

## Supporting Information

*Reduction of Charge Traps and Stability Enhancement in Solution-Processed Organic Field-Effect Transistors Based on a Blended n-type Semiconductor*

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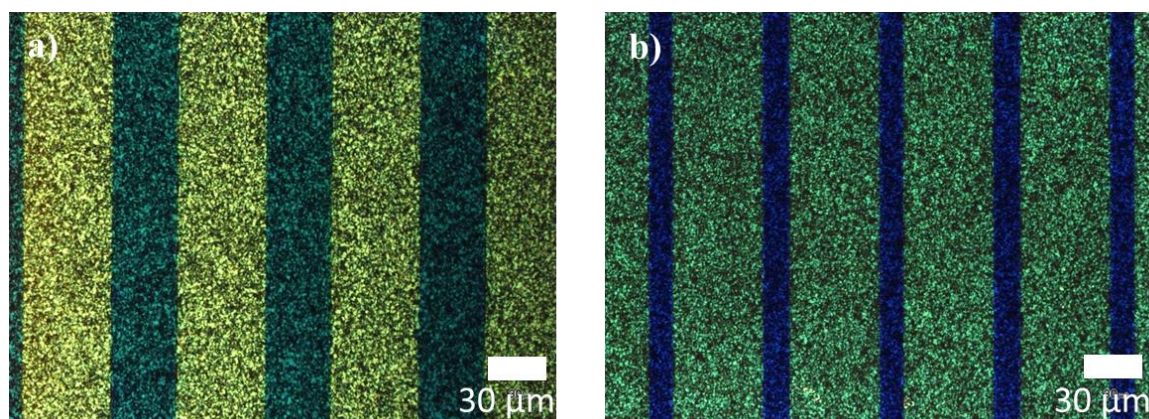
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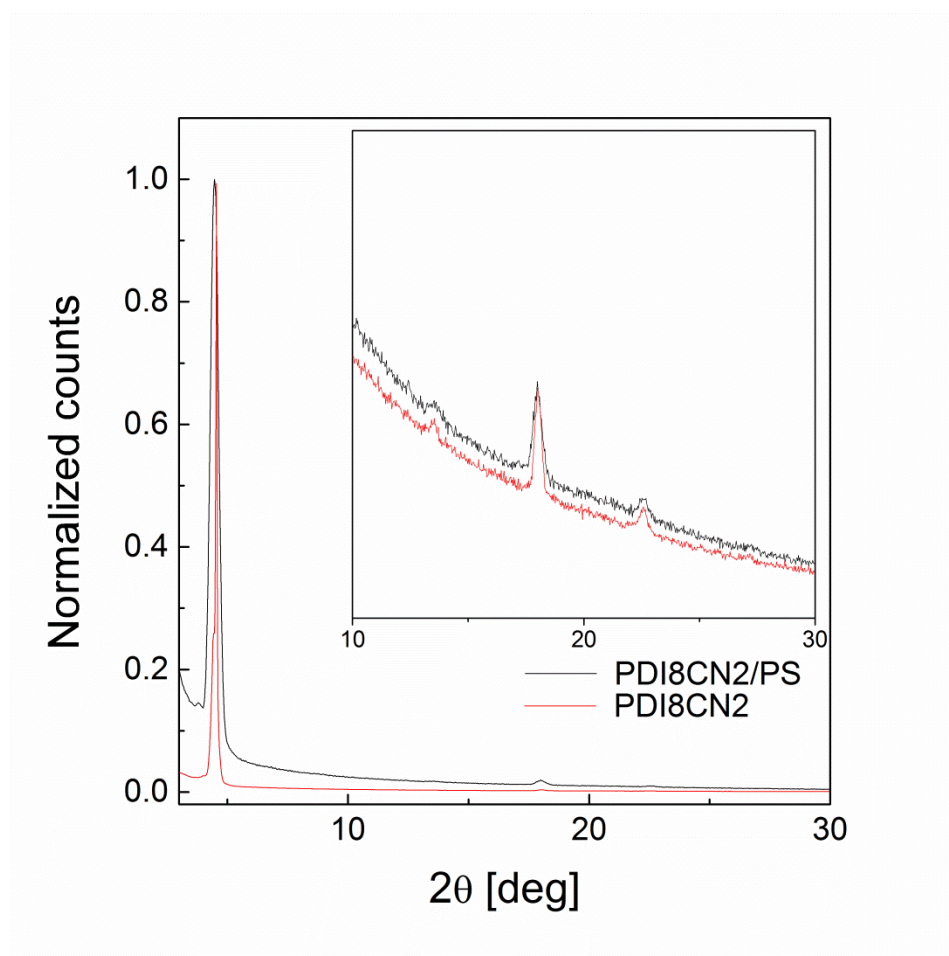
