

Supporting Information

Charge Transport Effect and Photovoltaic Conversion of Two-dimensional CdSeS Quantum Dot Monolayer in Inverted Polymer Solar Cells

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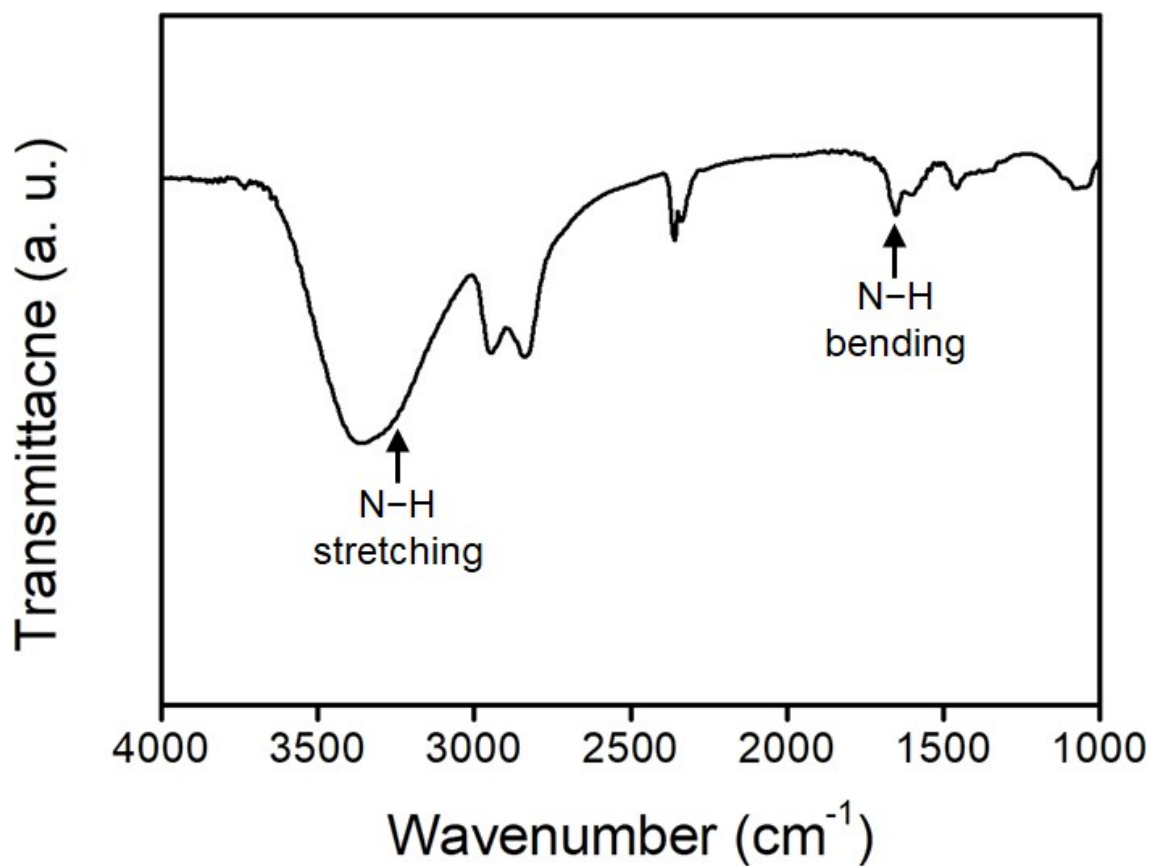


Figure S1. FT-IR spectrum of the PEIE on the ITO substrate.

