

Retail and street HID lighting can benefit from ballast switch, writes **Tom Ribarich**

Electronic ballasts light way to energy savings

Much excitement surrounds high-brightness LEDs these days as lighting companies promote their high lumens/watt and long life-time benefits.

However, LEDs still have high initial costs for lighting installations and technical handicaps, such as colour and brightness tolerances, complex optical systems and thermal management.

Meanwhile, other lighting technologies continue to dominate the various segments of the lighting industry.

High-intensity discharge (HID) lighting, for example, is still very popular for outdoor and retail lighting because of the high lumens, good colour rendering and long lifetime offered by these lamps.

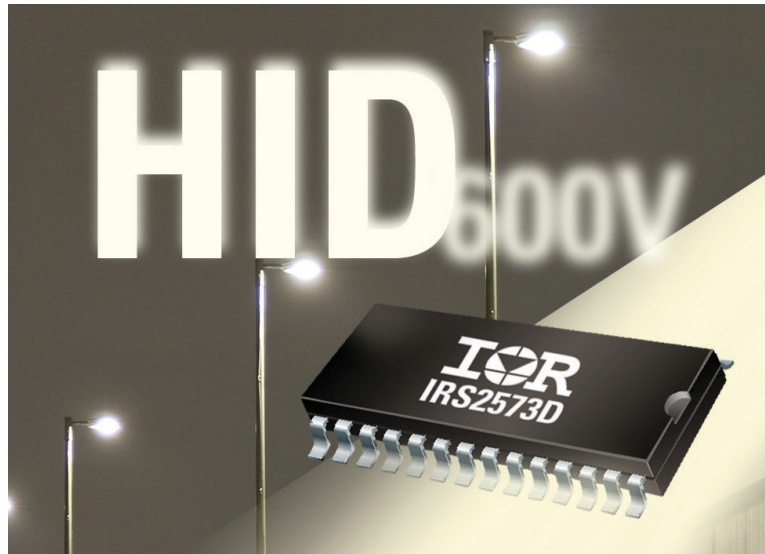
HID metal halide lamps are five times more efficient and last 20 times longer than incandescent types. But they are traditionally powered from an electromagnetic ballast, which is heavy, bulky, inefficient and produces flicker.

Energy savings

Replacing the electromagnetic ballast with a fully electronic ballast can offer energy savings, for example in the area of retail lighting.

Traditional retail lighting uses 150W halogen lamps to accent (or spot) light the various items for sale in stores. Today the same amount of lumen output and similar spatial area spotlighting can be achieved using HID lighting while consuming only 35W.

Street lighting is another area where energy savings can be made by replacing inefficient magnetic ballasts with more efficient electronic versions. Not only will the electronic ballast have less power loss, it will also provide constant light output during line surges and dips, and can provide dimming to capture further energy savings.



Electronic ballasts can produce energy savings in HID street lighting installations

This puts the emphasis back on the design of the electronic HID ballast.

While the energy saving potential is large, it needs to be accomplished with a robust and reliable design. There is a high risk involved with electronic power supply products, especially those used in harsh outdoor environments, which must be mitigated correctly, otherwise the energy savings will be negated directly by the high costs associated with field failures and shortened lamp life.

Of course the ballast should perform the primary function of turning on the lamp for providing light, but it also must perform additional functions to ensure a robust and reliable design.

These functions include ignition, warm-up and running of the lamp, and protecting against line and lamp fault conditions, such as AC line surges and brown-outs, failure to ignite, open and short circuit, and end-of-life.

Also, properly rated components should be used to guarantee the life-

time of the ballast, and the overall component count inside the ballast should be minimised wherever possible to further reduce the risk of component failure.

There are many HID ballast products on the market, each containing a slightly different control circuit. The control circuit typically contains a variety of integrated circuits, ranging from micro-controllers to mixed-mode Asics.

These markets present one example of what is available for saving energy using HID lighting and I believe they continue to grow even as LED is adopted more widely. The key with any of these lighting technologies is that they will have a higher initial cost to enter.

But how reliable they are will determine how soon a return on investment is achieved and how quickly each technology is adopted further in the marketplace. ●

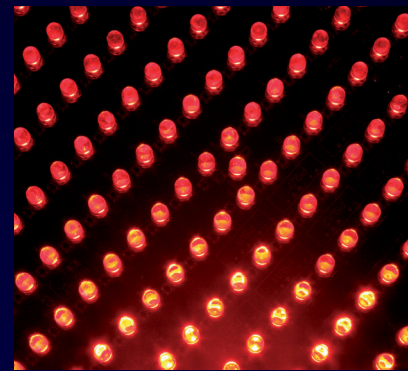
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