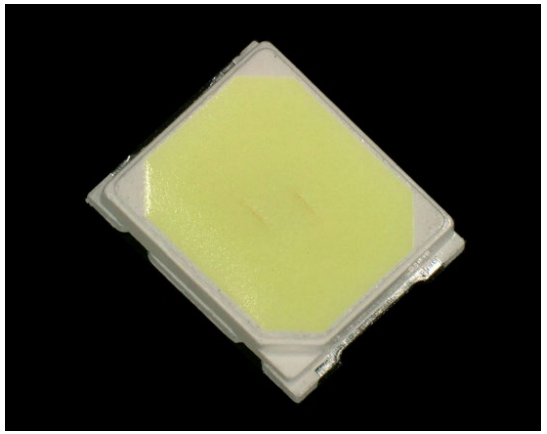
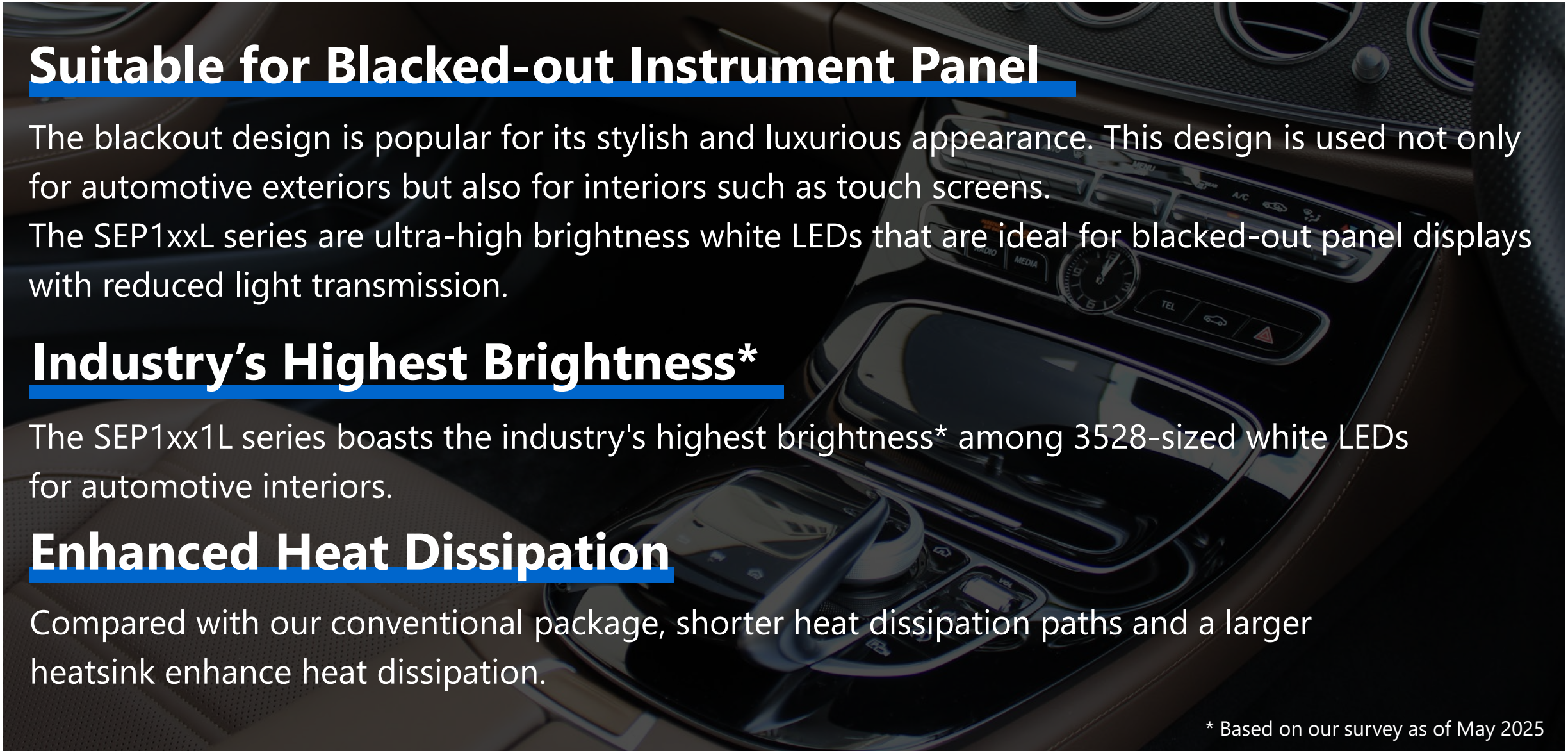
Working Together for a Greener Society

