

Resistive Switching in TaN/AlN_x/TiN Cell

Authors : Hsin-Ping Huang, Shyankay Jou

Abstract : Resistive switching of aluminum nitride (AlN_x) thin film was demonstrated in a TaN/AlN_x/TiN memory cell that was prepared by sputter deposition techniques. The memory cell showed bipolar switching of resistance between +3.5 V and -3.5 V. The resistance ratio of high resistance state (HRS) to low resistance state (HRS), RHRS/RLRS, was about 2 over 100 cycles of endurance test. Both the LRS and HRS of the memory cell exhibited ohmic conduction at low voltages and Poole-Frenkel emission at high voltages. The electrical conduction in the TaN/AlN_x/TiN memory cell was possibly attributed to the interactions between charges and defects in the AlN_x film.

Keywords : aluminum nitride, nonvolatile memory, resistive switching, thin films

Conference Title : ICNN 2014 : International Conference on Nanotechnology and Nanomedicine

Conference Location : Prague, Czechia

Conference Dates : July 10-11, 2014