

### Supporting Information

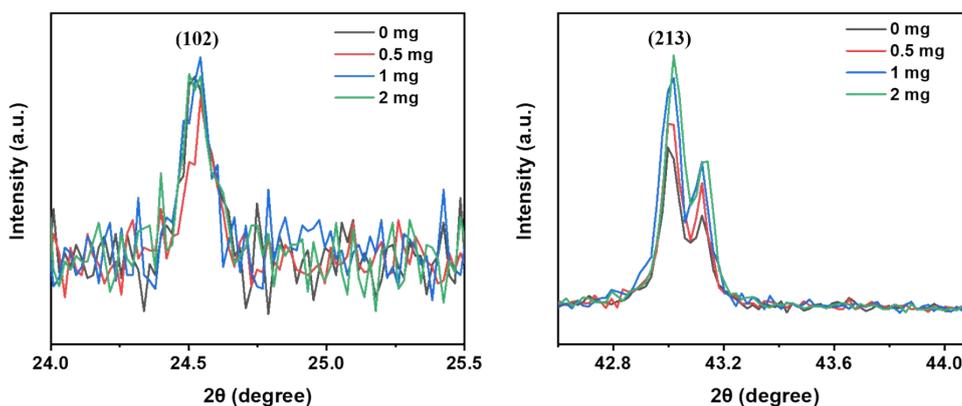


Fig. S1 The enlarged XRD patterns of (102) and (213) planes.

