

Advanced packaging technologies are changing the LED manufacturing supply chain

LED Packaging Technology and Market Trends 2014 report

LYON, France – October 8, 2014 – Two weeks ago, [Yole Développement](#) (Yole) announced the update of its technology and market analysis, [LED Packaging Technology & Market Trends](#). Under this new report, the research market and strategy consulting company highlights the impact of advanced packaging technologies in the LED industry.

“The combination of cost reduction and advanced packaging technologies such as Flip Chip and Chip Scale Package, is changing the LED industry landscape, especially its supply chain”, announces Yole. For example, introduction of Chip Scale Package solution clearly reduces the number of manufacturing steps: today, some LED chip manufacturers, with Chip Scale Package technology, already supply their products to the LED module makers directly...

Yole’s report represents a comprehensive survey on recent trends regarding LED Packaging including Flip Chip LED, Chip Scale Package, LED Filament Lamp.... It describes associated technological breakthroughs and manufacturing processes, provides also a list of key players involved ...

Flip Chip technology has step by step attracted attention from the lighting, backlighting and flash markets, becoming one the most important developing items this year.

Following the LED TV crisis and with the entry of Chinese players, positioning has been reshuffled in the LED industry. The product quality of Chinese LED manufacturers has increased to a level where they are now real competitors for all players. In such a highly competitive environment, three major challenges lie ahead for the LED industry regarding the General Lighting market: efficacy improvement, cost decrease and color consistency increase.

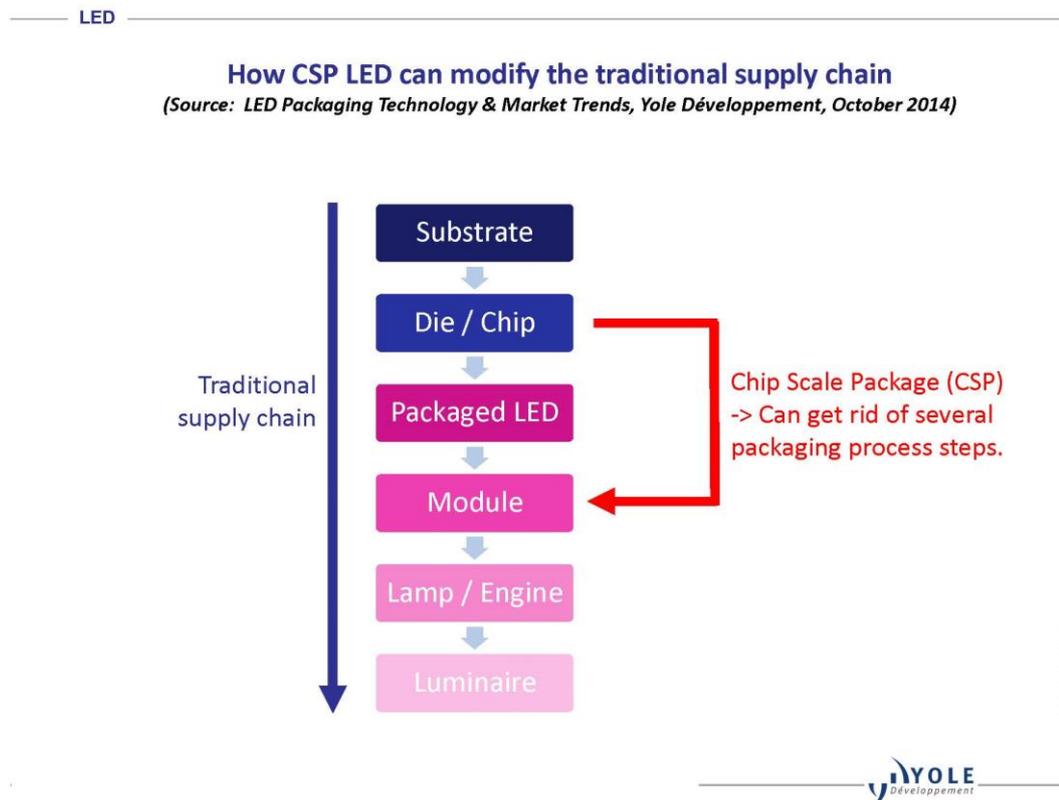
To answer these challenges, several players have now turned to Flip Chip (FC) LED, as these components present several advantages over traditional horizontal (MESA) and vertical LEDs: they are wire-bonding free, can be driven at higher current, and have a smaller size package (...).

And although the FC LED technology has been launched for quite a long time by Lumileds, it was restricted from “popularization” due to technical / technological barriers (low yield regarding bumping / eutectic process...). Additionally, the financial investment required for packaging equipment, represented a strong barrier in an industry that was still recovering. But the technology has gradually attracted attention from the lighting, backlighting and flash markets, becoming one the most important developing items this year.

