Abstracts

Output Power and Loss Analysis of 2/sup n/ Injection-Locked Oscillators Combined Through an Ideal and Symmetric Hybrid Combiner

J.R. Nevarez and G.J. Herskowitz. "Output Power and Loss Analysis of 2/sup n/ Injection-Locked Oscillators Combined Through an Ideal and Symmetric Hybrid Combiner." 1969 Transactions on Microwave Theory and Techniques 17.1 (Jan. 1969 [T-MTT]): 2-10.

The scattering matrix for an ideal (2/sup n/+1) port combiner, formed by interconnecting (2/sup n/-1) magic-tee hybrids, is developed. This matrix is then used to describe a coherent power-summing technique for 2/sup n/ injection-locked oscillators for n=3. The losses that arise from combining oscillators with different injection-locking characteristics are evaluated by two methods: 1) expressions for the output power and loss of the combiner as functions of the input signals are obtained with amplitude and phase as parameters; 2) a semigraphical solution for the combined output and loss is obtained by means of a flow chart and computer-generated gain, loss, and phase characteristics of a single-hybrid junction. The amplitude and phase balance required between individual oscillators for efficient power addition is described, giving the engineer a quantitative measure of the multiple-oscillator design requirements.

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