

## **ECN's exclusive interview with Digikey on LEDs and the state of the marketplace**

Robbie Paul, Lighting Sales Director, Digikey

Solid state lighting is continuing its solid growth across a range of industries and applications. ECN recently spoke to Robbie Paul, Lighting Sales Director at Digikey to discuss the solid state lighting market and the latest LED trends.

ECN: Describe the business climate for manufacturers of LEDs for OEMs.

RP: The number of players in the LED market has grown so much over the years it has become crowded and very competitive. The good news is that demand for LEDs in lighting is growing exponentially. So, right now, everyone's getting a larger piece of the pie.

ECN: How would you describe the LED marketplace overall?

RP: Product differentiation is becoming more difficult to achieve for LED manufacturers. Most manufacturers offer products in high-power, mid-power and, more recently, many have an offering in chip-on-board (COB) packages. This puts tremendous pressure on price, which has been falling faster than forecasted.

ECN: What are customers demanding from today's LED vendors?

RP: Now that lighting OEMs understand binning, they are demanding specific bins as well as tighter bins. In response, LED manufacturers are increasing the bin choices by creating micro-bins and allowing OEMs to purchase from these new combinations.

ECN: What are distributors doing to help engineers get LEDs integrated into their designs?

RP: One advantage that distributors have is the ability to offer multiple solutions to engineers; as opposed to a LED manufacturer only offering their one solution. The ability to compare products and easily narrow the selection of LEDs is something distributors are continually trying to improve. Distributors can also provide access to specialists trained in the latest lighting technologies and round the clock technical support.

ECN: With the price of LED bulbs falling to approximately \$10, will that be a game changer for consumer adoption or will consumers still need more reason to switch?

RP: The most common bulb is the 60W equivalent, and the price of a 60W LED bulb is between \$13 and \$20. The price of the type of LED bulb will need to fall below \$10 for a noticeable increase in consumer adoption. I would expect to see these

price points by the end of this year. To keep up with consumer demand, this bulb will need to be dimmable as well.

ECN: What is the LED industry doing to make products that can be used with traditional electric grids?

RP: There are a number of LED manufacturers focused on developing AC-driven LEDs, which run off 120 volt mains and do not require a separate driver or power supply. These AC LEDs are making inroads in applications where space is at a premium or in products that cannot accommodate a driver module, such as wall sconces.

ECN: Besides the smart home, what vertical market or application area is helping advance LED technology?

RP: The next big step in LED technology and usage will come from the ability to control color through color-changing bulbs, something consumers are only now starting to appreciate. LEDs - in combination with wireless control - make color changing easy and fun.

ECN: Can you describe the commercialization of OLED displays? When will we see more of them?

RP: OLEDs are still finding their place in the lighting market. There are some niche products available, but beyond esthetics, there isn't a compelling advantage to use them over standard LEDs. The technology around OLEDs will need to become less expensive and easier to integrate into lighting fixtures before their usage becomes wide spread.

ECN: What are the latest thermal management strategies being used with today's LEDs?

RP: Active cooling technology is starting to gain acceptance. As LEDs are used in higher power applications, like high-bay lights, cooling them by passive means becomes more challenging. Active cooling technology has improved in the last couple of years, eliminating many of the complaints that came with the first generation product, like noise - both audible and electrical.

ECN: What are driver vendors doing to keep pace with advancements in solid state lighting? Will we see more capacitor-less drivers?

RP: The next big technology leap with drivers will be around magnetics. Advancement in magnetics will allow the creation of new form factors and increase flexibility of the integration with lighting fixtures.

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