Abstracts

Analysis of Symmetric-Varactor Frequency Triplers

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A simple analytical model for varactors that have a symmetric capacitance-voltage characteristic is introduced. This empirical but general model can be used to represent the reactance nonlinearity of quantum-barrier varactors, symmetric high-electron-mobility varactors and back-to-back BNN/sup +/ diodes. Using this model, a generalized large-signal analysis of symmetric-varactor triplers is developed. The analysis yields an expression for the maximum efficiency. It is further shown that a series-resonant circuit including a symmetric varactor can be described by Duffing's equation. The solution of this equation predicts hysteresis effects.

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