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ISL98611

High Efficiency Display Power and LED Driver for Smart Phones

FN8662
Rev.3.00
Apr 27, 2017

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 $\pm 4.5V$ up to $\pm 6V$.

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 ($\pm 2.2\%$ down to 1mA and $\pm 2.8\%$ at 50 μA), 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 2.33x2.61mm² 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: $\pm 5V$, $\pm 5.6V$
- Positive and negative voltages can be programmed from $\pm 4.5V$ to $\pm 6V$
- >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
- $\pm 2.2\%$ current matching down to 1mA and $\pm 2.8\%$ at 50 μA
- Can drive 2 strings of LEDs
- 10-bit linear and 11-bit logarithmic DC output current control
- I²C, PWM, and SWIRE dimming inputs with internal multiplier for CABC
- 2.5V to 5V input voltage range
- VP and VN output adjustable from $\pm 4.5V$ up to $\pm 6V$ with 50mV steps
- I²C adjustable output voltages and settings
- 1 μA shutdown supply current
- RoHS compliant

TABLE 1. KEY DIFFERENCES BETWEEN PARTS

PART NUMBER	VP/VN OPTIONS (V)
ISL98611IIZ-T	± 5
ISL98611IIS6Z-T	± 5.6

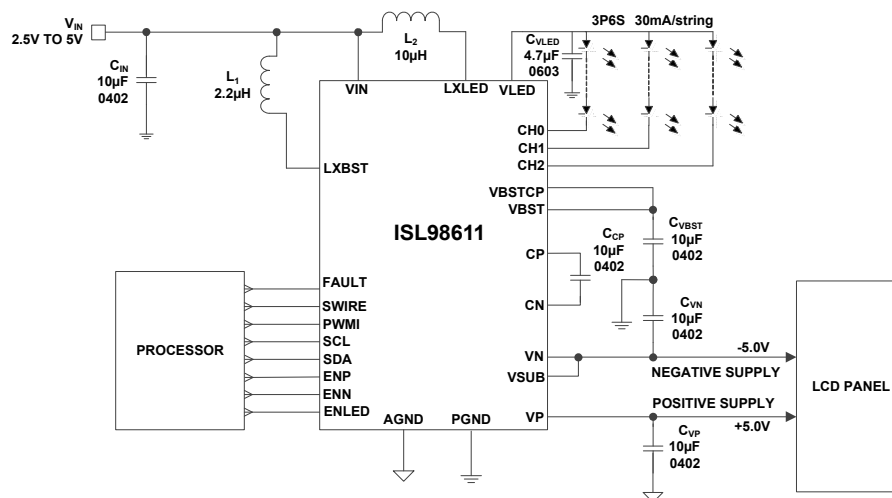


FIGURE 1. TYPICAL APPLICATION CIRCUIT FOR 3-CHANNEL LED DRIVER

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