Supplementary materials

Dipolar cation accumulation at interfaces of perovskite light emitting solar cells

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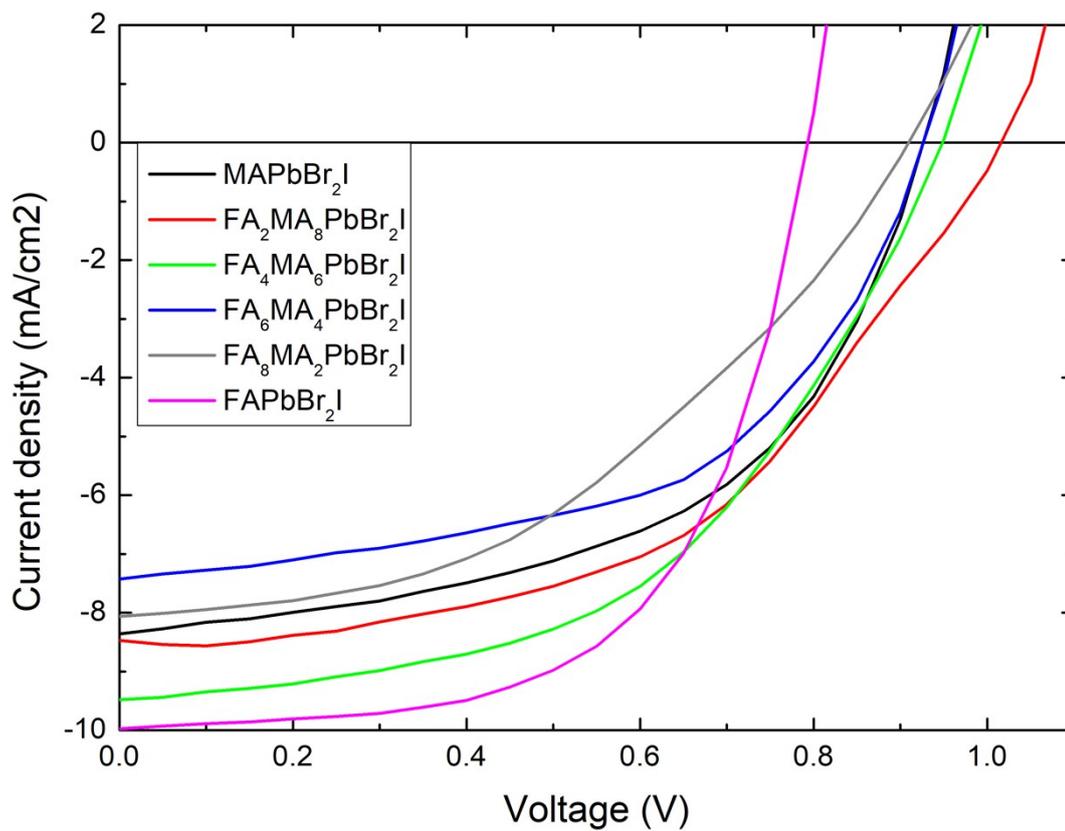
Figure S1. IV curves of devices based on ITO/PEDOT:PSS/$FA_xMA_{1-x}PbBr_2I$/C60/LiF/Ag (0≤x≤1).

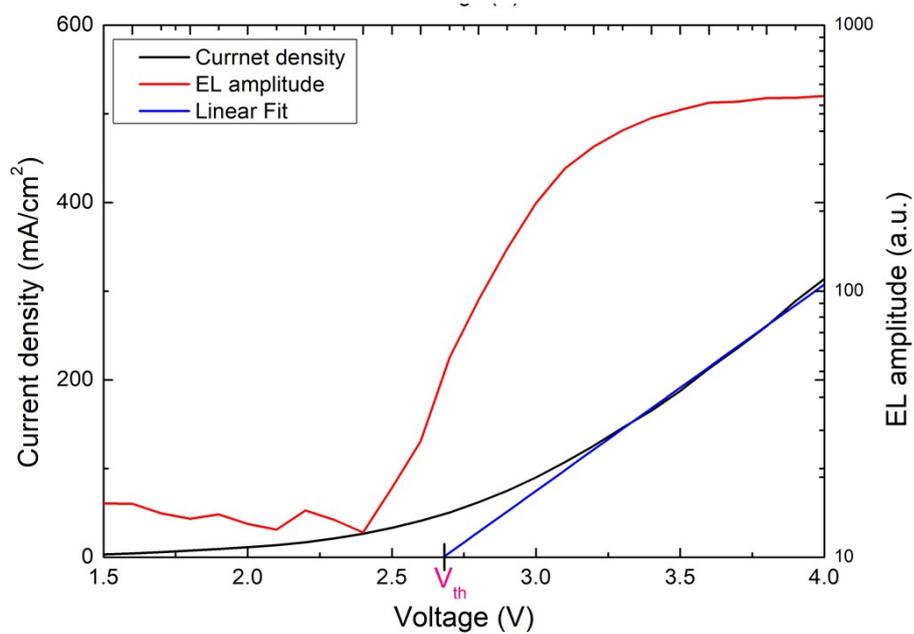All devices demonstrate pretty the same parameters (PCE ≈ 4%)

Fig. S2. J-V characteristic and EL amplitude (log scale) dependence measured for FAPbBr$_2$I-based perovskite device. V$_{th}$ determines by zero-crossing of linear approximation of IV curve.
