Electronic Supplementary Material (ESI) for Energy & Environmental Science

Supplementary Information:

Optimization of Polymer Photovoltaic Cells with Bulk Heterojunction Layers Hundreds of Nanometers Thick: Modifying the Morphology and Cathode Interface

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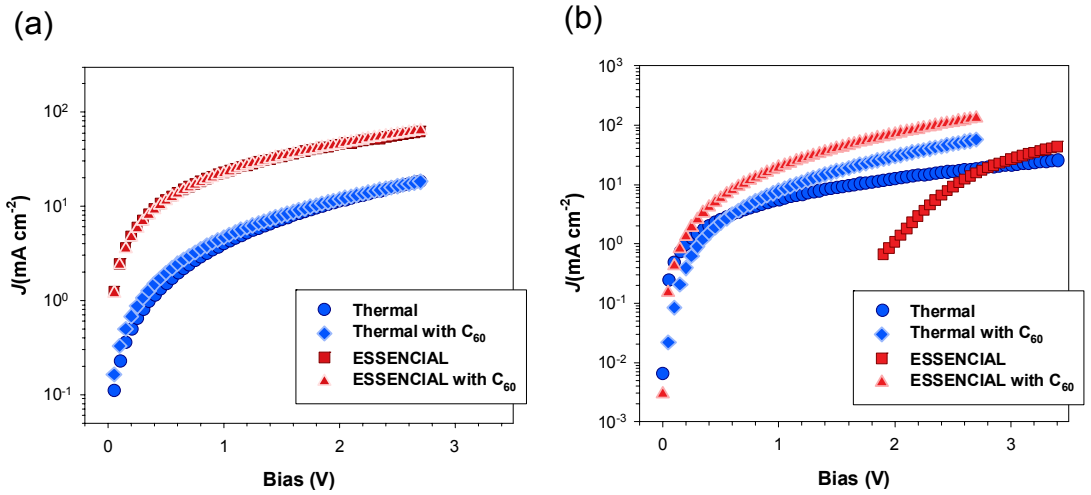

Figure S1 Measured *J–V* plots under dark condition of (a) hole- and (b) electron-only devices for SCLC calculation.

