

SC5012Q High Efficiency 4-Ch, 150mA/Ch LED Driver with I²C Interface and Phase-Shifted PWM Dimming

The SC5012/Q is a 4-channel high-precision, high-effi-

ciency step-up (Boost) HB LED driver designed for back-

light applications. It features wide input voltage range

(4.5V to 45V), flexible output configuration, wide analog

and PWM dimming range, phase shifting, optional fading,

external boost controller frequency synchronization

(FSYNC), I²C interface, and numerous protection features.

The boost controller, with programmable switching fre-

quency from 200kHz to 2.2MHz, can maximize efficiency

by dynamically minimizing the output voltage while

maintaining LED string current accuracy. It provides excel-

lent line and load response with no external compensa-

tion components. Each linear current sink is matched

within $\pm 1\%$ for superb lighting uniformity, and the accu-

racy of each string current is $\pm 2\%$. An external resistor

adjusts the current from 40-150mA per string. It also fea-

tures PWM dimming resolution of 9 or 10 bits (user select-

able) over a 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

SC5012/Q is available in 4mm X 4mm 24 Ld QFN package.

The SC5012Q is an AEC-Q100 (Grade2) gualified version.

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improves dimming linearity.

Description

SC5012

POWER MANAGEMENT

Features

- Input Voltage 4.5V to 45V
- Output Voltage Up to 65V
- Step-up (Boost) Controller
 - Ultra-Fast Transient Response
 - Programmable Switching Frequency
 - External Sync Frequency for Boost Controller
- Linear Current Sinks
 - 4 Strings, up to 150mA/String
 - Current Matching ±1%
 - Current Accuracy ±2%
- PWM Dimming
 - 5000:1 dimming ratio
 - String-by-String Phase Shifting
 - Dimming Frequency 100Hz-30kHz
 - User Selectable 9 or 10 Bits Dimming Resolution
 - Optional Synchronization to VSYNC Signal
- **External Frequency Synchronization, FSYNC**
- 8-bit Analog Dimming
- I²C Interface
 - Fault Status Open/Short LED, OTP
 - Device Control: SYNC Freq, PLL Setting
- Protection Features
 - Open/Shorted LED(s) and adjustable OVP
 - **Over-Temperature**
- 4mm X 4mm 24 Ld QFN Package
- AEC-Q100 (Grade2) Qualified Version Available

Applications

- Medium-sized LCD Panel
- Automotive Car Navigation/Information Display
- LCD Monitors

Typical Application Circuit

