ADVANCED FUNCTIONAL MATERIALS

Supporting Information

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Laminated Polymer-Encapsulated Halide Perovskite Photoconductors

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Table S1. Compiled list of polymers and their processability when used in blends with perovskites

Polymer	**Passed 5 mm radius bend test**	**Substrate adhesion**
Poly(methy-methacronate)	No	No
Polystyrene	No	No
Poly(ethylene oxide)	No	No
Poly(isobutyl methacrylate)	No	At 100 °C
Poly(butyl methacrylate)	Yes	At 100 °C
Poly(ethyl methacrylate)	Yes	No
Poly(benzyl methacrylate)	No	At 100 °C
Poly(cyclohexyl methacrylate)	No	No
Kollicoat MAE	No	No
Poly(tert-butyl acrylate-co-ethyl acrylate-co-methacrylic acid)	No	At 160 °C
Poly(methyl methacrylate-co-ethyl acrylate)	Yes	No

Equation S1.

$$D^* = \frac{\mathrm{R}\sqrt{\mathrm{A}}}{\sqrt{2\mathrm{q}I_{dark}}}$$

where, D^* is the specific detectivity, R is the responsivity, A is the active area of the device, q is the elementary charge, and I_{dark} is the dark current.

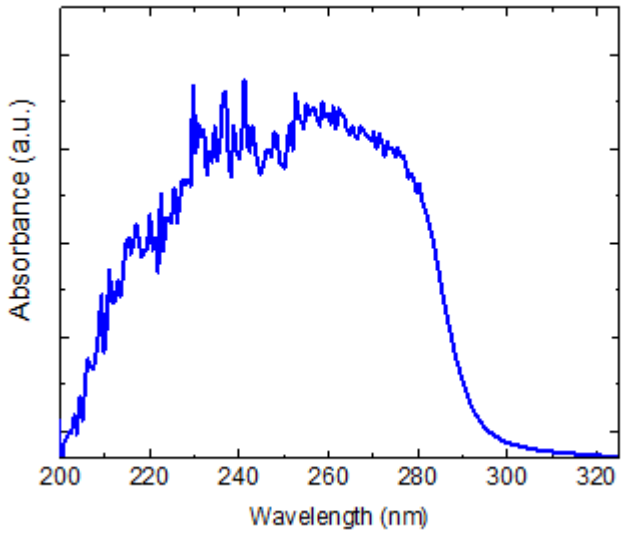

Figure S1. Absorbance spectra of a disk containing PBMA only.

