

Supporting Information

Stacking Sequence and Acceptor Dependence of Photocurrent Spectra and Photovoltage in Organic Two-Junction Devices

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Table S1 Open-circuit voltage of devices with single-junction layer (ITO/PEIE/Junction Layer/MoO₃/Ag) and two-junction layers (ITO/PEIE/Junction Layer1/Junction Layer 2/MoO₃/Ag).

Layer 1	Layer 2	Voltage (V)
P3HT:ICBA	/	0.83
/	PCE10:PCBM	0.78
/	PDPP4T:PCBM	0.65
P3HT:ICBA	PCE10:PCBM	1.09
PCE10:PCBM	P3HT:ICBA	0.8
P3HT:ICBA	PDPP4T:PCBM	0.92
PDPP4T:PCBM	P3HT:ICBA	0.74
P3HT:PCBM	/	0.56
P3HT:PCBM	PCE10:PCBM	0.68
PCE10:PCBM	P3HT:PCBM	0.56
P3HT:PCBM	PDPP4T:PCBM	0.63

Figure S1 Energy diagram of the electron donors and acceptors.

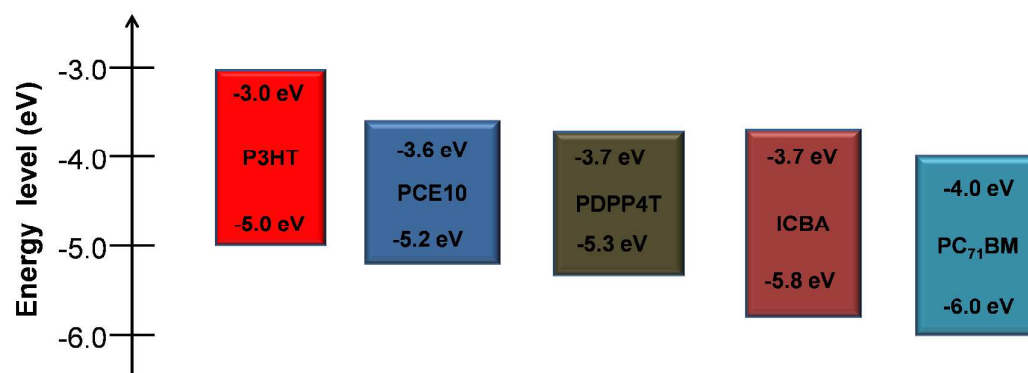


Figure S2 (a) J - V characteristics; (b) EQE spectrum of devices with a PCE10:ICBA single-junction layer (ITO/PEIE/PCE10:ICBA/MoO₃/Ag).

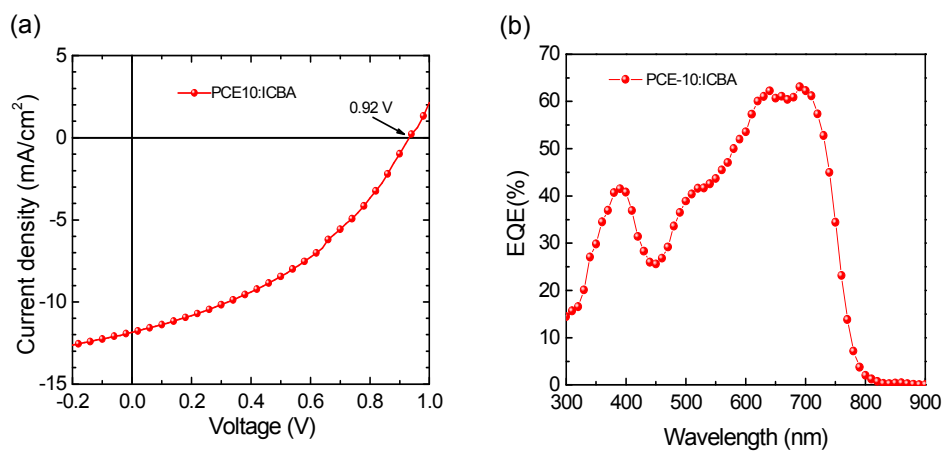


Figure S3 J - V characteristics of a P3HT:ICBA/PDPP4T:PCBM-based two-junction device with a transparent top electrode illuminated from different sides (ITO/PEIE/P3HT:ICBA/PDPP4T:PCBM/PEDOT:PSS).

