

Electronic Supplementary Information (ESI)

**Synergistically enhanced wide spectrum photodetection of  
heterogeneous trilayer CsPbI<sub>3</sub>/PbS/ZnO architecture**

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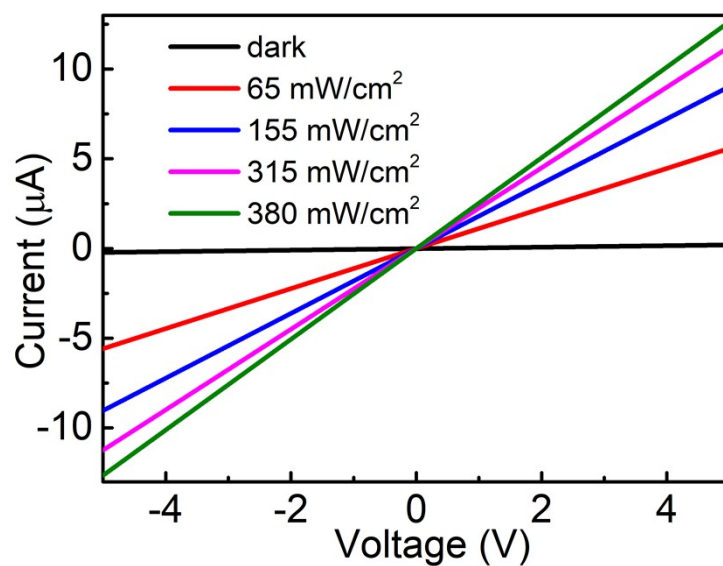
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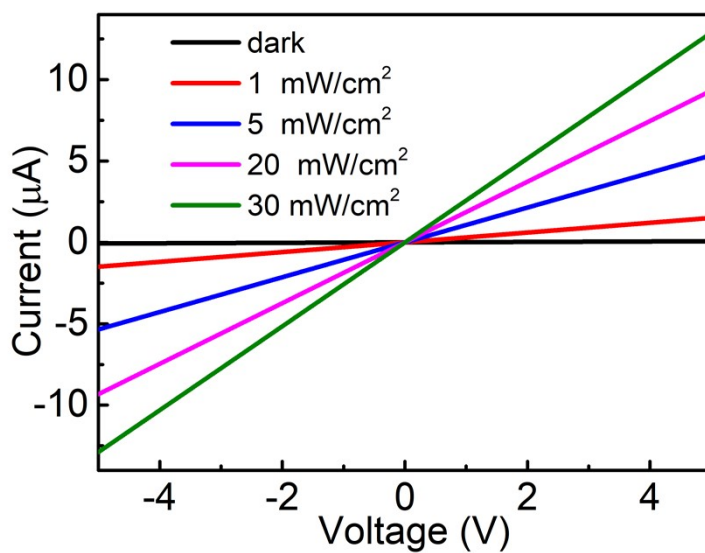
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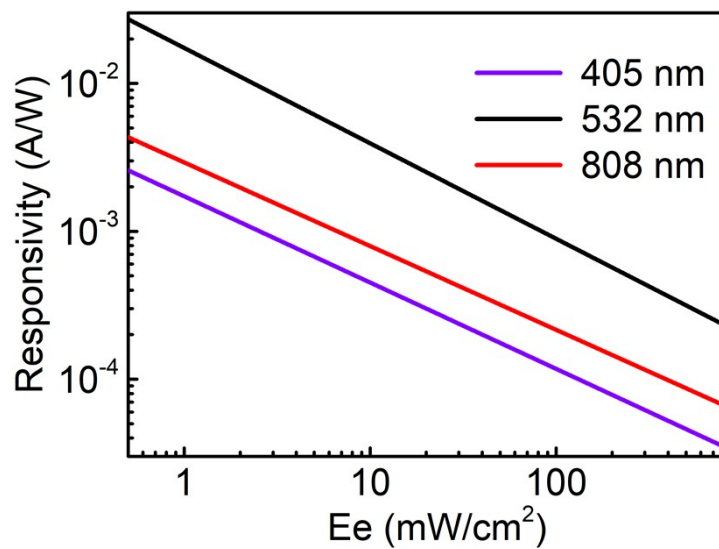
**Keywords:** heterogeneous trilayer, perovskite, quantum dots, photodetection, flexible optoelectronic devices.



