

Fig. 1. (a) Schematics of the super-cycle approach in ALD and MLD processes. TDMA-Hf and H₂O were used for the ALD process, while TDMA-Hf and ethylene glycol (EG) were used for the MLD process. (b) Batch variations of 15% carbon-doped HfO_x memristors. Across 5 batches, the devices consistently exhibit reproducible born-ON operation, maintaining consistent low resistance state (LRS).

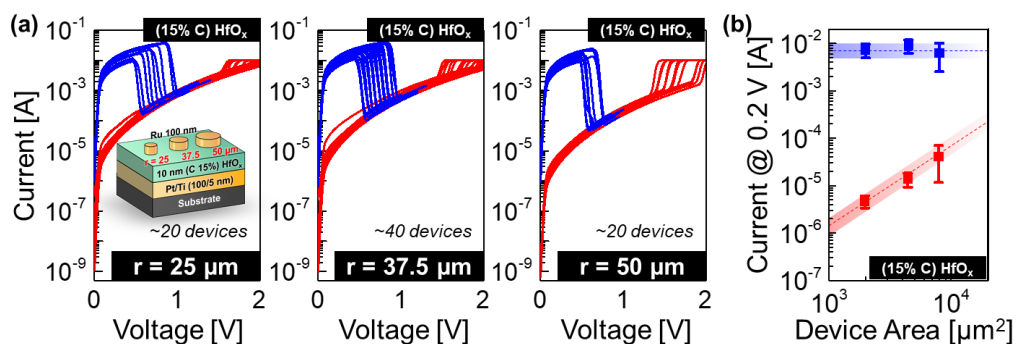


Fig. 2. (a) Device variations of 15% carbon-doped HfO_x memristors with various device-areas. Reasonable device-to-device variations were demonstrated with the 15% carbon-doped HfO_x memristor. (b) Device area dependent ON and OFF current characteristics.