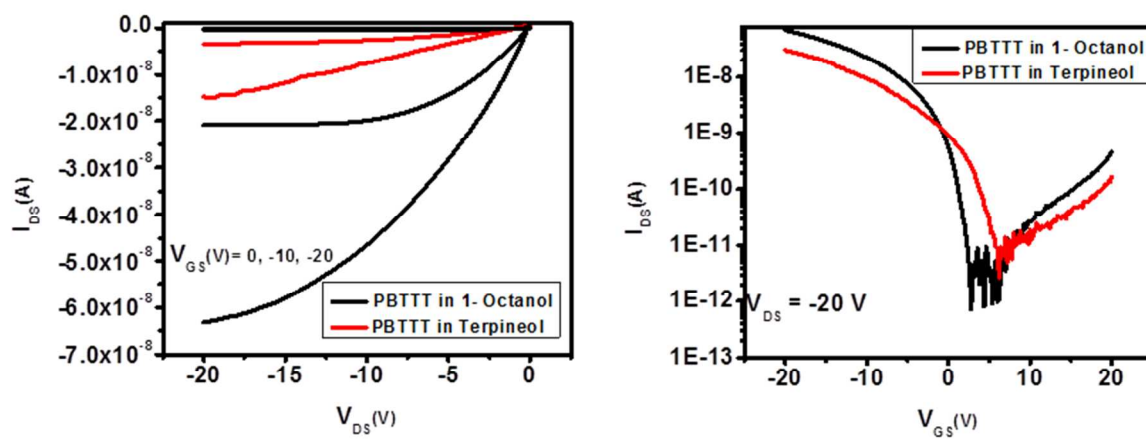# Supporting Information

Proving Scalability of an Organic Semiconductor to Print a TFT-Active Matrix Using a Roll-to-Roll Gravure

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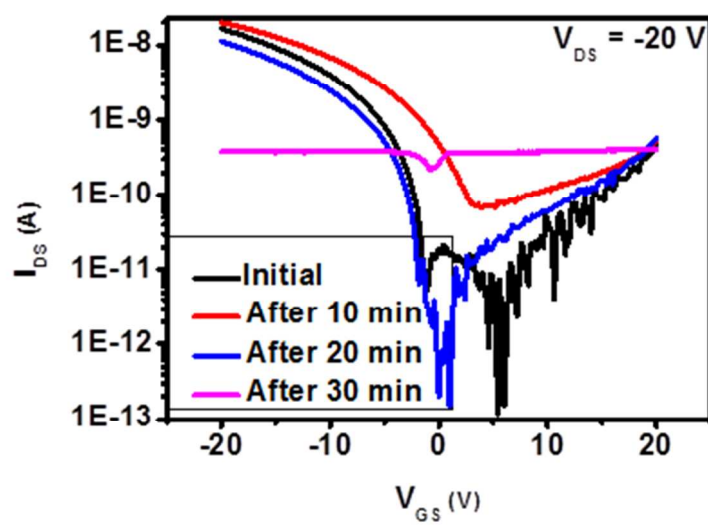
[†] Dept. of Printed Electronics of Sunchon National University, Sunchon, 540-742, Korea.
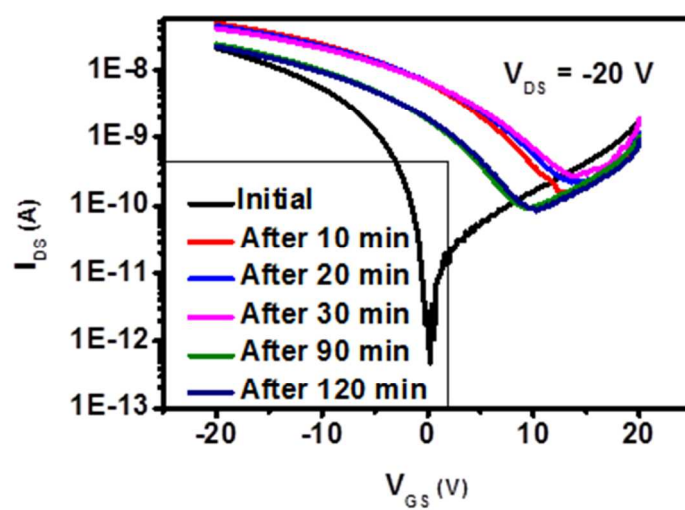
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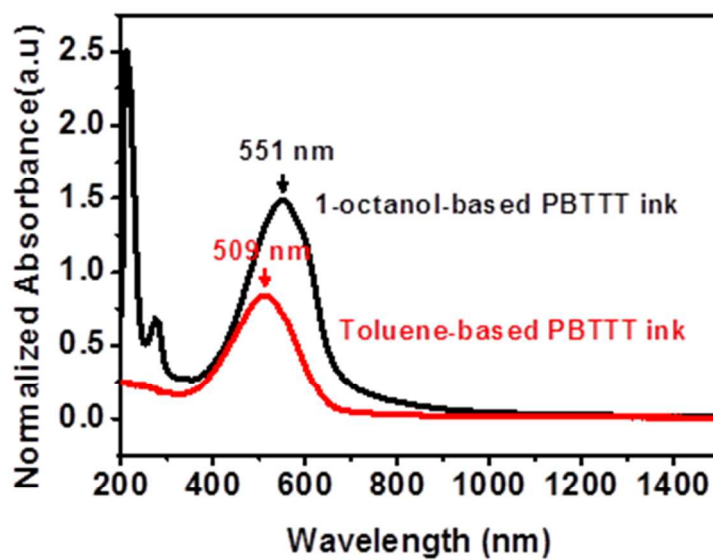
Figure S1. R2P gravure printed PBTTT-based TFT with 1-octanol and terpineol as the solvents.