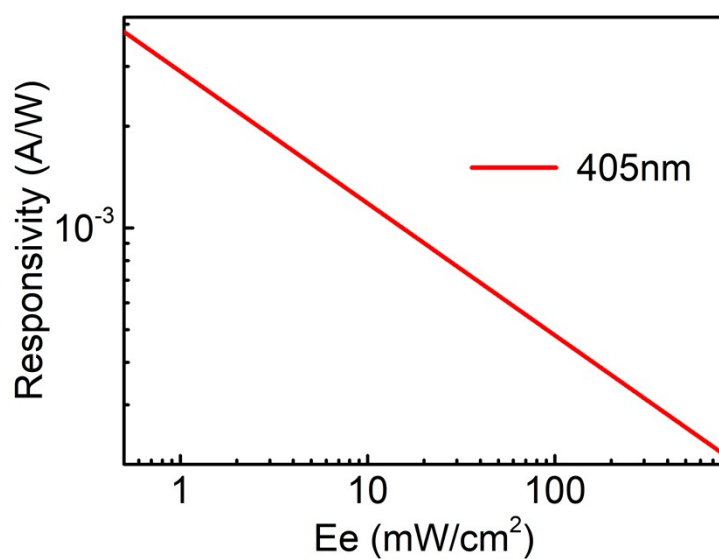
**Figure S1.** Output characteristic curves of CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 532 nm light illumination.



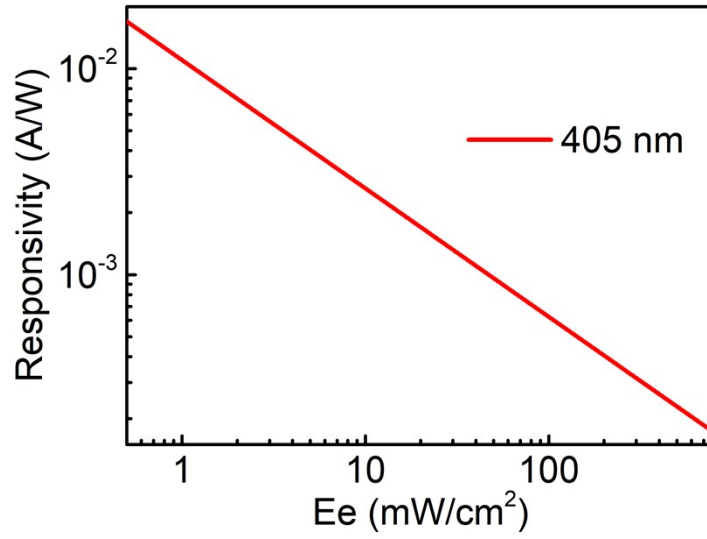
**Figure S2.** Output characteristic curves of CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 808 nm light illumination.



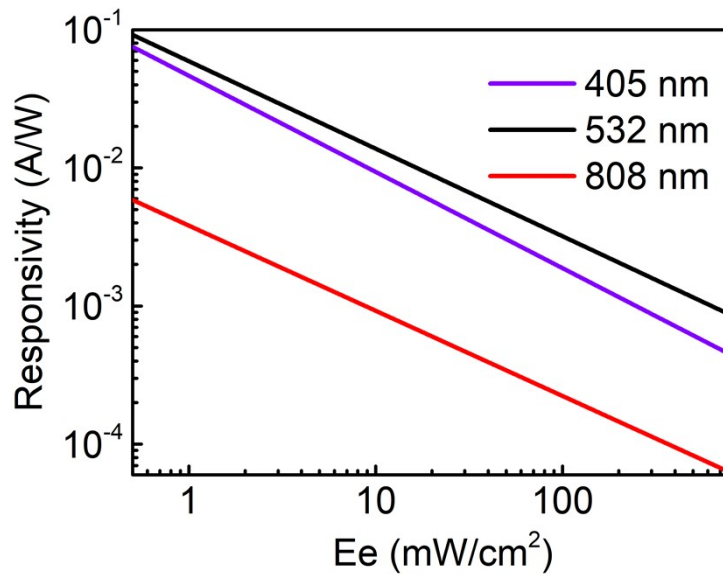
**Figure S3.** Optical responsivity vs. incident light power density of PbS QDs photodetectors under 405, 532 and 808 nm light illumination.



