

Supporting Information

Furan Substituted Diketopyrrolopyrrole and Thienylenevinylene Based Low Band Gap Copolymer for High Mobility Organic Thin Film Transistors

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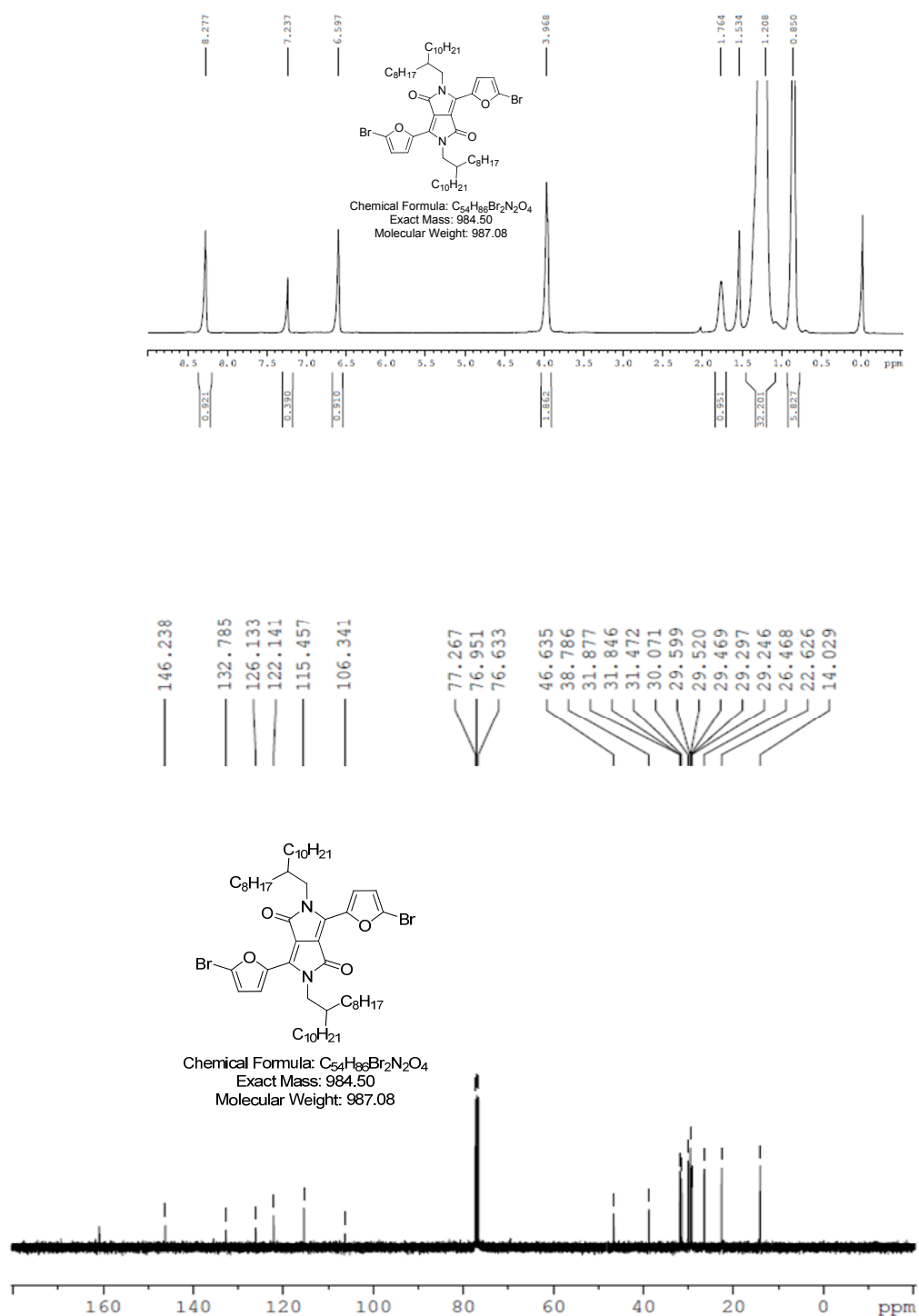


Figure S1. 1H NMR and ^{13}C spectrum of 3,6-bis(5-bromofuran-2-yl)-2,5-bis(2-octyl-1-dodecyl)pyrrolo[3,4-*c*]pyrrole-1,4(2*H*,5*H*)-dione in $CDCl_3$ (**2**).

