

New White Chip LEDs: High Luminous Intensity (2.0cd) in a Class-Leading Small 1608 Size (Metric)

April 22nd, 2021

Improved ultra-compact design for greater space savings in battery-driven IoT equipment and drones

ROHM has developed ultra-compact high luminous intensity white chip LEDs, called [CSL1104WB](#). The products are optimized for applications requiring high brightness white light emission, such as IoT devices, drones, and other battery equipped applications.



In recent years, high luminous intensity (2.0cd) white LEDs are being increasingly adopted to improve visibility in a range of applications in the consumer electronics and automotive sectors. At the same time, the emergence of applications that mount multiple LEDs in a small space –such as IoT devices and drones – require high density mounting. This makes it difficult to achieve high brightness in a compact footprint.

The CSL1104WB series achieves a high luminous intensity of 2.0cd in an ultra-compact 1608 size ($1.6\text{mm} \times 0.8\text{mm} = 1.28\text{mm}^2$), which was previously difficult to achieve. The result is the same luminosity as the current mainstream 3528 size PLCC package ($3.5\text{mm} \times 2.8\text{mm} = 9.8\text{mm}^2$) but in an 87% smaller form factor.

Moreover, color variation (an issue with white LEDs) is significantly improved, simplifying the color adjustment process by ensuring accurate white color chromaticity. This not only contributes to greater application space savings, but also improves design flexibility along with visibility through high density mounting of high luminosity LEDs, reducing development load considerably. In addition, qualification under the automotive reliability standard AEC-Q102 specifically developed for optical devices is planned, enabling a smooth application inside industrial equipment and automotive applications exposed to harsh environments.

ROHM is committed to further expand its lineup of 1608 size white chip LEDs from low to high brightness – aiming to improve design flexibility while reducing development load (i.e. decreasing application height, simplifying product design).

Ultra-Compact High Brightness White LED (CSL1104WB)

Standard Product
(High Brightness 2.0cd)



3.5mm × 2.8mm = 9.8mm²

New Product
(CSL1104WB)





1.6mm × 0.8mm = 1.28mm²

87% smaller mounting area

ROHM's new product achieves high brightness (2.0cd) in an ultra-compact 1608 size, improving design flexibility while providing greater space savings

High 2.0cd Brightness Contributes to Improved Design

Light Leakage Comparison: Low vs High Luminous Intensity products

Low Brightness Type		Since it is necessary to increase the transmittance of the cover material, characters not intended to be shown may become visible depending on the angle
New Product CSL1104WB High Brightness Type		Complete blackout is possible without being concerned with the transmittance of the cover material

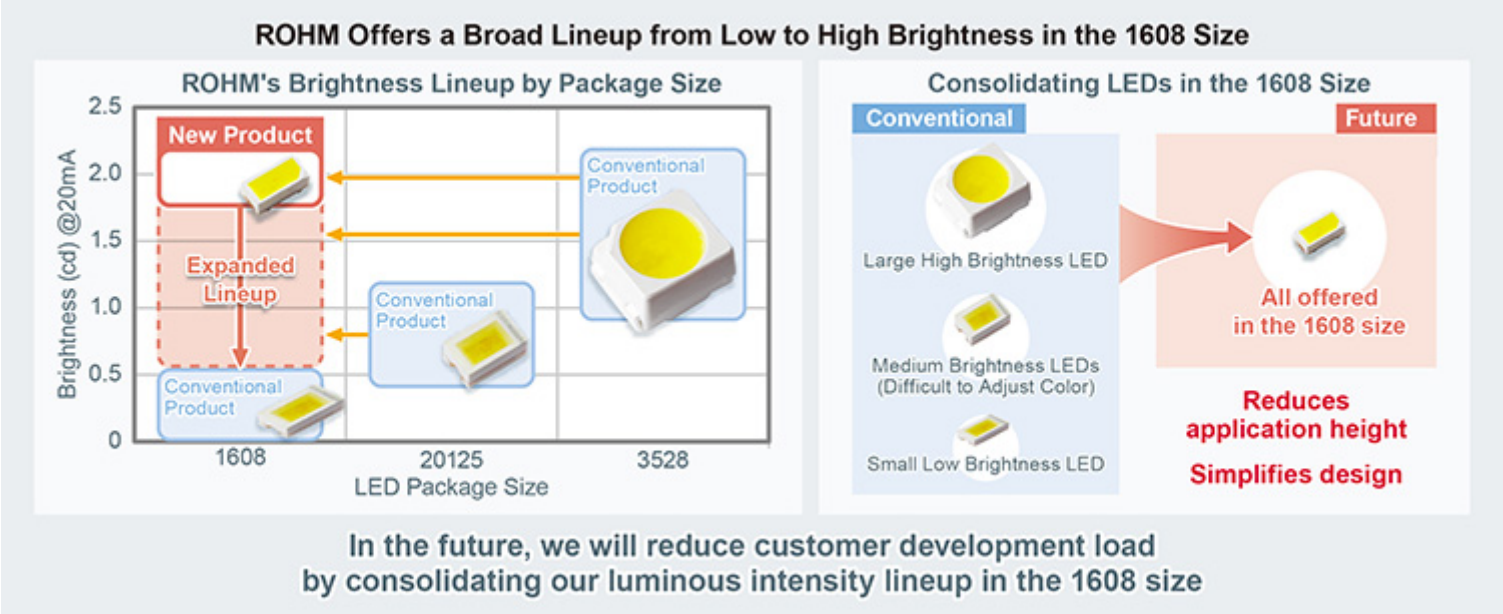
ROHM's new product ensures greater visibility and design freedom without the need to consider the transmittance of the cover material