Future of Power Electronics and the Earth

For In-vehicle Blacked-out Instrument Panel Displays

Ultra-high Brightness 3528 White LEDs SEP1xx1L Series





Suitable for Blacked-out Instrument Panel

The blackout design is popular for its stylish and luxurious appearance. This design is used not only for automotive exteriors but also for interiors such as touch screens.
The SEP1xxL series are ultra-high brightness white LEDs that are ideal for blacked-out panel displays with reduced light transmission.

Industry's Highest Brightness*

The SEP1xx1L series boasts the industry's highest brightness* among 3528-sized white LEDs for automotive interiors.

Enhanced Heat Dissipation

Compared with our conventional package, shorter heat dissipation paths and a larger heatsink enhance heat dissipation.

* Based on our survey as of May 2025

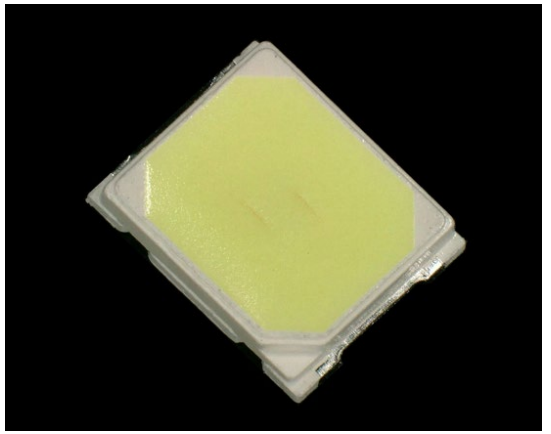
Product Overview of the SEP1xx1L Series

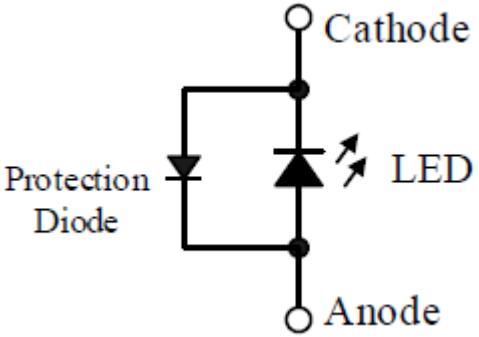
■ Features

- Automotive-grade Qualified
- Ultra-high Brightness White LED
  SEP1WC1L19DTA：
  Luminous Intensity, I_V = 3500 mcd (Typ.) (I_F = 30 mA)
- Thermally Enhanced Surface-mount Package
- ESD-protection Zener Diode Included
- No Light-scattering Sheet or Lens Embossing Required

