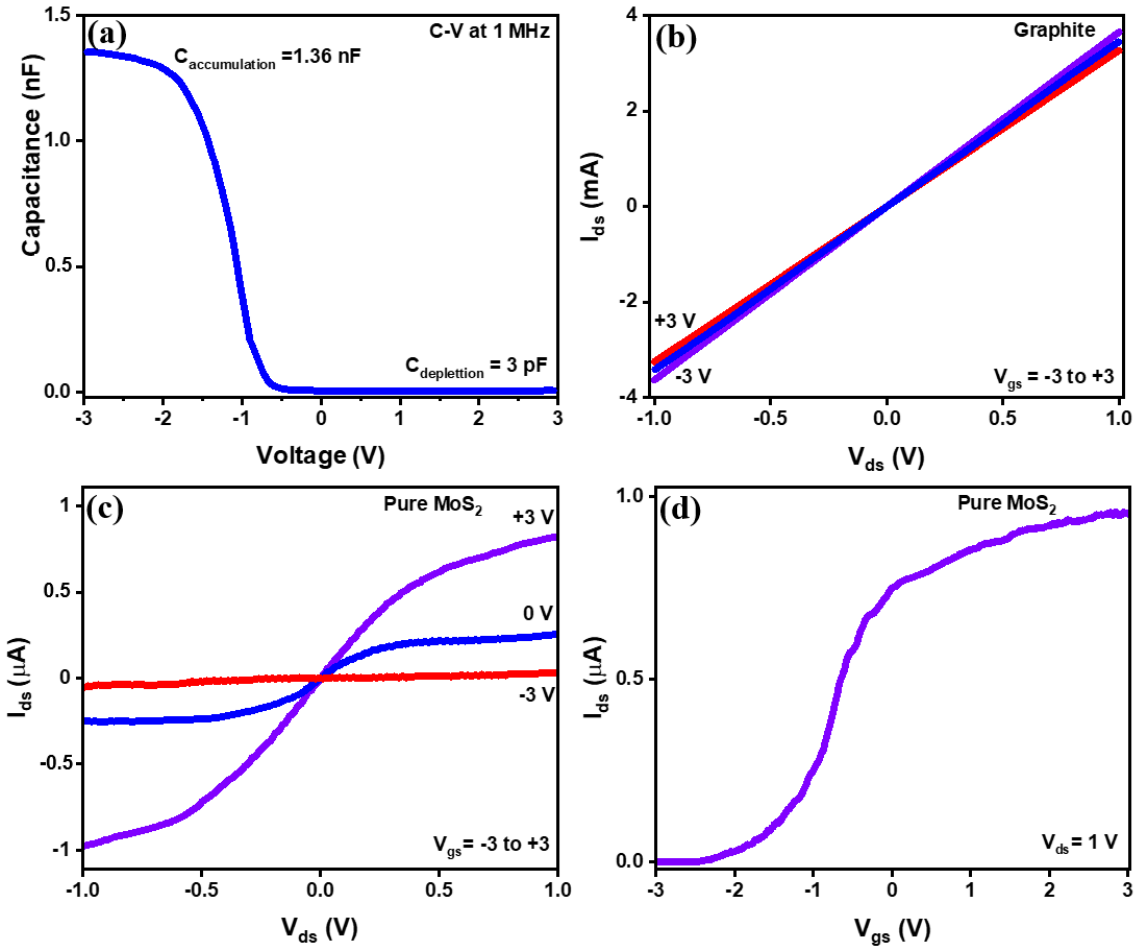

Figure S1 (a) Capacitance-voltage curve of the device at 1 MHz. (b) Output characteristics of the graphite. (c) Output characteristics of the multilayer MoS_2. (d) Transfer curve of the multilayer MoS_2.

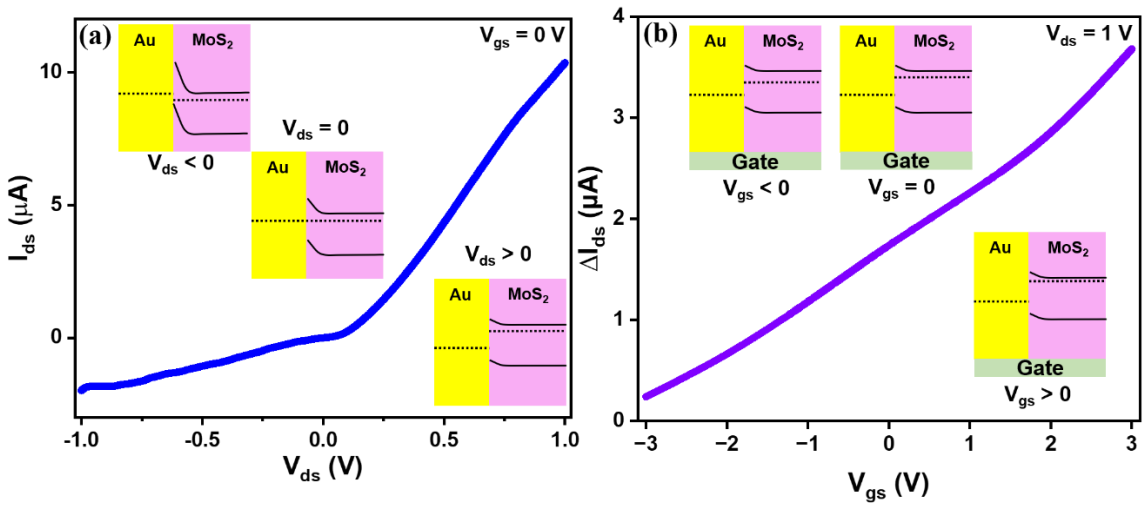

Figure S2 (a) I-V characteristic of the device under the dark condition exhibiting Schottky-barrier behaviors at the Au/MoS_2 interface with V_{ds} sweeping from -1 V to +1 V. The insets present the evolution of the Schottky barrier during the V_{ds} sweep. (b) Gate-bias-dependent ΔI_{ds} of the device under V_{gs} sweeping from -3 V to +3 V. The insets present the evolution of the Schottky barrier during the V_{gs} sweep.