

Supporting information

Reconfigurable self-powered imaging photodetectors by reassembling and disassembling ZnO/perovskite heterojunction

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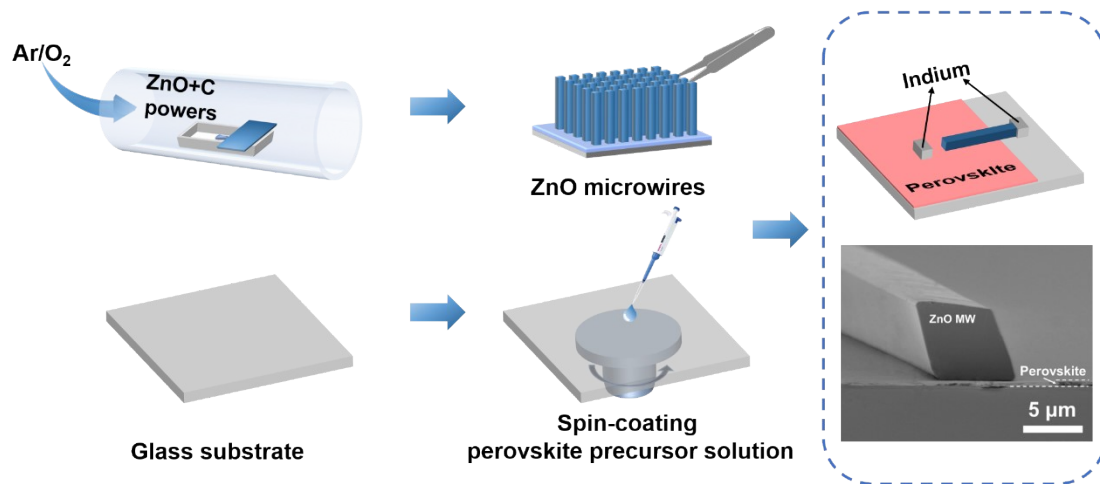


Fig. S1 Schematic illustration of the ZnO MW/Perovskite heterojunction fabrication process.