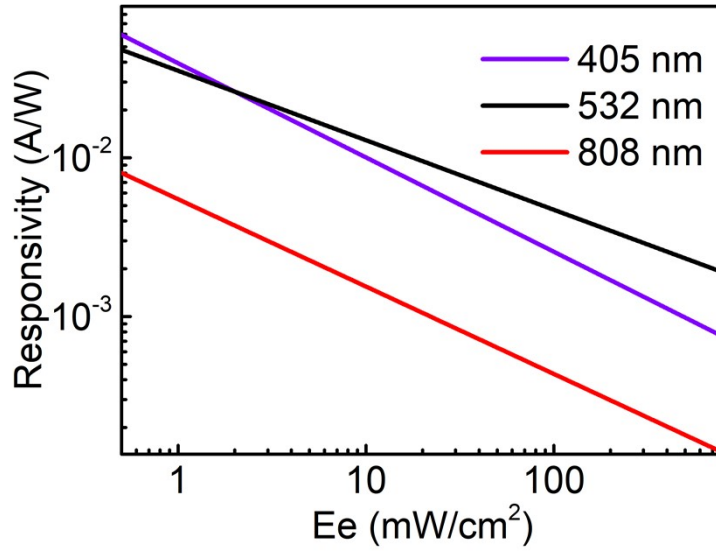
**Figure S4.** Optical responsivity vs. incident light power density of ZnO QDs photodetectors under 405 nm light illumination.



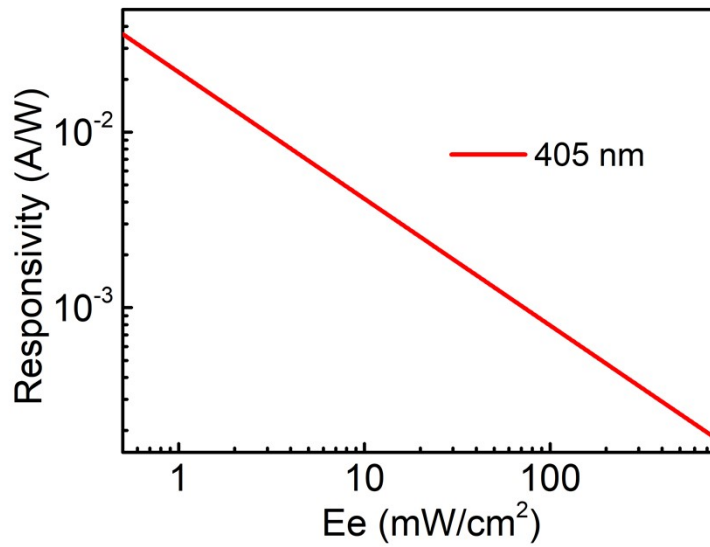
**Figure S5.** Optical responsivity vs. incident light power density of CsPbI<sub>3</sub> QDs photodetectors under 405 nm light illumination.



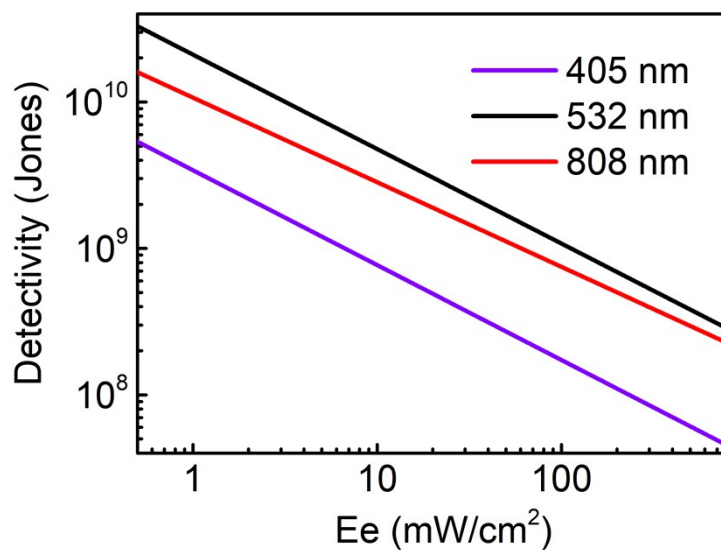
**Figure S6.** Optical responsivity vs. incident light power density of PbS/ZnO photodetectors under 405, 532 and 808 nm light illumination.



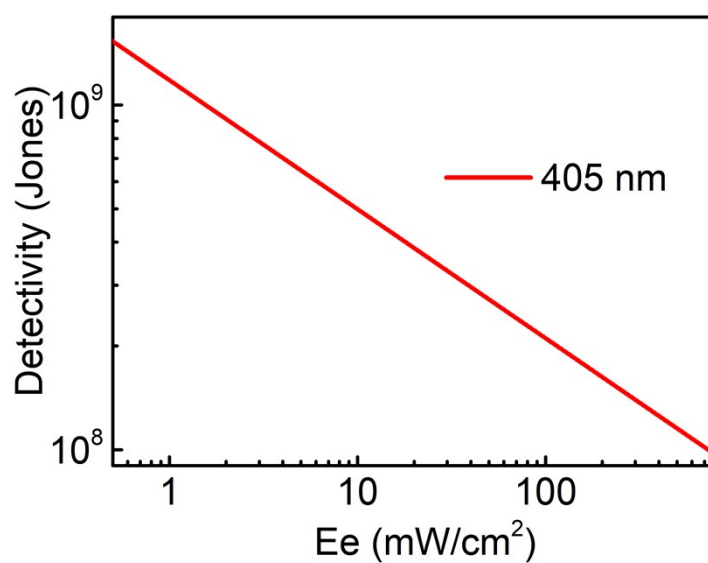
**Figure S7.** Optical responsivity vs. incident light power density of CsPbI<sub>3</sub>/PbS photodetectors under 405, 532 and 808 nm light illumination.



