ADVANCED FUNCTIONAL MATERIALS

Supporting Information

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Hexagonal Boron Nitride–Enhanced Optically Transparent Polymer Dielectric Inks for Printable Electronics

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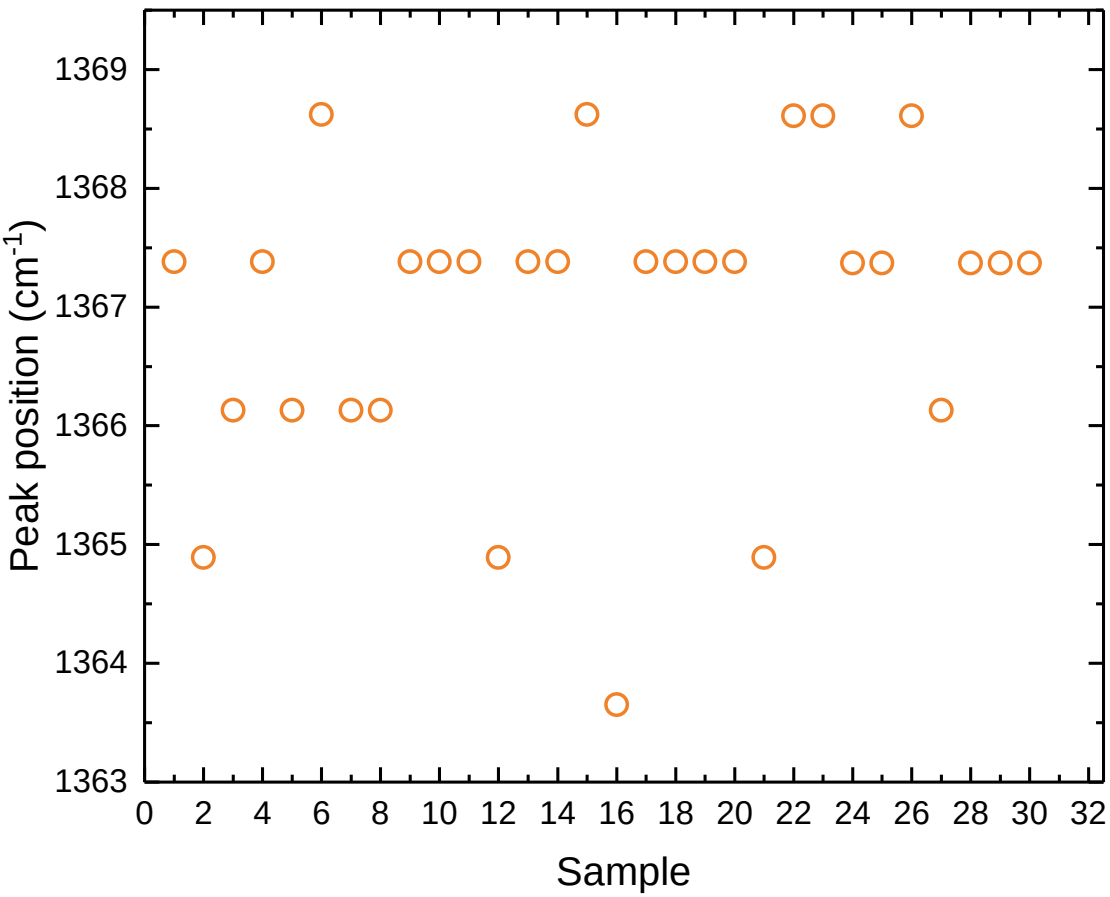
1 Raman statistics

