Supporting Information

Efficient vacuum-free-processed quantum dot light-emitting diodes

with printable liquid metal cathodes

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Figure S1. Characterization of ZnO nanoparticle: (a) TEM image of the ZnO nanoparticles (5 nm in diameter); (b) Current density-voltage characteristics (J-V) of an electron-only device (ITO/ZnO/Al). The thickness of the ZnO layer is 400 nm. The electron mobility of the ZnO film is obtained by fitting space-charge-limited-current region, \( J \propto v^2 \) with Child's law, 
\[
J = \frac{9}{8} \varepsilon_r \varepsilon_0 \mu_e v^2 / d^3,
\]
where \( \varepsilon_0, \varepsilon_r, \mu_e \) and \( d \) are the vacuum permittivity, relative permittivity, electron mobility and film thickness, respectively \([1,2]\). By assuming that \( \varepsilon_r=4 \), \( \mu_e \) is determined to be \( 2.8 \times 10^{-3} \) cm\(^2\)V\(^{-1}\)s\(^{-1}\).

References


Figure S2. Characterization of quantum dots: The TEM images of the QDs were obtained using Tecnai F30 microscope at imaging center of Southern University of Science and Technology. (a) CdZnSe/CdS/ZnS red QDs, (b) CdZnSeS/ZnS green QDs, and (c) ZnCdS/ZnS blue QDs.