

# LED Lighting Key Patent Analysis: Thermal Management Technologies

<https://marketpublishers.com/r/L340230EC25EN.html>

Date: August 2012

Pages: 144

Price: US\$ 4,250.00 (Single User License)

ID: L340230EC25EN

## 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)

## Contents

### 1. INTRODUCTION

Background and objective of analysis

Classification of LED thermal management technologies

Patent analysis method

### 2. PATENT TREND ANALYSIS

Overall patenting trend

(Patenting trend by year/country, and patenting trend of major applicants by country, patenting trend of major applicants by year, and technology type)

Patenting trend: thermal management technology for LED chips/packages

Patenting trend: board-level thermal management technologies

Patenting trend: system-level thermal management technologies

### 3. KEY PATENT ANALYSIS

Overview of key patent analysis

Key patent- current status of U.S. patents (issued)

Key patent- current status of U.S. patents (published)

### 4. PATENT ANALYSIS ON THERMAL MANAGEMENT TECHNOLOGIES FOR LED CHIPS/PACKAGES

Current status of key patents

Technology flowchart- LED chips/packages

Patent summaries (key patents)

### 5. PATENT ANALYSIS ON BOARD-LEVEL THERMAL MANAGEMENT TECHNOLOGIES

Current status of key patents

Technology flowchart- board-level thermal management technologies

Patent summaries (key patents)

### 6. PATENT ANALYSIS ON SYSTEM-LEVEL THERMAL MANAGEMENT TECHNOLOGIES

Current status of key parents

Technology flowchart- system-level thermal management technologies

Patent summaries (key patents)

## **7. CONCLUSION**

Patenting trend on thermal management technologies

Trend of major applicants in LED lighting industry

Patenting trend of major LED companies

Thermal management technology development trend in LED lighting industry

Patented technologies (example)

Implications

## **8. APPENDIX**

List of patents on thermal management technologies for LED chips/packages

List of patents on board-level thermal management technologies

List of patents on system-level thermal management technologies

## I would like to order

Product name: LED Lighting Key Patent Analysis: Thermal Management Technologies

Product link: <https://marketpublishers.com/r/L340230EC25EN.html>

Price: US\$ 4,250.00 (Single User License / Electronic Delivery)

If you want to order Corporate License or Hard Copy, please, contact our Customer Service:

[info@marketpublishers.com](mailto:info@marketpublishers.com)

## Payment

To pay by Credit Card (Visa, MasterCard, American Express, PayPal), please, click button on product page <https://marketpublishers.com/r/L340230EC25EN.html>

To pay by Wire Transfer, please, fill in your contact details in the form below:

First name:  
Last name:  
Email:  
Company:  
Address:  
City:  
Zip code:  
Country:  
Tel:  
Fax:  
Your message:

**\*\*All fields are required**

Customer signature \_\_\_\_\_

Please, note that by ordering from marketpublishers.com you are agreeing to our Terms & Conditions at <https://marketpublishers.com/docs/terms.html>

To place an order via fax simply print this form, fill in the information below and fax the completed form to +44 20 7900 3970