# Supporting Information

**Title**
**Light-Activated Electric Bistability for Evaporated Silver Nanoparticles in Organic Field-Effect Transistor**

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## EXPERIMENTAL SECTION

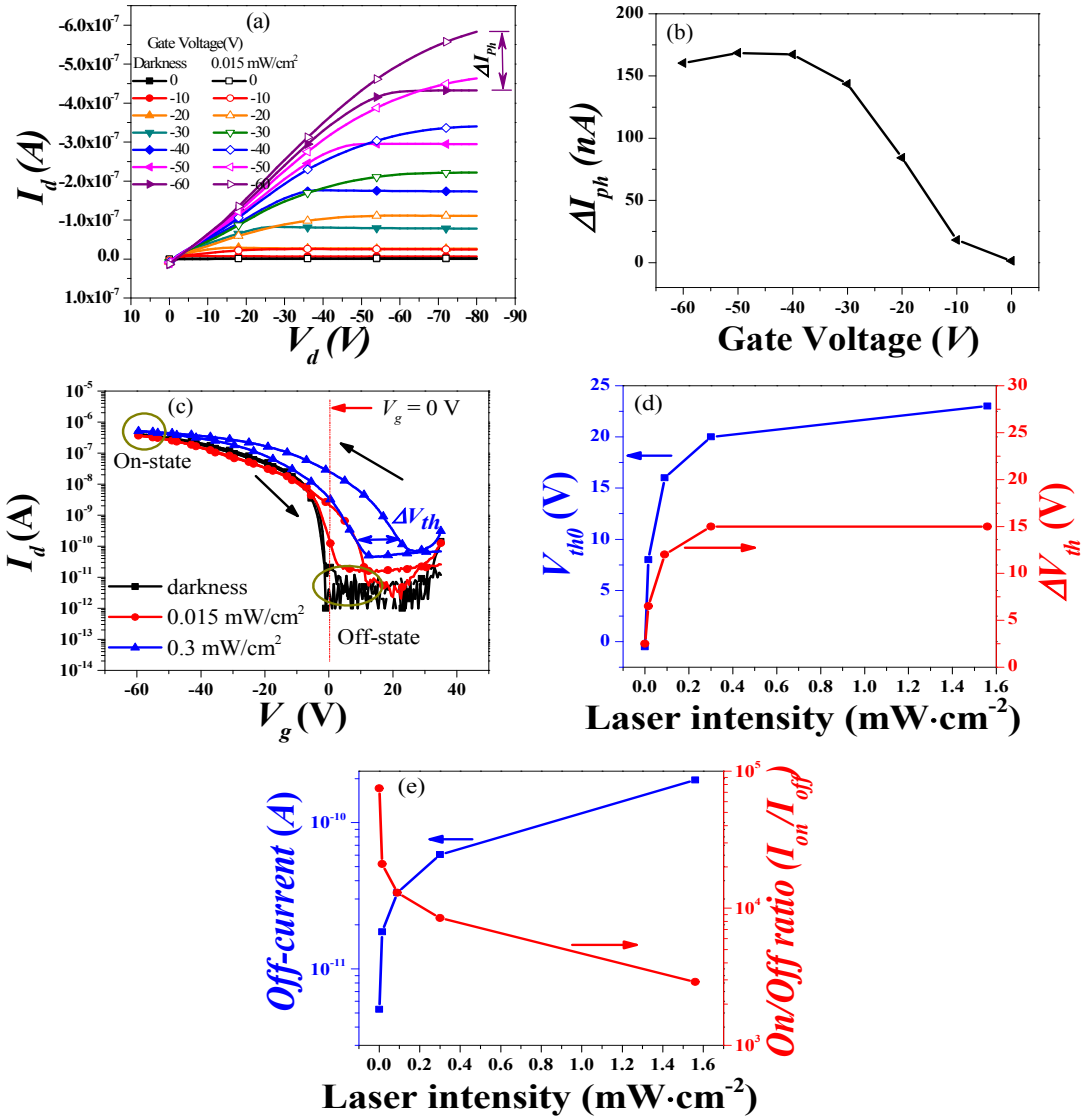


**Figure S1.** (a) the contrastive output characteristics curves of 20 nm-thick PMMA of OFETs device without Ag-NPs (logogram as control device ) in dark and under weak photo-irradiation (0.015 mW/cm$^2$), (b) the $\Delta I_{Ph}$ value of control device as a function of gate voltage under photo-irradiation, (c) the transfer *I-V* characteristics curves of control device. (d) The $V_{th0}$ and $\Delta V_{th}$ of control device variation as a function of laser intensity. (e) The Off-current and On/Off ratio of control device variation as a function of laser intensity.

