

Electronic Supplementary Information for

2D Ruddlesden-Popper Perovskite Sensitized SnP₂S₆ Ultraviolet

Photodetector Enabling High Responsivity and Fast Speed

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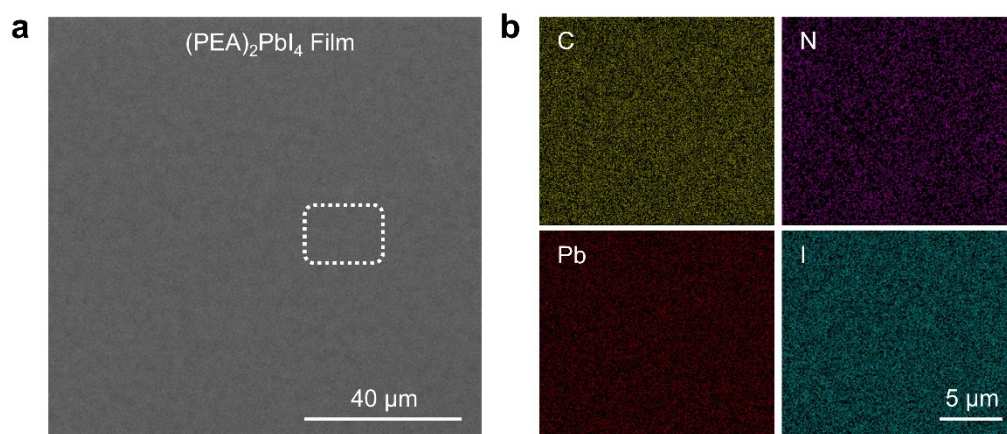


Fig. S1 (a) SEM image of (PEA)₂PbI₄ layer. (b) EDS mapping (C, N, Pb and I elements) of the white box area in (a).

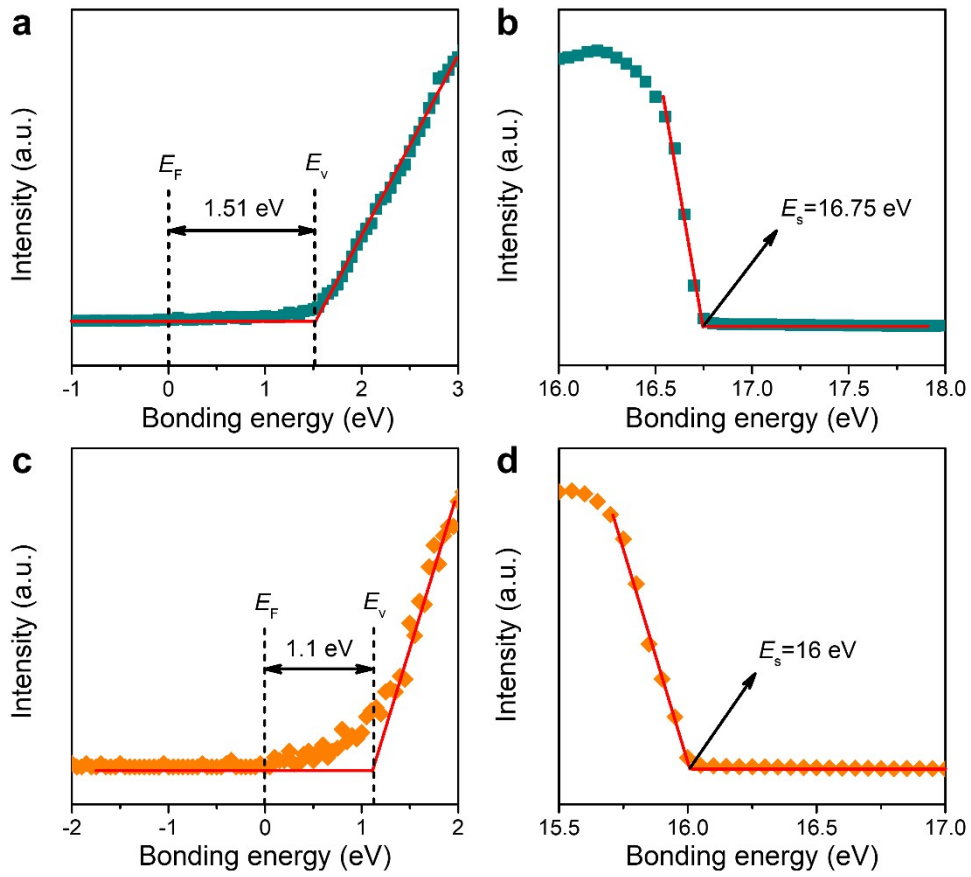


Fig. S2 UPS of (a-b) SnP_2S_6 and (c-d) $(\text{PEA})_2\text{PbI}_4$, displaying the valence band spectra and secondary electron cut-off edge.