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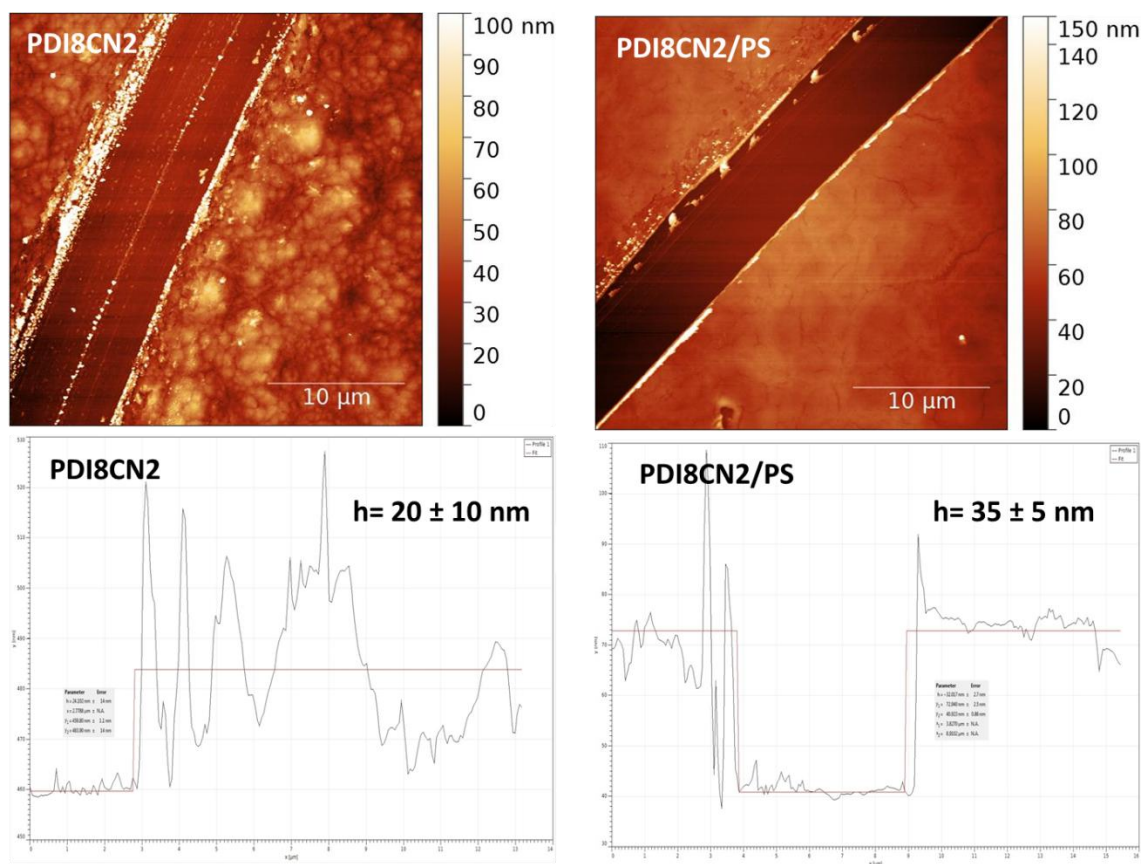
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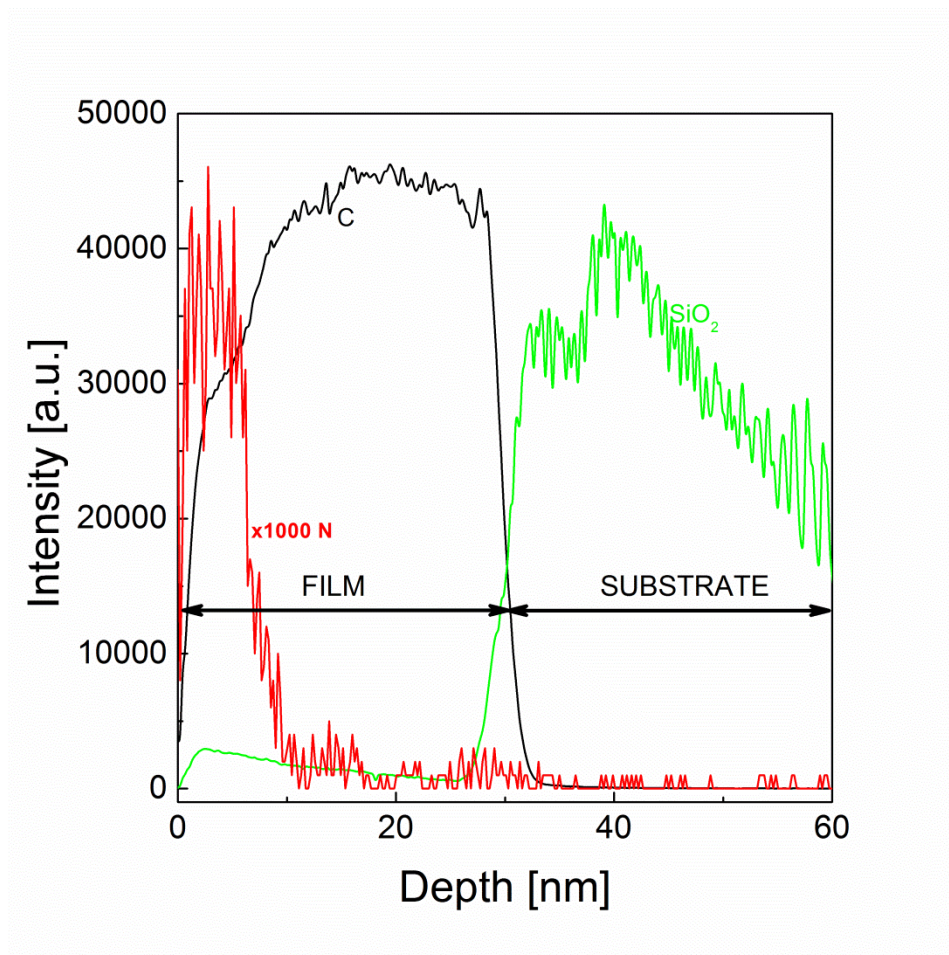
**Figure S1.** Cross polarized optical microscope images of (a) PDI8CN2 and (b) PDI8CN2/PS films.



