Sensitized monolayer MoS$_2$ phototransistors with ultrahigh responsivity

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Fig. S1 (a) Transfer characteristics ($I_{sd}$-$V_g$) of the pure-few-layer MoS$_2$ based phototransistors under dark and light illumination in log scale. (b) The corresponding transfer curves in linear scale of y-axis. (c, d) Output characteristics $I_{sd}$-$V_{sd}$ of few-layer MoS$_2$ device in dark and light illumination states in log and linear scale of y-axis, respectively. (e) Temporal response of the pure-few-layer MoS$_2$ at different back gate and a bias voltage $V_{sd}$ of 1 V.
Fig. S2 (a) Responsivity and (b) photocurrent of pure-few-layer MoS$_2$ phototransistors at different back gate voltage and a bias voltage $V_{sd}$ of 1 V as a function of light power density, respectively. Compared with the sensitized-MoS$_2$, the pure-few-layer MoS$_2$ device also exhibits a smaller responsivity and photocurrent at $V_{sd} = 1$ V.

Fig. S3 (a) The output curves ($I_{sd}$-$V_{sd}$) of pure-monolayer MoS$_2$ device under dark and 14.4 mW/cm$^2$ illumination intensities for different back gate $V_g$ in log scale. (b) Corresponding output curves with linear scale of y-axis. It can be observed that the drain current under both dark and illumination is also much smaller than that in sensitized-MoS$_2$ device.