Supporting Information

Oxygen Vacancies Modulating the Photodetector Performances in ε-Ga_2O_3 Thin Films

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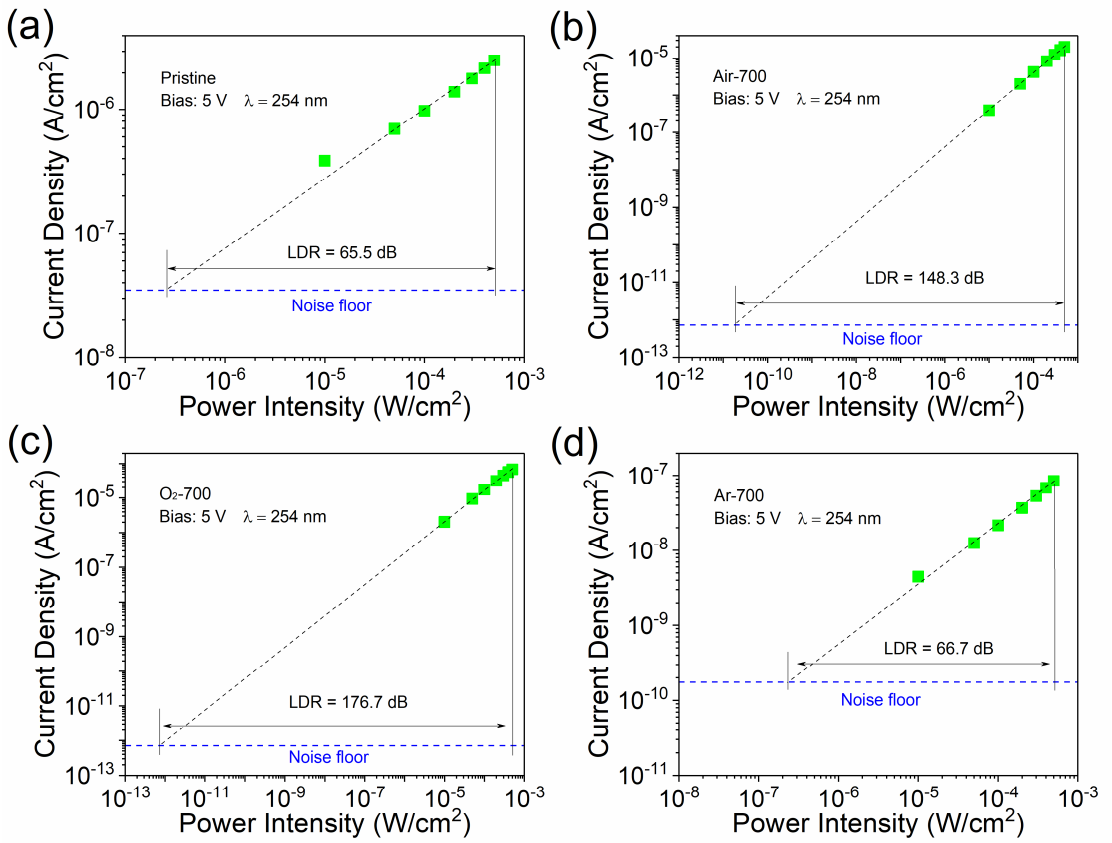

Fig. S1 Linear dynamic ranges of the ε-Ga_2O_3 based photodetectors under different post-annealing conditions: (a) pristine, (b) Air-700, (c) O_2-700 and (d) Ar-700. The noise floors are the dark current densities of the corresponding ε-Ga_2O_3 photodetectors which are measured without any light radiations.

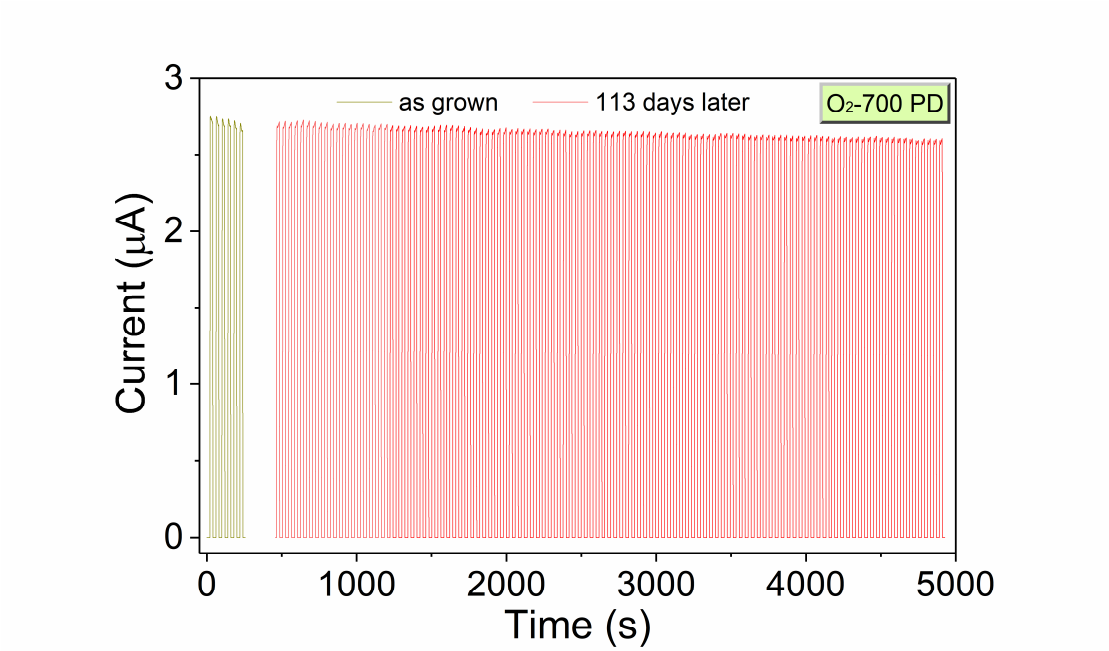

Fig. S2 The operation stability of the O_2-700 photodetector measured at as-grown status (2020-11-23) and after 113 days later (2021-3-16) under 5 V bias with 254 nm light intensity of 500 μW/cm^2.

Table S1 The fitting response speeds evaluated from the Figure 4(f)

Sample	Rise/decay time (ms)	
	τ_{r1}/τ_{r2}	τ_{d1}/τ_{d2}
Ti/ε-Ga_2O_3/Ti (Pristine)	263/1709	169/3897
Ti/ε-Ga_2O_3/Ti (Air-700)	79.1/573	152.3/186.1
Ti/ε-Ga_2O_3/Ti (O_2-700)	61.1/355	87.5/106.9
Ti/ε-Ga_2O_3/Ti (Ar-700)	782.7/782.9	175.2/2380