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Supporting Information

Perovskite Photodetectors with both Visible-infrared Dual-mode Response and Super-narrowband Characteristics towards Photocommunication Encryption Application

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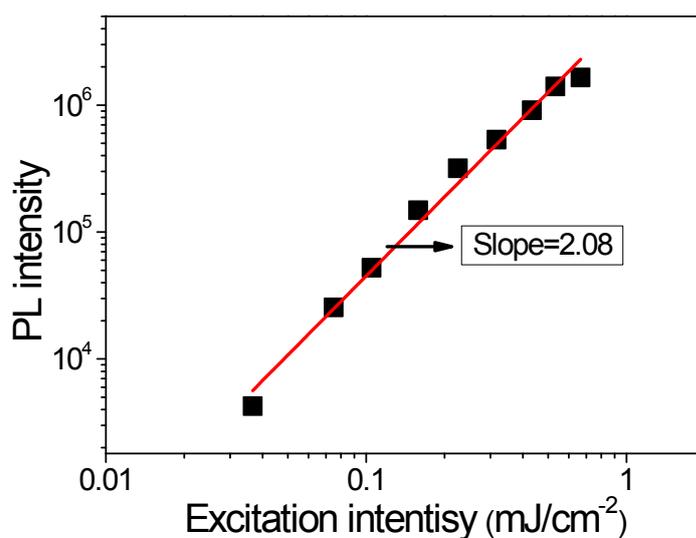


Figure S1. Integrated PL intensity as a function of laser excitation intensity (800 nm).

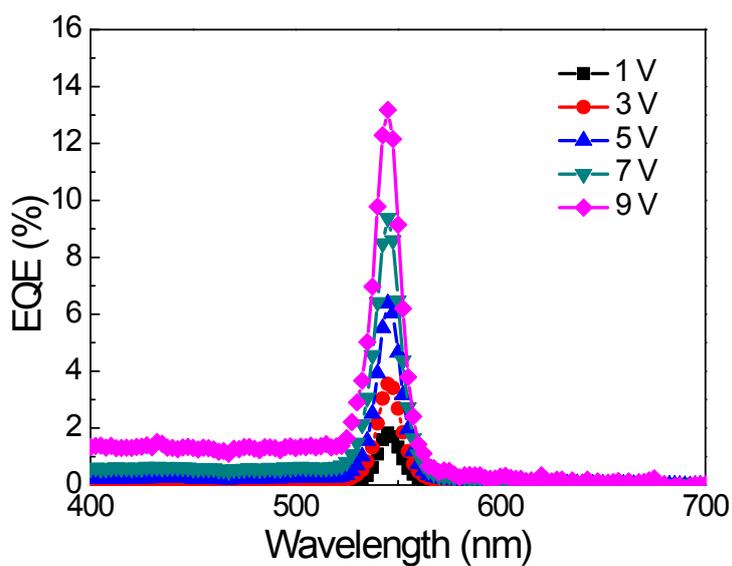


Figure S2. External quantum efficiency of the highly narrowband PD as a function of wavelength under different biases.

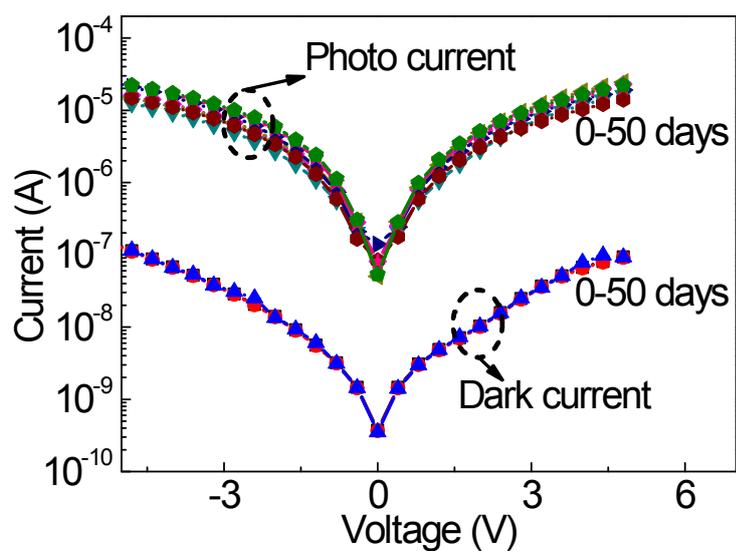


Figure S3. Environmental stability of the device after 50 days storage in ambient condition, without any protection.

