

Sub-60 mV/decade switching in ion-gel-gated In-Sn-O transistors with a nano-thick charge trapping layer

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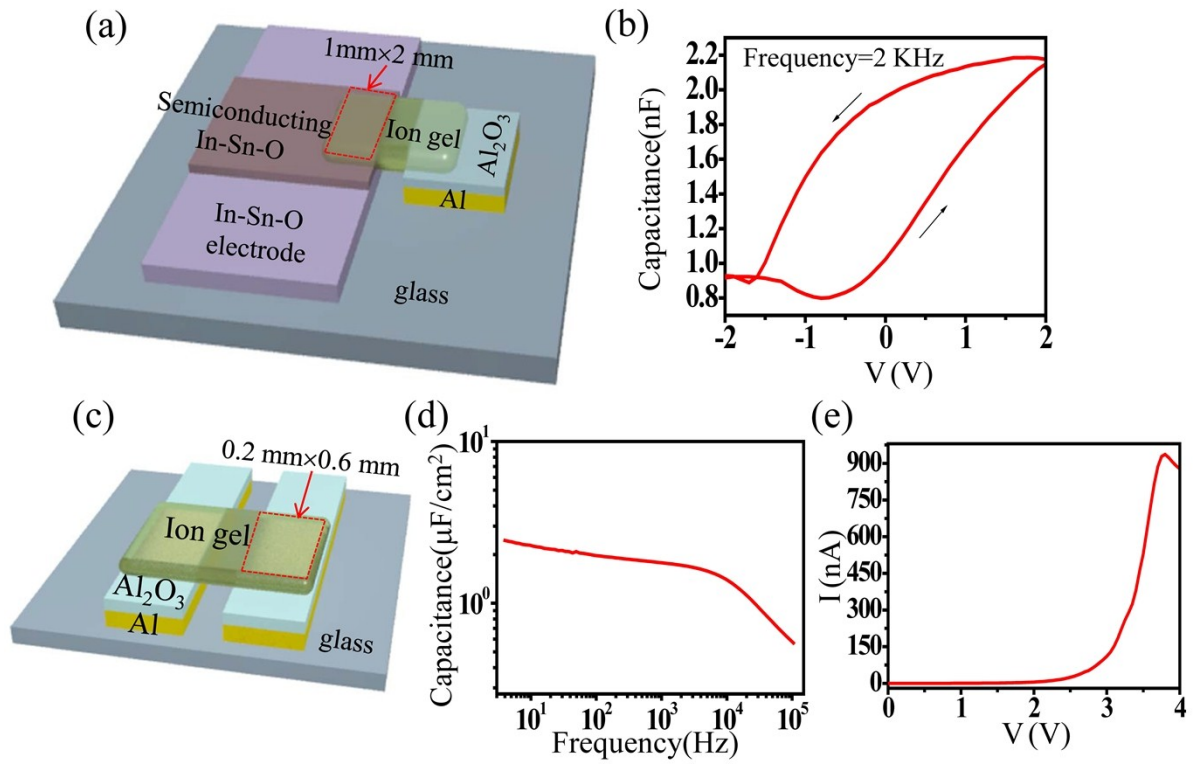


Figure S1. The dielectric properties of the stacking layer of naturally oxidized Al₂O₃ and an ion gel. (a) A schematic image of device structure for C-V measurement. The semiconducting In-Sn-O was prepared by using RF sputtering with a Ar/O₂ flow rate of 46 sccm / 4 sccm. (b) The C-V curve of the stacking dielectric. (c) A schematic image of device structure for C-F and breakdown measurements. (d) The C-F curve of the stacking dielectric. (e) The I-V curve of the stacking dielectric.

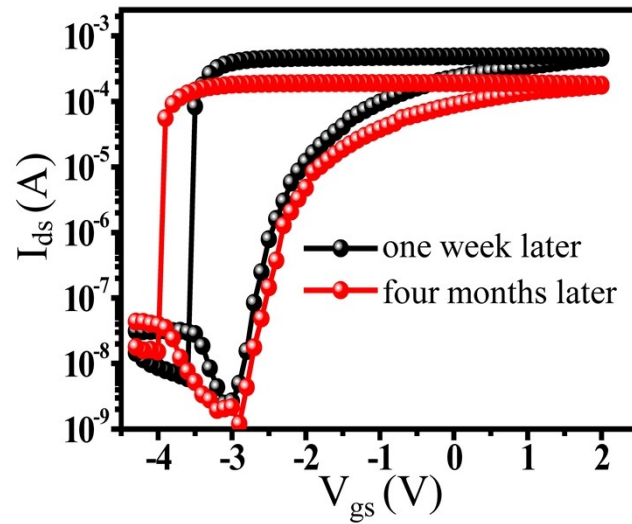


Figure S2. The transfer characteristics of Al gate device was measured when the device was placed in air for 1 week and 4 months, respectively.