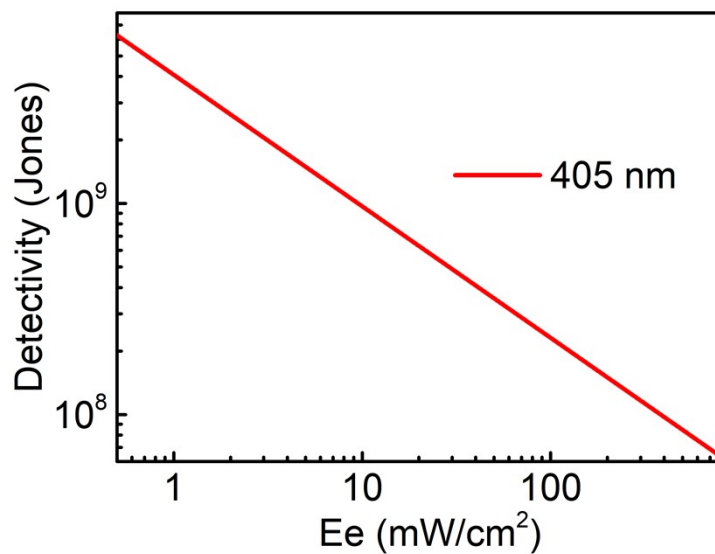
**Figure S8.** Optical responsivity vs. incident light power density of CsPbI<sub>3</sub>/ZnO photodetectors under 405 nm light illumination.



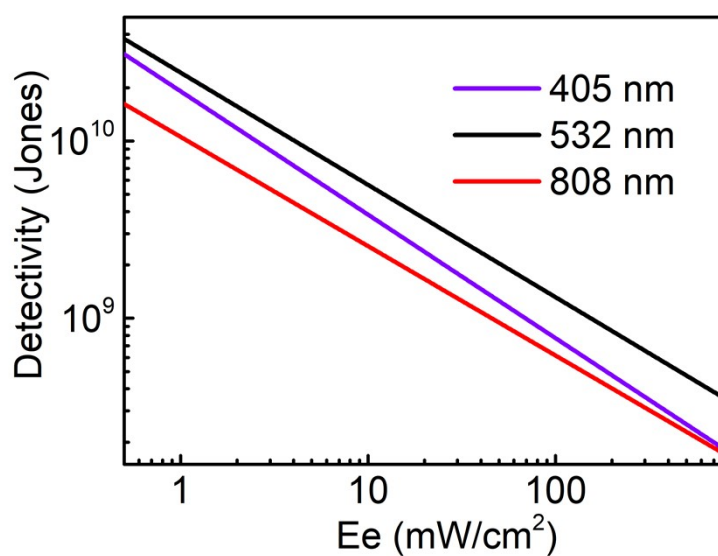
**Figure S9.** Detectivity vs. incident light power density of PbS QDs photodetectors under 405, 532, and 808 nm light illumination.



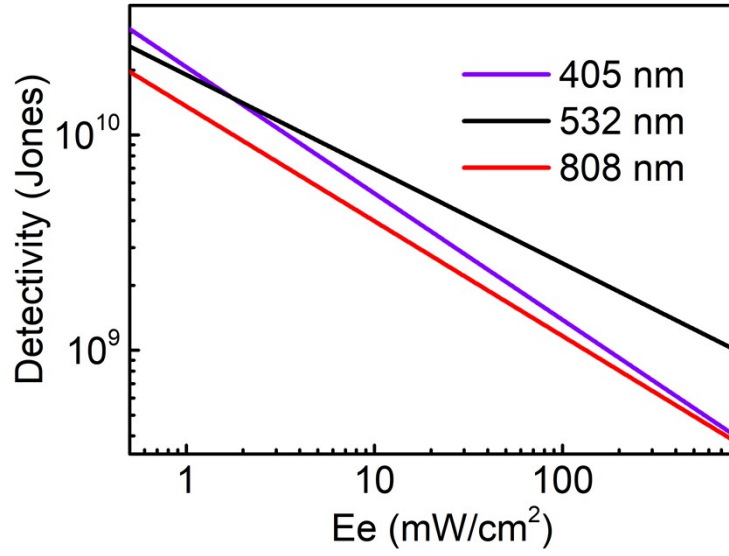
**Figure S10.** Detectivity vs. incident light power density of ZnO QDs photodetectors under 405 nm light illumination.