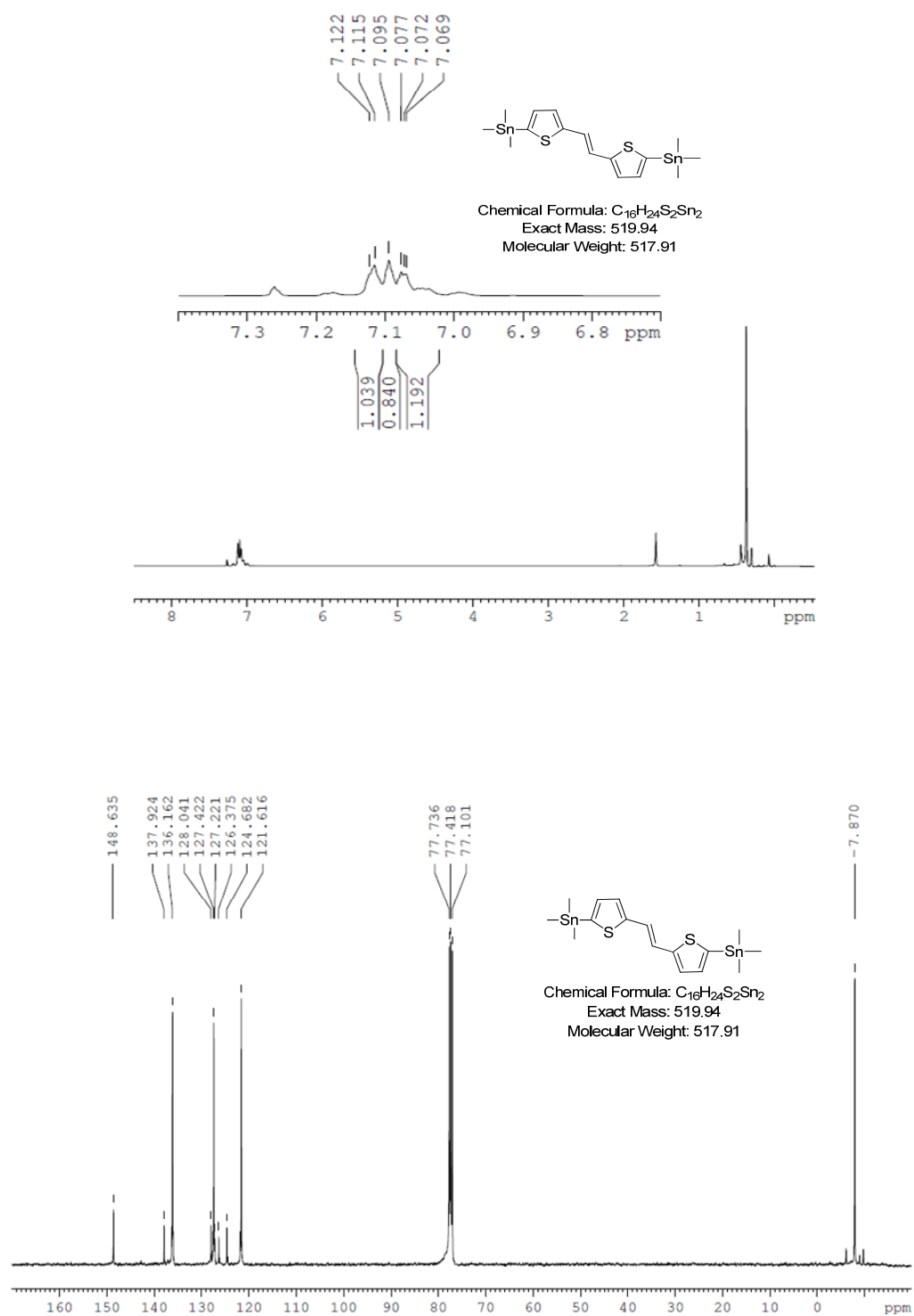


Figure S2. 1H NMR and ^{13}C spectrum of (E)-1,2-bis(5-trimethylstannyl)thiophen-2-yl-ethene in $CDCl_3$ (4).