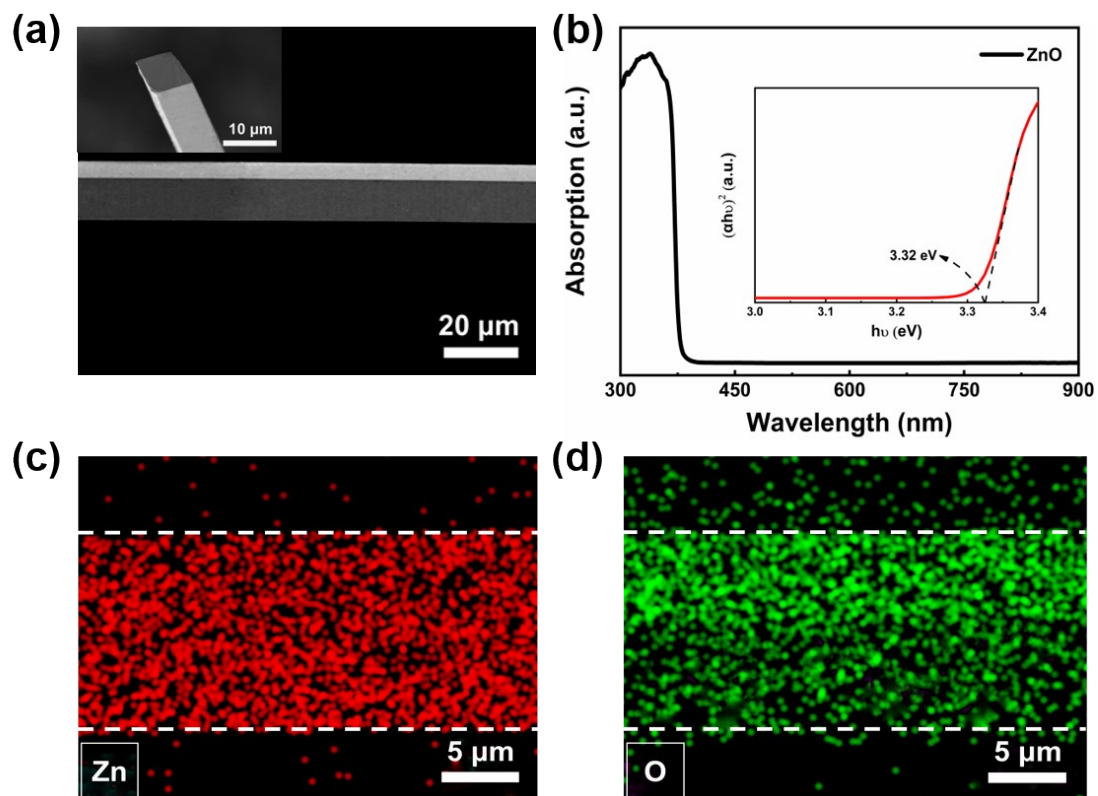


Fig. S2 (a) The SEM images of the ZnO MW, with the cross-section shown in the inset. (b) The optical absorption spectrum of the ZnO MW. The corresponding elemental mapping distributions of (c) Zn and (d) O in ZnO MW.

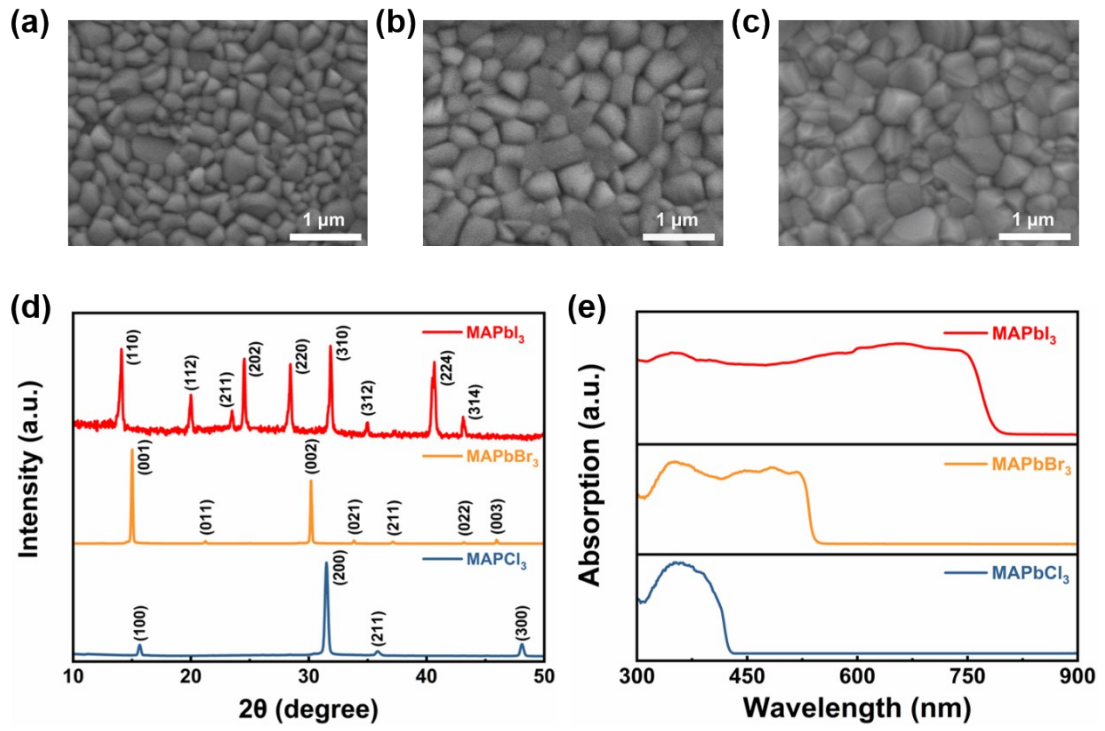


Fig. S3 (a-c) The SEM images of MAPbCl₃, MAPbBr₃ and MAPbI₃ film. (d) The XRD and (e) The absorption spectra of MAPbI₃, MAPbBr₃ and MAPbCl₃ film, respectively.