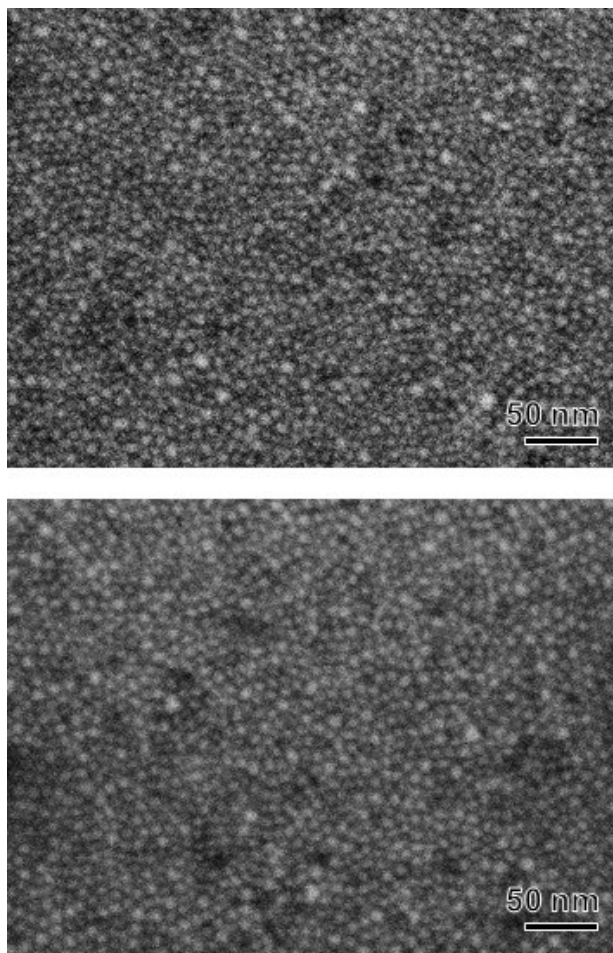


Figure S2. Additional SEM images of the CdSeS QDM on PEIE layer. From these images, an average density of the CdSeS QDs was measured to be around $1.61 \times 10^{12} \text{ cm}^{-2}$.

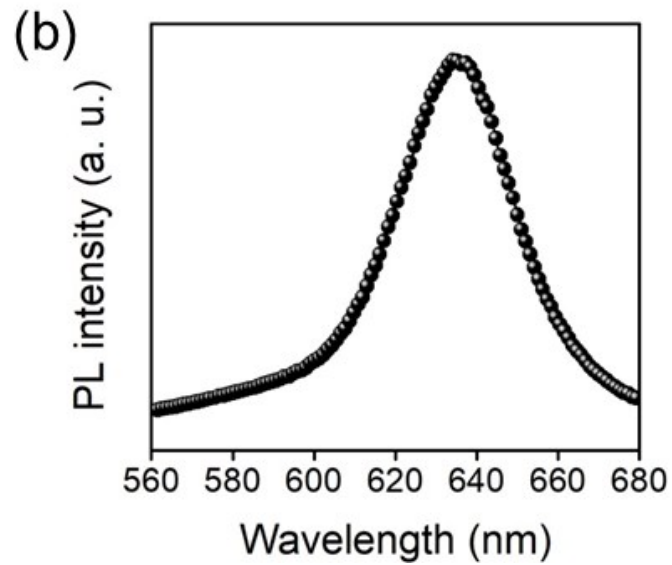
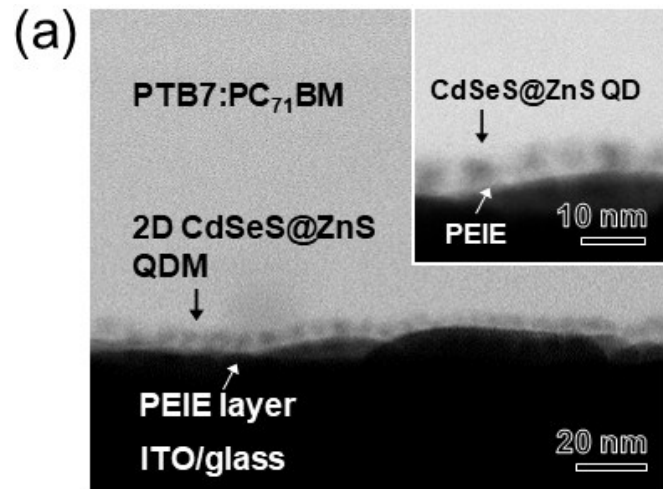


Figure S3. (a) The cross-section TEM and HRTEM (inset) images of the iPSCs with the 2D CdSeS@ZnS QDM. (b) PL spectrum of the 2D CdSeS@ZnS QDM by using a RISE technique.