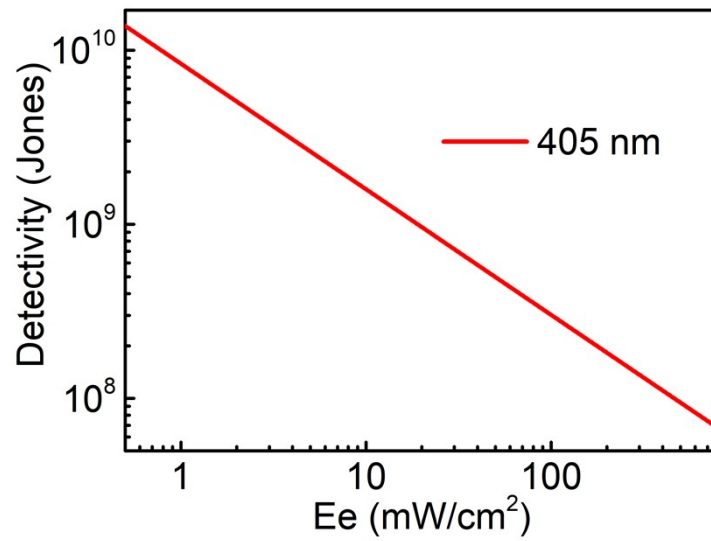
**Figure S11.** Detectivity vs. incident light power density of CsPbI<sub>3</sub> QDs photodetectors under 405 nm light illumination.



**Figure S12.** Detectivity vs. incident light power density of PbS/ZnO photodetectors under 405, 532 and 808 nm light illumination.

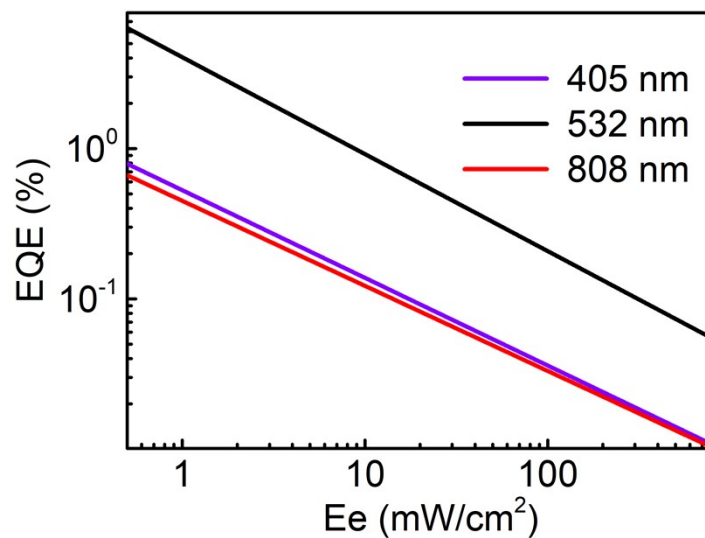


**Figure S13.** Detectivity vs. incident light power density of CsPbI<sub>3</sub>/PbS photodetectors under 405, 532 and 808 nm light illumination.

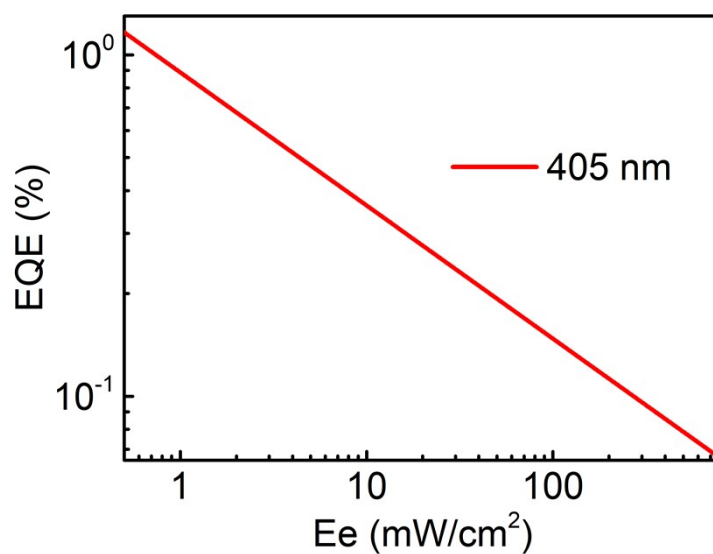


**Figure S14.** Detectivity vs. incident light power density of CsPbI<sub>3</sub>/ZnO photodetectors under 405 nm light illumination.

