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**United States Patent**

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*Michelle K. Lee*

*Director of the United States Patent and Trademark Office*



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(12) **United States Patent**  
**Chung et al.**

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(54) **LED PACKAGE STRUCTURE FOR INCREASING LIGHT-EMITTING EFFICIENCY AND CONTROLLING LIGHT-PROJECTING ANGLE AND METHOD FOR MANUFACTURING THE SAME**

(52) **U.S. Cl.**  
USPC ..... **257/98**; 257/99; 257/100  
(58) **Field of Classification Search** ..... 257/98-100  
See application file for complete search history.

(75) Inventors: **Chia-Tin Chung**, Miaoli County (TW);  
**Chao-Chin Wu**, Taipei (TW);  
**Fang-Kuei Wu**, Taoyuan County (TW)

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(73) Assignee: **Paragon Semiconductor Lighting Technology Co., Ltd.**, Taoyuan County (TW)

\* cited by examiner  
*Primary Examiner* — Samuel Gebremariam  
(74) *Attorney, Agent, or Firm* — Houtteman Law LLC

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(57) **ABSTRACT**  
An LED package structure for increasing light-emitting efficiency and controlling light-projecting angle includes a substrate unit, a light-emitting unit, a light-reflecting unit and a package unit. The substrate unit has a substrate body and a chip-placing area disposed on a top surface of the substrate body. The light-emitting unit has a plurality of LED chips electrically disposed on the chip-placing area. The light-reflecting unit has an annular reflecting resin body surrounding formed on the top surface of the substrate body by coating. The annular reflecting resin body surrounds the LED chips that are disposed on the chip-placing area to form a resin position limiting space above the chip-placing area. The package unit has a translucent package resin body disposed on the top surface of the substrate body in order to cover the LED chips. The position of the translucent package resin body is limited in the resin position limiting space.

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(51) **Int. Cl.**  
**H01L 33/00** (2010.01)

**8 Claims, 9 Drawing Sheets**

