

Supporting Information

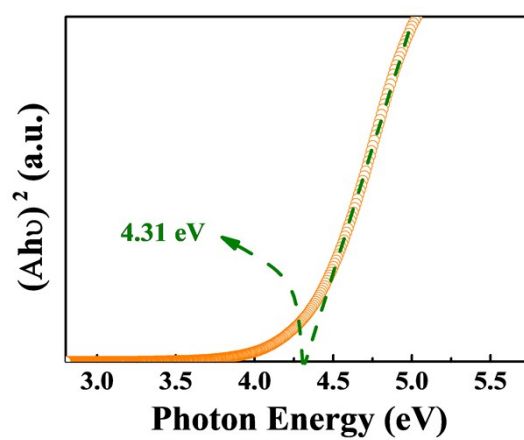


Figure S1. the $(Ah\nu)^2$ vs $h\nu$ diagram and the band gap of the a-Ga₂O₃ film.

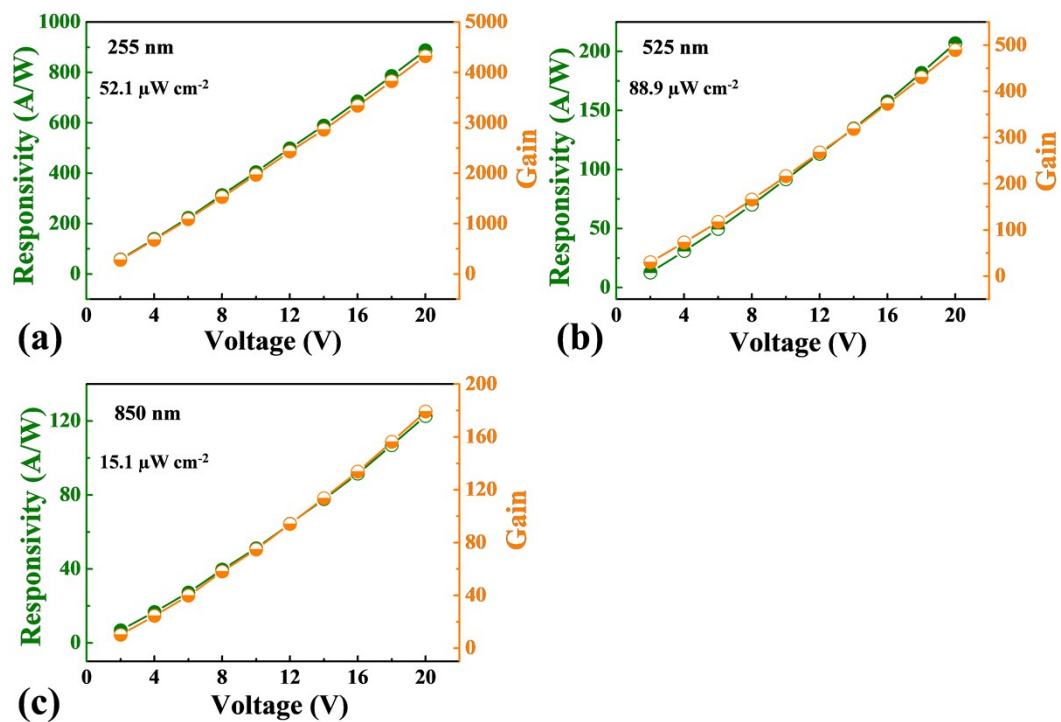


Figure S2. Both responsivity and gain of the a-Ga₂O₃ detector irradiated by the three given wavelengths of (a) DUV-255 nm (b) Vis-525 nm and (c) NIR-850 nm with different bias voltages.

