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MDPI

Supplementary Material

Realization of High Current Gain for Van der Waals $MoS_2/WSe_2/MoS_2$ Bipolar Junction Transistor

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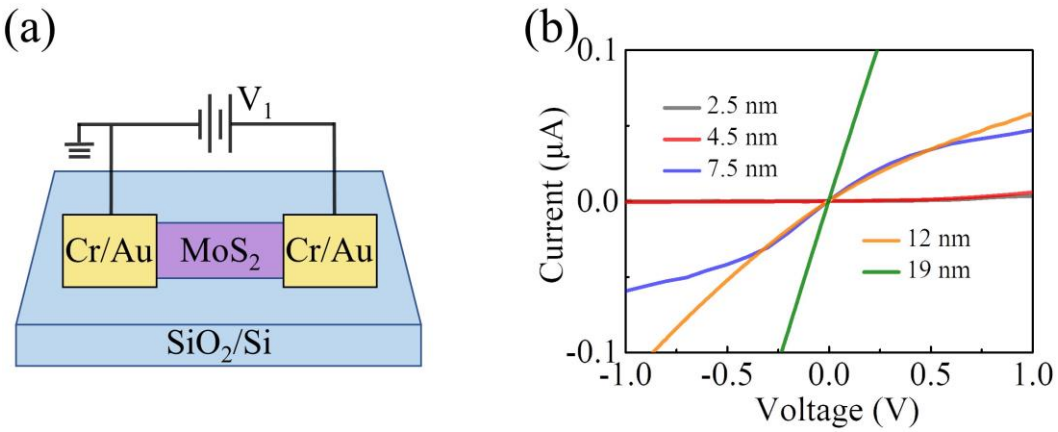

Figure S1. (a) A schematic illustration of the electrical connection to investigate the electrical characteristics of the undoped MoS_2 flakes with different thicknesses. (b) Typical I–V curves of the undoped MoS_2 flakes with different thicknesses.

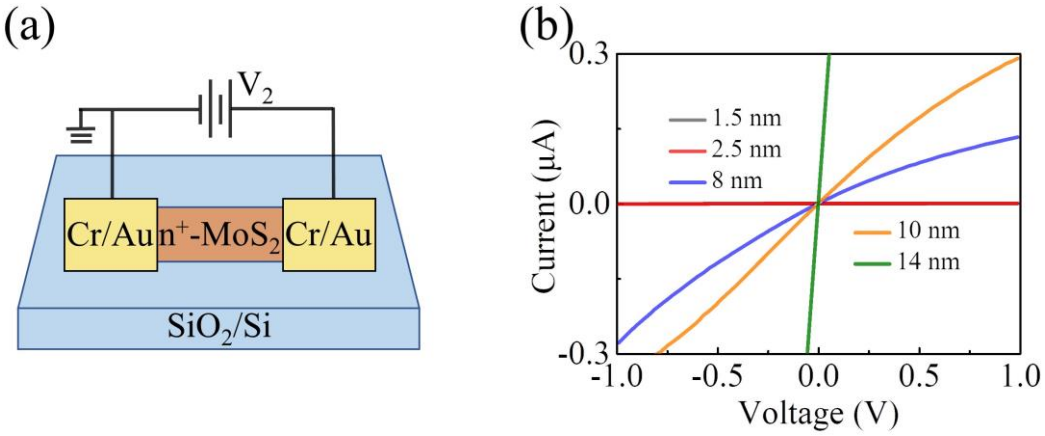

Figure S2. (a) A schematic illustration of the electrical connection to investigate the electrical characteristics of the re-doped MoS_2 flakes with different thicknesses. (b) Typical I–V curves of the re-doped MoS_2 flakes with different thicknesses.