**Figure S2.** XRD of PDI8CN2 and PDI8CN2/PS films.



**Figure S3.** On the top, AFM images showing the scratch where the film thickness was measured and, on the bottom, the profile that were used to extract the thickness.

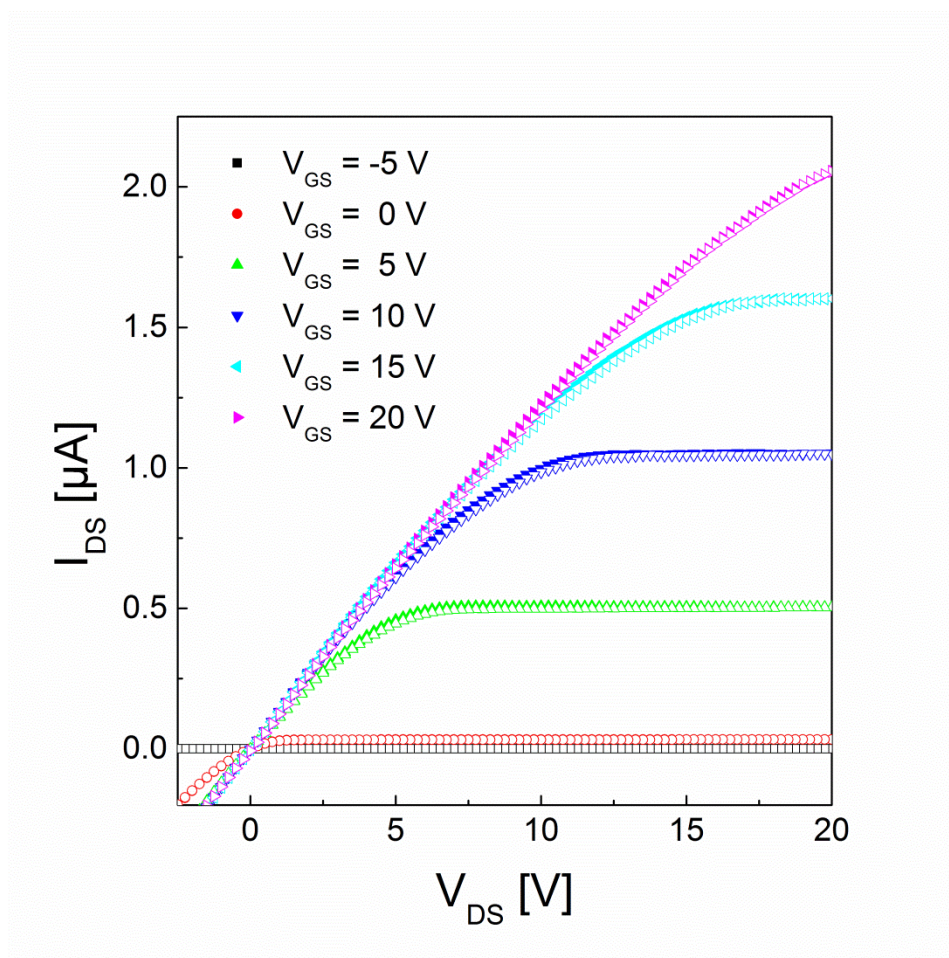


**Figure S4.** ToF-SIMS graph of the PDI8CN2/PS film. This graph confirms that there is a vertical phase separation with a PDI8CN2 top layer and a thicker PS layer underneath. The signal of the N has been increased x1000 so the phase separation can be observed.