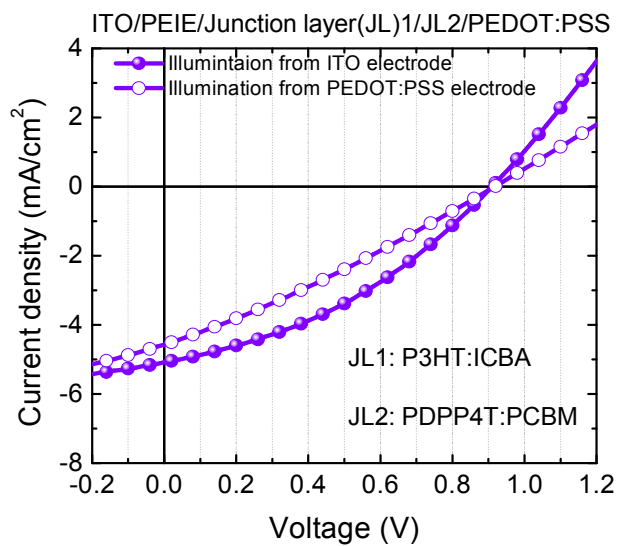


Figure S4 EQE spectrum of the single-junction devices with different layer

(ITO/PEIE/Active layer/MoO₃/Ag).

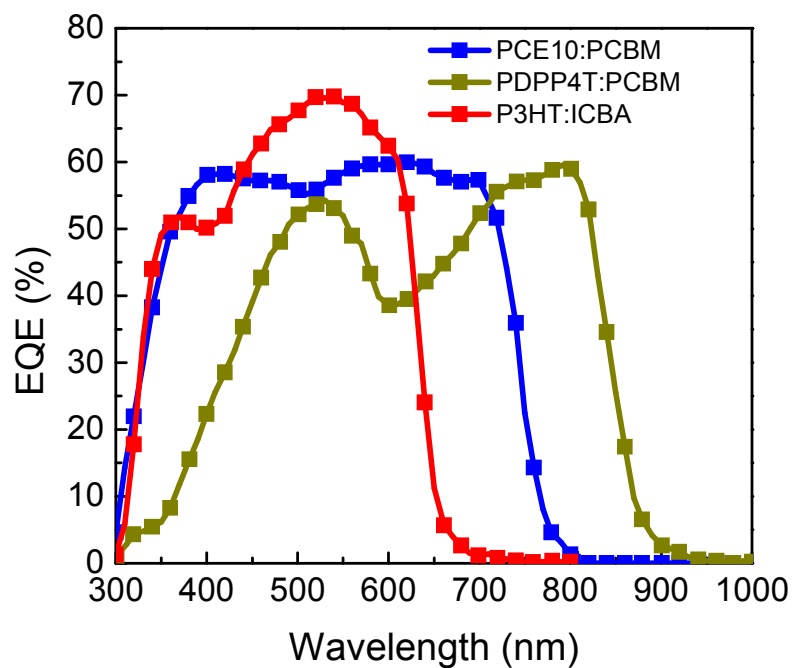


Figure S5 (a) J - V characteristics; (b) EQE spectrum of a P3HT:PCBM-based single-junction device (ITO/PEIE/P3HT:PCBM/MoO₃/Ag) .

