Supporting Information

Side Chain Engineering of Conjugated Polymers toward Highly Efficient Near-Infrared Organic Photo-Detector via Morphology and Dark Current Management

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Scheme S1 Detailed chemical structures and synthetic routes of the designed conjugated polymers.
Fig. S1 UV-visible absorption of obtained conjugated polymers in chloroform solution.

Fig. S2 External quantum efficiency and corresponding detectivity of each CP:PC$_{71}$BM blend films; (a) 5-PDBF:PC$_{71}$BM, (b) 2-PDBF:PC$_{71}$BM, and (c) 2EO-PDBF:PC$_{71}$BM.
Fig. S3 TEM images of each CP:PC\textsubscript{71}BM blend films; (a) \textbf{5-PDBF:PC\textsubscript{71}BM}, (b) \textbf{2-PDBF:PC\textsubscript{71}BM}, and (c) \textbf{2EO-PDBF:PC\textsubscript{71}BM}.

Fig. S4 Phase mode AFM images of each CP:PC\textsubscript{71}BM blend films; (a) \textbf{5-PDBF:PC\textsubscript{71}BM}, (b) \textbf{2-PDBF:PC\textsubscript{71}BM}, and (c) \textbf{2EO-PDBF:PC\textsubscript{71}BM}.
Fig. S5 2D GIXRD of each CP and corresponding PC$_{71}$BM blend films; (a-c) 2D diffraction images and (d-f) integrated diffraction tendency of 5-PDBF, 2-PDBF, and 2EO-PDBF.
Fig. S6 (a) Contact angle measured with ethylene glycol droplet, and (b) calculated surface energy of obtained conjugated polymers.

Fig. S7 Temperature-dependent dark current of each OPDs. (a) 5-PDBF:PC71BM, (b) 2-PDBF:PC71BM, and (c) 2EO-PDBF:PC71BM
Fig. S8 GPC molecular weight and its distribution of obtained conjugated polymers. (a) 5-PDBF, (b) 2-PDBF, and (c) 2EO-PDBF