■ Package

- 2.8 mm × 3.5 mm × 0.7 mm



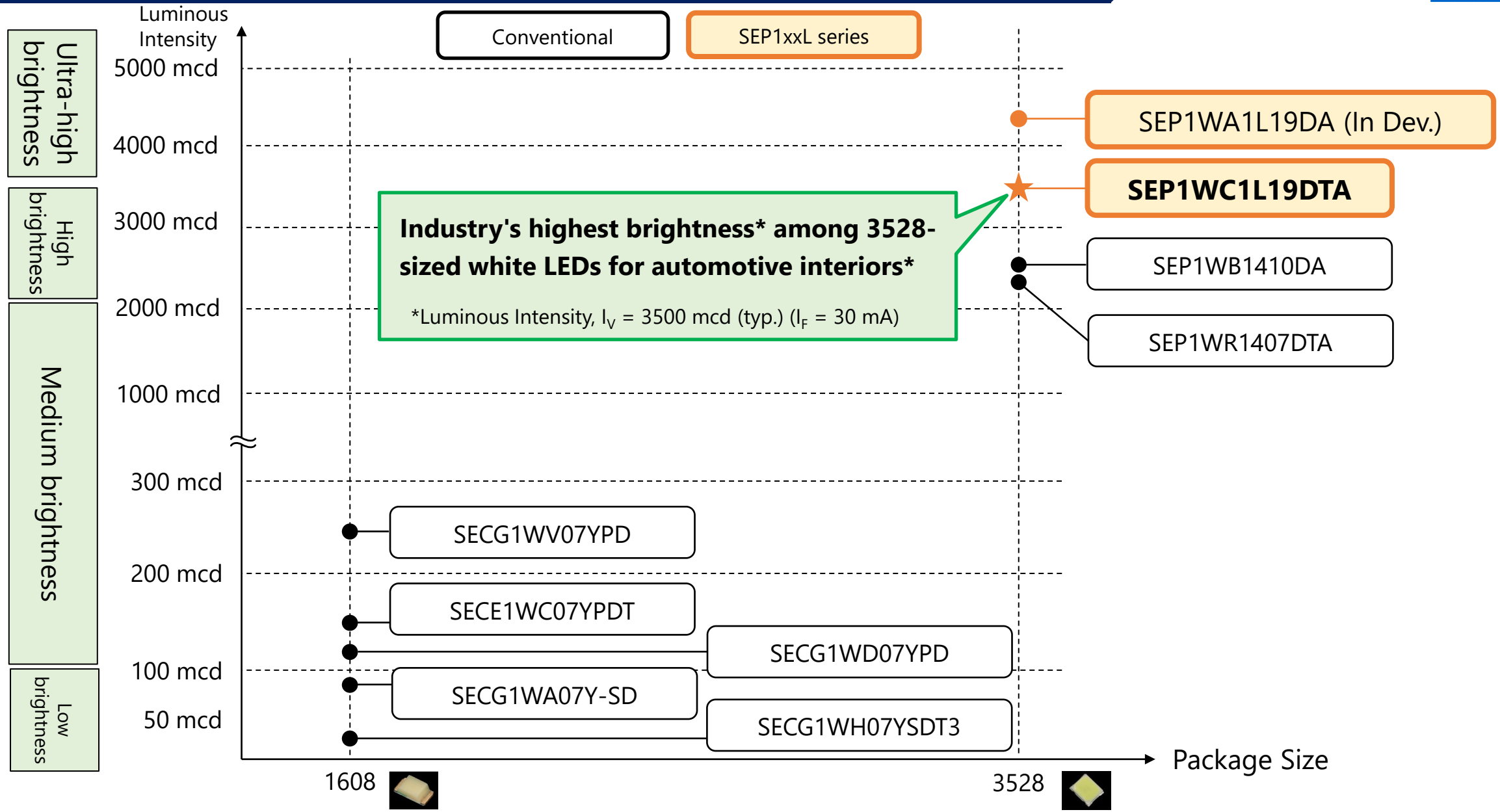


■ Applications

For automotive interior applications such as:

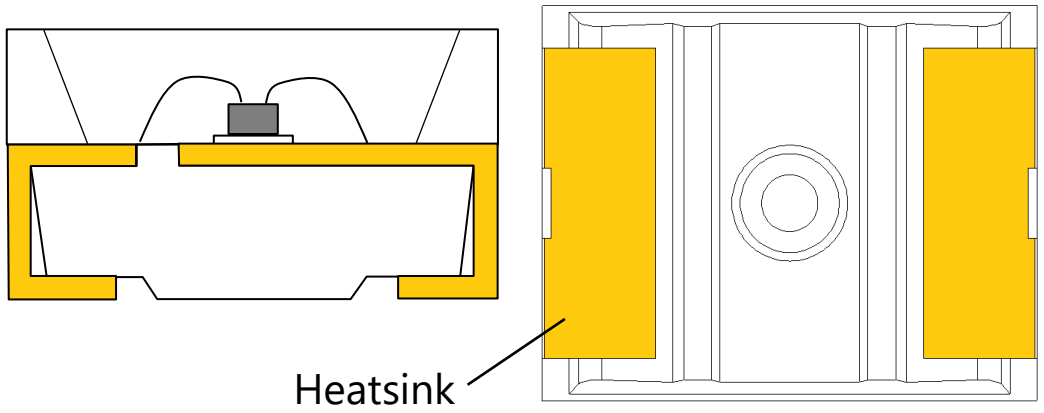
- Blacked-out Instrument Panel Displays with Low Light Transmission
- Footlights and Other Lighting Equipment

