

## Supporting Information

### Performance enhanced self-powered near ultraviolet detector based on a NiO/ZnO/SnO<sub>2</sub> sandwich structure

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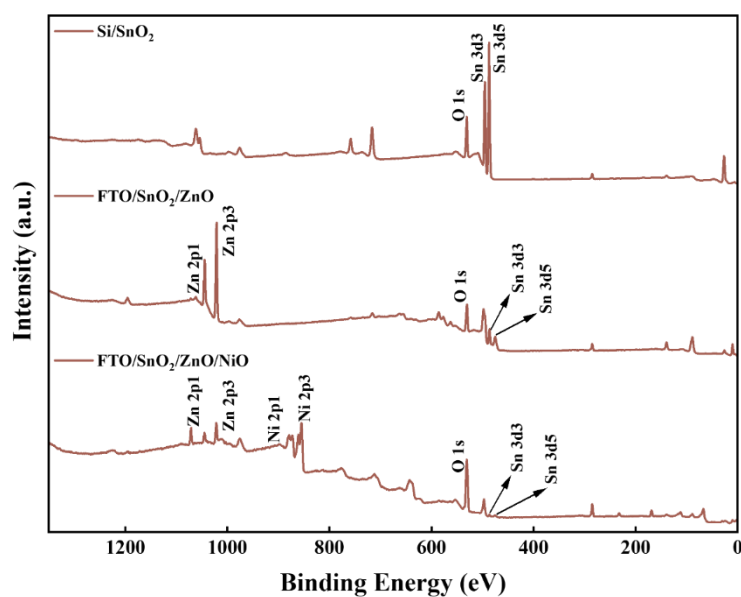


Figure S1 XPS full spectra of Si/SnO<sub>2</sub>, FTO/SnO<sub>2</sub>/ZnO, and FTO/SnO<sub>2</sub>/ZnO/NiO thin films

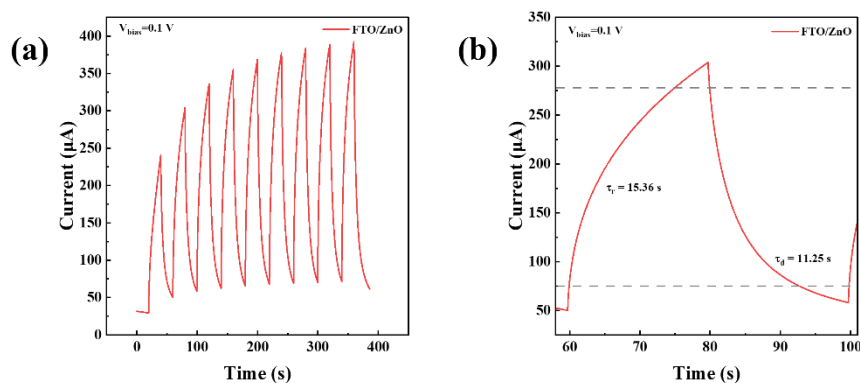


Figure S2 Current response curve of a single-layer ZnO film under a 0.1 V bias voltage

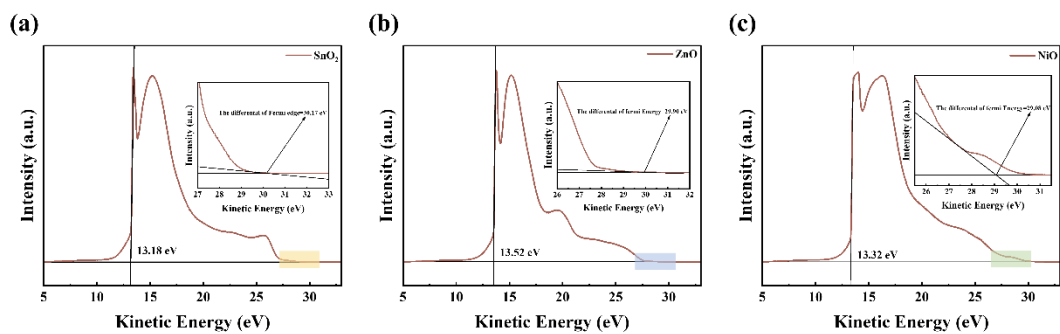


Figure S3 Ultraviolet Photoelectron Spectra of  $\text{SnO}_2$ ,  $\text{ZnO}$  and  $\text{NiO}$