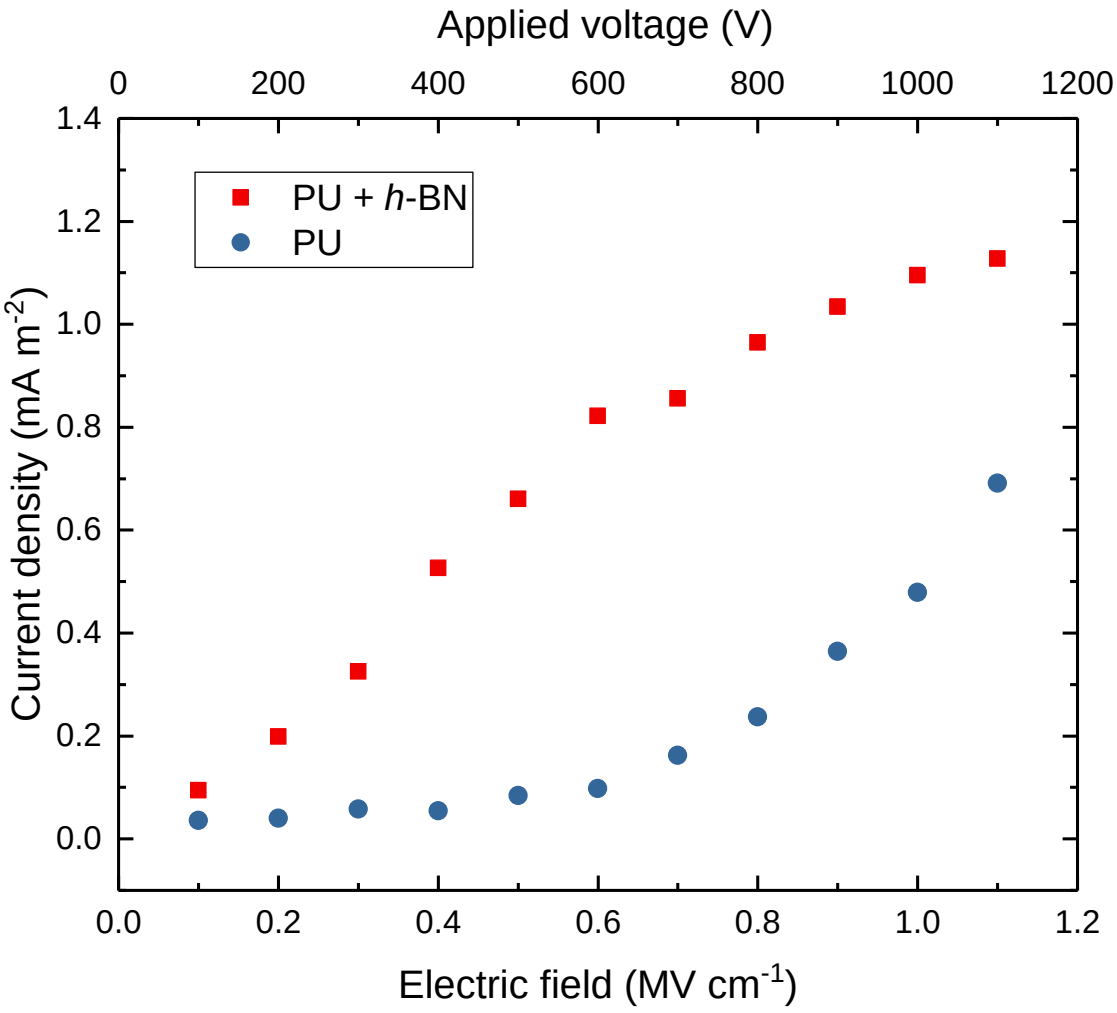
In order to investigate the correlation between the number of layers of the exfoliated *h*-BN flakes and the E_{2g} peak positions, we conducted statistical Raman analysis. 30 different points are taken randomly across the deposited PU+*h*-BN sample. The Raman spectroscopy measurement is carried out at wavelength 514nm. Supplementary Fig.1 demonstrates the E_{2g} peak positions at 30 different points, having most of the E_{2g} peak at $\sim$ 1367.5 cm^{-1}.



Supplementary Fig. 1 Statistical Raman analysis of the E_{2g} peak positions at 30 different sample points.

2 Breakdown voltage measurement

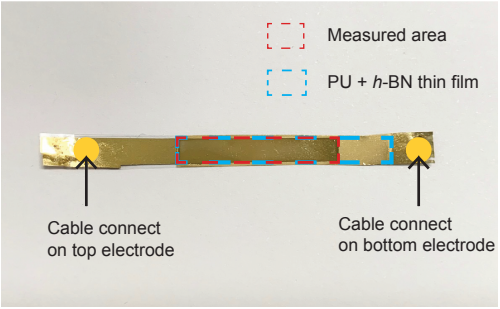
The breakdown voltage measurement of the pure PU and PU+*h*-BN dielectrics is shown in Supplementary Fig.2. A high voltage up to 1100 V is applied on the printed thin-film (25 mm^2 area, with a thickness of ~10 μm) of pure PU and PU+*h*-BN. The current density (mA m^{-2}) with respect to the applied electric field (and the applied voltage) indicates an onset of breakdown for the pure PU at 600 V.



Supplementary Fig. 2 The plot of breakdown voltage measurement for pure PU and PU+*h*-BN dielectrics.

3 Flexibility test

Supplementary Fig.3 shows the photo of the sample for the flexibility test. It highlights (in dotted blue line) the coated PU+*h*-BN thin film on the PET substrate with a thin layer of thermal evaporated Au (∼50 nm). Another thin layer of Au (∼50 nm) is also deposited above the coated PU+*h*-BN film as the top electrode. The measured area (in dotted red line) is the overlap area of the bottom and top electrode. The cable connections of the LCR meter are introduced at the two ends of the sample stripe, connecting one on the top electrode and the other on the bottom electrode.



Supplementary Fig. 3 Photo of the PU+*h*-BN thin film sample for flexibility test.