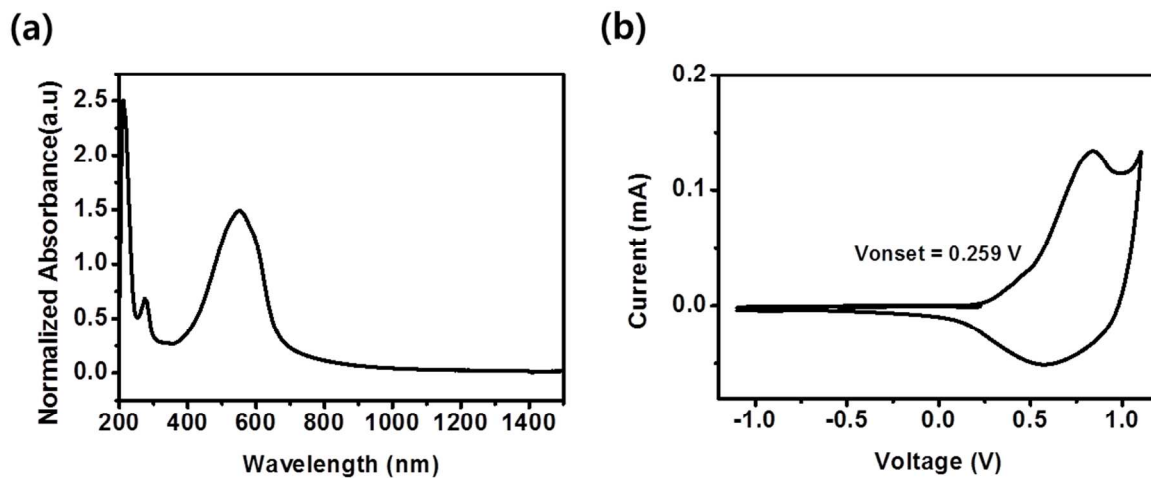
Figure S2. Time dependent transfer characteristics of R2R gravure printed PBTTT-based TFT under exposed ambient condition.
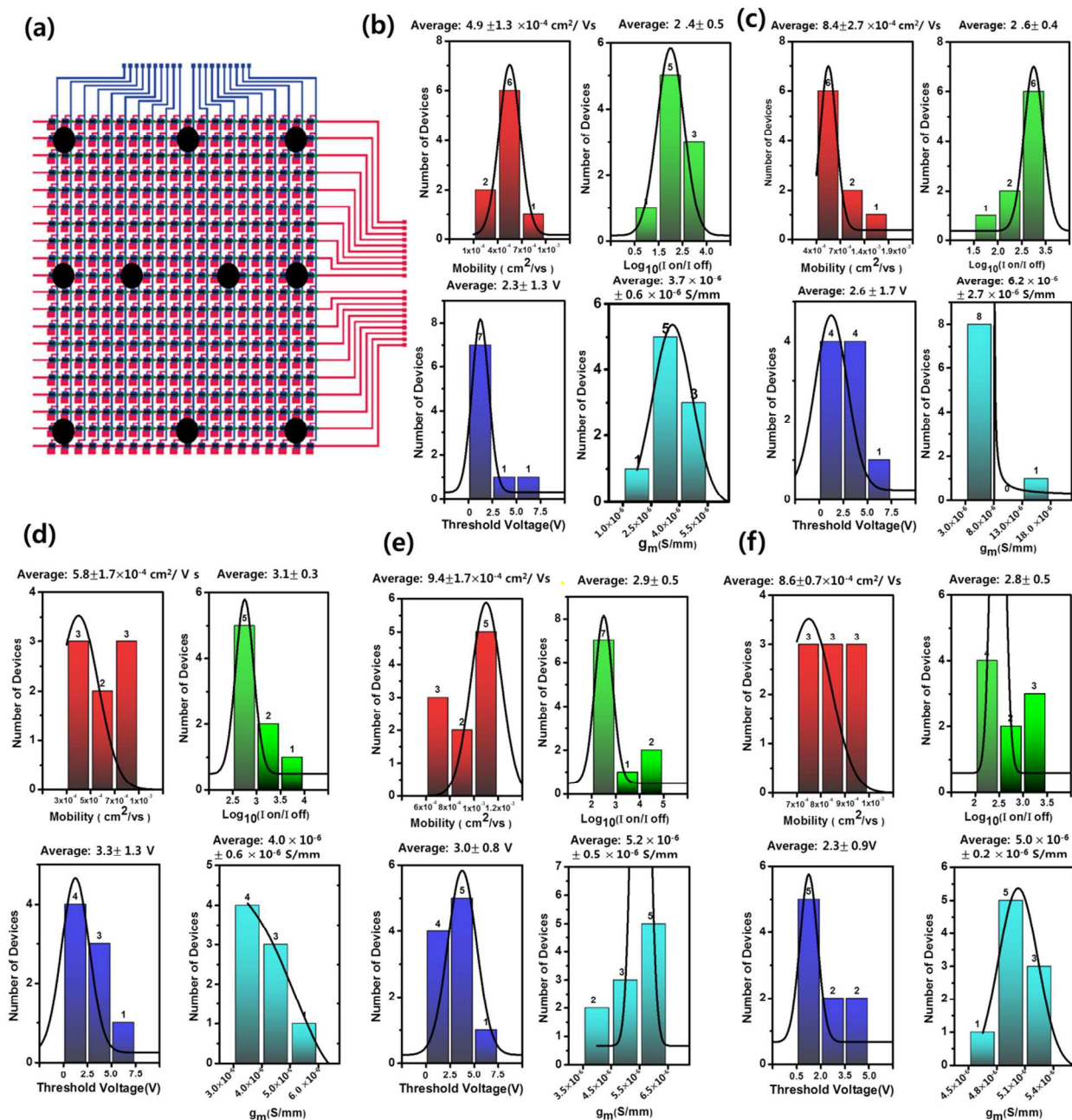
