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Supplementary data

Suppression of Thermally Activated Carrier Transport in Atomically Thin MoS_2 on Crystalline Hexagonal Boron Nitride Substrates

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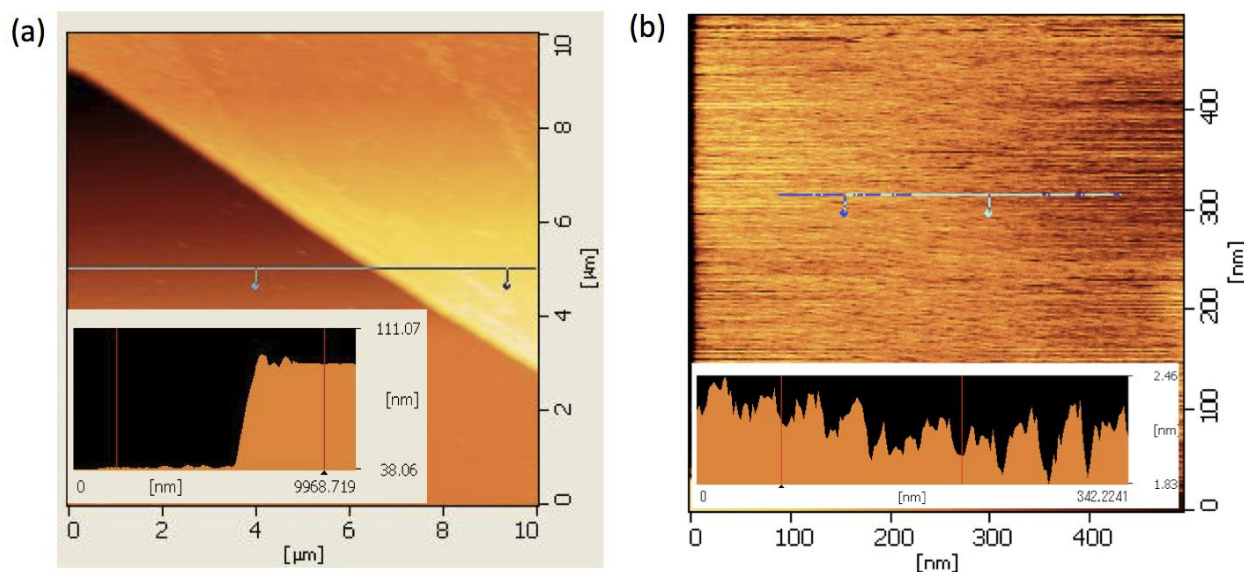

Fig. S1 (a) AFM image of a representative h-BN flake exfoliated onto a Si / SiO_2 substrate, measured under a scan size of 10 μm^2. Inset shows the stepheight of the h-BN of ~ 53 nm relative to the SiO_2 background, where the h-BN surface is relatively smooth except for the inhomogeneities near the edges. (b) AFM image of the h-BN flake measured under a scan size of 500 nm^2. Inset shows the height profile across the scan line, with a measured RMS roughness of 0.2 nm.