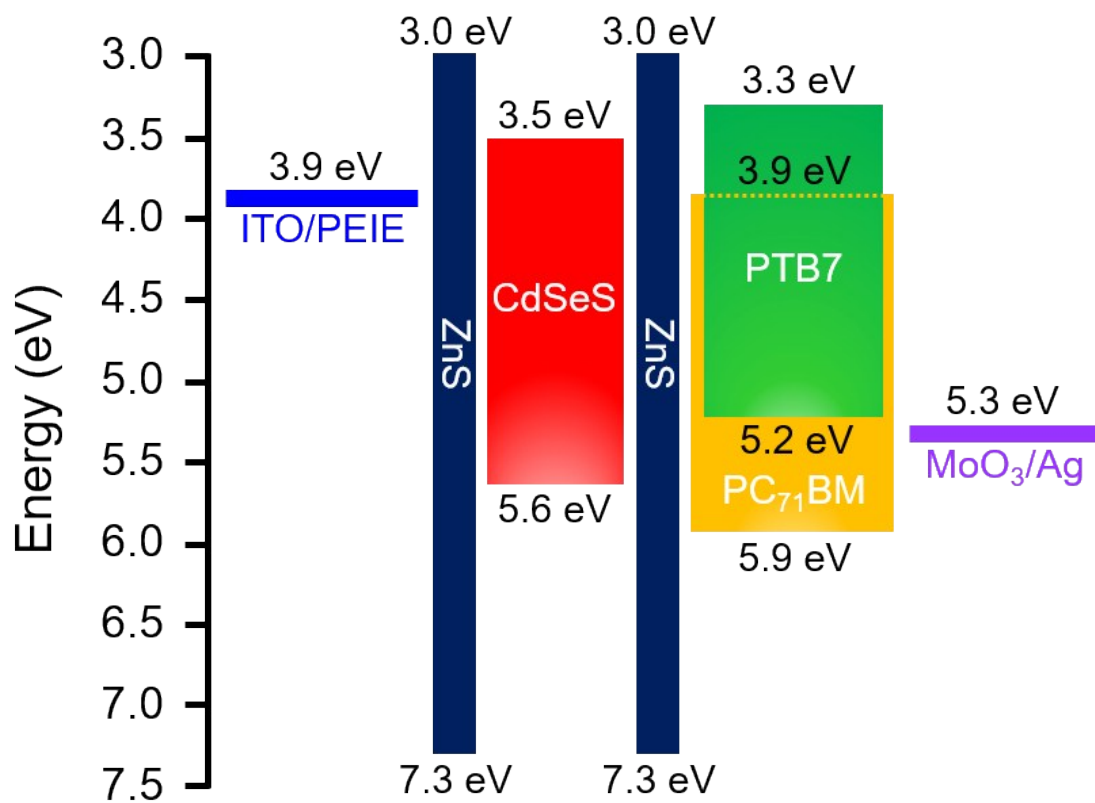


Figure S4. Energy level diagram of the iPSC with the 2D CdSeS@ZnS QDM.

