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A dc SQUID Phase Qubit with Controlled Coupling to the Microwave Line[1] R.P. BUDOYO, B.K. COOPER, JQI and CNAM, University of Maryland, V. ZARETSKEY, Laboratory for Physical Sciences and University of Maryland, C.J. BALLARD, JQI and CNAM, University of Maryland, Z. KIM, JQI, University of Maryland, H. KWON, J.R. ANDERSON, C.J. LOBB, F.C. WELLSTOOD, JQI and CNAM, University of Maryland — We have designed and fabricated a Al/AlO_x/Al dc SQUID phase qubit on a sapphire substrate with a qubit junction area of 0.4 μm^2. The qubit junction is shunted with a 1 pF interdigitated capacitor, and is isolated from the bias leads by an LC filter and an inductive isolation network using a larger Josephson junction. Our previous device (A. Przybysz *et al.*, IEEE Trans. on Appl. Supercond., 2011) with similar parameters had its relaxation time T_1 limited by coupling to the microwave line. To reduce this coupling, we adopted a coplanar stripline design and verified the coupling strength using finite element model microwave simulations. We will discuss our design, the microwave simulations, estimates for the overall coherence time due to losses and noise from various sources, the device fabrication process, and progress towards testing the device.

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