Electronic supplementary information

Efficient and Stable All-Inorganic Perovskite Solar Cells Based on Nonstoichiometric $Cs_xPbI_2Br_x$ (x>1) Alloys

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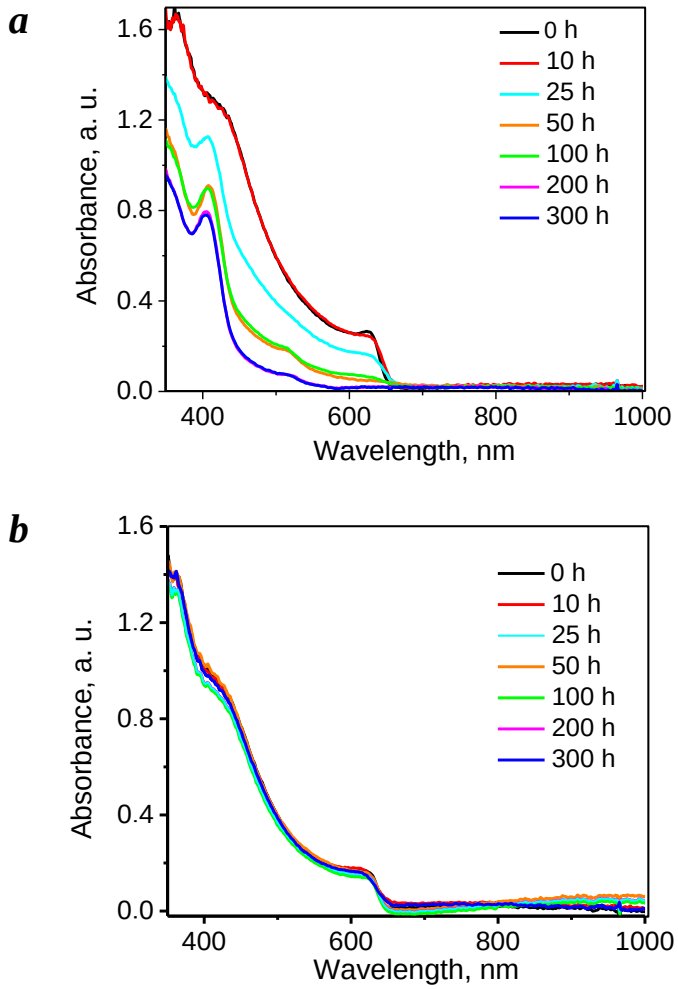

Figure S1. Evolution of the absorption spectra of the stoichiometric $CsPbI_2Br$ (a) and non-stoichiometric $Cs_{1.2}PbI_2Br_{1.2}$ (b) thin films exposed to white light illumination (100 mW/cm^2) at 70 °C in inert atmosphere (O_2, H_2O <0.1 ppm).

