

## LED driver delivers high performance and lower cost in commercial lighting



[Dialog Semiconductor](#) [1]

announced a new solid state lighting (SSL) LED driver that integrates boost and flyback converters into a single IC to reduce the bill of material (BOM) costs and simplify the design, compared to conventional two-stage driver approaches, while delivering exceptional performance. The new iW3623 was developed by Dialog's Power Conversion Business Group, formerly iWatt Inc., acquired in July 2013 and delivering on Dialog's product portfolio diversification strategy to expand into the digital power management market space.

The iW3623 offers a universal 100V<sub>AC</sub> to 277V<sub>AC</sub> input range and output power up to 45W. It integrates a boost controller for power factor correction (PFC) and a flyback converter for LED current regulation, while enabling high PF >0.95 and low total harmonic distortion (THD) of <10%. Dialog's patented Flickerless design achieves a near-zero 100 to 120Hz output ripple and the built-in over-temperature protection (OTP) and derating enables lighting designers to deliver a predictable, reliable bulb operating life.

The rich combination of integrated features makes the iW3623 an ideal solution for a wide range of non-dimmable, commercial SSL downlight, PAR, T8, and flat panel ceiling lamp applications.

The iW3623 provides additional BOM savings by using Dialog's patented PrimAccurate primary-side control technology that eliminates the need for a

secondary-side regulator and optical feedback isolator. It also allows FETs to be replaced with lower cost bipolar junction transistors (BJTs). While using BJT switches lowers the total solution cost, achieving high conversion efficiency can be a challenge. The iW3623 solves this by using quasi-resonant mode switching for both the boost and flyback stages and dynamic base current to optimise conversion efficiency and minimise EMI. Additionally, Dialog's EZ-EMI technology simplifies EMI filtering to further minimise the external component count.

Most power ICs are designed with a thermal shutdown feature, which simply shuts the IC down in high temperature environments. This protects the IC, but not the LED driver circuit. The iW3623 includes a robust, built-in over-temperature protection and derating function that actually monitors the temperature inside the sealed SSL bulb. The OTP feature is configured via an NTC resistor. When thermal conditions in the bulb reach the set temperature, the iW3623 automatically and incrementally reduces the current drive to the LEDs. This lowers the power dissipation, results in cooler operation, and ensures the temperature rating of the electrolytic capacitors in the system is not exceeded. Derating allows the capacitors to operate within the maximum lifetime of the SSL bulb and results in a predictable bulb operating life. The derating of the current drive results in negligible light reduction, so users will likely not experience any visible changes in light output. In extreme temperature situations, the iW3623 will shut down the current drive to the LEDs to prevent safety and fire risks.

Additional, iW3623 safety features include LED open/short circuit, single fault, over-current, current sense resistor short-circuit, input over-voltage, brown-out and AC line over-voltage/frequency protections. During output over-voltage conditions, the iW3623 goes into an extended discharge mode, while maintaining a quick recovery, allowing support for hot-plug LED modules without causing dangerously high output voltages.

## **iW3623 key features**

- Output power: 3W to 45W
- Universal input range: 100 – 277V<sub>AC</sub>
- High power factor (PF) >0.95
- Low total harmonic distortion (THD) <10%
- Flickerless technology eliminates LED flicker with <5% 100Hz – 120Hz output current ripple
- Integrated boost and flyback converters, PrimAccurate primary-side control: reduce solution size, lower BOM cost, increase reliability
- NTC-based LED over-temperature protection (OTP) and derating
- Meets global standards, including European Union IEC61000-3-2<sup>(1)</sup> requirement
- Compatible with Zhaga<sup>(2)</sup> hot-plug LED module for LED light interchangeability

## **Packaging, pricing, availability**

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The iW3623 is available now in production quantities. It comes in a standard, 14-lead SOIC package and is priced at US \$0.93 each in 1000-piece quantities. Product brief is available: [iW3623 Product Brief](#) [2].

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### **Links:**

[1] <http://www.dialog-semiconductor.com>

[2] [http://iwatt.com/wp-content/uploads/2013/04/iW3623\\_Product\\_Brief.pdf](http://iwatt.com/wp-content/uploads/2013/04/iW3623_Product_Brief.pdf)