Theoretical and experimental studies on junction temperature of light-Emitting diodes / 李宸毅 撰 .- 彰化縣大村鄉

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ABSTRACT

Increase in luminous efficiency is a key reason that light-emitting diodes (LED) become more popular in lighting market. Moreover, the advantages of LEDs include long lifetime, fast response speed, small size, low power consumption, and friendly to the environment. This study utilize an automated junction-temperature measurement system, and the technology computer-aided design (TCAD) software of Synopsys, Inc. for simulating characteristics of LEDs, Taurus TCAD (including Taurus TSUPREM-4 and Taurus Medici) and Sentaurus TCAD (including Sentaurus Process and Sentaurus Device) are provided by National Chip Implementation Center (CIC) and National Center for High-performance Computing (NCHC), respectively. Comparing the measured and simulated results, it will direct the developing direction for manufacturing the LEDs with high efficiency and reliability. Therefore, after finishing this study of luminous efficiency and junction temperature, it is possible to cooperate with the industry in LED heat dissipation and illumination. Key Words : Light-emitting diodes, Forward bias, Junction temperature, Taurus TCAD , Sentaurus TCAD

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