Electronic Supplementary Material (ESI) for Materials Horizons.

Supporting Information

Ambipolar Operation of Progressively Designed Symmetric Bidirectional Transistors Fabricated Using Single-channel Vertical Transistor and Electrochemically Prepared Copper Oxide

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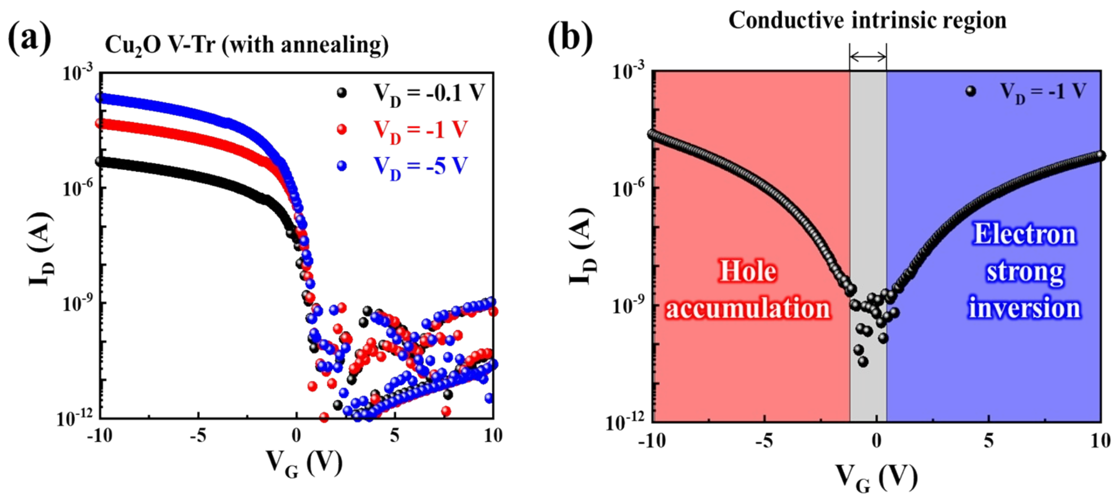

Figure S1. Electrical performances of vertical transistor device fabricated using high-conductivity *p*-type Cu_2O channel. Transfer curves for (a) annealed and (b) annealed and OPT-treated transistors.

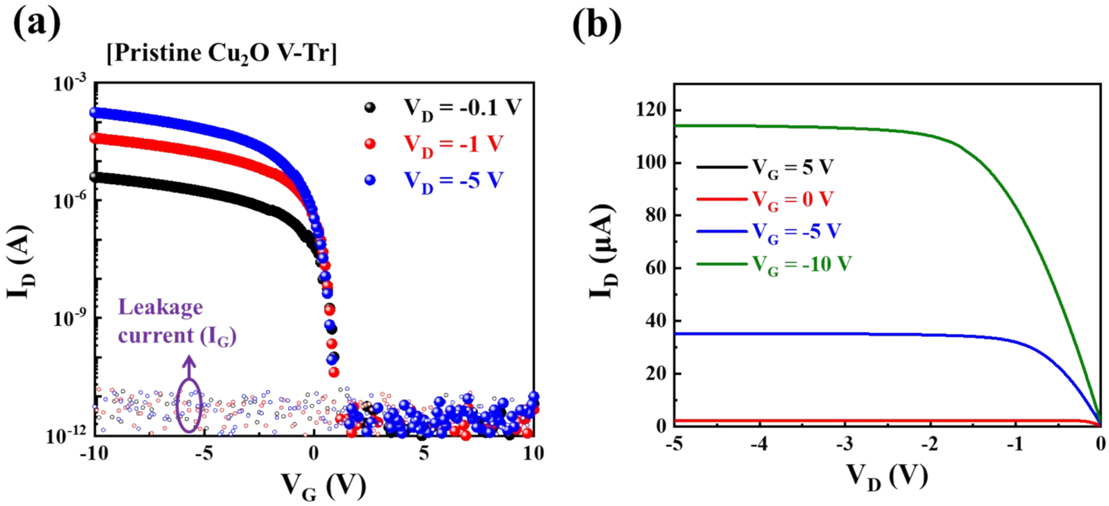

Figure S2. Electrical performances of OPT-free vertical *p*-type Cu_2O transistor exhibiting unipolar characteristics: (a) Transfer and (b) Output curves.

