

Supplementary Information

High-detectivity, efficient, ambient-stable inverted organic photodetectors incorporating conjugated polymer as an electron transport layer

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S1. Statistic plots for the dark and the light current densities of both OPDs.

The statistic plots of the dark and the light current densities at $V = -1$ and 0 V are shown in Fig. S1. At -1 V, the average dark current densities for ZnO and N2200/PFN-OX devices are $(5.27 \pm 0.37) \times 10^{-9}$ and $(4.04 \pm 0.48) \times 10^{-10}$ A/cm², respectively, and the respective light currents are 6.63 ± 0.19 and 7.36 ± 0.07 mA/cm². At 0 V, the average dark current densities for ZnO and N2200/PFN-OX devices are $(3.29 \pm 0.61) \times 10^{-10}$ and $(2.43 \pm 0.64) \times 10^{-11}$ A/cm², respectively, and the respective light current densities are 6.28 ± 0.20 and 6.90 ± 0.14 mA/cm².

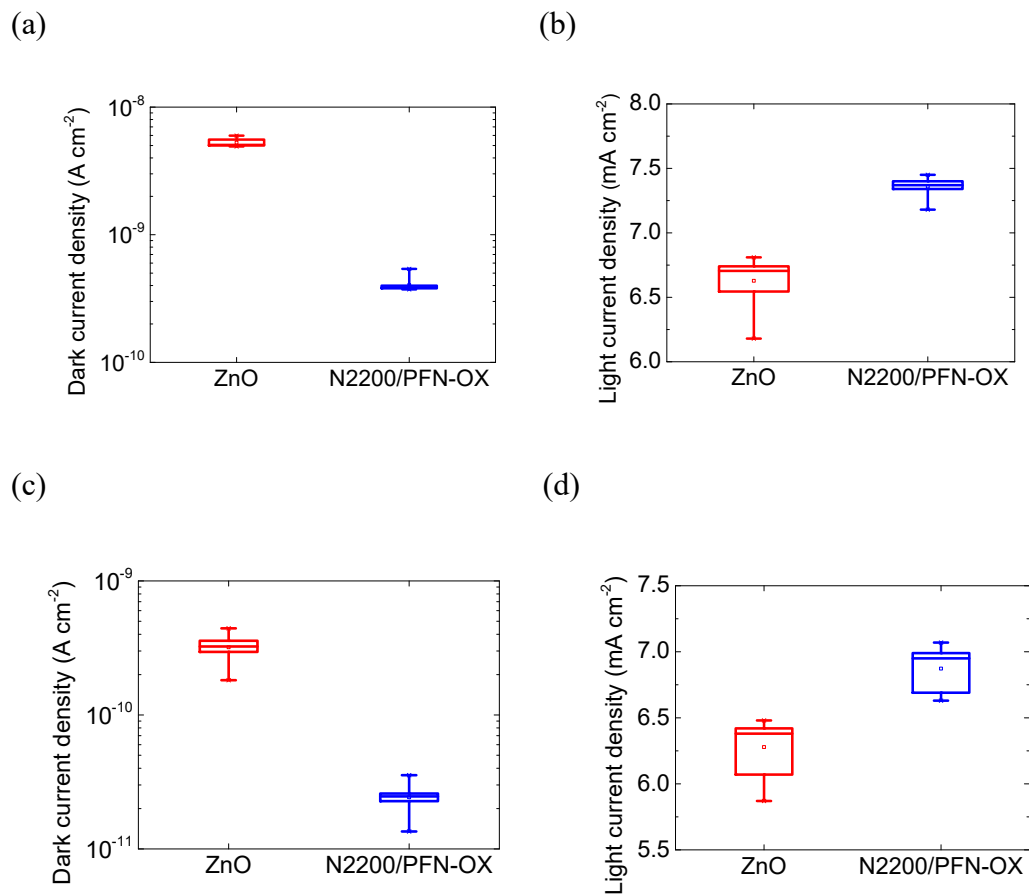


Fig. S1 Statistics plots for ZnO and N2200/PFN-OX OPDs at $V = -1$ and 0 V. (a) The dark and (b) the light current densities at -1 V. (c) The dark and (d) the light current densities at 0 V.

