Supporting information for:

Influences of Gas Adsorption and Au Nanoparticles on Electrical Properties of CVD-Grown MoS_2 Thin Films

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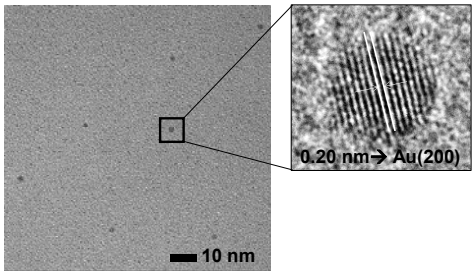

Figure S1. Transmission electron microscope (TEM) images of Au nanoparticles (NPs) on a carbon film, grown in the identical conditions for the preparation of the Au NPs on our MoS_2 thin films. The lattice spacing found from the high-resolution TEM image is identified to be around 0.20 nm, corresponding to the Au (200) atomic plane.

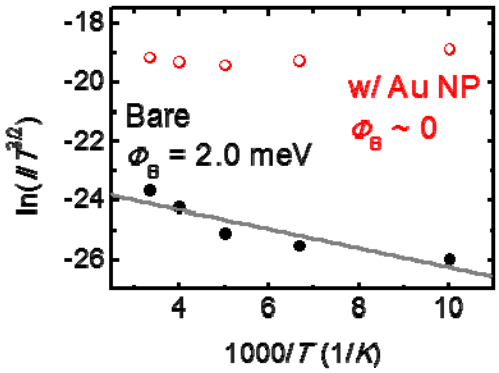

Figure S2. The current (I)-voltage (V) characteristics of our device can be explained by the 2D thermionic model, as described by the following equation:

$$I = A^*_{2D} S T^{3/2} \exp\left[-\frac{q}{k_B T}\left(\phi_B - \frac{V}{n}\right)\right]$$

where A^*_{2D} is the 2D equivalent Richardson constant, S is the contact area, T is the temperature, q is the electron charge, k_B is the Boltzmann constant, ϕ_B is the Schottky barrier height, and n is the ideality factor [Kim *et al.*, *Sci. Rep.* **2016**, *16*, 1890-1895]. From the Arrhenius plots of $\ln(IT^{-3/2})$ vs. T^{-1}, ϕ_B can be estimated. The estimated ϕ_B values for the bare and coated samples are 2.0 and 0 meV, respectively. This indicates Ohmic contact formation in our devices.