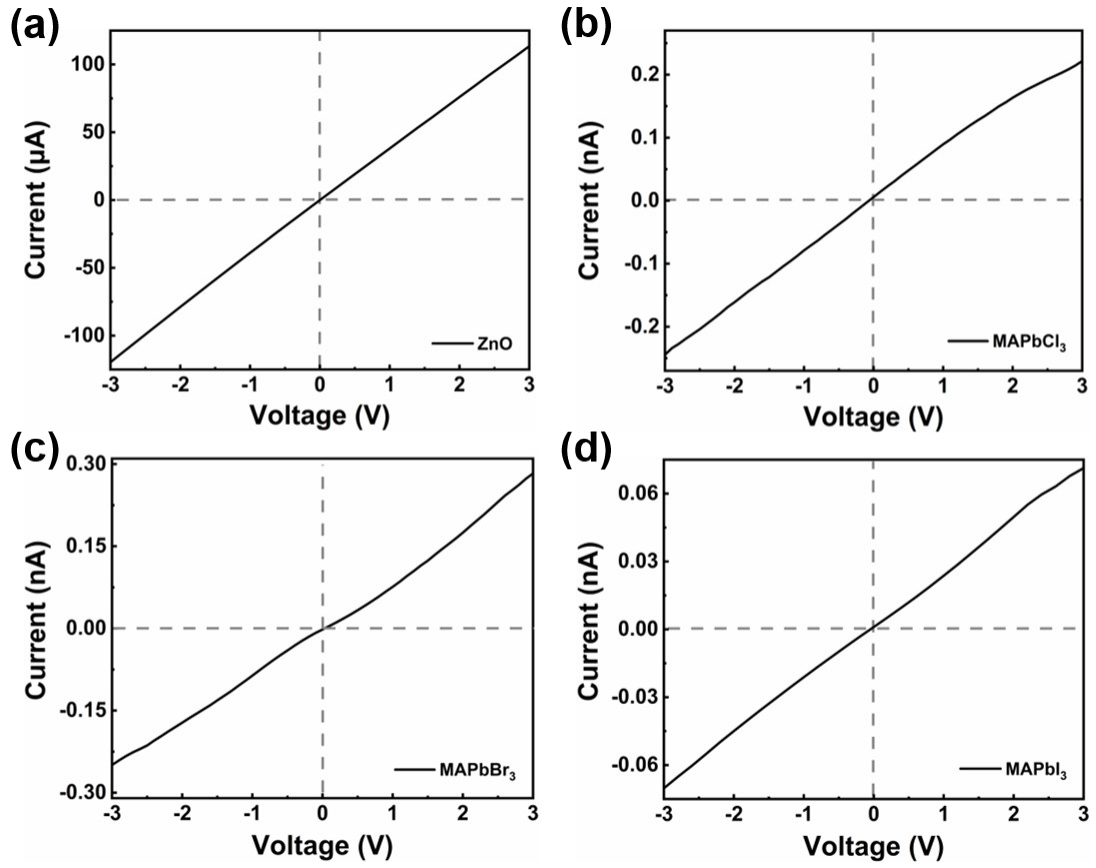


Fig. S4 The *I-V* curves of (a) Indium-ZnO MW-Indium, (b) Indium-MAPbCl₃-Indium, (c) Indium-MAPbBr₃-Indium and (d) Indium-MAPbI₃-Indium under dark.

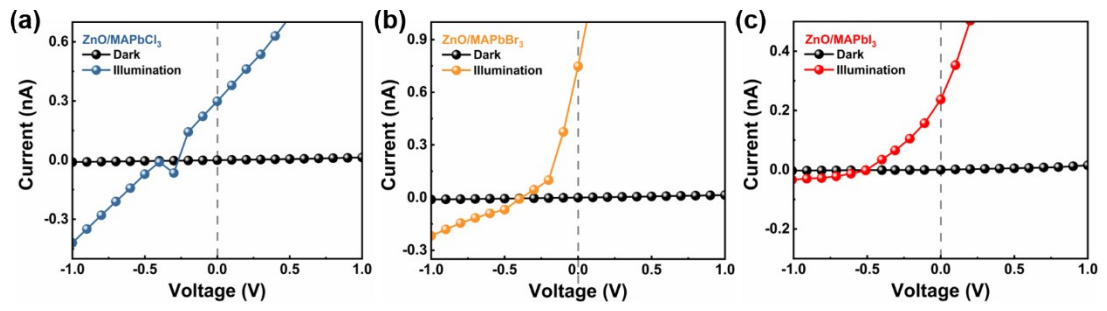


Fig. S5 The linear *I-V* curves of (a) ZnO MW/MAPbCl₃, (b) ZnO MW/MAPbBr₃ and (c) ZnO MW/MAPbI₃ in dark and under illumination (AM 1.5G, 100 mW cm⁻²) near the 0 V.

