

Electronic Supplementary Information (ESI)

CdS Nanobelt Based Self-powered Flexible Photodetectors with High Photosensitivity

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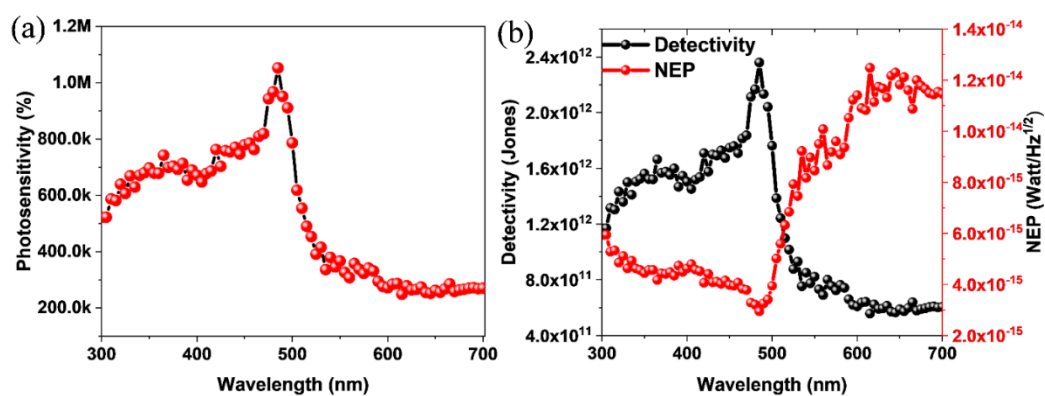


Figure S1. (a) Photosensitivity of CdS nanobelt device measured in the wavelength range of 300 to 700 nm with fixed light intensity of $215 \mu\text{W}/\text{cm}^2$. (b) D^* and NEP plots of CdS nanobelt photodetector as a function of wavelength.

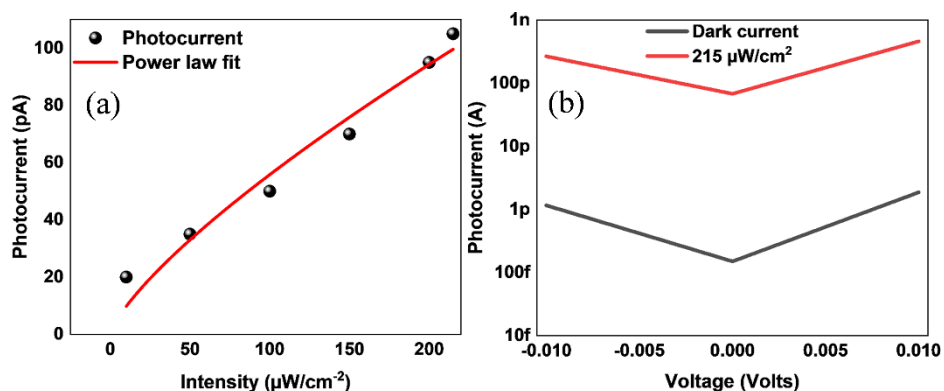


Figure S2. (a) Photocurrent reliance on light power density at bias of 0 V. The obtained fitting value of θ is 0.95 ($I \sim P^{0.95}$). (b) Corresponding semi-logarithmic I-V plot of FSPD from Figure 5b.

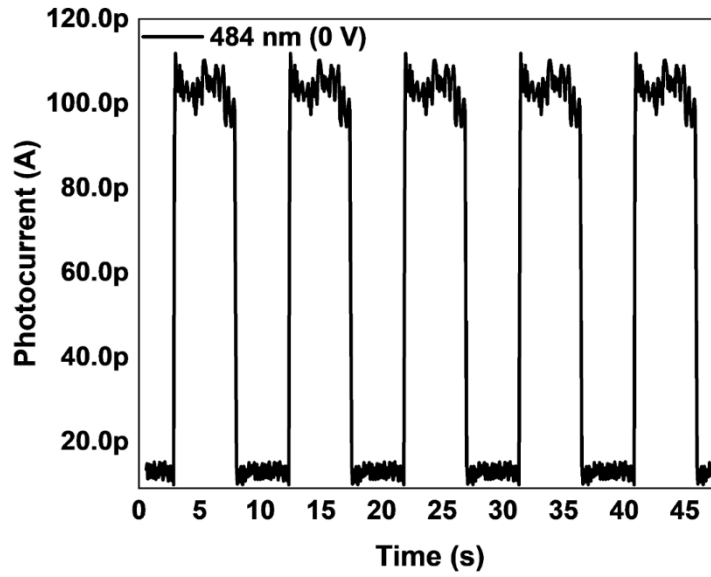


Figure S3. Photoswitching photocurrent of the photodetector at zero bias under 484 nm illumination with a fixed light intensity of $215 \mu\text{W}/\text{cm}^2$.

