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Abstract:The potential of N⁺NN⁺ GaN transferred-electron devices of mesa type operating in the accumulation layer transit-time mode at 1 THz is investigated by means of 1-D time-domain energy/momentum numerical modeling. GaN transport parameters are specified. The device structure has been optimized. The RF operating mode is analyzed. The RF emitted performance demonstrates that such a diode is a potential candidate for the realization of continuous-wave cooled or pulsed low-power sources at 1 THz. Moreover, because of both electronic and thermal limitations, the maximum achievable operating frequency is close to 1 THz. © 2012 IEEE.
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