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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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**Wu et al.**

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(54) **LED PACKAGE STRUCTURE**

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 334 days.

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2011/0089441 A1\* 4/2011 Wu ..... 257/91

\* cited by examiner

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(57) **ABSTRACT**

An LED package structure with standby bonding pads for increasing wire-bonding yield includes a substrate unit, a light-emitting unit, a conductive wire unit and a package unit. The substrate unit has a substrate body and a plurality of positive pads and negative pads. The light-emitting unit has a plurality of LED bare chips. The positive electrode of each LED bare chip corresponds to at least two of the positive pads, and the negative electrode of each LED bare chip corresponds to at least two of the negative pads. Each wire is electrically connected between the positive electrode of the LED bare chip and one of the at least two positive pads or between the negative electrode of the LED bare chip and one of the at least two negative pads. The package unit has a light-permitting package resin body on the substrate body to cover the LED bare chips.

**6 Claims, 6 Drawing Sheets**