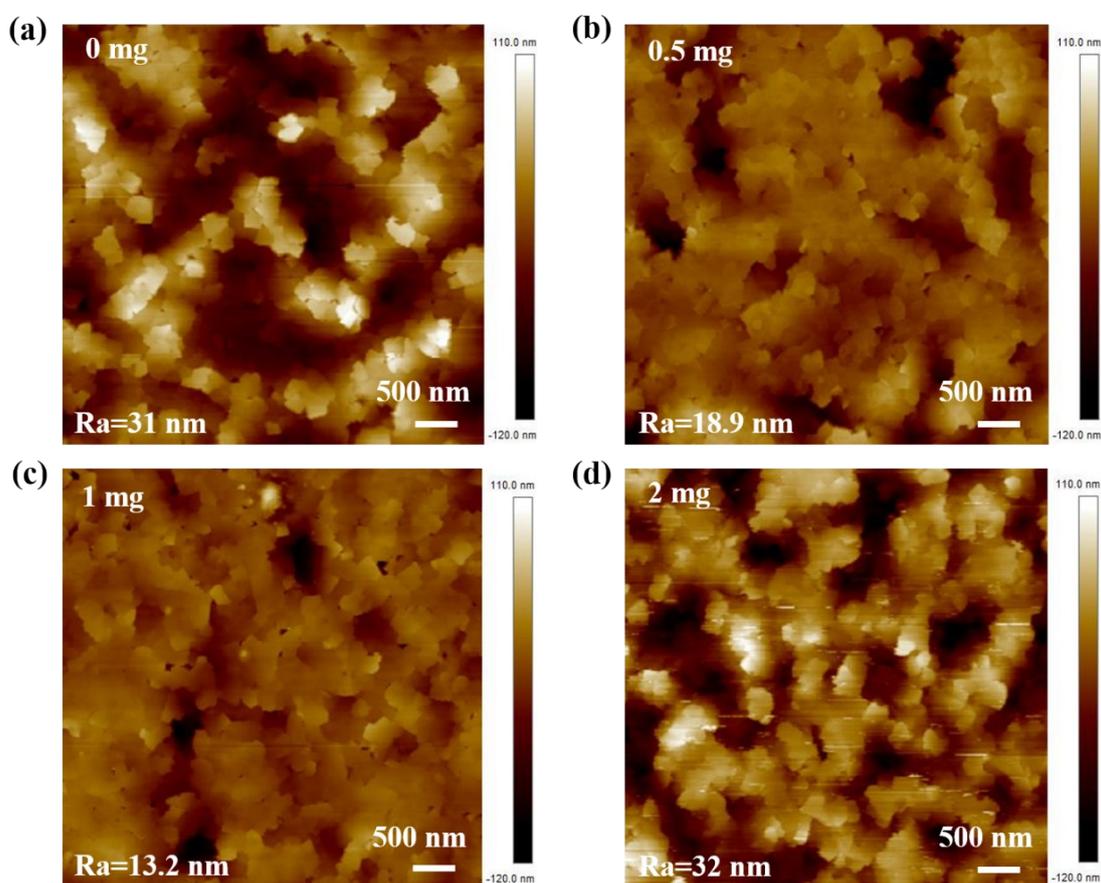


Fig. S2 AFM images of the  $\text{PEA}_{0.2}\text{FA}_{0.8}\text{SnI}_3$  films with (a) 0, (b) 0.5, (c) 1, and (d) 2 mg 2-aminopyrimidine.

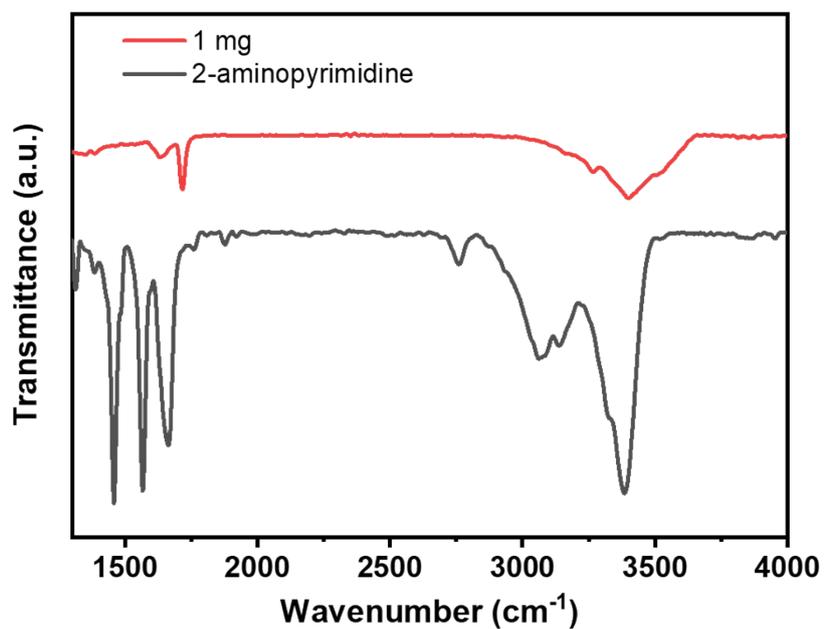


Fig. S3 FTIR spectra of 2-aminopyrimidine and PEA<sub>0.2</sub>FA<sub>0.8</sub>SnI<sub>3</sub> with 1mg 2-aminopyrimidine.

