Electronic Supplementary Material (ESI) for Nanoscale.
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Supporting Information:

MoS_2-on-paper optoelectronics: drawing photodetectors with van der Waals semiconductors beyond graphite

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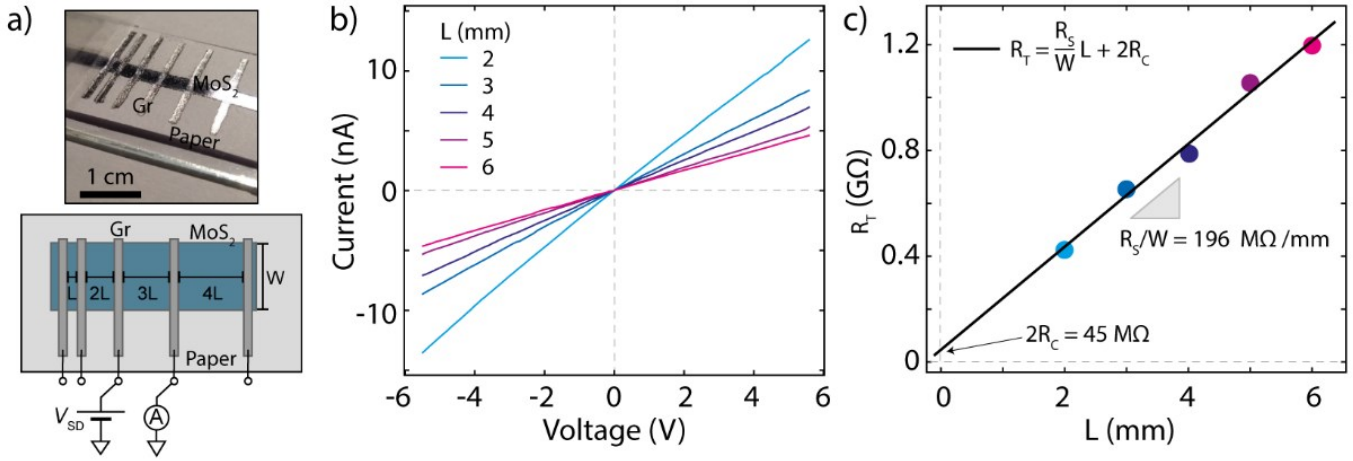

Figure S1. Contact resistance measurement though the transfer length method. (a) Picture and scheme of the fabricated device. The width (W) of the MoS_2 strip is 2 mm. (b) *IV* characteristics measured for different channel lengths. (c) Resistance *vs.* channel length. The experimental data follows a linear trend and the contact resistance can be found from the crossing of the linear trend with the vertical axis.

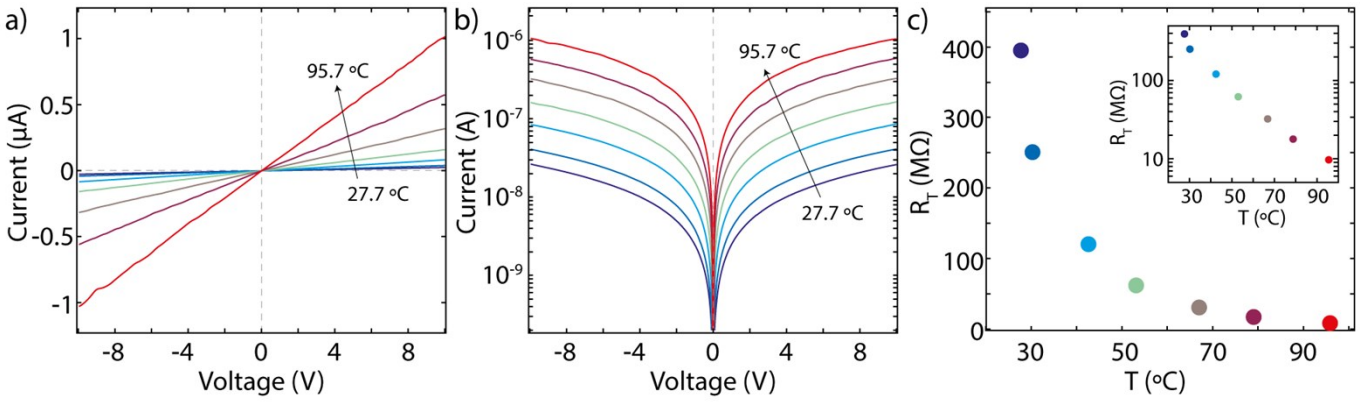

Figure S2. Temperature dependent electrical characteristics. (a) *IV* characteristics of a MoS_2 photodetector device acquired at different temperatures. (b) Absolute value of the current (in logarithmic scale) *vs.* bias voltage at different temperatures. This representation allows to better resolve the electrical characteristics change upon heating. (c) Resistance as a function of the temperature. (Inset in c) semilogarithmic plot of the temperature dependence of the resistance where the exponential decay of the resistance with temperature is evident.

