

# LED Lighting Key Patent Analysis: Thermal Management Technologies

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## Abstracts

This report is intended to provide to related companies or research institutes information about patenting trends on 'LED thermal management' technologies, which have become an issue among LED lighting technologies.

Since LED lighting has excellent luminous efficiency compared to the existing lighting fixtures such as incandescent lamps or fluorescent lamps, it is considered as one of representative energy-saving technologies that can greatly contribute to energy conservation

However, LED chips have a problem that if the temperature of LED chips increases due to internal heat when being used, energy consumption increases due to a reduction in luminous efficiency, which shortens the life of LED chips and peripheral circuits.

To use LEDs as lighting devices to substitute incandescent and fluorescent lamps in practice, optical output should be higher than the current level, but there is a problem that the more power is applied to LED light sources, the higher heat the devices generate. Thus, the most important factor is how well the internal heat of LEDs can be discharged to the outside as well as electrical and optical properties.

To solve this problem, there is a sharp increase in the number of patents on various types of thermal management technologies to rapidly and efficiently discharge heat that generated from LED chips.

In this context, SNE Research provides analysis of patents on LED thermal management technologies to solve this heating issue. For the research/analysis, patents on LED thermal management technologies that have been filed in Korea,

Japan, and Europe until May, 2012 are divided into three divisions: thermal management technologies for LED chips/packages, board-level thermal management technologies, and system-level thermal management technologies. Among the parent population of 3,368 cases, 1,529 cases of effective patents are selected to carry out the research/analysis.

For in-depth analysis of each technology, technology flowcharts that indicate current status of key patents and the flow of technology development, and patent summaries. In the conclusion, the patenting trend of major applicants in the LED lighting industry, the patenting trend of major LED lighting companies regarding thermal management technologies, and the development trends of thermal management technologies in the LED lighting industry are provided.

This report is geared towards providing information on patenting trends on 'LED thermal management' technologies, which have become an issue among LED lighting technologies, is expected to be a good guideline for related companies or research institutes to look into the patenting trend and related key patents on LED thermal management technologies. (Total 144 pages)

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