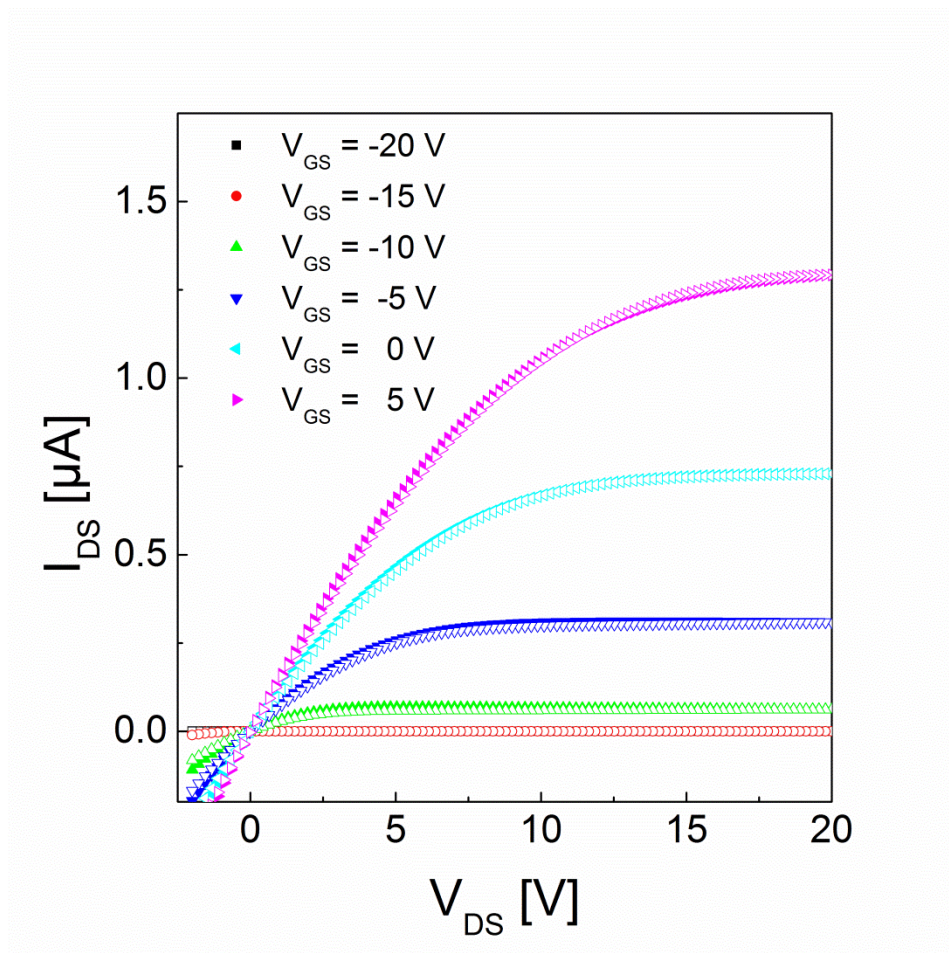


**Table S1.** Mobility and threshold voltage values of the formulation tested to find the optimized film.

OSC/Polymer (Molecular weight) Ratio	$\mu_{\text{FE,sat}} [\text{cm}^2/\text{V}\cdot\text{s}]$	$V_{\text{TH}} [\text{V}]$
<b>Pristine PDI8CN2</b>	$(5.5 \pm 0.5) \cdot 10^{-3}$	$-8.4 \pm 1.2$
<b>PDI8CN2/PMMA (120k) 4:1</b>	$(1.3 \pm 0.1) \cdot 10^{-2}$	$-7.2 \pm 1.1$
<b>PDI8CN2/PMMA (120k) 1:1</b>	$(1.1 \pm 0.1) \cdot 10^{-2}$	$-9.3 \pm 1.0$
<b>PDI8CN2/P<math>\alpha</math>MS (100k) 4:1</b>	$(8.4 \pm 2.1) \cdot 10^{-3}$	$-15.6 \pm 3.8$
<b>PDI8CN2/P<math>\alpha</math>MS (100k) 1:1</b>	$(4.6 \pm 0.4) \cdot 10^{-2}$	$-8.8 \pm 0.9$
<b>PDI8CN2/PS (280k) 4:1</b>	$(1.9 \pm 0.3) \cdot 10^{-2}$	$-4.3 \pm 0.4$
<b>PDI8CN2/PS (280k) 1:1</b>	$(2.4 \pm 0.3) \cdot 10^{-2}$	$-1.5 \pm 0.2$
<b>PDI8CN2/PS (280k) 1:2</b>	$(2.8 \pm 0.3) \cdot 10^{-2}$	$-0.9 \pm 0.1$



