

DOWA News

Dowa Succeeds in Practical Application for Mass Production of a Deep Ultraviolet LED Chip Having the World's Highest Output

TOKYO, March 15, 2010—Dowa Electronics Materials Co., Ltd., a subsidiary of Dowa Holdings Co., Ltd., has successfully developed practical applications for a deep ultraviolet LED that generates shorter wavelengths than the ultraviolet LEDs currently available on the market. Dowa Electronics Materials has begun to offer samples to develop a market.

The deep ultraviolet LED chip is expected to be used in a wide range of fields, including resin cure, adhesion, drying, medical treatment, analyses, photo catalysts, water purification, and sterilization, and is attracting the attention of companies worldwide. Compared with the existing mercury light source, the LED chip is expected to diversify wavelengths, create mercury-free light sources, and have a longer life. Because of a lack of suppliers able to mass-produce deep ultraviolet LEDs, the market is immature. However, if a supply system is established, we expect a market worth tens of billions of yen will emerge.

The deep ultraviolet LED consists of a nitride semiconductor and has been very difficult to manufacture. No manufacturers have therefore succeeded in mass-production. Dowa Electronics Materials has succeeded in developing a practical application for a deep ultraviolet LED chip that emits light with wavelengths of 300nm to 350nm. The company created an LED with the world's highest output power in wavelengths by combining its own AlN template (high-quality AlN film growing on the sapphire substrate) technology, and the newly obtained ultraviolet LED epi growth technology from Palo Alto Research Center (PARC) and RIKEN. The currently available sample has achieved an optical output power of 1.4mW with 20mA in wavelengths of 320nm to 350nm. Dowa Semiconductor Akita Co., Ltd., a subsidiary manufacturer of Dowa Electronics Materials, is creating prototypes and is striving to start mass production. It will seek to increase the output power while at the same time developing deep ultraviolet LED chips that will emit light with shorter wavelengths.

Dowa Electronics Materials has the ability to manufacture many types of GaAs products and has more than 20 years of experience in the red and infrared LED business. The company has also in recent years been rapidly enhancing the lineup of nitride semiconductors. In the first stage, it has launched a nitride electronic device (HEMT) epi for high-frequency waves used at next-generation mobile phone base stations, etc. and for power semiconductors. The deep ultraviolet LED chip is a nitride product in the second stage. With the introduction of this product Dowa aims to bolster the base of its semiconductor business.



Deep ultraviolet LED chip
(Emitting very slightly visible blue-white light)

Profile of PARC:

Name: Palo Alto Research Center Inc.
 Representative: President & CEO Mark Bernstein
 Capital: Wholly-owned subsidiary of Xerox of the U.S.
 Location: Palo Alto, California, U.S.A.
 Number of employees: about 230

Profile of RIKEN:

Established in 1917 as a judicial foundation, RIKEN is a research institute having a history of more than 90 years. RIKEN is now an independent administrative institution under the Ministry of Education, Culture, Sports, Science and Technology and the only comprehensive natural science research institute in Japan.