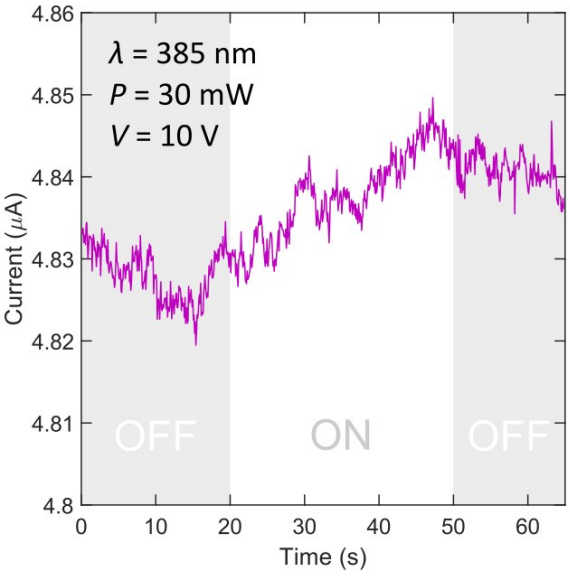

Figure S3. Current flowing across a graphite-on-paper device (similar to that shown in Figure 1 but with graphite channel instead of MoS_2), at a fixed bias voltage V = 10V, as a function of time while a 385 nm illumination source is switched ON and OFF. The graphite channel has been fabricated in a similar manner to the MoS_2 device.

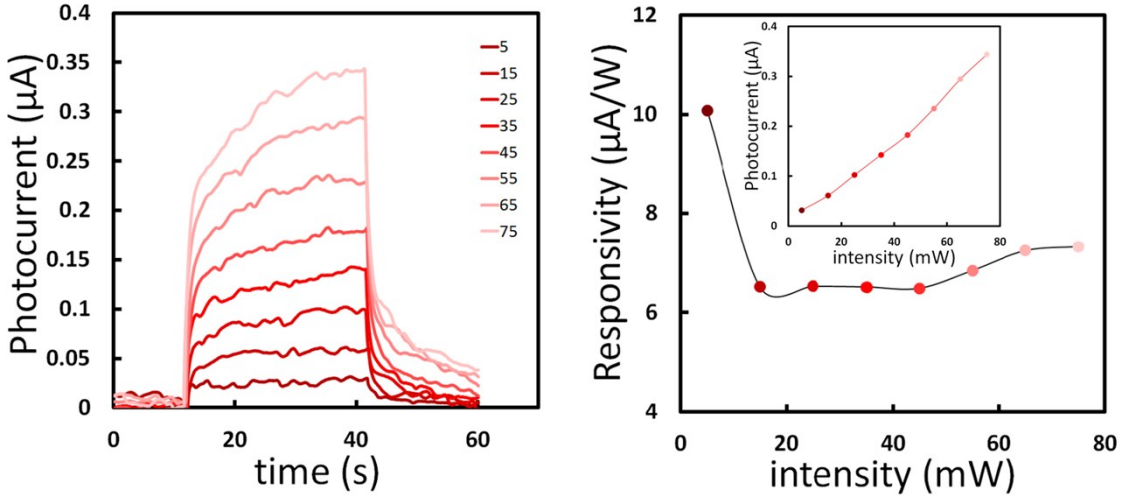

Figure S4. Photoresponse measured at 70 ºC. (left) Power dependence of the photocurrent (at a fixed bias voltage V = 20 V, wavelength λ = 660 nm and temperature T = 70 ºC). Illumination power ranges from 5 mw to 75 mW. (right) Responsivity as a function of the incident power showing a rather constant value around 7 μA/W. (inset) Photocurrent *vs*. incident power relationship.