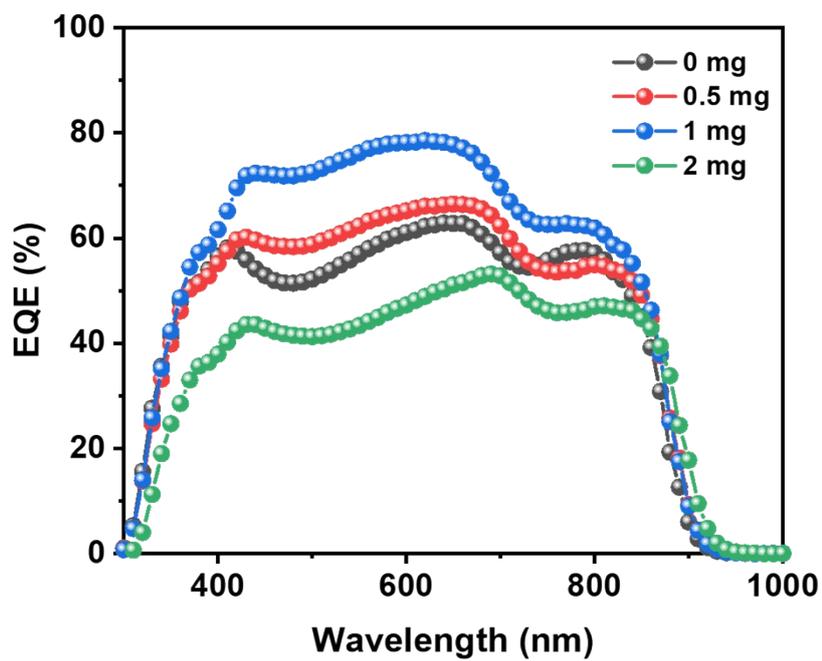
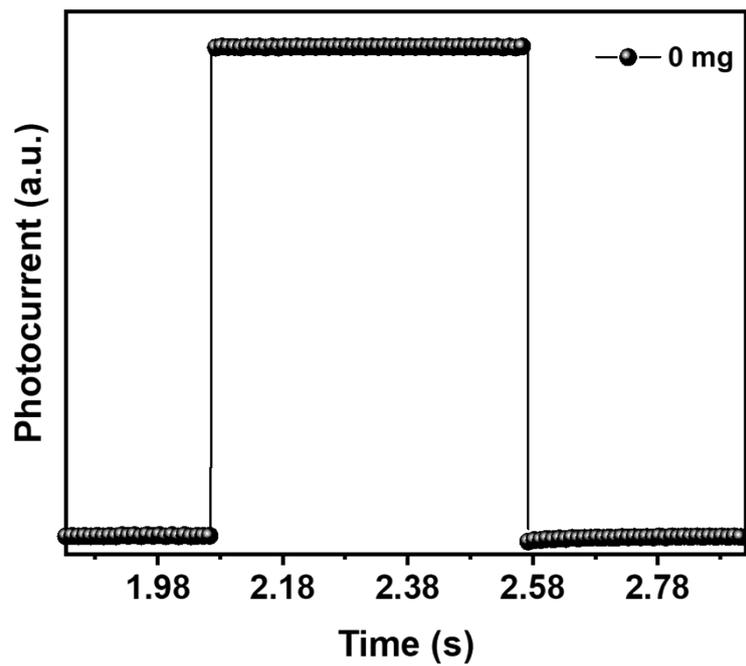
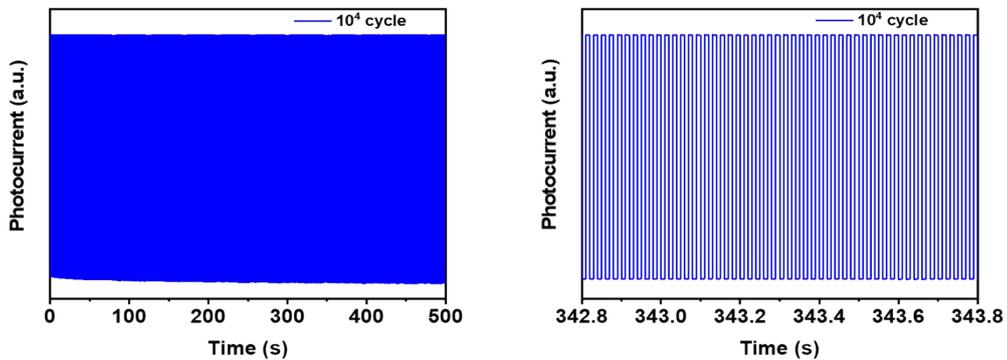


Fig. S4 EQE spectra of PEA<sub>0.2</sub>FA<sub>0.8</sub>SnI<sub>3</sub>-based PDs with different additive concentrations.



**Fig. S5** Response time of the  $\text{PEA}_{0.2}\text{FA}_{0.8}\text{SnI}_3$ -based PD without 2-aminopyrimidine.



**Fig. S6** (a) Long-term I-t curve of the pristine  $\text{PEA}_{0.2}\text{FA}_{0.8}\text{SnI}_3$ -based PD under 533 nm green laser illumination. (b) Enlarged I-t curve.