

Supplementary Information

Boosting Lateral Photosensing Performances in P(VDF-TrFE)/Bi₂Se₃/Si Heterojunction Induced by Surface Modification and Ferroelectric and Pyroelectric effects

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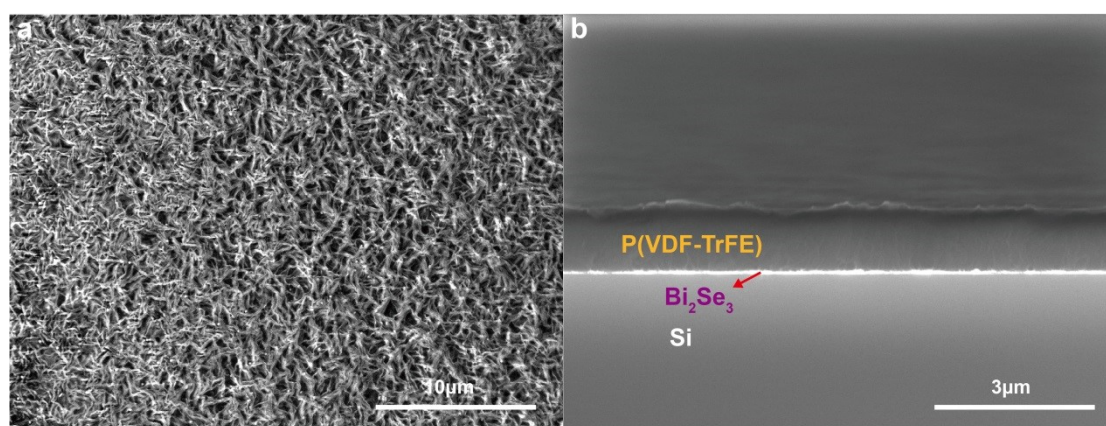


Figure S1. a) Top-view, and b) cross-section SEM images of the P(VDF-TrFE)/Bi₂Se₃/Si heterojunction.

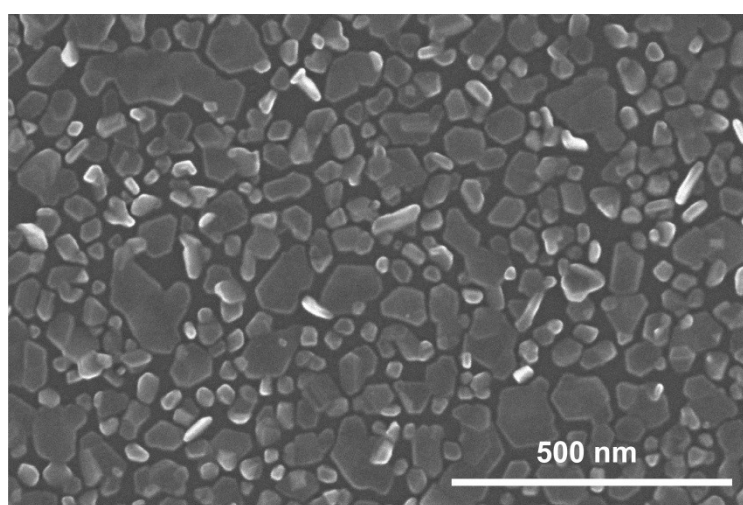


Figure S2. Top-view SEM image of the Bi₂Se₃ film in a higher magnification.

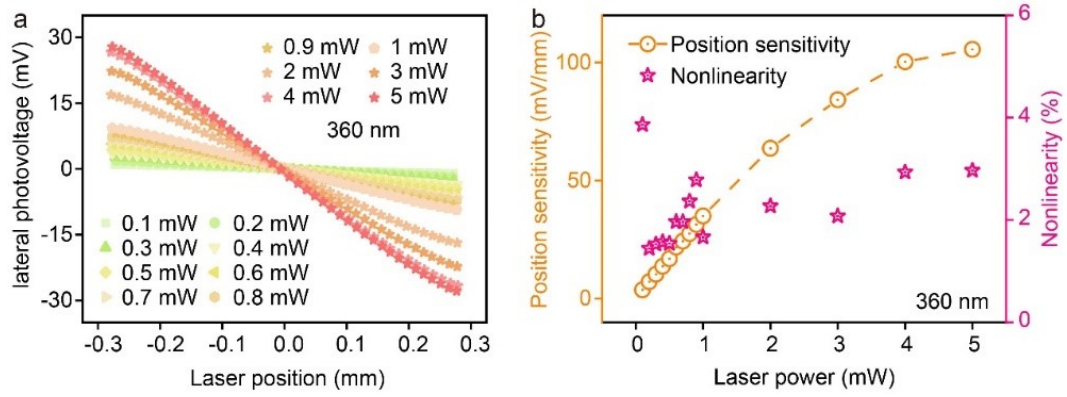


Figure S3. a) Laser position-dependent LPV curves under illumination of various powers of a 360 nm laser. b) Extracted position sensitivity and nonlinearity results of various laser powers.

