

Enhancement of Light Out Efficiency of PLED Device Employing Designed Substrate Combined with Nano-Line Patterns

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Abstract : This paper reports a study for the light outcoupling efficiency of the PLED device. In use of a designed substrate combined with nano-line patterns in PLED device, the light outcoupling efficiency can be significantly enhanced. The designed substrate was made by UV imprinting technology, such as triangular microlens arrays on the front and periodic corrugated patterns on the back surface. The nano-line patterns in PLED device was fabricated by advanced microstamping and ink-jet printing techniques. For high angles of observation with respect to the substrate surface normal, the light out intensity of the developed PLED device is increased from 0.05 (a.u.) up to 0.69 (a.u.) at the view angle 85 degree. The designed integration leads to 64% increase of the light out intensity compared with the conventional PLED device.

Keywords : triangular microlens, corrugation patterns, nano-line patterns, PLED device, UV imprinting technology, microstamping

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