**Figure S5.** Output characteristic of a PDI8CN2/PS device.

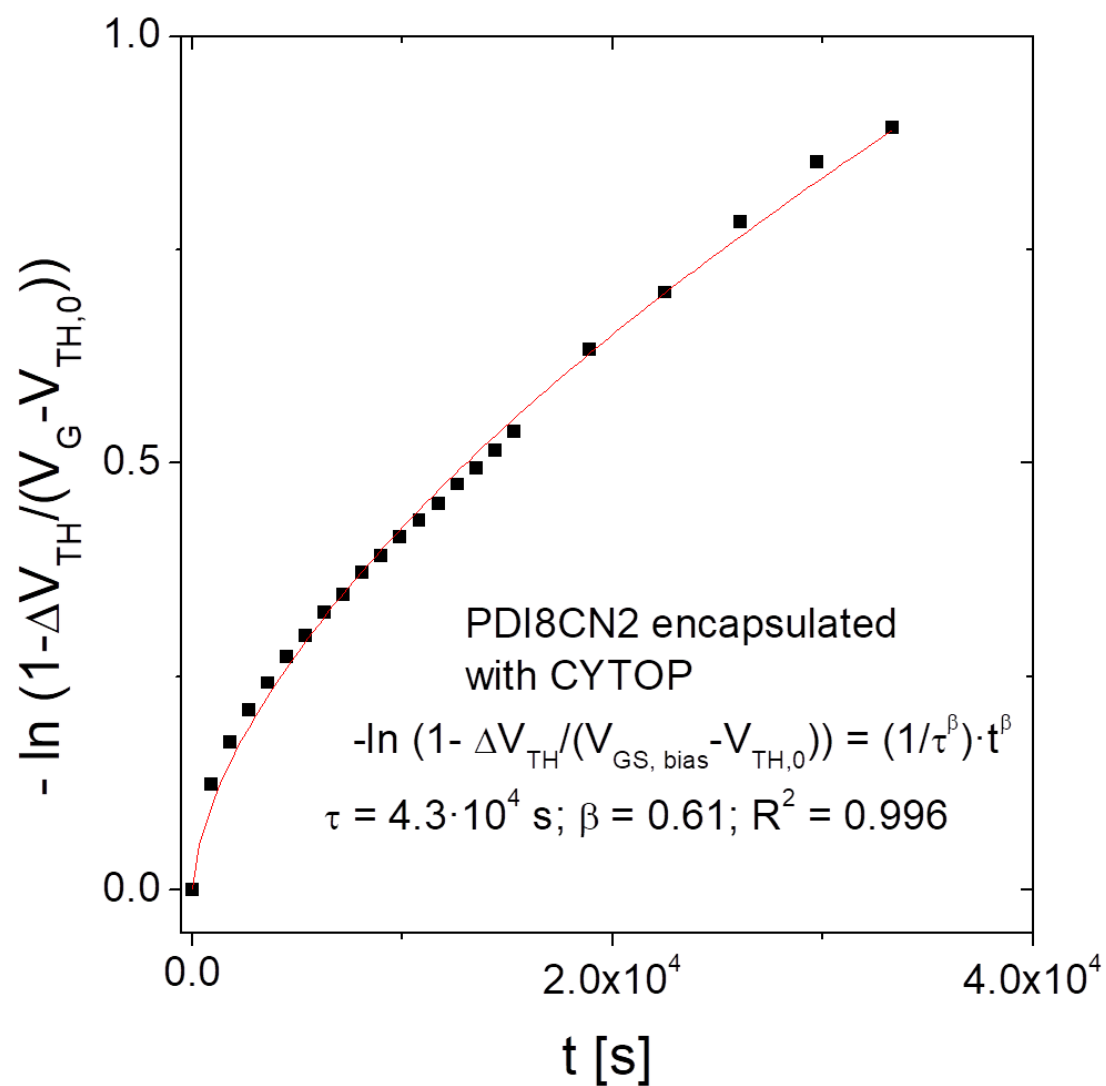


**Figure S6.** Output characteristics of a PDI8CN2 device.

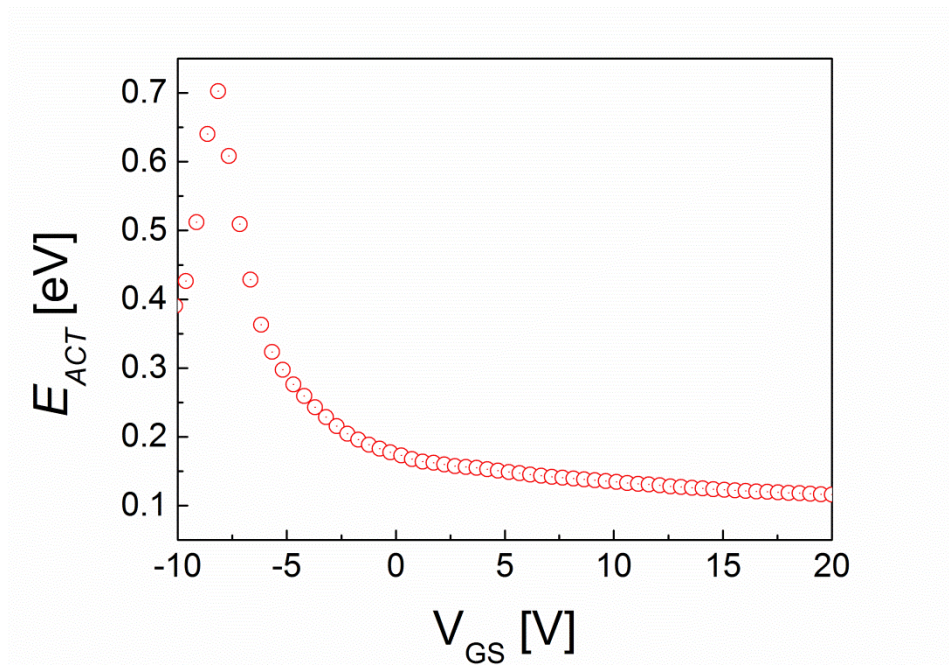
**Table S2.** Field-effect mobility and threshold voltage values of PDI8CN2 and PDI8CN2/PS films in the bias stress stability test.

