

## Supplementary Information

### ITO-free, inkjet-printed transparent organic light-emitting diodes with single inkjet-printed Al:ZnO:PEI interlayer for sensing applications

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#### Inkjet printing of the Al:ZnO:PEI interlayer

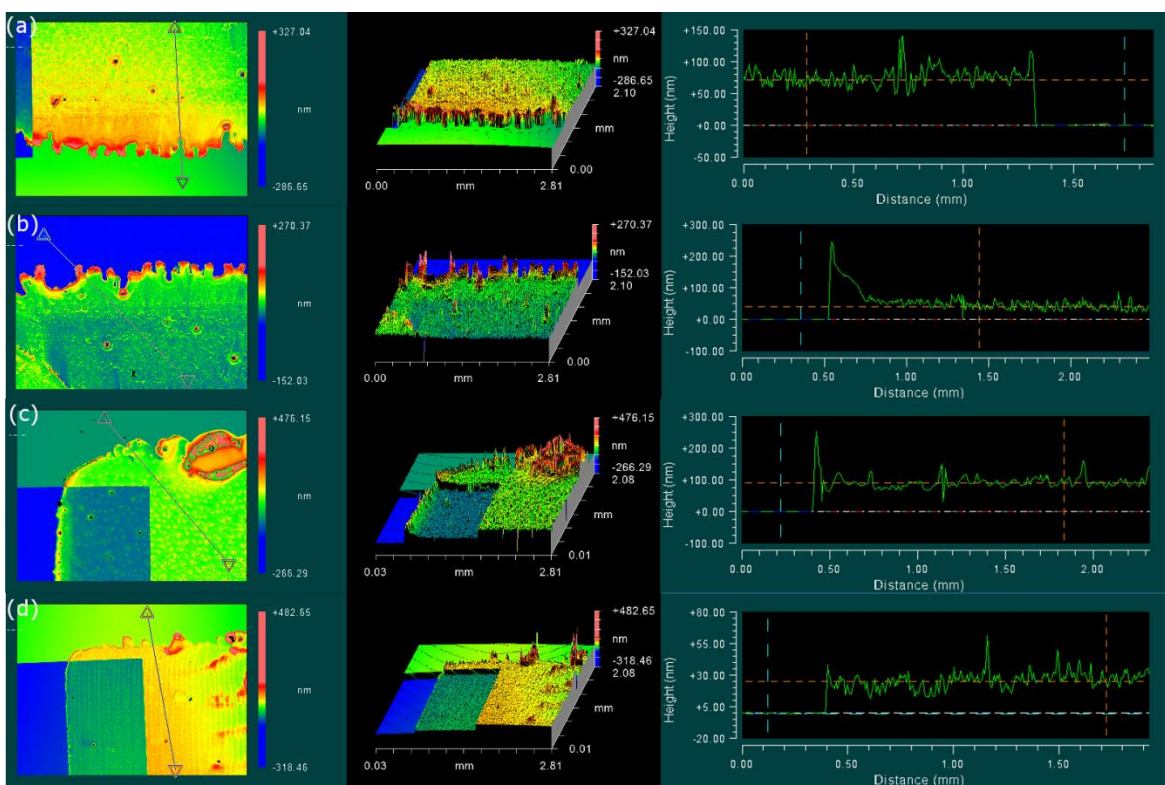


Figure S1 White light interferometer measurement of inkjet-printed Al-doped ZnO thin film with dot spacing of (a) 40  $\mu\text{m}$  and (b) 60  $\mu\text{m}$ , and inkjet-printed thin films from Al-doped ZnO mixed 0.5 wt% PEI ink with dot spacing of (c) 40  $\mu\text{m}$  and (d) 60  $\mu\text{m}$ . All thin films were inkjet printed on pre-patterned ITO glass substrates. The substrates were activated by short low-pressure argon plasma (100 W, 30 s) before inkjet printing. Left and middle images show the 2D top and 3D view of measured structures, while right images show the cross-section of corresponding structures. The cross-section measurements were taken at the positions indicated by a line between two triangles on the 2D top view images.

