Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

A Self-Encapsulated Broadband Phototransistor Based on the Hybrid of Graphene and Black Phosphorus Nanosheets

Guigang Zhou,[a] Zhongjun Li,[b] Yanqi Ge,[b] Han Zhang[b] and Zhenhua Sun*[a]

[a] College of Physics and Optoelectronic Engineering, Shenzhen University, Shenzhen 518060, China. E-mail: szh@szu.edu.cn.

[b] Shenzhen Engineering Laboratory of Phosphorene and Optoelectronics, Key Laboratory of Optoelectronic Devices and Systems of Ministry of Education and Guangdong Province, Shenzhen University, Shenzhen 518060, China.

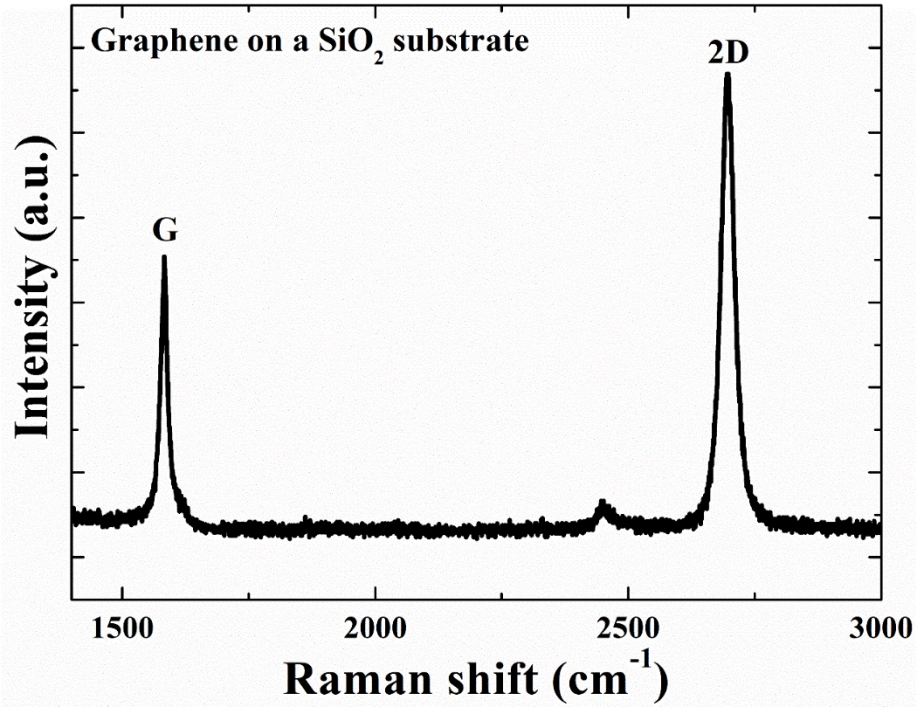

Figure S1. Raman spectrum of graphene on SiO2 substrate.

