

Parameter name	Value
EC'_q/h	0.0734 GHz
$2E_J/h$	7.92 GHz
$W_q/2\pi$	2.0687 GHz
$\omega_c/2\pi$	7.294 GHz
$/2\pi$	-81.4 MHz
$\alpha_c/2\pi$	-0.0155 MHz
$\kappa_c/2\pi$	17.2 MHz
$\chi_{qc}/2\pi$	-2.02 MHz

Table 1: Main sample parameters. Note that the effective Josephson energy of the transmon mode is $2E_J$ instead of E_J .