

## Supporting Information

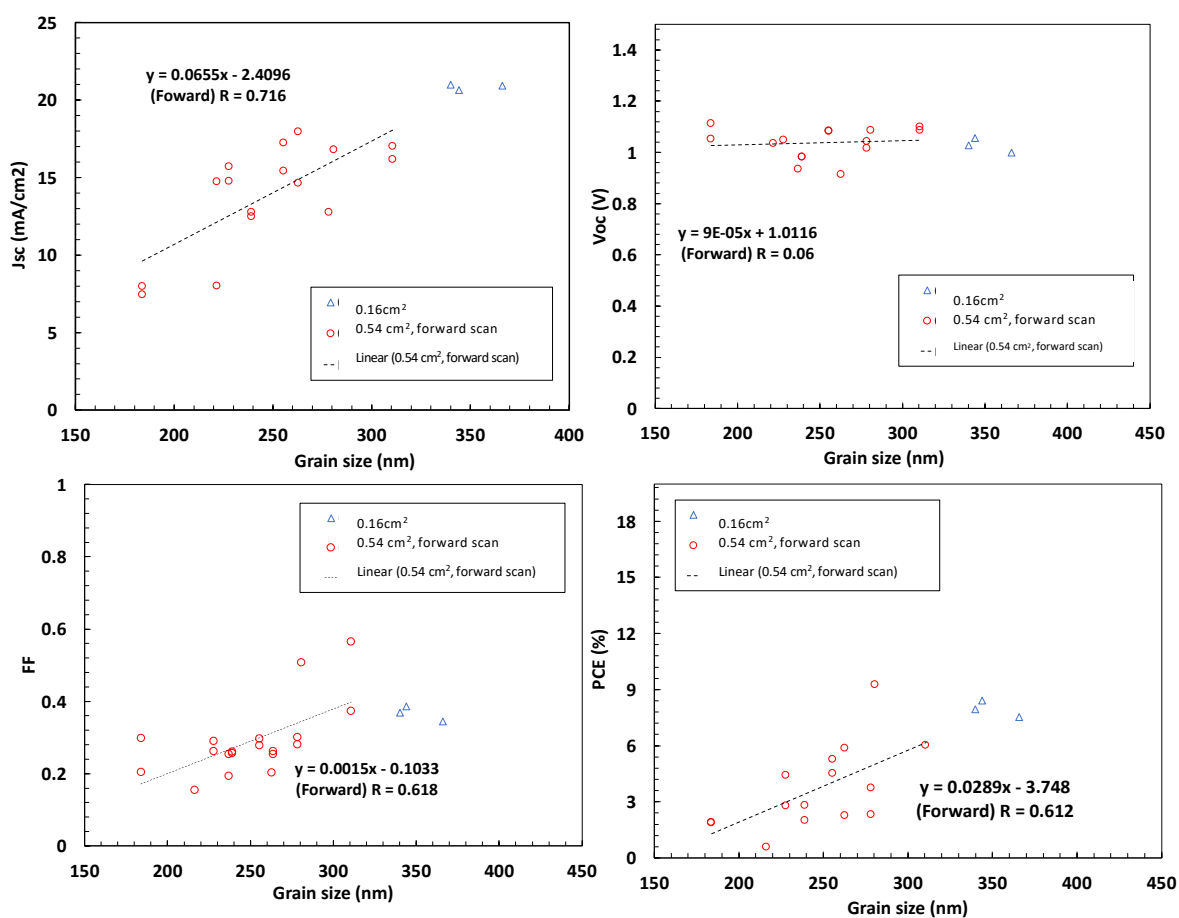


Figure S1. Effect of average perovskite grain size on PSC performance parameters measured using forward scan: (a)  $J_{sc}$ , (b)  $V_{oc}$ , (c) FF, and (d) PCE. All PCSs were fabricated using ITO/compact TiO<sub>2</sub>(1-butanol  $T_s = T_a = 450^\circ\text{C}$ )/MAPbI<sub>3</sub>/Spiro-OmeTAD/Au).