Figure S3. Time dependent transfer characteristics of CYTOP coated R2R gravure printed PBTTT-based TFT under exposed ambient condition.
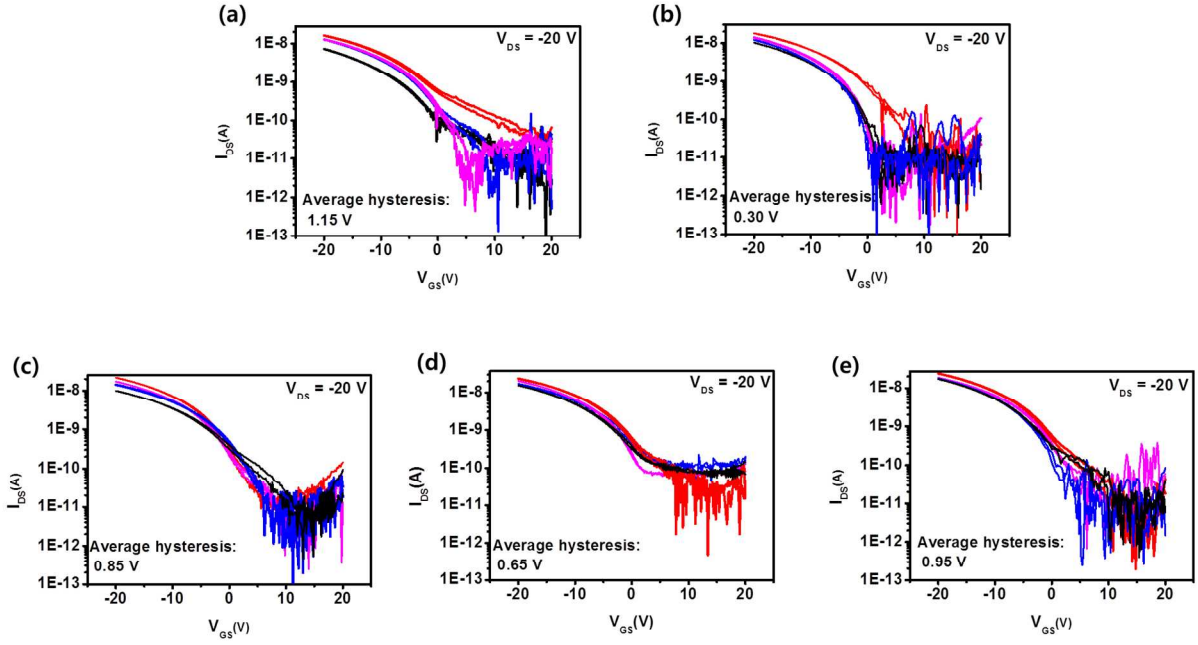
Figure S4. UV-Vis absorption spectra for formulated PBTTT ink in 1-octanol and toluene.

