Supporting information

Epitaxial NiO/$Al_{0.5}Ga_{0.5}N$ Heterostructures for High-Performance Solar-Blind Ultraviolet Self-Powered Photodetectors

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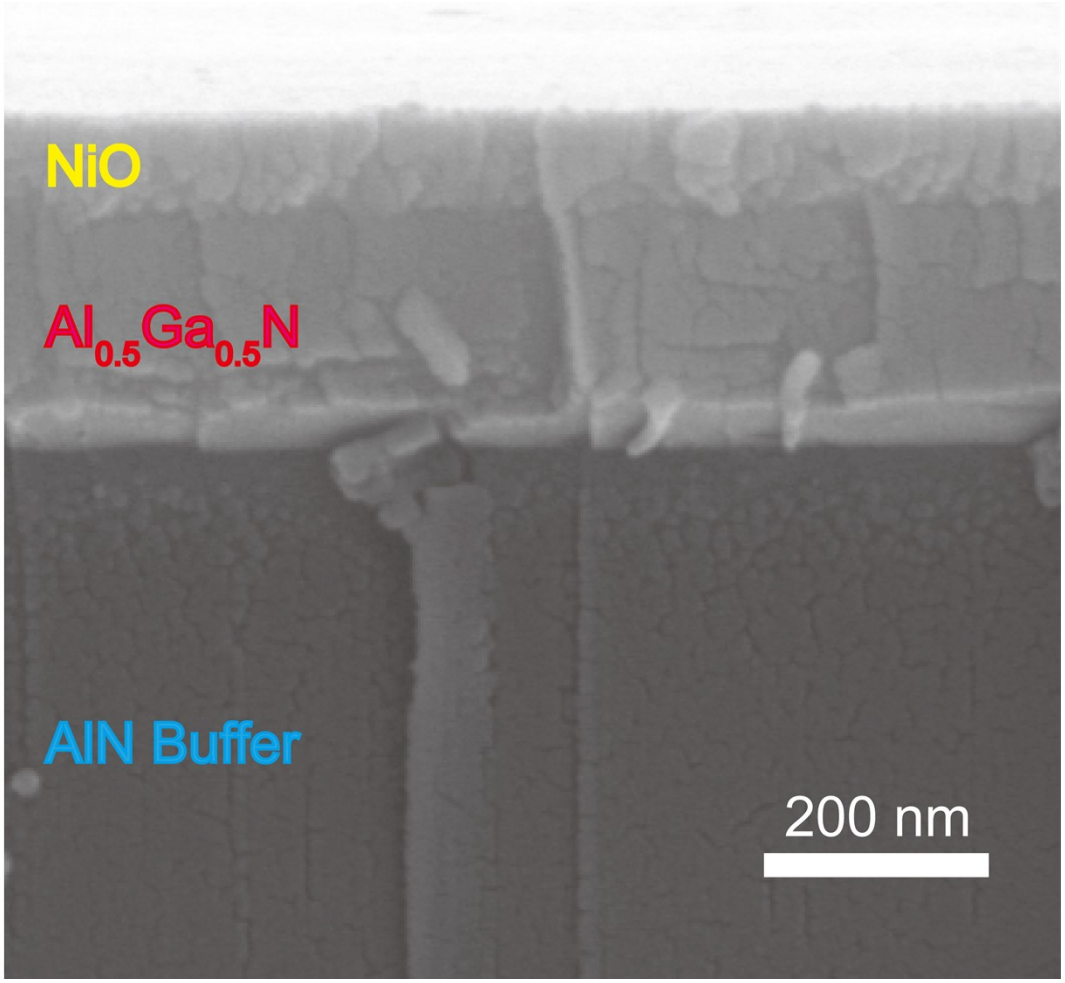

Figure S1. The cross-sectional morphology of NiO/$Al_{0.5}Ga_{0.5}N$ heterostructure, the NiO layer was deposited by PLD at room temperature under the oxygen pressure of 3.0×10^{-3} Pa.