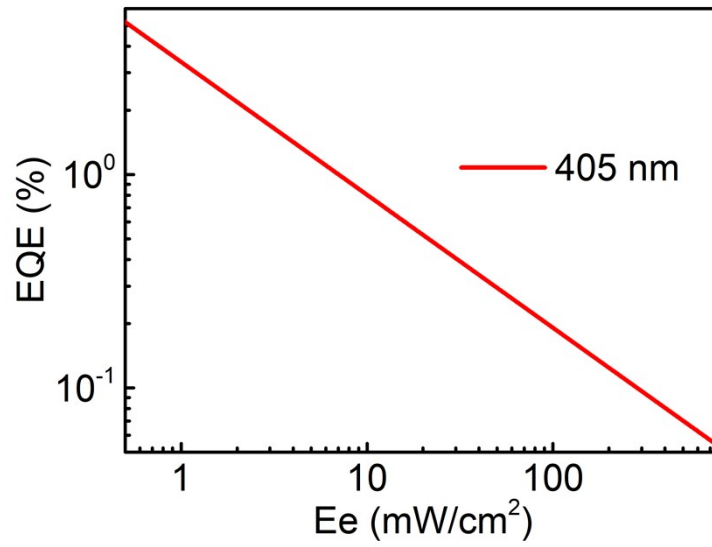




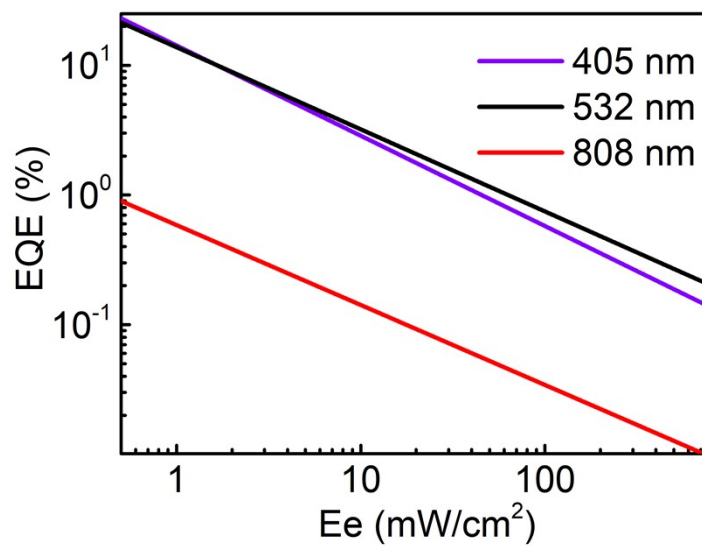
**Figure S15.** *EQE* vs. incident light power density of PbS QDs photodetectors under 405, 532 and 808 nm light illumination.



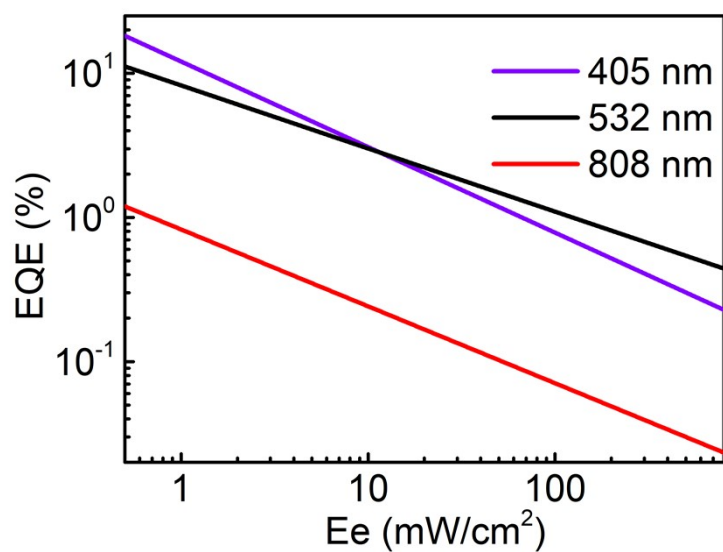
**Figure S16.** *EQE* vs. incident light power density of ZnO QDs photodetectors under 405 nm light illumination.



