Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C. This journal is © The Royal Society of Chemistry 2018

## **Electronic Supplementary Information (ESI)**

Hydrogen Bonds Induced High Performance Ternary Fullerene-Free

Organic Solar Cells with Increased Current Density and

**Enhanced Stability** 

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500 PTB7-Th:5% C7 B7-Th:10% C7 400 Th:15% C7 PL intensity (a.u.) Th:20% C7 300 200 100 0 600 700 800 900 Wavelength (nm)

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Figure S1. PL spectra of the PTB7-Th:C7 blend films with different doping ratio of C7

 Table S1. The elemental content in top surfaces of blend films with different active layers

 characterized by XPS

Active layer	S	С	Ν	0	F	2F/O
PTB7-Th:ITIC	5.82%	87.31%	0.76%	4.68%	1.44%	61.54%
PTB7-Th:10 wt%C7:ITIC	5.91%	87.77%	1.32%	3.68%	1.33%	72.28%

## Calculation of the top surface compositions

PTB7-Th molar content:

$$(PTB7 - Th) \ \ \% = \frac{n_{PTB7 - Th}}{n_{PTB7 - Th} + n_{ITIC} + n_{C7}}$$

$$\frac{2n_{PTB7-Th} + 2n_{ITIC} + 2n_{C7}}{n_{PTB7-Th}} = \frac{20}{F}$$
$$(PTB7-Th) \quad \% = \frac{2F}{0}$$

 $n_{PTB7-Th}$  is the mole number of a repeating unit of PTB7-Th;

 $n_{ITIC}$  is the mole number of ITIC;

 $n_{C7}$  is the mole number of C7;

 $\frac{O}{F}$  is the atom ratio of O/F.