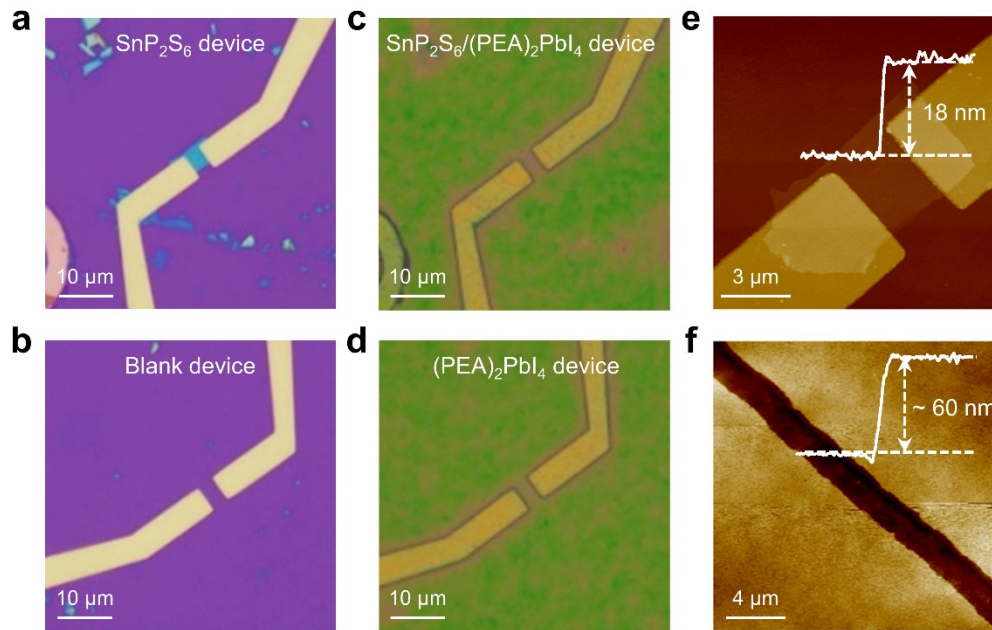


Fig. S3 (a-b) Optical images of SnP₂S₆ device and blank device. (c-d) Optical images of SnP₂S₆ device and blank device after spin-coating (PEA)₂PbI₄. (e-f) AFM images of SnP₂S₆ device and (PEA)₂PbI₄ film.

