Electronic Supplementary Information

Sensing Extremely Limited H2 Contents by Pd Nanogap Connected to an Amorphous InGaZnO Thin-film Transistor†

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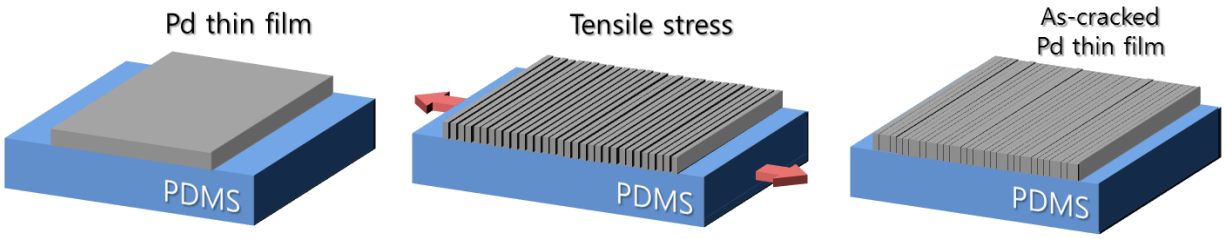

Fig. S1 Fabrication of nano cracks in Pd TF. The Pd/PDMS substrate was mounted onto a stretching machine and nano cracks were created under a tensile stress

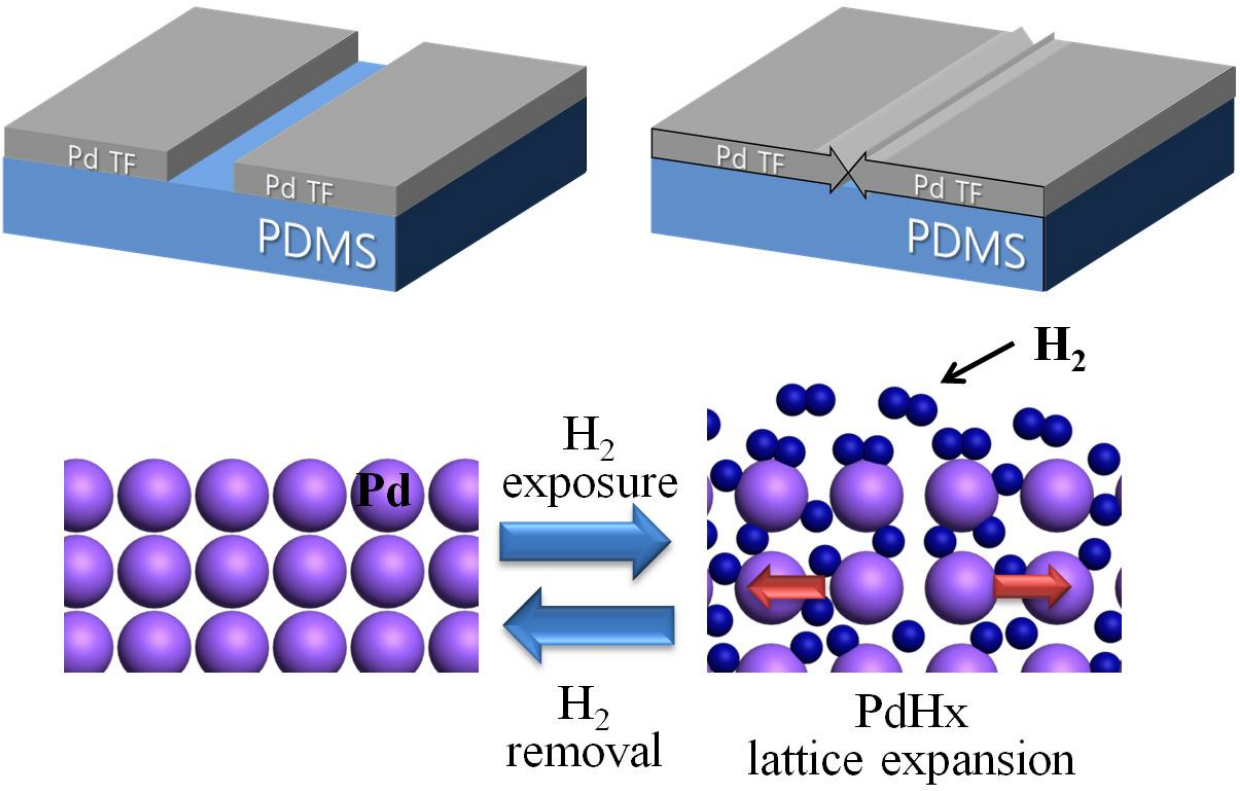

Fig. S2 Illustration of physical contact in the Pd nanogap. H_2 adsorption and penetration into the lattice of Pd induces the volume expansion of Pd TF with phase change to PdH_x, so that physical contact forms within the gap.

