Electronic Supplementary Information

High-performance photodetector based on Sb_2S_3 nanowire: wavelength dependence and wide temperature range utilization

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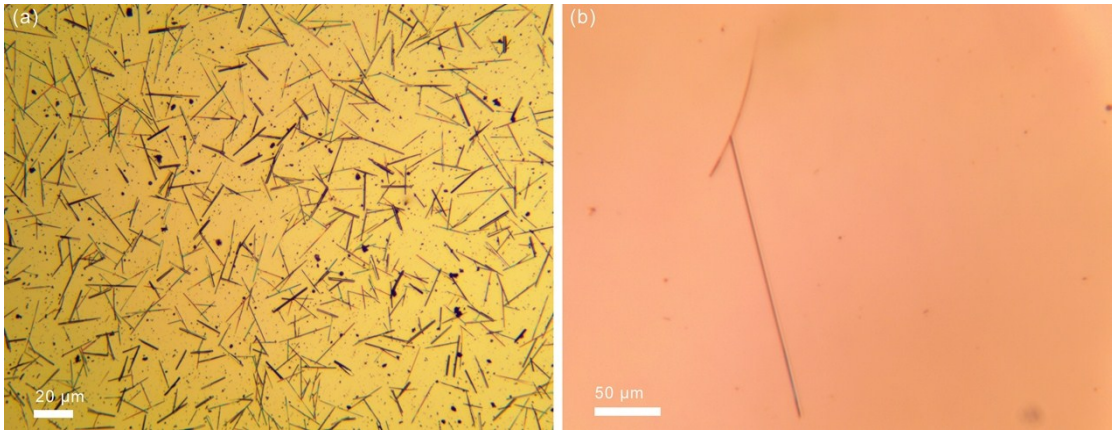

Fig. S1 (a) Optical microscopy image of as-prepared Sb_2S_3 nanowires. (b) Magnified optical microscopy image of the typical individual Sb_2S_3 nanowire.

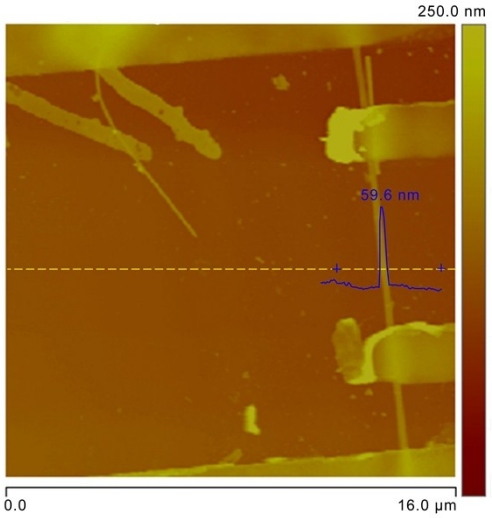

Fig. S2 The AFM image of a typical individual Sb_2S_3 NW based photodetector. The diameter of this NW is 59.6 nm.

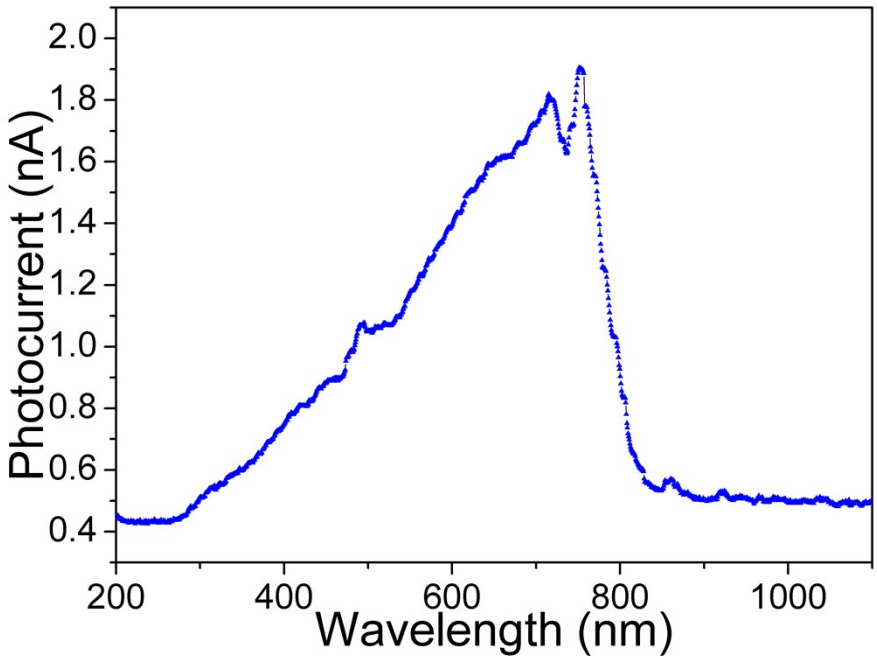

Fig. S3 The wavelength-dependent photocurrent response of the photodetector.

