

Supplementary Information

Large Positive Magnetoresistance in Semiconducting Single-Walled Carbon Nanotubes at Room Temperature

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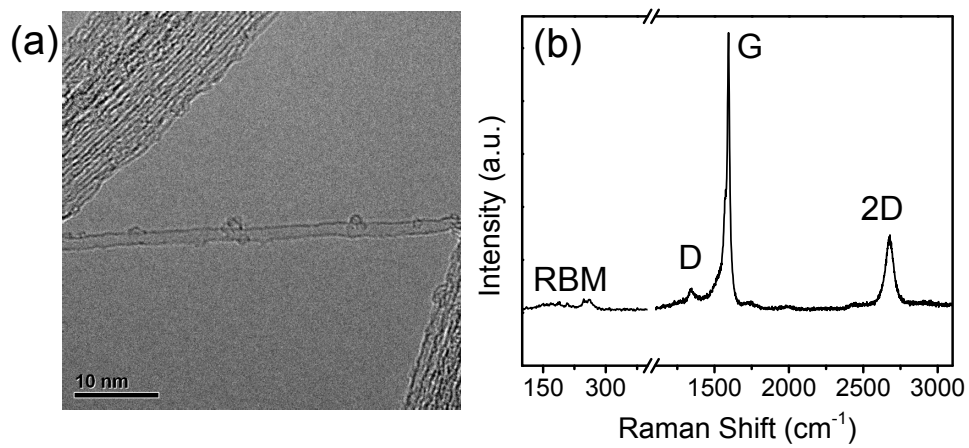


Fig. S1. Characterization of SWNTs (a) TEM and (b) Raman spectra of SWNTs used in this study.

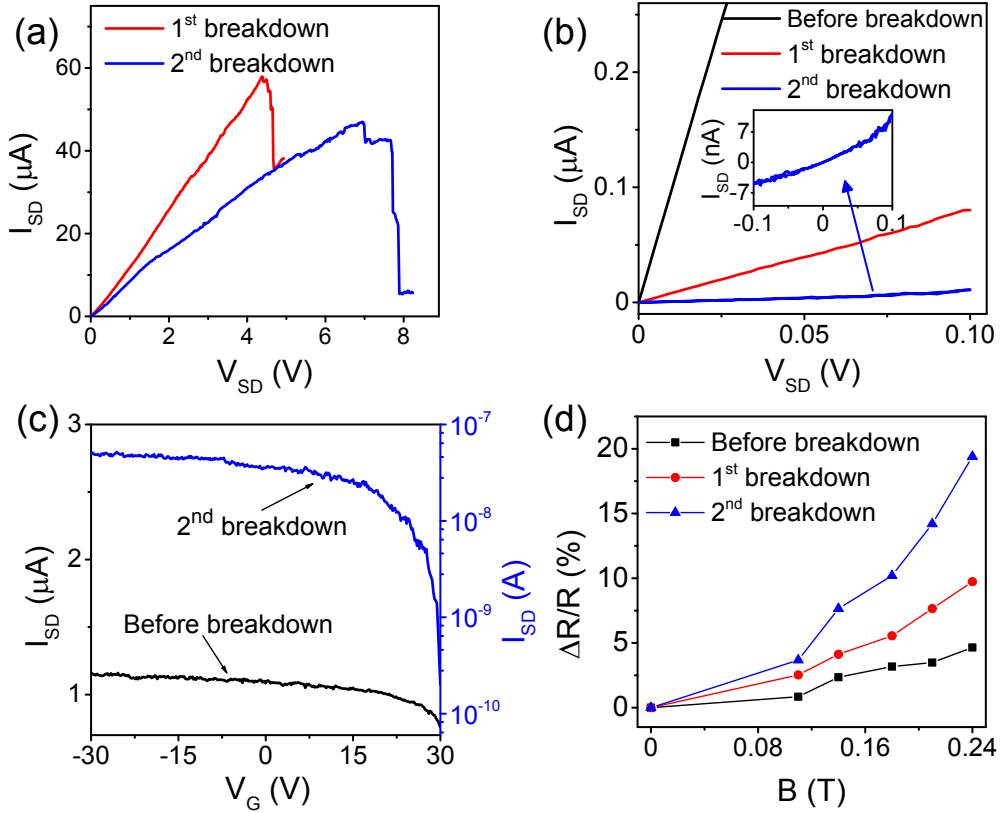


Fig. S2. MR measurements of the second SWNT device before and after electrical breakdown

