Abstracts

The DIGILATOR, a New Broadband Microwave Frequency Translator

G. Klein and L. Dubrowsky. "The DIGILATOR, a New Broadband Microwave Frequency Translator." 1967 Transactions on Microwave Theory and Techniques 15.3 (Mar. 1967 [T-MTT]): 172-179.

Frequency translation of an RF wave can be accomplished by subjecting it to a constant rate of phase shift or by applying an ideal repetitive sawtooth phase function which snaps to zero at 360 degrees (serrodyne modulation). The DIGILATOR is a new type of frequency translator which employs a multibit latching ferrite phase shifter with a suitable digital switching driver to obtain a multiple-step approximation to the serrodyne phase function. This paper reviews the theory of an N-step DIGILATOR and describes the design of a 16-step, X-band device. Experiments showed that performance is independent of microwave frequency over the design frequency band of the phase shifter. The carrier and close-in sidebands were suppressed by 39 dB and predicted far-out sidebands were within 1 dB of theoretical amplitudes.

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