

Supporting Information for:

Improving photodetection and stability of visible light

QDs/ZnO phototransistor via Al₂O₃ additional layer

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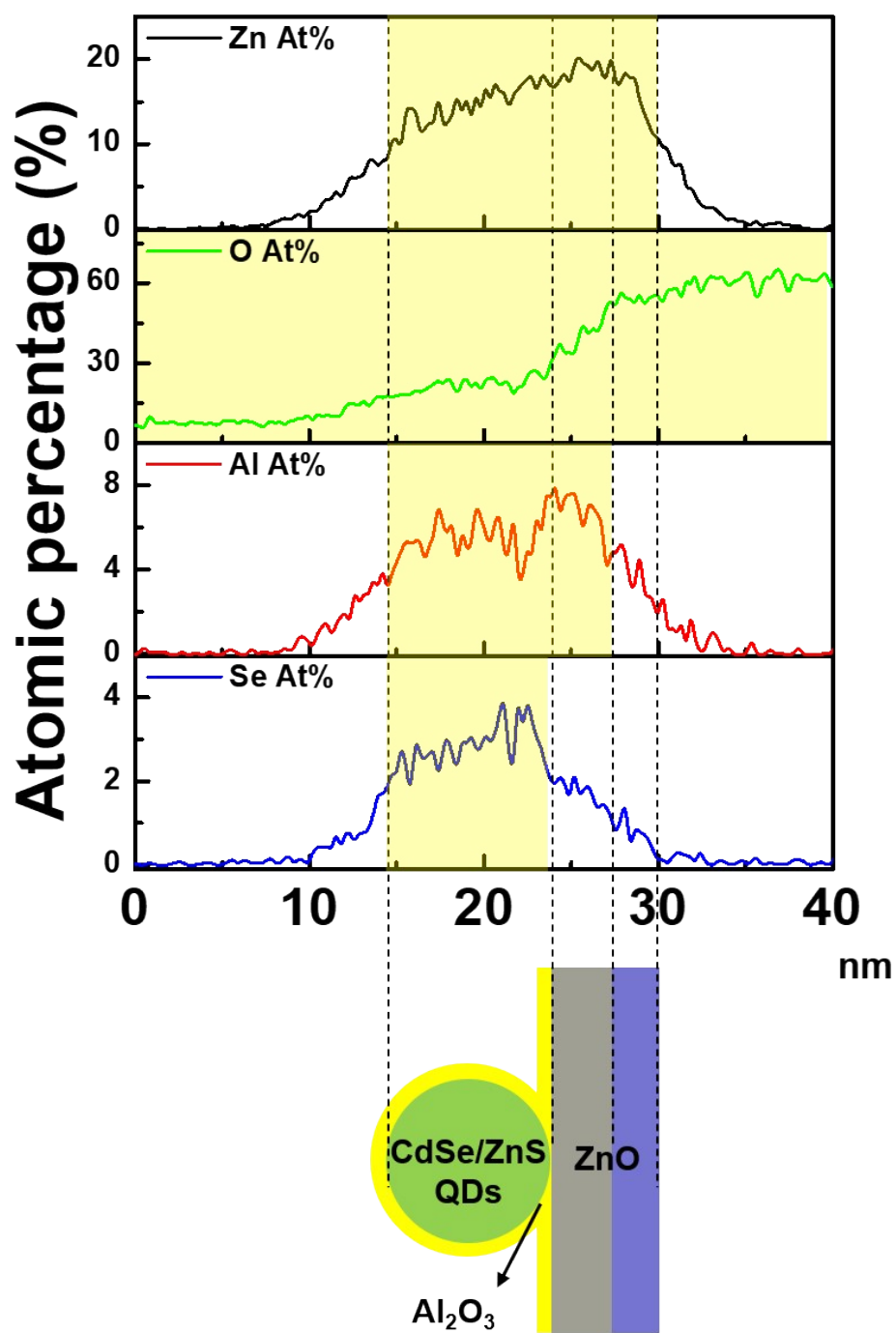


Figure S1. EDS line scan showing the depth profile of the elemental distribution.

