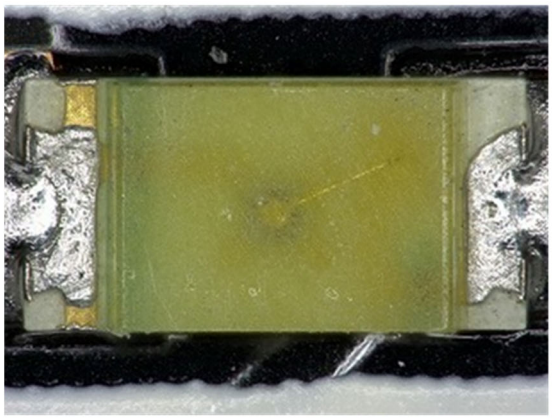
Blue and white LED long-term luminous intensity degradation

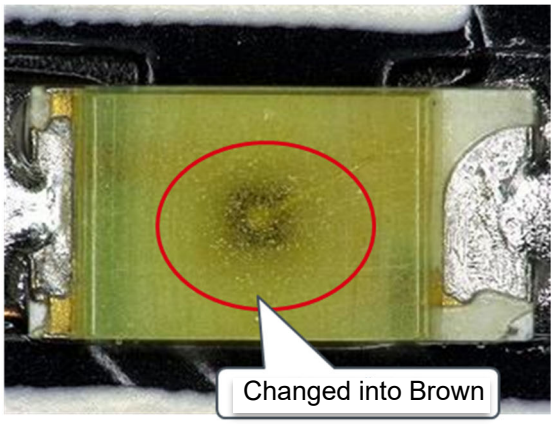
Blue and white LED long-term luminous intensity degradation

It is common to use epoxy resin as the encapsulating resin for blue and white LEDs of compact size, but if the LEDs are used for a long period of time, the light intensity may deteriorate.

Blue and white compact products Light intensity degradation due to long-term use

Small packages with blue or white LEDs using epoxy resin as the encapsulation resin may cause the resin around the LEDs to change color and reduce the luminous intensity of the LEDs due to the short wavelengths (blue) that the LEDs emit when used with power for a long time.

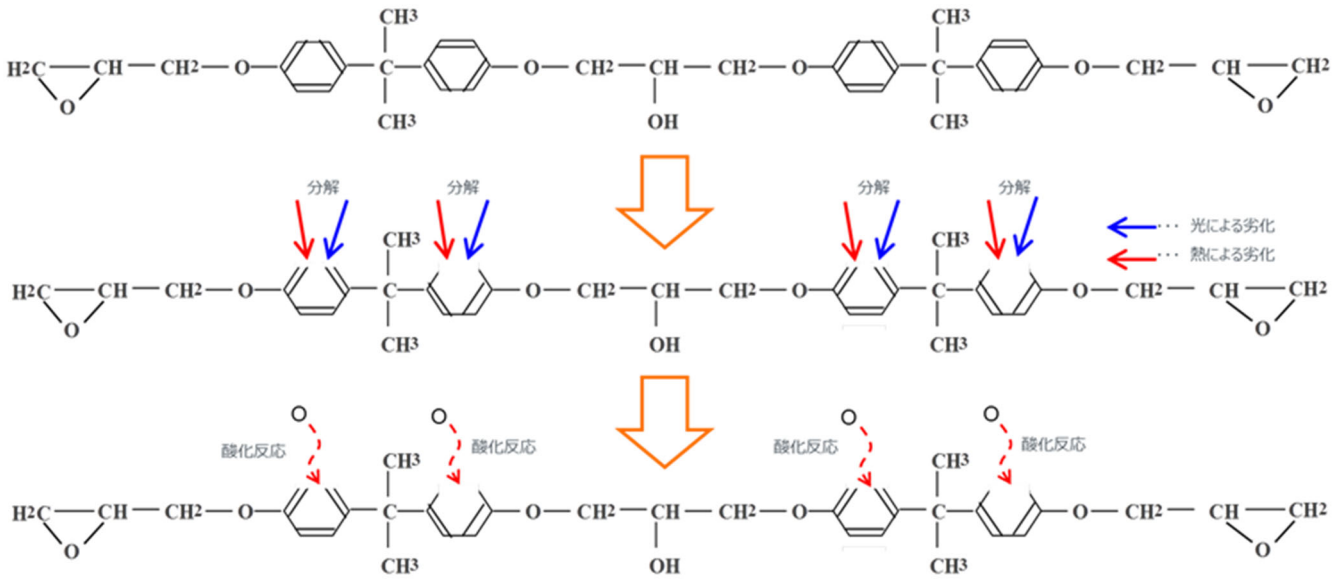




Mechanism of Degradation

The cyclic structure of the benzene ring in the epoxy resin is decomposed and oxidized by short-wavelength emission energy (e.g. blue) and thermal energy in the operating environment, resulting in a brown discoloration of the epoxy resin. As a result, the efficiency of light extraction is reduced and luminous intensity is reduced.

