

High Efficiency 8-Channel LED Driver with I²C Interface and Phase-Shifted PWM Dimming

POWER MANAGEMENT

Features

- VIN Range — 4.5V to 27V, VOUT Range — Up to 50V
- Step-up (Boost) Controller
 - Excellent Transient Response
 - Programmable Switching Frequency
- Linear Current Sinks
 - 8 Strings, up to 30mA/String
 - Current Matching $\pm 1\%$
 - Current Accuracy $\pm 1.5\%$
- PWM Dimming
 - String-by-String Phase Shifting
 - Input Dimming Frequency 100Hz-30kHz
 - User Selectable 9 or 10 Bits Dimming Resolution
 - Optional Synchronization to VSYNC/HSYNC Signal
- 5-bit Analog Dimming
- Optional External p-MOSFET Disconnect Switch
 - True Load Disconnect and Inrush Current Limiting
- I²C Interface
 - Fault Status — Open/Short LED, UVLO, OTP
 - Device Control — SYNC Freq, PLL Setting
- Protection Features
 - Open/Shorted LED(s) and adjustable OVP
 - Over-Temperature and UVLO Shutdown Protection
- 4 X 4(mm) 28-pin QFN Package

Applications

- Notebook PCs, UMPC, LCD Monitors, and Tablet PCs

Description

The SC5010 is an 8-channel high-precision, high-efficiency step-up (Boost) LED driver for backlight applications. It features wide input voltage range (4.5V to 27V), flexible output configuration, wide analog and PWM dimming range, phase shifting and fading. It also features video signal synchronization (VSYNC), I²C interface, and numerous protection features. An optional disconnect p-MOSFET provides true load disconnection and inrush current limiting.

The boost controller, with programmable switching frequency from 200kHz to 2.2MHz, maximizes efficiency by dynamically minimizing the output voltage while maintaining LED string current accuracy. It provides excellent line and load response with no external compensation components. Each linear current sink is matched within $\pm 1\%$ for superb lighting uniformity, and the accuracy of each string current is $\pm 1.5\%$. An external resistor adjusts the current from 10-30mA per string. It also features PWM dimming resolution of 9 or 10 bits (user selectable) over dimming frequency from 100Hz to 20kHz, synchronized to the SYNC signal or the boost oscillator. String-by-string phase shifting reduces the demand on the input/output capacitance, decreases EMI, and improves dimming linearity.

SC5010 is available in a low-profile, thermally enhanced, 4 X 4 X 0.6(mm) QFN 28-pin package.

Typical Application Circuit