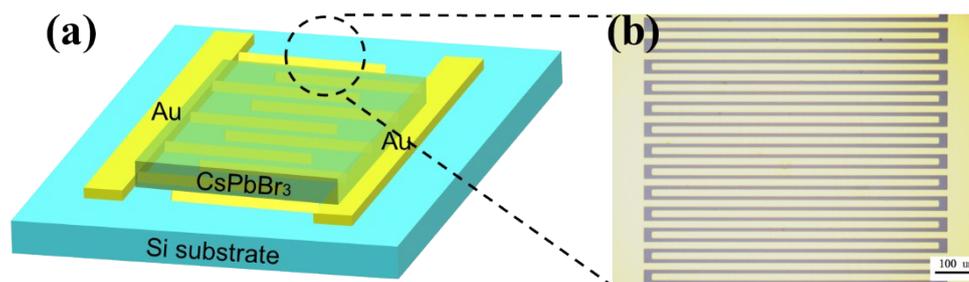


Figure S4. (a) Schematic demonstration of device configuration. (b) Microscope image of interdigitated electrodes. The scale bar is 100 μ m.

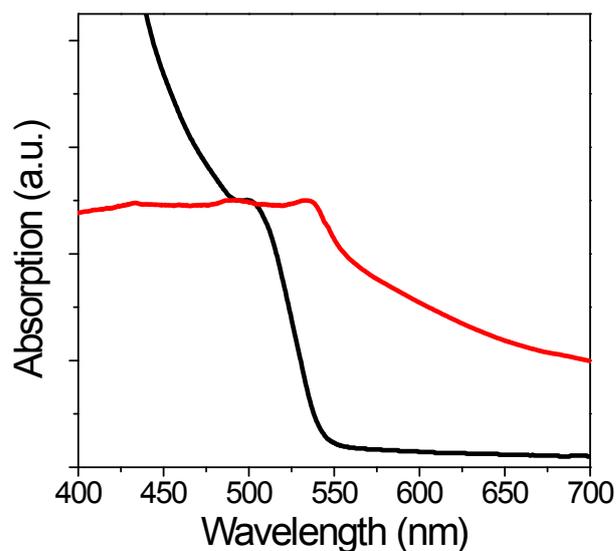


Figure S5. the absorption spectra of the thinnest and the thickest films.