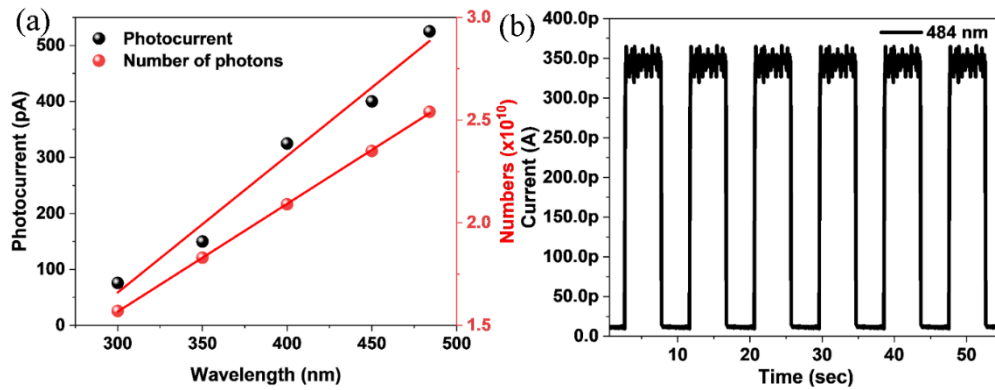


Figure S4. (a) Photocurrent and number of photons of the device over varied wavelength of light and the linear correlation coefficient (R^2) of the curve is 0.99. The number of photons with different wavelengths was obtained according to the formula $P.S=N.h.c/\lambda$, where P , S , N , h , c and λ are the light power density, the effective area under irradiation, the number of incident photons, Planck's constant, the velocity of light, and the wavelength of illuminated light, respectively [1]. (b) Photoswitching photocurrent of the flexible device at low bias under 484 nm illumination with a fixed light intensity of $215 \mu\text{W}/\text{cm}^2$. When turn on the illumination, photocurrent rises and the τ_r is less than 80 ms. When turn off the illumination, the photocurrent drops to zero nearly, and the τ_f is less than 50 ms.

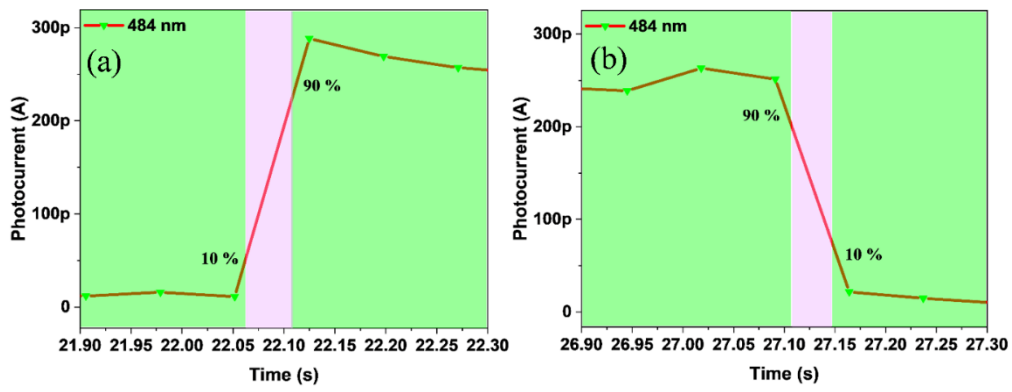


Figure S5. corresponding rise and fall time obtained from selected cycle from Figure 4b. The rise and fall time were found ~40 ms and 30 ms, respectively.

References

- [1] G. Li, L. Liu, G. Wu, W. Chen, S. Qin, Y. Wang, T. Zhang, Self-Powered UV-Near Infrared Photodetector Based on Reduced Graphene Oxide/n-Si Vertical Heterojunction, *Small* 12 (2016) 5019-5026.