White LED Map for Automotive Interiors



The package heat dissipation is enhanced by the new structure that transfers chip-generated heat directly under the chip.

SEP1xx14 Series（Exg. Structure）

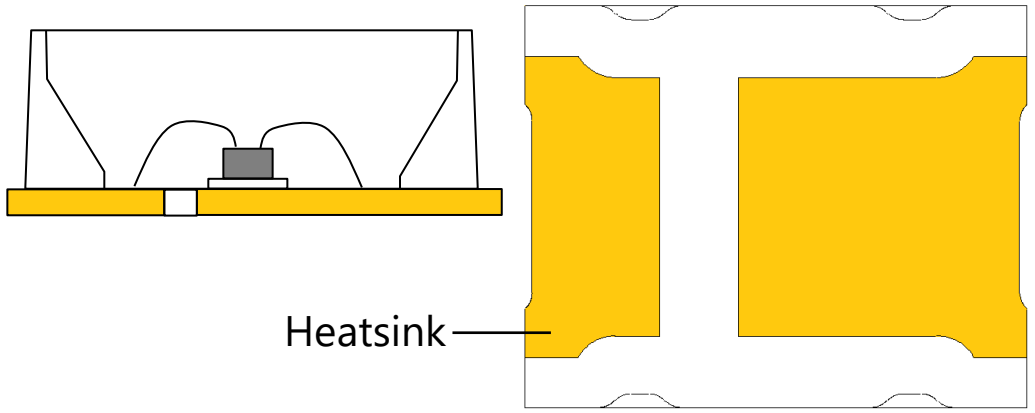


Thermal Resistance, $\theta_{(J-S)}$ = 100 ℃/W

Longer heat dissipation paths; decreased heat dissipation

Smaller heatsink

SEP1xx1L Series (New Structure)



✓ **Thermal Resistance, $\theta_{(J-S)}$ = 25 ℃/W**

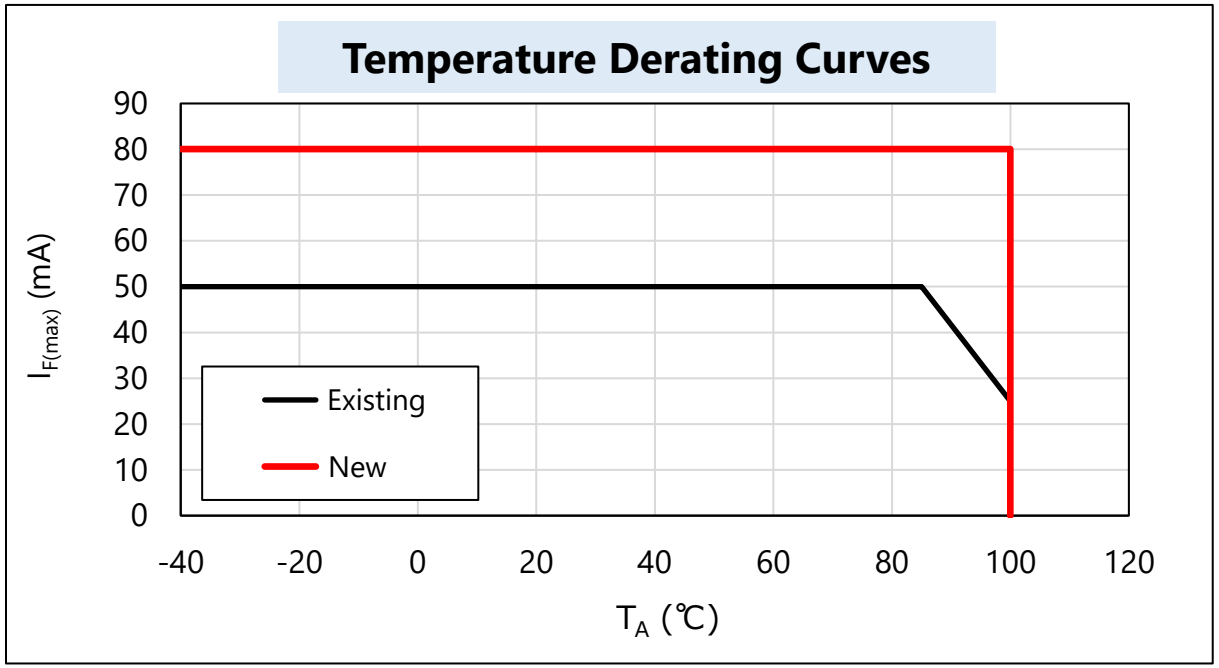
✓ **Shorter heat dissipation paths; increased heat dissipation**

