

Supplementary Materials

Low-Power Graphene/ZnO Schottky UV Photodiodes with Enhanced Lateral Schottky Barrier Homogeneity

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■ Current–Voltage Characteristics of Various ZnO/AT-SLG and ZnO/TC-SLG Schottky PDs

When we fabricated the graphene/ZnO Schottky photodiodes (PDs) by direct sputtering ZnO onto single-layer graphene (SLG). Statistically, more than 85% of the graphene/ZnO Schottky PDs devices showed a clear rectifying behavior in their current–voltage (I–V) characteristics at room temperature. In Figures S1 and S2, we show multiple samples of graphene/ZnO Schottky PDs that have been fabricated through an identical device fabrication process using as-transferred (AT) SLG and thermally-cleaned (TC) SLG, respectively. Both the ZnO/AT-SLG Schottky PDs and the ZnO/TC-SLG Schottky PDs clearly revealed the obvious rectifying characteristics. The Schottky barrier height (ϕ_B) and the ideality factor (η) of the ZnO/AT-SLG Schottky PDs were 0.58–0.59 eV and 1.92–1.99, respectively, and were 0.60–0.61 eV and 1.17–1.21, respectively, for the ZnO/TC-SLG Schottky PDs.

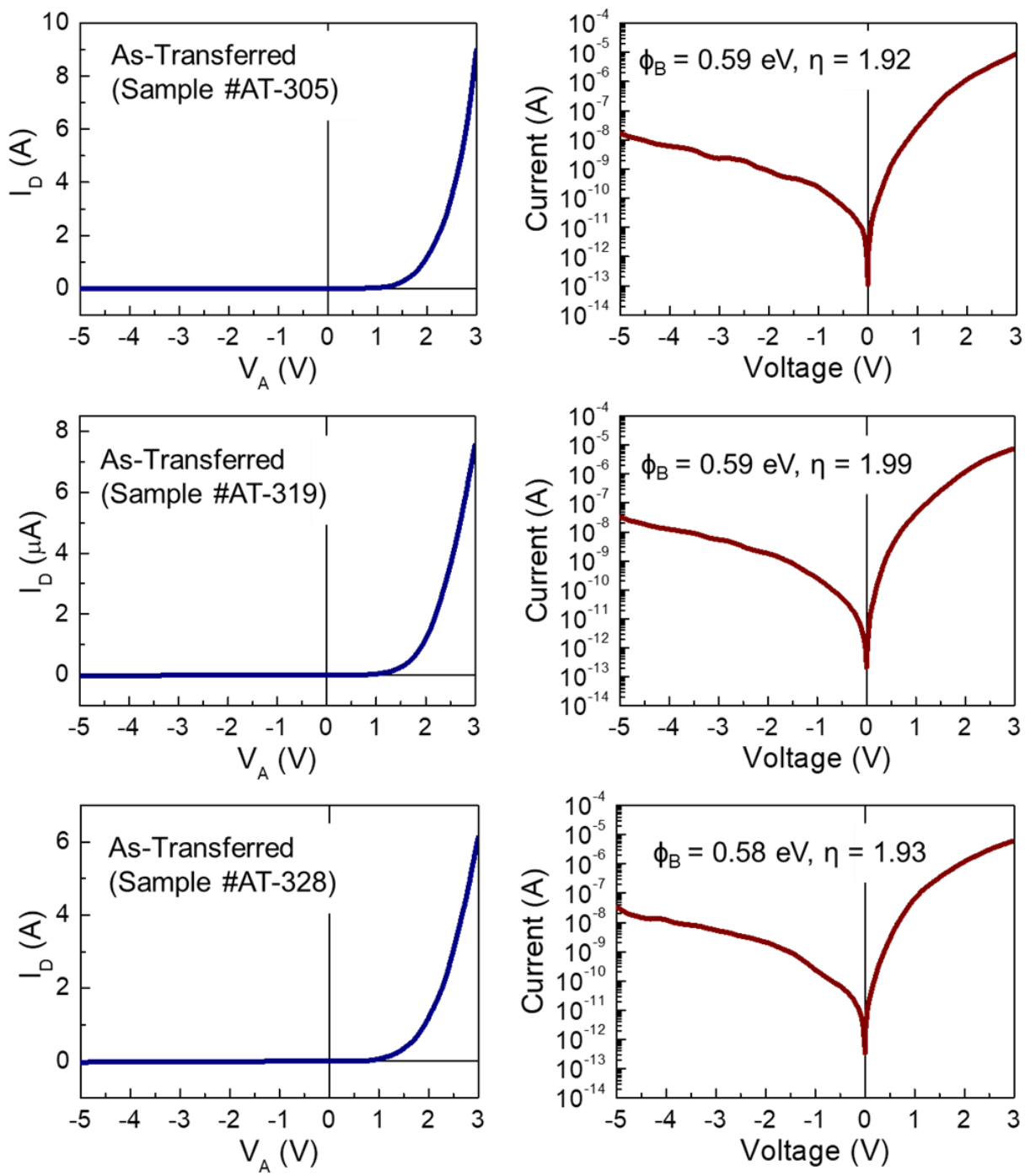


Figure S1. I-V characteristic curves of various ZnO/AT-SLG Schottky PDs fabricated through an identical device fabrication process using as-transferred SLG.