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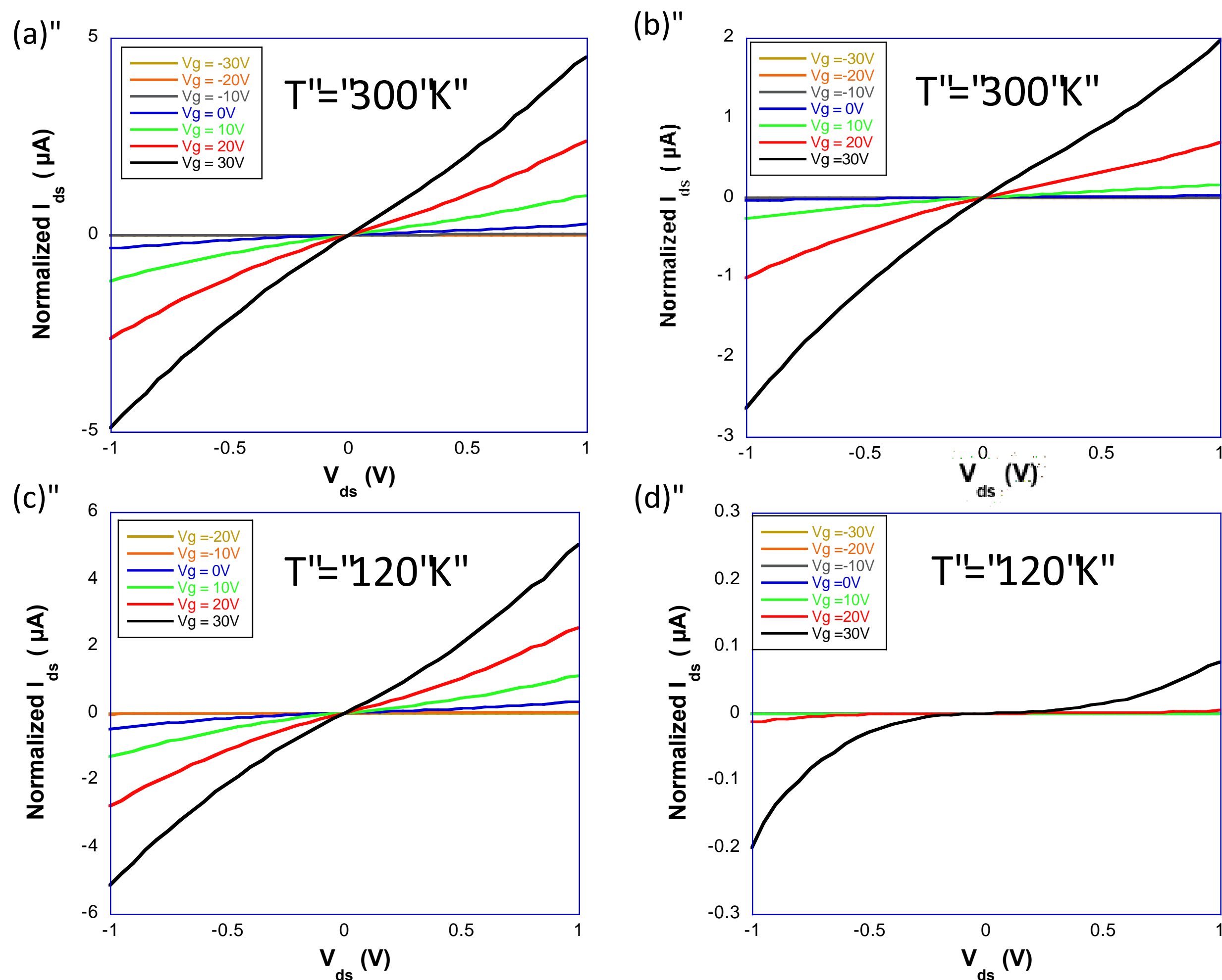

Fig. S2 Room temperature I_{ds}-V_{ds} characteristics for the MoS_2 devices on (a) h-BN and (b) SiO_2 substrate. Low temperature I_{ds}-V_{ds} characteristics at T = 120 K for the MoS_2 devices on (c) h-BN and (d) SiO_2 substrate.

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TABLE S1. Summary of the Device Parameters.

Sample	No. of layers	Mobility @ $10V_g$	Subthreshold slope ($mVdec^{-1}$)	Channel area (L x W)
MoS_2/h-BN - D1	1	1.6	890	2.1 x 10.1
MoS_2/SiO_2 – R1	1	0.2	1400	1.1 x 2.7
MoS_2/h-BN – D2	2	11	760	2.5 x 0.7
MoS_2/SiO_2 – R2	2	0.9	1740	2.6 x 2.4