**Dual functions of V/SiO*x*/AlO*y*/p++Si device as selector and memory**

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To analyze the SiO*x* and AlO*y* films deposited in our laboratory. X-ray photoelectron spectroscopy (XPS) analysis was performed by using a Thermo VG ESCA Sigma Probe spectrometer operated at 15 kV and 100 W with a monochromatric Al-Ka radiation source. The calibration of the binding-energy scale was set by fixing the C 1s at 284.5 eV.



Figure S1 XPS spectra of SiO*x* film: Si 2p (a) and O 1s (b) and AlO*y* film: Al 2p (c) and O 1s (d).



Figure S2 Negative forming of V/SiO*x*/AlO*y*/p++-Si device.