“Whereas Flip Chip LED represented only 11% of overall high power LED packaging in 2013, we expect this component to represent 34% by 2020. Flip Chip LED will take market share from vertical LED that will represent 27% of overall high power LED packages by 2020”, says

Pars Mukish, Senior Market & Technology Analyst, LED, Lighting Technologies, Compound Semi. and OLEDs.

In addition to offering an increased “performance / cost” ratio, Flip Chip LEDs are also a key enabling technology for the development of Chip Scale Package (CSP) that could allow for further cost reduction.



CSPs are novel to the LED industry but they are the mainstay of the semiconductor industry. Development of CSPs in the Silicon ICs was driven by miniaturization, improved thermal management, higher reliability, and simply the need to connect to an ever increasing pin-count on an ever shrinking die. Chip Scale packages also enabled a reduction in device parasitic and allowed for ease of integration into Level 2 packaging (e.g.: module packaging for LED). It is therefore a natural evolution for this packaging innovation to proliferate into other industries (such as the LED industry).

Basically, a CSP represents a single chip direct mountable package that is the same size as the chip. Regarding LED devices, CSPs are made of a blue FC LED die on which a phosphor layer is coated (the main application of such package being General Lighting).

CSP presents several advantages such as: miniaturized size, better thermal contact to substrates...

However, eliminating several process steps of traditional LED packaging, CSPs are also having an impact on the industry structure with some LED chip manufacturers supplying their

products directly to LED module manufacturers. At middle and long term, this technology could make chip manufacturers supply directly to module manufacturers.

More information about LED Packaging report is available on www.i-micronews.com, [LED section](#).

About LED Packaging Technology and Market Trends 2014 report

- Authors:



Pars Mukish holds a master's degree in Materials Science & Polymers and a master's degree in Innovation & Technology Management (EM Lyon – France). He works at Yole Développement as Senior Market and Technology Analyst in the fields of LED, Lighting Technologies, Compound Semiconductors and OLEDs to carry out technical, economic and marketing analysis. Previously, he has worked as Marketing & Techno-Economic Analyst at the CEA (French Research Center).



Eric Virey holds a PhD in Optoelectronics from the national Polytechnic Institute of Grenoble. In the last 12 years, he's held various R&D, engineering, manufacturing and marketing positions with Saint-Gobain. Most recently, he was Market Manager at Saint-Gobain Crystals, in charge of Sapphire and Optoelectronic products.

- Publication date: October 2014

- Companies cited in this report:

3M, A-Bright, ACC Silicon, Accretech, ADT Dicing, Advanced Photoelectronic, ALSI, AM Technology, Amceram, American Bright, American Opto Plus, AOT, Apeax, APT, Asahi Glass, ASM Pacific, Assymtec, Autec, Avago, Axxon, Bayer, Bergquist, Brightled, Brightview, BYD, Cascade Microtech, Century Epitech, Ceramtec, CETC, Chroma, Citizen, CMO, Cofan PCB, Cree, CS Bright, Curamik, Daitron, Datacon, Delphi Laser, Denka, Dian, Disco, Dominant Semiconductor, Doosan, Dow Chemical, Dow Corning, Dowa, Dupont, Dynatex, Edison Opto, Photon Star, Epistar, Epitex, Epoxy Technology, epworks, ESEC, ESI, Essemtec, Everlight, EV-Group, Evident Technologies, Excellence, Fangda, Fittech, Formosa Epitaxy, Friatec, GE, Gia Tzong, Golden Valley, Han's Laser, Harvatek, Hauman, Heesung, Heptagon, Hilight, Holy and more...

- Rates: Euros 5,990.00 (Full report - Multi user license) – For special offers and the price in dollars, please contact David Jourdan (jourdan@yole.fr or +33 472 83 01 90).

About Yole Développement – www.yole.fr

Founded in 1998, Yole Développement has grown to become a group of companies providing marketing, technology and strategy consulting, media in addition to corporate finance services. With a strong focus on emerging applications using silicon and/or micro manufacturing, Yole Développement group has expanded to include more than 50 collaborators worldwide covering MEMS, Compound Semiconductors, LED, Image Sensors, Optoelectronics, Microfluidics & Medical, Photovoltaics, Advanced Packaging, Manufacturing, Nanomaterials and Power Electronics.

The group supports industrial companies, investors and R&D organizations worldwide to help them understand markets and follow technology trends to develop their business.

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- Market data & research, marketing analysis
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- Patent analysis

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CONTACTS

For more information about:

- Consulting Services: Jean-Christophe Eloy (eloy@yole.fr)
- Financial Services: Géraldine Andrieux-Gustin (Andrieux@yole.fr)
- Reports business: David Jourdan (jourdan@yole.fr)
- Corporate Communication: Sandrine Leroy (leroy@yole.fr)

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