Coherent control of a hybrid superconducting circuit made with graphene-based van der Waals heterostructures

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SUPPLEMENTARY INFORMATION

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Supplementary fig.1. Spectroscopy data from additional devices. Resonator (left panels) and qubit spectra (right panels) as functions of backgate voltage $V_g$ from three additional devices shown in (a), (b), and (c) respectively. Note in device (c), for which the graphene is presumably highly-doped ($V_{CNP} \sim 7.8$), the Fabry–Pérot oscillation of qubit frequency is not observed. Data is plotted in arbitrary units.
Supplementary fig. 2. Spectroscopy data from additional devices. Resonator (left panels) and qubit spectra (right panels) as functions of backgate voltage $V_g$ from three additional devices, shown in (a), (b), and (c) respectively. Data is plotted in arbitrary units.
Supplementary fig. 3. Time domain measurements from additional devices [corresponding to supplementary fig. 1(c)]. (a)-(c) Rabi oscillation measured with different qubit-drive power $P_{dr}$ at $V_g = -7.59$ V. (d) Ramsey fringes as a function of qubit-drive frequency $f_{dr}$ and time delay $\tau_{Ramsey}$ measured at $V_g = -7.34$ V. The energy relaxation time $T_1$ and dephasing time $T_2^*$ are of the same order as those reported in the main text. Data is plotted in arbitrary units.