Supporting information

High photodetector responsivity and weak light detection in Manganese doped lead-free low dimensional perovskite

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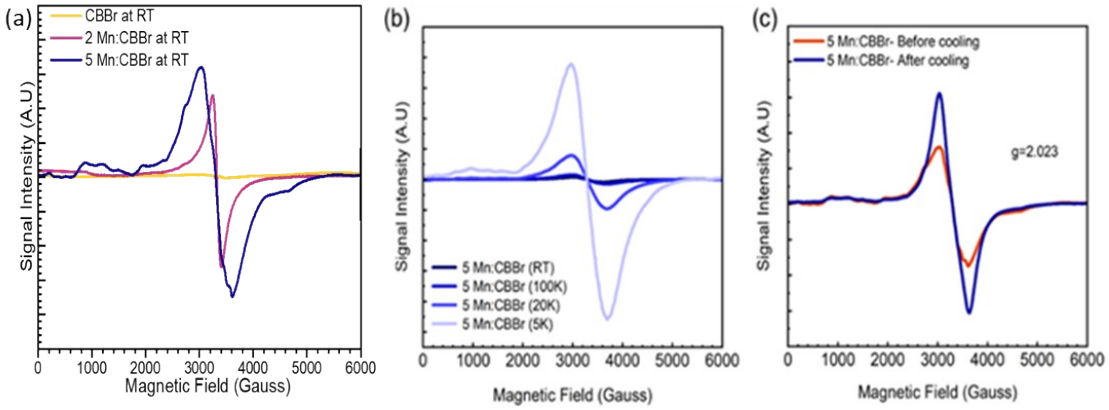

Figure S1. EPR spectra of (a) the pristine CBBr, 2Mn:CBBr, and 5Mn:CBBr at room temperature, (b) the temperature dependence EPR for 5Mn:CBBr, and (c) the comparison of EPR signal at room temperature before and after cooling to 5 K under magnetic field.

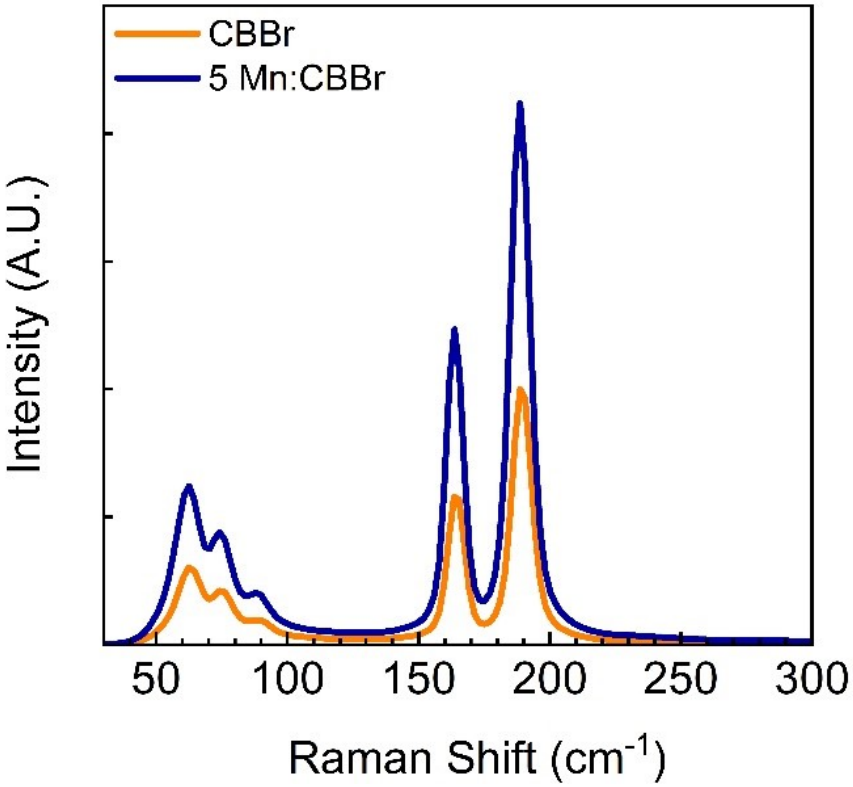

Figure S2. Raman spectra of pristine and 5Mn:CBBr powder at room temperature.