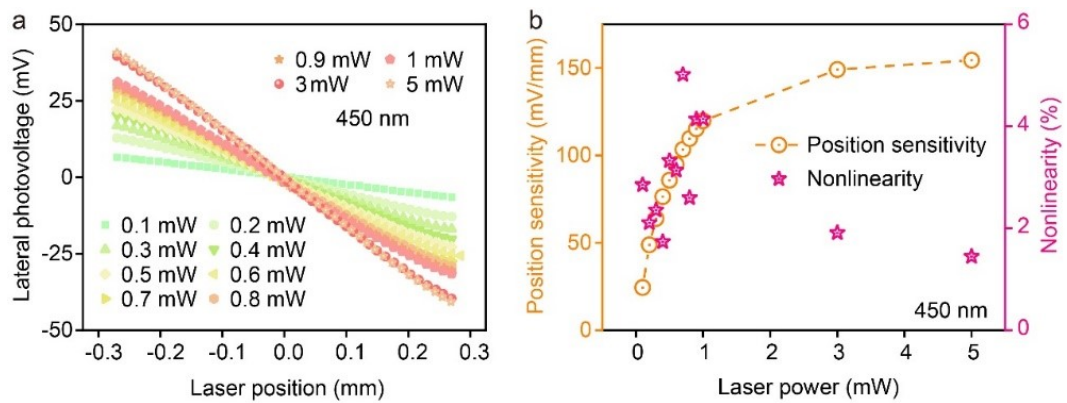


Figure S4. a) Laser position-dependent LPV curves under illumination of various powers of a 450 nm laser. b) Extracted position sensitivity and nonlinearity results of various laser powers.

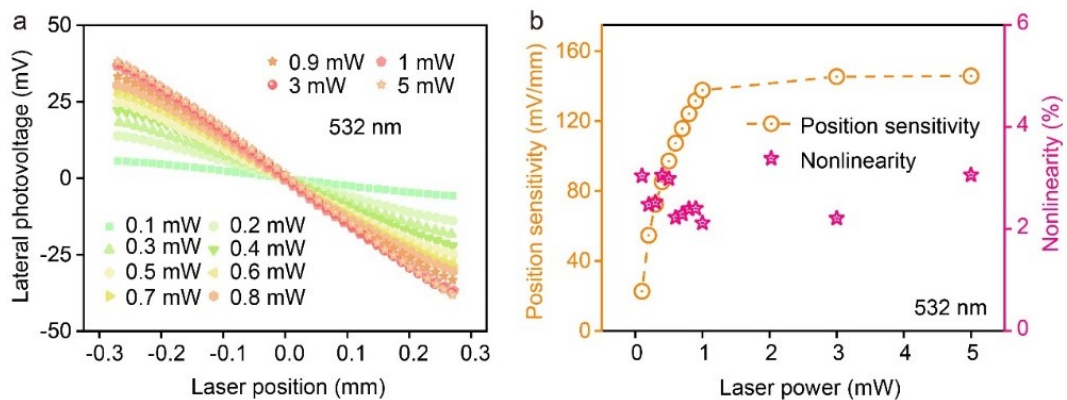


Figure S5. a) Laser position-dependent LPV curves under illumination of various powers of a 532 nm laser. b) Extracted position sensitivity and nonlinearity results of various laser powers.