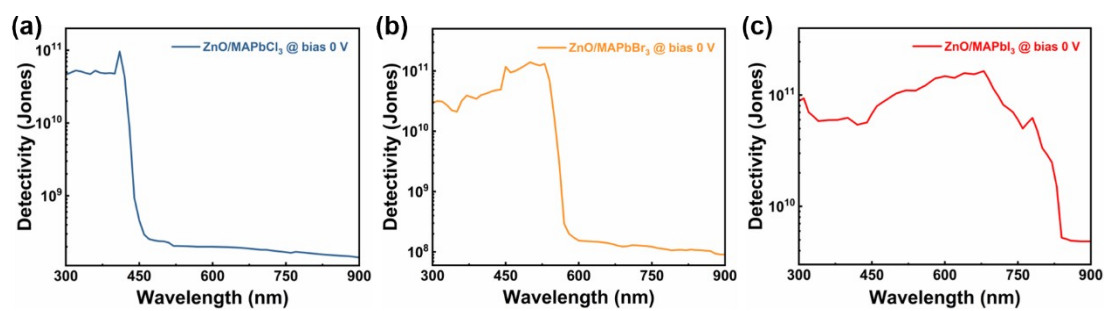


Fig. S6 (a-c) The detectivity spectrum of the ZnO MW/MAPbCl₃, ZnO MW/MAPbBr₃ and ZnO MW/MAPbI₃ heterojunction photodetector at 0 V.

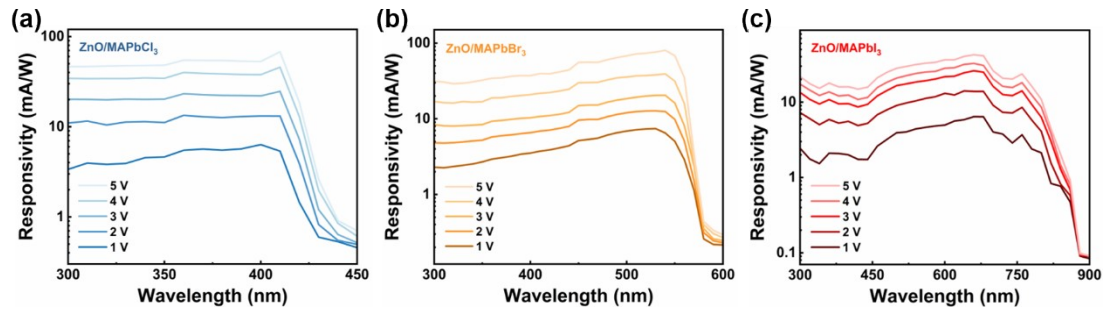


Fig. S7 (a-c) The photoresponse spectra of the ZnO MW/MAPbCl₃, ZnO MW/MAPbBr₃ and ZnO MW/MAPbI₃ heterojunction photodetector at different bias voltage.

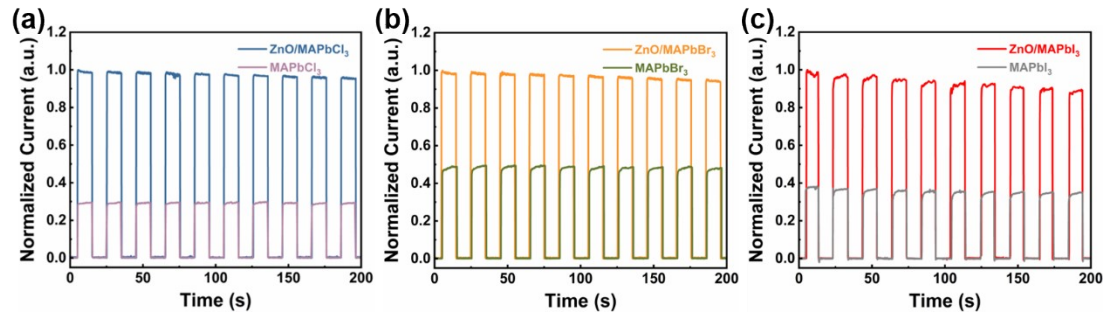


Fig. S8 (a-c) Time-dependent response of heterojunction and perovskite film photodetectors at 5 V under illumination (AM 1.5G, 100 mW cm⁻²).