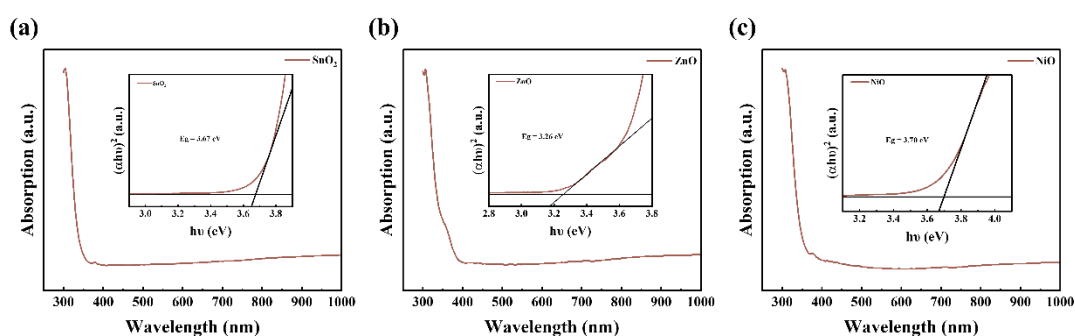


Figure S4 UV-vis DRS spectra of  $\text{SnO}_2$ ,  $\text{ZnO}$  and  $\text{NiO}$  (insert shows the corresponding Tauc plot)

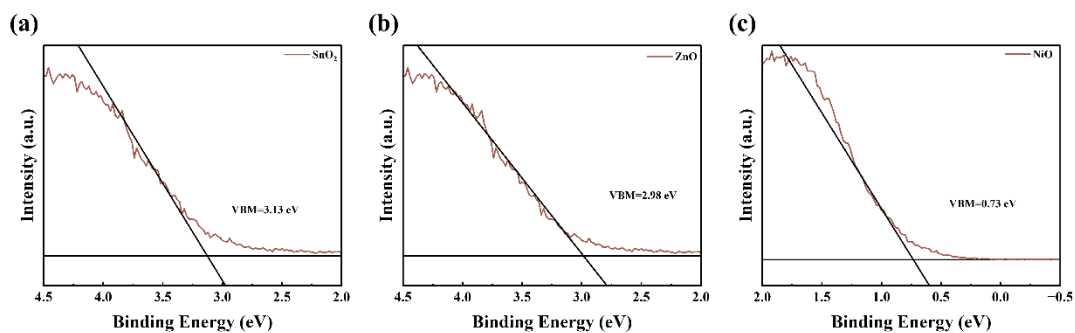


Figure S5 The valence band maximum (VBM) of  $\text{SnO}_2$ ,  $\text{ZnO}$  and  $\text{NiO}$

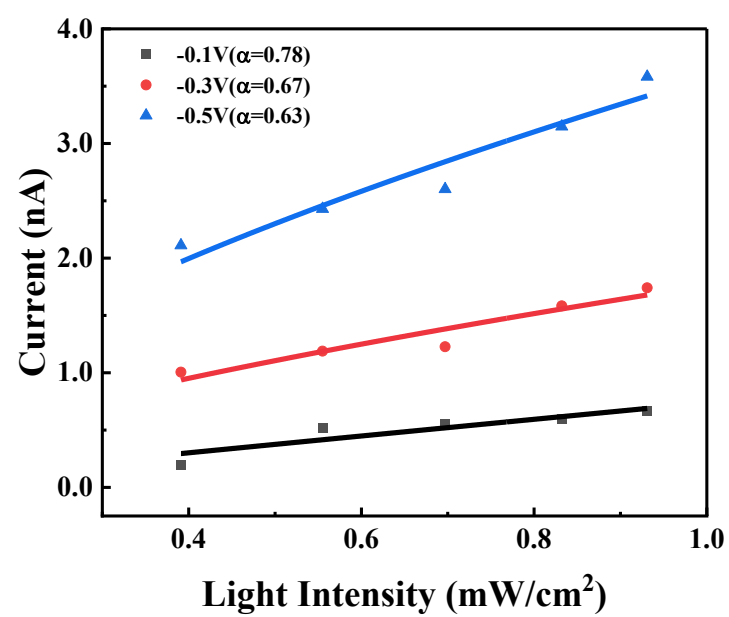


Figure S6 Relationship Between Photocurrent and Light Intensity in the FTO/SnO<sub>2</sub>/ZnO/NiO Double Heterojunction Devices Under Different Bias Voltages