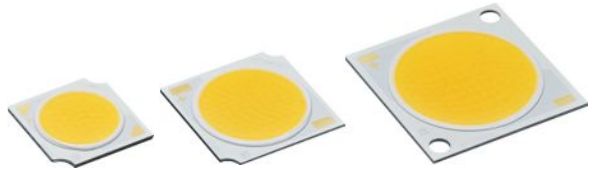



## Development of LED packages for lighting that have fewer chromaticity variations and improved luminous efficacy

Citizen Electronics Co., Ltd. (Head Office: Fujiyoshida City, Yamanashi Prefecture. President: Sekiguchi Kanetaka) has developed LED packages for lighting, 'COB \*1 Series, Version 8,' that have fewer chromaticity variations and improved luminous efficacy.

**LED packages for lighting 'COB Series, Version 8'**

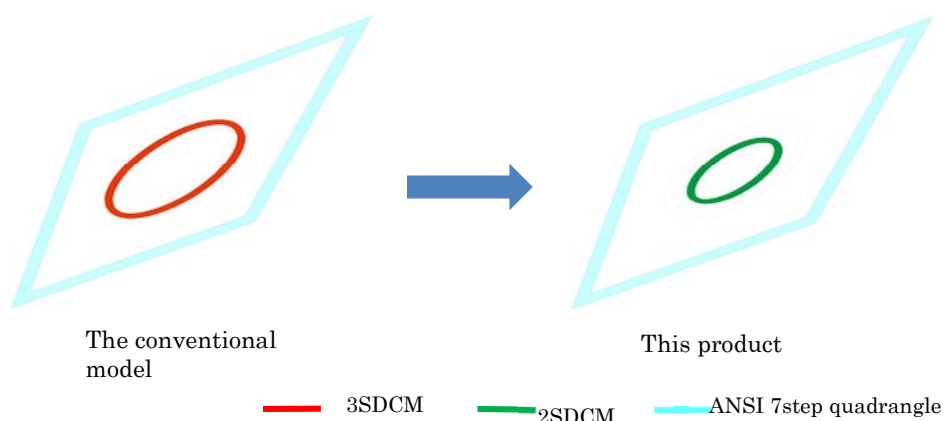
Series: 3 series and 12 types  
 Luminous flux: 23,500 lm at maximum  
 (CLU04J-1818C9-502M2U1 5,000K Ra80 Tj= 85°C)  
 Applications: LED bulbs, downlights, streetlights, floodlights, stadium lighting, etc.  
 Mass production is scheduled to start at the beginning of October 2019

CLU02J Series
CLU03J Series
CLU04J Series

### 1. 2 SDCM, which has about half the chromaticity variations compared to conventional model, is standardized

Generally, LED lighting is produced by mixing several blue LED dies and phosphor, and because of the variations of these materials it tends to have chromaticity variations such as bluish or yellowish even at the same color temperature. Those variations lead to differences of color in a space where a lot of lighting is installed. So far, chromaticity variations have been restrained by tightening selection criteria of raw materials and manufacturing conditions. However, in this product, the range of chromaticity variations by SDCM\*2 is reduced to 2 SDCM, which is about half the ordinary 3 SDCM by improving accuracy. Previously, 2 SDCM was achieved only in customized products, but it is achieved in a standard product in this product.



## **2. Luminous efficacy has been improved by a maximum of 5 %, contributing to energy saving of luminaire**

Luminous efficacy has been improved by a maximum of 5 % over those of the current model through enhancement of light extraction efficiency and heat dissipation with reselection and improvement of materials such as dies. Emitting bright light with reduced power, it contributes to energy conservation of luminaires.

Comparison of the two models below made when they light up under the same conditions (3,000K, Ra 80 min., Tj=85°C)

	Luminous efficacy	Product code
New product:	137 lm/W	CLU03J-1205C9-303H5U2
Current model:	130 lm/W	CLU038-1205C4-30H5M3-F1

**【About 5% increase】**

With the widespread replacement of florescent lights and mercury lamps by LED lighting, LED lighting has become generally available, and demand for not only chromaticity variations, brightness, luminous efficacy, but for ‘quality of light,’ which enables an illuminated object to look more beautiful, has been increasing year by year. Citizen Electronics will meet these demands by providing products with improved performance and quality.

\*1 COB: stands for Chip on Board and is a structure where LED dies are directly mounted on a board.

\*2 SDCM is the acronym for Standard Deviation Color Matching. It is an indicator of chromaticity variation. The smaller the figure, the less the variation.



”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.

Information provided on this press release was accurate at the time of announcement.

**Inquiry about products** E-mail:cej-inquiry@ml.citizen.co.jp