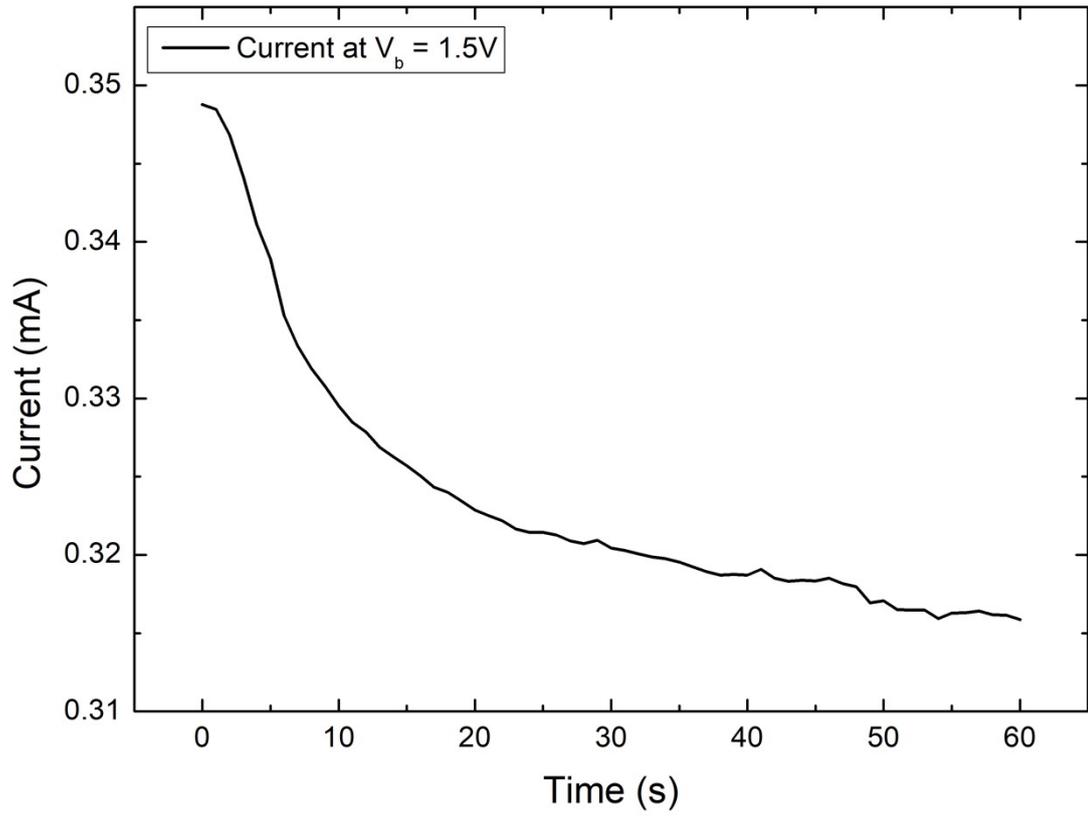
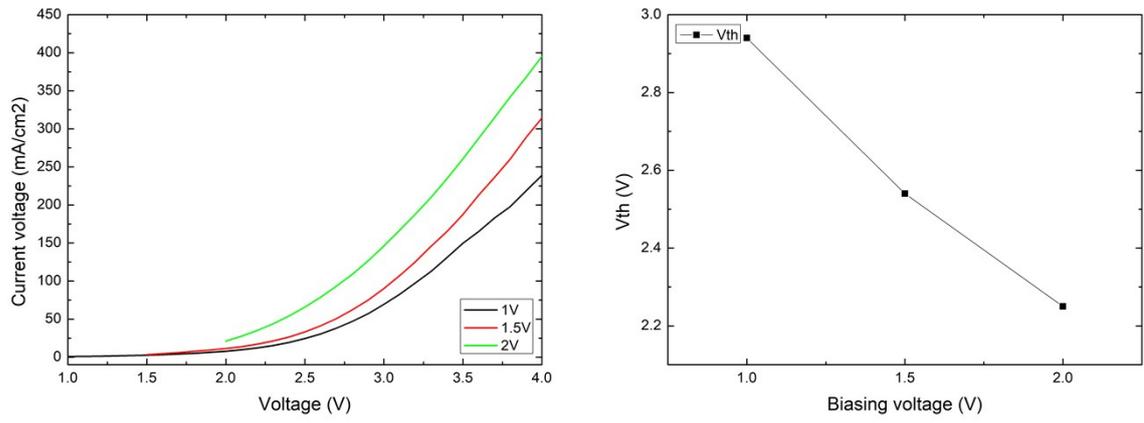Fig. S3. Dependence of current flowing through the device during prebiasing at V_b = 1.5 V

Fig. S4. I-V curve evolution upon pre-biasing voltage. Inset shows V_{th} values obtained for certain voltage.
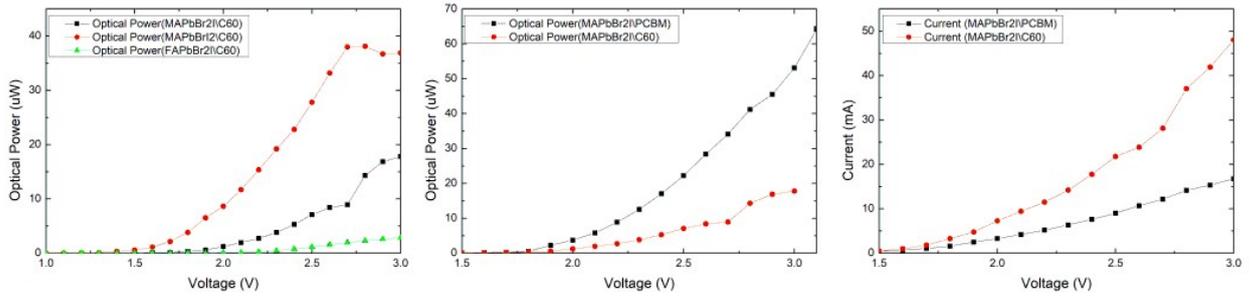
Fig. S5. **a** Optical power of dual functional devices based