

# High Efficiency Display Power and LED Driver for Smart Phones

## ISL98611

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 PCB area by integrating the two functions into a single IC and by requiring only 8 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 $\mu A$ ), 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<sup>2</sup> 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

## 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 $\mu A$
- Can drive 2 strings of LEDs
- 10-bit linear and 11-bit logarithmic DC output current control
- I<sup>2</sup>C, 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
- I<sup>2</sup>C adjustable output voltages and settings
- 1 $\mu A$  shutdown supply current
- RoHS compliant

TABLE 1. KEY DIFFERENCES BETWEEN PARTS

PART NUMBER	VP/VN OPTIONS (V)
ISL98611IIZ-T	$\pm 5$
ISL98611II56Z-T	$\pm 5.6$

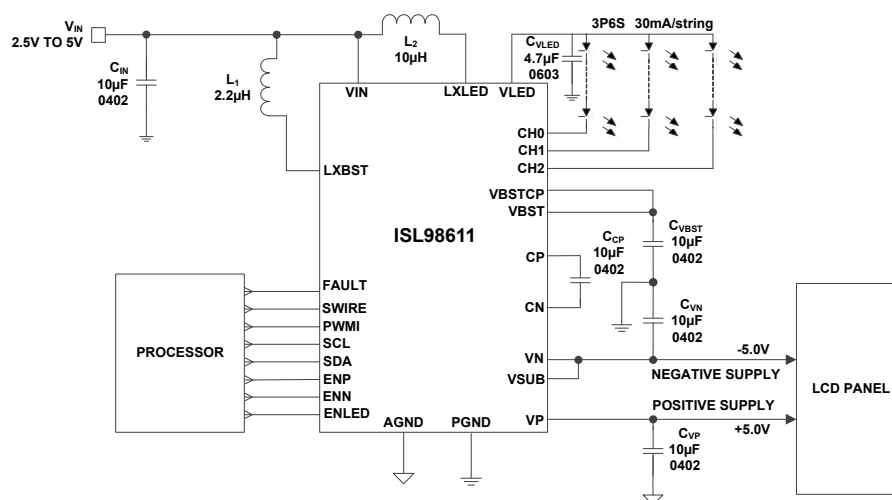


FIGURE 1. TYPICAL APPLICATION CIRCUIT FOR 3-CHANNEL LED DRIVER

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