STMicroelectronics Raises Reliability and Efficiency for Ultra-Compact LED Lamps

The first in a new family of mains-operated LED lamp drivers from STMicroelectronics will enable designers to deliver more reliable and efficient LED retrofit lamps featuring primary-side current regulation.

LED lighting, including retrofit bulbs, is expected to account for 80% of the lighting market by 2020 or sooner. Primary-Side Regulation (PSR) cuts bill-of-materials costs for retrofit bulbs, thereby reducing the payback time, while also simplifying design and reducing the space occupied by LED control circuitry.

The new HVLED805 integrates an 800V avalanche-rugged MOSFET, achieved using ST's high-voltage integration process, which is higher than in competing devices and hence offers greater reliability. The high-voltage on-chip startup circuitry allows the device to start reliably when the AC line voltage is applied to the lamp.

Further technical information:
Primary-side regulation maintains the constant LED current that is needed to ensure consistent light output, without requiring the current-sensing components and opto-coupler used in conventional secondary-side regulation. The elimination of these components decreases the cost and size of the LED driving circuitry and saves current-sensing losses, improving overall efficiency.

Using PSR, the HVLED805 guarantees LED current regulation to within 5% accuracy. Reliability is also enhanced, due to the elimination of the opto-coupler in the secondary side, whose degradation can significantly decrease the mean-time-between-failure of the lamp.

The HVLED805 PSR controller integrates high-voltage startup for efficient power-on, and the robust 800V power MOSFET allows a reduction of the snubber network. The highly efficient quasi-resonant (QR) operating mode further boosts energy savings for LED lighting and dramatically reduces the EMI filtering required, saving space and costs.

Major features of HVLED805:
800V avalanche-rated MOSFET power switch 5%-accurate constant-current regulation Quasi-resonant operation High-voltage startup circuitry
Open- or short-circuit LED string management Automatic self supply Input voltage feed-forward for mains-independent constant-current regulation

The HVLED805 is in mass production now in the SO-16N narrow package, priced at $0.70 in quantities of 10,000. Alternative pricing options are available for larger quantities.

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