Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supplementary Information

Wafer-scale and environmentally-friendly deposition methodology for extremely uniform, high-performance transistor arrays with an ultra-low amount of polymer semiconductors

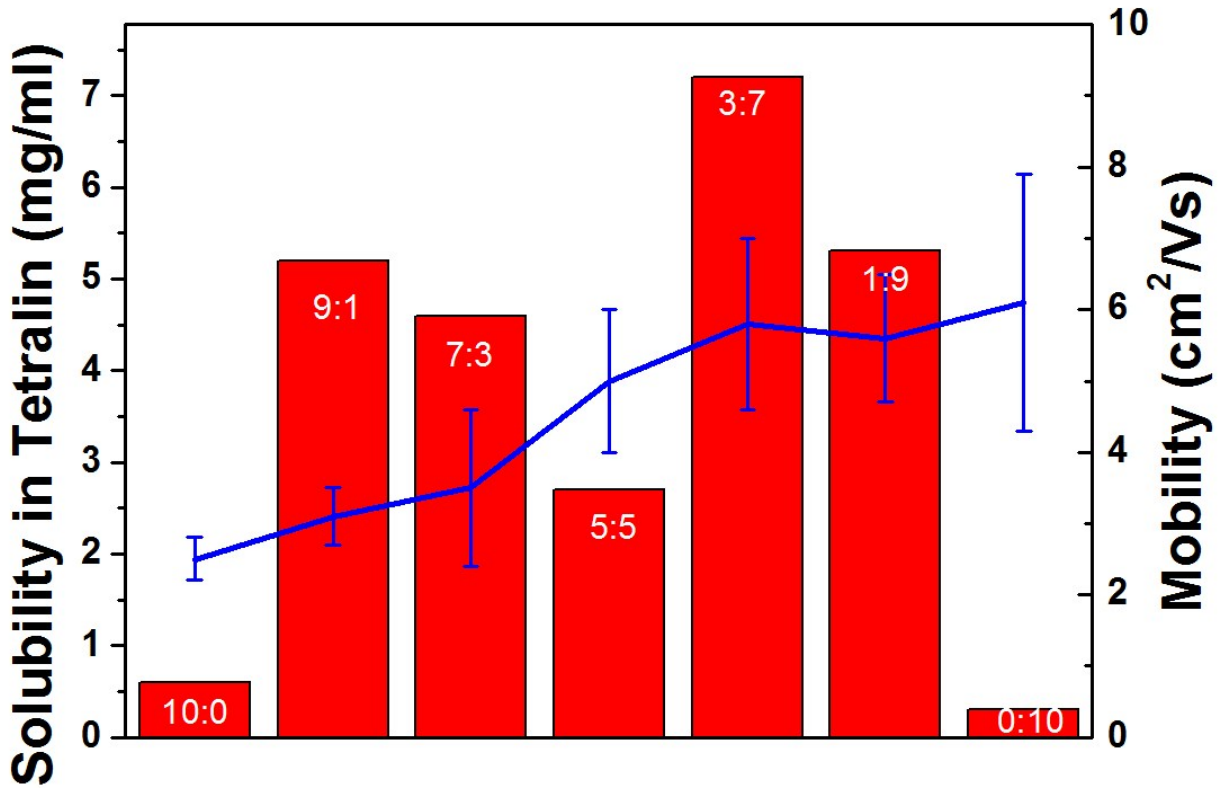

Figure S1. The dependence of solubility and mobility on the composition ratio of copolymer (Red block corresponds to solubility and solid line corresponds to mobility)