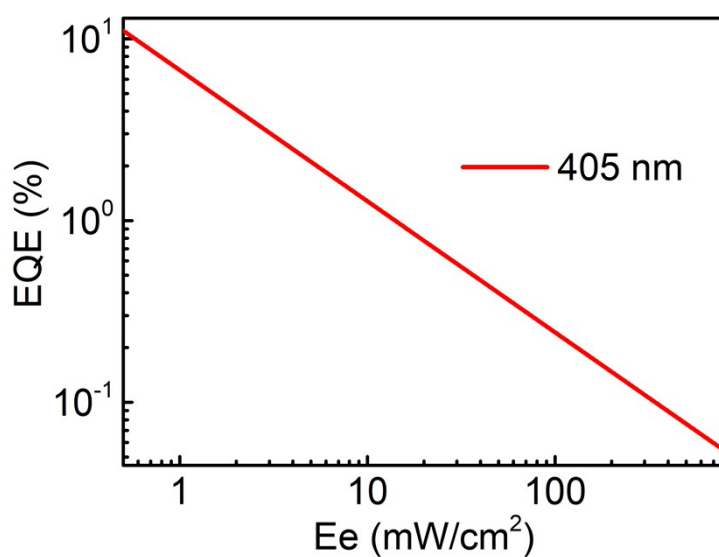
**Figure S17.** *EQE* vs. incident light power density of CsPbI<sub>3</sub> QDs photodetectors under 405 nm light illumination.



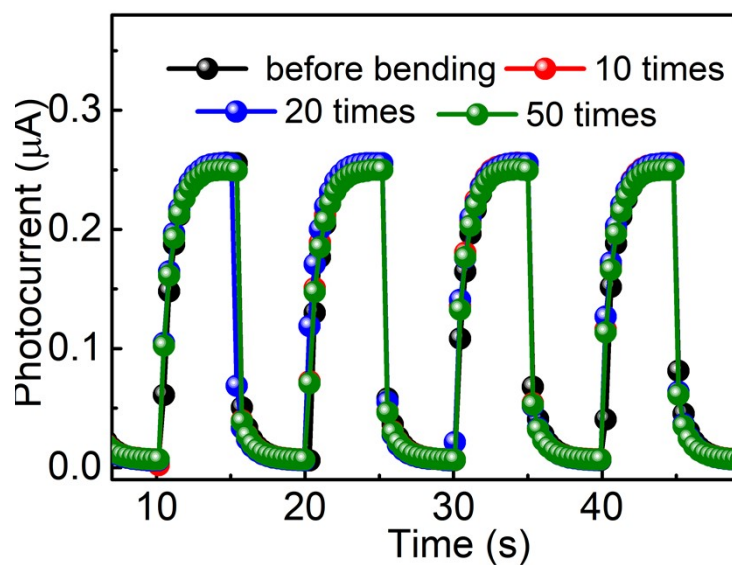
**Figure S18.** *EQE* vs. incident light power density of PbS/ZnO photodetectors under 405, 532 and 808 nm light illumination.



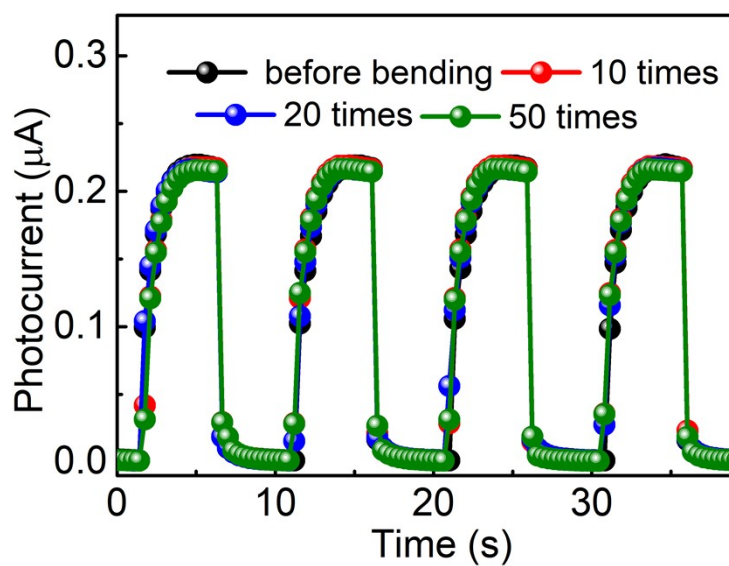
**Figure S19.** *EQE* vs. incident light power density of CsPbI<sub>3</sub>/PbS photodetectors under 405, 532 and 808 nm light illumination.



