



The high resistance state (HRS) and low resistance state (LRS) of 1000 cycles in WO_3/ZnO , $WO_x/WO_3/ZnO$, and $WO_x/WO_3/ZnO/AlN$ ReRAM. With the WO_x layer, the ReRAM endurance can extend to 10^4 cycles. The AlN film stabilizes the HRS and increase the resistance ratio.