(a) I-V characteristics during electrical breakdown at room temperature. (b) Characteristic I-V curves before and after each cycle of breakdown. Inset shows the I-V curve after the second breakdown. There is no electrical hysteresis since same values of current are obtained in both forward and reverse direction of the I-V sweep. (c) Typical drain current I_{SD} (at bias $V_{SD} = 100$ mV) versus gate voltage V_G of the device at room temperature before breakdown (black line; left-hand scale) and after the second breakdown (blue line; right-hand scale). (d) Magnetic field dependence of the MR after each cycle of electrical breakdown.

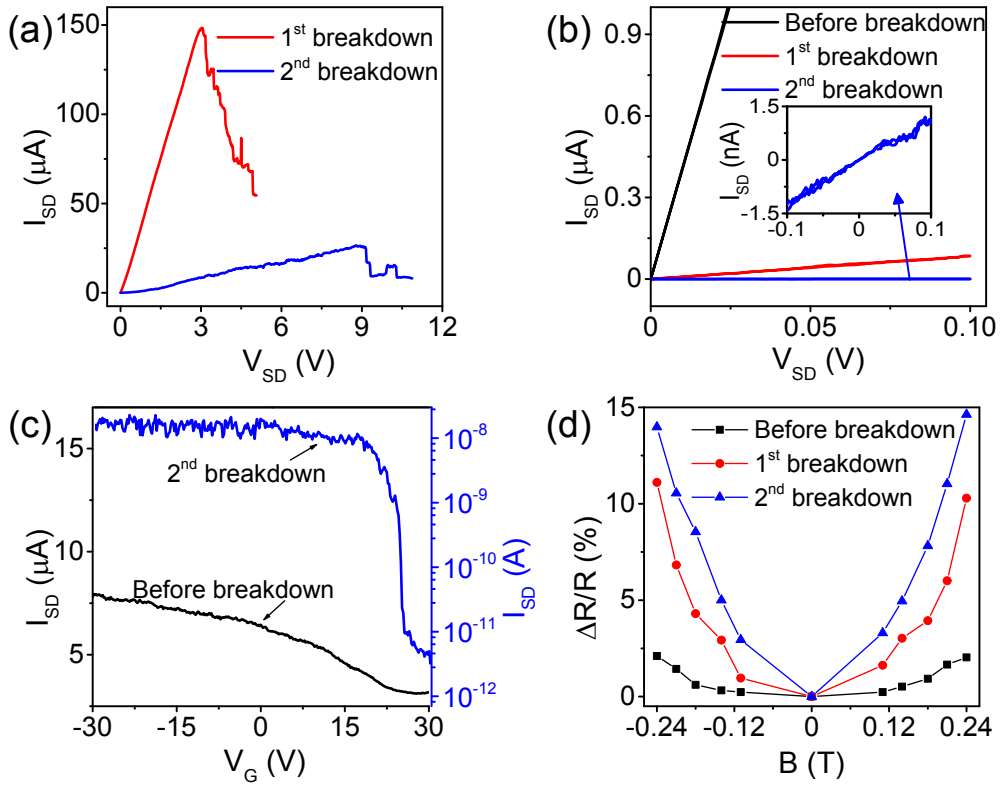


Fig. S3. MR measurements of the third SWNT device before and after electrical breakdown

(a) I-V characteristics during electrical breakdown at room temperature. (b) Characteristic I-V curves before and after each cycle of breakdown. Inset is the I-V curve after the second breakdown which shows no electrical hysteresis. (c) Typical drain current I_{SD} (at bias $V_{SD} = 100$ mV) versus gate voltage V_G of the device at room temperature before breakdown (black line; left-hand scale) and after the second breakdown (blue line; right-hand scale). (d) Magnetic field dependence of the MR after each cycle of electrical breakdown. The MR shows similar behavior and almost the same magnitude in both positive and negative magnetic fields.