Supplementary Information

Performance enhancement of p-Si/n-$ZnGa_2O_4$ heterojunction solar-blind UV photodetector through interface engineering

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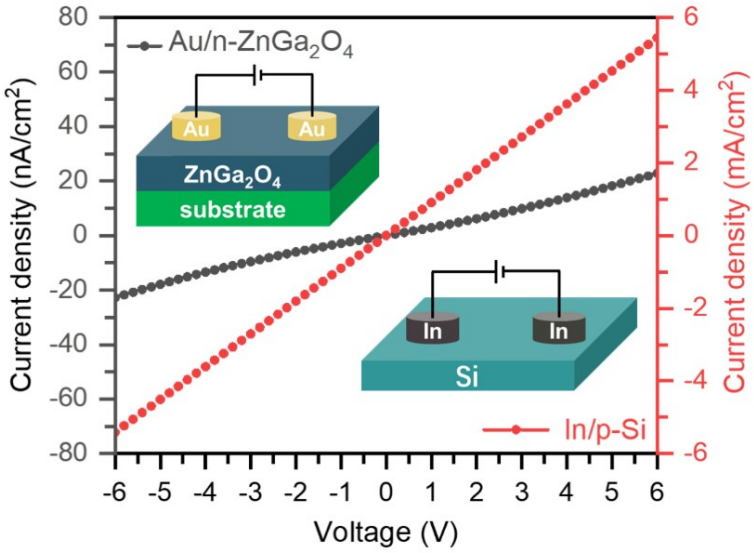

Fig. S1 *I-V* plots of the In metal contacts on *p*-Si and Au metal contacts on *n*-$ZnGa_2O_4$.

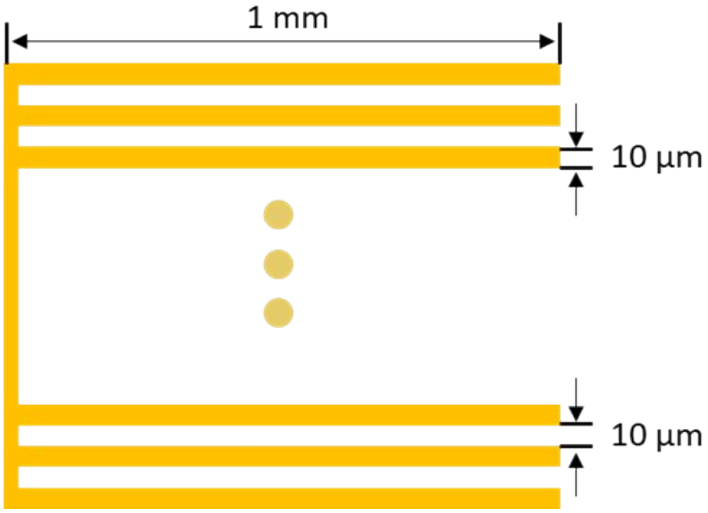

Fig. S2 The shape of the Au electrode. The comb-shaped Au electrode has a tooth width of 10 μm, a length of 1 mm and a gap of 10 μm.

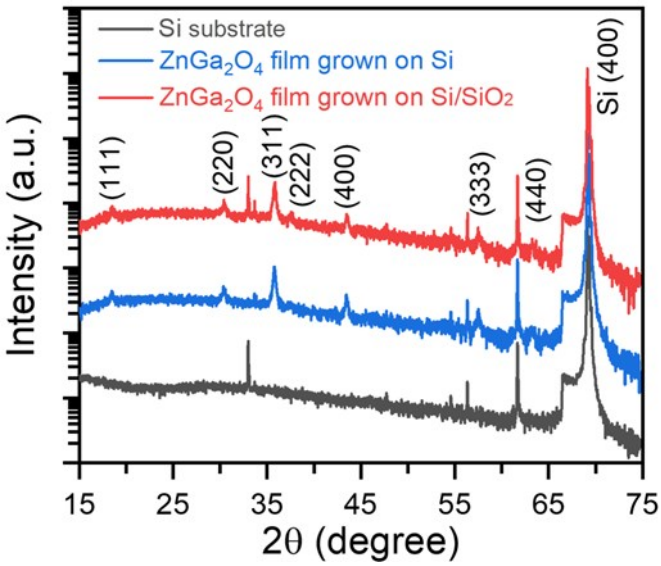

Fig. S3 XRD patterns of Si substrate, $ZnGa_2O_4$ film grown on Si and Si/SiO_2.

