Supplementary Information

for

Anti-ambipolar and Photovoltaic effect in

p-$MoTe_2$/n-InSe Heterojunctions

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Figure Caption

Figure S1. XRD pattern of β-InSe.

Figure S2. PL spectra of the InSe/$MoTe_2$ heterostructure.

Figure S3. Calculated band edges of single-layer and InSe and $MoTe_2$ with respect to the vacuum level.

Figure S4. Schematic illustration of PVA transfer methods.

Figure S5. (a-b) Transfer characteristic of InSe and $MoTe_2$ with different thickness.

Figure S6. I_{ds}−V_{ds} curves of the $MoTe_2$/InSe anti-ambipolar transistors with different V_{ds}.

Figure S7. I_{ds}−V_{ds} characteristics of the detector in different light intensities at 635 nm.

Figure S8. (a) I−t curves of the device under light intensities 405 and 635 nm without biase for longtime.

Figure S9. I−t curves of the device under various biases with light wavelength at 635 nm.

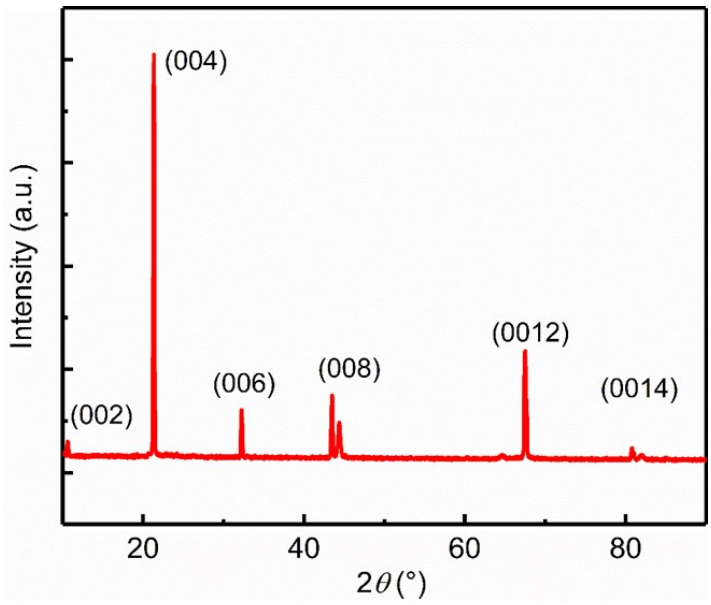

Figure S1. XRD pattern of β-InSe.

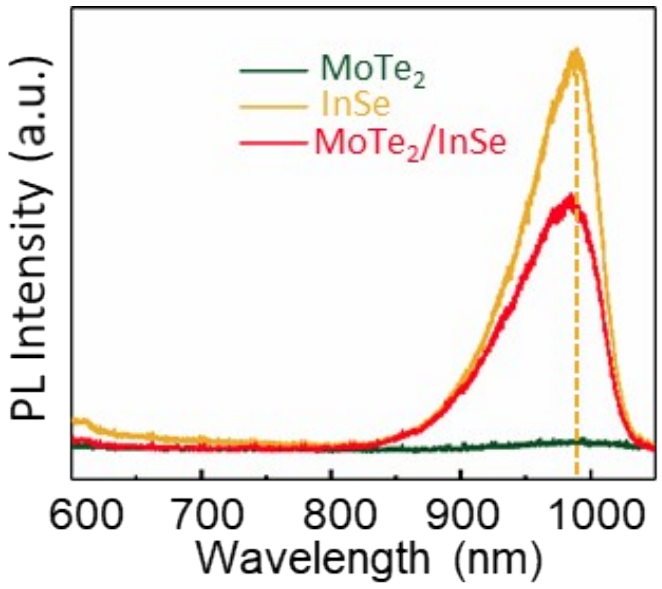

Figure S2. PL spectra of the InSe/$MoTe_2$ heterostructure.

