Abstracts

Injection-locked oscillator chain: a possible solution to millimeter-wave MMIC synthesizers (Sep. 1997 [T-MTT])

K. Kamogawa, T. Tokumitsu and M. Aikawa. "Injection-locked oscillator chain: a possible solution to millimeter-wave MMIC synthesizers (Sep. 1997 [T-MTT])." 1997 Transactions on Microwave Theory and Techniques 45.9 (Sep. 1997 [T-MTT]): 1578-1584.

An injection-locked oscillator (ILO) monolithic-microwave integrated-circuit (MMIC) chain-a cascade of low- and high-frequency-band ILOs-is proposed for simple and cost-effective millimeter-wave local oscillators and synthesizers. Primary 5, 20, and 50 GHz-band ILO MMICs are designed and fabricated as an ILO-chain chip set. Improvements made to the active combiner/dividers (A-C/D's), the heart of the MMIC, in the external feedback path for an amplifier to suppress spurs at the output port of 5 and 20 GHz band ILOs, and enhance the loop gain and layout flexibility at millimeter-wave frequencies. Fabricated 5 and 20 GHz-band ILO MMICs are chain-connected to confirm the design techniques. The ILO chain provides a 20 GHz-band output signal for an injection signal of 571 MHz, as well as a very low level of spurs of less than -45 dBc around the output signal. The measured results show that the proposed ILO chain is extremely suitable for developing full millimeter-wave MMIC frequency synthesizers.

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