S2. $J - V$ characteristics for ITO/ETL/P3HT/MoO₃/Ag planar heterojunction structure in the dark.

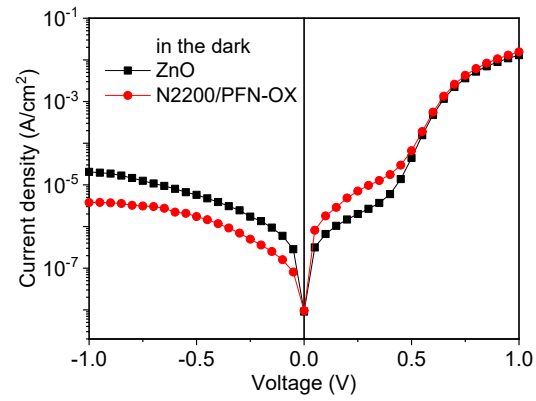
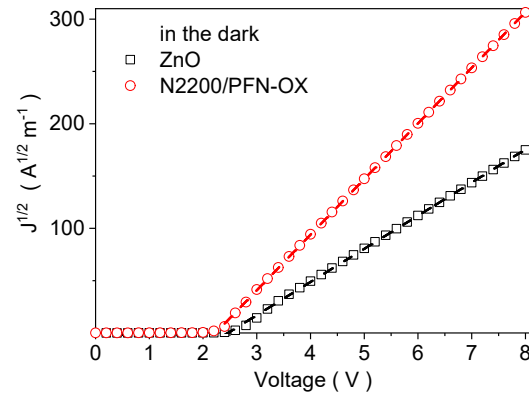


Fig. S2 Current density – Voltage ($J - V$) characteristics for planar heterojunction structure based on ZnO and N2200/PFN-OX as ETLs in the dark.

S3. $J^{1/2} - V$ and $\log J - \log V$ characteristics of the electron-only devices

(a)



(b)

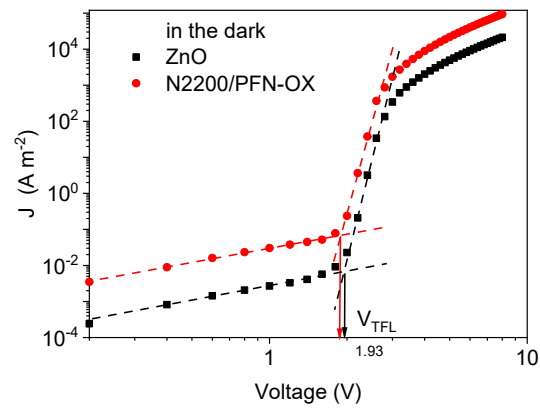


Fig. S3 (a) $J^{1/2} - V$ and (b) $\log J - \log V$ characteristics of the electron-only devices (ITO/ETL/P3HT:PCBM/MoO₃/Al).

S4. $J - V$ characteristics of OPDs using ZnO, PFN-OX, and N2200/PFN-OX as ETLs in the dark

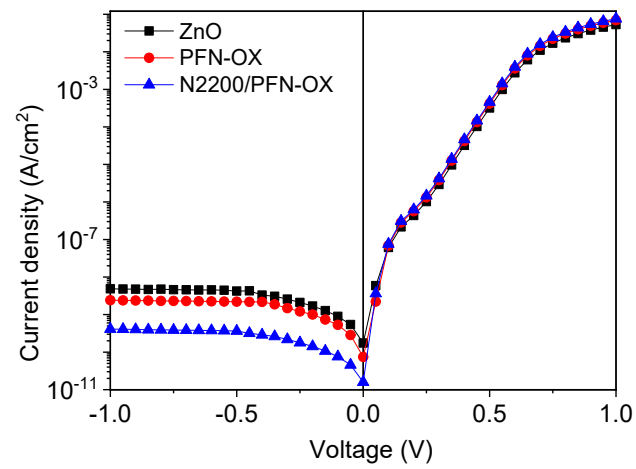


Fig. S4 Current density – Voltage ($J - V$) characteristics for ZnO, PFN-OX, N2200/PFN-OX OPDs in the dark.