

Supplementary Data

Fast and High Photoresponsivity Gallium Telluride / Hafnium Selenide Van der Waals Heterostructure photodiode

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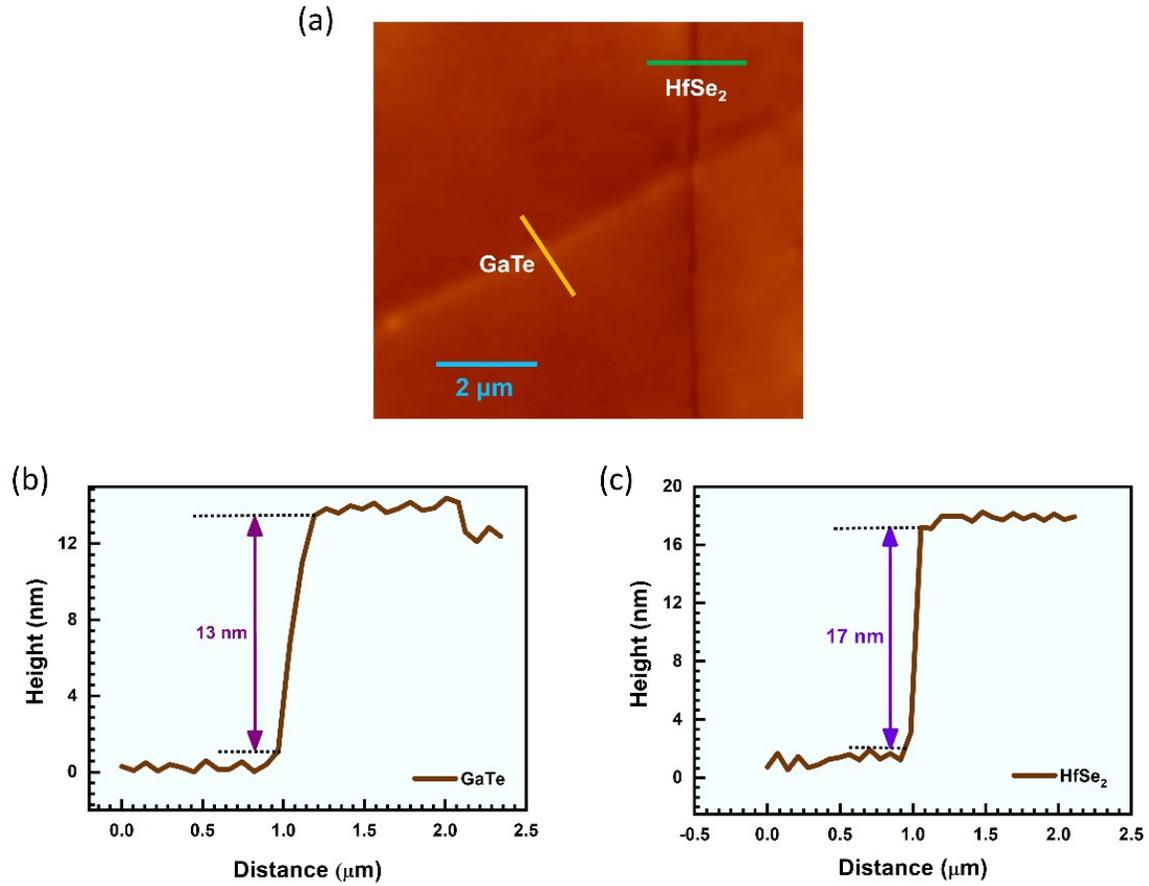


Figure S1: (a) Image of the p-GaTe/n-HfSe₂ heterojunction device obtained by using AFM, (b) is the height profile of p-GaTe flake. The thickness of the GaTe flake is observed around 13 nm and (c) is the height profile of n-HfSe₂ flake. The thickness of the HfSe₂ flake is 17 nm.