✓ **Larger heatsink**

Feature: Nearly 1.6 Times Brighter than Conventional

- **Enhances heat dissipation**
- **Uses high heat-resistant/light-resistant material for the reflector resin**
- **Uses high heat-resistant chip**

Results in better temp. derating factors and operation at a higher current



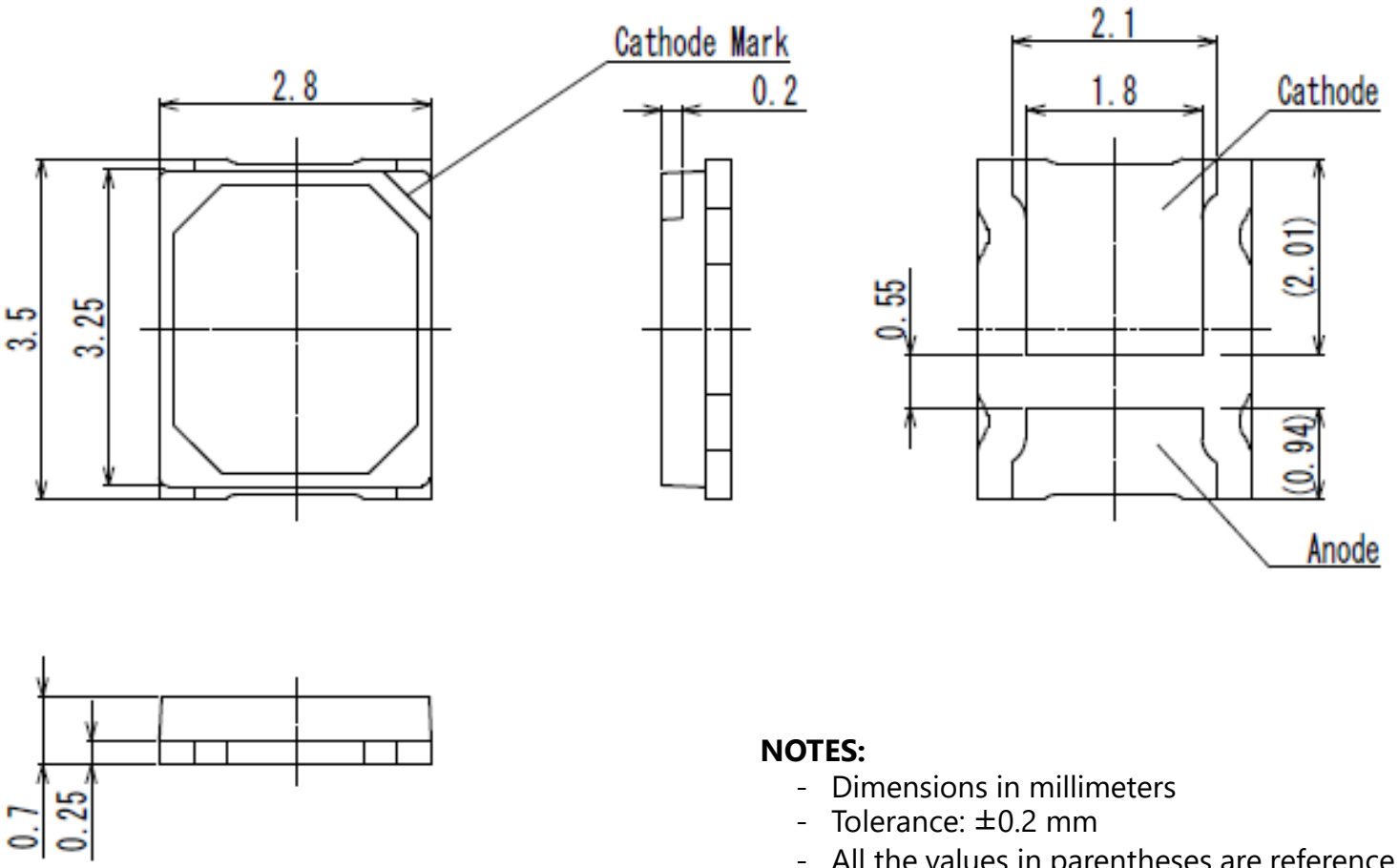
Nearly 1.6 times brighter than conventional LEDs (3528 size)*.