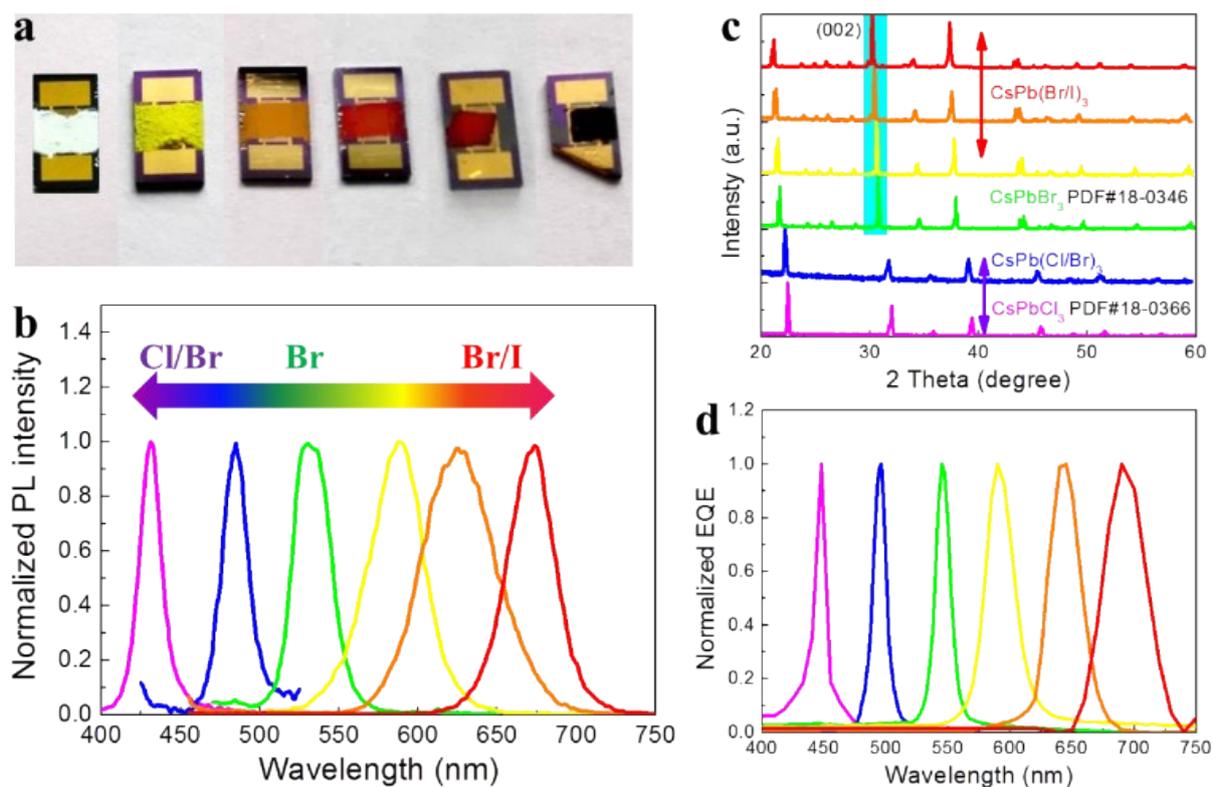


Figure S6. (a) Photographs of the highly narrowband PDs with different halide composition. (b) Corresponding XRD patterns of the perovskite films. (c) Normalized PL intensity of the films and (d) normalized EQE of the narrowband PDs with different halide compositions.

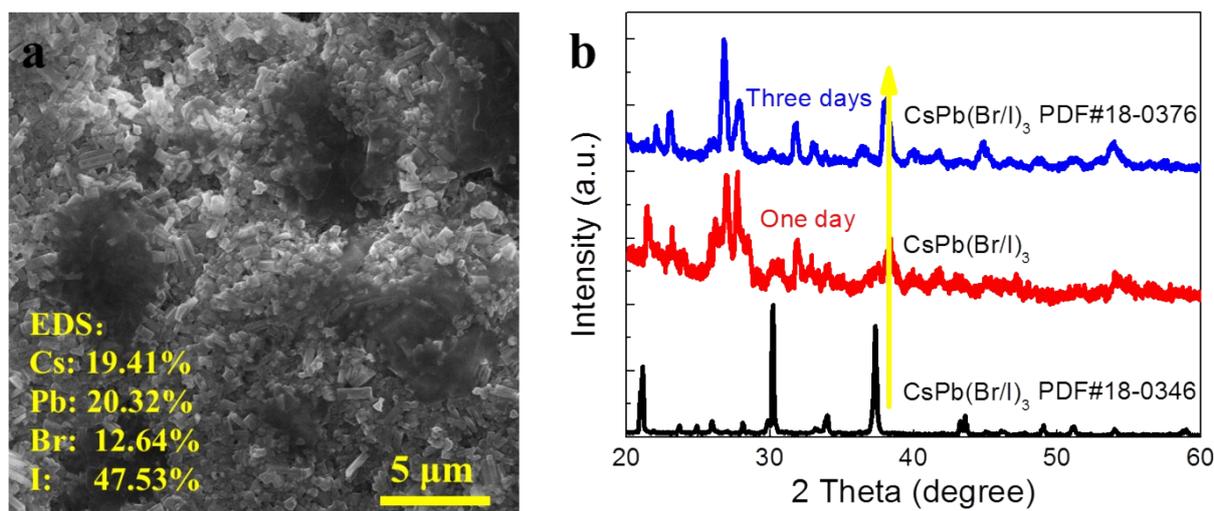


Figure S7. (a) SEM and EDS results of the as-prepared CsPb(Br/I)₃ film. (b) XRD pattern of the CsPb(Br/I)₃ film after different storage time.