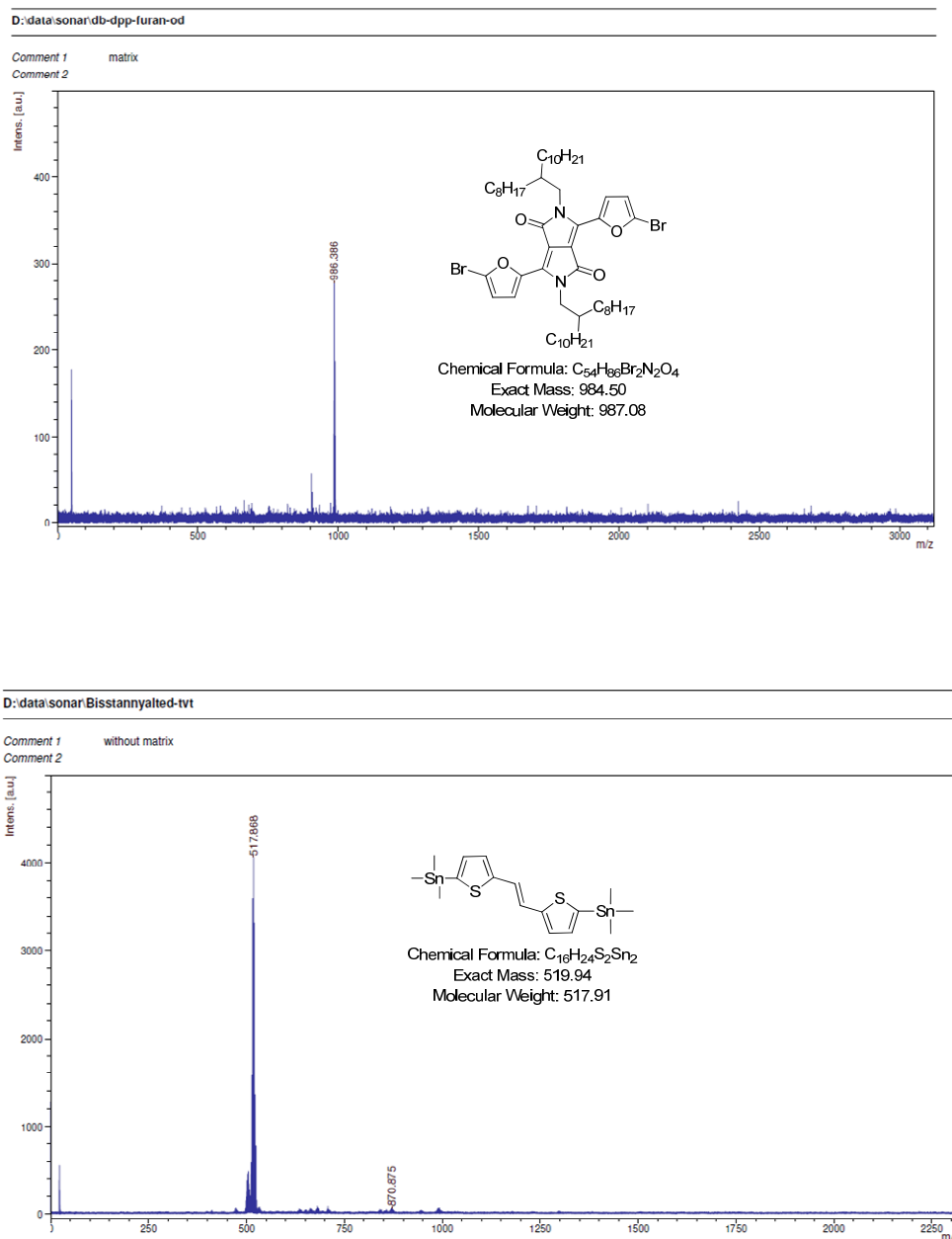


Figure S3. Matrix assisted time of flight (MALDI-TOF) spectrum of 3,6-bis(5-bromofuran-2-yl)-2,5-bis(2-octyl-1-dodecyl)pyrrolo[3,4-c]pyrrole-1,4(2*H*,5*H*)-dione (**2**) and (E)-1,2-bis(5-trimethylstannyl)thiophen-2-yl-ethene (**4**).

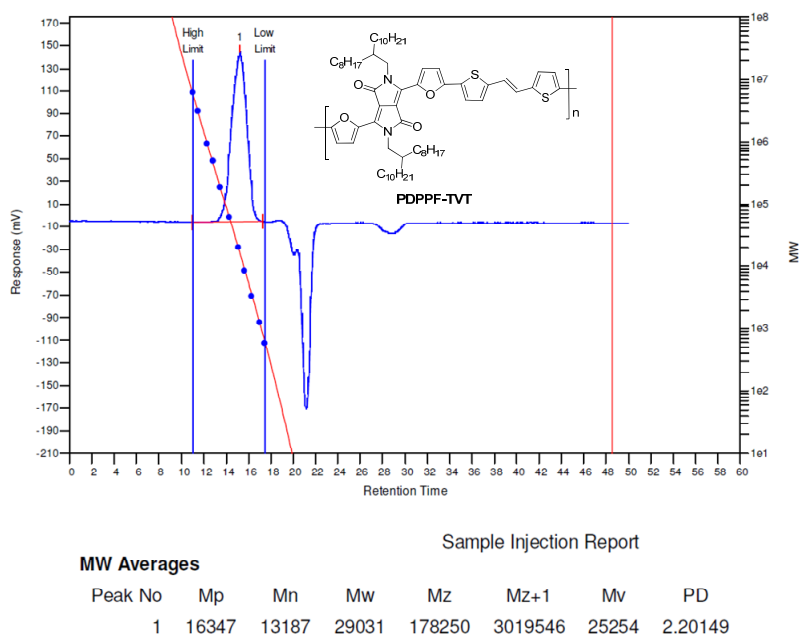