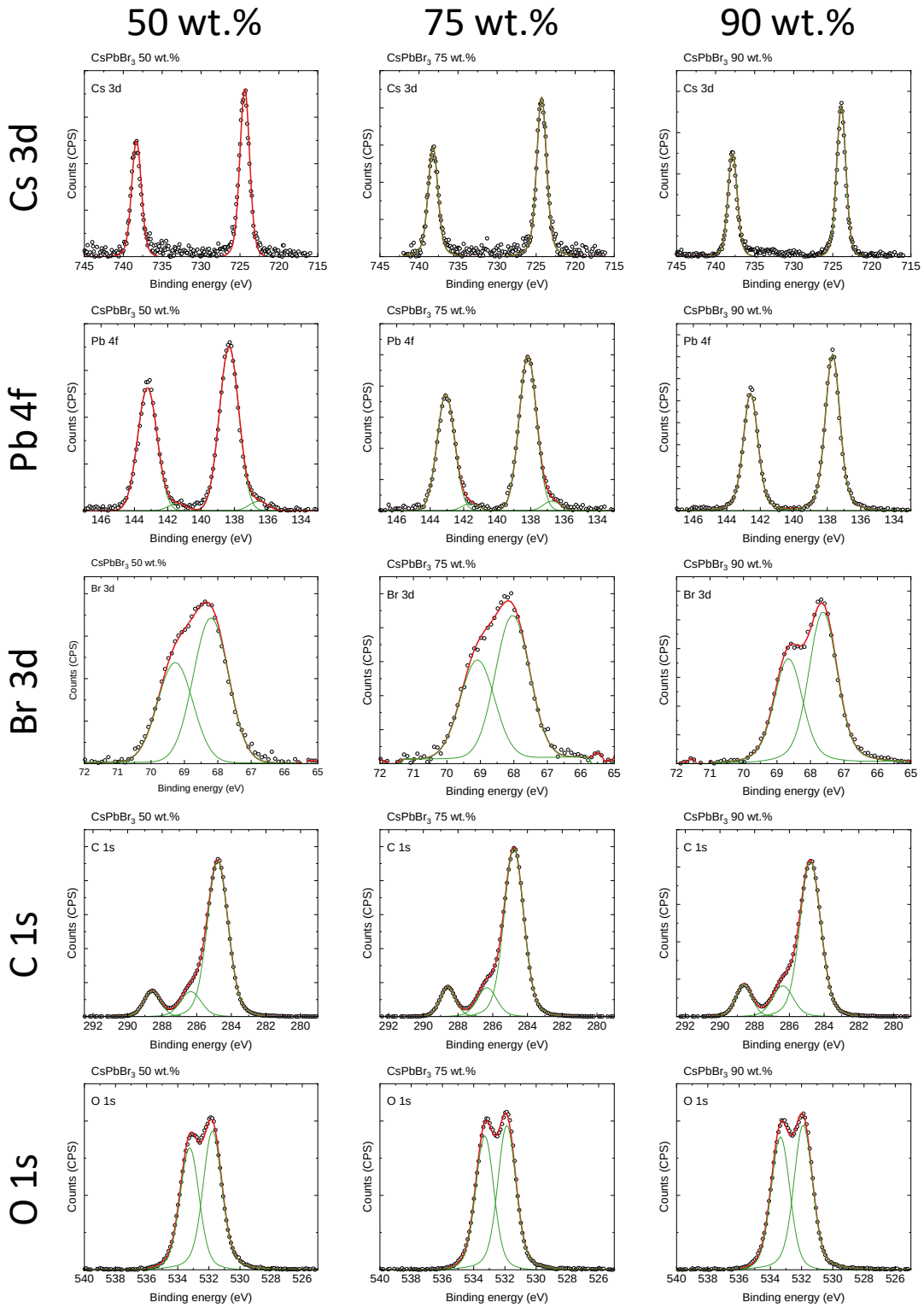

Figure S2. XPS analysis of the material with increasing perovskite loading. In the Cs and Br 3d spectra, only the 3d signals that correspond to $3d_{3/2}$ and $3d_{5/2}$ peaks can be observed, without any other components. The low energy C1s (284.8 eV) is ascribed to the aliphatic carbon from the polymer chain. The signal at higher BE (286.5 eV) is the C1s signal from the C-O bond, while the highest BE (288.7 eV) corresponds to the C=O bond of the PBMA polymer. Importantly, we observed only two O1s signals, corresponding to the two O atoms of the polymers: no other components are presents, so that all in all there seems to be no interaction between the perovskite and the polymer.

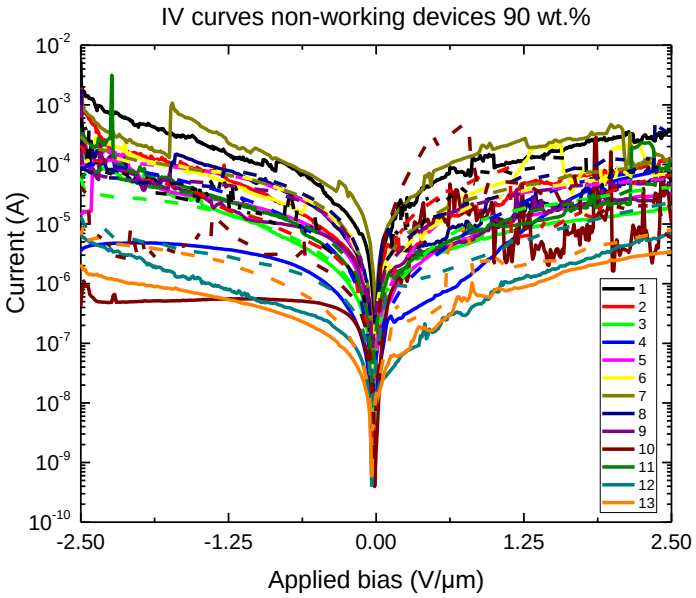

Figure S3. IV curves of non-working devices where the full lines are IV curves under dark conditions and the dashed lines are the IV curves under illumination of 1 Sun.