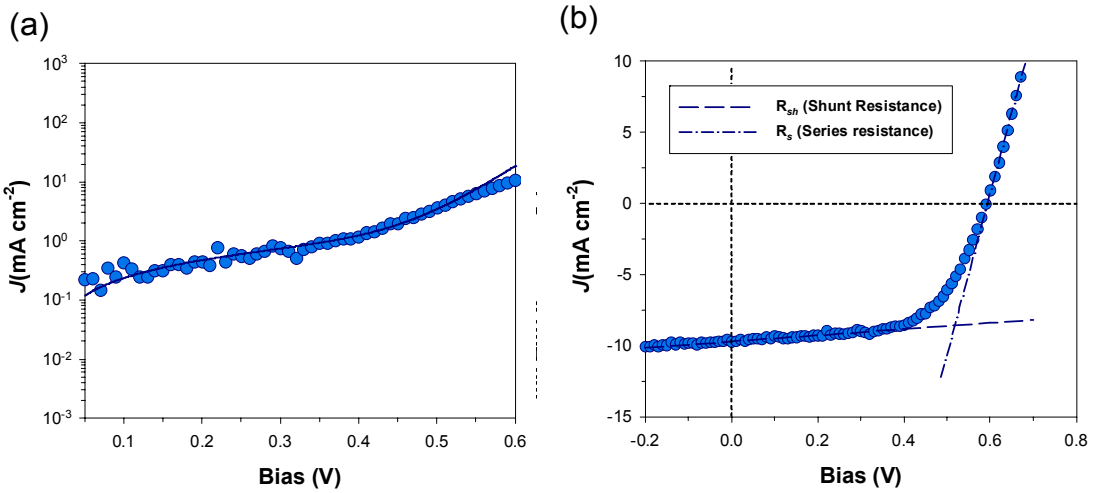

Figure S2 (a) Measured log*J–V* plots under dark condition of thermally annealed BHJ PV cell (320 nm thickness) to calculate diode ideality factor, *n*. Circles are experimental data and lines are the fit to the Shockley equation. (b) *J–V* plots of thermally annealed BHJ PV cell (320 nm thickness) to calculate shunt resistance (R_{sh}) and series resistance (R_s). Circles are experimental data, and dash line and dash-dot line are the fit for shunt resistance and series resistance, respectively. Thermal annealed BHJ PV cell are shown as a representative for the calculation.

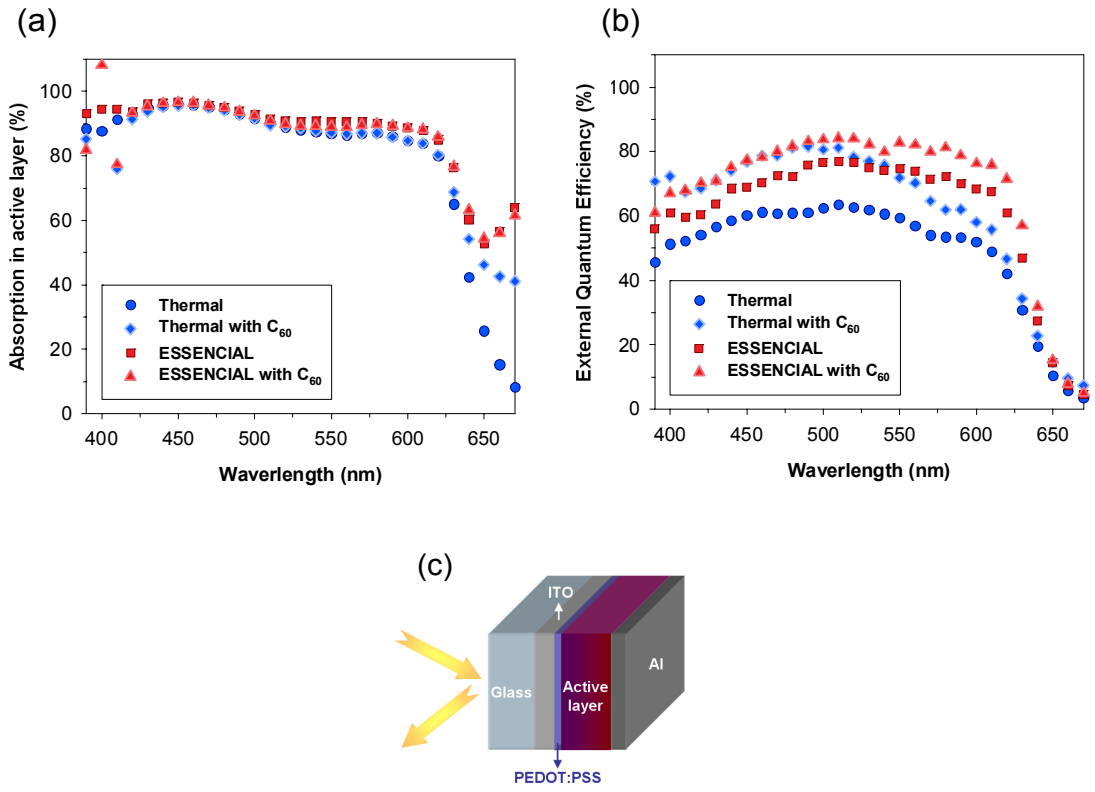

Figure S3 (a) Absorption efficiency in photoactive layer obtained by eliminating parasitic absorption in PV device, calculated by transfer matrix method, from the reflection spectrum. (b) External quantum efficiency (EQE) measured by IPCE. (c) Schematic of the reflection spectrum measurement.