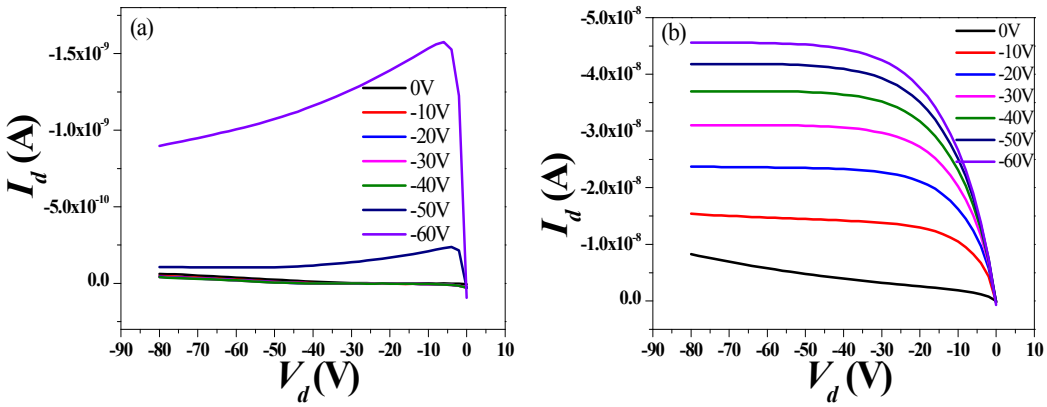


**Figure S2.** The output characteristics curves of 5 nm-thick PMMA of Ag-NPs device embedded with 6 nm-thick Ag-NPs.(a) in dark and (b) under photo-irradiation (10.42 mW/cm$^2$).

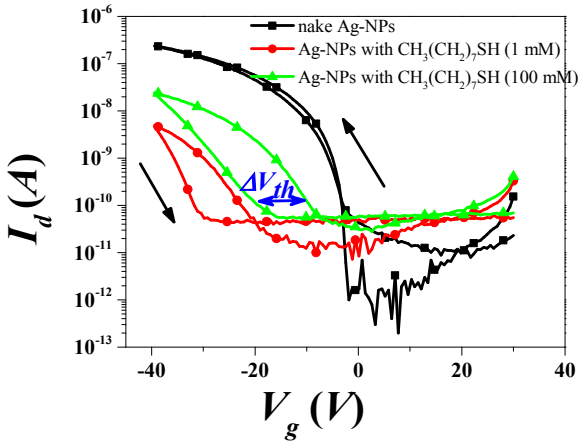


**Figure S3.** The transfer *I-V* characteristics curves of 30 nm-thick PMMA of Ag-NPs device embedded with 2 nm-thick Ag-NPs (possessing surface modification or not) in dark. The black line represents the device embedded with naked Ag-NPs; the red line represents the device with Ag-NPs having been immersed in a 1 mM ethanol solution of $CH_3(CH_2)_7SH$; the green line represents the device with Ag-NPs immersed in a 100 mM ethanol solution of $CH_3(CH_2)_7SH$. With the purpose of surface modification, the nanoparticle-decorated substrates were immersed in an ethanol solution of $CH_3(CH_2)_7SH$ with different concentration for 12h for SAM formation.

