https://doi.org/10.1007/s11467-023-1323-1

RESEARCH ARTICLE

High-sensitive two-dimensional PbI_2 photodetector with ultrashort channel

Kaiyue He[1,2*], Jijie Zhu[1*], Zishun Li[2], Zhe Chen[2], Hehe Zhang[1], Chao Liu[1], Xu Zhang[1], Shuo Wang[1], Peiyi Zhao[1], Yu Zhou[1], Shizheng Zhang[1], Yao Yin[1,†], Xiaorui Zheng[2,‡], Wei Huang[1], Lin Wang[1,§]

[1]School of Flexible Electronics (Future Technologies) & Institute of Advanced Materials (IAM), Key Laboratory of Flexible Electronics (KLOFE), Jiangsu National Synergetic Innovation Center for Advanced Materials (SICAM), Nanjing Tech University, Nanjing 211816, China
[2]Research Center for Industries of the Future (RCIF), School of Engineering, Westlake University, Hangzhou 310030, China
Corresponding authors. E-mail: †iamyyin@njtech.edu.cn, ‡zhengxiaorui@westlake.edu.cn, §iamlwang@njtech.edu.cn
*These authors contributed equally to the work.
Received March 8, 2023; accepted May 12, 2023

Supporting Information

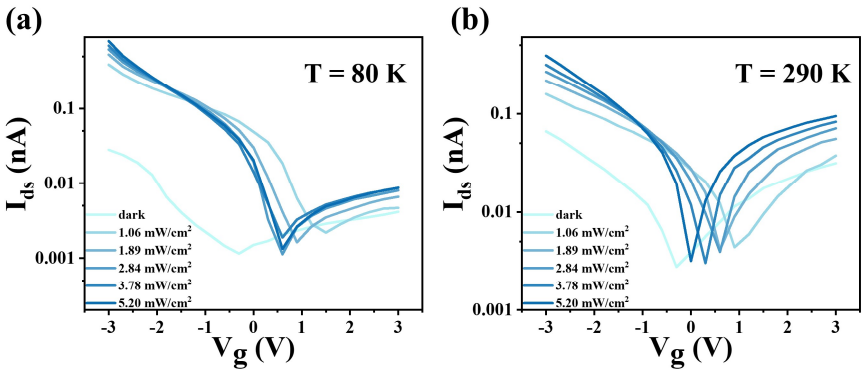

Fig. S1 Transfer curves of the PbI_2 ultrashort channel photodetector with a V_{ds} of 3 V at **(a)** 80 K and **(b)** 290 K. The wavelength of the incident laser is 405 nm. I_{ds}-V_g trace shifts under different incident power densities.

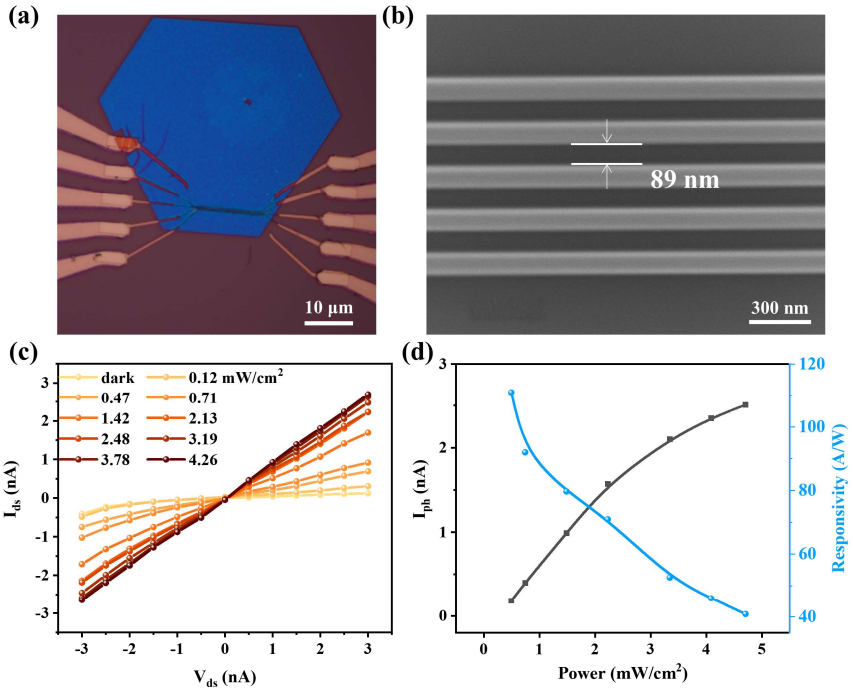

Fig. S2 Photodetection performance of PbI_2 photodetector with 89 nm channel length. **(a)** The optical image of the device. **(b)** SEM image of electrodes with a spacing of 89 nm. **(c)** *I-V* characteristics in the dark and under different incident power densities. **(d)** Responsivity as a function of incident power density.

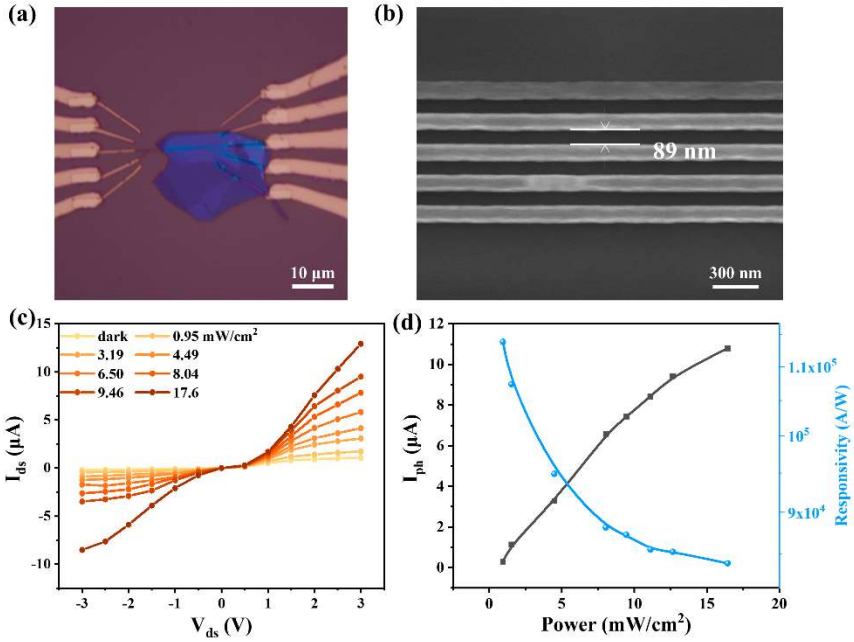

Fig. S3 Photodetection performance of MoS_2 photodetector with 89 nm channel length. **(a)** The optical image of the device. **(b)** SEM image of electrodes with a spacing of 89 nm. **(c)** *I-V* characteristics in the dark and under different incident power densities. **(d)** Photocurrent and responsivity as a function of incident power density.