

Two-dimensional PtSe₂ thin-film coupled with graphene/Si Schottky-junction for high performance photodetector

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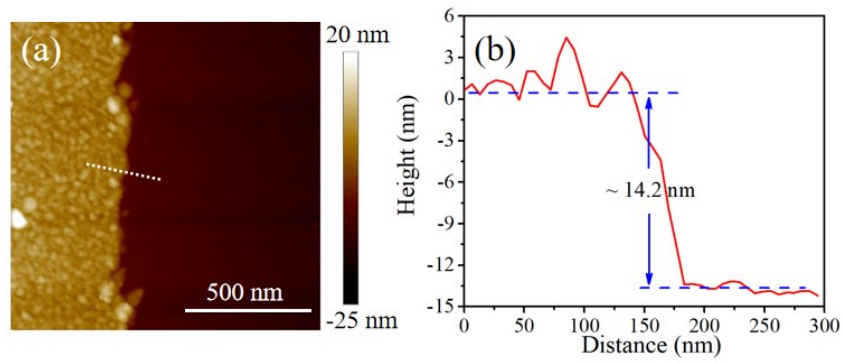


Fig. S1 (a) AFM image of PtSe₂ film. (b) The height profile along the white line marked in (a).

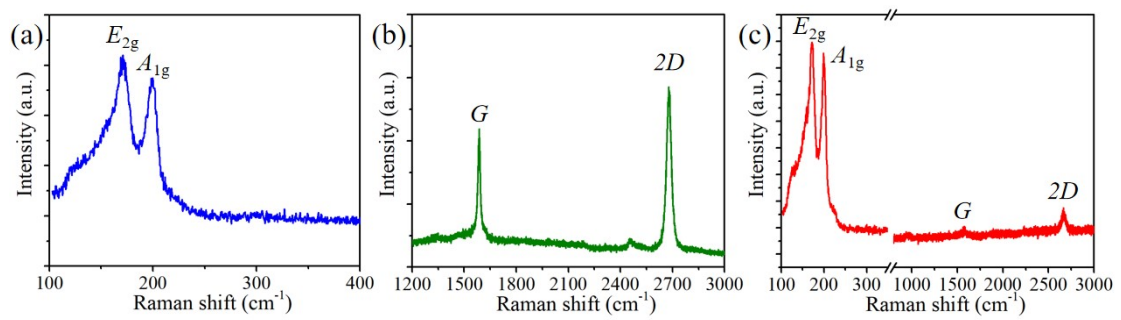


Fig. S2 Raman spectra of (a) PtSe₂, (b) graphene, and (c) PtSe₂/graphene heterojunction.

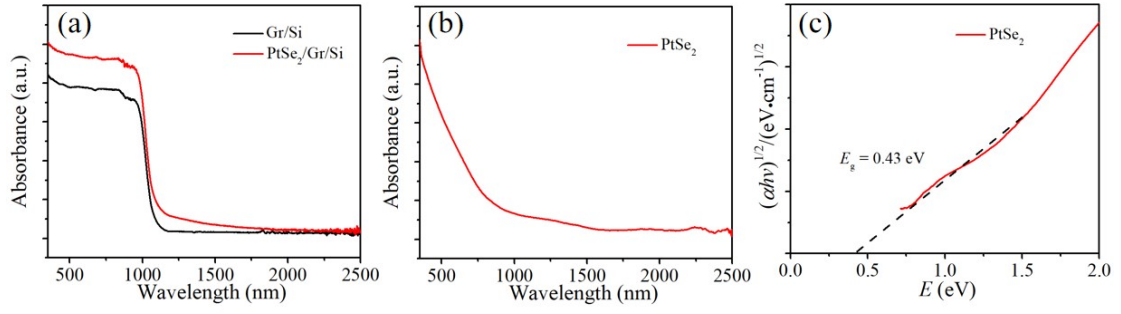


Fig. S3 UV-VIS-NIR absorption spectra of (a) Gr/Si and PtSe₂/Gr/Si heterojunction, and (b) PtSe₂ film. (c) Tauc plot of PtSe₂ film showing the bandgap of 0.43 eV.