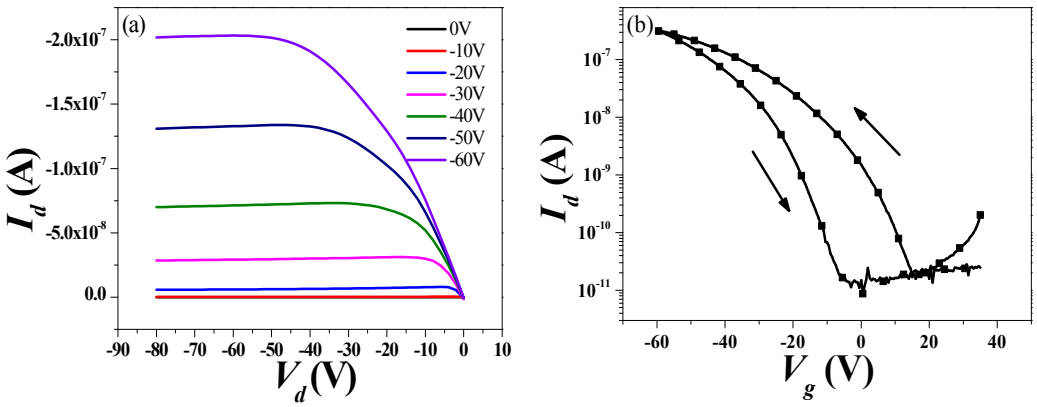


**Figure S4.** The output characteristics curves (a) and transfer *I-V* characteristics curves (b) of 20 nm-thick PMMA of Ag-NPs device embedded with 6 nm-thick Ag-NPs (logogram as Ag-NPs (6nm) device) under weak photo-irradiation (0.015 mW/cm$^2$).

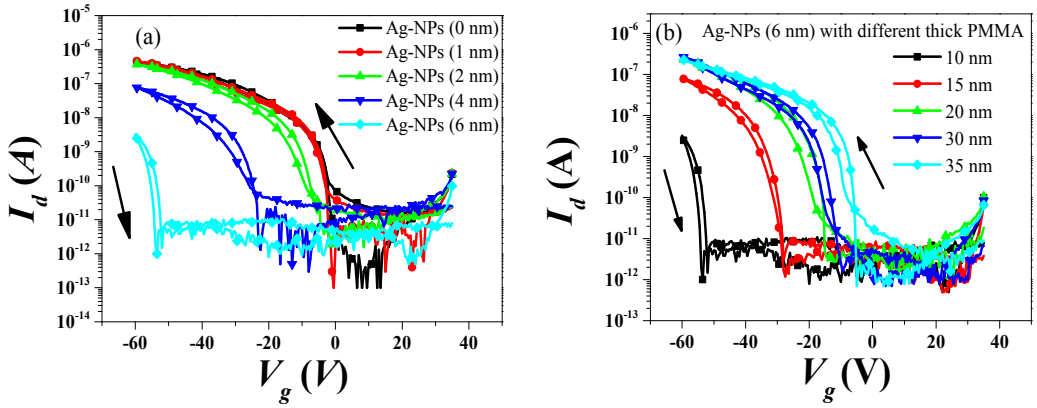


**Figure S5.** The transfer *I-V* characteristics curves in dark. (a) 10 nm-thick PMMA of Ag-NPs devices as a function of the thickness of embedded Ag-NPs, and (b) Ag-NPs devices (6 nm thick Ag-NPs) as a function of PMMA thicknesses.

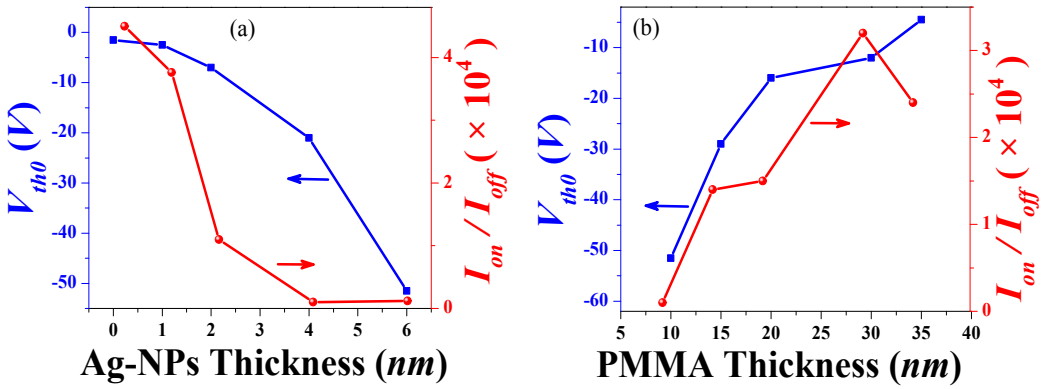


**Figure S6.** (a) The threshold voltage ($V_{th0}$) and the on/off ratio ($I_{on}/I_{off}$) of 10 nm-thick PMMA of Ag-NPs devices in dark as a function of Ag-NPs thicknesses. (b) the threshold voltage ($V_{th0}$) and the on/off ratio ($I_{on}/I_{off}$) of 6 nm-thick Ag-NPs of Ag-NPs devices in dark as a function of PMMA thicknesses.