

# Supporting Information

## Dual-band photodetector based on mixed-dimensional WSe<sub>2</sub>/GaN junction

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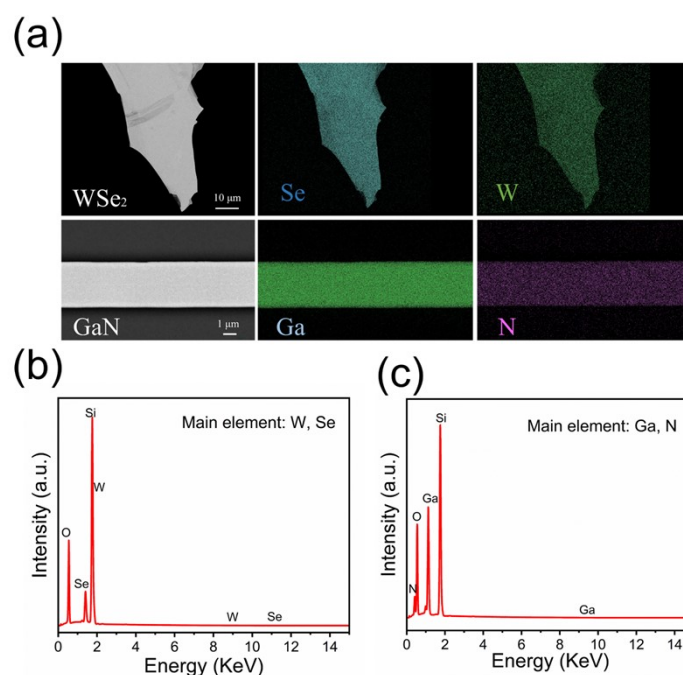


Fig. S1. (a) SEM image of WSe<sub>2</sub> nanosheet and GaN microwires, and corresponding EDS element mapping of Se, W, Ga and N atoms, respectively. (b) The corresponding EDS spectrum of WSe<sub>2</sub> nanosheet. (c) The corresponding EDS spectrum of GaN microwire.

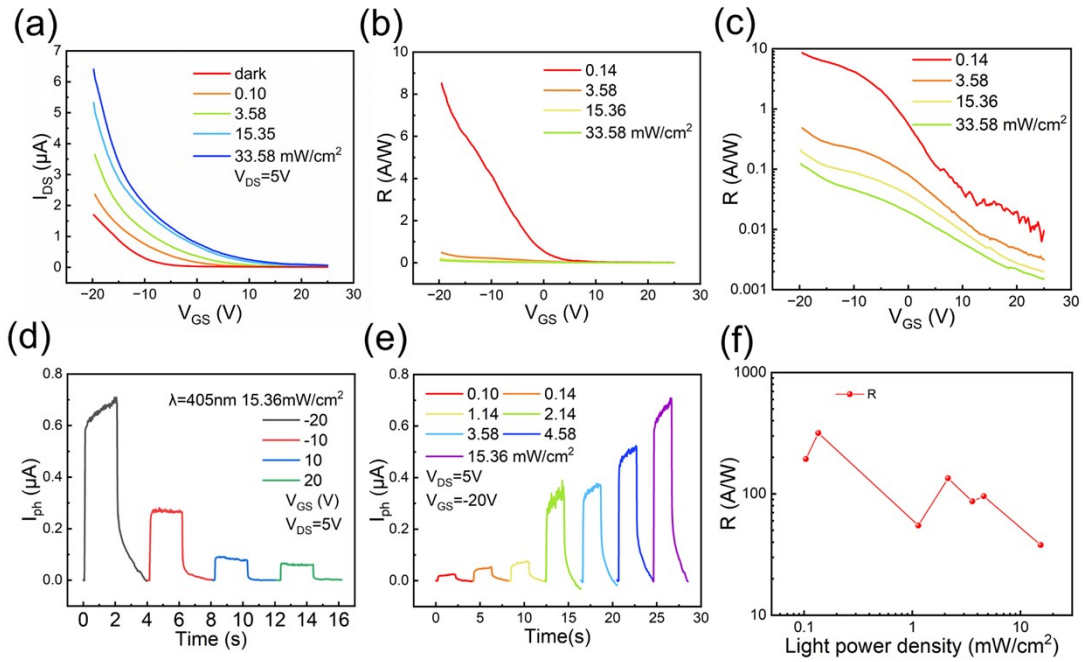


Fig. S2. (a) Transfer characteristic of the WSe<sub>2</sub>/GaN JFET under 405 nm light illumination with different light power intensity at the bias of 5V. (b, c)  $V_{GS}$  dependent responsivity under variable light power intensit in (b) linear scale and (c) logarithmic scale of of y-axis. (d) Time-dependent photocurrent of the device at 405 nm (15.36mW/cm<sup>2</sup>) under different  $V_{GS}$ . (e) Time-dependent photocurrent with increasing light power density at 405 nm ( $V_{ds}=5$  V,  $V_{GS}=-20$  V). f) Light power density dependent responsivity (R) of the device under 405nm.

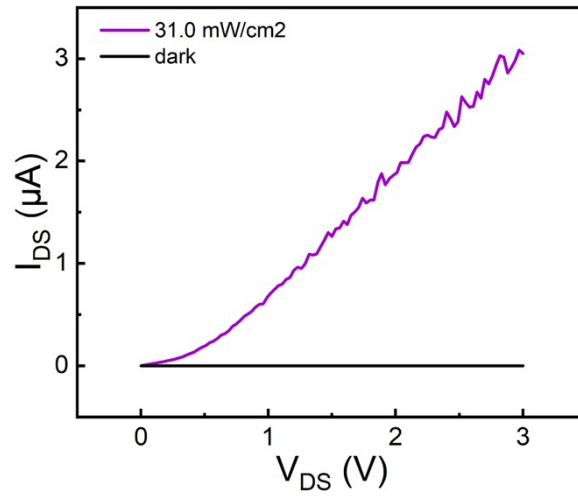


Fig. S3. The I-V characteristic curves of pure GaN under dark and 325 nm light illumination.