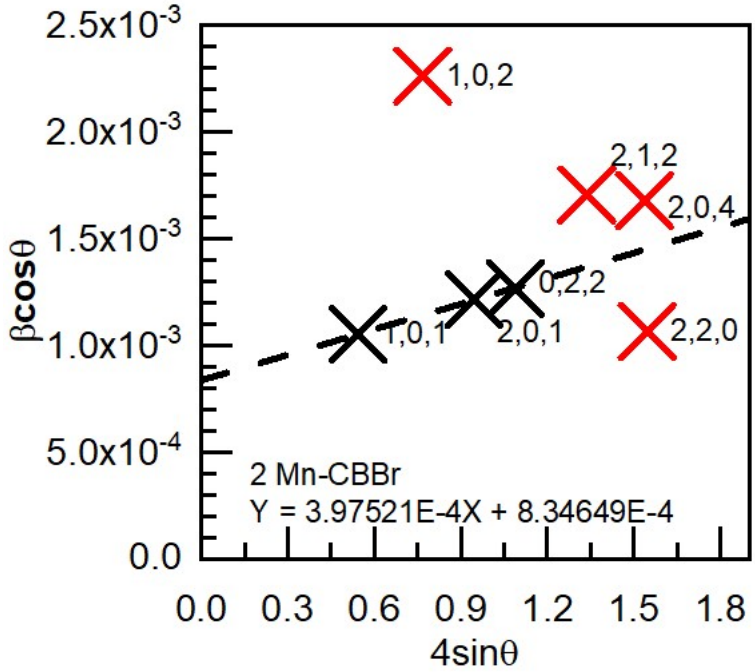

Figure S3. Williamson-Hall plot of 2Mn:CBBr powder.

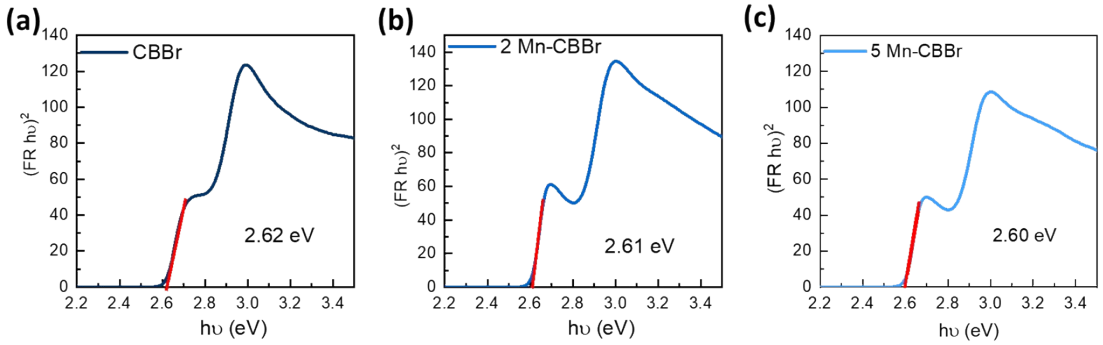

Figure S4. Tauc plots derived from diffuse reflectance data for direct band gap calculation of perovskite powders generated from a) CBBr, b) 2Mn:CBBr, and c) 5Mn:CBBr perovskites.

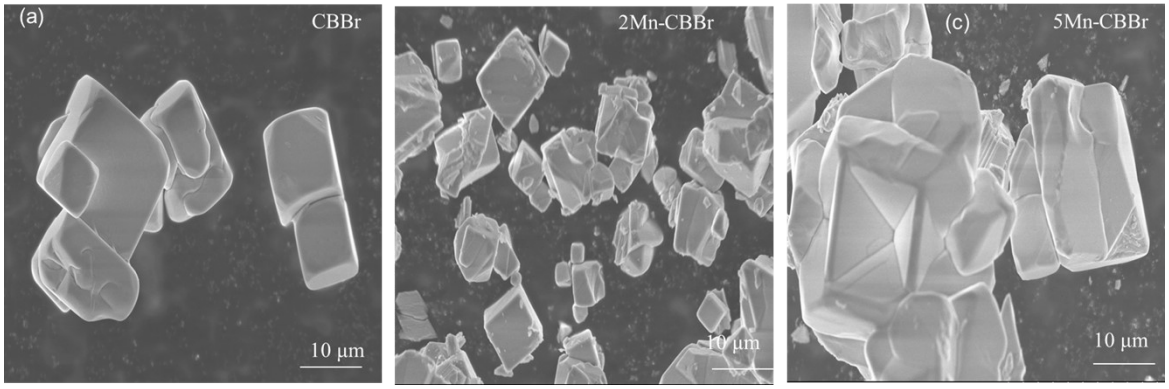

Figure S5. The SEM image of (a) pristine, (b) 2Mn:CBBr, and (c) 5Mn:CBBr.

