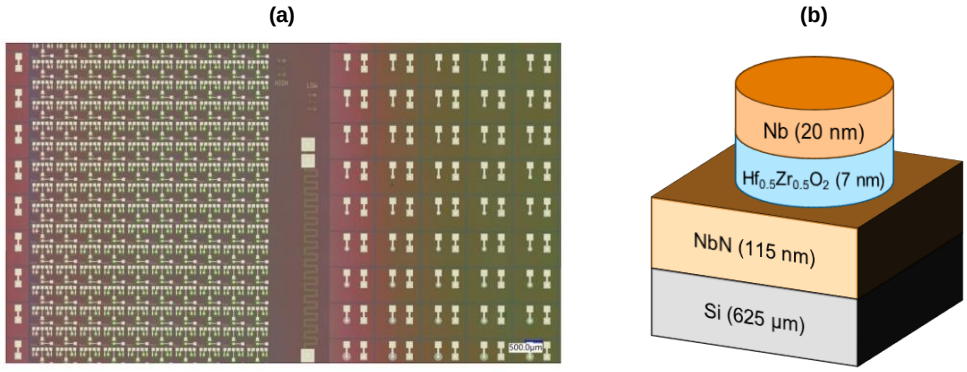

Figure 1. (a) Optical image of fabricated Nb/ $Hf_{0.5}Zr_{0.5}O_2$/ NbN FTJs with top Nb and HZO patterned to realize isolated MFM capacitors with diameters varied from 74 µm to 117 µm. (b) Cross sectional schematic highlighting the thickness of individual FTJ layers.

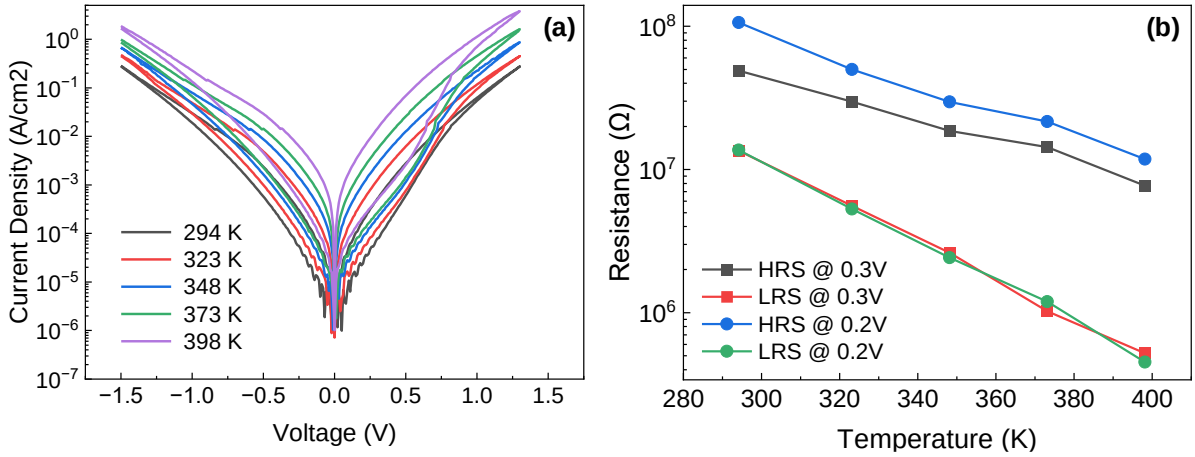

Figure 2. (a) Current density of a 100 µm diameter (7,854 μm^2 area) Nb/ $Hf_{0.5}Zr_{0.5}O_2$/ NbN FTJ per chuck temperature with drive voltage swept from -1.5V to 1.3V. (b) High resistance state (HRS) and low resistance state (LRS) resistances for the same device read at 0.2 V and 0.3 V from 294K to 398K. Of note is a negative linear trend with temperature on a semi-log plot, alluding that conduction in HZO FTJs is exponentially

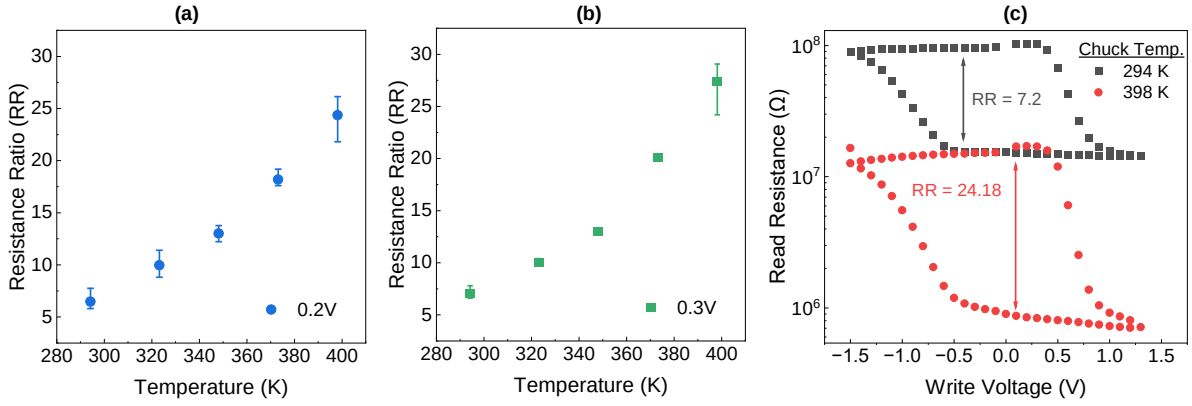

Figure 3. Average and outlier resistance ratios (RRs) across temperature for 74, 86, 100, and 117 µm diameter HZO FTJs, calculated at (a) 0.2V and (b) 0.3V. (c) Pulsed hysteresis measurement for a 7,697 μm^2 area device at 294 K and 398 K. Device resistance is read at 0.2V and a pulse width of 100ms, following a write pulse progressing from -1.5V to 1.3V and back with 100mV step and 100ms pulse width.