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Josephson Junction Double-Balanced Modulator for Qubit Control OFER NAAMAN, JOSHUA STRONG, DAVID FERGUSON, JONATHAN EGAN, ROBERT HINKEY, NANCYJANE BAILEY, Northrop Grumman — We report on a double-balanced modulator built with a Josephson junction bridge embedded in a band-pass network. The device was engineered to operate in the 6-10 GHz range, dissipate no power on chip, exhibit saturation powers in excess of 1 nW, and actuate using flux signals with IF bandwidth from DC to 850 MHz. We discuss the characterization of the device performance using S-parameter and saturation power measurements, and demonstrate its balanced operation in a carrier-suppressed modulation experiment. The device can be integrated with passive components to implement an on-chip vector modulator functioning as a drop-in replacement for the ubiquitous I/Q mixer.

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