

Fig. S1 Top view and lateral view illustration of BN paper PD structure

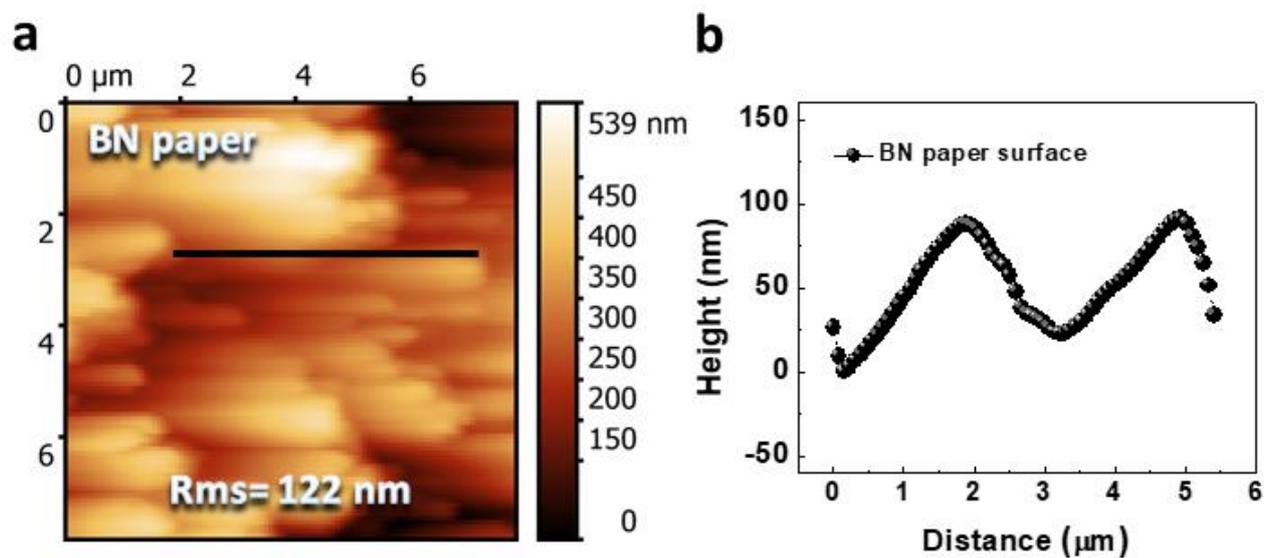


Fig. S2 Atomic force microscopy characterization of the BN paper. **a** Topographical mapping of the BN paper. The root mean square surface roughness (Rms) was 122 nm. **b** The height profile along the black line of Fig. S2a

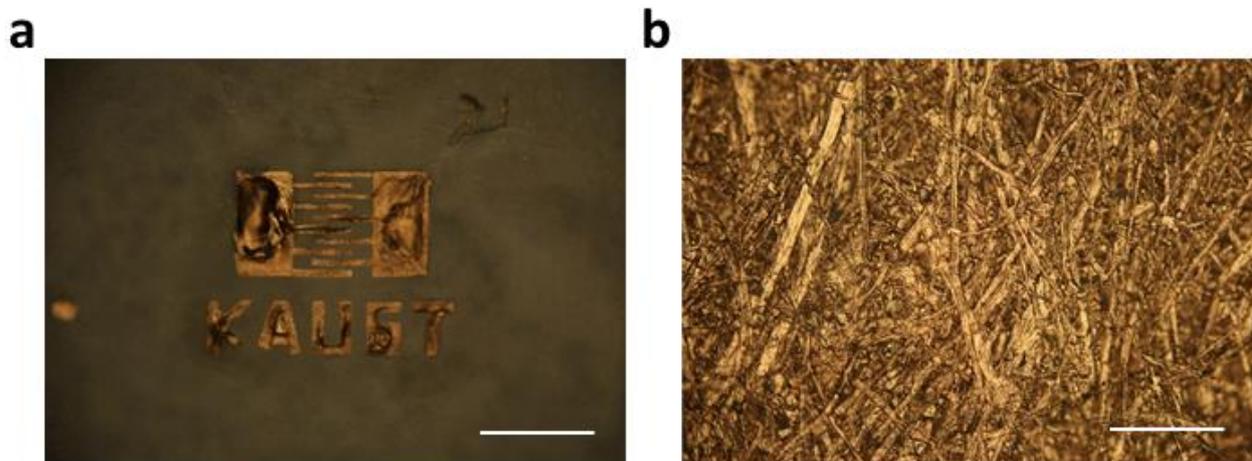


Fig. S3 The optical microscope image of BN paper and conventional paper after treating by electron beam lithography patterning. **a** Patterned Au electrodes were successfully built on BN paper. However, due to the flexible feature of BN paper, a part of patterns is slightly distorted after several solution processes. Therefore, the BN paper should be fixed very well on a rigid substrate and treated carefully during lithography processes to avoid pattern distortion. The scale bar is 200 μm . **b** Due to the rough surface, the smooth resist layer cannot form on conventional paper, and the Au cannot be removed during lift-off process. The scale bar is 200 μm

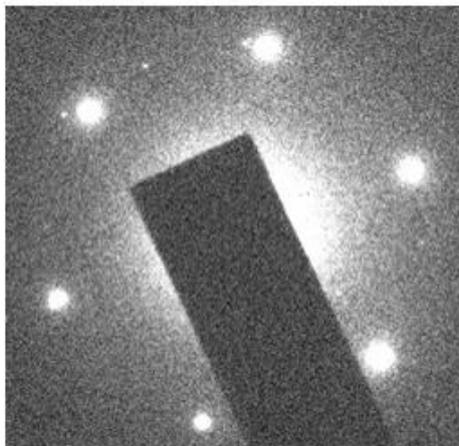


Fig. S4 The diffraction pattern from transmission electron microscopy of an h-BN nanosheet to illustrate its crystallinity