Abstracts

Image Conversion Effects in Diode Mixers

M.E. Hines. "Image Conversion Effects in Diode Mixers." 1977 MTT-S International Microwave Symposium Digest 77.1 (1977 [MWSYM]): 487-490.

A time-domain technique is presented for the analysis of mixers. Three simple circuit models using "ideal diodes" have been analyzed exactly, yielding values for their optimum impedance conditions and expressions for the conversion coefficients for all small-signal first-order conversion products. Some new physical insights are obtained. Without image rejection, 3.92 dB conversion loss is the minimum for an untuned mixer, 3.36 dB with single-stub tuning, and 3.0 dB with resonator tuning. For the optimum bias level and IF impedance, no image signal is generated in any of these cases. With an image band-stop filter, lower conversion loss is predicted when the impedances are changed, but, the improvement predicted is small unless the conversion loss without the image filter can approach 3.0 dB.

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