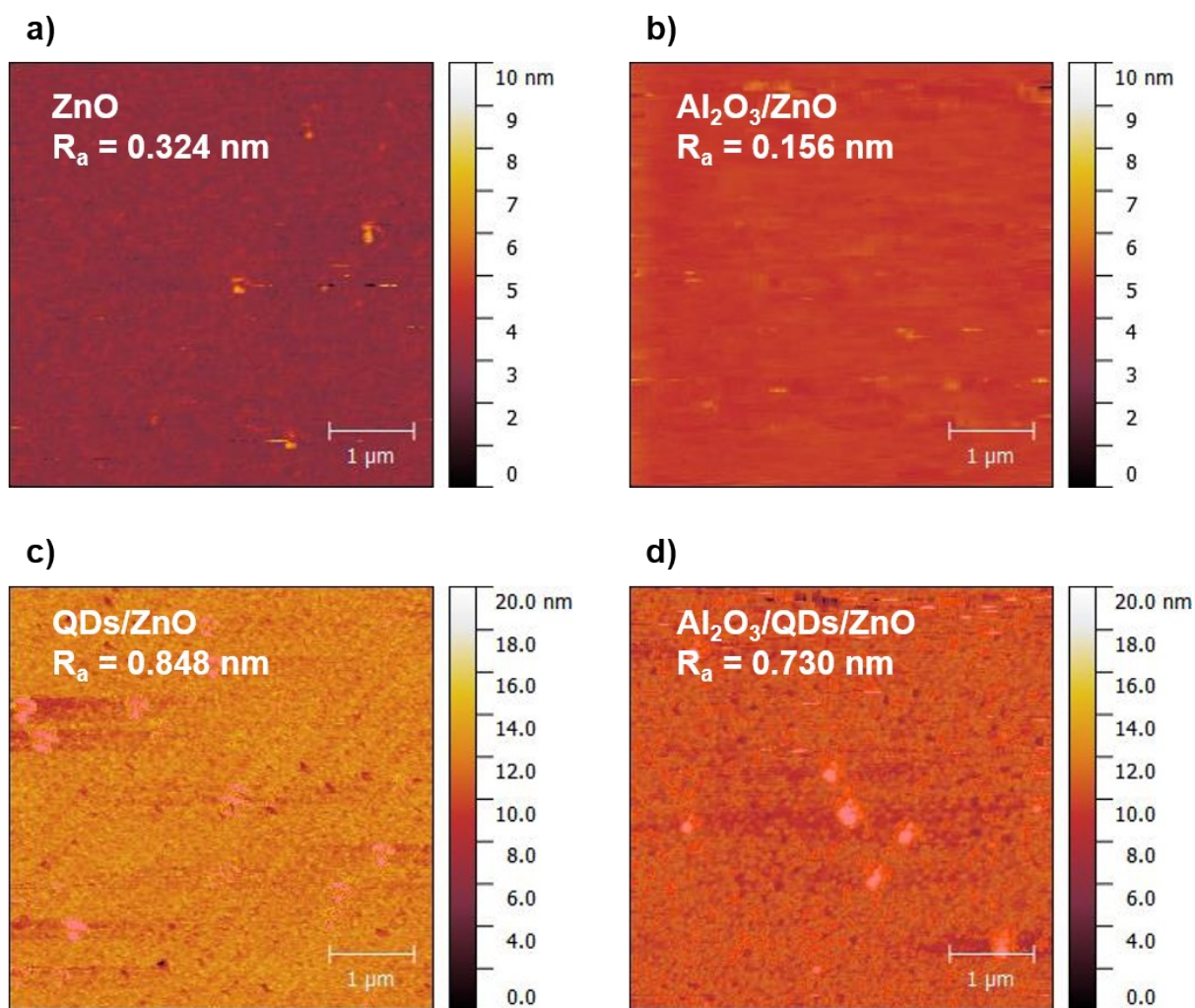


Figure S2. AFM topography images and root mean square (RMS) roughness of a) ZnO, b) $\text{Al}_2\text{O}_3/\text{ZnO}$, c) QDs/ZnO, and d) $\text{Al}_2\text{O}_3/\text{QDs}/\text{ZnO}$ films.