Figure S4. GPC elution curve and molecular weight of **PDPPF-TVT** using trichlorobenzene (TCB) as eluent and PMMA as standards at a column temperature of 160°C.

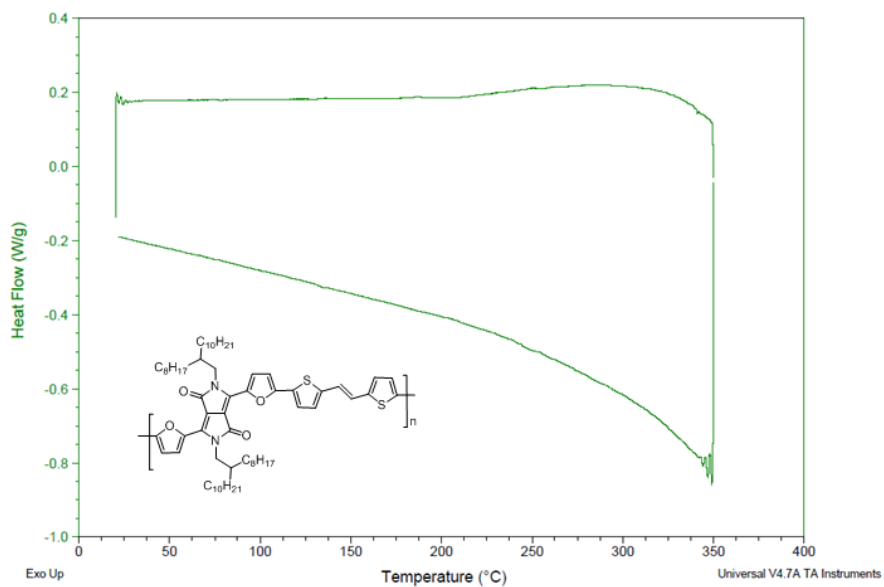


Figure S5. Differential Scanning Calorimetry (DSC) analysis of **PDPPF-TVT** polymer.

