Supporting Information for

Trap-induced Photoresponse of Solution–Synthesized MoS_2

Youngbin Lee[1†], Jaehyun Yang[2†], Dain Lee[1], Yong–Hoon Kim[1,2], Jin-Hong Park,[3] Hyoungsub Kim[2*] and Jeong Ho Cho[1,4*]

[1]SKKU Advanced Institute of Nanotechnology (SAINT), [2]School of Advanced Materials Science and Engineering, [3]School of Electronics and Electrical Engineering, [4]School of Chemical Engineering, Sungkyunkwan University, Suwon 440-746, Korea.

[†]These authors equally contributed to this work.
*Corresponding authors: jhcho94@skku.edu and hsubkim@skku.edu

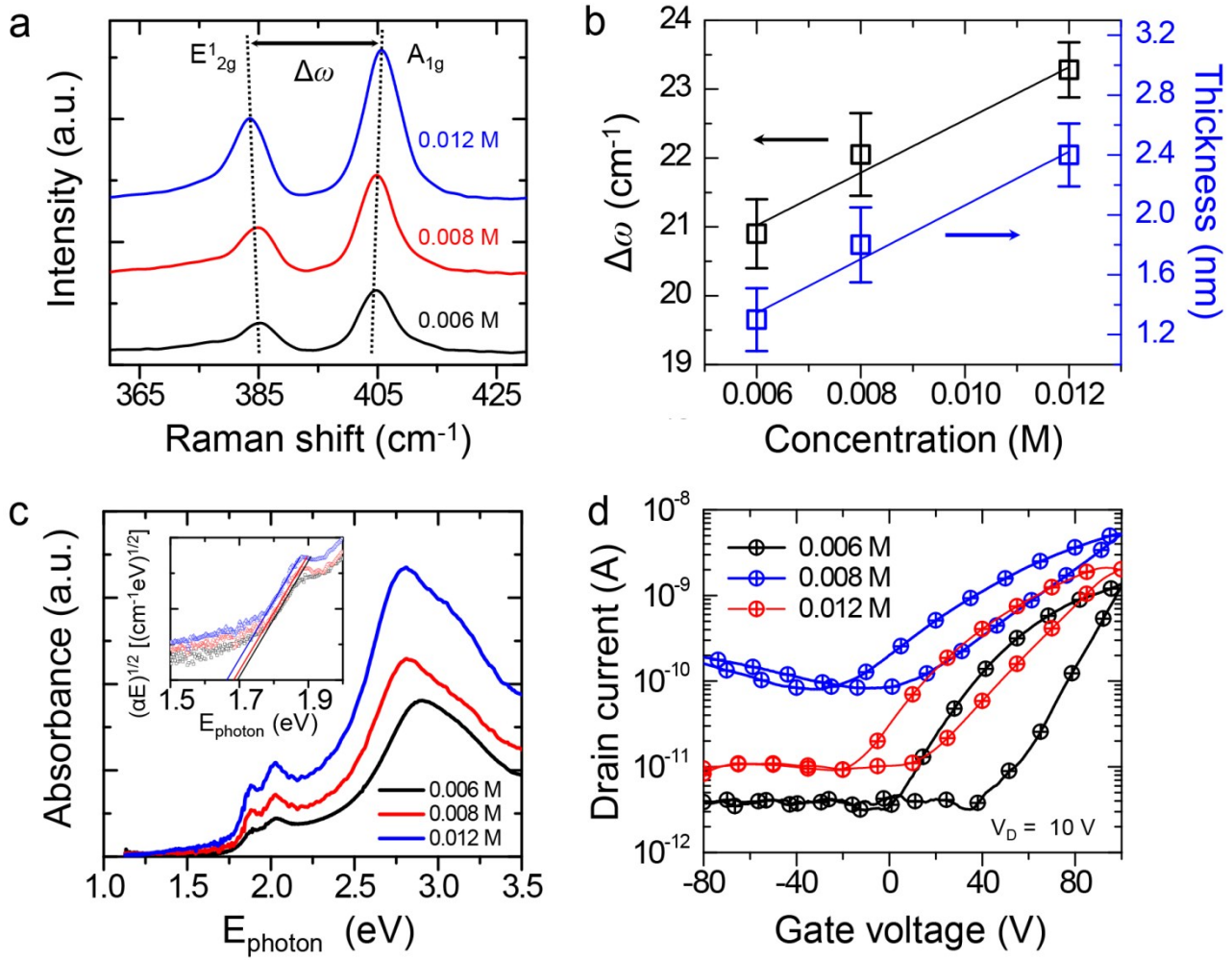

Figure S1. (a) Raman spectra of solution-synthesized MoS_2 films with different precursor concentrations. (b) Relative peak position difference ($\Delta\omega$) between two major Raman modes and AFM thickness of solution-synthesized MoS_2 films as a function of precursor concentrations. (c) UV-Vis absorption spectroscopy of solution-synthesized MoS_2 films with different precursor concentrations. (d) Transfer characteristics of solution-synthesized MoS_2 phototransistor with respect to different channel thickness at a fixed drain voltage of 10 V.