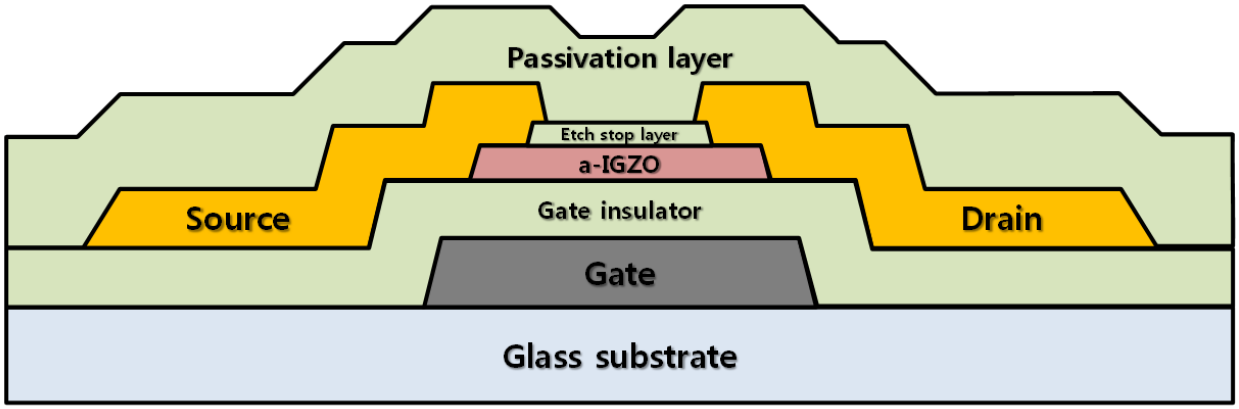

Fig. S3 The device structure of a-IGZO TFT was an inverted-stagger type with a width-to-length (W/L) ratio of 100/10 μm using a bottom gate.

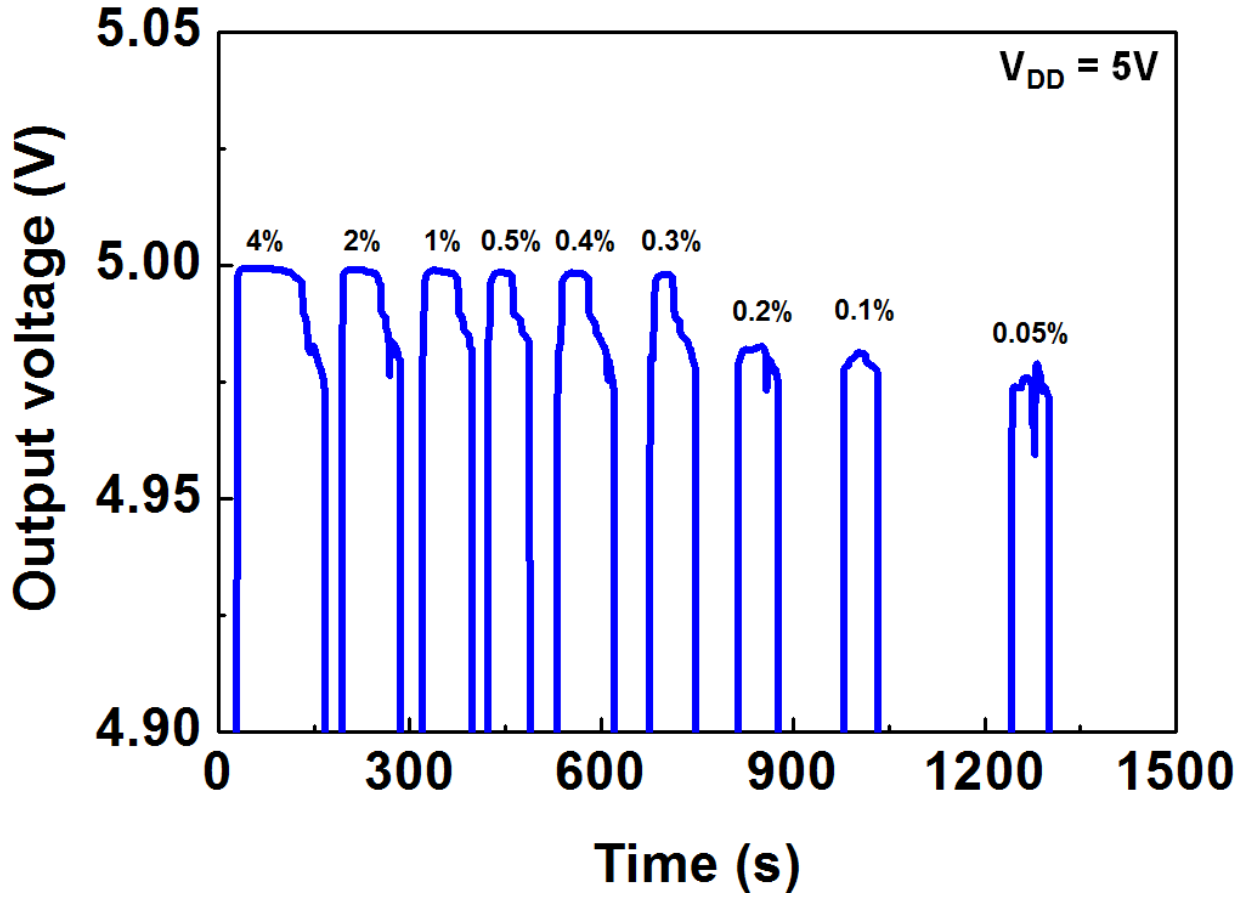

Fig. S4 The magnified time domain V_{OUT} plot of Fig. 4b. The V_{OUT} signal from 0.05 % is 4.95 V which is only slightly lower than that (5.0 V) of 4 % H_2 ambient.