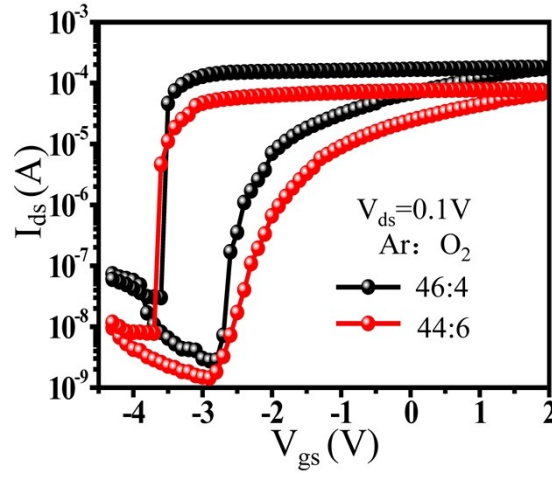


Figure S3. Transfer characteristics curves of In-Sn-O FETs by changing the Ar/O₂ flow rate and a V_{ds} is fixed at 0.1 V

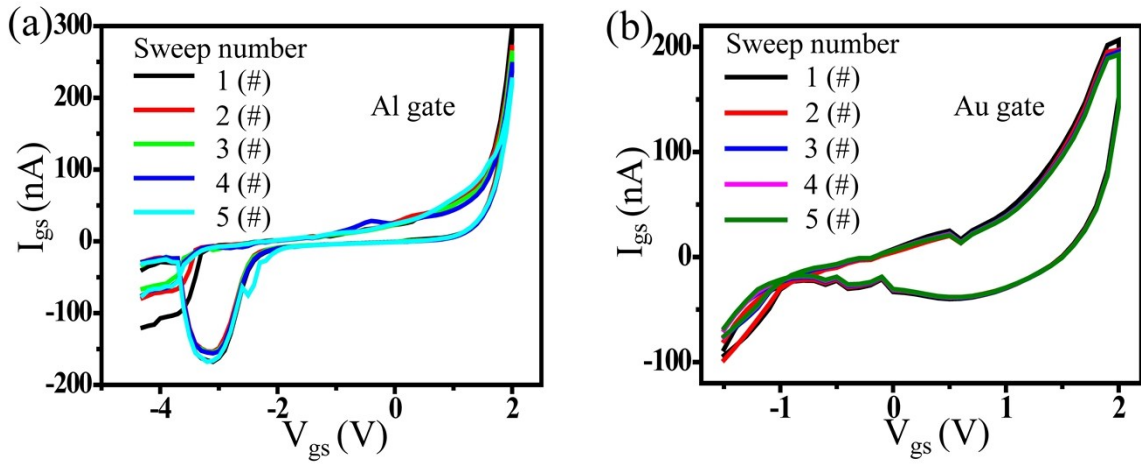


Figure S4. (a) The corresponding I_{gs} curves of the devices with an Al gate electrode. (b) The corresponding I_{gs} curves of the devices with a Au gate electrode.

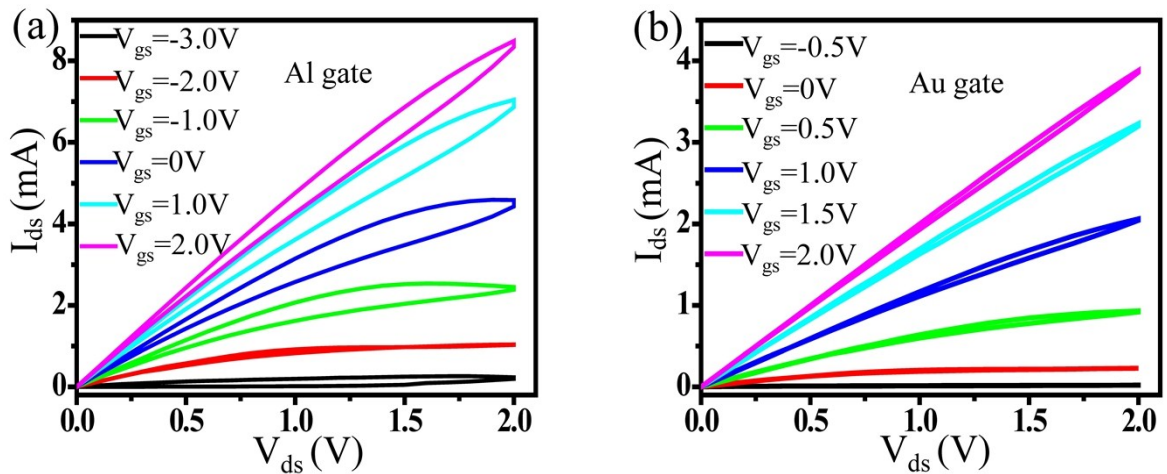


Figure S5. (a) The dual sweep output curve of FET with an Al gate electrode. (b) The dual sweep output curve of FET with a Au gate electrode.