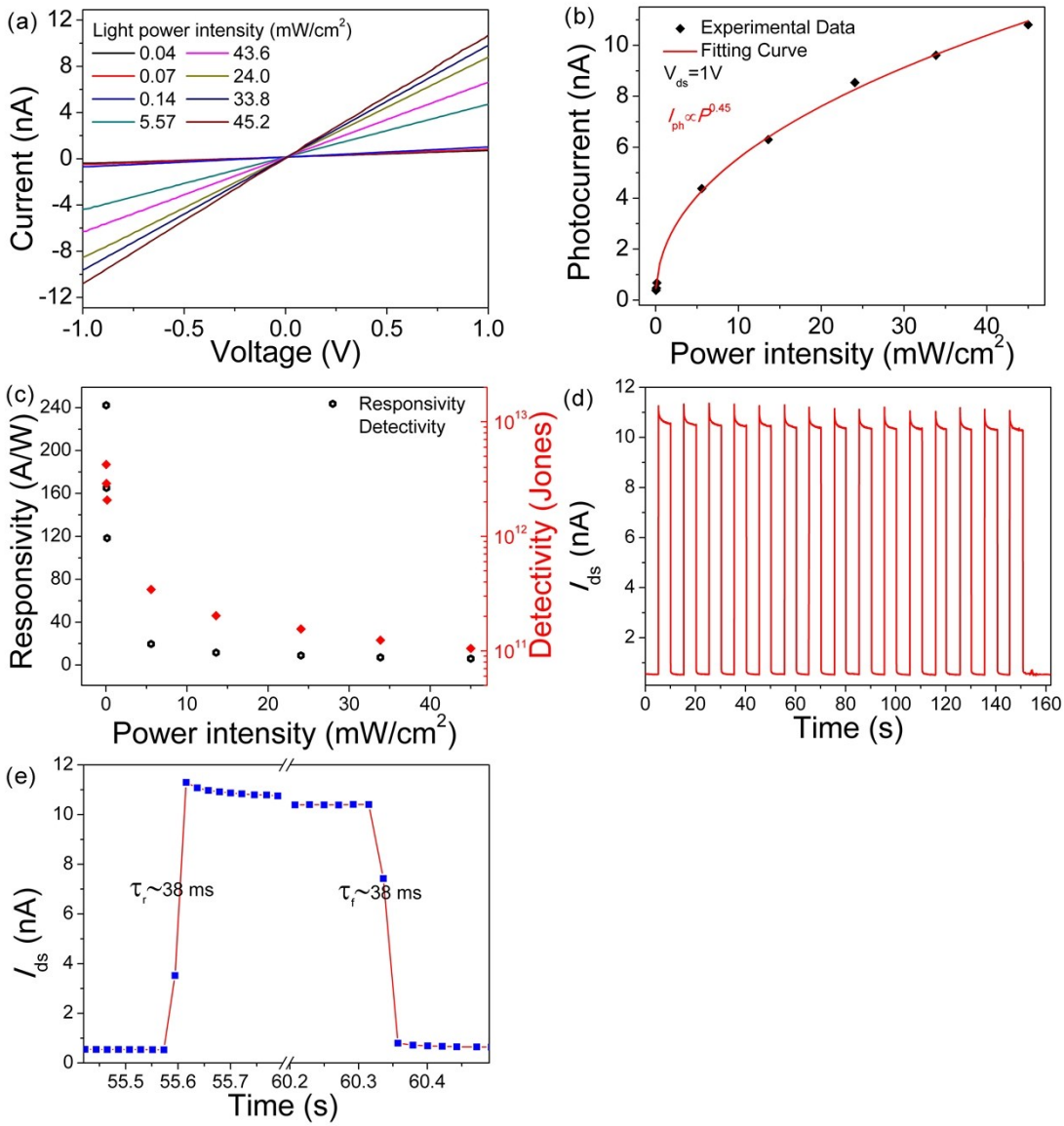

Fig. S4 (a) *I–V* curves of the photodetector under the illumination of 450 nm laser with different light power intensities (from 0 to 45 mW/cm^2); (b) The light power density dependence of the photocurrent measured with a bias voltage of 1 V under the illumination of 450 nm laser; (c) Light intensity dependent spectral responsivity (dark) and detectivity (red) at the illumination of 450 nm laser under a bias of 1 V; (d) The photoswitching behaviours, (e) photocurrent rise and decay of this photodetector under illumination of 450 nm laser with a light intensity of 45.2 mW/cm^2 and a bias voltage of 1 V.