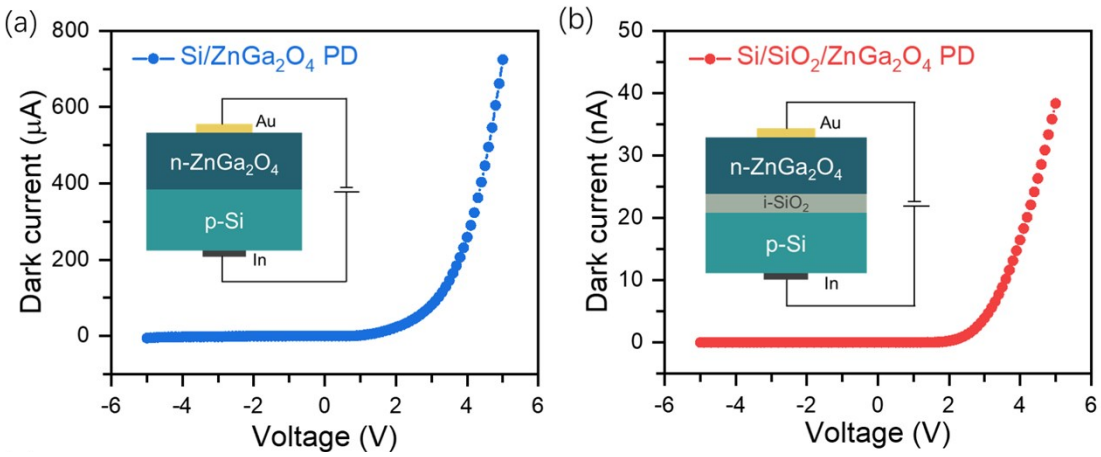

Fig. S4 *I-V* characteristic curves of the $Si/ZnGa_2O_4$ PD (a) and $Si/SiO_2/ZnGa_2O_4$ PD (b) in dark under linear coordinates. The inset is the schematic diagram of the power supply connections of the device at forward bias.

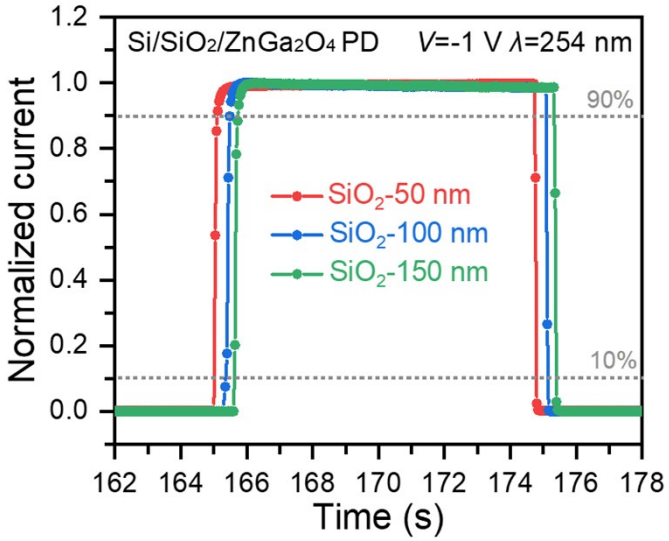

Fig. S5 The normalized transient current photoresponse characteristics of $Si/SiO_2/ZnGa_2O_4$ PDs with different SiO_2 layer thickness (from 50 nm to 150 nm) under 254 nm illumination with 1020 μW/cm^2 intensity at -1 V bias.

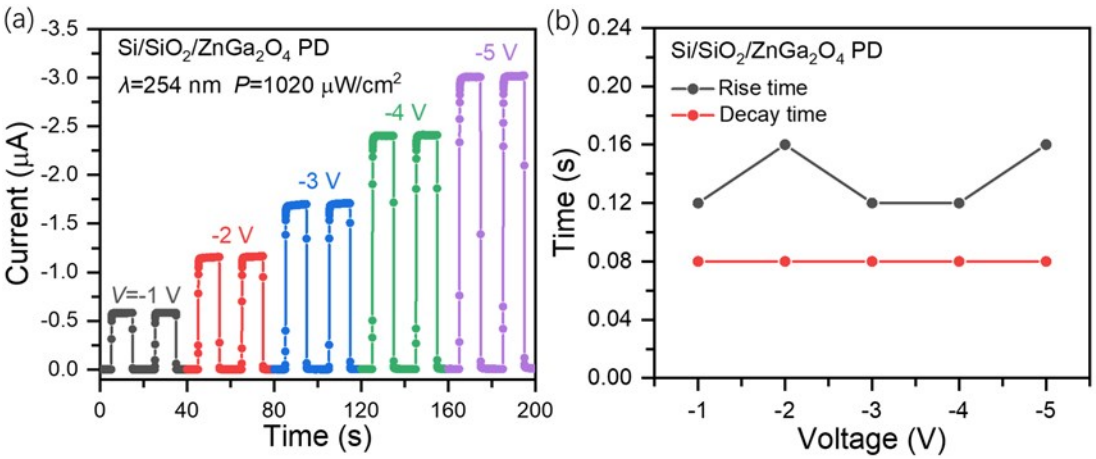

Fig. S6 (a) Time-dependent photoresponse characteristics of $Si/SiO_2/ZnGa_2O_4$ PD the under 254 nm illumination with 1020 μW/cm^2 intensity at different bias voltages from -1 V to -5 V. (b) The rise and decay times of $Si/SiO_2/ZnGa_2O_4$ PD as function of bias voltage.