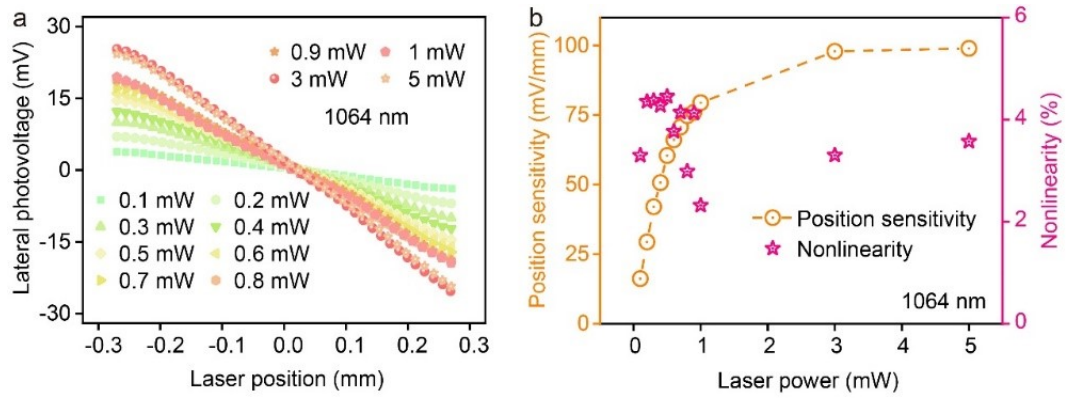


Figure S6. a) Laser position-dependent LPV curves under illumination of various powers of a 1064 nm laser. b) Extracted position sensitivity and nonlinearity results of various laser powers.

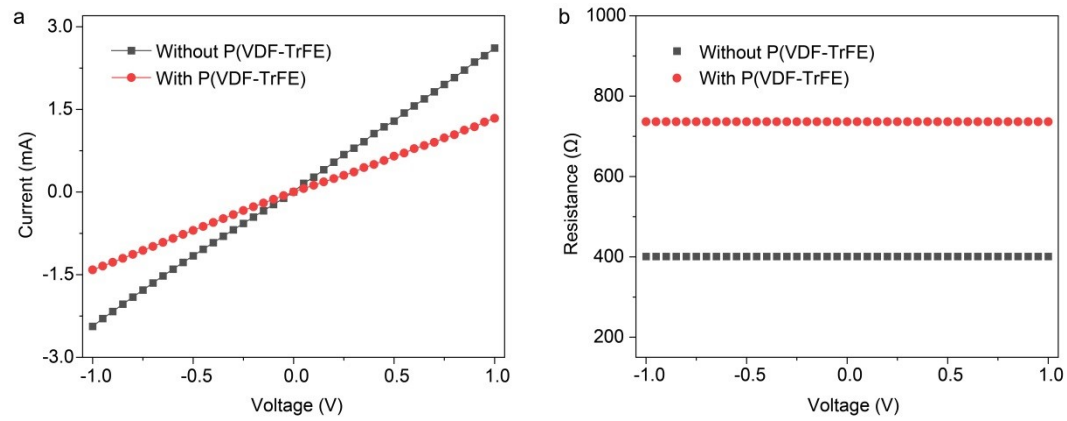


Figure S7. a) Transverse I - V curves of the Bi₂Se₃ film with and without P(VDF-TrFE) layer. b) Extracted resistances of the Bi₂Se₃ film with and without P(VDF-TrFE) layer.