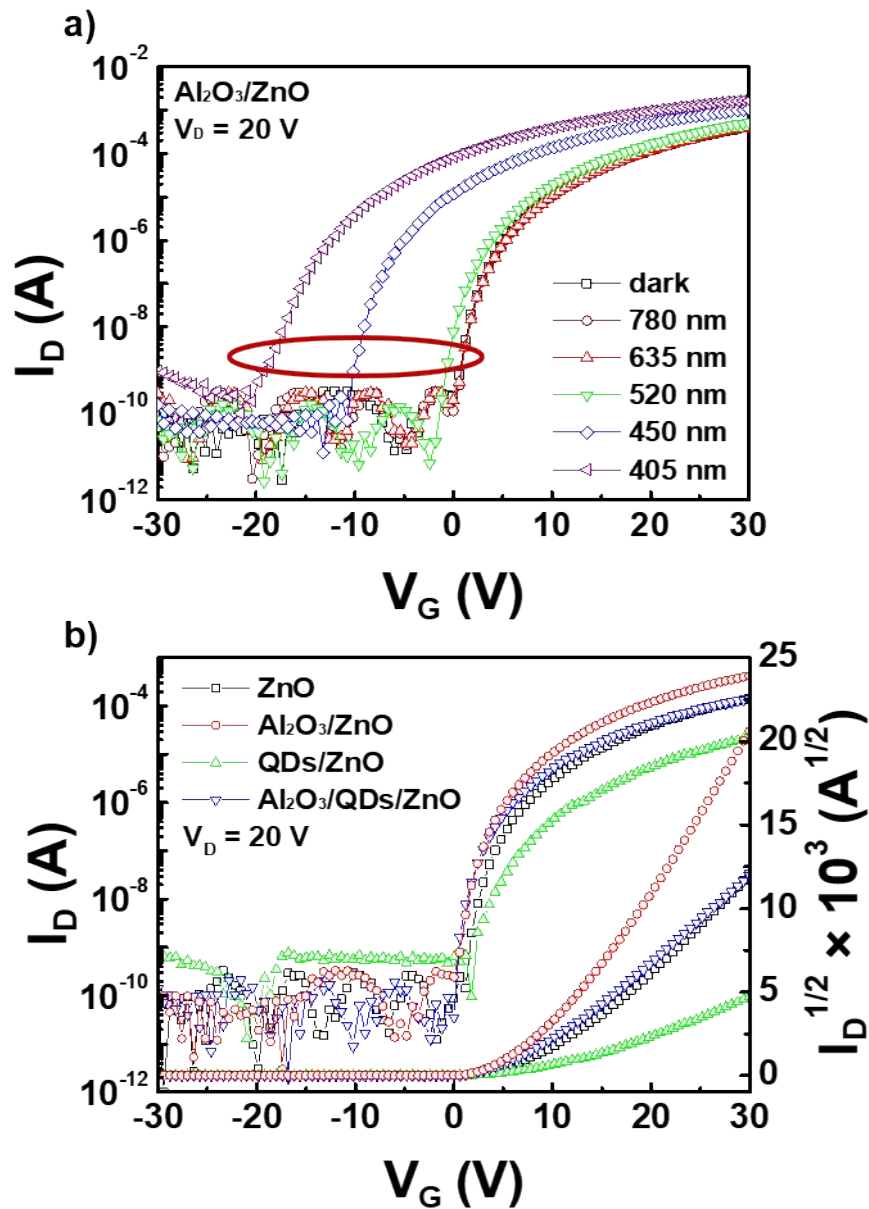


Figure S3. a) Transfer curve characteristic (measured at $V_D = 20$ V) of $\text{Al}_2\text{O}_3/\text{ZnO}$ TFTs upon irradiation with different wavelengths of light. b) Transfer curve characteristics (measured at $V_D = 20$ V) of ZnO, $\text{Al}_2\text{O}_3/\text{ZnO}$, QDs/ZnO , and $\text{Al}_2\text{O}_3/\text{QDs}/\text{ZnO}$ TFTs in darkness.