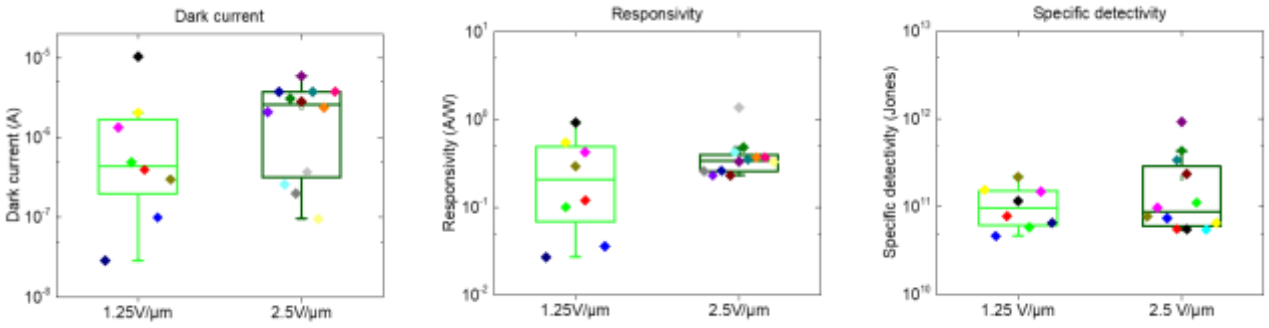

Figure S4. Statistics of the detectivity for devices operating at an applied field of 1.25 V/µm versus 2.5 V/µm for the 75 wt.% devices.

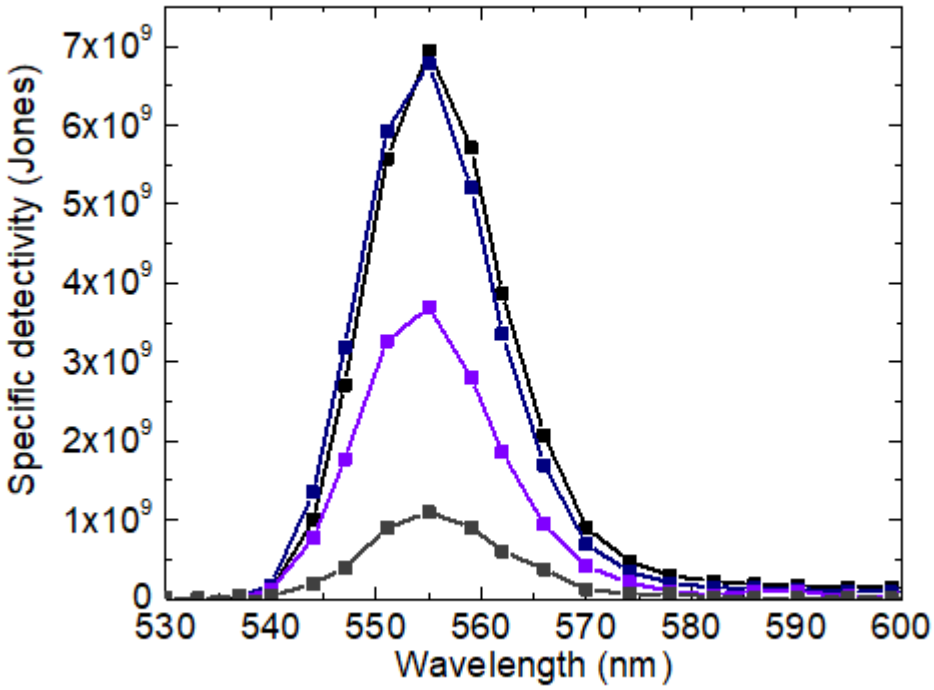

Figure S5. Specific detectivity of four filterless narrowband devices with a thickness of 25 µm.

