Supporting Information

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Electronic Transport in Heterostructures of Chemical Vapor Deposited Graphene and Hexagonal Boron Nitride

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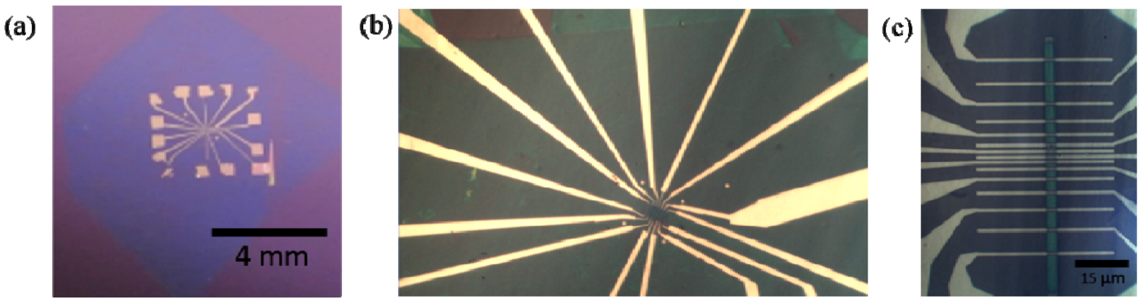

Figure S1. Graphene-hBN heterostructures. (a) Optical micrograph of electrodes in the TLM configuration contacting a graphene ribbon supported on five-layer CVD hBN. (b) Higher magnification optical micrograph of leads on five-layer hBN. (c) Optical image of PMMA etch mask (3 µm wide) spanning TLM design on a graphene-hBN stack.

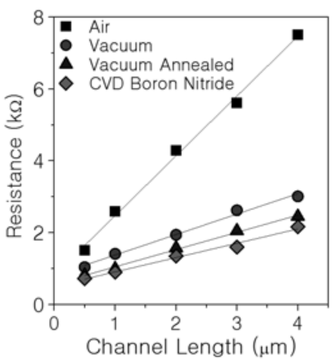

Figure S2. TLM measurements in four different systems (corresponding to Figure 3 in the main text). Resistance is measured for varying channel lengths on the same ribbon. Contact resistance is measured from the linear fit by extrapolating to a channel length of 0 µm. The extracted contact resistivity is reported in Figure 3c.

The field-effect mobility is derived using Equation 4 in Ref. 52:

$$R_T = R_C + (L/W)/(ne\mu)$$

R_T is the total resistance, R_C represents the contact resistance extracted from TLM, L and W represent the length and width of the graphene channel, respeively. We use the relation that $n = (n_0^2 + n_G^2)^{1/2}$ where n_0 is the carrier concentration at the Dirac point and n_G is the carrier concentration induced by the gate voltage. Experimentally, n_G is calculated using the relation $n_G = C_G (V_G - V_0)/e$ where C_G is the oxide capacitance per unit area, V_G is the gate voltage, V_0 is the gate voltage at the Dirac point, and e is the elementary charge. Using the parallel plate capacitor model, the calculated value of the areal gate capacitance C_G is 11.5 nF-cm^{-2}.

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