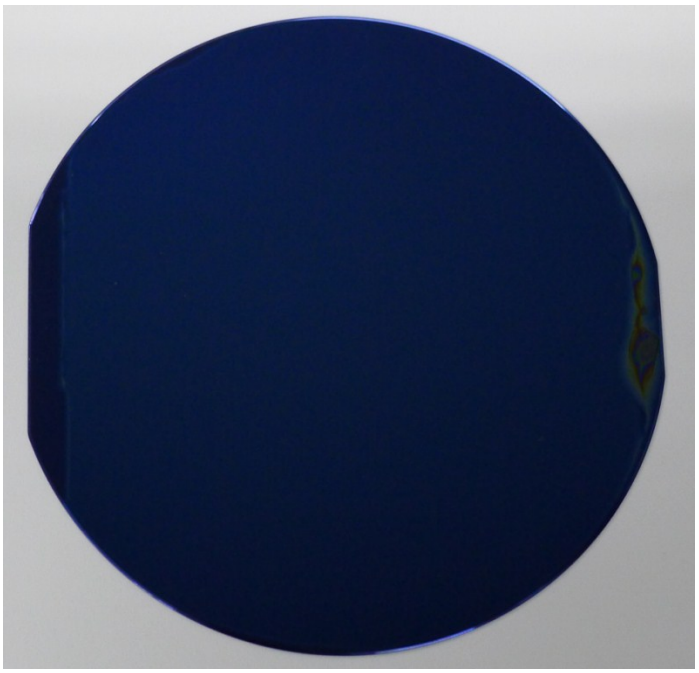

Figure S2. Digital image of PDPPBTTSVS/PαMS blend films deposited on 4-inch Si/SiO_2 substrate obtained by MDD method

