

E2

INFLUENCE OF GROWTH TEMPERATURE OF P-GaN LAYER ON THE CHARACTERISTICS OF InGaN/GaN BLUE LIGHT EMITTING DIODES

R.I.M Asri^{1,*}, N.A Hamzah¹, M.A Ahmad¹, E.A Alias¹, M.M Sahar¹, M Abdullah¹

¹*Institute of Nano Optoelectronics Research and Technology (INOR), Universiti Sains Malaysia, 11800 Penang, MALAYSIA.*

*Corresponding Author: rahilizzati@usm.my

ABSTRACT- InGaN/GaN blue light-emitting diodes (LEDs) have been successfully growth via metal organic chemical vapor deposition (MOCVD) in temperature range 920 to 1020 °C growth temperatures for p-GaN layer. The significant of p-GaN growth temperature are studied in detail according to the electrical, optical, and structural performances of InGaN/GaN multiple-quantum-well (MQW) blue LEDs. From experimental analysis, decrement growth temperature of p-GaN layer shows improvement trends in term of output power values and turn on voltage values. The optical and structural properties of InGaN/GaN MQW blue LEDs structure were enhanced based on the decrement of photoluminescence (PL) intensity with increasing growth temperature of the p-GaN layer. This study yields an optimized p-GaN layer growth temperature for understanding highly efficient InGaN/GaN blue LED devices.

Keywords: Light-emitting diode (LED), gallium nitride (GaN), InGaN, metal organic chemical vapor deposition (MOCVD), p-GaN.