

Supplementary Materials for

**How do oxygen vacancies affect carrier transport and interface states in  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>/4H-SiC heterojunction photodetectors at elevated temperatures?**

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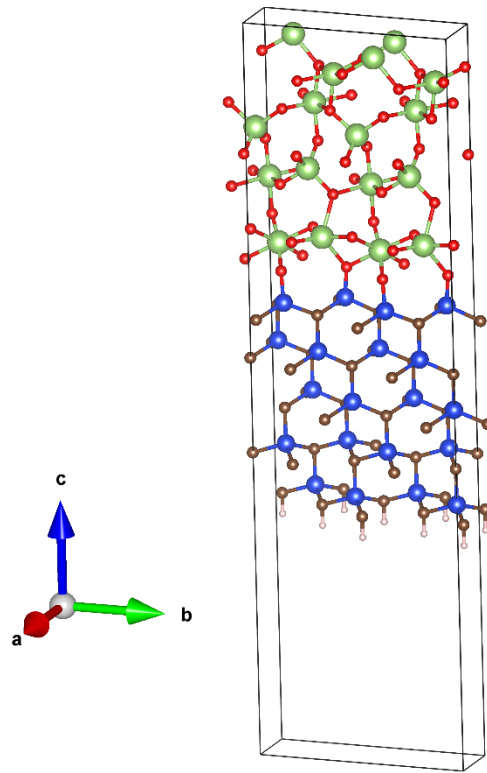


Fig. S1 The three-dimensional structure of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>/4H-SiC heterojunction at 0K.

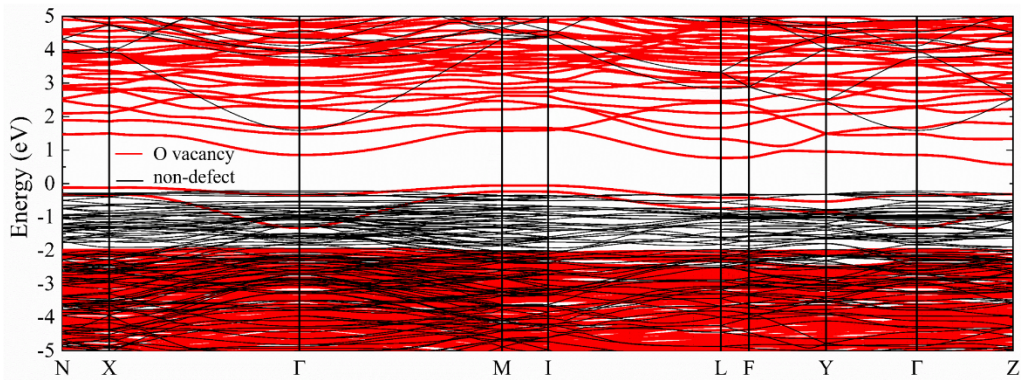


Fig. S2 The band structure of defective  $\text{Ga}_2\text{O}_3$  with O vacancies and non-defect.

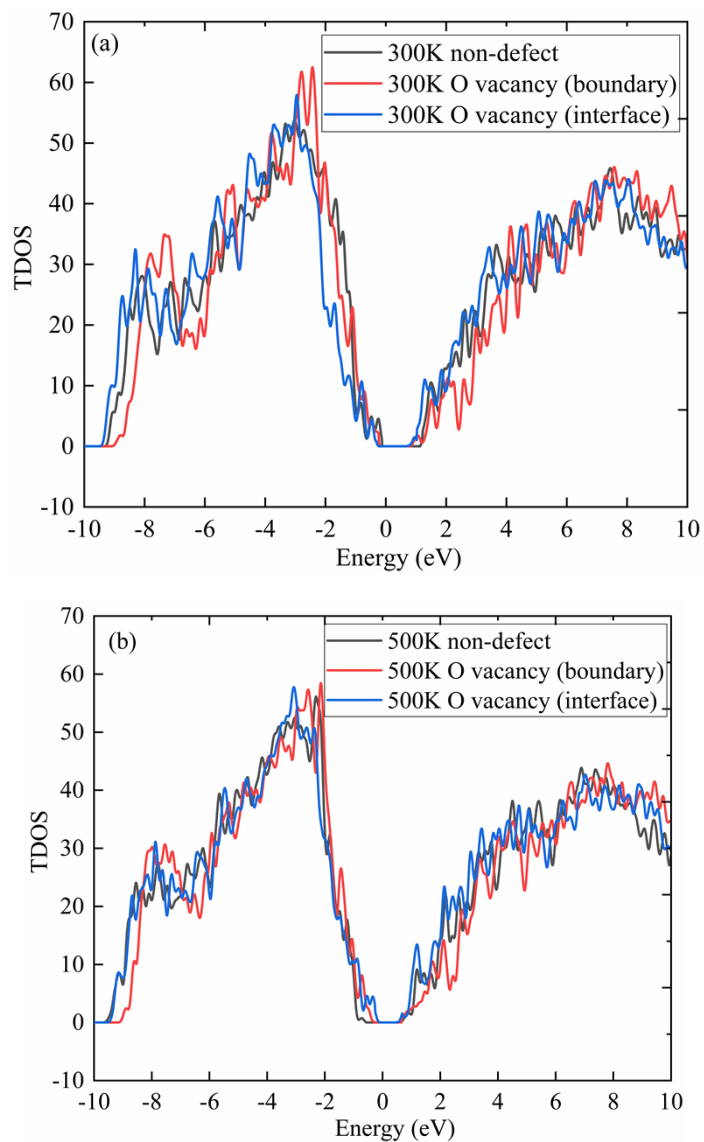


Fig. S3 The TDOS of  $\beta\text{-Ga}_2\text{O}_3/4\text{H-SiC}$  heterojunction under (a) 300K and (b) 500K calculated using PBE functional.