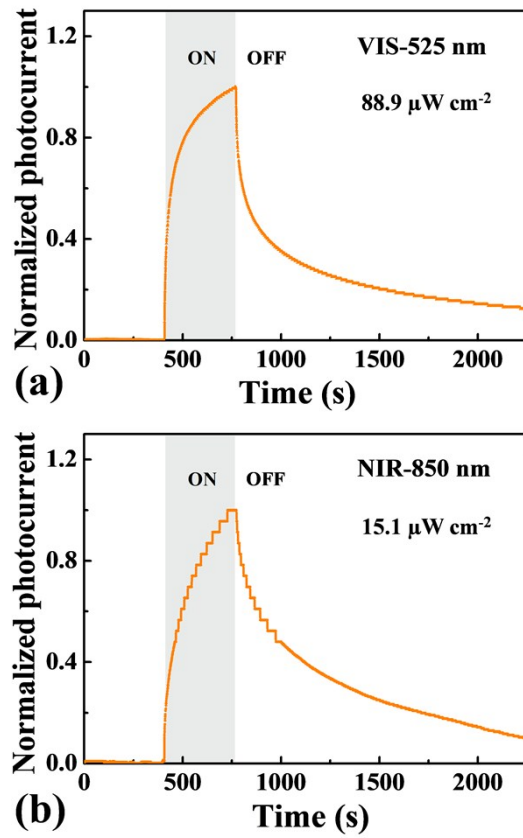


Figure S3. Typical PPC behavior in a-Ga₂O₃ film irradiated by the two given wavelengths of (a) VIS-525 and (b) NIR-850 nm with 5 V bias.

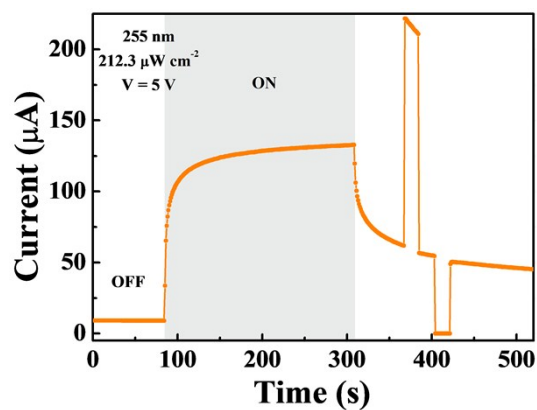


Figure S4. The time-dependent photoresponse of the α -Ga₂O₃ photodetector to UV illumination at RT. Notably, the application of 20 V pulse voltage or open circuit can not change the photocurrent decay rate obviously.

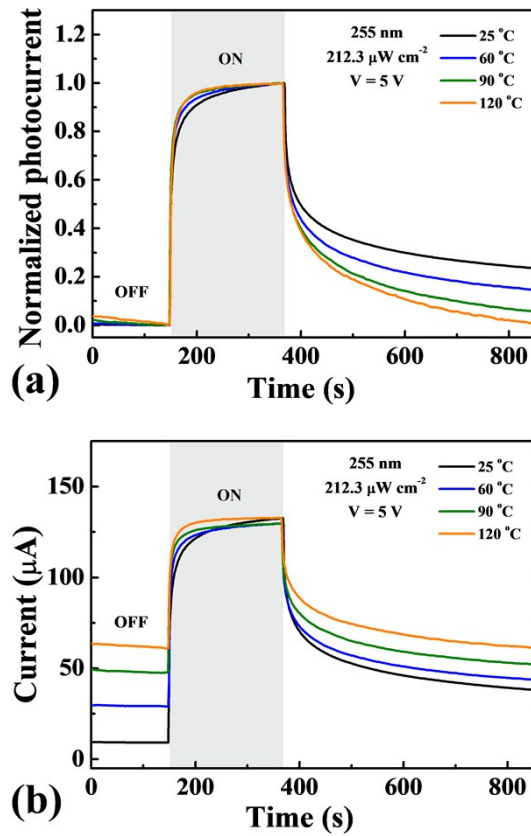


Figure S5. (a) Typical PPC behavior in a-Ga₂O₃ film irradiated by 255 nm UV light with 5 V applied voltage under different temperatures. (b) The time-dependent photoresponse of the a-Ga₂O₃ photodetector to 255 nm illumination at different temperatures.