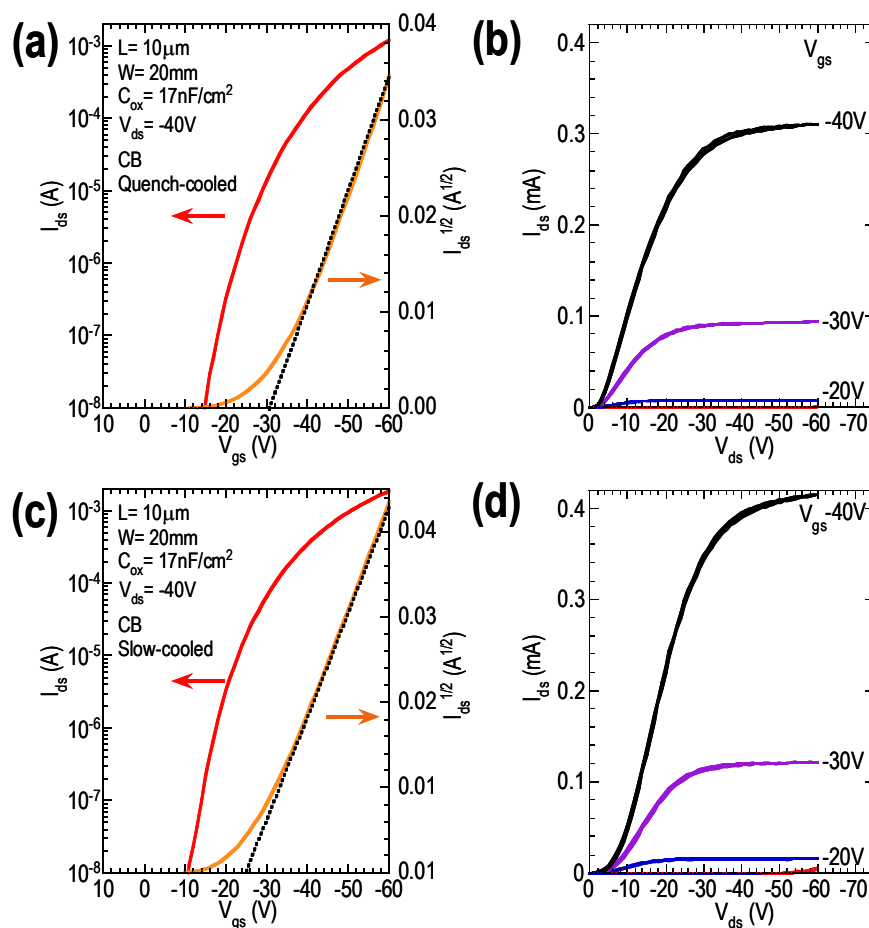


Figure S6. Transfer and output characteristics for **PDPPF-TVTFETs** spin-coated from chlorobenzene (CB) on OTS-HMDS-treated Si/SiO₂ substrates after annealing at 250°C for 15 min. (a) and (b) Quench-cooled (c) and (d) slow-cooled at a rate of 0.1°C/min to 50°C.