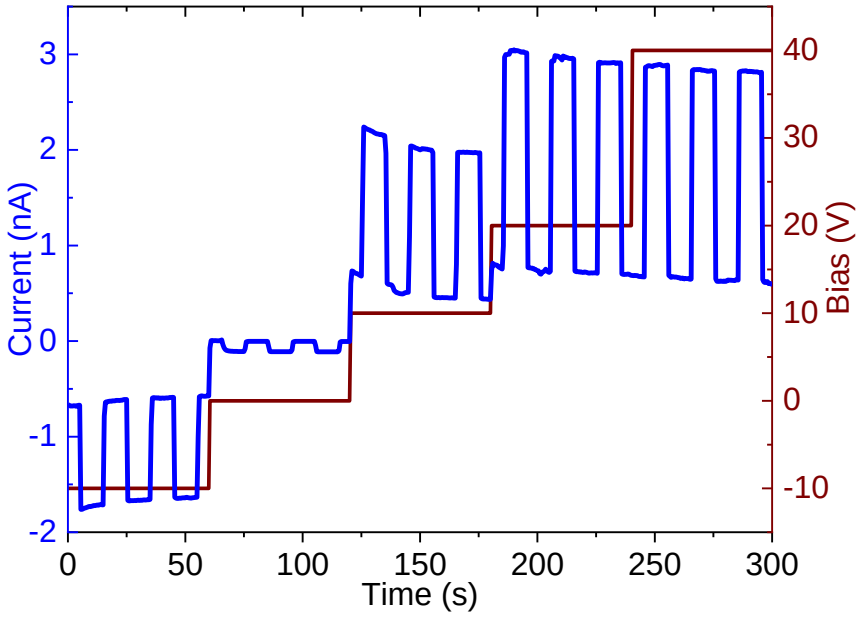

Figure S6. The output signal of a 50 wt.% perovskite device at different applied voltages at a dose of 1480 µG/s and photon energy of 150 kVp.

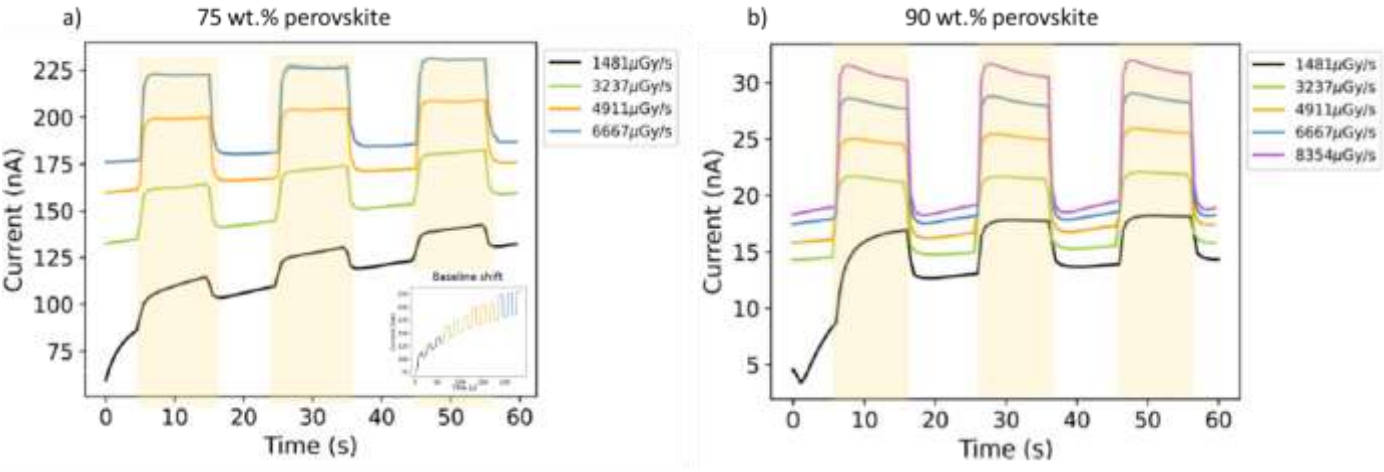

Figure S7. Response of devices when exposed to pulsed 150 kVp photons at different doses. (a) Response of a device with 75 wt.% perovskite content, wherein the inset the baseline drift of the device is visualized. (b) Response of a device with 90 wt.% perovskite content.