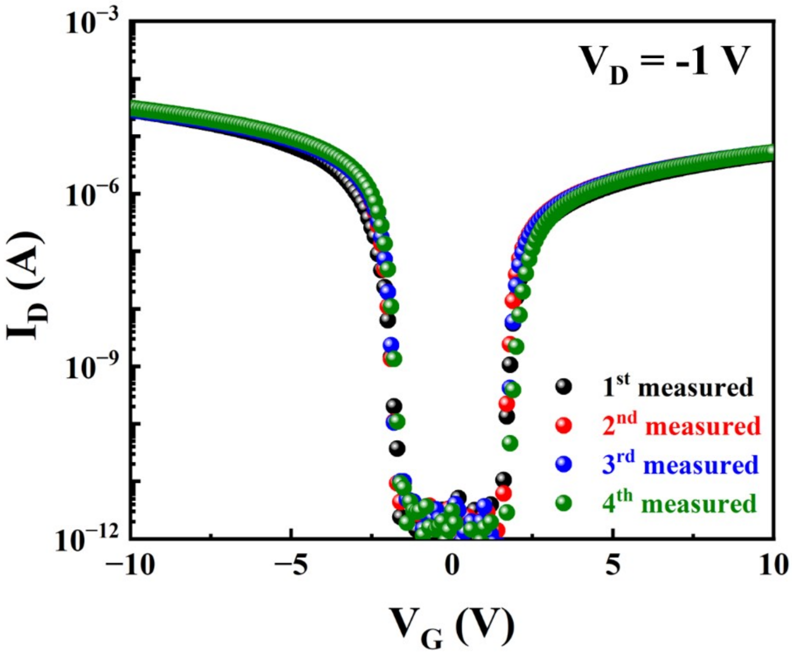

Figure S3. Repeated measurements used to build the transfer curve for the same SBT device.

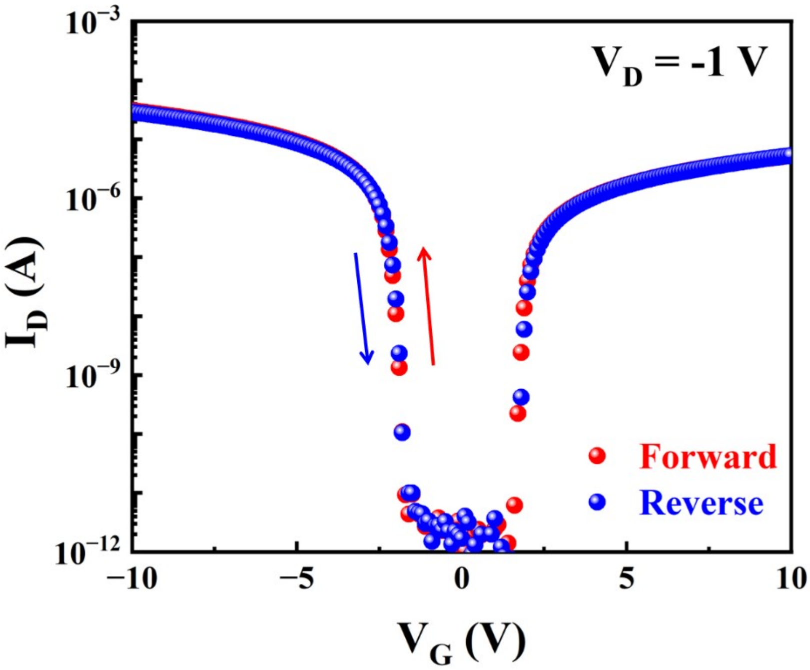

Figure S4. Hysteresis curve of an SBT device (500 nm thick Cu_2O layer) at $V_D = -1$ V.