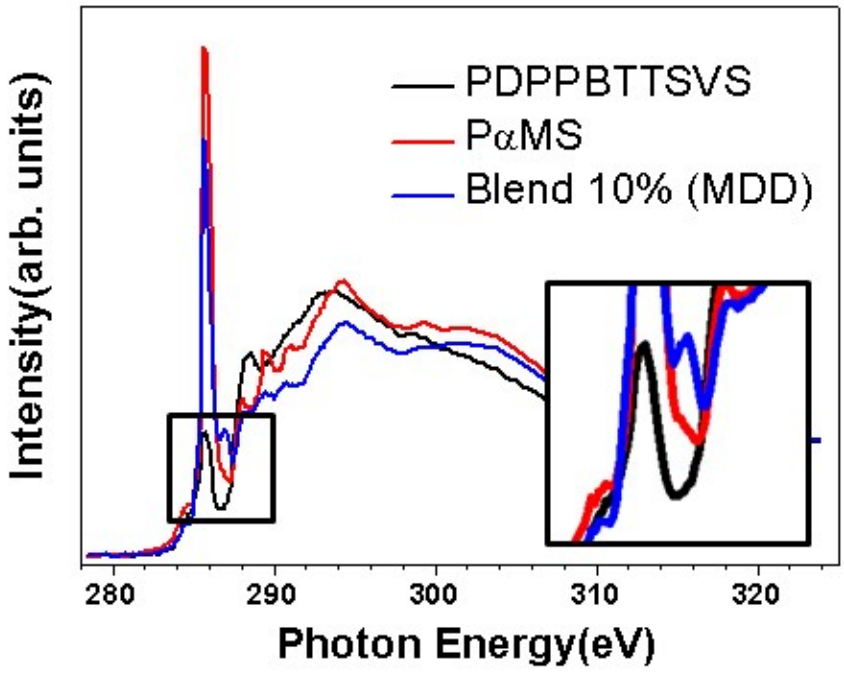

Figure S3. NEXAFS spectra of various films

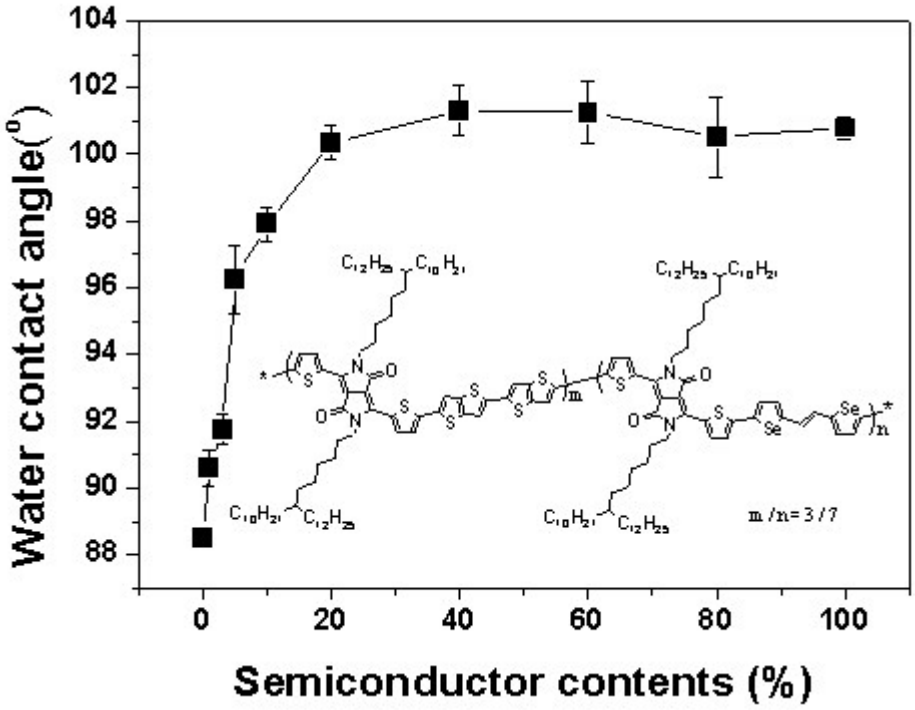

Figure S4. Summary on contact angle measurements for PDPPBTTSVS and PαMS thin films fabricated by MDD method

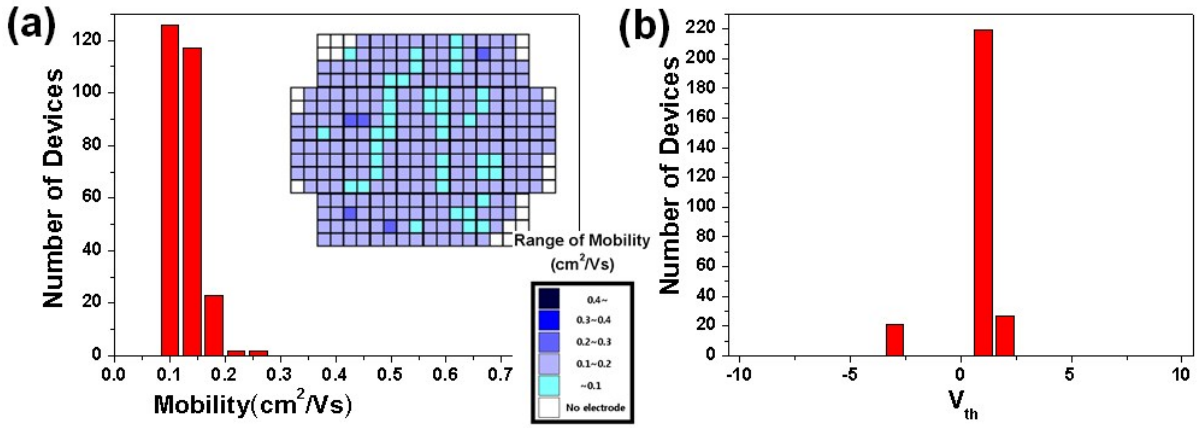

Figure S5. The statistical summarization of mobiltiy and threshold voltage of large areal device from MDD with 40μg of PDPPBTTSVS. The inset in (a) corresponds to actuall spatial distribution of mobilty in each device.