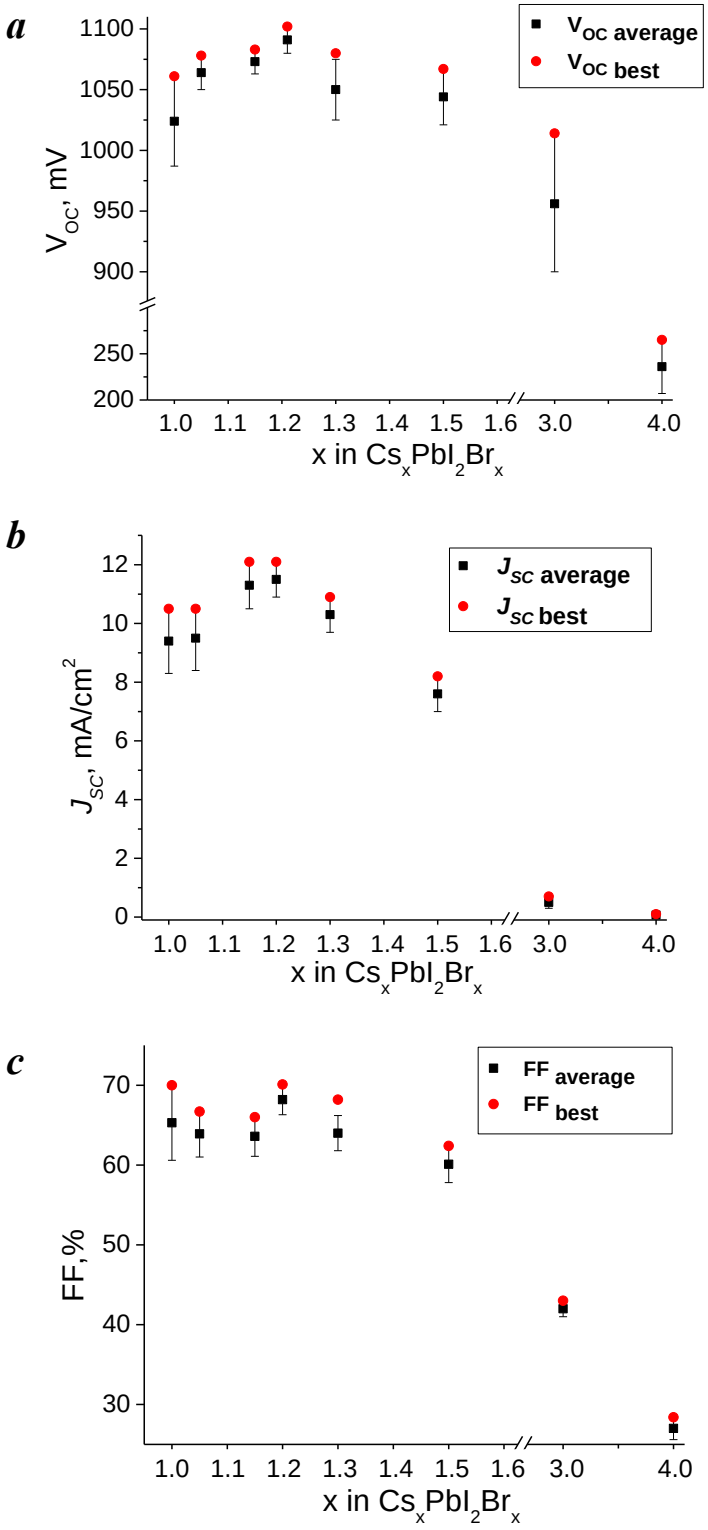

Figure S2. Best and average open circuit voltage (a), short circuit current density (*b*), and fill factor (c) of the devices based on the $Cs_xPbI_2Br_x$ films with different compositions extracted from *J*-V measurements (scan rate of 0.1 V/s in forward direction).

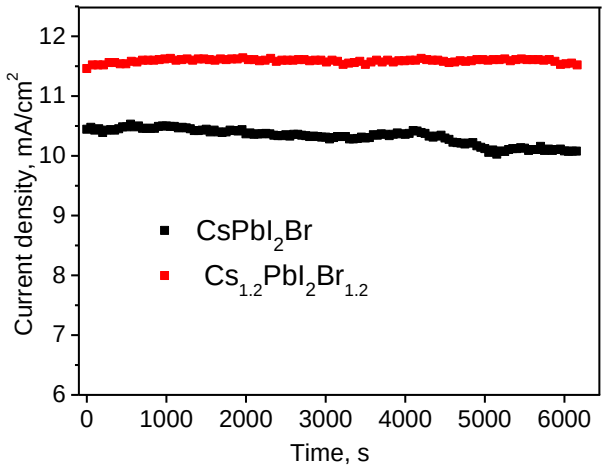

Figure S3. Steady-state photocurrent measurements under constant load near the device maximal power point at V_{max} of 760 mV.

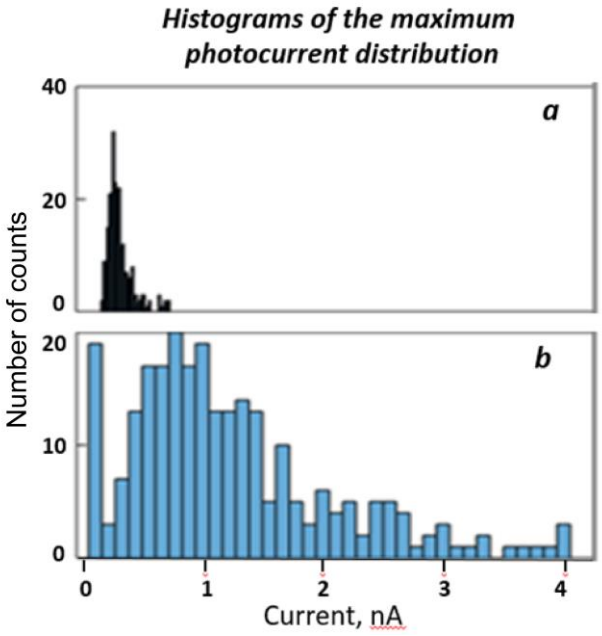

Figure S4. Histograms of the maximum photocurrent distribution from I-V measurements for the $CsPbI_2Br$ (a) and $Cs_{1.2}PbI_2Br_{1.2}$ (b) films.

Table S1. Average Cs/Pb atomic ratio in the deposited $Cs_xPbI_2Br_x$ films according to flame atomic absorption spectrometry (AAS).

Composition of the films as defined by the thicknesses of CsBr and PbI_2	**Cs/Pb atomic ratio experimentally determined using AAS***
$Cs_{0.95}PbI_2Br_{0.95}$	0.95
$CsPbI_2Br$	1.02
$Cs_{1.05}PbI_2Br_{1.05}$	1.07
$Cs_{1.15}PbI_2Br_{1.15}$	1.15
$Cs_{1.2}PbI_2Br_{1.2}$	1.18
$Cs_{1.3}PbI_2Br_{1.3}$	1.36
$Cs_{1.5}PbI_2Br_{1.5}$	1.50
$Cs_{3.0}PbI_2Br_{3.0}$	3.02
$Cs_{4.0}PbI_2Br_{4.0}$	3.93

* - The relative standard deviations of the measurements were within 1%.