# Supporting Information

## Black Phosphorus Field-Effect Transistors with Work Function Tunable Contacts

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**Supporting Information.** AFM measurements and electrical measurements of field effect transistors made with black phosphorus.

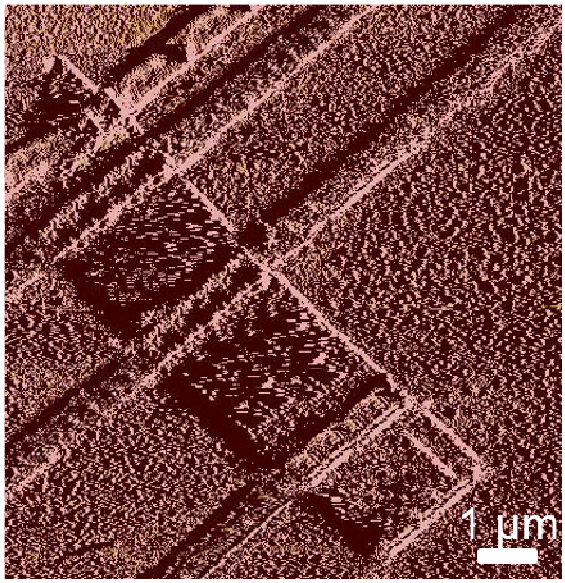


**Figure S1.** AFM image of BP-based FET with Pd contacts.

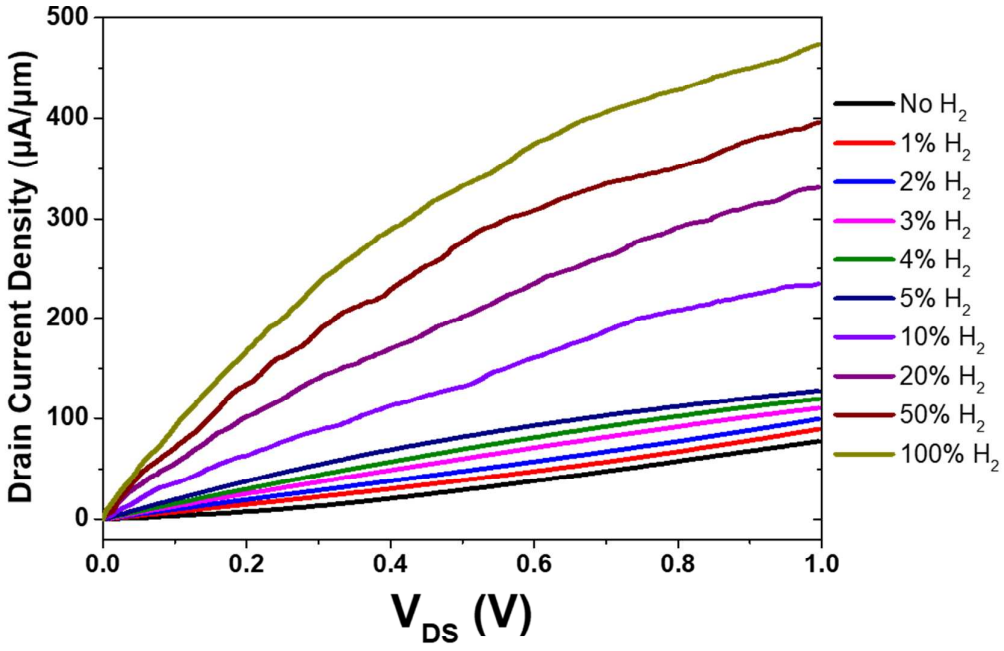


**Figure S2.** $I_{ds} - V_{ds}$ curves measured under different hydrogen concentrations. The on-state current can reach 475 μA/μm under pure hydrogen treatment, while the on-state current is 77 μA/μm for pure argon flushing. The backgate voltage is set to be -100 V.

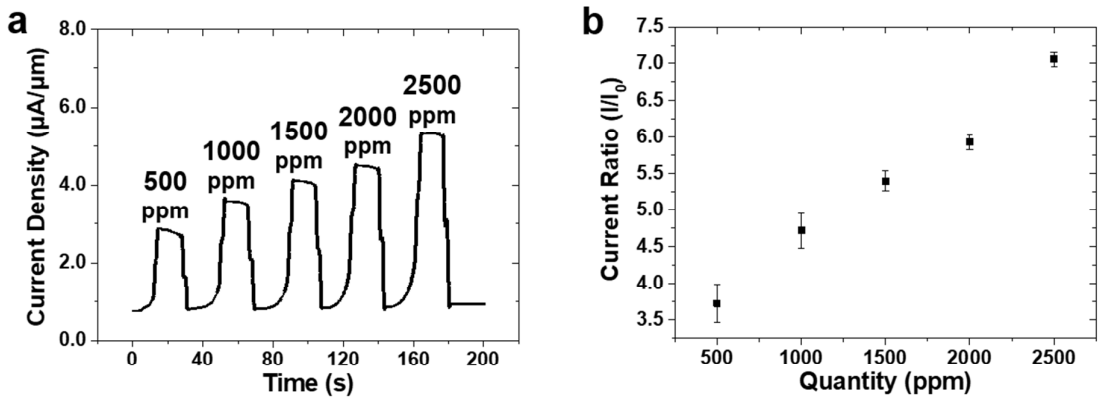


**Figure S3.** $H_2$ sensing performance of another Pd-contacted few-layer BP FET. (a) Current *versus* time (in seconds) for this device. (b) Current change *versus* $H_2$ concentration for this device.