April 5, 2013
Citizen Electronics Co., Ltd.

Development of LEDs for lighting, "COB Series, Version 2" - Luminous flux and luminous efficacy are improved by up to 33 % and 38 % respectively and high luminous flux of 20,190 lm is achieved. -

Citizen Electronics Co., Ltd. (Head Office: Fujiyoshida City, Yamanashi Prefecture. President: Yoshihiro Gohta) has developed five packages (shapes) and eleven types of LEDs for lighting, "COB [*1] Series, Version 2," by improving performance of our conventional models. Product demonstrations will be held during the "Euroluce 2013" in Milan, Italy from April 9, 2013.

■LEDs for lighting, "COB Series, Version 2"

Series of products: 5 packages and 11 types (64 models in total including color variations)
Mass production is scheduled to start in May 2013.

CITILED® The Light Engine

CLL012 Series	CLL022 Series	CLL032 Series	CLL042 Series	CLL052 Series
				
CLL012-0305	CLL022-1202 CLL022-1203 CLL022-1204	CLL032-1205 CLL032-1206 CLL032-1208 CLL032-1212	CLL042-1218 CLL042-1818	CLL052-1825

Background and advantages of development

The features of the conventional models, "COB Series, Version 1," are "producing a wide range of luminous flux with only one LED" and "possible to select LEDs according to luminous efficacy." There are social demands for acceleration and promotion of energy conservation, as well as market trends and needs for LEDs to be incorporated in luminaires that deliver high luminous flux. The newly developed products have achieved higher efficacy and higher luminous flux through reselection of dice and materials.

Main features

1. Luminous flux has been improved by up to 38 % over that of the conventional model

Luminous flux and luminous efficacy has been improved by 15 to 33 % and 15 to 38 % respectively over those of the conventional model through enhancement of light extraction efficiency by reselection and optimization of materials.

※Comparison of the two models below made when they light up with the same conditions

	Luminous flux	Luminous efficacy	
Conventional model:	8,160 lm	99 lm/W	CLL050-1825A1, 4000K
New product:	10,850 lm [33 % up]	137 lm/W [38 % up]	CLL052-1825A5, 4000K

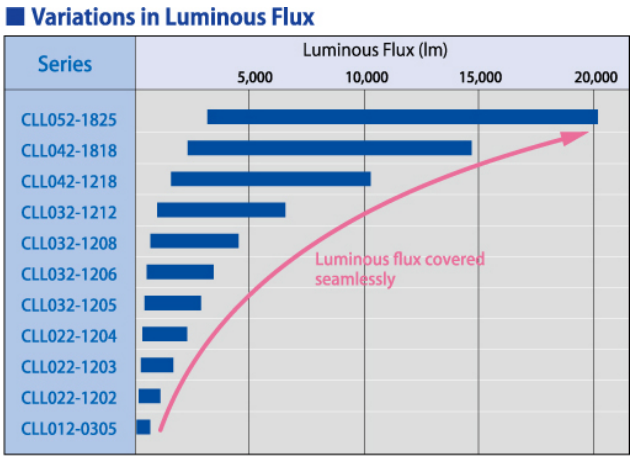
2. Possible to standardize design of luminaire

Only five LED packages can cover luminous flux of conventional light sources, from a 10 W bulb to a 300 W mercury lamp, a range which consists of several hundred different types of luminous flux. Therefore, it is possible to promote the efficiency of luminaire design, including standardizing the optical design of the peripheral part of LEDs.

In addition, you can replace LEDs of the "COB Series, Version 1" with LEDs of the "COB Series, Version 2" as the Version 2 inherits package sizes, shapes and electric circuits of the Version 1. This enables you to continue to use peripheral parts that you have used including connectors or drivers.

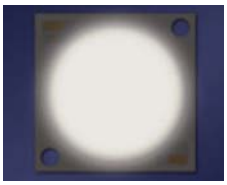
3. Product lineup covering a wide range of luminous flux

One LED can provide a wide range of luminous flux due to high heat dissipation by utilizing our original Chip on Aluminum technique (our company's patent) *2 and high efficiency of light extraction. The five packages and eleven types incorporate LEDs which can produce a wide range of luminous flux, and provide luminous flux over the entire range of approximately 100 lm to 20,190 lm (0.8 W to 170 W classes). It is also possible to select a desired LED from this series according to luminous efficacy.



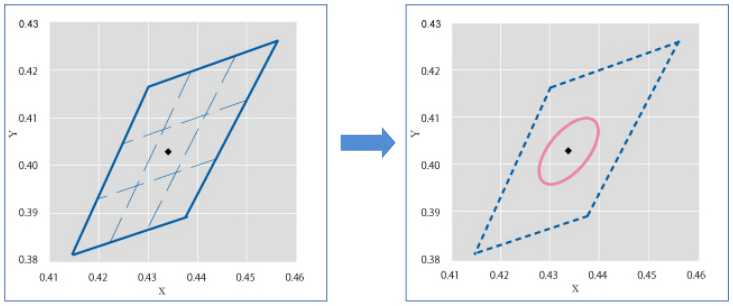
4. Uniform light

LED dice are placed to generate uniform light in consideration of optimizing the light distribution design of luminaires.



Die arrangement for creating a uniformly-light-emitting area

As the new products are compliant with the chromaticity control standard "3-Step MacAdam ellipses" which is about a ninth of the chromaticity range of ANSI C78.377 *3, chromaticity variations of LEDs are rarely noticed (excluding the 5,000K, Ra65 type).



Chromaticity range of ANSI C78.377 Chromaticity range of 3-Step MacAdam ellipse

5. **Selection of LEDs is simplified through use of a selector tool**

In order to support luminaire makers to select a desired LED, we provide a product selector tool (software tool) on our website. By entering desired conditions such as the amount of luminous flux, types of LEDs are narrowed down.

Main specifications

Series	CLL012 Series	CLL022 Series	CLL032 Series	CLL042 Series	CLL052 Series★
type	CLL012-0305	CLL022-1202 CLL022-1203 CLL022-1204	CLL032-1205 CLL032-1206 CLL032-1208 CLL032-1212	CLL042-1218 CLL042-1818	CLL052-1825
Size (mm)	9.5×9.5×1.4	13.5×13.5×1.4	19.0×19.0×1.4	28.0×28.0×1.4	38.0×38.0×1.4
Drive (W)	0.8～5.9	1.4～18.6	3.4～55.9	12.2～126.1	25.8～177.6
Total luminous flux (lm)	108～684	185～2,257	462～6,603	1,642～14,771	3,176～20,198
Color lineup (K)	Ra Min. 80 type (3-Step MacAdam ellipse): 2,700K, 3,000K, 3,500K, 4,000K and 5,000K High efficacy type: 5,000K				
Applications					

★For CLL052 Series, only 2,700K, 3,000K, 3,500K, and 4,000K of the Ra Min. 80 type are available.

*1 COB: stands for Chip on Board and is a structure where LED dice are directly mounted on a board.
*2 Chip on Aluminum technique: This is a technique where LED dice are directly mounted on an aluminum board. Citizen Electronics has acquired a patent for this technique.
*3 ANSI C78.377: a chromaticity control standard provided by the American National Standards Institute (ANSI)

CITILED
The Light Engine

”CITILED The Light Engine” is a brand name of LEDs for lighting manufactured by CITIZEN ELECTRONICS CO., Japan.
CITILED is a registered trademark of CITIZEN ELECTRONICS CO., Japan.

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