

Supporting Information

InGaSnO Synaptic Device Array for In-Sensor Convolution and Nondestructive Defect Detection

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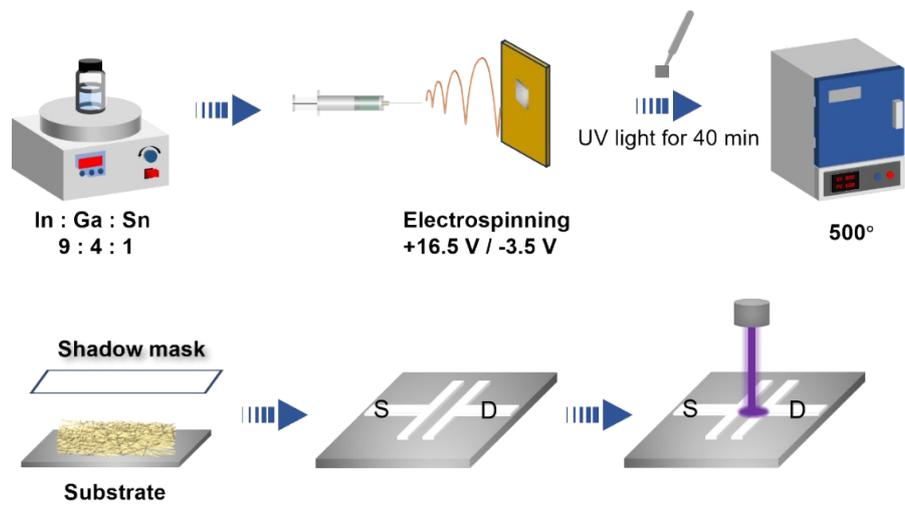


Figure S1. The flowchart showing the fabrication process of the device.



Figure S2. (a-c) Optical micrographs of three representative regions on the same substrate, showing highly consistent nanowire density, orientation distribution, and spatial coverage across the entire electrospun area.

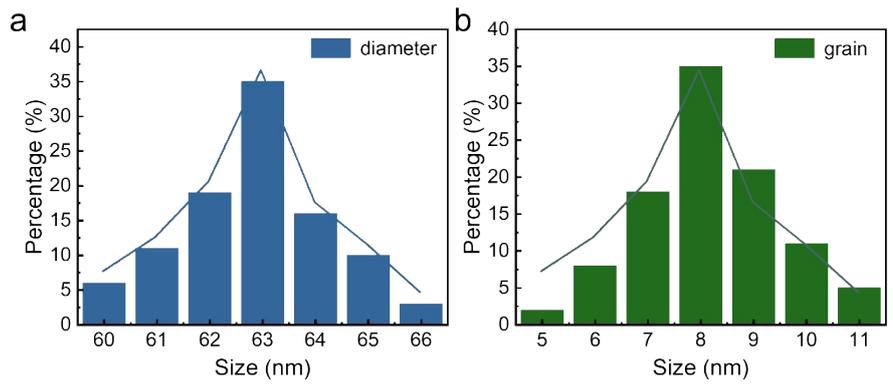


Figure S3. (a-b) Statistical analysis of the diameter distribution and grain size distribution based on 50 InGaSnO nanowires. The statistical results indicate that both the nanowire diameter and grain size follow a Gaussian distribution, with the diameter predominantly centered around 63 nm and the grain size concentrated near 8 nm.

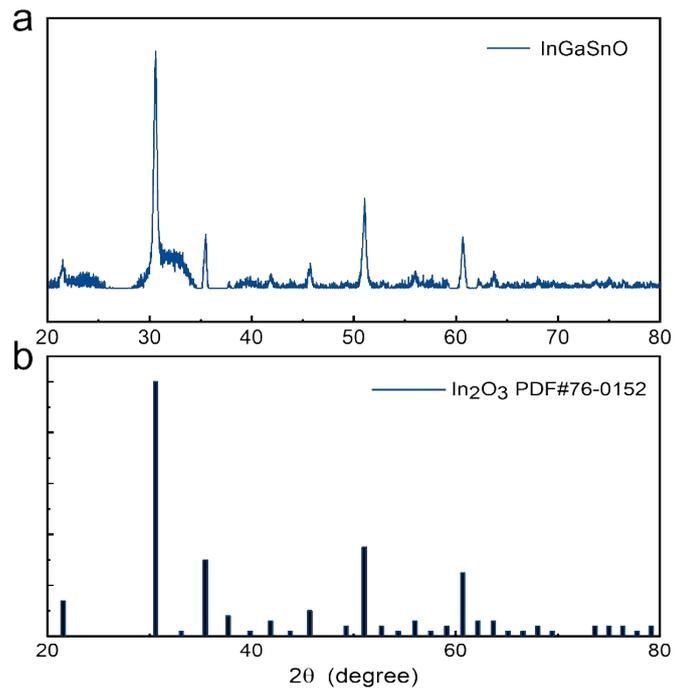


Figure S4. XRD pattern of InGaSnO nanowires, in which In₂O₃ corresponding to PDF#76-0152.