## Transmission and reflection measurement of PEDOT:PSS electrodes

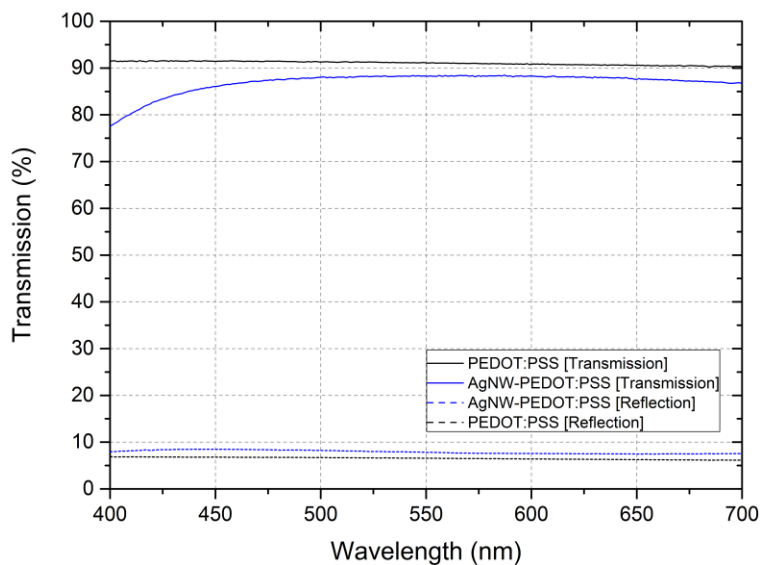


Figure S2 Transmission (solid lines) and reflection (dashed lines) spectra of printed PEDOT:PSS (black) and AgNW-PEDOT:PSS thin film (blue) on glass. The thicknesses of PEDOT:PSS and AgNW-PEDOT:PSS thin film are: 46 nm and 100 nm. The response sheet resistances are 500 and 33.3  $\Omega/\square$ . The measurement was performed at an incident light angle of 6 degree.

## Current efficiency curve of ITO-free, inkjet-printed OLEDs

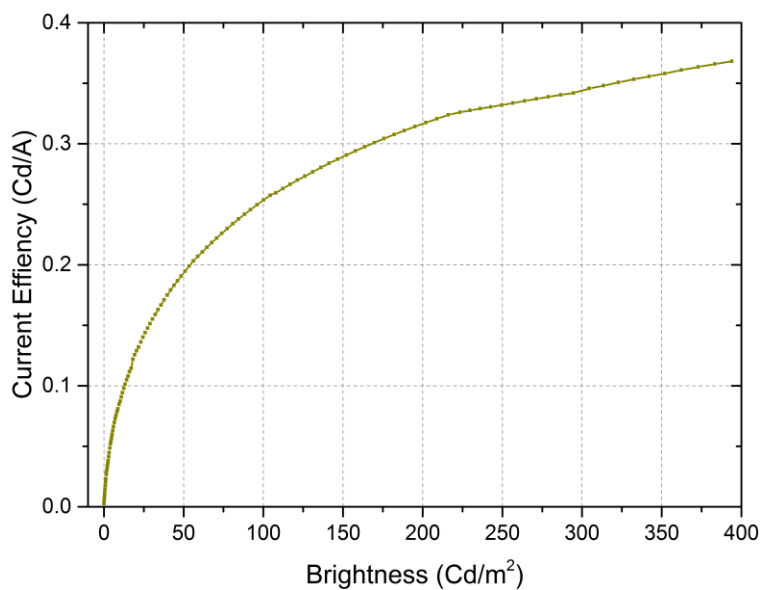


Figure S3 Brightness – current efficiency curve of ITO-free, fully solution-processed yellow OLEDs. The light-emitting brightness was measured from the top electrode AgNW-PEDOT:PSS only.