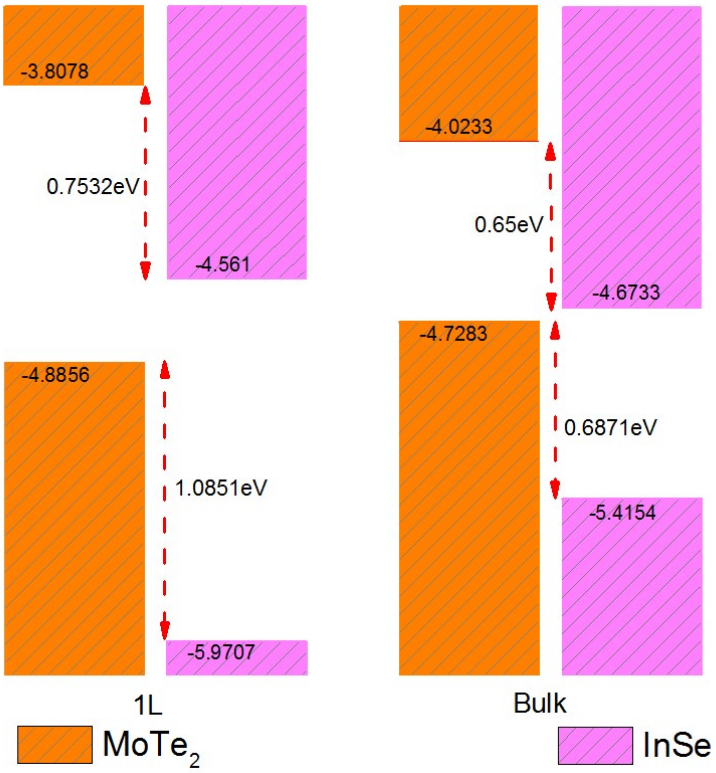

Figure S3. Calculated band edges of single-layer and InSe and $MoTe_2$ with respect to the vacuum level.

