Abstracts

Inter-Injection-Locked Oscillators with Applications to Spatial Power Combining and Phased Arrays

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Although the principle of injection locking has been applied to single- and multiple-device oscillators at microwave through millimeter wavelengths, the technique has not found many uses in hybrid or monolithic microwave integrated circuits. We present here a novel circuit topology which leads to the inter-injection-locking of a set of interconnected oscillators. Since each oscillator is coupled only to its two nearest neighbors, the scheme is very well adapted to integrated planar construction. Furthermore, phase control of only one injection power source can control the phases of all oscillators in the system in a manner suitable for driving a phased antenna array. A summary of the theory is followed by a description of results from an experimental VHF three-oscillator system. We conclude with a discussion of some proposed applications of inter-injection-locked systems.

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