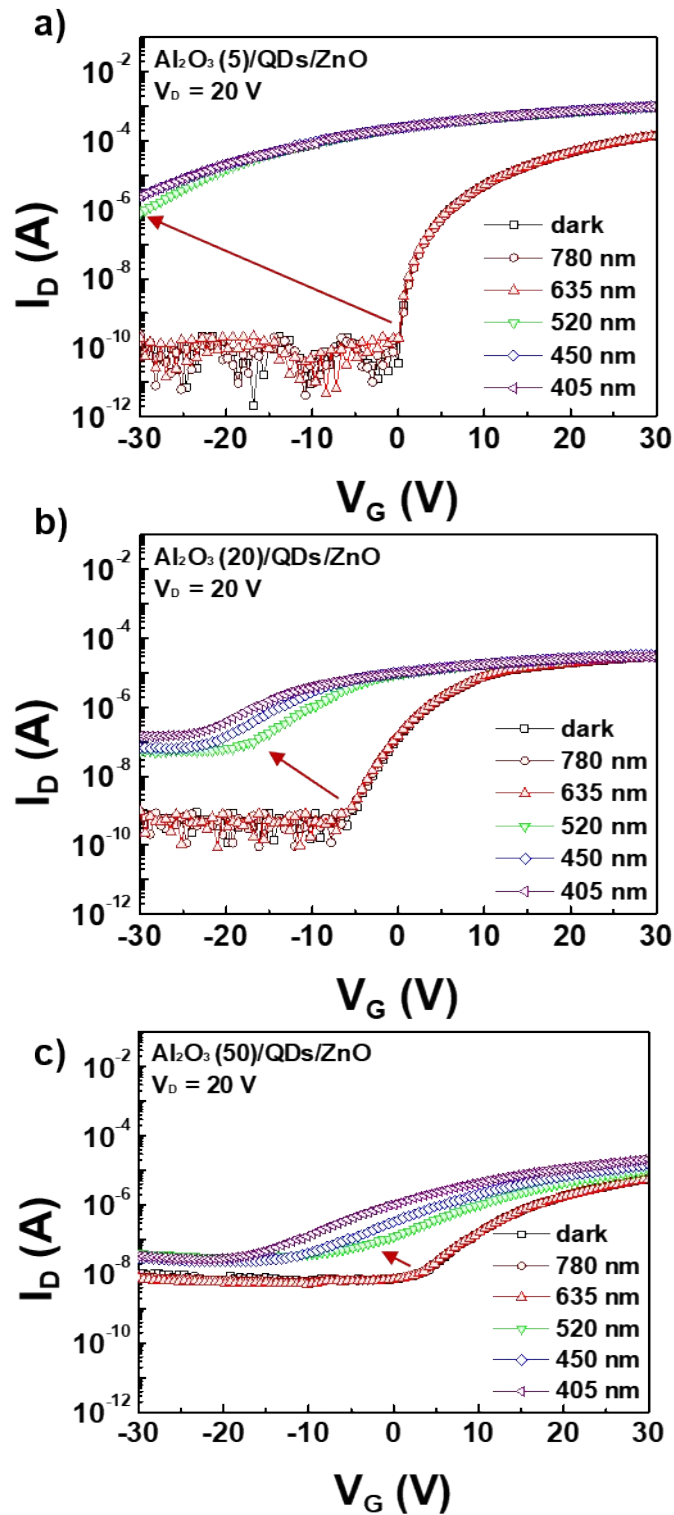


Figure S4. Transfer curve characteristic (measured at $V_D = 20$ V) of QDs/ZnO TFTs deposited with Al_2O_3 after a) 5 cycles, b) 20 cycles, and c) 50 cycles upon irradiation with different wavelengths of light.

