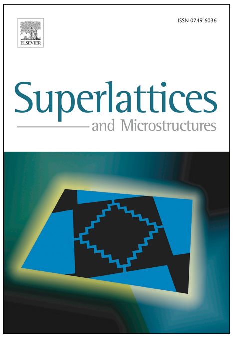

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Optimization on the luminous efficiency in AlGaN-based ultraviolet light-emitting diodes by amendment of a superlattice hole reservoir layer

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ABSTRACT

The application of a p-type superlattice hole reservoir layer in the traditional ultraviolet light-emitting diodes(UVLED) can obtain better Internal quantum efficiency(IQE) and output power, ease the problem about efficient carrier movement in high Al-content AlGaN material. Through computation and analysis by using the APSYS simulation software, the change of position of the hole reservoir layer can influence the luminous efficiency. The design of a superlattice hole reservoir layer between electron blocking layer(EBL) and p-type AlGaN layer can obviously reduce the hole potential height and increase the electron potential height, produce more hole injection and less electron leak, leading to higher carrier concentration, so as to realize the further increased for carrier recombination rate.

keywords: UVLED, AlGaN, hole reservoir layer, APSYS

1.Introduction

The development trend of LED in the future can be divided into two classes, one is visible light LED for general lighting, another is UVLED for innovation in many fields. In recent years, high Al-content AlGaN-based UVLED was widely used in purification for air or water, disinfection, anti-counterfeiting recognition, chemical sensors and medical equipment, despite a great advantage and broad application prospects. With more attention and deeper research, the problems and

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