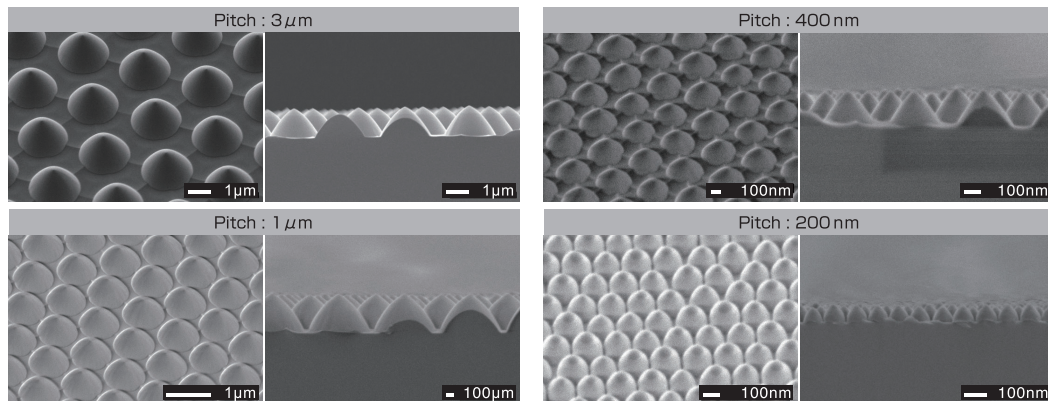


Sapphire Substrates with Fine Structure

(Development Samples)

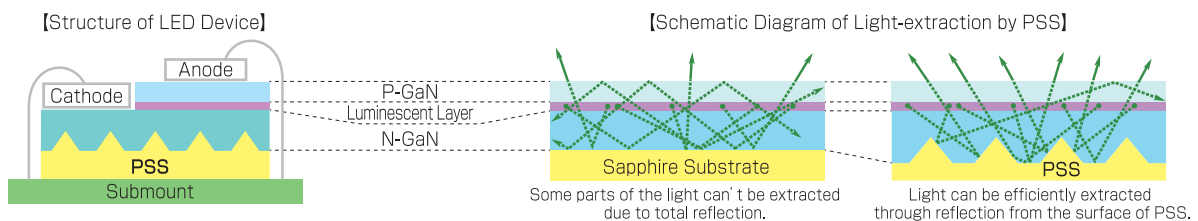
NANO DOT ARRAY

OJI proposes a variety of patterned sapphire substrates (PSS) with dot-shaped fine structures (Pitch: micrometer ~ nanometer), which enhances the light extraction efficiency of LEDs.



The Light Extraction Structure of LEDs

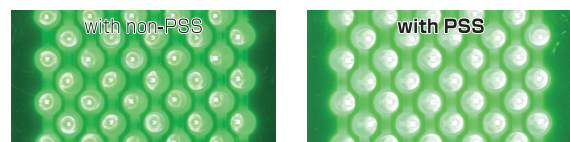
The PSS are widely used in order to efficiently extract the light from LEDs. The optimum structure of the PSS would vary with the layer structure of LEDs or the wavelength of emitting light. The newly-developed PSS have high controllability of pitch / shape of pattern, which enables flexible design with optimum structure to achieve a high light extraction efficiency.



Example

Comparison of the Lighting Image between LEDs with PSS and non-PSS

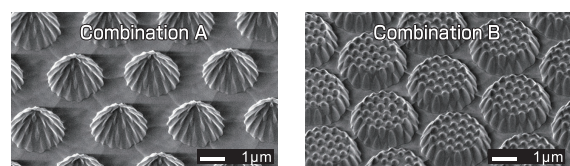
The LEDs using newly-developed PSS have enhanced front luminance by 2.4 times and total luminous flux by 1.8 times compared to that of LEDs with non-PSS. The LEDs using newly-developed PSS have shown 20% higher front luminance than that of LEDs with conventional PSS.



【Lighting Image of LEDs】

Improvement of the Performance by Applying the PSS with Combination Structure

Newly-developed technology can provide "combination structure". The combination structure consists of the pattern with several hundred nanometer pitch which would be effective to improve the quality of the thin film during fabrication process of LEDs, and the pattern with several micrometer pitch which is effective to improve light extraction from LEDs.



【Examples of Combination Structure】

【Technical information
/contact us】

https://www.ojiholdings.co.jp/r_d/theme/nano_dot_array.html



Oji Holdings Corporation

Strategic Planning Dept., Innovation Promotion Division
OJI_ND@oji-gr.com

