ISL98611

High Efficiency Display Power and LED Driver for Smart Phones

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The ISL98611 is a high-efficiency display power supply and LED driver for small size displays, such as smart phones. It integrates a boost regulator, LDO, and inverting charge pump that are used to generate regulated positive and negative voltages for display power. It also integrates a boost regulator and 3-channel current sinks for the LED backlight driver. The positive and negative output voltages can be adjusted from ±4.5V up to ±6V.

The ISL98611 extends the battery life of mobile devices by delivering greater than 88% efficiency for the display power function and up to 93% efficiency for the backlight driver when powering 12 LEDs. It reduces the PCB area by integrating the two functions into a single IC and by requiring only eight external components in total.

This product drives backlight LEDs with excellent current matching even at very low LED current (±2.2% down to 1mA and ±2.8% at 50µA), improving the brightness uniformity of LCD displays. It includes analog, PWM, and hybrid dimming to maximize LED efficiency while eliminating color shift issues.

The ISL98611 is offered in a 2.33x2.61mm^2 WLCSP package and the device is specified for operation across the -40°C to +85°C ambient temperature range.

Applications

- TFT-LCD Smart phone displays
- Small size/handheld display

Related Literature

- For a full list of related documents, visit our website
  - ISL98611 product page

Features

- Display power output voltage: ±5V, ±5.6V
- Positive and negative voltages can be programmed from ±4.5V to ±6V
- >88% efficiency with 12mA load between VP and VN
- Up to 93% efficient LED driver
- Only 8 external components; integrated compensation and feedback circuits
- Analog, PWM, and hybrid dimming
- ±2.2% current matching down to 1mA and ±2.8% at 50µA
- Can drive 2 strings of LEDs
- 10-bit linear and 11-bit logarithmic DC output current control
- I^{2}C, PWM, and SWIRE dimming inputs with internal multiplier for CABC
- 2.5V to 5V input voltage range
- VP and VN output adjustable from ±4.5V up to ±6V with 50mV steps
- I^{2}C adjustable output voltages and settings
- 1µA shutdown supply current
- RoHS compliant

TABLE 1. KEY DIFFERENCES BETWEEN PARTS

PART NUMBER	VP/VN OPTIONS (V)
ISL98611IIZ-T	±5
ISL98611II56Z-T	±5.6

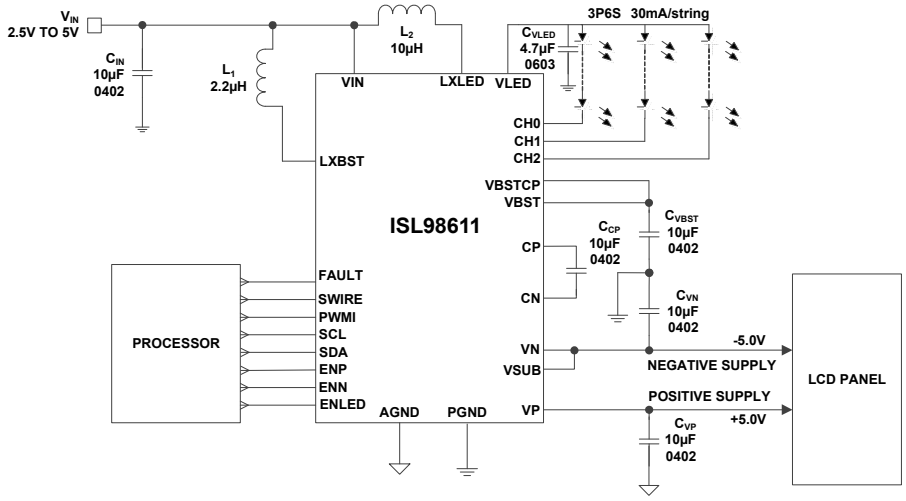

FIGURE 1. TYPICAL APPLICATION CIRCUIT FOR 3-CHANNEL LED DRIVER

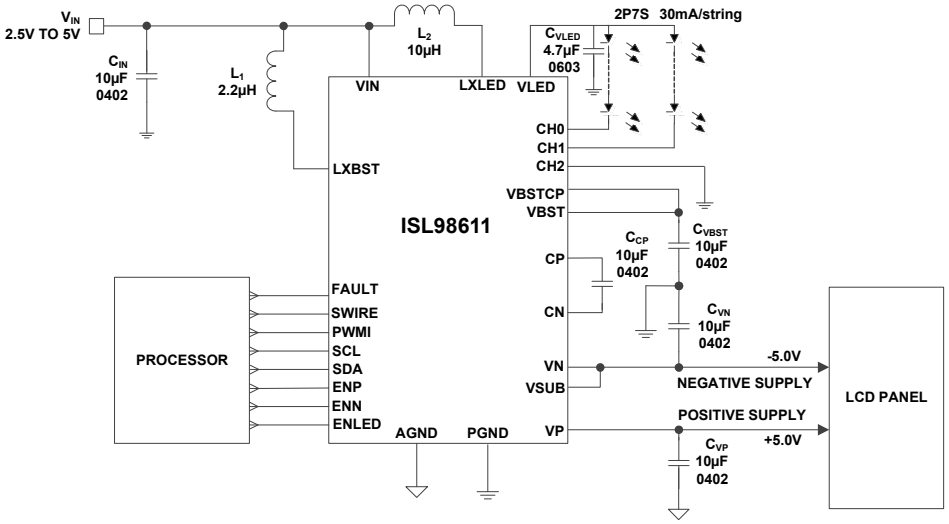

FIGURE 2. TYPICAL APPLICATION CIRCUIT FOR 2-CHANNEL LED DRIVER