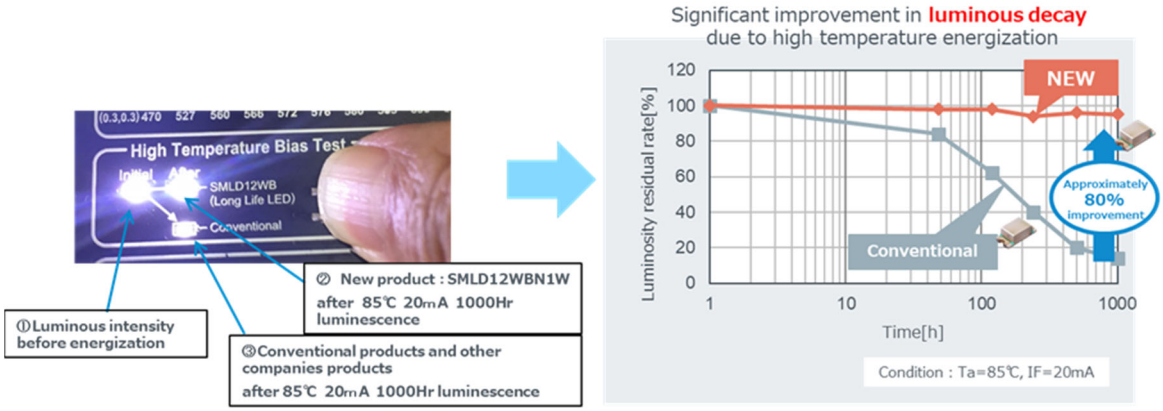
No. 63AN148E Rev.001
2020.10



When using blue or white LEDs made of epoxy resin in small packages, please evaluate their life expectancy carefully before using them. In addition, ROHM offers a lineup of compact packages that use high-reliability resins that resist luminous intensity degradation even in blue and white LED's. We hope you will consider these products

High Reliability White LEDs from ROHM

ROHM also offers the SMLD12WBN1W (1.6x0.8 t=0.55), which has a low luminous intensity degradation due to current application



n addition to white color, the 1608 size high-reliability series is also lined up (regarding the decrease in luminous intensity of blue and white with long-term use).

Part No.	Color	Wavelength (Chromaticity)	IF (mA)
SMLD12EN1W	Green	527nm	5
SMLD12E2N1W		505nm	
SMLD12E3N1W		496nm	
SMLD12BN1W	Blue	470nm	
SMLD12WBN1W	White	(0.295,0.280)	

Notes

1) The information contained herein is subject to change without notice.

2) Before you use our Products, please contact our sales representative and verify the latest specifications :

3) Although ROHM is continuously working to improve product reliability and quality, semiconductors can break down and malfunction due to various factors.
Therefore, in order to prevent personal injury or fire arising from failure, please take safety measures such as complying with the derating characteristics, implementing redundant and fire prevention designs, and utilizing backups and fail-safe procedures. ROHM shall have no responsibility for any damages arising out of the use of our Poducts beyond the rating specified by ROHM.

4) Examples of application circuits, circuit constants and any other information contained herein are provided only to illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

5) The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM or any other parties. ROHM shall have no responsibility whatsoever for any dispute arising out of the use of such technical information.

6) The Products specified in this document are not designed to be radiation tolerant.

7) For use of our Products in applications requiring a high degree of reliability (as exemplified below), please contact and consult with a ROHM representative : transportation equipment (i.e. cars, ships, trains), primary communication equipment, traffic lights, fire/crime prevention, safety equipment, medical systems, servers, solar cells, and power transmission systems.

8) Do not use our Products in applications requiring extremely high reliability, such as aerospace equipment, nuclear power control systems, and submarine repeaters.

9) ROHM shall have no responsibility for any damages or injury arising from non-compliance with the recommended usage conditions and specifications contained herein.

10) ROHM has used reasonable care to ensure the accuracy of the information contained in this document. However, ROHM does not warrants that such information is error-free, and ROHM shall have no responsibility for any damages arising from any inaccuracy or misprint of such information.

11) Please use the Products in accordance with any applicable environmental laws and regulations, such as the RoHS Directive. For more details, including RoHS compatibility, please contact a ROHM sales office. ROHM shall have no responsibility for any damages or losses resulting non-compliance with any applicable laws or regulations.

12) When providing our Products and technologies contained in this document to other countries, you must abide by the procedures and provisions stipulated in all applicable export laws and regulations, including without limitation the US Export Administration Regulations and the Foreign Exchange and Foreign Trade Act.

13) This document, in part or in whole, may not be reprinted or reproduced without prior consent of ROHM.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/