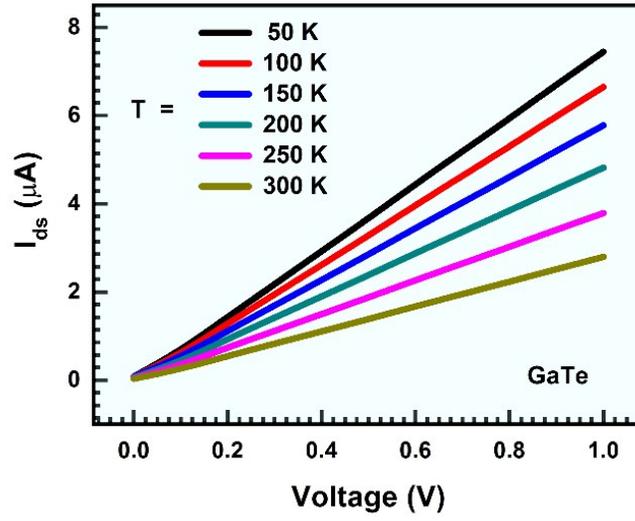


Figure S2. $I_{ds} - V_{ds}$ curves of p-GaTe at different temperatures.

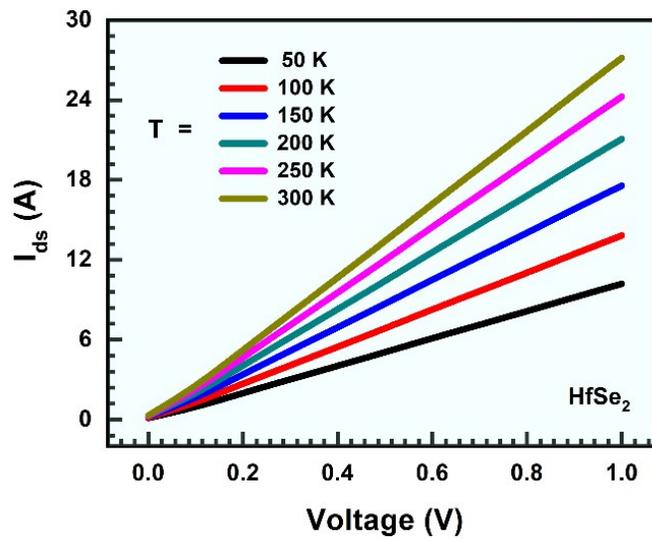


Figure S3. $I_{ds} - V_{ds}$ curves of HfSe₂ at different temperatures.

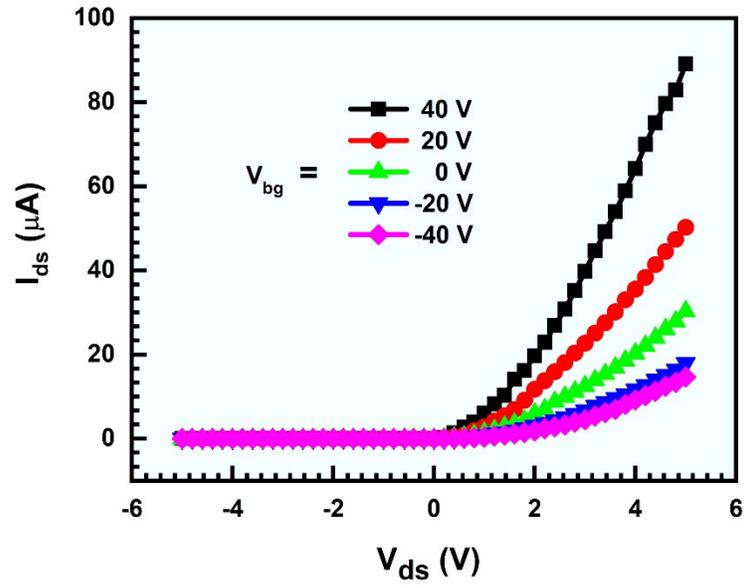


Figure S4. Gate-dependent rectification of p-GaTe/n-HfSe2 vdW heterojunction diode in linear scale.

