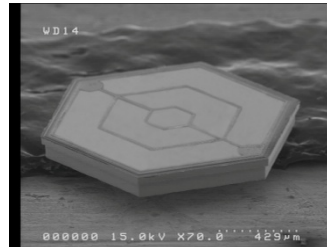
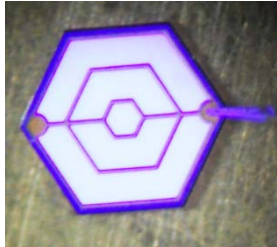


Verticle, Inc. announces the mass production of the World First Hexagonal LED chip - Honeycomb™

Feb 10, 2012

Honeycomb™ LED chip



Verticle, Inc. announces the mass production of hexagonal-shaped LED chip Honeycomb™, a revolutionary LED chip developed with Verticle's patented Cu substrate and chemical chip separation technology for optimized light extraction efficiency. This vertically structured LED chip features significant benefits that include higher light extraction and more uniform beam profile than conventional square or rectangular LED chips based on sapphire or silicon substrate, said Dr. Mike (M.C.) Yoo, Verticle's CEO.

Although there have been many attempts to fabricate various shapes of LED chip with conventional laser scribing or dicing, only a few shapes, like diamond or triangle-shaped LED chips, were possibly fabricated in R&D level, NOT in production level. Chemical chip separation technology invented by Verticle Inc. makes the chip separation step much easier and quicker than conventional chip separation techniques, making it easier to fabricate any shape of chips, even circular shaped.

In addition, Honeycomb™ delivers the improvement in performance of the diode, compare to square or rectangular type LEDs. Since the optical efficiency of LED chip depends on the effective current density in the active region and hexagonal architecture allows better control of current spreading, Honeycomb™ is able to operate at high currents, hence achieve higher brightness.

Conventional square or rectangular LED chip has a distorted beam profile, when it is packaged with typically circular lens. However, hexagonal-shaped LED chip that is closer to circular chips generates much less distorted beam profile hence very small dark spot. This allows a higher lumen than conventional square or rectangular chip that has similar electro-optical properties after packaging with circular lens. Honeycomb chip also can use same package flat form as square or rectangular chips, means there is no additional cost or system improvement required.

Furthermore, Honeycomb™, with its Cu substrate, has an excellent thermal and electrical conductivity, crucial for both long life and good thermal behavior of the diode.

According to Verticle Inc., main optical power range is between 370 - 420 mW at 350mA with a forward voltage range between 3.1 - 3.4V.

The mass production level Honeycomb™ chip will be introduced and available for sale at Guangzhou LED China 2012. For further information, ordering information and sample inquiry, please contact HyeonJik Song (ssong0503@samsung.com) or Jason Kang (jkang@verticle.co.kr).

Specification and information are available at <http://www.verticleinc.com>.