

## One-step Fabrication of Mixed-Halide Perovskite Film for High-efficiency Inverted Solar cell and Module

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### Electronic Supporting Information

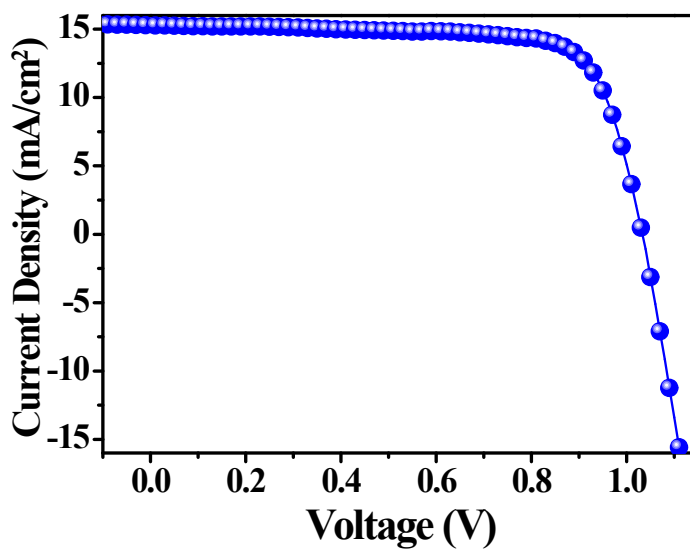


Figure S1: The I-V curve of the highest efficiency cell based on the mixed-halide perovskite film prepared with the spin program of 1000 rpm for 10 sec and then 7000 rpm for 20 sec.

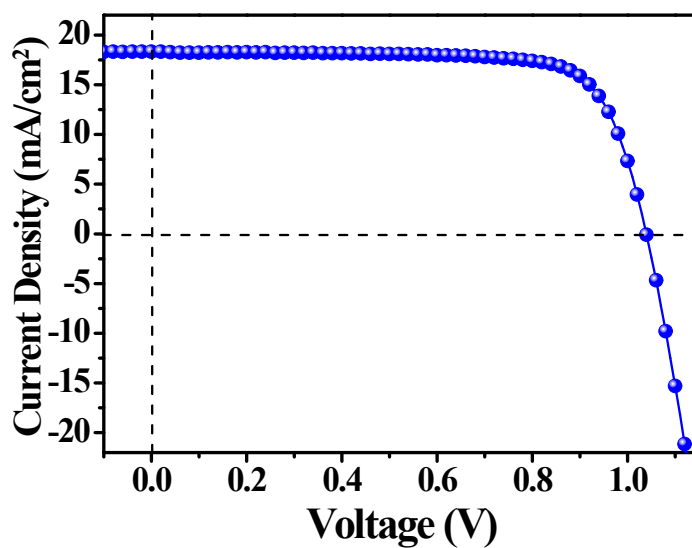


Figure S2: The I-V curve of the highest efficiency cell based on the mixed-halide perovskite film prepared with Hot Solution Spin-Coating (HSS) method.

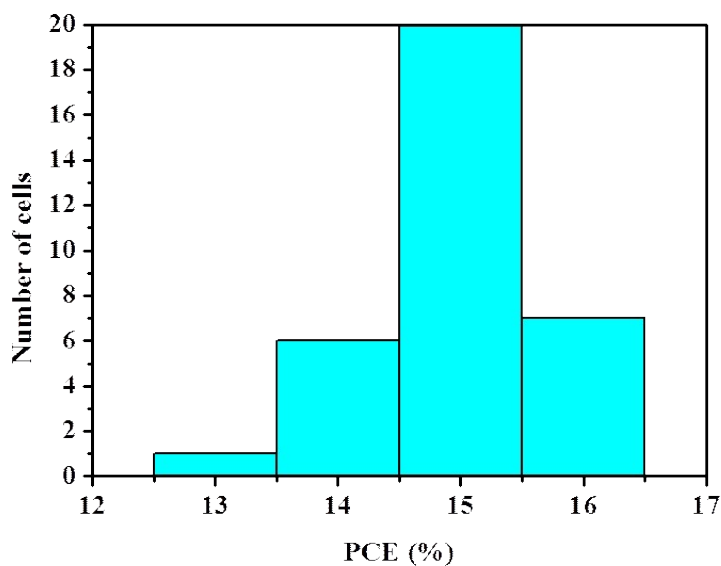


Figure S3: The efficiency statistics of the cells (34 cells) based on the mixed-halide perovskite prepared by combining HSS and solvent annealing (SA).