on MAPbBr$_2$I, FAPbBr$_2$I and MAPbBrI$_2$. **b** Optical power of dual functional device based on MAPbBr$_2$I with C60 or PCBM as ETL. **c** IV curves of dual functional device based on MAPbBr$_2$I with C60 or PCBM as ETL.
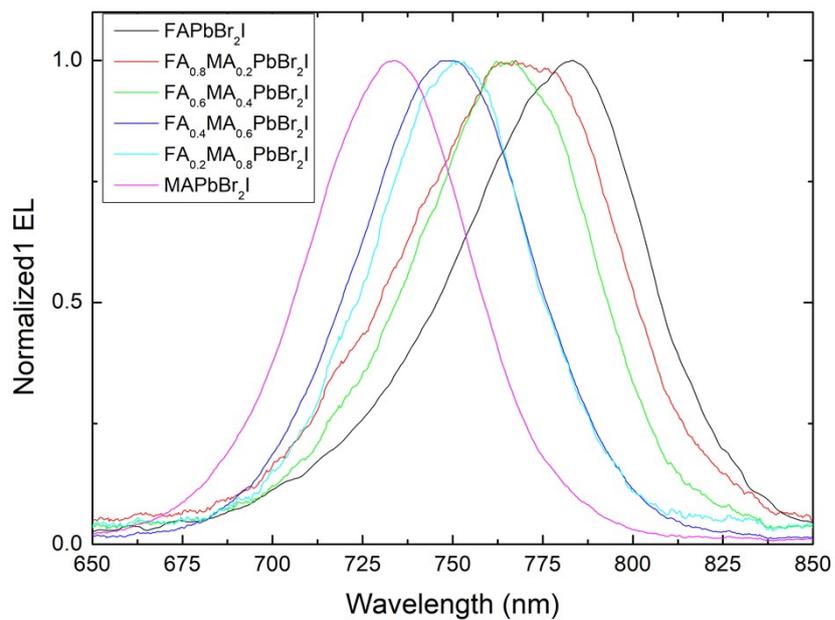
Fig. S6. Electroluminescence spectra of devices based on $FA_xMA_{1-x}PbBr_2I$ perovskite(x = 0, 0.2, 0.4, 0.6, 0.8, 1).