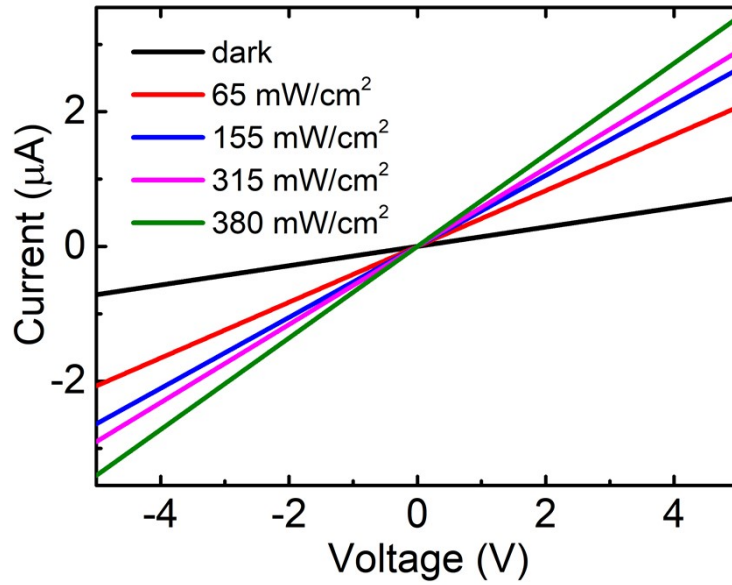
**Figure S20.** *EQE* vs. incident light power density of CsPbI<sub>3</sub>/ZnO photodetectors under 405 nm light illumination.



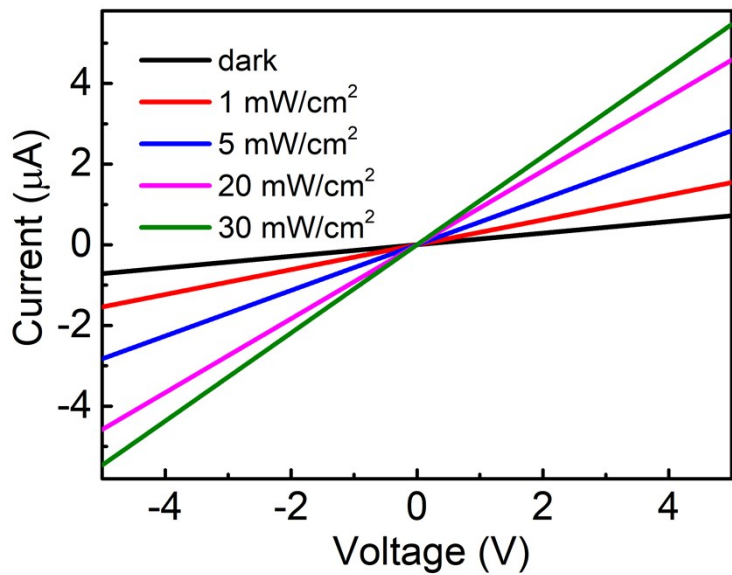
**Figure S21.** Time response curves of flexible CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 532 nm light illumination.



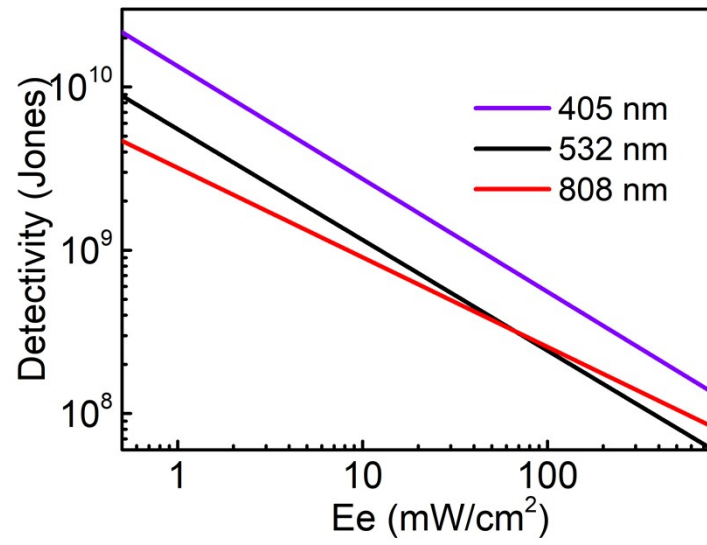
**Figure S22.** Time response curves of flexible CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 808 nm light illumination.



**Figure S23.** Output characteristics curves of flexible CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 532 nm light illumination.



**Figure S24.** Output characteristics curves of flexible CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 808 nm light illumination.



**Figure S25.** Detectivity vs. incident light power density of flexible CsPbI<sub>3</sub>/PbS/ZnO photodetectors under 405, 532 and 808 nm light illumination.