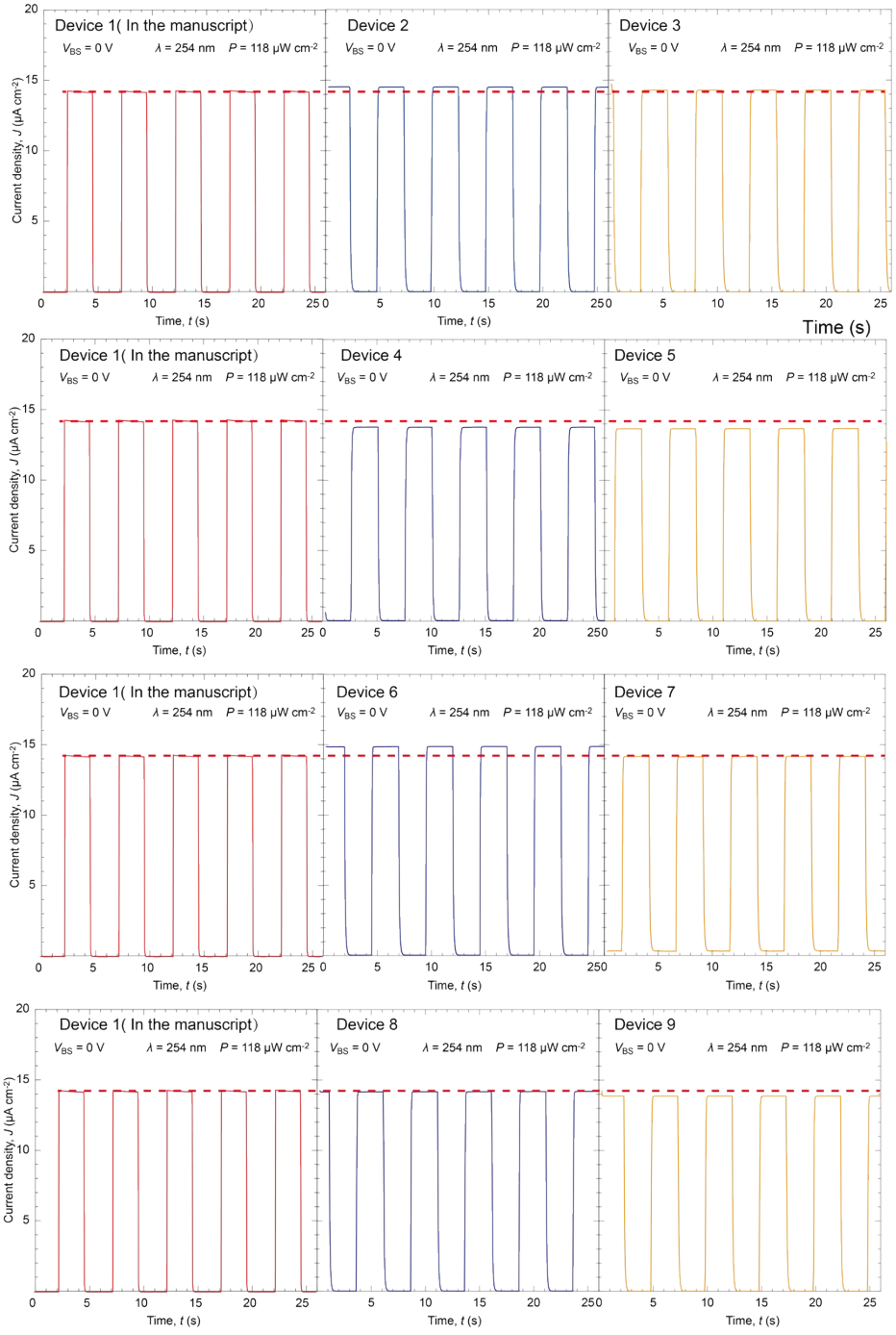

Figure S2. Reproducibility of the fabrication process demonstrated by the time-dependent photoresponse characteristics of 9 NiO/$Al_{0.5}Ga_{0.5}N$ devices fabricated at room temperature under an oxygen partial pressure of 3.0×10^{-3} Pa, which was measured under 254 nm UV illumination at 118 μW cm^{-2} at 0 V bias.

Table S1. Comparison of the characteristic parameters of the NiO/$Al_{0.5}Ga_{0.5}N$ self-powered photodetector under zero Bias from this work and other reported UV photodetectors

Device	Wavelength (nm)	Responsivity (R) @ 0 V (mA W^{-1})	Detectivity (D^*) @ 0 V (Jones)	τ_r/τ_f (ms)	Ref.
AlGaN/ GaN	255	22.5	N/A	121/150	1
Ga_2O_3/GaN	254	43.9	2.7×10^{11}	630/480	2
Ga_2O_3/Ga: ZnO	254	0.763	N/A	179/272	3
$CuCrO_2$/Ga_2O_3	254	50	3.7×10^{12}	254/50	4
ZnO/Ga_2O_3:Sn/ GaN	255	165.56	1.2×10^{13}	310/390	5
La_2O_3/Ga_2O_3	254	1.67	23.1×10^{10}	142.9/135.8	6
SnO_2/p-NiO	250	30.29	2.2×10^{11} @0.05 V	N/A	7
NiO/$Cs_2AgBiBr_6$/GaN	365	33	3.3×10^{11}	0.151/0.215	8
p-CuSCN/Ga_2O_3	254	5.5	N/A	450/260	9
p-NiO/AlGaN	254	118	3.1×10^{12}	21/70	This work

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