Figure S5. UV-Vis absorption spectrum and electrical oxidation-reduction data for formulated 1-octanol-based PBTTT ink. UV-Vis absorption spectrum for formulated 1-octanol-based PBTTT ink (a), and cyclic voltammogram for 1-octanol-based PBTTT ink (b).
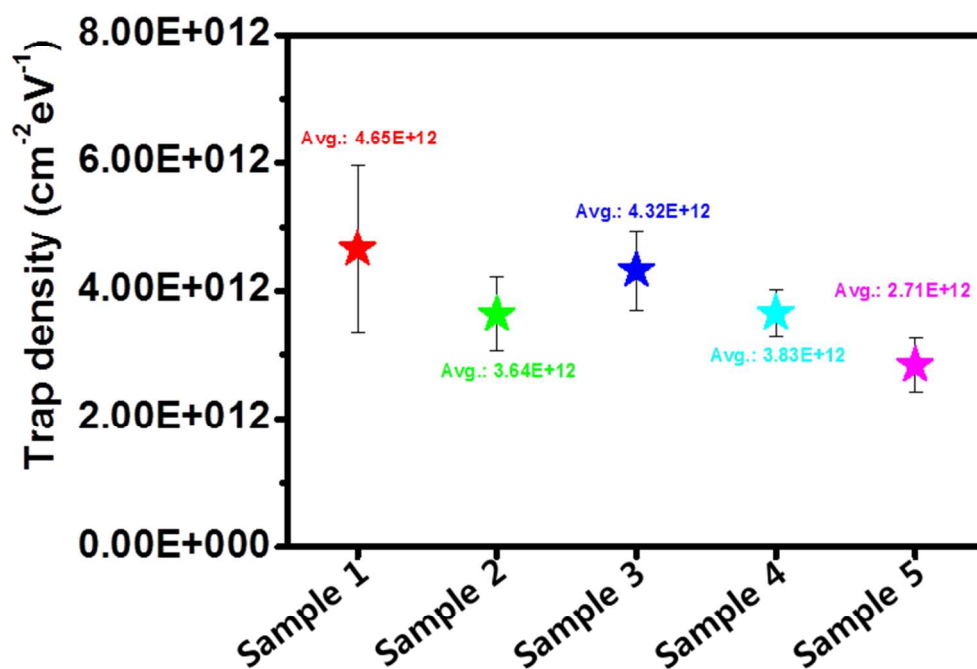
Figure S6. Calculated statistical data based on attained electrical properties from 10 TFTs per TFT-active matrix. Image of selected pixel points per TFT-active matrix (a). Statistical graphs of attained electrical properties from the 10 selected TFTs per TFT-active matrix at the first 2 m (b), second 2 m (c), third 2 m (d), fourth 2 m (e) and fifth 2 m (f) along the 10 m length of R2R gravure printed web.