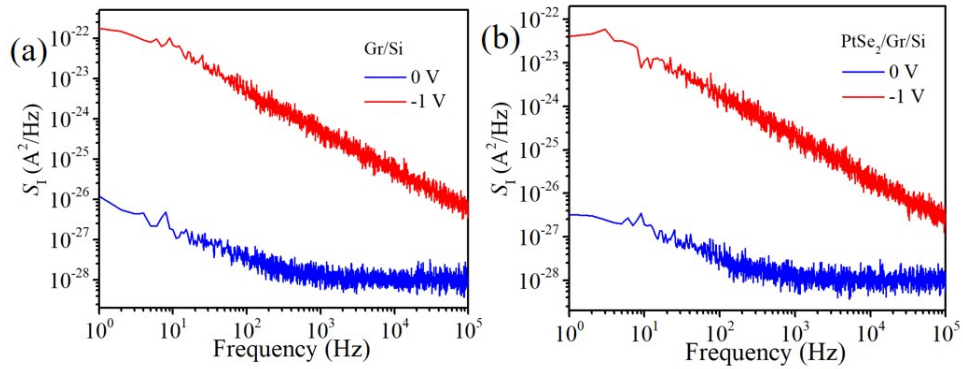


Fig. S4 The noise density spectra of (a) Gr/Si and (b) PtSe₂/Gr/Si devices as a function of frequency.

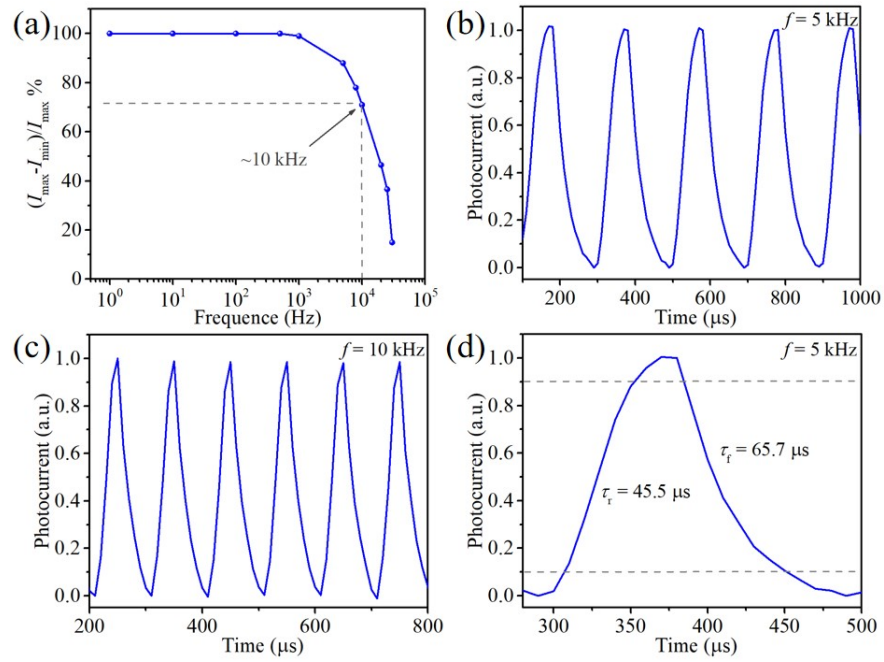


Fig. S5 (a) Relative balance of $(I_{\max} - I_{\min})/I_{\max}$ versus different frequencies of Gr/Si device under 808 nm illumination. Normalized photoresponse of Gr/Si PD with various laser frequencies of (b) 5, and (c) 10 kHz. (d) Response speed of Gr/Si PD extracted at 5 kHz. All the measurements were carried out at a bias voltage of -1 V.