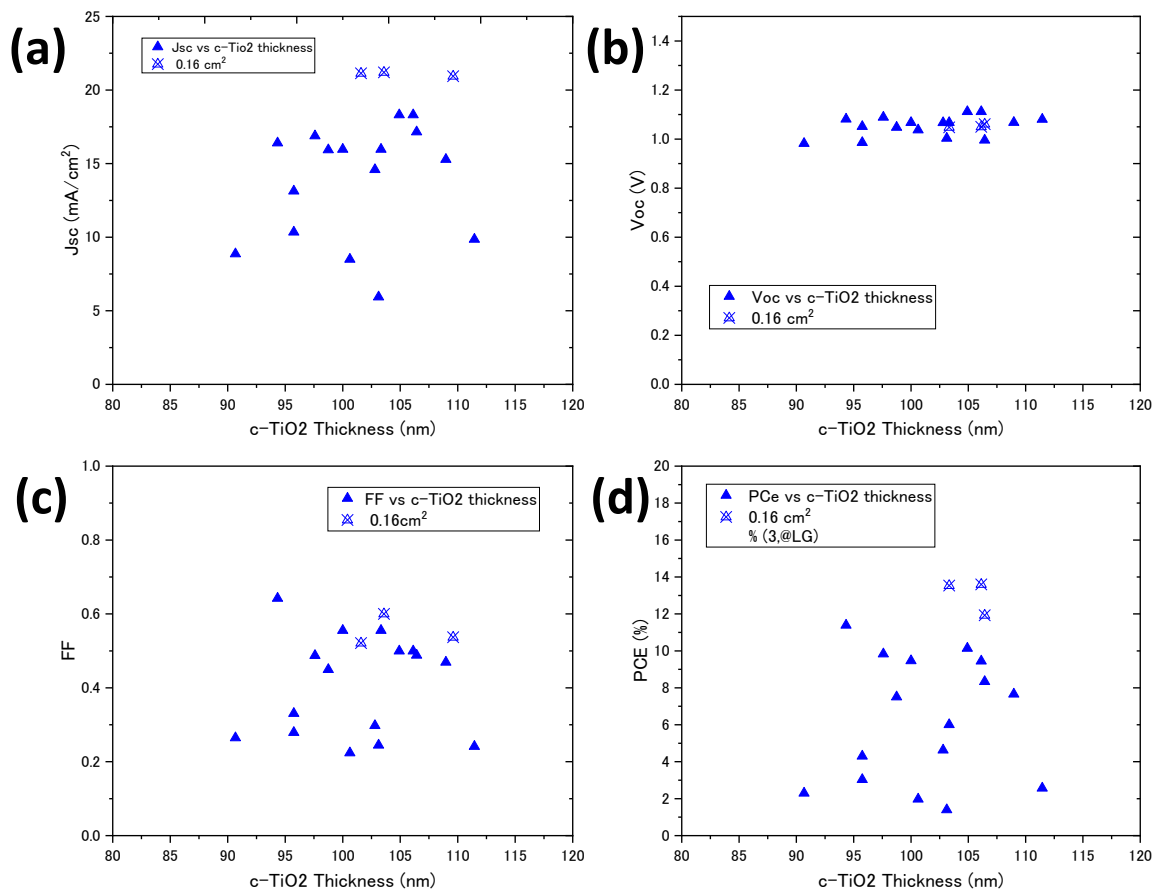


Figure S2. The effect of c-TiO<sub>2</sub> thickness on the PSC performance.

