

Supporting Information

High-efficiency of 15.47% for two-dimensional perovskite solar cells processed by blade coating with non-thermal assistance.

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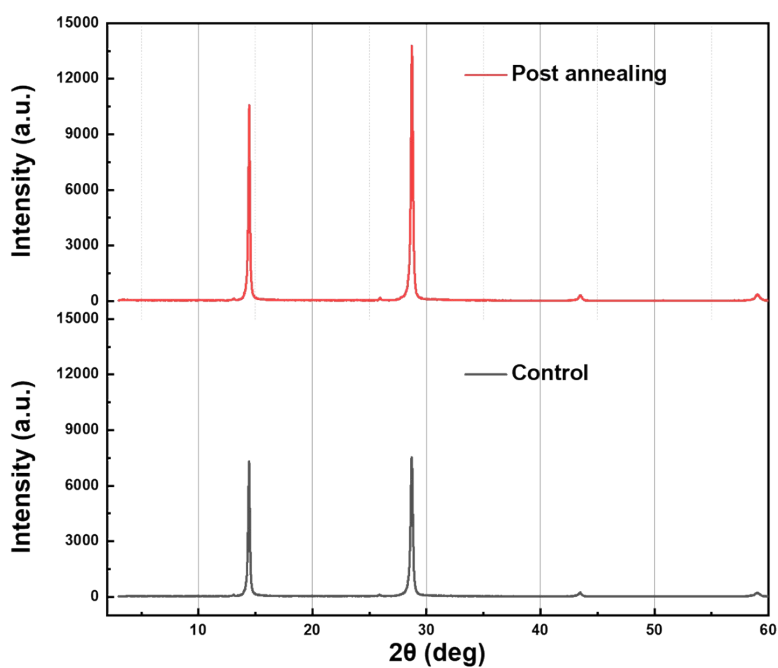


Figure S 1. XRD patterns for blade-coated $\text{BA}_2\text{MA}_3\text{Pb}_4\text{I}_{13}$ films before and after post-annealing.

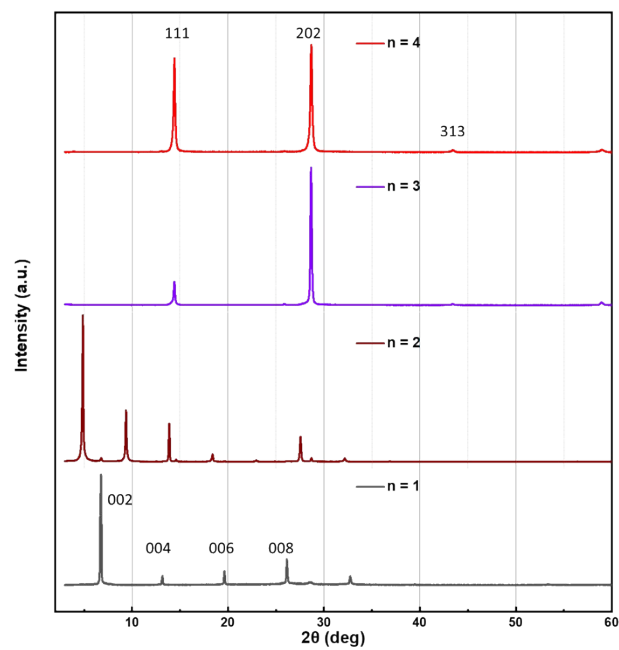


Figure S2. The XRD patterns for BA-based perovskite (spin-coated) with different values of n .

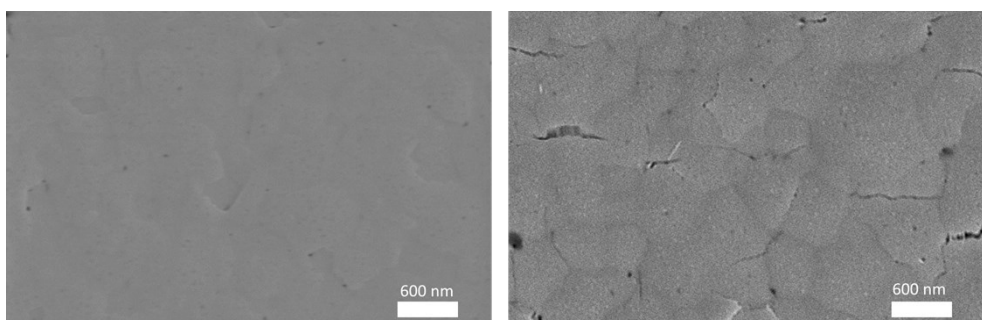


Figure S3. SEM images for two kinds of the film under a smaller field of view. (Left: blade-coated film; Right: spin-coated film)

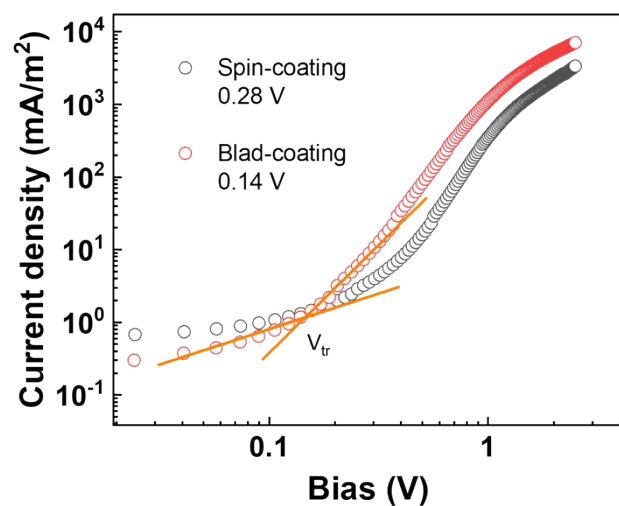


Figure S4. Dark J - V characteristics of electron-only devices based on spin and blade coated 2D perovskite active layers.

