

# STCF03

## LED flash driver with enhanced diagnostic and I<sup>2</sup>C™ interface



STMicroelectronics' STCF03 is a dual mode DC-DC converter designed to power a single high efficiency white LED in camera phones, PDAs and other hand-held devices.

The device operates at a constant switching frequency of 1.8 MHz (typ) and provides an output voltage of 2.5 V to 5.3 V from a 2.7 V to 5.5 V supply voltage.

This innovative LED flash controller with enhanced diagnostic and I<sup>2</sup>C communication provides brighter flash and higher quality pictures even in the worst lighting conditions.

By means of the I<sup>2</sup>C interface, the current intensity in flash and torch mode can be programmed separately using exponential steps. An auxiliary output can control an optional red LED recording indicator.

### Key features

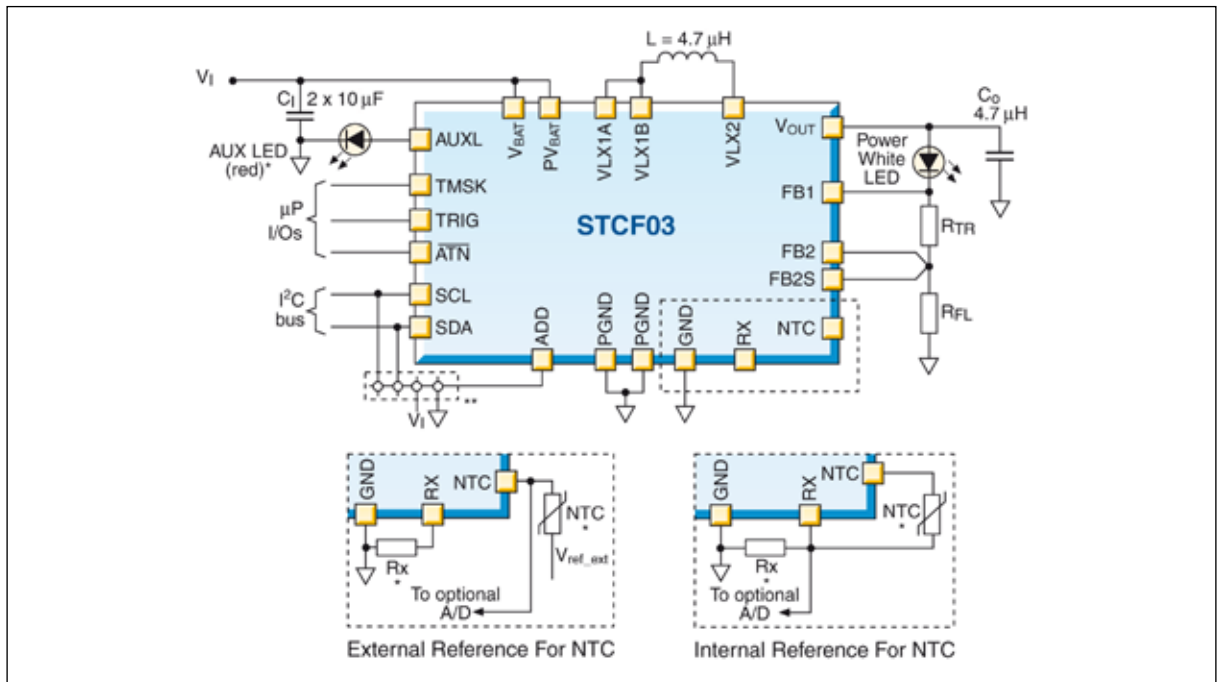
- Dual mode buck-boost DC-DC converter
- 1.8 MHz PWM control scheme
- Supplies one white power LED with a current in excess of 800 mA
- Operating input voltage from 2.7 to 5.5 V
- Operational modes supported:
  - Shutdown mode
  - Shutdown mode with NTC
  - Ready mode + auxiliary red LED
  - Flash mode: up to 800 mA
  - Torch mode: up to 200 mA
- Soft and hard flash triggering
- Flash and torch dimming in 16 exponential values
- Dimmable red LED indicator auxiliary output
- Internally or externally timed flash operation

### Main benefits

- Highly integrated solution
- Truly functional flash with minimal application size
- Flash intensity and duration easily programmable through I<sup>2</sup>C
- Real-time flash triggering through dedicated pin
- Extra features supported:
  - Torch mode for video recording
  - Autofocus and red-eye reduction
- Blinking red LED recording indicator
- Full set of protections including LED over-heating

The STCF03 buck-boost converter guarantees correct LED current control under all battery voltages and output voltage conditions. This highly efficient power supply solution is designed to drive a single white flash LED in camera phones, PDAs and other hand-held devices. The input current taken from the battery is kept below 1.5 A and the output current control ensures good current regulation over the forward voltage spread characteristics of the flash LED. The device supports hard and soft triggering of the flash and features several functions to protect the chip and

the power LED. These protection functions include soft-start control, chip over-temperature detection, and open and shorted LED detection. The device also implements a digital programmable time-out function which protects the LED from erroneous commands from the  $\mu\text{P}$ . All the functions are controlled through the I<sup>2</sup>C bus, reducing both the number of logic pins on the package and PCB traces on the board. An optional external NTC protects the LED against over-heating. The device is available in the QFN20 package.



STCF03 application schematic

\*Optional components to support auxiliary functions

## LED flash driver solutions

Part number	Topology	V <sub>in</sub> [V]	I <sub>out</sub> [mA]	Efficiency [%]	Frequency [MHz]
STCF03	Buck - Boost	2.7 to 5.5	800	92	1.8
STCF02	Buck - Boost	2.7 to 4.5	600	90	1.8
STCF01	Boost	2.6 to 5.5	300	90	1.5



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For selected STMicroelectronics sales offices fax:

China +86 21 34054689; France +33 1 55489569; Germany +49 89 4605454; Italy +39 02 8250449; Japan +81 3 57838216; Singapore +65 64815124; Sweden +46 8 58774411; Switzerland +41 22 9292900; United Kingdom and Eire +44 1628 890391; USA+1 781 861 2678

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