

High-performance broadband phototransistor array of PdSe₂/SOI

Schottky junction

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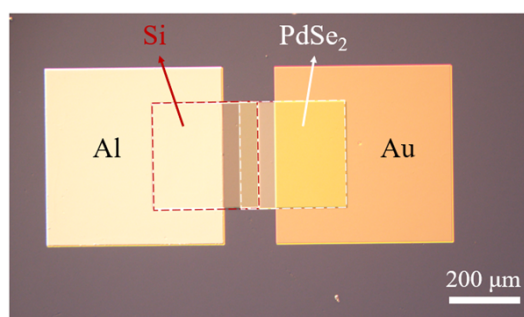


Fig. S1 Optical image of the fabricated PdSe₂/Si phototransistor.

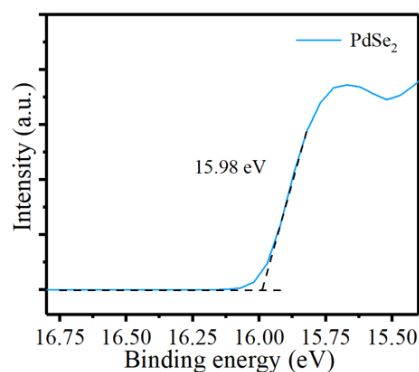


Fig. S2 UPS spectra of PdSe₂ film. The calculation formula of Fermi energy level of PdSe₂ is as

follows: $E_f = 21.22 \text{ eV} - 15.98 \text{ eV} = 5.24 \text{ eV}$.

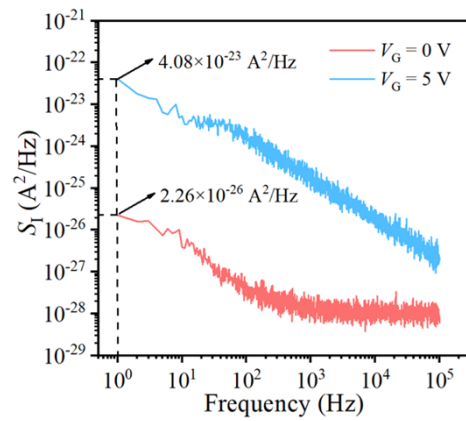


Fig. S3 Noise spectral density versus frequency for PdSe₂/Si phototransistor at gate voltages of 0 V and 5 V.

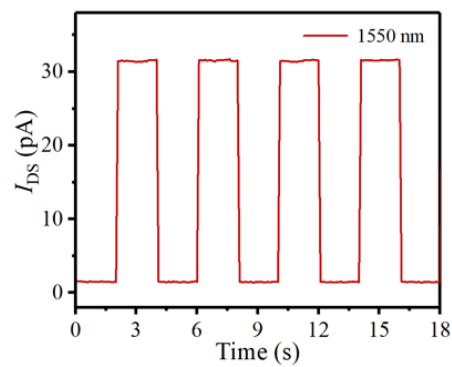


Fig. S4 Time-dependent photocurrent of PdSe₂/Si phototransistor under 1550 nm illumination at $V_G = 0 \text{ V}$ and $V_{DS} = 0 \text{ V}$.

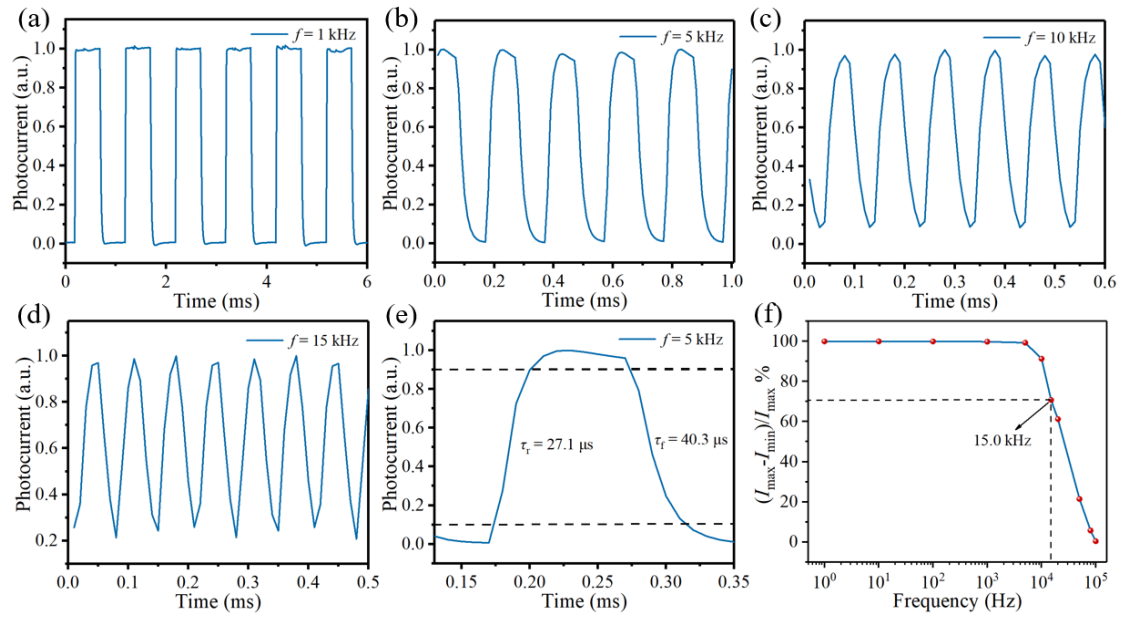


Fig. S5 Photoresponse characteristics of PdSe₂/Si phototransistor to pulsed light irradiation at frequencies of (a) 1 kHz, (b) 5 kHz, (c) 10 kHz and (d) 15 kHz under 808 nm illumination. (e) Rising and falling edges for estimating the rise time (τ_r) and the fall time (τ_f) of PdSe₂/Si phototransistor at pulsed light frequency of 5 kHz under 808 nm illumination ($V_G = 0$ V and $V_{DS} = 0$ V). (f) Frequency response characteristic of PdSe₂/Si phototransistor.