



## ADP1650 1.5 A LED Flash Driver with I2C Compatible Interface

### Interface

#### General Description:

The ADP1650 is a very compact, highly efficient, single white LED flash driver for high resolution camera phones that improves picture and video quality in low light environments. The device integrates a programmable 1.5 MHz or 3.0 MHz synchronous inductive boost converter, an I2C-compatible interface, and a 1500 mA current source. The high switching frequency enables the use of a tiny, 1 mm high, low cost, 1  $\mu$ H power inductor, and the current source permits LED cathode grounding for thermally enhanced, low EMI, and compact layouts.



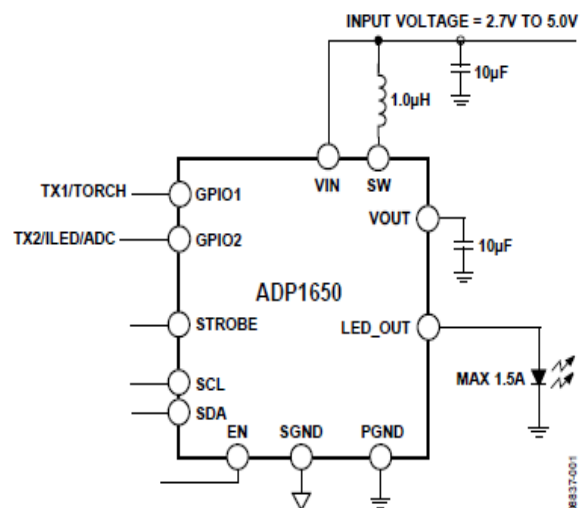
The LED driver maximizes efficiency over the entire battery voltage range to maximize the input-power-to-LED-power. Conversion and minimize battery current draw during flash events. A programmable dc battery current limit safely maximizes LED current for all LED VF and battery voltage conditions.

Two independent TxMASK inputs permit the flash LED current and battery current to reduce quickly during a power amplifier current burst. The I2C-compatible interface enables the pro-grammability of timers, currents, and status bit readback for operation monitoring and safety control.

The ADP1650 comes in a compact 12-ball, 0.5 mm pitch package and operates within specification over the full  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  junction temperature range.

#### Key Features:

- Ultracompact solution Small, 2 mm  $\times$  1.5 mm, 12-ball WLCSP package Smallest footprint, 1 mm height, 1  $\mu$ H power inductor
- LED current source for local LED grounding
- Simplified routing to/from LED
- Improved LED thermals
- Synchronous 3 MHz PWM boost converter, no external diode
- High efficiency: 90% peak Reduces high levels of input battery current during flash Limits battery current drain in torch mode



- I2C programmable Currents up to 1500 mA in flash mode for one LED with 7% accuracy over all conditions Currents up to 200 mA in torch mode
- Programmable dc battery current limit (4 settings)
- Programmable flash timer up to 1600 ms
- Low VBAT mode to reduce LED current automatically
- 4-bit ADC for LED VF, die/LED temperature readback
- Control
  - I2C-compatible control registers
  - External STROBE and torch input pins
  - 2 transmitter mask (TxMASK) inputs
- Safety
  - Thermal overload protection
  - Inductor fault detection
  - LED short-/open-circuit protection

## Applications:

- Camera-enabled cellular phones and smart phones
- Digital still cameras, camcorders, and PDAs

## Related Products Information:

Mfr Part #	Farnell #	Newark #	Description
ADP1650ACBZ-R7	1827346	74R5888	1.5 A LED Flash Driver with I2C-Compatible Interface -12-Ball Wafer Level Chip Scale Package [WLCSP]