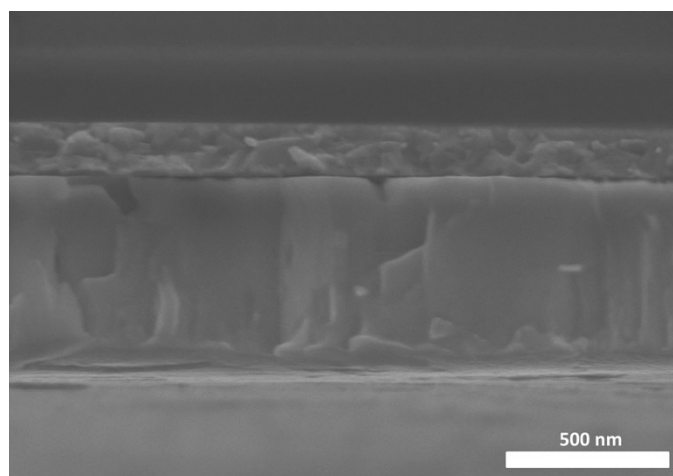


Figure S5. Cross-section scanning electron microscopy image of a 2D PSC based on blade-coated $\text{BA}_2\text{MA}_3\text{Pb}_4\text{I}_{13}$ photo-absorber.

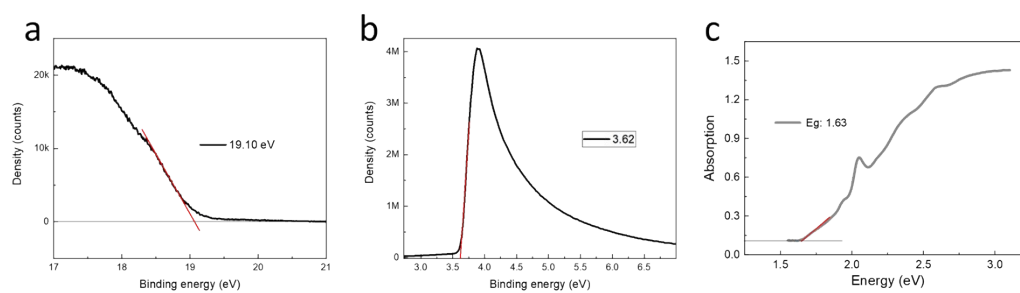


Figure S6. (a-b) UPS data of $\text{BA}_2\text{MA}_3\text{Pb}_4\text{I}_{13}$ perovskite film. (c) The optical band gap (E_g) fitted by absorption spectra.

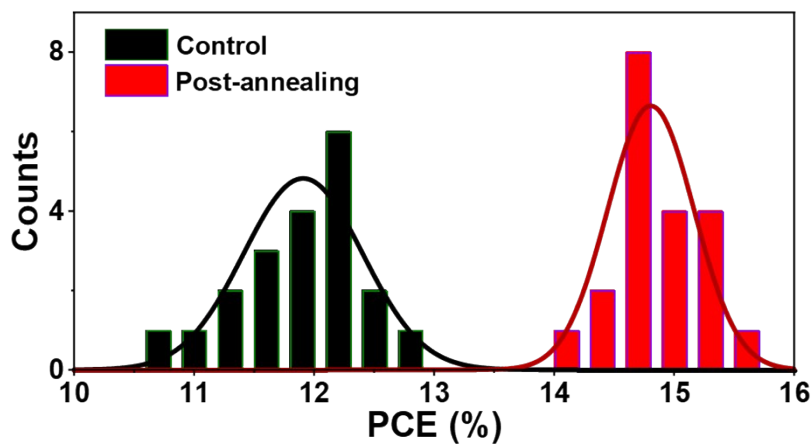


Figure S7. Histogram of statistical PCE of blade coated $\text{BA}_2\text{MA}_3\text{Pb}_4\text{I}_{13}$ solar cells obtained from 20 devices for each processing condition.

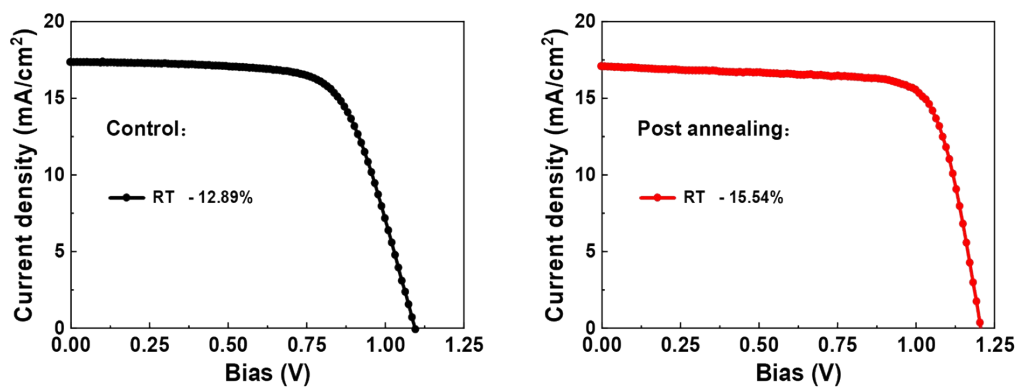


Figure S8. Current density versus voltage (J-V) characteristics of spin-coated 2D PSCs (before and after treatment with post annealing) under AM 1.5G solar irradiation (100 mW cm^{-2}). Inset text: extracted power conversion efficiencies (PCEs) of respective devices.