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National Semiconductor

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LM3550 PRODUCT BRIEF

5A Flash LED Driver with Automatic Vf and ESR Detection for Mobile Camera Systems

General Description

LM3550 is a low noise, switched capacitor DC/DC converter designed to operate as a current-limited and adjustable (up to 5.3V) super-capacitor charger. LM3550 features user selectable super-capacitor charge termination voltages and an optimal charge termination mode that maximizes flash energy efficiency by accounting for flash element losses. Additionally, the device provides one adjustable constant-current output (up to 200mA) and one NFET controller ideal for driving one or more high current LEDs either in a high power Flash mode or a low power Torch mode.

The LM3550 can be configured to utilize a proprietary super-capacitor charging scheme (Optimal Mode), allowing faster charging times (0 to Target Voltage) and lower current source power dissipation. Optimal Charge mode adapts to changes in the flash LEDs forward voltage as well as the super-capacitor's ESR ensuring that the super-capacitor is charged to the ideal voltage required to sustain constant current flash operation.

The LED current and Flash pulse duration of the LM3550 can be programmed via an I²C compatible interface. The Strobe pin allows the Flash to be toggled via a Flash enable signal from a camera module. The $\overline{EOC}$ pin sinks current when the output voltage reaches 95% of the final value.

The ALD/TEMP input pin allows either a light sensor to adjust the flash current level based on the ambient light conditions, or it allows for over-temperature detection and protection of the LED during high power operation or high ambient temperature conditions by connecting an NTC thermistor temperature monitoring circuit to the pin.

Notice: This document is not a full datasheet. For more information regarding this product or to order samples, please contact your local National Semiconductor sales office or visit http//www.national.com/support/dtr.html.

Features

- Up to 5A Flash Current
- 4 Selectable Super-Capacitor Charge Voltage Levels (4.5V, 5.0V, 5.3V, Optimized)
- Flash Optimized Charge Mode for Optimal Efficiency
  -33% Faster Charge Time Using Optimal Mode
  -49% Less Power Dissipated in Current Source using Optimal Charge Mode
- Fast Super-Capacitor Charger with 500 mA Input Current Limit
- Adjustable Torch Current (60mA to 200mA)
- Ambient Light or LED Thermal Sensing with Current Scaleback
- End-of-Charge Output ($\overline{EOC}$)
- Dedicated Indicator LED Current Source
- No Inductor Required
- Manual Flash Enable via Strobe Pin Input
- Programmable Flash Pulse Duration, and Torch and Flash Currents via I²C Compatible Interface
- True Shutdown (LED Disconnect)
- Flash Time-Out Protection
- LED Temperature Protection or Ambient Light Sensing Pin
- Low Profile 20–Pin LLP Package (3.0 mm × 2.5 mm × 0.8 mm)

Applications

- Camera Phones
- Digital Still Camera
- Voltage Rail Management

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Voltage Reference	www.national.com/vref	Design Made Easy	www.national.com/easy
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