*vs. our old LEDs (new product: SEP1WC1L19DTA)

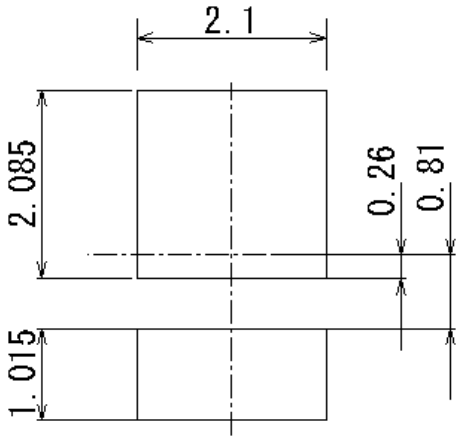
What is more, our new device uses:

- **High-reflective Ag plating to increase luminous intensity**
- **Silicone encapsulation resin to prevent Ag sulfuration**

■ Surface Mount: 2.8 mm × 3.5 mm × 0.7 mm



■ Land Pattern Example



Unit: mm

NOTES:

- Dimensions in millimeters
- Tolerance: ±0.2 mm
- All the values in parentheses are reference dimensions.
- Pb-free (RoHS compliant)
- MSL 3 (Moisture Sensitivity Level 3)

Ultra-high Brightness LED Selection Guide

In addition to white LEDs, we offer a lineup of ultra-high brightness LEDs that are ideal for automotive interiors.

Emission Color	Part Number	Luminous Intensity (I_F)	Chromaticity (x, y)	I_F (max.)
White	SEP1WA1L19DA*	4300 mcd (30 mA)	0.310, 0.315	80 mA
	SEP1WC1L19DTA	3500 mcd (30 mA)	0.267, 0.279	80 mA
Blue	SEP1E1L21DA*	3100 mcd (100 mA)	0.126, 0.061	150 mA
Pure Green	SEP1D1L19DA*	4000 mcd (50 mA)	0.173, 0.717	80 mA
Green	SEP1P41L19DA*	8400 mcd (50 mA)	0.390, 0.580	80 mA
Yellow	SEP1P71L19DA*	7700 mcd (50 mA)	0.440, 0.540	80 mA
Orange	SEP1P91L19DA*	5100 mcd (50 mA)	0.580, 0.410	80 mA
Amber	SEP1P81L19DA*	3200 mcd (50 mA)	0.640, 0.350	80 mA
Red	SEP1P21L21DA*	5100 mcd (150 mA)	0.688, 0.309	240 mA

＊ Under development

Customization Available

If our standard products do not have the color you want, spectrum-level customization is available.

Various approaches will be taken so that you can compare samples, such as color quantification or visual confirmation. We can offer you a “custom light” suitable for your application.