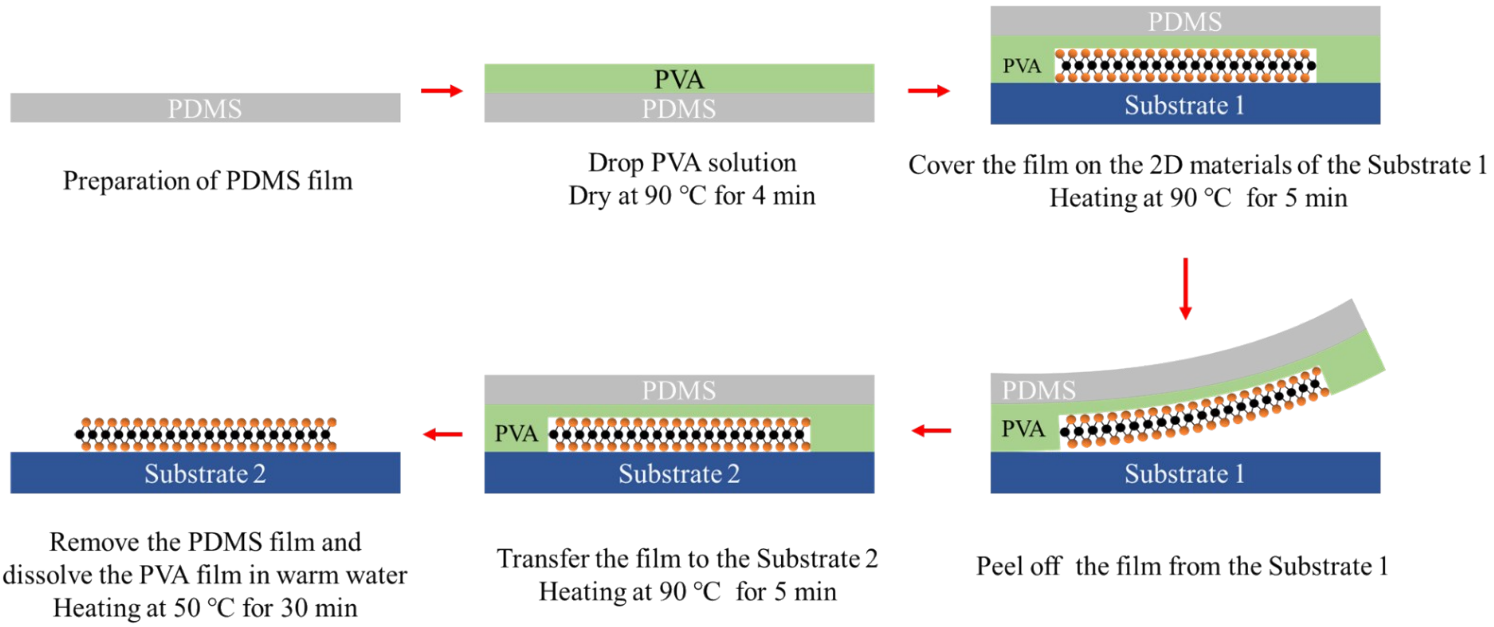

Figure S4. Schematic illustration of PVA transfer methods.

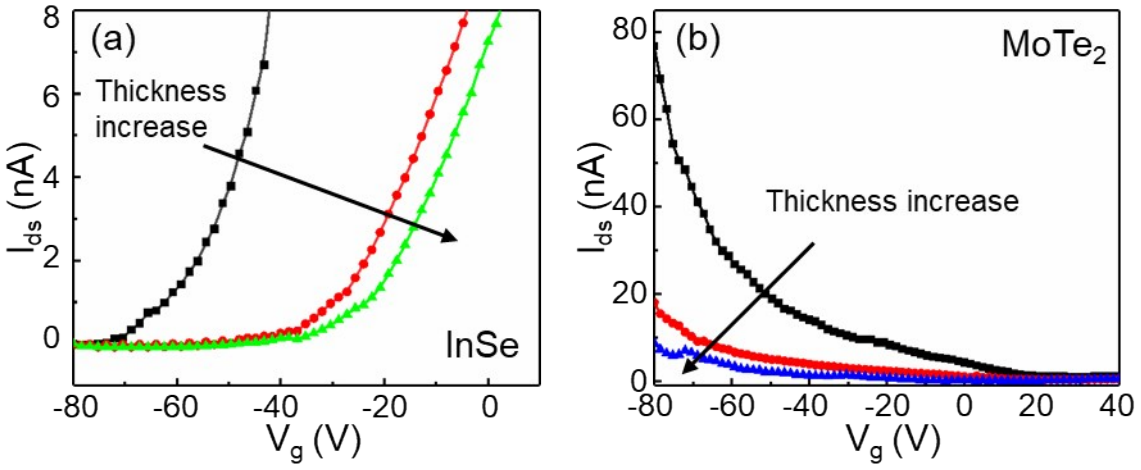

Figure S5. (a-b) Transfer characteristic of InSe and $MoTe_2$ with different thickness.

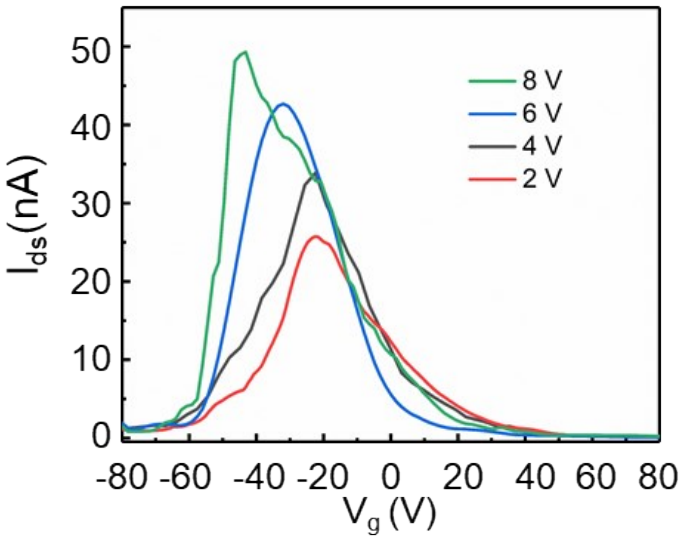

Figure S6. I_{ds}−V_{ds} curves of the $MoTe_2$/InSe anti-bipolar transistors with different V_{ds}.

