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Shot noise tunnel junctions for calibrating amplifier MINHYEA LEE, LAFE SPIETZ, JOSÉ AUMENTADO, NIST — We present the application of shot noise tunnel junction (SNTJ) made of $Al/AlO_x/Al$ for calibrating microwave amplifiers. Junctions are fabricated via double angle deposition. Oxidization condition for the junction is carefully determined in such way that the characteristic impedance is about 50 ohm with less than -15 dB of return loss up to 8 GHz. In comparison with conventional Y-factor measurement, we can improve the speed and accuracy tremendously in obtaining gain and noise temperature at various temperatures, by taking advantage of the self-calibrating nature of SNTJ. We demonstrate the calibrations of different kind of microwave amplifiers with this broad band noise source and will discuss its merits in practice.

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