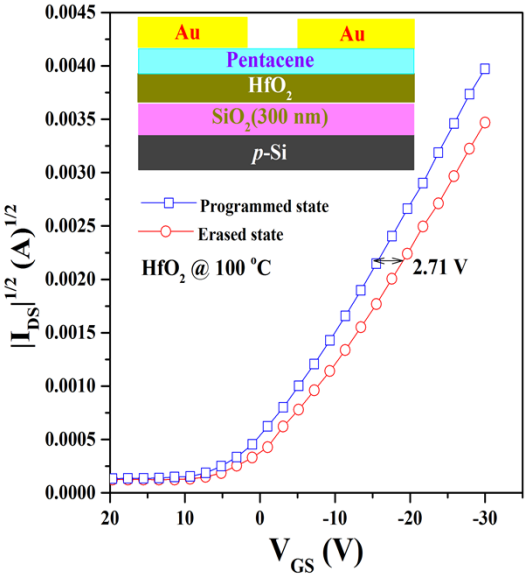

Fig. S2. Transfer characteristics of memory devices with HfO_2 spin-coated at 3000 rpm and annealed at 100 °C on Si wafer with 300 nm SiO_2 and the program and erase voltages are +60 V and -60 V for 5 s, respectively.

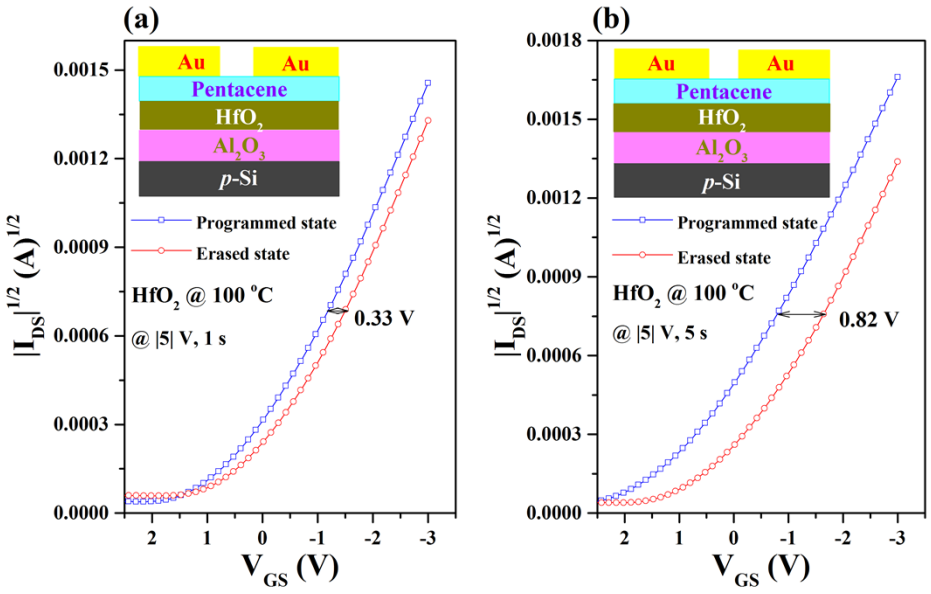

Fig. S3. Transfer characteristics of memory devices with HfO_2 spin-coated at 3000 rpm and annealed at 100 °C on Si wafer with 25 nm Al_2O_3 and the program and erase voltages are +5 V and -5 V for 1 s (a) and (b) 5 s, respectively.

Table S1. Comparison of charge retention performance of devices with HfO_2 prepared by solution process and deposition method.

References	Remained memory window percentage after 10^4 s	HfO_2 preparation method
Our study	57.5 %	Sol-gel and spin-coating
Thin Solid Films, 2010, 518, 6460-6464.	53.3 %~ 84.9 %	Atomic layer deposition
Semiconductor Science and Technology, 2007, 22, 884-889.	57.1 %	Atomic layer deposition

Table S2. Comparison of operation voltage of devices with solution processed HfO_2 on SiO_2 and other polymer charge trapping elements.

References	Operation voltage	Memory window
Our study (control layer, SiO_2)	+70/-70 V	29.85 V
	+80/-80 V	32.32 V
Advanced Functional Materials, 2008, 18, 3678-3685	+70/-70 V	25~30 V
Applied Physics Letters, 2010, 96, 033302.	+80/-80 V	~ 34 V