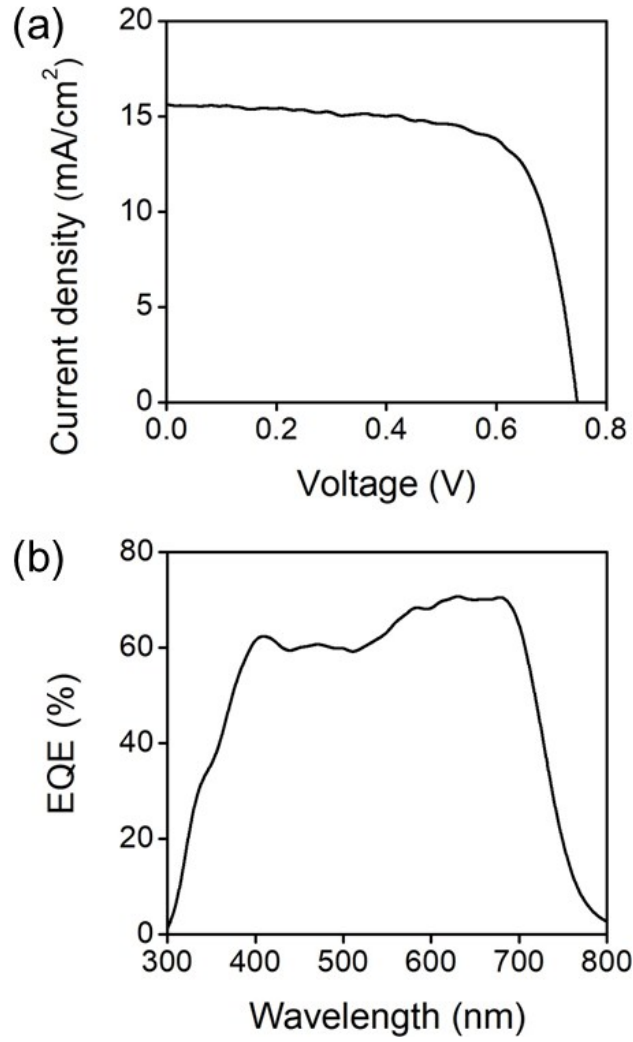


Figure S5. (a) J - V characteristics of the iPSCs with the 2D CdSeS@ZnS QDM under the illumination of AM 1.5, 100 mW/cm². (b) EQE spectra of the iPSCs with the 2D CdSeS@ZnS QDM.

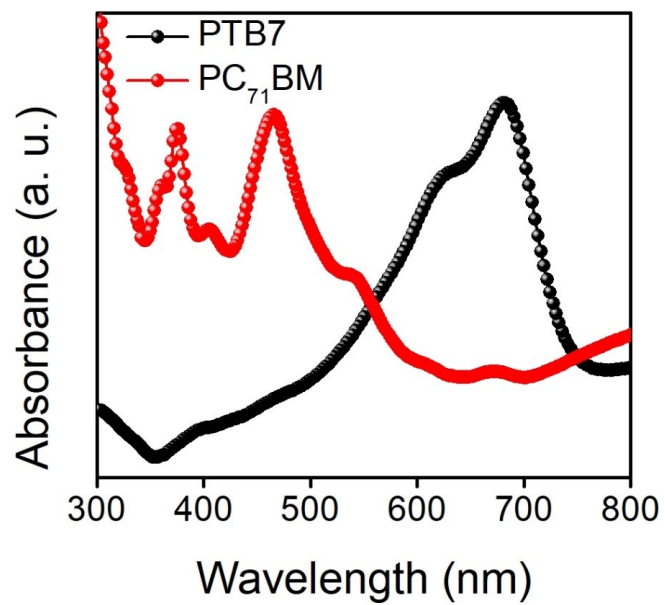


Figure S6. Absorption spectra of the PTB7 (black) and PC₇₁BM (red) films.

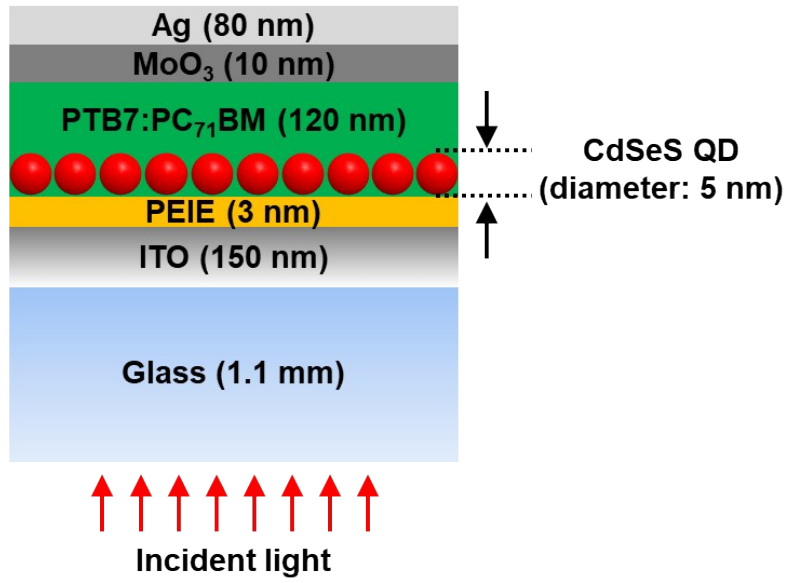


Figure S7. A schematic illustration of the ITO/PEIE/PTB7:PC₇₁BM/MoO₃/Ag structure for the FDTD simulation.