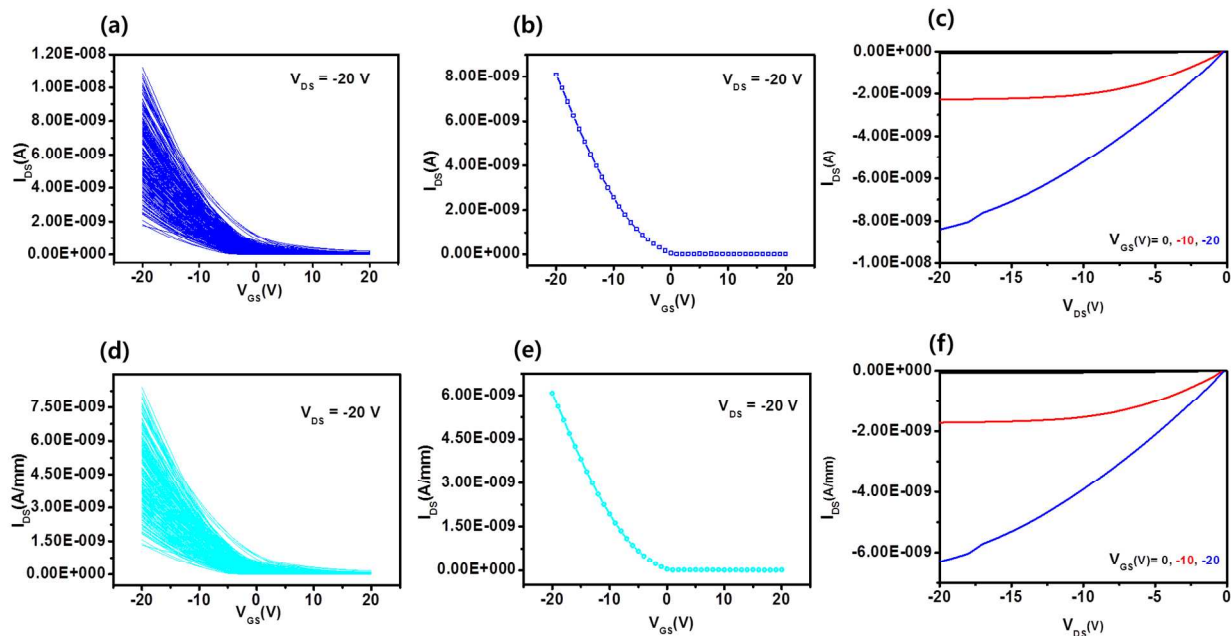
Figure S7. Attained hysteresis from transfer output characteristics of 4 selected TFTs in each TFT-active matrix along the first 2 m (a), second 2 m (b), third 2 m (c), fourth 2 m (d) and fifth 2 m (e) along the 10 m length of R2R gravure printed web.
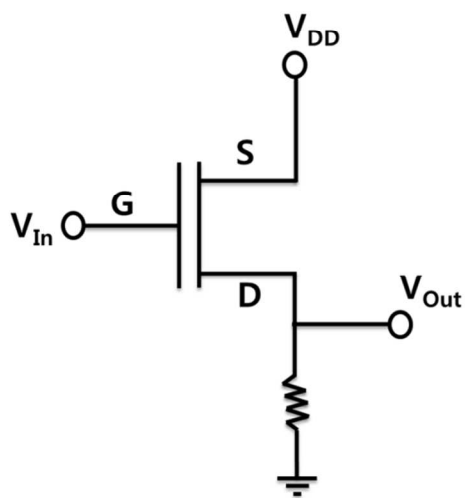
Figure S8. Calculated trap density from the 10 selected TFTs in a single TFT-active matrix along the 10 m length of the R2R gravure printed web. The sample 1 was selected at the first 2 m, the sample 2 at the second 2 m, the sample 3 at the third 2 m, the sample 4 at the fourth 2 m and the sample 5 at the fifth 2 m respectively.
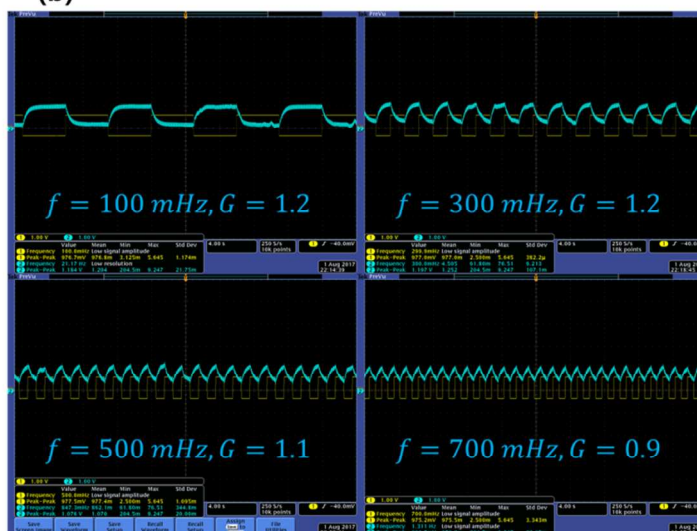
Figure S9. I-V transfer characteristics for 400 TFTs in the active matrix (a), one typical example of I-V transfer (b) and output (c) characteristics. Actual I-V transfer characteristics for 400 TFTs in the active matrix with the current density (d), one typical example of I-V transfer (e) and output (f) characteristics with the current density.

Figure S10. Cut-off frequency measurement for printed TFT. An inverter circuit (a) used for measuring a cut-off frequency by inputting (yellow color) pulse signal and measuring output (green color) signals by applying the input pulse signals with different frequencies (b).