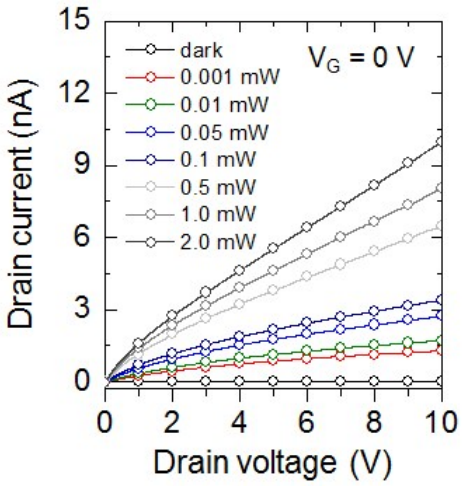

Figure S2. Output characteristics of the solution–synthesized MoS_2 phototransistors as a function of illumination power at a fixed incident illumination wavelength of 520 nm.

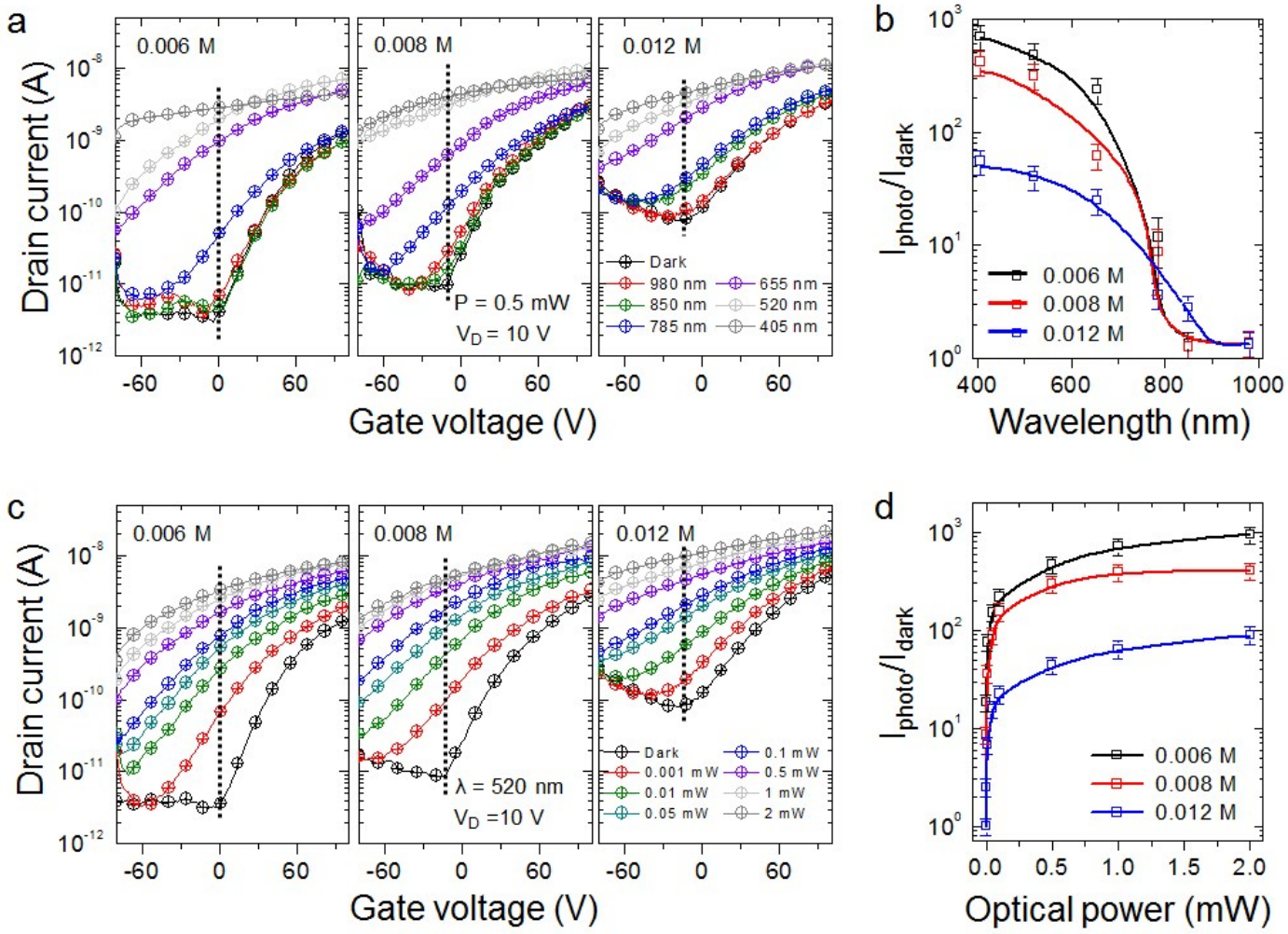

Figure S3. (a) MoS_2 channel thickness dependent transfer characteristics (V_D = 10 V) of the phototransistors under different illumination wavelengths at a fixed incident illumination power of 0.5 mW. (b) Photo-induced on/off ratio at V_G = 0 V of the phototransistors with different MoS_2 channel thickness as a function of the illuminated wavelength. (c) MoS_2 channel thickness dependent transfer characteristics (V_D = 10 V) of the phototransistors under different illumination powers at a fixed wavelength of 520 nm. (d) Photo-induced on/off ratio (at V_D = 0 V) of the phototransistors as a function of the illumination power.