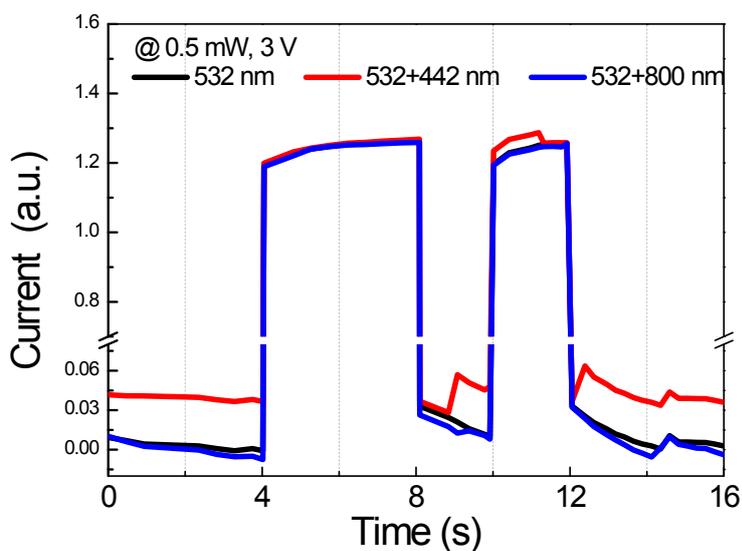


Figure S8. As prepared narrowband photodetector under two light sources sending signals simultaneously (0.5 mW, 3 V)

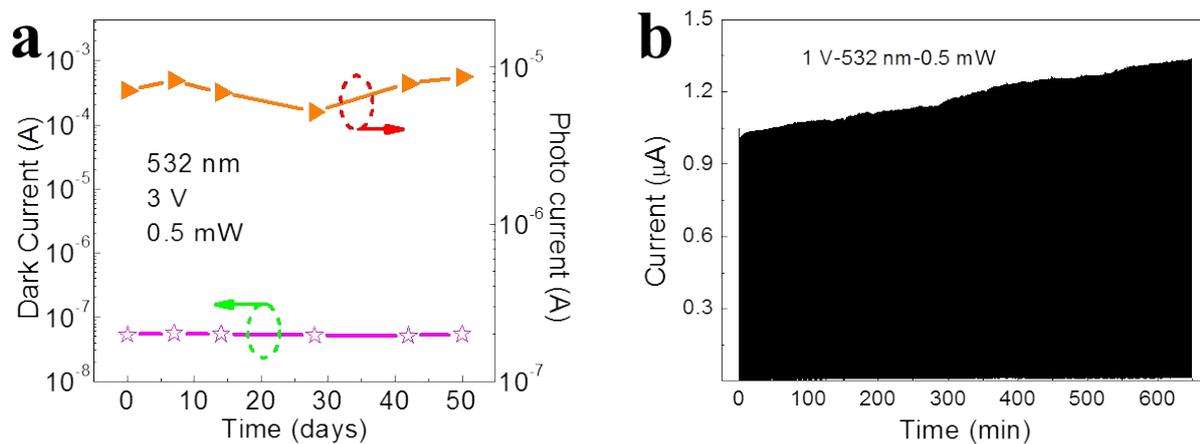


Figure S9. (a) Device stability of the photodetector under ambient conditions. (b) Periodic photoresponse of the photodetector under continuous irradiation for more than 10 h (1 V, 532 nm, 0.5 mW cm^{-2}).