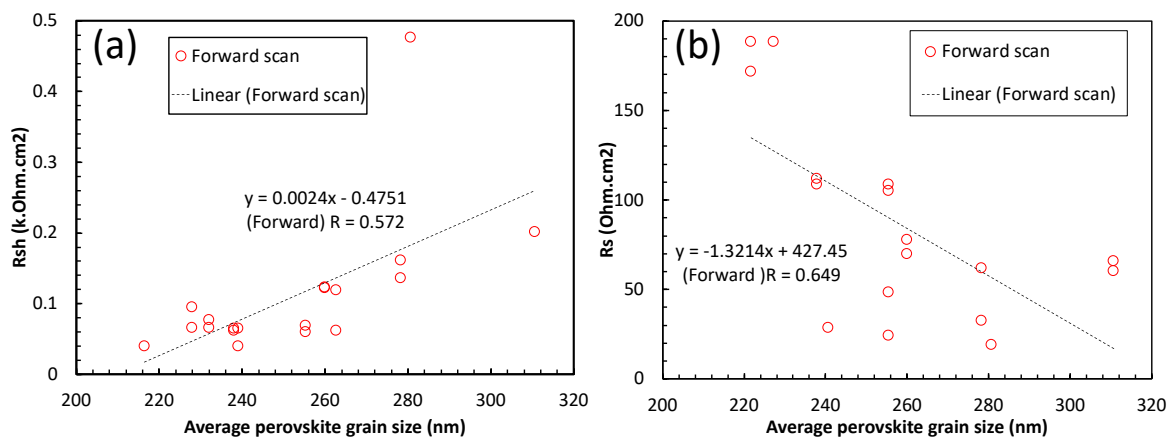


Figure S2. Effect of average perovskite grain size on (a) series resistance ( $R_s$ ) and (b) shunt resistance ( $R_{sh}$ ) for PSC samples with 1-butanol as solvent at  $T_s = T_a = 450^\circ\text{C}$  with 0.54 cm<sup>2</sup> as an active area. Data was collected from the forward scan.

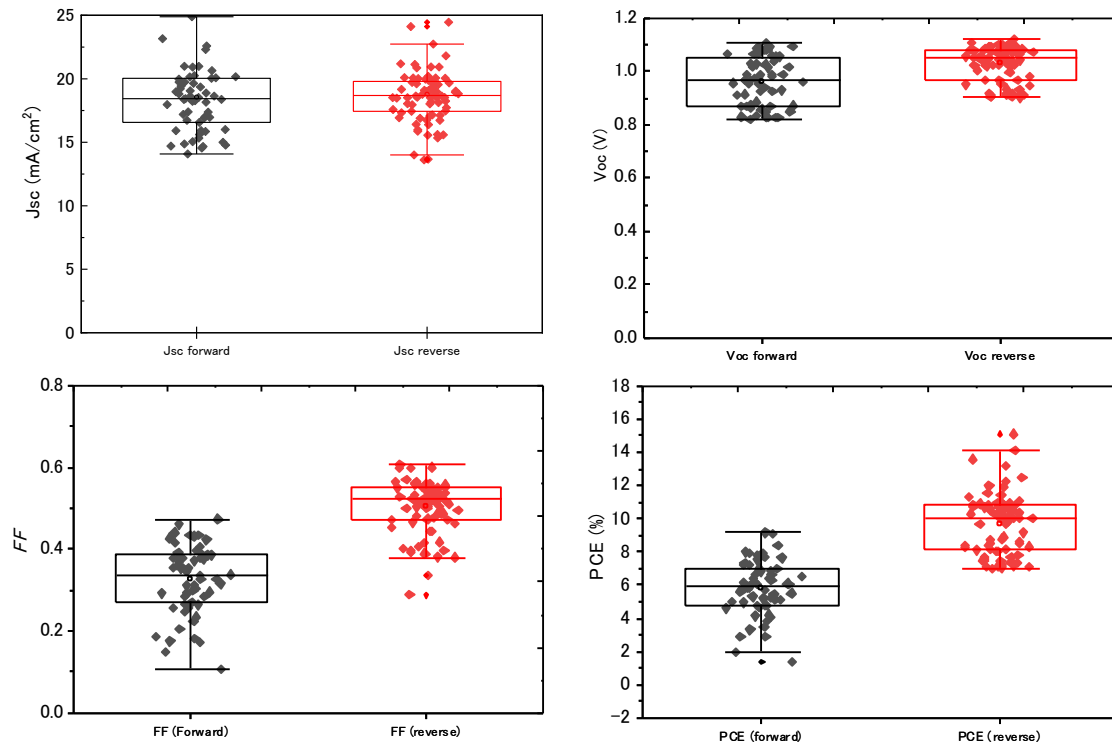


Figure S3. Distribution reproducible graphs of PSCs (0.16cm<sup>2</sup> active area samples) comparing forward scan and reverse scan: (a)  $J_{sc}$  (b)  $V_{oc}$  (c) FF and (d) PCE.