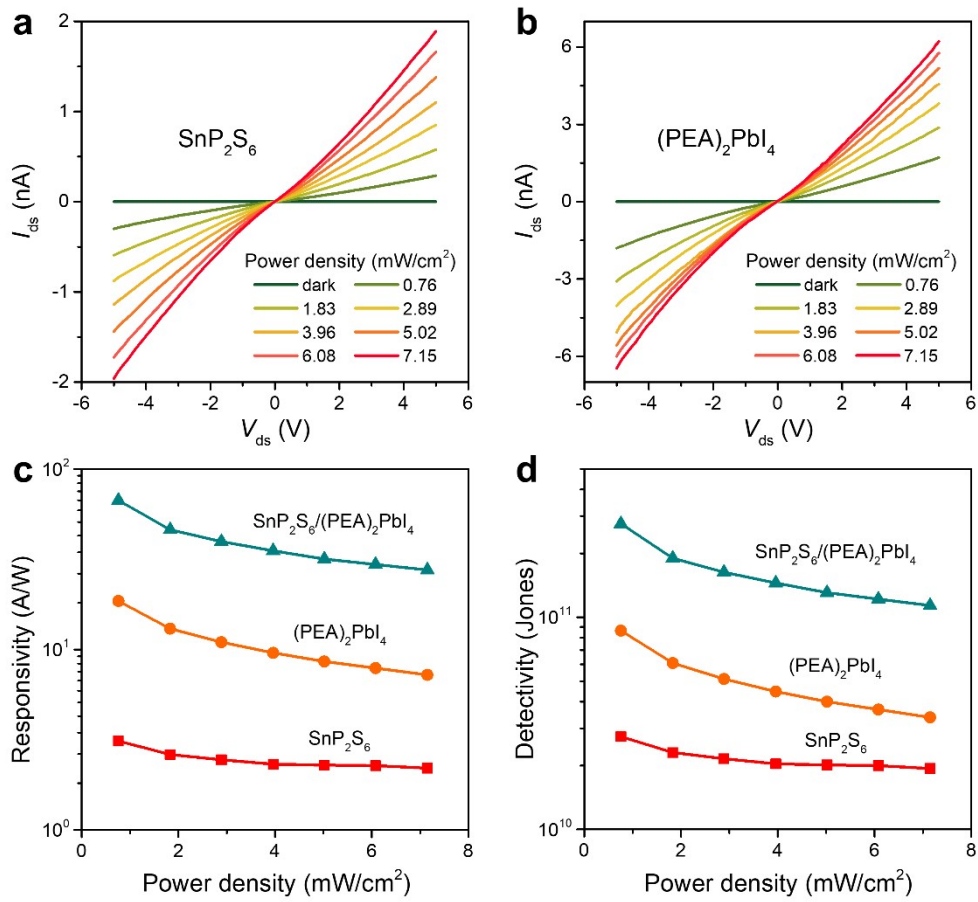


Fig. S4 (a-b) I_{ds} - V_{ds} curves of pure SnP_2S_6 device and pure $(\text{PEA})_2\text{PbI}_4$ device in the dark and under 365 nm laser illumination with various power densities. (c-d) Responsivity and detectivity comparison of SnP_2S_6 , $(\text{PEA})_2\text{PbI}_4$ and $\text{SnP}_2\text{S}_6/(\text{PEA})_2\text{PbI}_4$ heterojunction at $V_{ds} = 5$ V.

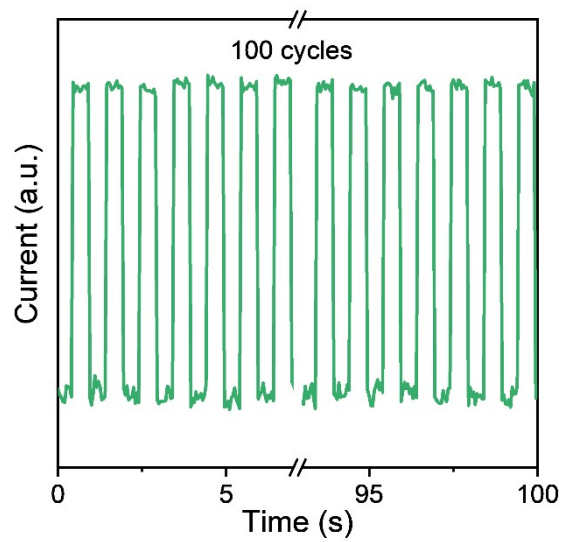


Fig. S5 Time resolved photoresponse of the heterojunction device after 2-weeks storage in the glove box.

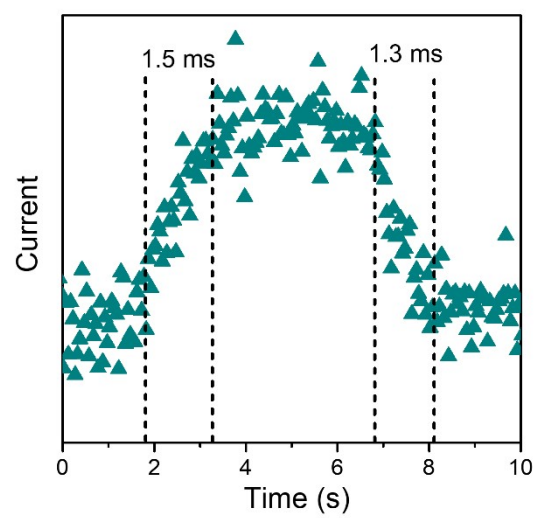


Fig. S6 Response time of pure SnP₂S₆ device under 365 nm pulsed laser.

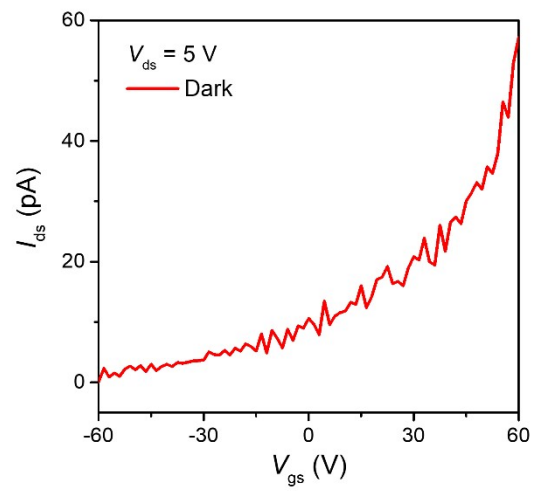


Fig. S7 Transfer characteristic curve of SnP₂S₆/(PEA)₂PbI₄ heterojunction device under dark condition.