

Abstract Submitted
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The role of emitter-base capacitances in the behavior of nonlinear oscillations in a unijunction transistor (UJT) oscillator.¹ JOHN ZIELINSKI, SUNY College of Technology at Canton, MARK KOEPKE, West Virginia University — The plasma double-layers in a triple-plasma device provide the necessary nonlinearities that allow nonlinear oscillations to occur (1). In comparison, the nonlinear oscillations in a UJT circuit are due to the nonlinear behavior of the emitter-base pn junction (2). Besides the well known UJT conductivity modulation that produces nonlinear damping, there are additional nonlinear effects due to charge storage at the emitter base junction: the depletion or junction capacitance, and the diffusion capacitance (3). Recent analytic and numerical studies that include the effects of these two capacitances will be provided along with a comparison of processes that occur in plasma double layers and the UJT emitter base junction. 1) M. Wendt, I Axnas, S. Torven, Amplitude collapse of nonlinear double-layer oscillations, Phys. Rev. E, 57, 4638, 1998. 2) M. Koepke, D. Hartley, Experimental verification of periodic pulling in a nonlinear electronic oscillator, Phys. Rev. A, 44, 6877, 1991 3) J. Carroll, Physical models for semiconductor devices, Crane, Russak and Co., 1974

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