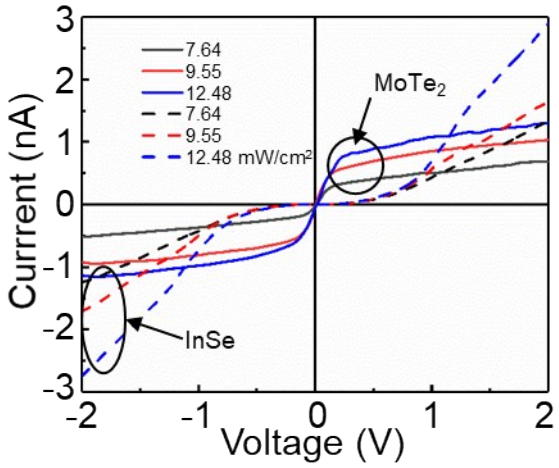

Figure S7. I_{ds}−V_{ds} characteristics of the detector in different light intensities at 635 nm.

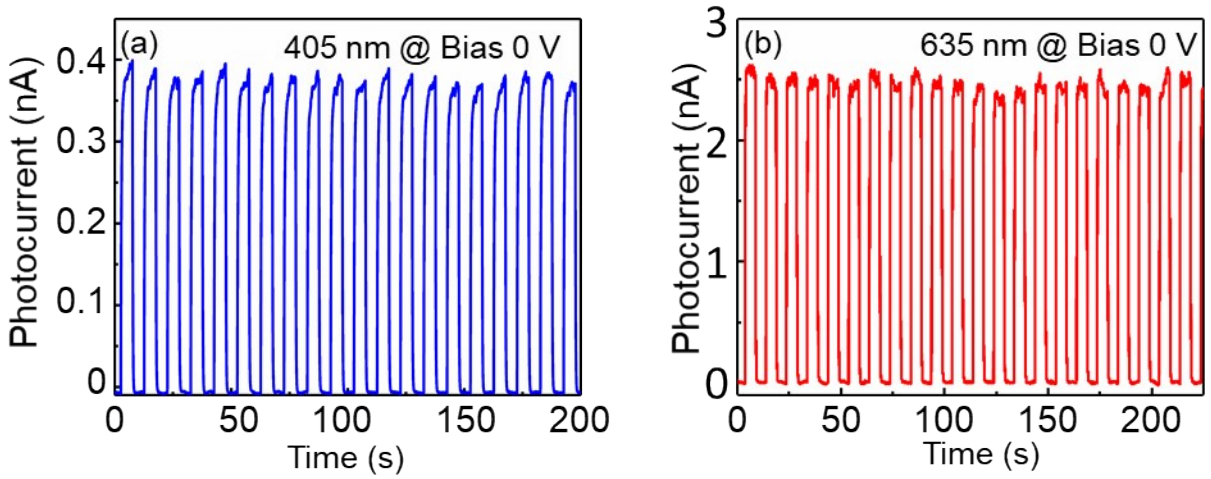

Figure S8. (a) I−t curves of the device under light intensities 405 and 635 nm without biase for longtime.

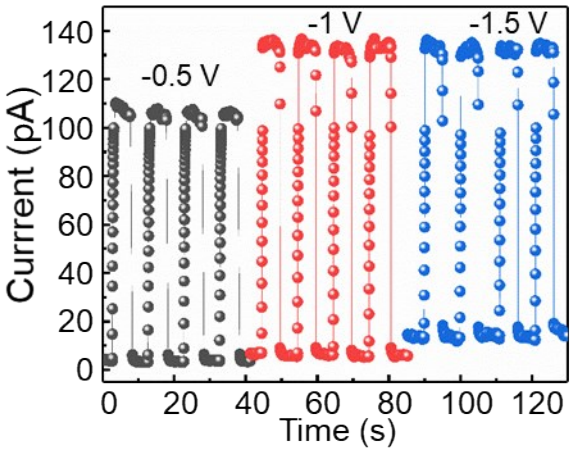

Figure S9. I−t curves of the device under various biases with light wavelength at 635 nm.