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Strained layer relaxation effect on current crowding and efficiency improvement of GaN based LED DEEDER AURONGZEB, Arizona State University, Department of Electrical Engineering, Tempe, Arizona 85287 — Efficiency droop effect of GaN based LED at high power and high temperature is addressed by several groups based on career delocalization and photon recycling effect(radiative recombination). We extend the previous droop models to optical loss parameters. We correlate stained layer relaxation at high temperature and high current density to carrier delocalization. We propose a third order model and show that Shockley-Hall-Read and Auger recombination effect is not enough to account for the efficiency loss. Several strained layer modification scheme is proposed based on the model.

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