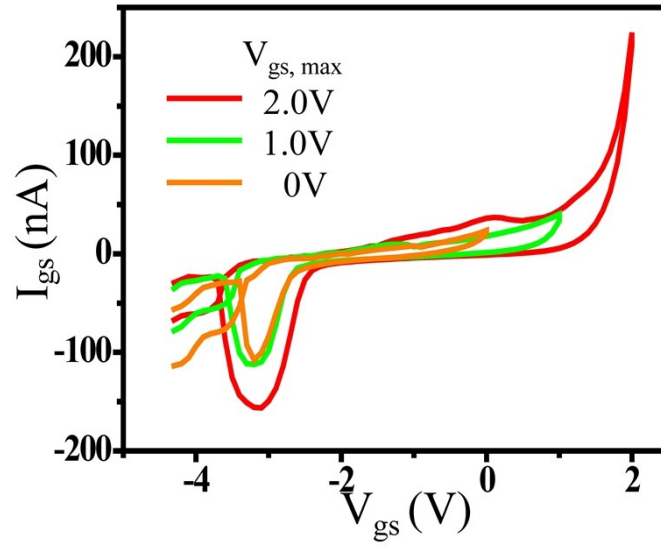


Figure S6. The corresponding I_{gs} curves by changing the maximum gate-source voltage $V_{gs, \max}$.

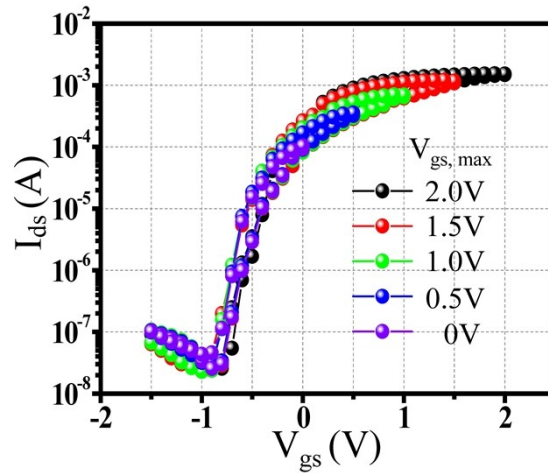


Figure S7. Transfer characteristic curves for different maximum gate-source voltages $V_{gs, \max}$ of Au gate electrode device.

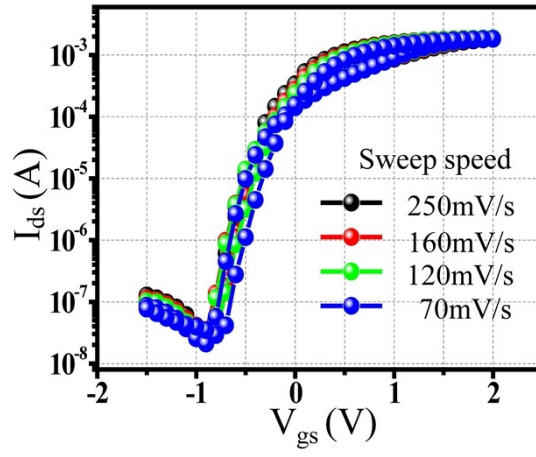


Figure S8. Transfer characteristic curves for different sweep speed of Au gate electrode device.

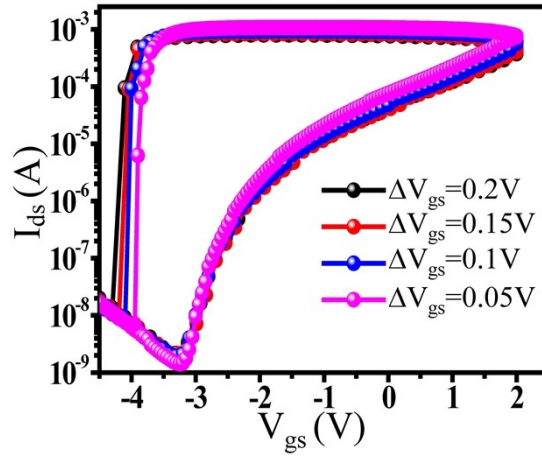


Figure S9. Transfer characteristic curves of the devices with an Al gate electrode for different V_{gs} scan intervals.