MODELING OF EFFICIENCY DROOP EFFECT IN GaN LEDS

Tomasz CEGIELSKI

ABSTRACT *Despite the development that occurred in the technology of white Light-Emitting Diodes, this devices are still limited by the phenomenon of the efficiency droop that occurs in light generation for large current densities. Moreover, its physical basis is still not sufficiently recognized. The paper presents possible models describing this effect, based on the hypothetical reasons discussed in the literature: different types of Auger recombination, thermal effects, the presence of strong electric fields and the occurrence of the asymmetry of carriers, etc.*

Knowing the potential reasons for the droop phenomenon will allow the further development of Solid State Light sources. This leads to lower cost retrofits or replacements of traditional light sources and greater their market penetration, which may significantly reduce global energy consumption increase.

Keywords: *Solid State Lighting, LED, GaN, InGaN, Internal Quantum Efficiency, Quantum Well, Recombination, Efficiency Droop*