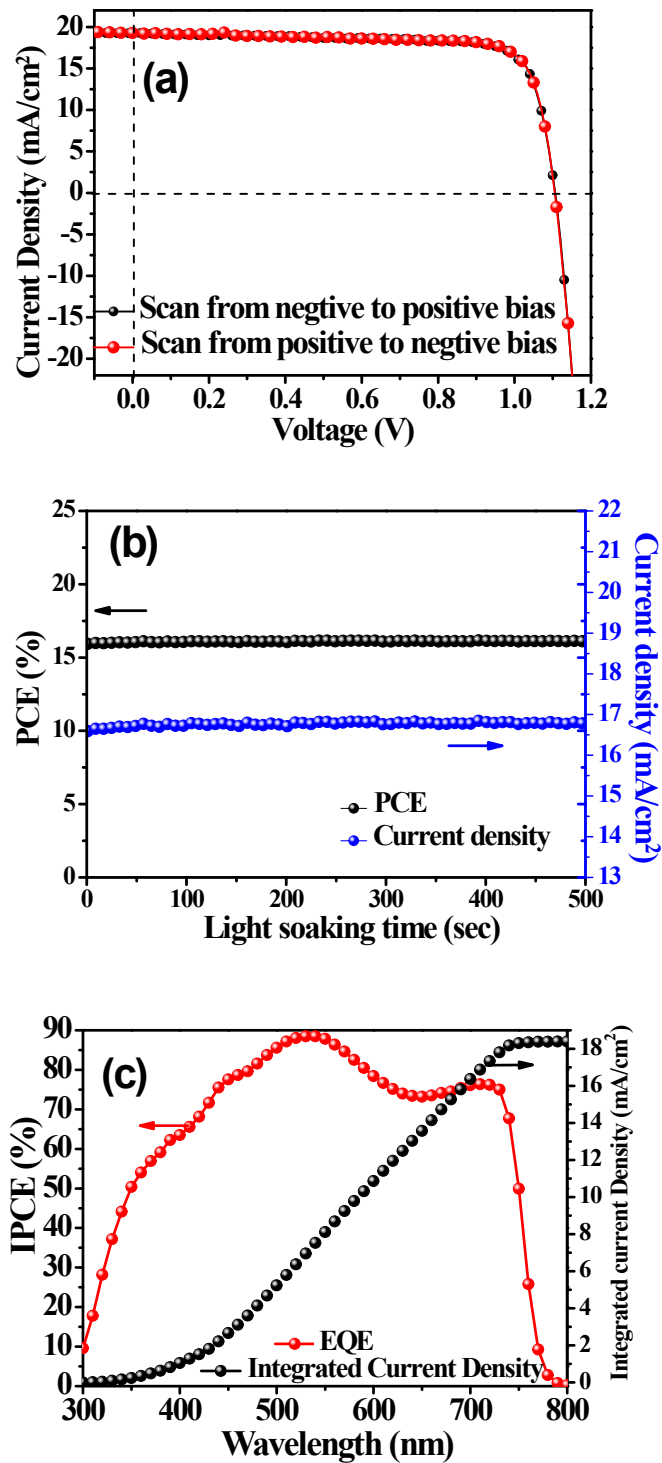


Figure S4: (a) I-V curve of the highest efficiency cell based on the mixed-halide perovskite film prepared by combining Hot Solution Spin-Coating (HSS) and Solvent Annealing (SA). (b) The steady-state  $J_{sc}$  and efficiency as a function of time. (c) The IPCE curve and the theoretical current integrated from the IPCE curve *via* Sun spectrum (AM 1.5).

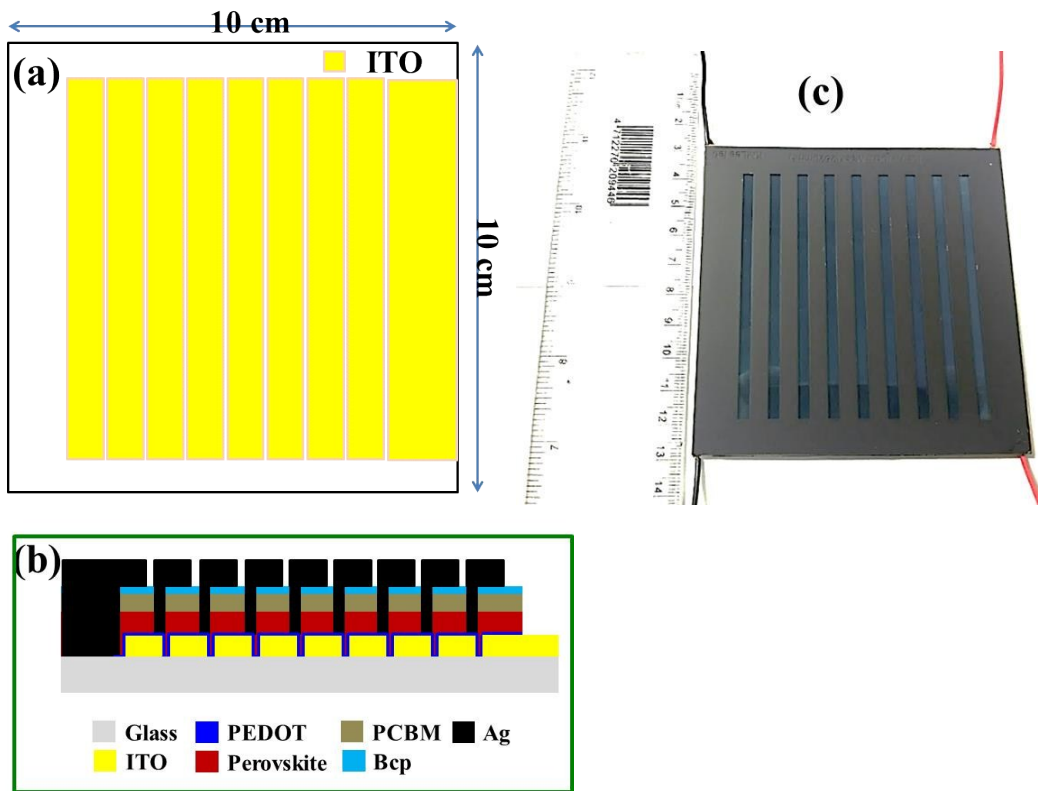


Figure S5: (a) The illustration of the ITO pattern on the substrate for perovskite solar module. (b) The illustration of the cross-section for the resulting module. (c) The picture of the real perovskite solar module with mask.