

## Resistive Switching in TaN/AlN<sub>x</sub>/TiN Cell

**Authors :** Hsin-Ping Huang, Shyankay Jou

**Abstract :** Resistive switching of aluminum nitride (AlN<sub>x</sub>) thin film was demonstrated in a TaN/AlN<sub>x</sub>/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 (LRS), 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<sub>x</sub>/TiN memory cell was possibly attributed to the interactions between charges and defects in the AlN<sub>x</sub> film.

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

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