Key Features

1. High brightness in an ultra-compact size improves design flexibility

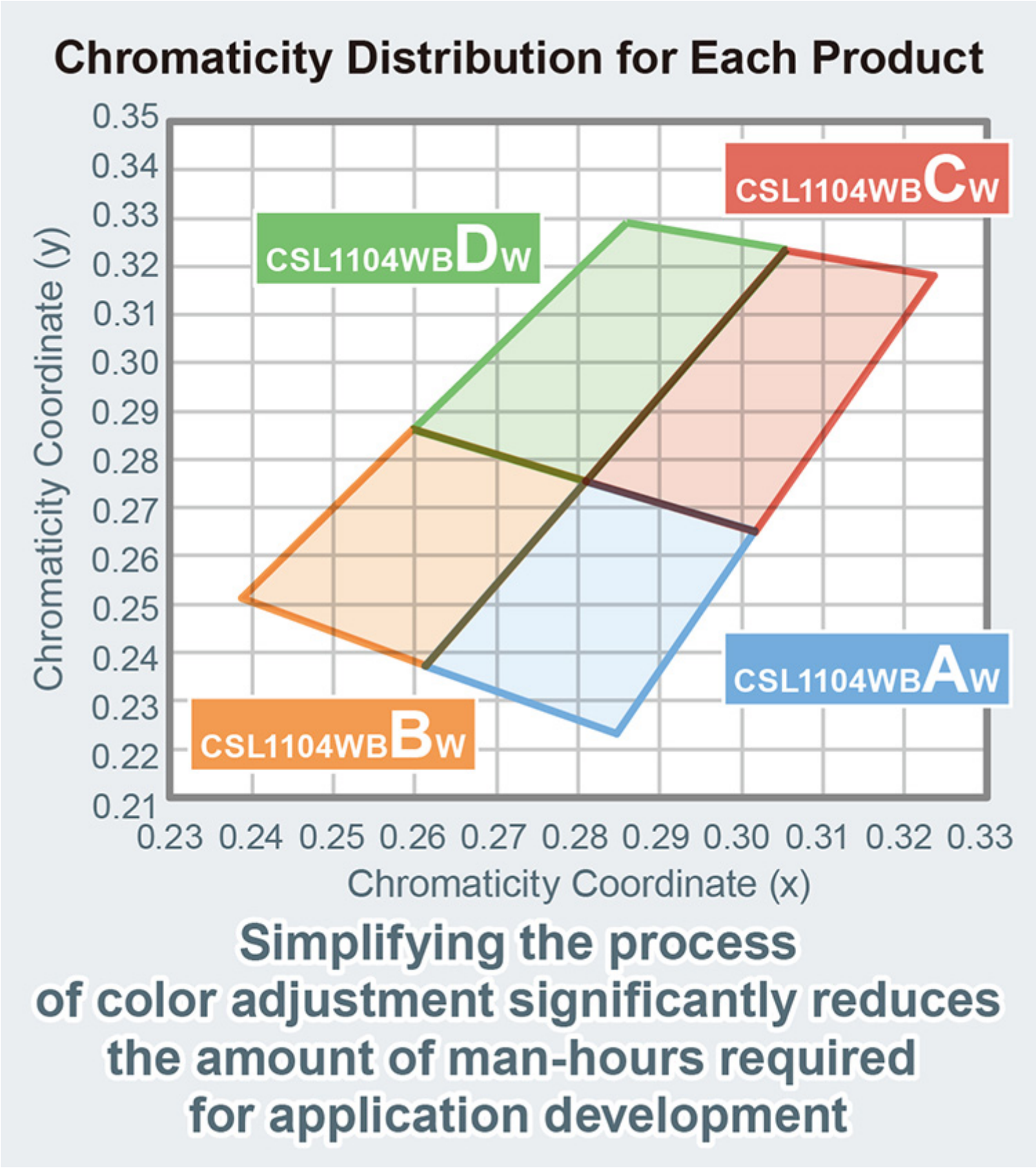
The new CSL1104WB series of reflector-type white LEDs provide high 2.0cd luminous intensity in a compact 1608 size by leveraging proprietary compact package technology and adopting a high luminosity chip. As a result, the same luminous intensity as the standard 3528 size PLCC package (3.5mm x 2.8mm = 9.8mm²) is achieved but in the 1608 size, reducing mounting area by 87%. This doesn't only contribute to greater application space savings, but also improves flexibility of design along with visibility (e.g. complete blackout on panels) by supporting high density mounting of high luminous intensity LEDs, reducing development load considerably.

At the same time, compliance with the automotive reliability standard AEC-Q102 specifically formulated for optical devices is planned, ensuring a smooth application inside industrial equipment and automotive applications exposed to harsh environments.



Key Features

- 2. Fine-grained, accurate white color chromaticity simplifies color adjustment



This new product improves color variability, which is an issue with white LEDs, enabling accurate, detailed white representation. Achieving color uniformity simplifies the process of color adjustment, significantly reducing the amount of man-hours required for application development (i.e. faithfully reproducing brand colors).

CSL1104WB Product Lineup

Part No.	Chromaticity Coordinates (Typ.)		Brightness (mcd)	V _F (V)	Directivity Angle (deg)	I _F (mA)	I _{Fmax} (mA)
	x	y					
New CSL1104WB AW	0.281	0.247	2,000	2.9	115	20	40
New CSL1104WB BW	0.259	0.258					
New CSL1104WB CW	0.302	0.292	2,200				
New CSL1104WB DW	0.282	0.299					

The chromaticity coordinates are optimized for each product to achieve accurate white expression