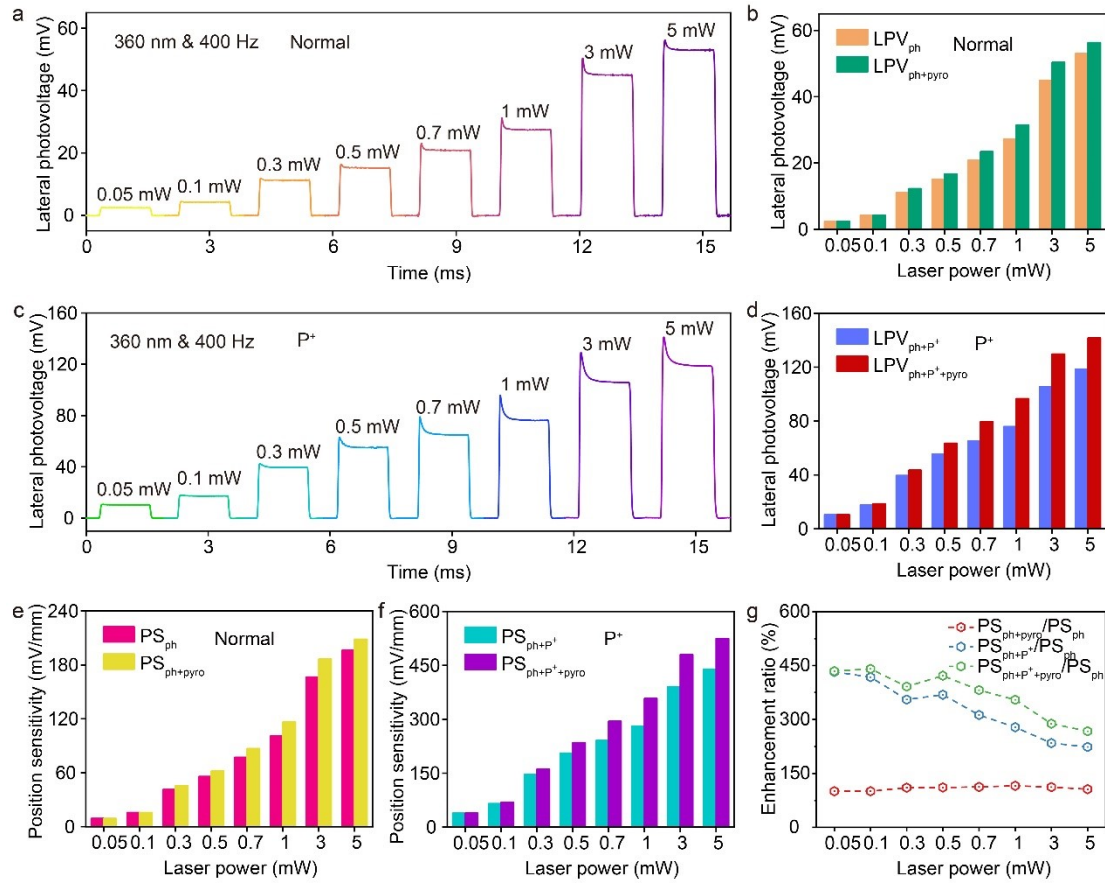


Figure S8. a) Transient $LPV-t$ curves under illumination of a 360 nm laser at various powers and 400 Hz without ferroelectric polarization. b) Extracted LPV results of various laser powers. c) Transient $LPV-t$ curves under illumination of a 360 nm at various laser power and 400 Hz with P⁺ ferroelectric polarization. d) Extracted LPV results of various laser powers. Extracted position sensitivity results of various laser powers e) without ferroelectric polarization and f) with P⁺ ferroelectric polarization. g) The calculated enhancement ratios of various laser powers.

