

Synchronous Boost Converter with 1.2A Dual High Side LED Drivers and I²C Compatible Interface

General Description

The LM3554 is a 2 MHz fixed frequency, current mode synchronous boost converter. The device is designed to operate as a dual 600mA (1.2A total) constant current driver for high current white LEDs, or as a regulated 4.5V or 5V voltage source.

The dual high side current sources allow for grounded cathode LED operation. An adaptive regulation method ensures the current source for each LED remains in regulation and maximizes efficiency.

The main features include: an I²C compatible interface for controlling the LED current or the desired output voltage, a hardware Flash enable input for direct triggering of the Flash pulse, and dual TX inputs which force the Flash pulse into a low current Torch mode allowing for synchronization to RF power amplifier events or other high current conditions. Additionally, an active high hardware enable (HWEN) input provides a hardware shutdown during system software failures.

Five protection features are available within the LM3554 including a software selectable input voltage monitor, an internal comparator, for interfacing with an external temperature sensor, four selectable current limits to ensure the battery current is kept below a predetermined peak level, an over-voltage protection feature to keep the output voltage below the OVP threshold in case of an open LED, and an output short circuit protection which limits the output current during an output short to GND. Additionally, the device provides various fault indicators including: a thermal fault flag indicating the LED temperature has tripped the thermal threshold, a flag indicating a TX event has occurred, a flag indicating the flash timeout counter has expired, a flag indicating the device die temperature has reached the thermal shutdown threshold, and a flag indicating an open or short LED.

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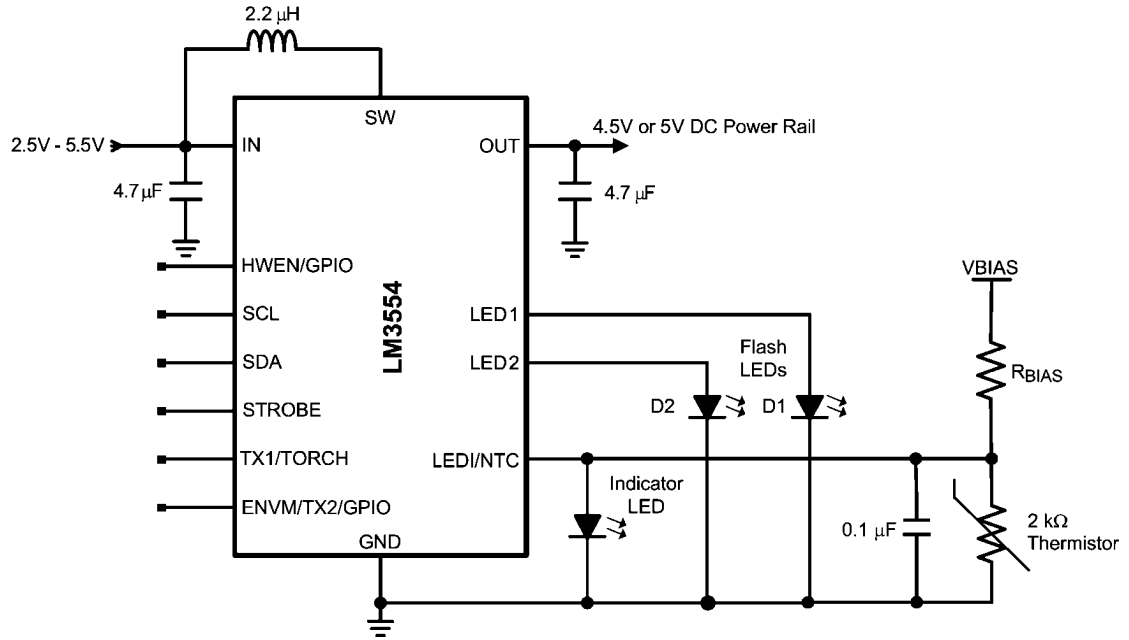
Features

- Dual High Side Current Sources
- Grounded Cathode Allowing for Better Heatsinking and LED Routing
- >90% Efficiency
- Ultra-Small Solution Size: < 23mm²
- Four Operating Modes: Torch, Flash, LED Indicator and Voltage Output
- Accurate and Programmable LED Current from 37.5mA to 1.2A
- Programmable 4.5V or 5.0V Constant Output Voltage
- Hardware Flash and Torch Enable
- LED Thermal Sensing and Current Scaleback
- Software Selectable Input Voltage Monitor
- Programmable Flash Timeout
- Dual Synchronization Inputs for RF Power Amplifier Pulse Events
- Open and Short LED Detection
- Active High Hardware Enable for Protection Against System Faults
- 400kHz I²C Compatible Interface
- 16-Bump (1.7mm × 1.7mm × 0.6mm) μSMD

Applications

- Camera Phone LED Flash Controller
- Class D Audio Amplifier Power
- LED Current Source Biasing

Typical Application Circuits



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Notes

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