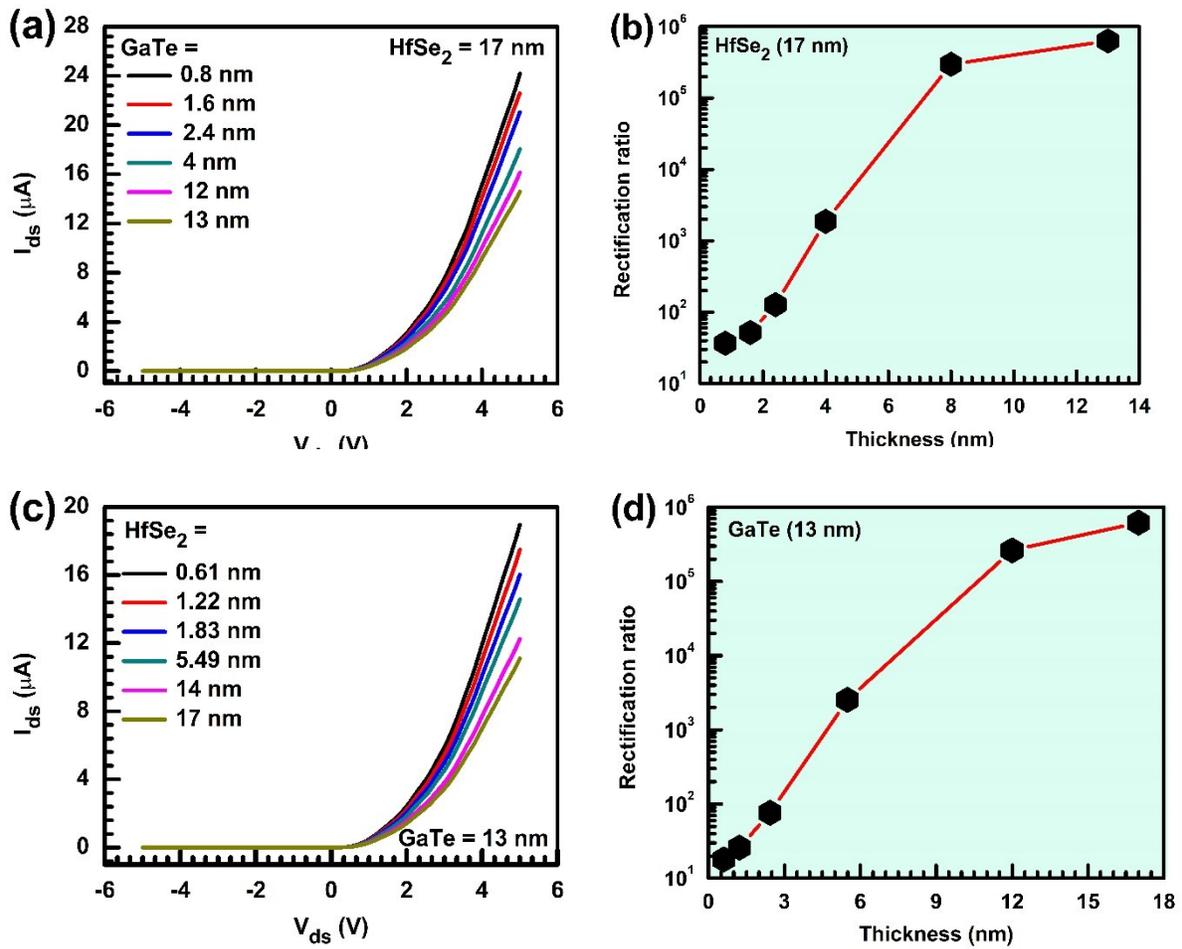


Figure S5. (a) Thickness dependent current-voltage characteristics of GaTe/HfSe₂ vdW heterostructure. (b) Changes in rectification ratio with the thickness of GaTe. (c) Thickness dependent current-voltage characteristics of GaTe/HfSe₂ vdW heterostructure (d) Changes in rectification ratio with the thickness of HfSe₂.

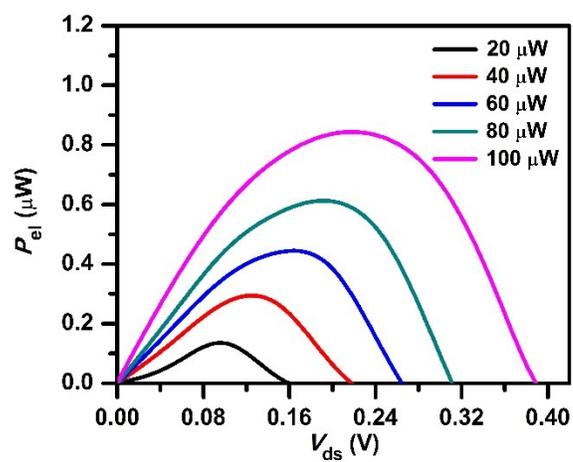


Figure S6. Photoelectric conversion efficiency (optical power values generated by the p-GaTe/n-HfSe₂ vdW heterostructure diode) for powers of illuminated laser light.