

## Electronic Supplementary Information

### **Zn doped MAPbBr<sub>3</sub> single crystal with advanced structural and optical stability achieved by strain compensation**

*Ruxue Li,<sup>†a,b</sup> Shaoqing Chen,<sup>†c</sup> Xia Li,<sup>†c,d</sup> Guoxin Yin,<sup>c</sup> Youpin Gong,<sup>a,e</sup> Jiahao Yu,<sup>a</sup> Guotao Pang,<sup>a</sup> Jianxun Liu,<sup>a</sup> Yanjun Liu,<sup>a</sup> Zhenhua Ni,<sup>b</sup> Liyuan Zhang,<sup>e</sup> Rui Chen<sup>\*a</sup> and Hsing-Lin Wang<sup>\*c</sup>*

<sup>a</sup> Department of Electrical and Electronic Engineering, Southern University of Science and Technology, Shenzhen, Guangdong 518055, P. R. China

<sup>b</sup> School of Physics, Southeast University, Nanjing, Jiangsu 211189, P. R. China

<sup>c</sup> Department of Materials Science and Engineering, Southern University of Science and Technology, Shenzhen, Guangdong 518055, P. R. China

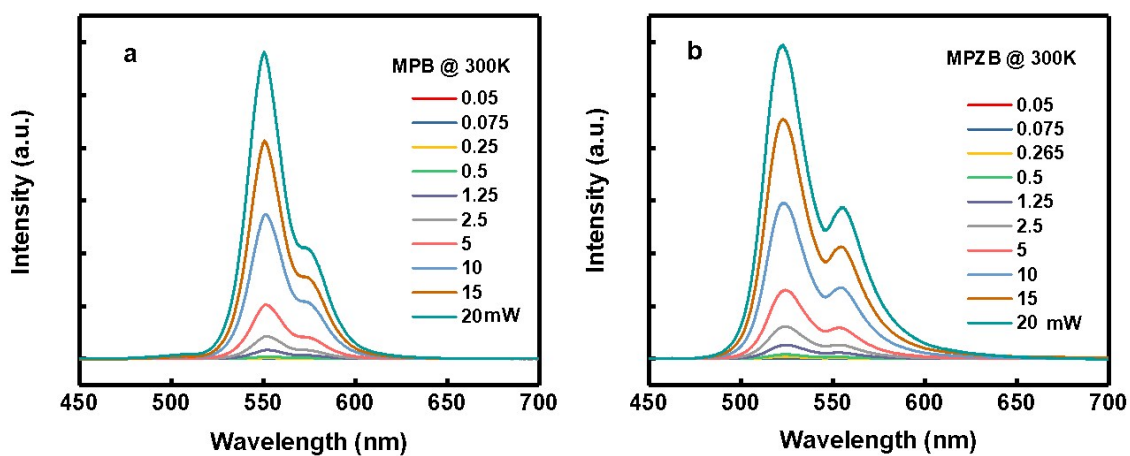
<sup>d</sup> State Key Laboratory of Inorganic Synthesis and Preparation Chemistry, College of Chemistry, Jilin University, Changchun, 130012, P. R. China

<sup>e</sup> Department of Physics, Southern University of Science and Technology, Shenzhen, Guangdong 518055, P. R. China

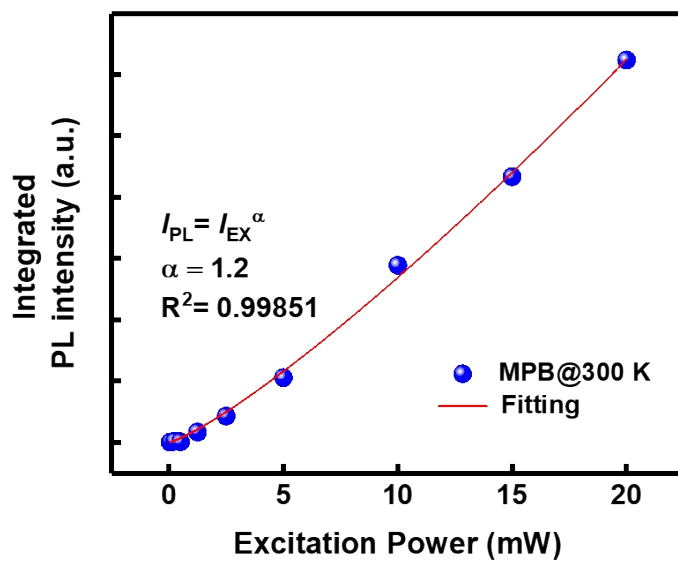
\* Author to whom correspondence should be addressed: [chenr@sustech.edu.cn](mailto:chenr@sustech.edu.cn) (Rui Chen);  
[wangxl3@sustech.edu.cn](mailto:wangxl3@sustech.edu.cn) (Hsing-Lin Wang)

<sup>†</sup> These authors contributed equally to this work.



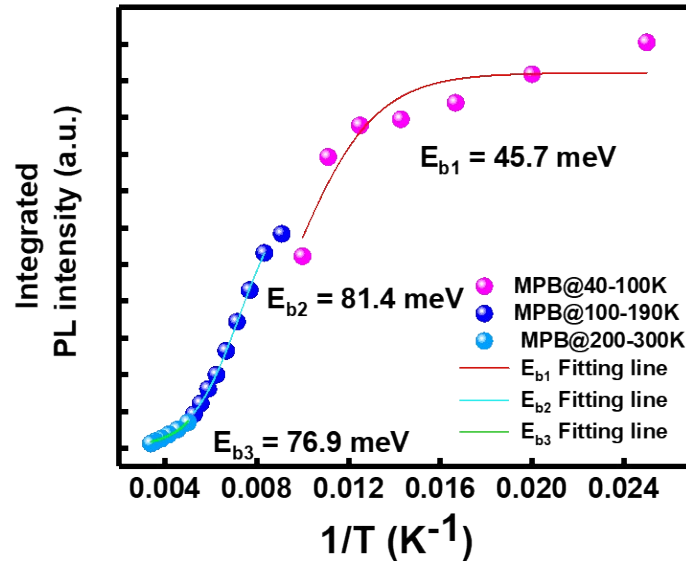


**Figure S1.** Power dependent PL spectra of the MPB and MPZB samples at 300 K.



**Figure S2.** The relationship between the integrated PL intensity and the excitation power of the MPB SC at 300 K.





**Figure S3.** Integrated PL intensity of the MPB SC as a function of reciprocal temperature from 10 to 300 K in different regions.



**Figure S4.** Digital photographs of the size of the MPZB SC photodetector.