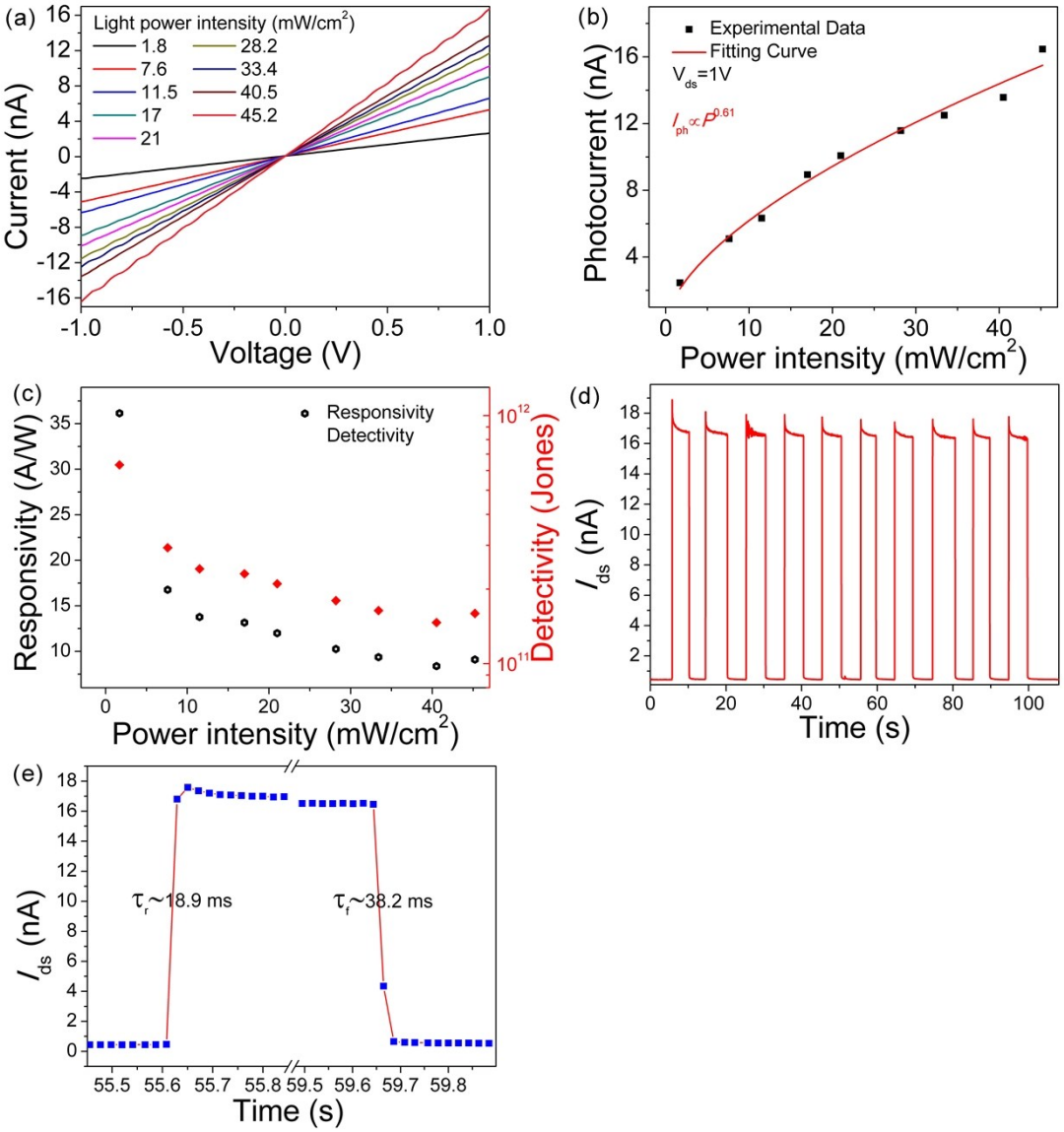

Fig. S5 (a) *I–V* curves of the photodetector under the illumination of 532 nm laser with different light power intensities (from 1.8 to 45.2 mW/cm^2); (b) The light power density dependence of the photocurrent measured with a bias voltage of 1 V under the illumination of 532 nm laser; (c) Light intensity dependent spectral responsivity (dark) and detectivity (red) at the illumination of 532 nm laser under a bias of 1 V; (d) The photoswitching behaviours, (e) photocurrent rise and decay of this photodetector under illumination of 532 nm laser with a light intensity of 45.2 mW/cm^2 and a bias voltage of 1 V.