



## 10-Channel, Integrated, High Efficiency 120 White LED Driver

### POWER MANAGEMENT

#### Features

- Wide input voltage range from 4.5V to 21V
- 42V maximum operating output voltage
- Programmable LED current up to 30mA per string
- +/- 1% current matching
- Integrated 3A switch
- Low current sink voltage
- Up to 91% efficiency
- Flexible LED configurations
  - Mismatched LED channels
  - Disable individual channel(s)
  - Parallel channels for high LED current
- PWM dimming capability
  - Up to 50kHz dimming frequency
  - >500:1 dimming range
- Switching frequency: 500kHz - 1MHz
- Parallel device operation with Sync Pin
- Protection features:
  - Adjustable OVP
  - Cycle-by-cycle current limit
  - LED short channel with disable /Open channel
  - Over-Temperature protection
- MLPQ-28 lead-free package (WEEE and RoHS compliant), 4x4mm x 0.6mm

#### Applications

- Automotive LCD Backlighting
- Desktop monitors
- Notebook PCs
- Portable TVs

#### Description

The SC442 is a 10-channel, high efficiency integrated step-up (boost) driver IC capable of powering up to 120 WLEDs. The device has a wide input voltage of 4.5V to 21V with no internal regulator or bypass capacitor required. The wide input range, up to 42V output voltage and flexible implementation make it the ideal LED backlight driver solution for medium to large LCD displays. The current sink channels are programmed with an external resistor up to 30mA each.

Channel-channel current matching is +/-1% . The device disables open or shorted LEDs by disabling only the affected LED channel; thus increasing LCD panel life. Channel-channel LED mismatch voltage is accommodated by adjusting the SCPSET resistor. The current sink channels may be operated in parallel for increased LED current. Unused channels are be disabled by connecting the pin to the input voltage.

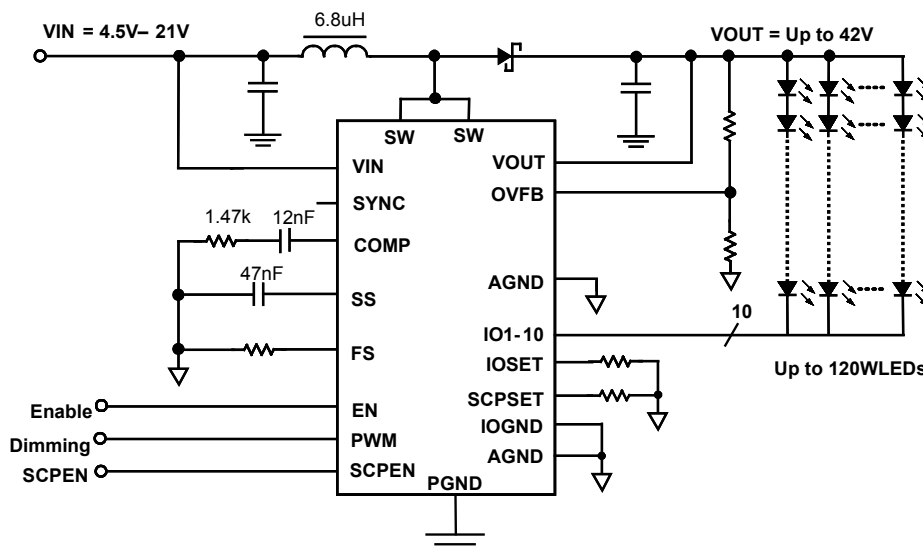
Losses in the switching device and current sinks are minimized across the operating range; yielding >90% efficiency and excellent battery life for portable systems.

The device accepts PWM dimming up to 50kHz. Maximum dimming range is greater than 500:1 with excellent linearity for optimum PWM dimming characteristics. The high frequency dimming capability (>20kHz) eliminates audio emissions and allows small ceramic output capacitors.

Switching frequency is programmable from 200kHz to 1MHz; allowing efficiency versus L/C sizing tradeoffs across the input/output voltage range. Alternatively, the SYNC pin allows the designer to synchronize the switching frequency to an external system clock and, if necessary, a parallel SC442 device - eliminating potential system intermodulation and interference problems.

Over-temperature shutdown protects the IC from over-heating under abnormal conditions. The device is available in a small 4mmx4mm MLPQ-28 pin package with 0.6mm maximum height and is fully WEEE and RoHS compliant.

#### Typical Application Circuit



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