Power Supply OEMs Light Up Our Lives

Electronic ballasts, LED illumination offer attractive growth opportunities

By Marijana Vukicevic, iSuppli Corporation

For years, the mainstream power-supply OEMs kept the market for consumer and industrial lighting on the sidelines. However, that all started to change about 15 years ago, when the power-supply industry became aware of the huge growth potential of the lighting market. With light ballasts already having transitioned from magnetic to electronic control, the next step in the global illumination market is underway: the move to replace conventional incandescent and fluorescent bulbs with Light-Emitting Diodes (LEDs).

Charge of the light brigade

Some of the largest consumers of electricity are public commercial and industrial lights. To improve the energy efficiency of lights, manufacturers have offered fluorescent bulbs with electronic control circuitry, which replaced conventional magnetic ballasts. For the same amount of input power, a compact fluorescent lamp with electronic control delivers four times the brightness of a incandescent bulb. At the same time, the fluorescent lamp lasts six to eight times longer than the incandescent lamp.

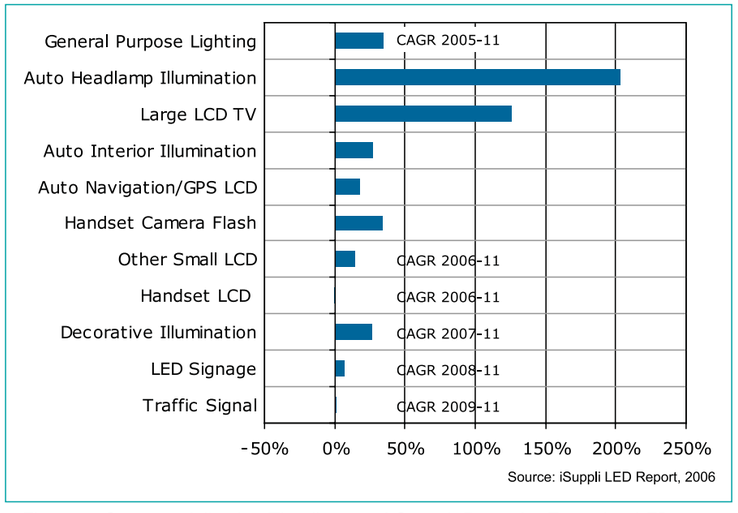

Figure 1. Commercialization Timelines and Growth Rates for Emerging LED Lighting Applications.

A long day's journey into light

The evolution from magnetic to electronic control circuits in fluorescent bulbs was a long journey.

Magnetic-ballast designs that employ simple passive components are still in use, but the industry has realized the importance of electronic ballasts. However, not all electronic ballasts are controlled.

The basic electronic ballasts are self-oscillating and are based on simple discrete components that implement functions like start-up circuitry or even Power Factor Correction (PFC). These self-oscillating solutions account for about 50 percent of the electronic ballast market.

The other 50 percent of the electronic ballast market consists of solutions that integrate dimming features, along with PFC. Only a very small portion—less than 1 percent—of those ballasts are advanced, i.e. they use digital control and management.

Although the advantages of electronic-ballast fluorescent lighting are obvious, the market has not taken off as expected. The penetration of fluorescent lamps in homes and other venues is much higher in developed regions than it is in the third world. Thus, there is much room for growth in the market.

Enter the LED

Over the last decade, semiconductor Light Emitting Diodes (LEDs) have entered the global illumination industry.

A radical departure from incandescent and fluorescent lighting, solid-state LEDs have rapidly replaced traditional lighting sources in many existing applications while simultaneously creating new market niches. Today, LEDs are the lighting source of choice in diverse applications in the consumer, commercial and industrial sectors, including:

- Indoor and outdoor full-color displays
- Signage and traffic lighting
- High-intensity surgical lamps
- Automotive lighting
- Backlighting of small-sized LCDs in mobile phones
- Backlighting of large-sized LCDs in notebooks, TVs and desktop computers
- Mobile-phone keypad and camera flash lighting

Some of the obvious advantages of LED lighting are higher brightness and longer lifetime. For the same input power, LED lamps are five to six times brighter than fluorescent lamps. LED lamps last ten times longer than fluorescent lamps at the same power level.

The near monochromatic emission of LEDs and their resulting capability to tune their spectral characteristics will enable more dramatic growth of LED lighting applications. The number of LED lamp units is predicted to grow at 87 percent by 2011. By 2011, LED illumination sales will amount to one third of the fluorescent ballast market.

In order to succeed in the lighting market, LEDs lamps must undergo significant price reductions. Pricing for the high-brightness LEDs used in lighting applications eroded by 26 percent in 2006. However, in order for LEDs to be widely accepted in lighting applications, this rate of price erosion must continue for several more years.

The highest commercialization rates for LED lighting are expected in the automotive industry, large-screen TVs and in general purpose lighting.

Figure 1 presents iSuppli's forecast of the commercialization timelines and growth rates for emerging LED lighting applications.

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For more information on the power-management market, read Vukicevic' s latest report, entitled: Turbulence on Horizon among Power MOSFET Suppliers. To learn about this report, please visit: http://www.isuppli.com/catalog/detail.asp?id=7832