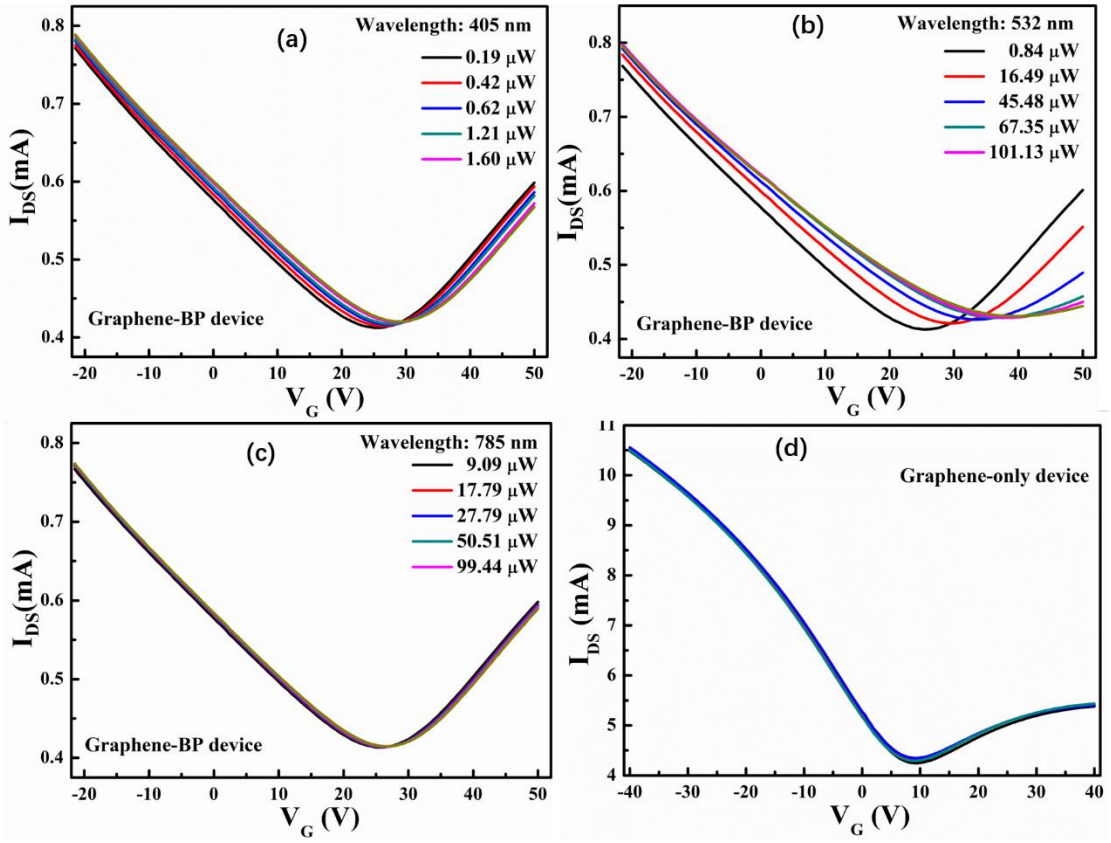

Figure S2. Transfer characteristics (V_{DS}=0.1 V) of the phototransistor based on graphene-BP characterized under different radiant fluxes with the wavelengths of a) 405 nm, b) 532 nm, and c) 785 nm; d) Transfer characteristics (V_{DS}=0.5 V) of the phototransistor without BP nanosheets under the illuminaiton of four different light sources with each the highest intensity.

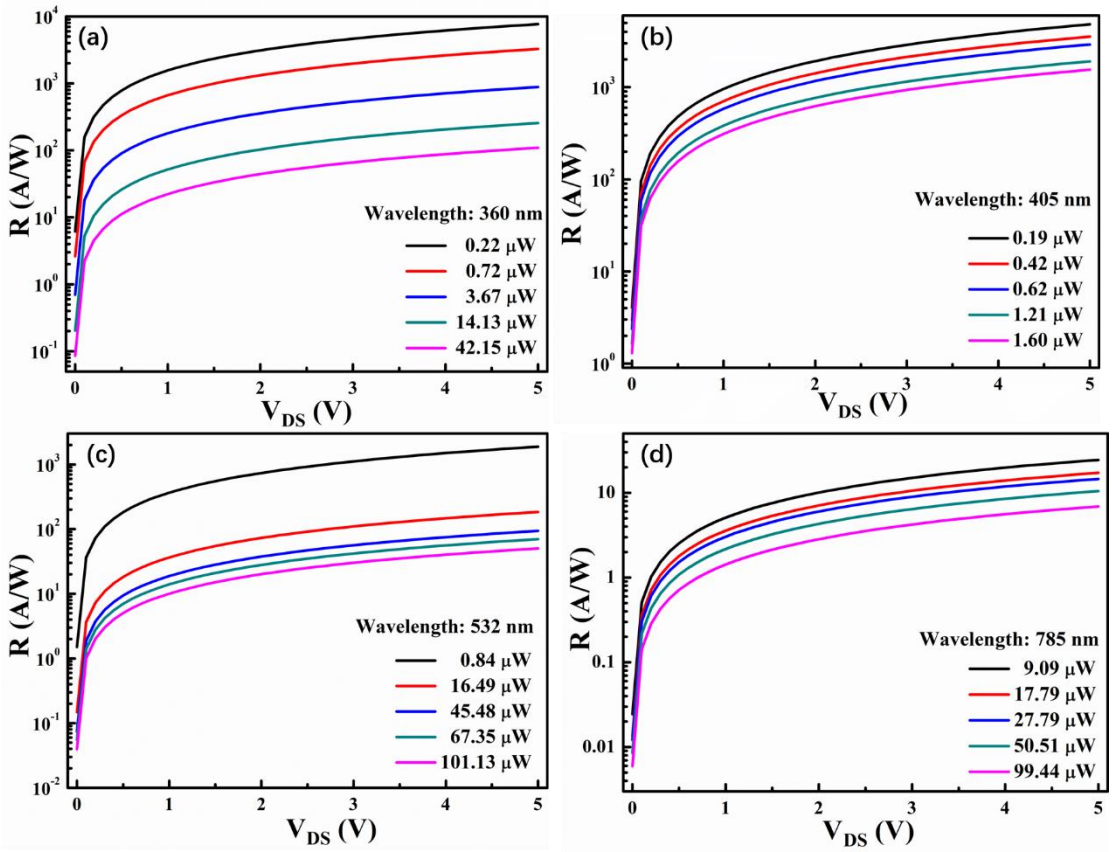

Figure S3. Responsivities as functions of V_{DS} ($R \sim V_{DS}$, $V_G = 0$) with different radiant fluxes for light of a) 360 nm, b) 405 nm, c) 532 nm, and d) 785 nm.