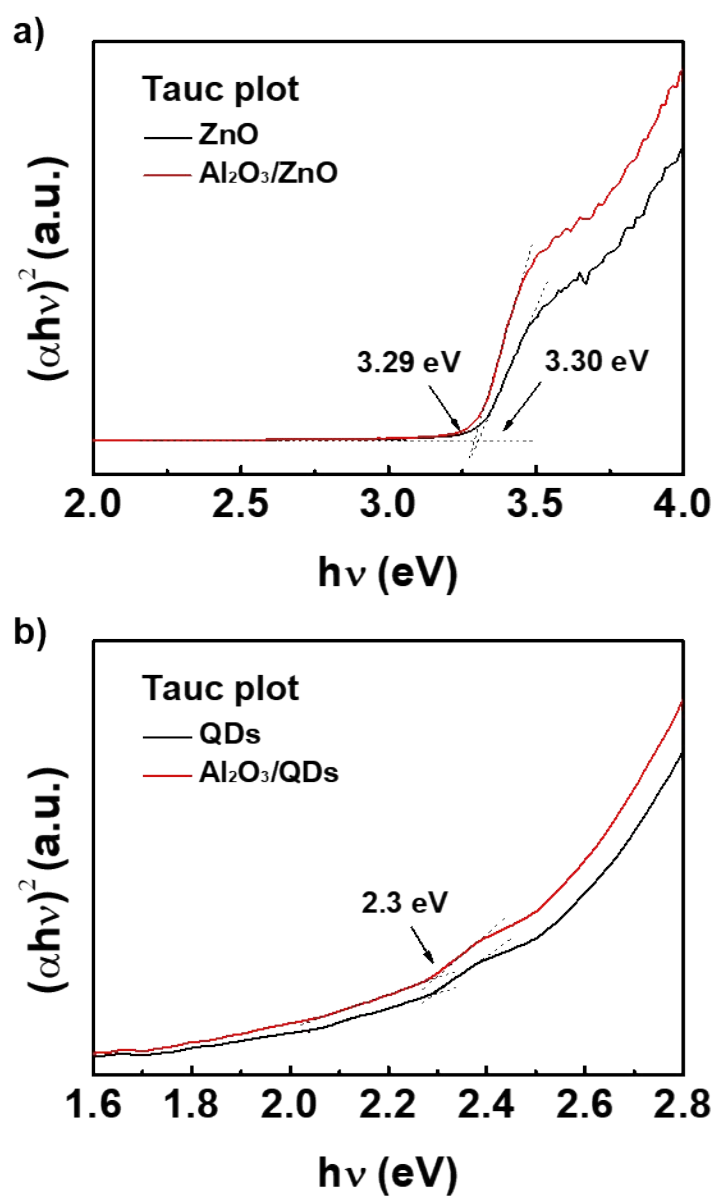


Figure S5. Tauc plots of a) ZnO and $\text{Al}_2\text{O}_3/\text{ZnO}$, and b) QDs and $\text{Al}_2\text{O}_3/\text{QDs}$ films.