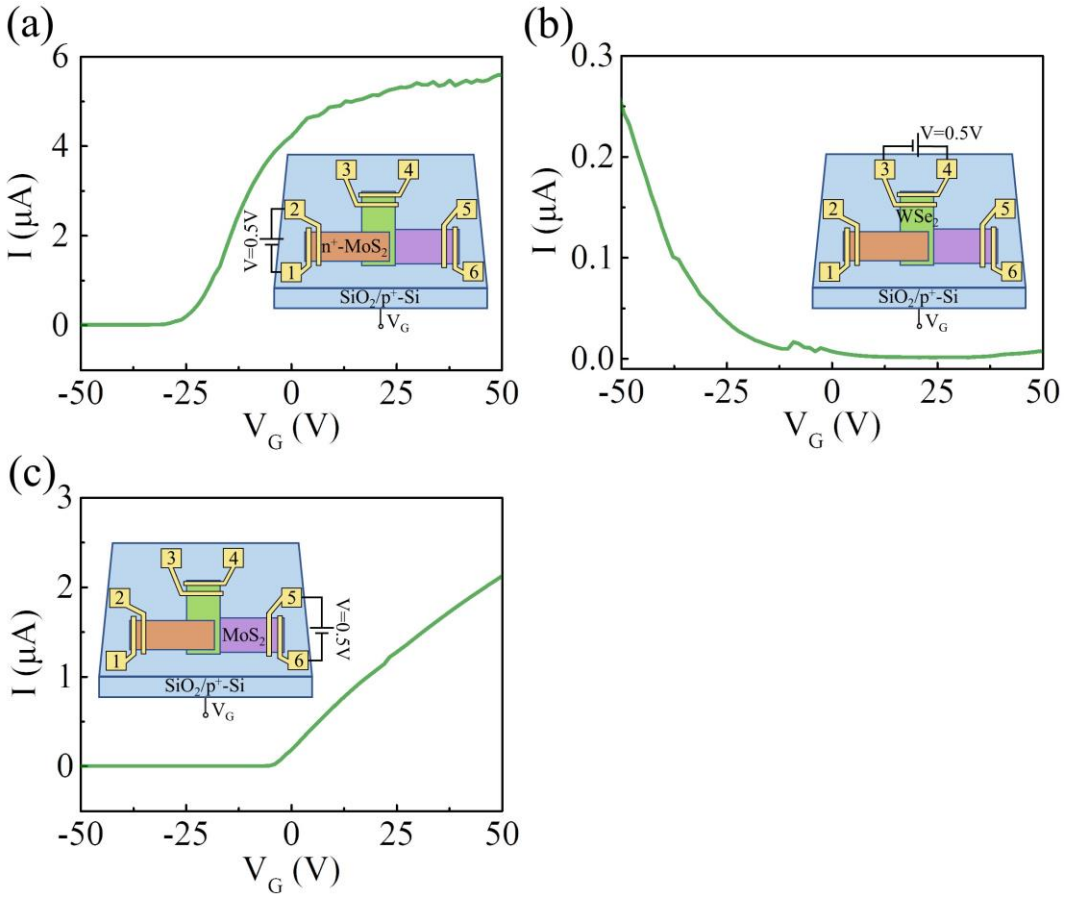

Figure S3. (a) The transfer curve of the individual n^+-MoS_2 flake; (b) The transfer curve of the individual WSe_2 flake; (c) The transfer curve of the individual MoS_2 flake.

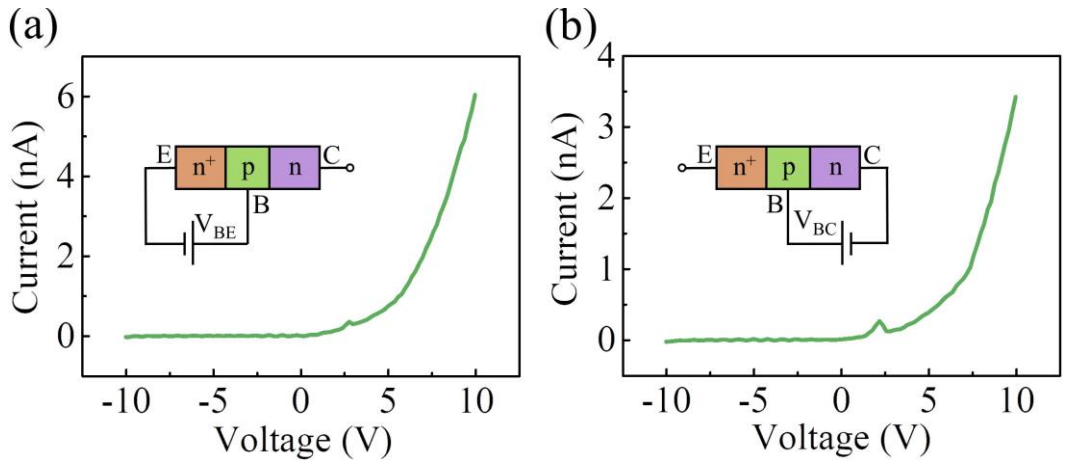

Figure S4. (a) I–V curves of the base-emitter (top-n^+-MoS_2/WSe_2) junction; (b) I–V curves of the base-collector (bottom-MoS_2/WSe_2) junction.

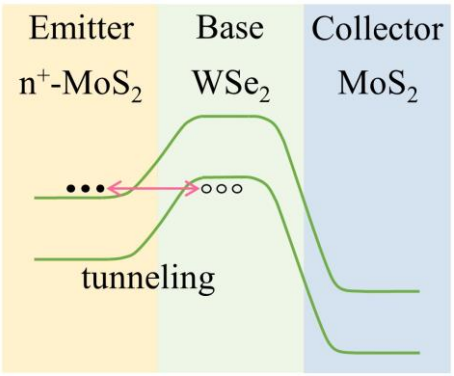

Figure S5. Band diagram of the n^+-MoS_2/WSe_2/MoS_2 bipolar junction transistor operating in the negative differential resistance region

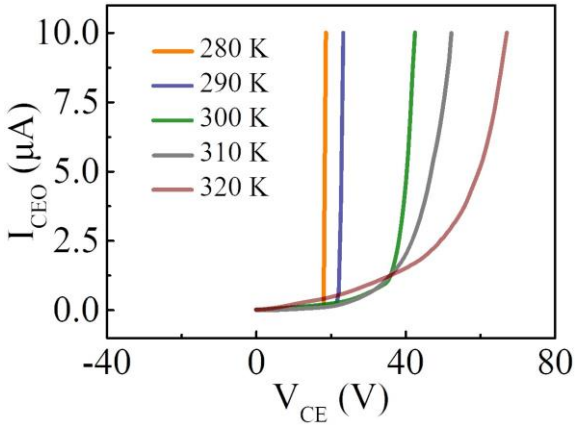

Figure S6. The open-base collector-emitter breakdown characteristics of the device operating at different temperatures (from 280 K to 320 K).