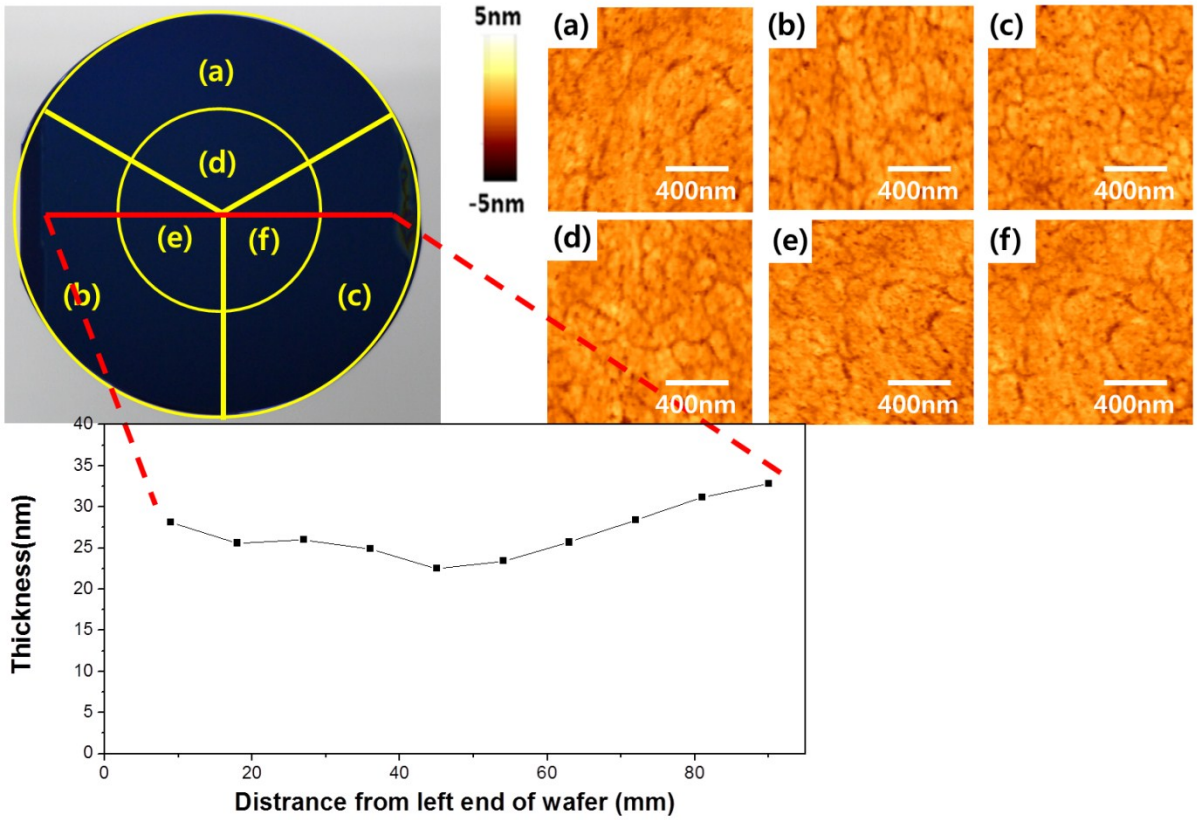

Figure S6. AFM topography images of PDPPBTTSVS/PαMS blend films deposited on 4-inch Si/SiO_2 substrate obtained by MDD method. The measured r.m.s roughness is a) [r.m.s]=0.459nm, b) [r.m.s]=0.541nm, c) [r.m.s]=0.552nm, d) [r.m.s]=0.461nm, e) [r.m.s]=0.495nm and f) [r.m.s]=0.482nm. The panel located below the wafer image shows thickness distribution of MDD-processed film, along the radial direction of wafer.

	Conducting polymer	PαMS
Water (°)	102.17±0.48	91.73±0.75
Diiodomethane(°)	49.83±0.49	25.74±0.52
Surface Energy (mJm^{-2})	35.85±0.35	47.28±0.14

Table S1. Measurement of surface energy between PDPPBTTSVS and PαMS by contact angle. Surface energy values were calculated by the following equation.

$$1 + cos\theta = \frac{2(\gamma_s^d)^{1/2}(\gamma_{lv}^d)^{1/2}}{\gamma_{lv}} + \frac{2(\gamma_s^p)^{1/2}(\gamma_{lv}^p)^{1/2}}{\gamma_{lv}}$$

where γ_s and γ_{lv} are the surface energies of the sample and test liquid, respectively, and the superscripts d and p refer to dispersion and polar components, respectively. Also, the values of γ_{lv}, γ_{lv}^p and γ_{lv}^d for the test liquids and the procedure to solve the equation are provided in Ref. [1].

[1] A.J. Kinloch, Adhesion and Adhesives: Science and Technology, Chapman and Hall, 1987. (pp. 18–32, Chap. 2).