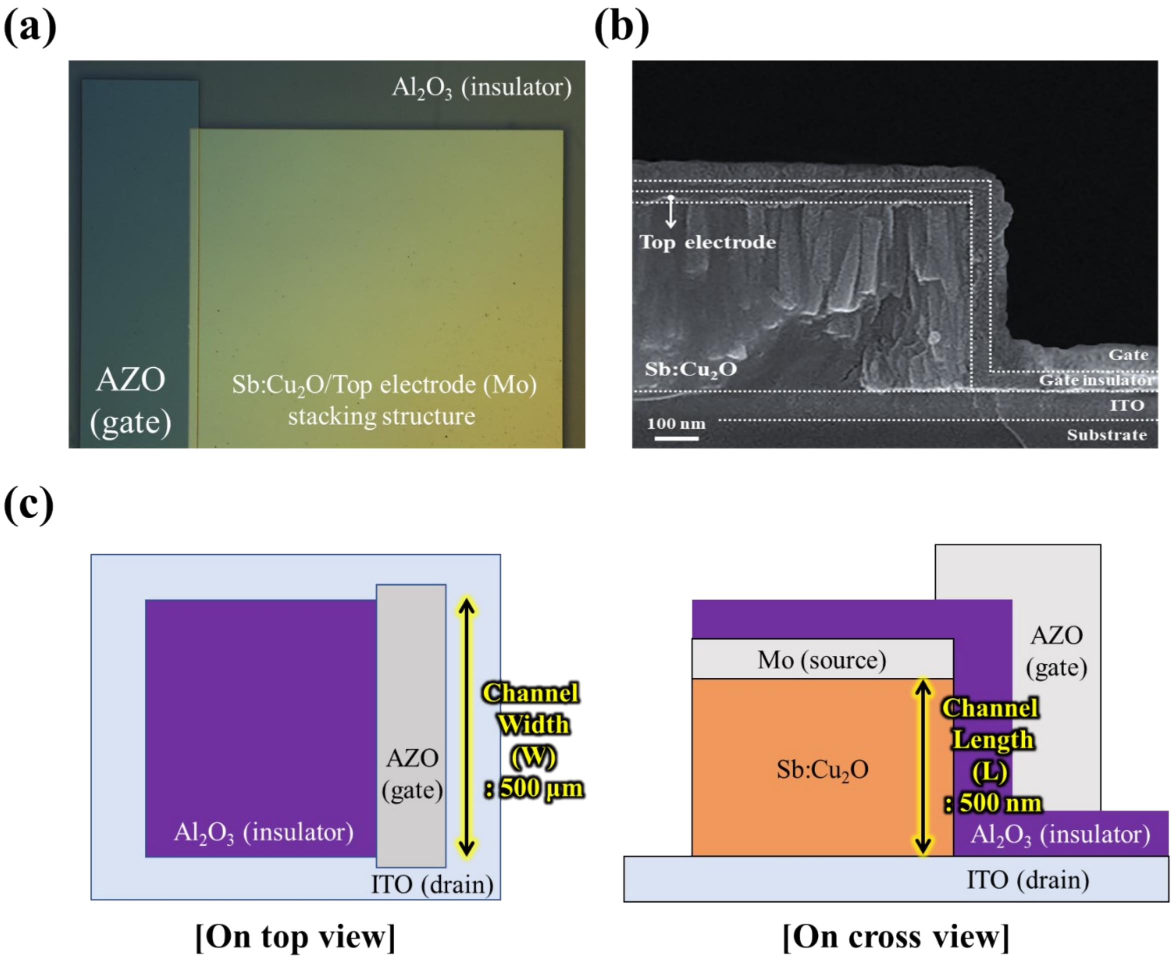

Figure S5. Structure and dimension of an SBT device: (a) optical micrograph, (b) cross-sectional SEM image, and (c) schematic of an SBT device including dimensions.