PDI8CN2			PDI8CN2/PS		
t [min]	$\mu \cdot 10^{-3} [\text{cm}^2 \text{V}^{-1} \text{s}^{-1}]$	$V_{\text{TH}} [\text{V}]$	t [min]	$\mu \cdot 10^{-2} [\text{cm}^2 \text{V}^{-1} \text{s}^{-1}]$	$V_{\text{TH}} [\text{V}]$
0	6.01	-5.5	0	2.27	-0.2
15	4.06	2.6	15	2.54	2.7
30	3.69	6.5	30	2.21	3.5
45	3.43	9.0	45	2.05	4.0
60	3.34	11.0	60	1.93	4.4
90	3.04	14.0	75	1.78	4.7
120	2.75	15.9	90	1.70	4.9
150	2.56	17.1	105	1.64	5.1
180	2.33	17.9	120	1.61	5.4
210	2.43	18.4	135	1.56	5.5
240	2.89	18.9	150	1.56	5.6
270	3.70	19.5	165	1.53	5.8
300	3.88	19.5	180	1.48	5.8
			195	1.45	6.0
			210	1.40	6.1
			225	1.35	6.2
			240	1.33	6.3
			300	1.14	6.4
			360	1.07	6.6
			420	0.89	6.7
			480	0.87	7.0
			540	0.78	7.1
			600	0.73	7.2
			660	0.66	7.4
			720	0.60	7.5