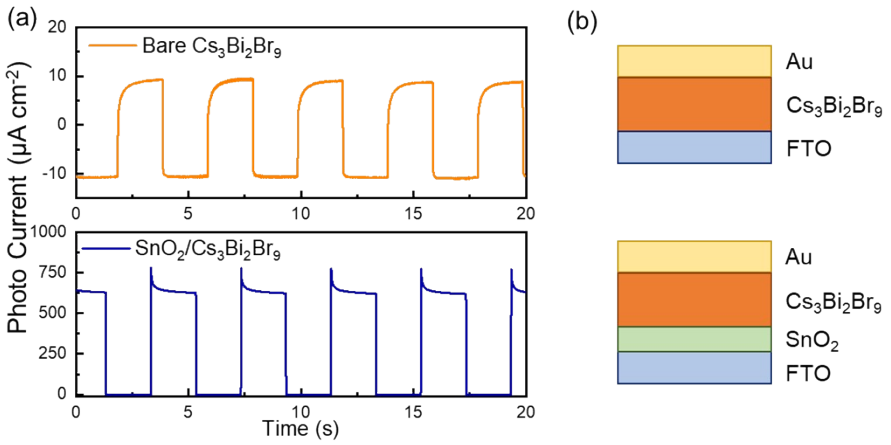

Figure S6. (a) Photo-response behavior curve (0 V bias) of the bare CBBr and SnO_2 /CBBr heterojunction PDs (light modulation frequency: 0.5 Hz, wavelength: 375 nm, light intensity: 39 mW cm^{-2}), and (b) the corresponding structure profiles of the PDs.

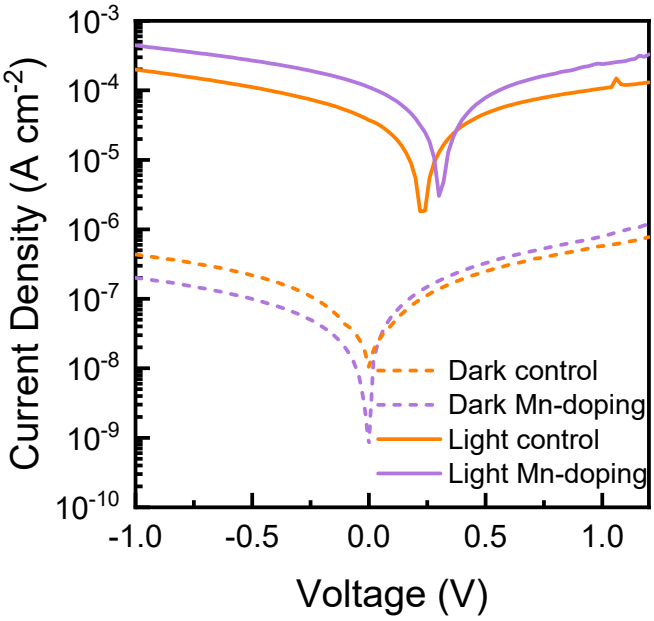

Figure S7. The current density under light (3.14 mW cm^{-2}) and dark current of the photodetector with and without Mn-doping under a forward scanning from 1.0 to 1.25 V.

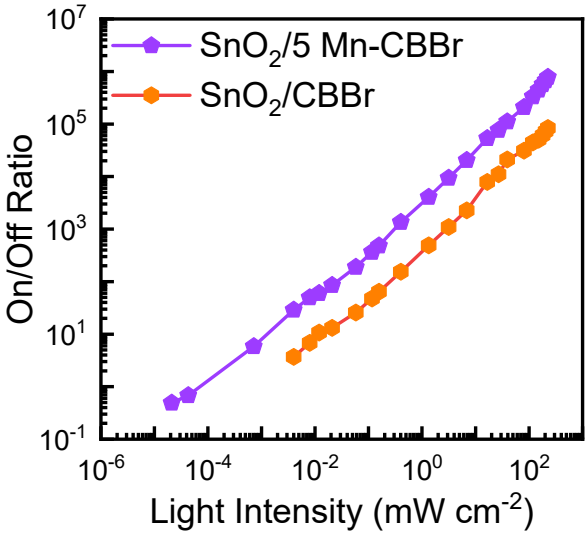

Figure S8. Light intensity-dependent On/Off ratio of the optimized SnO_2/CBBr heterojunction PD with and without Mn-doping.

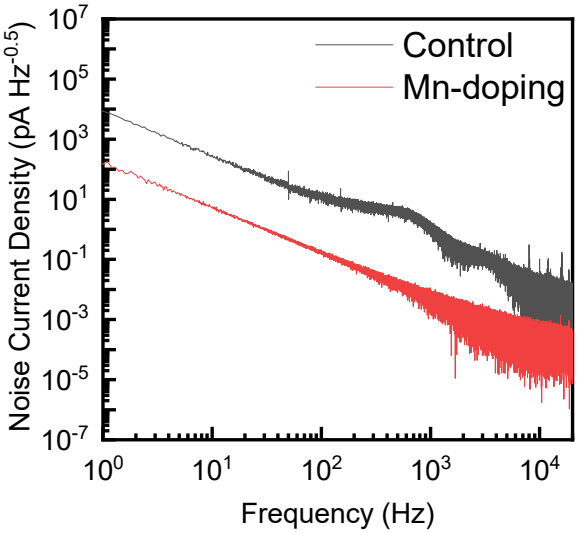

Figure S9. The noise current spectral density curves for the control and optimized 5 Mn:CBBr photodetector in a frequency ranging from 1 Hz to 2×10^4 Hz.