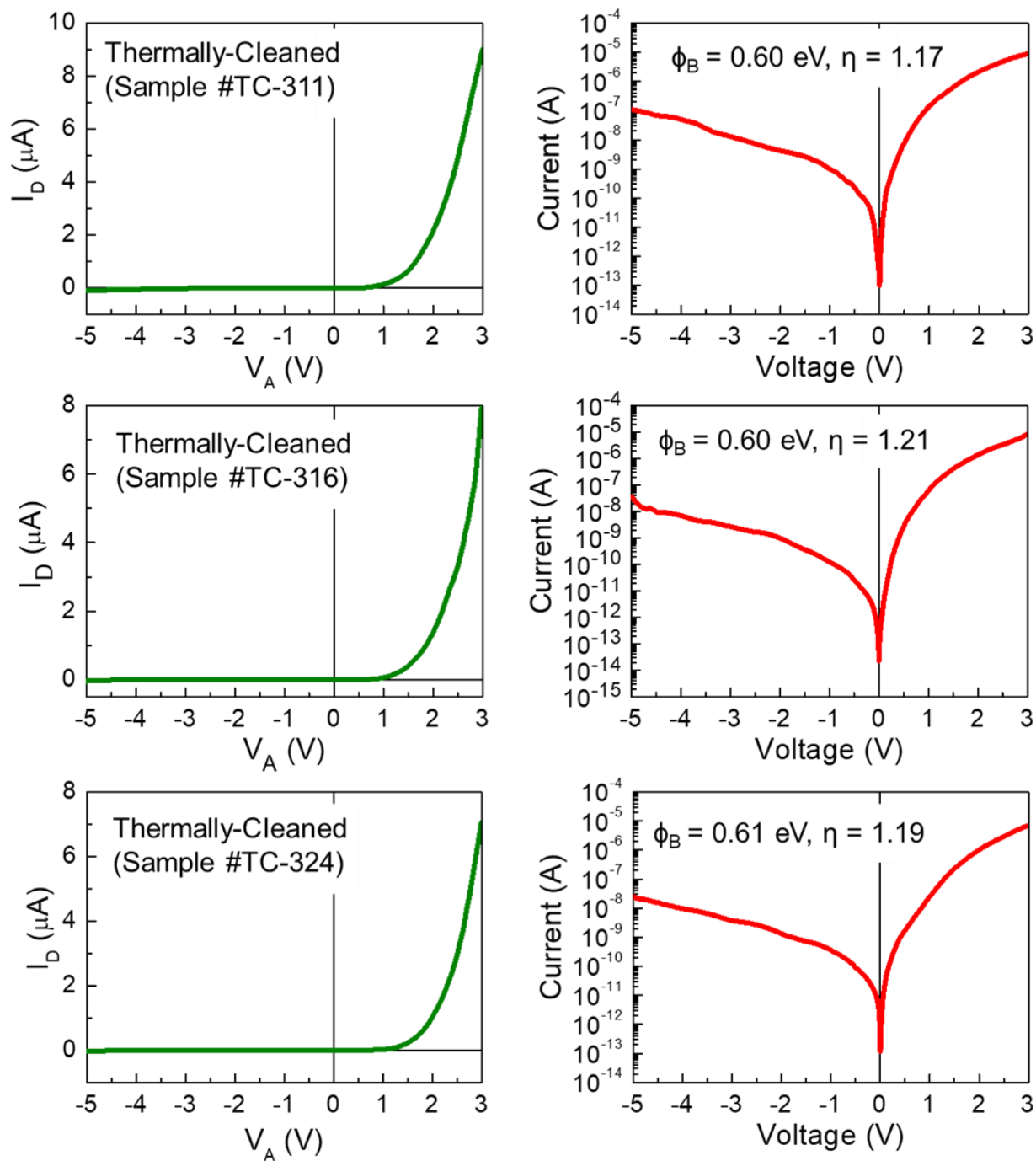


Figure S2. I-V characteristic curves of various ZnO/TC-SLG Schottky PDs fabricated through an identical device fabrication process using thermally-cleaned SLG.