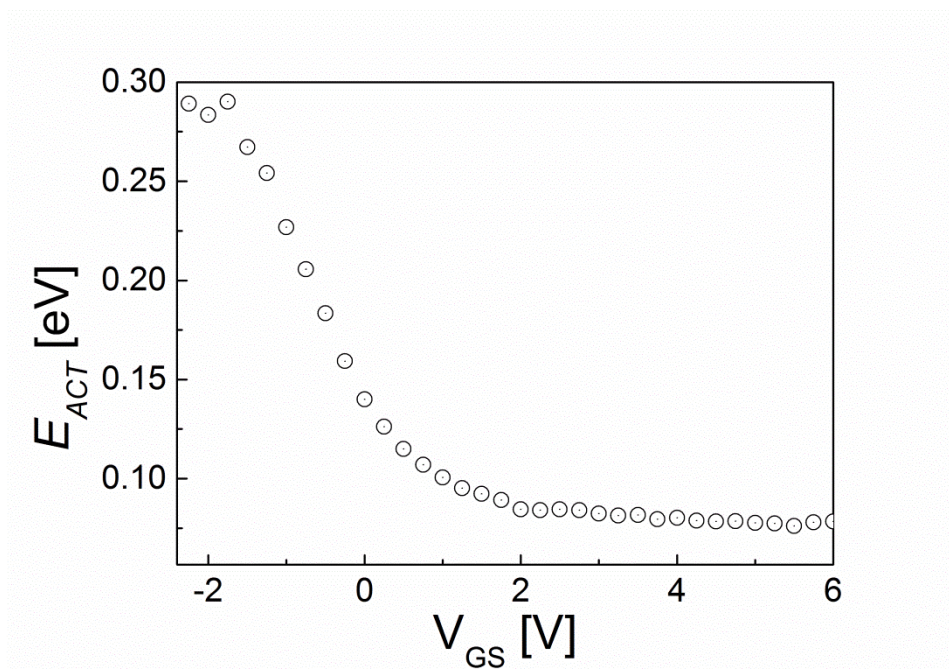




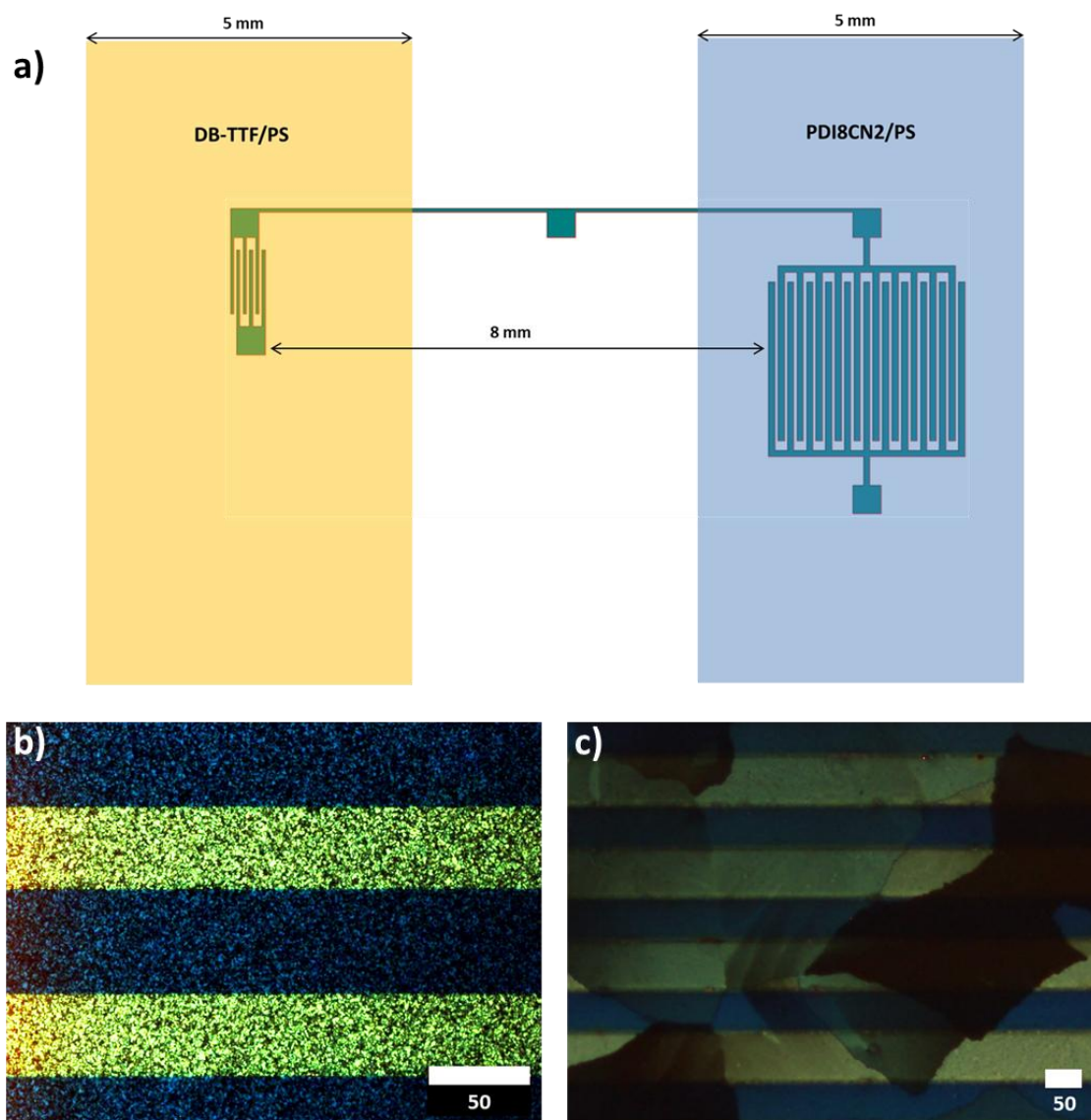
**Figure S7.** Bias stress stability of a film of PDI8CN2 encapsulated with Cytop.



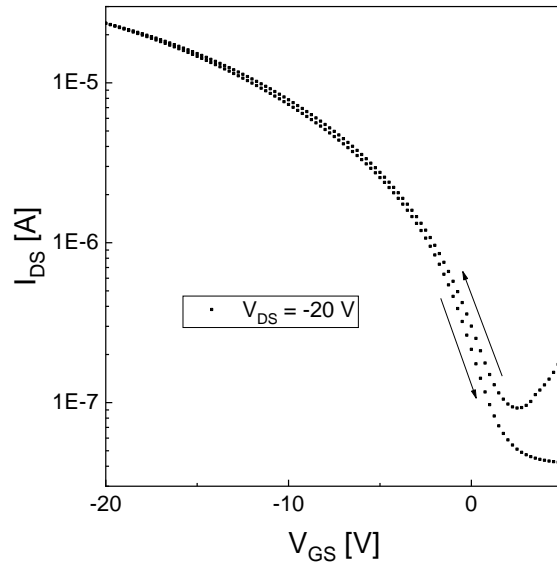
**Figure S8.** Activation energy of a PDI8CN2 device vs.  $V_{GS}$ .



**Figure S9.** Activation energy of a PDI8CN2/PS device vs  $V_{GS}$ .



**Figure S10.** a) Schematic representation of the inverter layout. Polarized optical microscope images of (b) a PDI8CN2/PS film and (c) DB-TTF/PS film. The scale bar corresponds to 50 μm.



**Figure S11.** DB-TTF/PS OFET transfer characteristics.