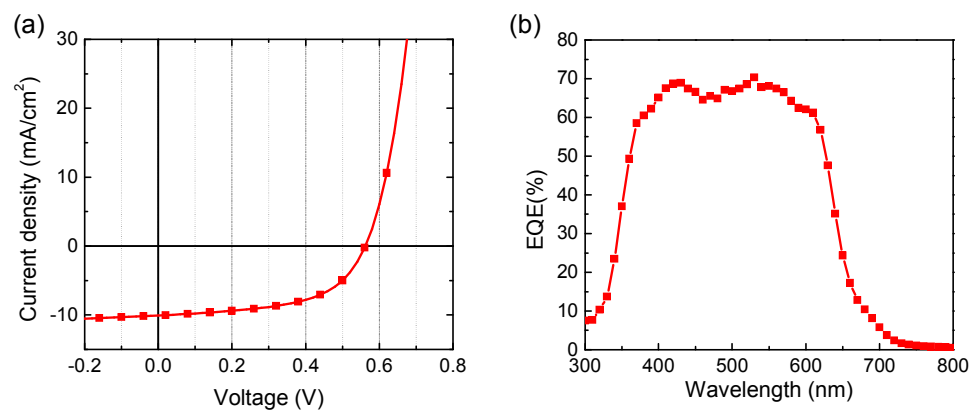


Figure S6 J - V characteristics of a PCE10:PCBM/P3HT:PCBM-based and P3HT:PCBM/

PCE10:PCBM/two-junction device

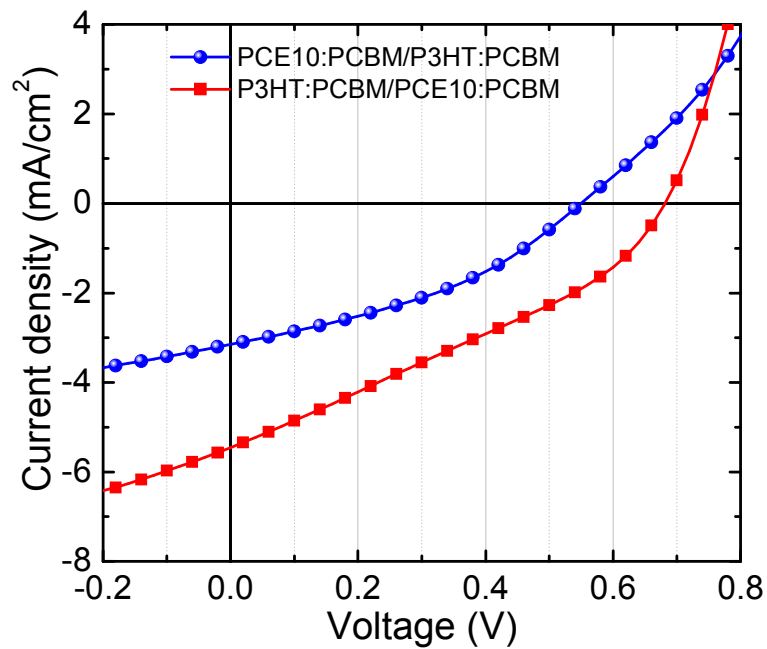


Figure S7 (a) J - V characteristics of PDPP4T:PCBM/PCE10:PCBM and PCE10:PCBM/PDPP4T:PCBM-based two-junction devices; (b) absorbance of the two-junction layers with different stacking layers; (c) EQE spectra of the two junction devices.

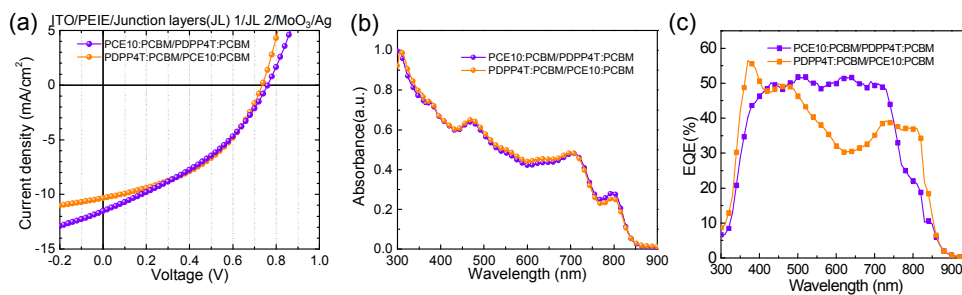


Figure S8 (a) $J-V$ characteristics of quaternary devices based on P3HT:ICBA mixed with PCE10:PCBM at different ratios (ITO/PEIE/P3HT:ICBA:PCE10:PCBM/MoO₃/Ag); (b) EQE spectra of corresponding quaternary device.