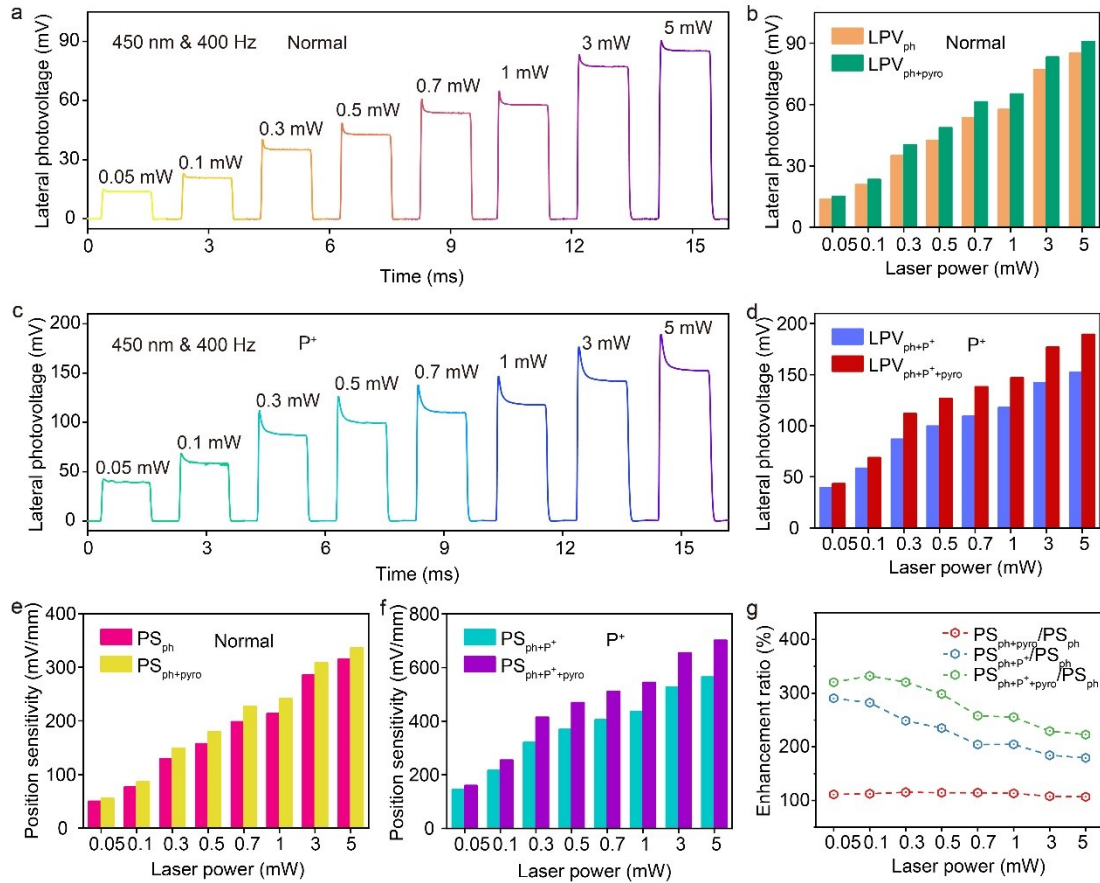


Figure S9. a) Transient $LPV-t$ curves under illumination of a 450 nm laser at various powers and 400 Hz without ferroelectric polarization. b) Extracted LPV results of various laser powers. c) Transient $LPV-t$ curves under illumination of a 450 nm at various laser power and 400 Hz with P⁺ ferroelectric polarization. d) Extracted LPV results of various laser powers. Extracted position sensitivity results of various laser powers e) without ferroelectric polarization and f) with P⁺ ferroelectric polarization. g) The calculated enhancement ratios of various laser powers.

