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Cryogenic Broadband Impedance-Matched Absorptive Microwave Filters DANIEL SLICHTER, OFER NAAMAN, IRFAN SIDDIQI, Quantum Nanoelectronics Lab, UC Berkeley — We report Johnson noise and S parameter measurements of a broadband impedance-matched low pass microwave filter consisting of a section of lossy stripline transmission line. The thermal noise power generated by the filter was measured in the frequency band of 1.2 GHz - 1.8 GHz at temperatures from 30 mK to 300 mK. The noise power was comparable to that of a 50Ω reference load held at the same temperature and measured with the same microwave measurement chain using a cryogenic mechanical switch. Transmission measurements on a filter with f_{3dB}=1.3 GHz show that the filter's cutoff characteristics remain essentially unchanged between room temperature and 20 mK. The filters are robust to thermal cycling and are simple to manufacture. We have used these filters to obtain low Cooper pair temperatures in high-bandwidth microwave measurements on superconducting devices.

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