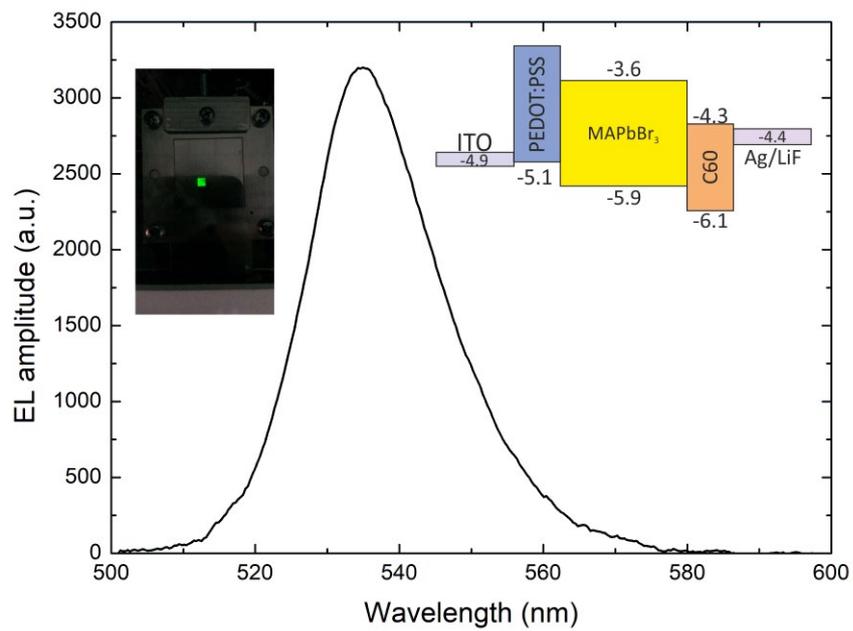
Fig. S7. Band structure of MAPbBr$_3$ based device, EL spectra of the device at 3.5V bias and microphotograph of the device in the LED working regime.
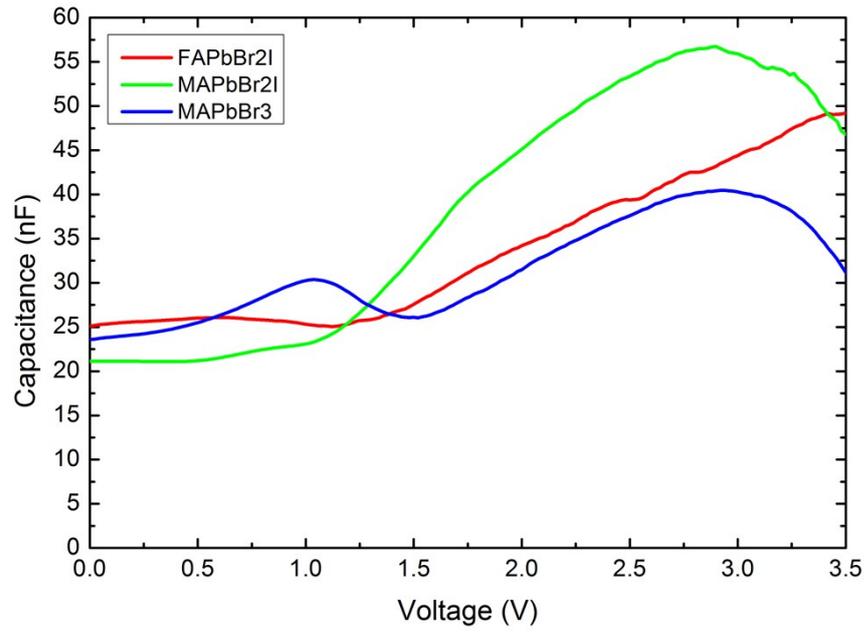
Fig S8. Capacitance –voltage characteristics of LESC based on MAPbBr$_2$I, FAPbBr$_2$I, MAPbBr$_3$ after pre-biasing.