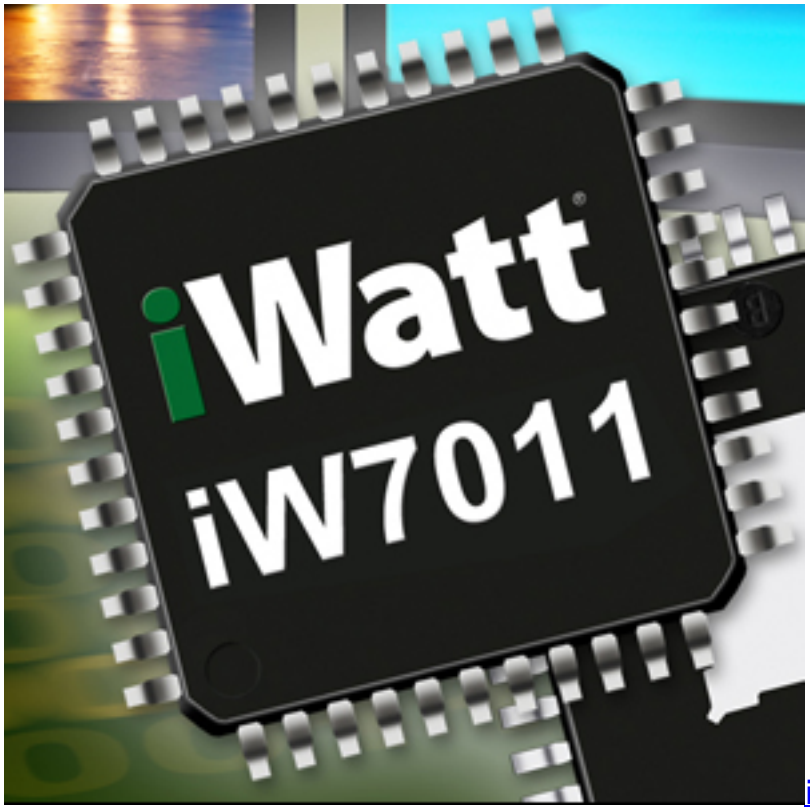
6-channel LED driver simplifies design, reduces BOM for mid to large-size LCD TVs



iWatt [1]announced its latest LED driver for LCD TV backlighting. The new iW7011 [2] is a 6-channel LED driver with a built-in intelligent digital control engine, developed to reduce the bill of materials (BOM) cost and simplify design of edge-lit and direct-lit LCD TVs. The digital core of the iW7011 provides on-chip control of the DC-to-DC boost circuit, along with precise LED dimming control and all the monitoring and feedback for the LED drivers. It also allows timing delays to be set for dynamic scanning, simplifying design by enabling one part to be used for both 2D and 3D TVs. The iW7011 uses external LED current sinks and external boost MOSFETs for easy current and voltage scaling (up to 300mA per channel and Vout close to 85V), allowing designers to source one part type to meet requirements spanning medium- to large-size LCD TVs and monitors.

The iW7011 lowers BOM costs by integrating a number of design features. The on-board boost controller provides a high-voltage power supply for the external LED strings. The digital control engine allows real-time control of phase delays (especially relevant for 3D TVs) and manages Vsync synchronization (from 50Hz to 480Hz) and fault read outs, eliminating costly microcontrollers. Additionally, the iW7011 offers an 85V capability on drain sensing, which means there is no need for cascodes or zener clamps for protection, while high-voltage drain sensing eliminates external diodes usually required for LED short-circuit fault management.

The digital control engine in the iW7011 improves overall system efficiency by

optimizing the DC-to-DC voltage based on the minimum feedback voltage of the LED strings that is required to maintain the target current regulation. The digital control engine also generates the current sink PWM waveforms, processes the fault conditions, and reports on all faults.

The iW7011 enables accurate dimming control, with 14-bit resolution at 120Hz PWM frequency. It offers the flexibility of phase-shifted dimming of the current sinks either through direct PWM mode or through an SPI interface. Additionally, an optional 8-bit analog register can be used to increase the dimming resolution. Phase-shifted dimming reduces capacitance demand on the input and output to improve both dimming linearity and EMI (electromagnetic interference) performance. Four phase-shift dimming options are available: three fixed options for 6-channel operation and an adaptive phase shift option where the shift is evenly distributed based on the number of active channels.

The iW7011 features a wide input voltage of 10V to 28V and LED current up to 300mA. It provides high, 2% channel-to-channel matching accuracy and 0.5% absolute current accuracy to deliver uniform brightness across the entire display. Comprehensive, built-in protection features include over-voltage, over-current, UVLO and over-temperature protection on the boost converter, with open detection and short fault protection for the LED drivers.

The iW7011 is packaged in a 44-pin, 10mm x 10mm , thin QFP with 0.8 mm pitch and a pin-out optimized for single-layer PCB layout.

iW7011 key features

- 6-channel LED driver controller, 85V (max) LED voltage
- Integrated DC/DC boost controller
- Wide input voltage: 10V to 28V
- Up to 300mA LED current
- Supports both 2D and 3D LCD TV modes
- Digitally controlled scanning mode
- Dimming control: 14-bit, 120Hz direct adaptive phase-shift PWM or SPI interface PWM dimming

Pricing, availability

The iW7011 LED driver is available now in production quantities. Samples are available at $1.10 in 1000-piece quantities. Product brief is available: iW7011 Product Brief [3].

www.iwatt.com [4]

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Links:
[1] http://www.iwatt.com/
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