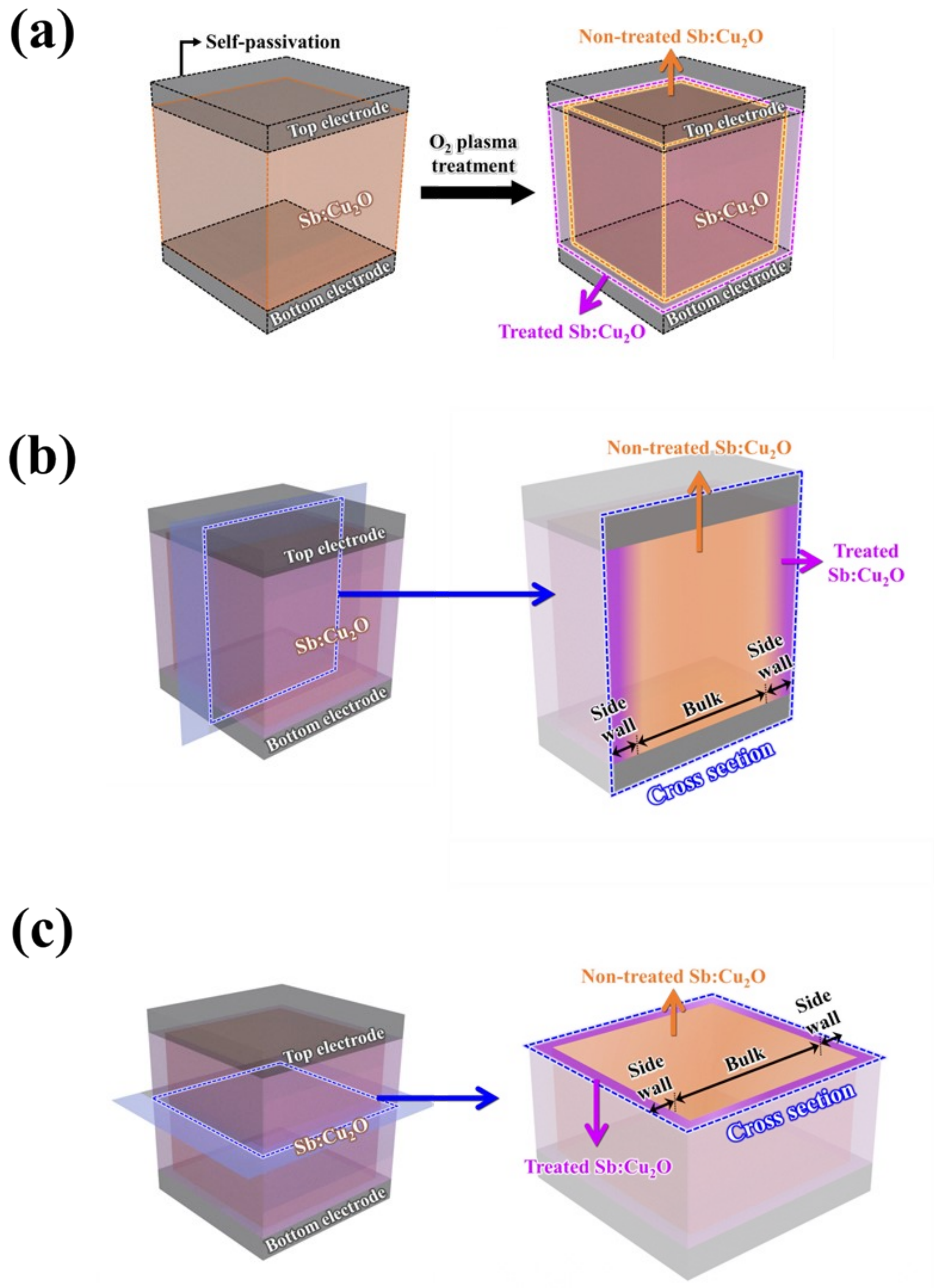

Figure S6. Schematic of a Cu_2O active layer used to evaluate the effect of O_2 plasma treatment (a) Cu_2O active layer before and after treatment. Non-treated and O_2-plasma-treated regions along the (b) vertical and (c) horizontal directions. The non-treated and treated regions are shown in orange and purple, respectively.