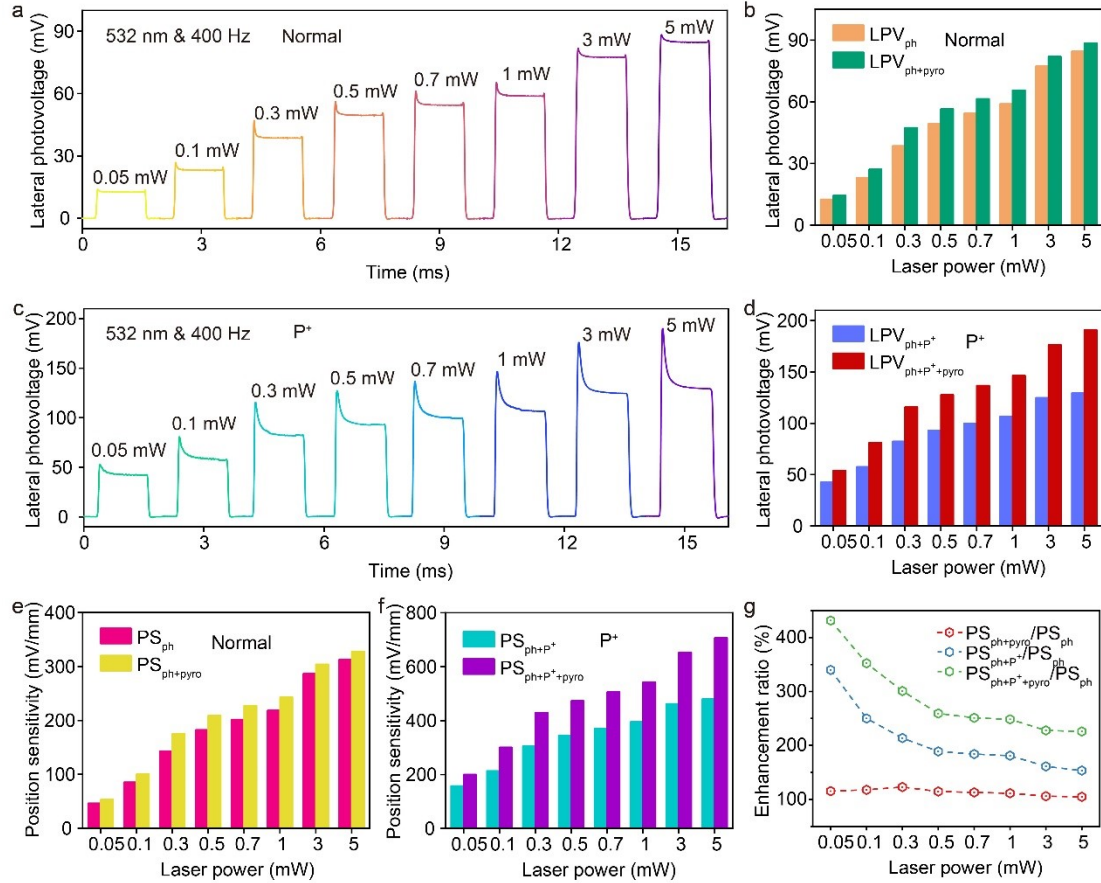


Figure S10. a) Transient $LPV-t$ curves under illumination of a 532 nm laser at various powers and 400 Hz without ferroelectric polarization. b) Extracted LPV results of various laser powers. c) Transient $LPV-t$ curves under illumination of a 532 nm at various laser power and 400 Hz with P⁺ ferroelectric polarization. d) Extracted LPV results of various laser powers. Extracted position sensitivity results of various laser powers e) without ferroelectric polarization and f) with P⁺ ferroelectric polarization. g) The calculated enhancement ratios of various laser powers.

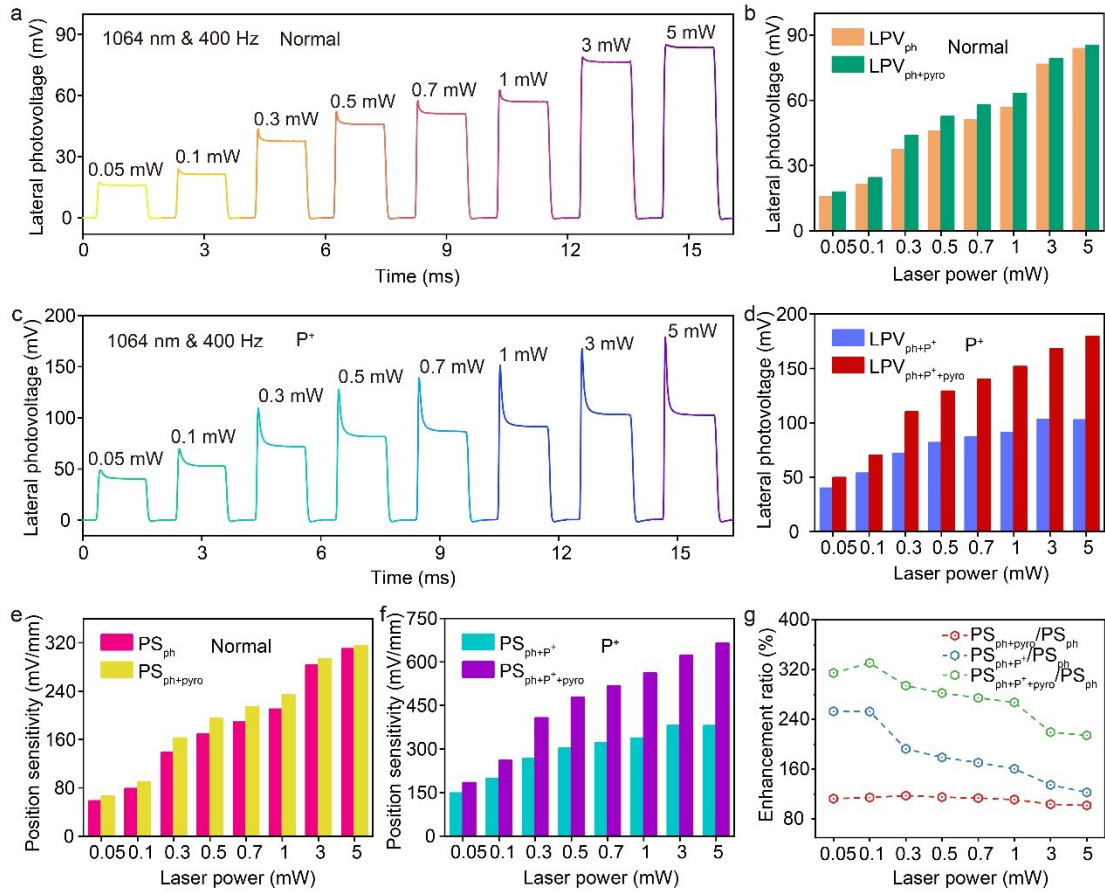


Figure S11. a) Transient $LPV-t$ curves under illumination of a 1064 nm laser at various powers and 400 Hz without ferroelectric polarization. b) Extracted LPV results of various laser powers. c) Transient $LPV-t$ curves under illumination of a 1064 nm at various laser power and 400 Hz with P⁺ ferroelectric polarization. d) Extracted LPV results of various laser powers. Extracted position sensitivity results of various laser powers e) without ferroelectric polarization and f) with P⁺ ferroelectric polarization. g) The calculated enhancement ratios of various laser powers.