Orders are subject to certain conditions, including mass production quantities and specifications. Please do not hesitate to contact us for more information.

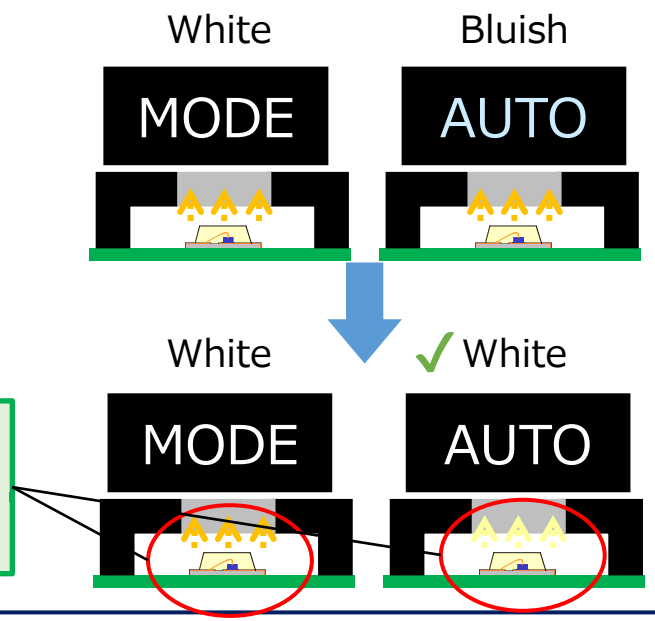
Inquiry Form: https://www.semicon.sanken-ele.co.jp/en/contact/form/

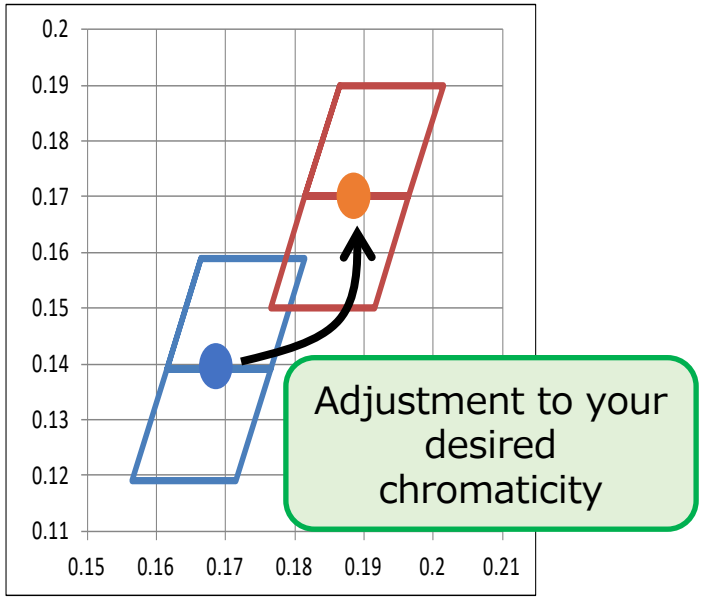
Example Customization: Backlight of Button

Even if white LEDs with the same chromaticity are used, the color tone may differ depending on the internal structure.

In such cases, we will adjust the chromaticity to achieve your desired color.

Custom color LED
(Adjustment to increase yellow components)