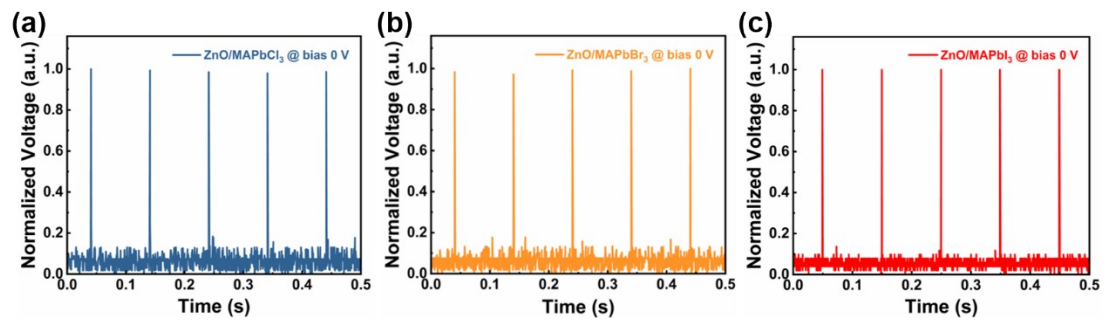


Fig. S9 (a-c) Transient photoresponse of the ZnO MW/MAPbCl₃, ZnO MW/MAPbBr₃ and ZnO MW/MAPbI₃ heterojunction photodetector at 0 V.

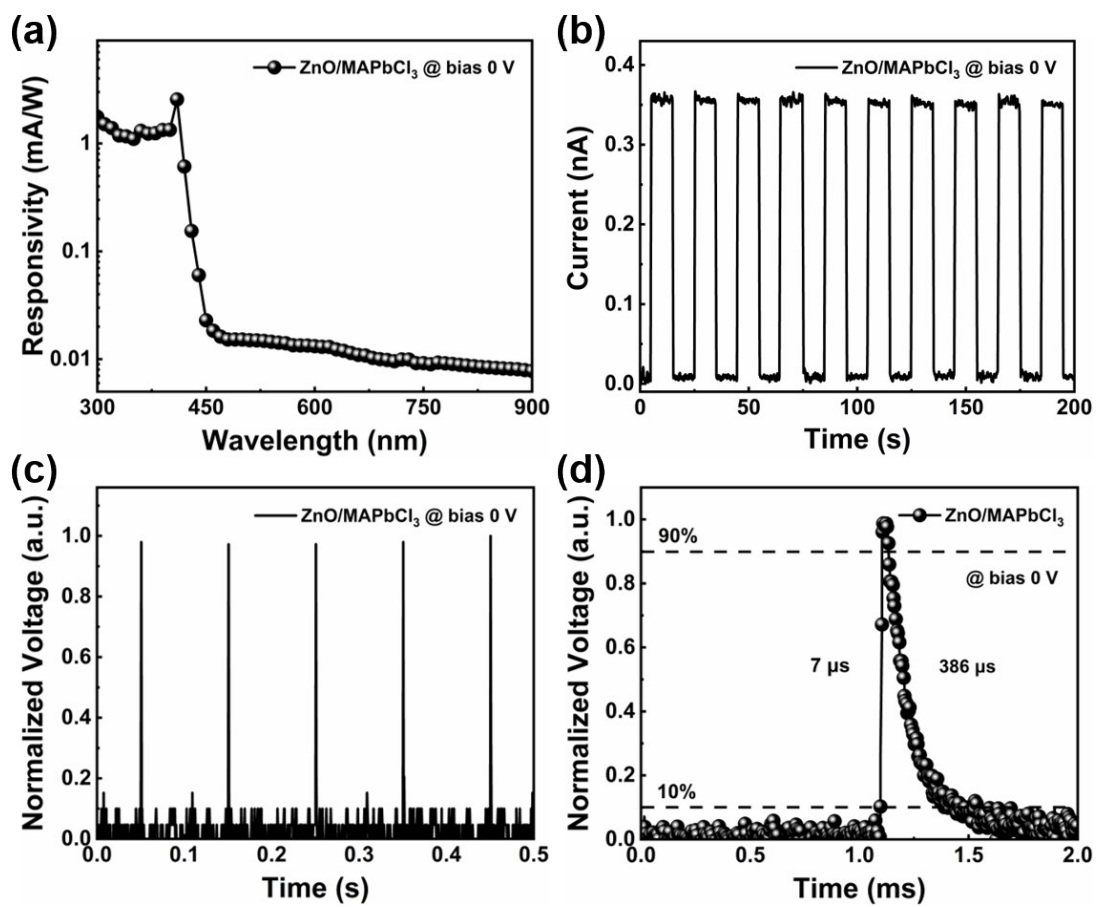


Fig. S10 (a) The responsivity spectra of the second reassembly ZnO MW/MAPbCl₃ at 0 V. (b) Time-dependent response of ZnO MW/MAPbCl₃ photodetectors at 0 V under illumination (AM 1.5G, 100 mW cm⁻²). (c) Transient photoresponse and (d) a single period transient photoresponse of the ZnO MW/MAPbCl₃ at 0 V under the excitation of 355 nm pulsed laser.



Fig. S11 The image for the object “heart” on black cardboard.