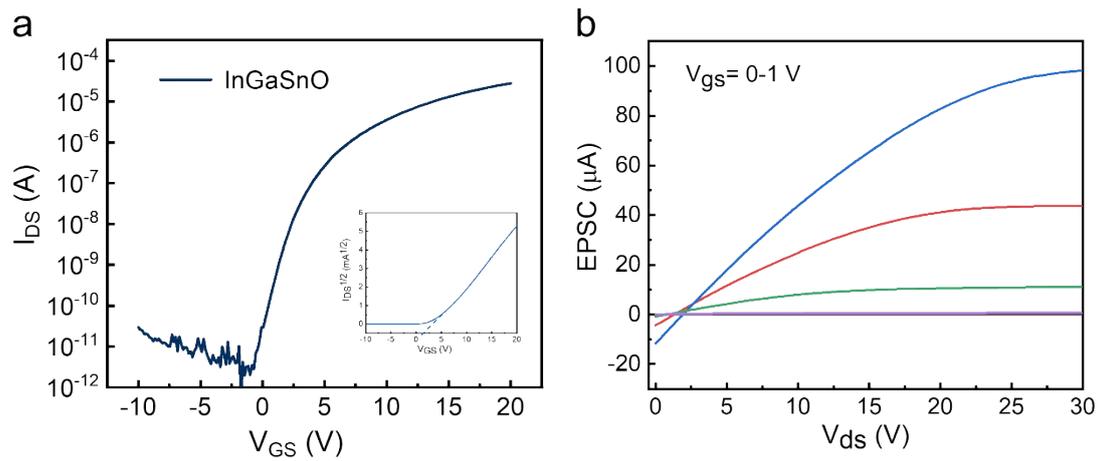


Figure S5. (a) transfer curve of the InGaSnO FET. (b) Output curves of InGaSnO FET.

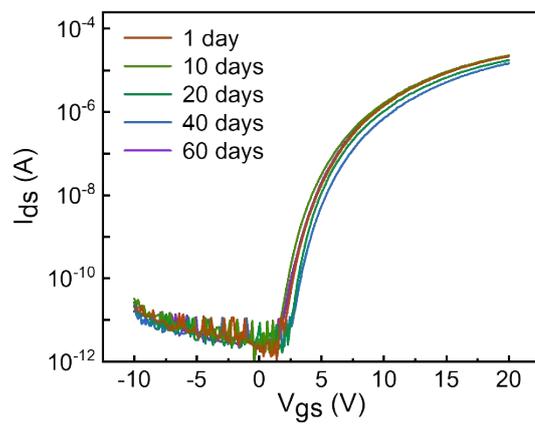


Figure S6. FET with InGaSnO as channel material at different days.

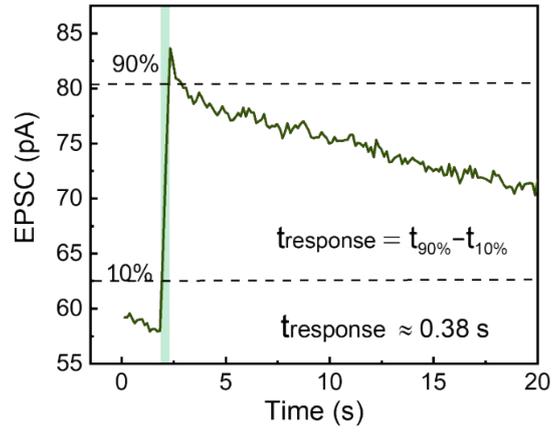


Figure S7. Optical response time of the InGaSnO synaptic device.

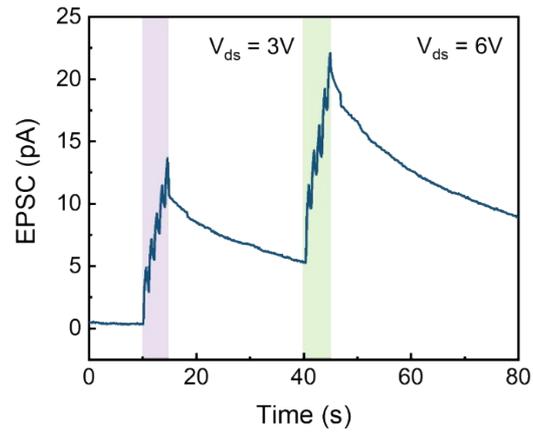


Figure S8. EPSC responses of the InGaSnO synaptic device under identical optical pulse stimulation measured at different electrical bias conditions ($V_{ds}=3$ V and $V_{ds}=6V$).

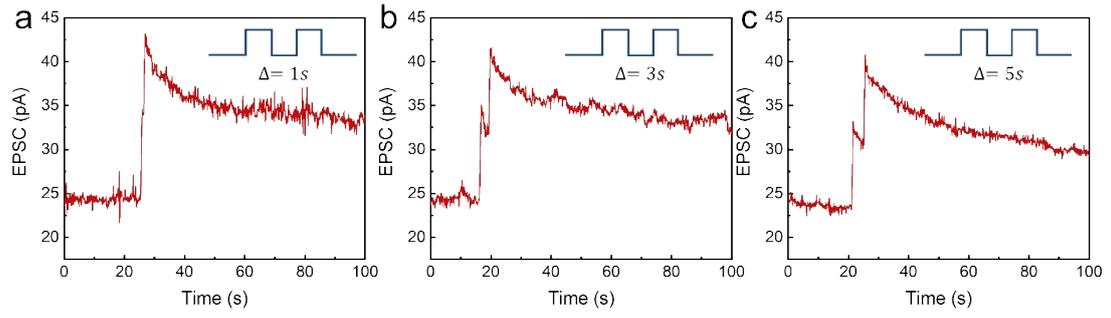


Figure S9. Distinct PPF behaviors at different time intervals.