Important Notes

- All data, illustrations, graphs, tables and any other information included in this document (the "Information") as to Sanken's products listed herein (the "Sanken Products") are current as of the date this document is issued. The Information is subject to any change without notice due to improvement of the Sanken Products, etc. Please make sure to confirm with a Sanken sales representative that the contents set forth in this document reflect the latest revisions before use.
- The Sanken Products are intended for use as components of electronic equipment or apparatus (transportation equipment and its control systems, home appliances, office equipment, telecommunication equipment, measuring equipment, etc.). Prior to use of the Sanken Products, please put your signature, or affix your name and seal, on the specification documents of the Sanken Products and return them to Sanken. If considering use of the Sanken Products for any applications that require higher reliability (traffic signal control systems or equipment, disaster/crime alarm systems, etc.), you must contact a Sanken sales representative to discuss the suitability of such use and put your signature, or affix your name and seal, on the specification documents of the Sanken Products and return them to Sanken, prior to the use of the Sanken Products. The Sanken Products are not intended for use in any applications that require extremely high reliability such as: aerospace equipment; nuclear power control systems; and medical equipment or systems, whose failure or malfunction may result in death or serious injury to people, i.e., medical devices in Class III or a higher class as defined by relevant laws of Japan (collectively, the "Specific Applications"). Sanken assumes no liability or responsibility whatsoever for any and all damages and losses that may be suffered by you, users or any third party, resulting from the use of the Sanken Products in the Specific Applications or in manner not in compliance with the instructions set forth herein.
- In the event of using the Sanken Products by either (i) combining other products or materials or both therewith or (ii) physically, chemically or otherwise processing or treating or both the same, you must duly consider all possible risks that may result from all such uses in advance and proceed therewith at your own responsibility.
- Although Sanken is making efforts to enhance the quality and reliability of its products, it is impossible to completely avoid the occurrence of any failure or defect or both in semiconductor products at a certain rate. You must take, at your own responsibility, preventative measures including using a sufficient safety design and confirming safety of any equipment or systems in/for which the Sanken Products are used, upon due consideration of a failure occurrence rate and derating, etc., in order not to cause any human injury or death, fire accident or social harm which may result from any failure or malfunction of the Sanken Products. Please refer to the relevant specification documents and Sanken's official website in relation to derating.
- No anti-radioactive ray design has been adopted for the Sanken Products.
- The circuit constant, operation examples, circuit examples, pattern layout examples, design examples, recommended examples, all information and evaluation results based thereon, etc., described in this document are presented for the sole purpose of reference of use of the Sanken Products.
- Sanken assumes no responsibility whatsoever for any and all damages and losses that may be suffered by you, users or any third party, or any possible infringement of any and all property rights including intellectual property rights and any other rights of you, users or any third party, resulting from the Information.
- No information in this document can be transcribed or copied or both without Sanken's prior written consent.
- Regarding the Information, no license, express, implied or otherwise, is granted hereby under any intellectual property rights and any other rights of Sanken.
- Unless otherwise agreed in writing between Sanken and you, Sanken makes no warranty of any kind, whether express or implied, including, without limitation, any warranty (i) as to the quality or performance of the Sanken Products (such as implied warranty of merchantability, and implied warranty of fitness for a particular purpose or special environment), (ii) that any Sanken Product is delivered free of claims of third parties by way of infringement or the like, (iii) that may arise from course of performance, course of dealing or usage of trade, and (iv) as to the Information (including its accuracy, usefulness, and reliability).
- In the event of using the Sanken Products, you must use the same after carefully examining all applicable environmental laws and regulations that regulate the inclusion or use or both of any particular controlled substances, including, but not limited to, the EU RoHS Directive, so as to be in strict compliance with such applicable laws and regulations.
- You must not use the Sanken Products or the Information for the purpose of any military applications or use, including but not limited to the development of weapons of mass destruction. In the event of exporting the Sanken Products or the Information, or providing them for non-residents, you must comply with all applicable export control laws and regulations in each country including the U.S. Export Administration Regulations (EAR) and the Foreign Exchange and Foreign Trade Act of Japan, and follow the procedures required by such applicable laws and regulations.
- Sanken assumes no responsibility for any troubles, which may occur during the transportation of the Sanken Products including the falling thereof, out of Sanken's distribution network.
- Although Sanken has prepared this document with its due care to pursue the accuracy thereof, Sanken does not warrant that it is error free and Sanken assumes no liability whatsoever for any and all damages and losses which may be suffered by you resulting from any possible errors or omissions in connection with the Information.
- Please refer to our official website in relation to general instructions and directions for using the Sanken Products, and refer to the relevant specification documents in relation to particular precautions when using the Sanken Products.
- All rights and title in and to any specific trademark or tradename belong to Sanken and such original right holder(s).

DSGN-AEZ-16003