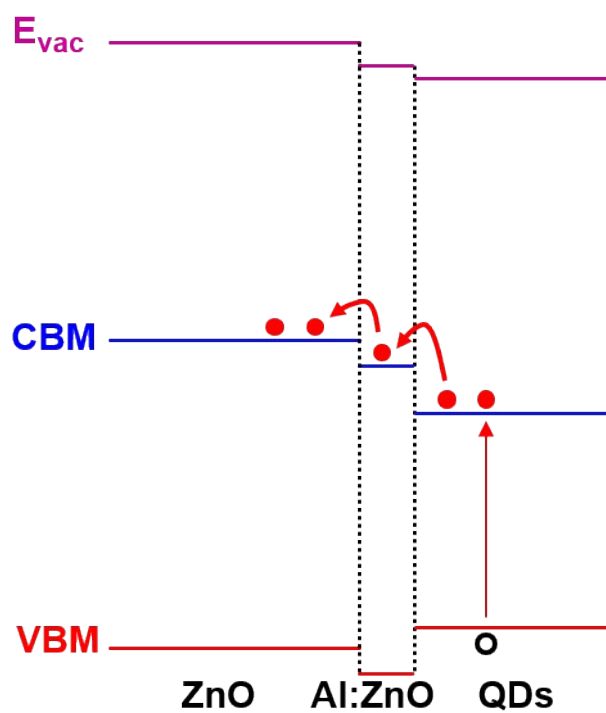


Figure S6. Schematic of the photo-generated charge transportation at the $Al_2O_3/QDs/ZnO$ TFT.

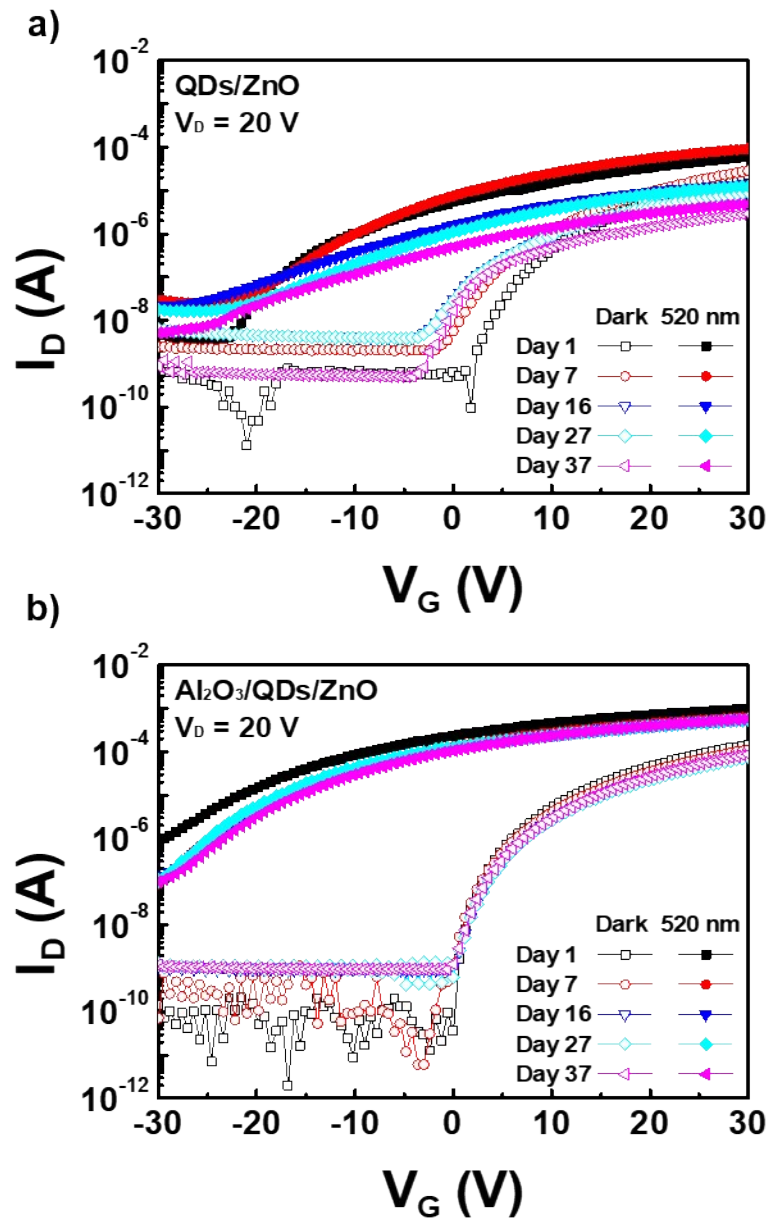


Figure S7. Transfer curve characteristics (measured at $V_D = 20$ V) of a) QDs/ZnO and b) $\text{Al}_2\text{O}_3/\text{QDs}/\text{ZnO}$ TFTs upon irradiation with 520 nm light, measured periodically after exposure to air at room temperature.