Abstracts

Phase and Frequency Coherency of Multiple Optically Synchronized 20GHz FET Oscillators for Satellite Communications

A.S. Daryoush, P.R. Herczfeld, R. Glatz and A.P.S. Khanna. "Phase and Frequency Coherency of Multiple Optically Synchronized 20GHz FET Oscillators for Satellite Communications." 1987 MTT-S International Microwave Symposium Digest 87.2 (1987 Vol. II [MWSYM]): 823-826.

Future generation of communication satellites are based on large aperture phased array antennas, which are composed of many active transmit/receive modules. The phase and frequency coherency of these modules are of concern. A viable technique to provide phase and frequency references for synchronization is through fiber-optic distribution and using indirect subharmonic optical injection locking techniques. Experimental results of phase and frequency coherency of two 20GHz FET oscillators are reported in this paper. Optimum performance was achieved at subharmonic factor of 1/4 with locking range of 84MHz ancl phase noise degradation of only 14 dB. Initial phase coherency measurements of two injection locked oscillators indicate that a phase error can be introduced due to the detuning between the slave and master oscillator signals. A scheme to correct for this phase error is also presented.

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