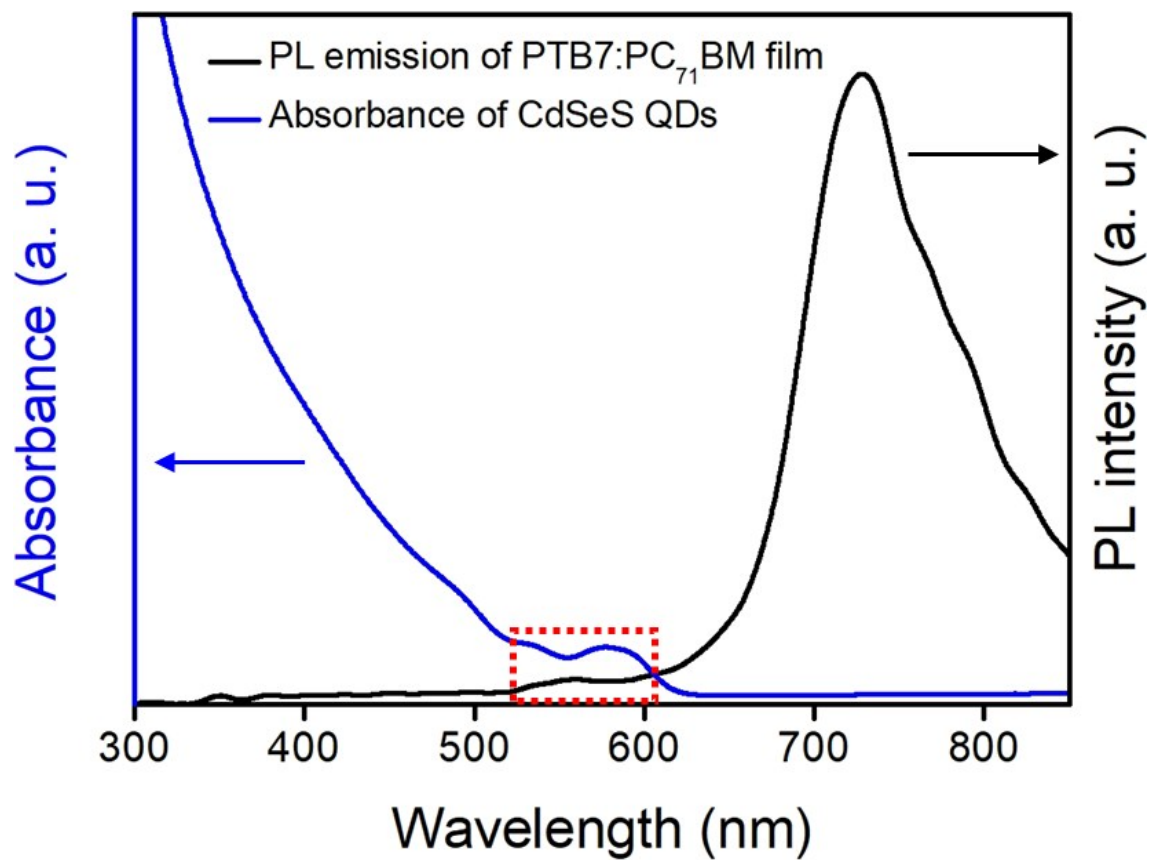


Figure S8. The UV-vis absorption spectrum of the CdSeS QDs dispersed in a toluene vs. the PL emission spectrum of the PTB7:PC₇₁BM film.

Table S1. Characteristics of iPSC devices with the 2D CdSeS@ZnS QDM.

Sample	max. V_{OC} (avg.) (V)	max. J_{SC} (avg.) (mA/cm ²)	max. FF (avg.)	max. PCE (avg.) (%)
iPSC with 2D CdSeS@ZnS QDM	0.75 (0.74)	15.58 (15.46)	71.00 (71.40)	8.25 (8.21)