

Oscillator Noise Cancellation in Hybrid Mixers (Correspondence)

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Low-noise mixers frequently employ two diodes and a magic-T in a "balanced mixer" configuration to cancel oscillator noise, i.e., noise caused by spurious oscillator output at or near the signal or image frequencies (see Fig. 1). When working in stripline, the most convenient "balanced mixer" configurations use 3-dB edge-coupled or branch-line directional couplers. These are 90° hybrids, not 180° hybrids like the magic-T. The question is whether the oscillator noise still cancels. As shown below, it does so for any hybrid, if the phase difference between the two output ports is the same at the signal, local oscillator, and image frequencies.

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