

Exceptional High Temperature Retention in $\text{Al}_{0.93}\text{B}_{0.07}\text{N}$ Films

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This paper reports the retention behavior for $\text{Al}_{0.93}\text{B}_{0.07}\text{N}$ thin films, a member of the novel family of wurtzite ferroelectrics. Our experiments suggest that bipolar cycling of metal (Pt/W)/ $\text{Al}_{0.93}\text{B}_{0.07}\text{N}$ /W/ Al_2O_3 film stacks first induced wake-up and then a region of constant switchable polarization. The films showed excellent retention of the stored polarization state. As expected, data retention was slightly inferior in the opposite state (OS) measurements. However, it is noted that even after 3.6×10^6 s (1000 h) at 200 degrees C, the OS signal margin still exceeded 200 $\mu\text{C}/\text{cm}^2$. The predicted OS retention is 82% after 10 yr. baking at 200 degrees C.