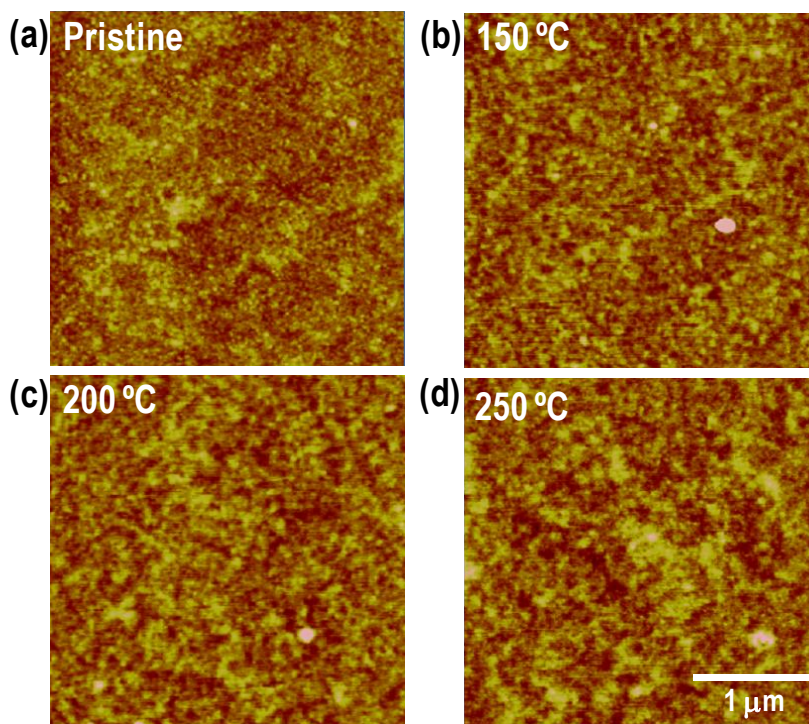


Figure S7. AFM images of 60 nm-thick film of **PDPPF-TV** spin coated from chlorobenzene on OTS-HMDS- treated native Si substrate. (a) as-casted film. Films annealed at (b) 150°C (c) 200°C and (d) 250°C for 15min. Scale bar denotes 1 μ m. z-height= 12 nm.

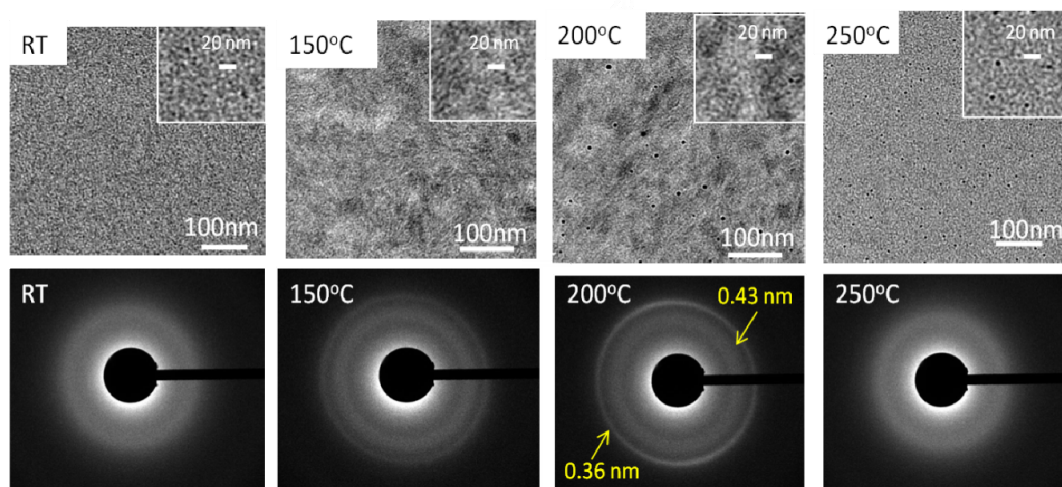


Figure S8. Transfer characteristics of (a) rrP3HT, (b) PBTTT and (c) PDPPF-TV FETs ($L=20\mu\text{m}$; $W=2\text{mm}$; $C_{ox}, 17\text{nF}/\text{cm}^2$) at $V_{ds} = -40\text{V}$ before and after exposure to air in light for 1 day, 2 days and 3 days respectively. (d) PBTTT and PDPPF-TV FETs subjected to 1800 cycles of on/off pulses: $V_g=0$ and -60V at 1Hz with $V_{ds}=-40\text{V}$.

