Brief Description

The ZLED7012, one of our ZLED family of LED control ICs, is a low-noise, constant-frequency charge pump DC/DC converter that can drive up to four LED channels, providing a programmable constant current level ranging from 1.8mA to 20mA per LED channel. It can also drive higher current LEDs because its current sinks can operate in parallel. It enables white or other color LED applications that require uniform intensity and/or linear progressions in brightness. Capable of operating efficiently with DC voltage supplies ranging from 2.8V to 5.5V, it is ideal for small, battery-powered applications because very few external components are needed: typically one small-dimension 1µF capacitor across the C+ and C- pins and two small-dimension 2.2µF capacitors to GND from the VCC and Vout pins.

The ZLED7012's Pulse Count Control (PCC) serial digital input is used to enable/disable the LEDs and set the current level (14 settings using a nearly logarithmic scale to provide a linear brightness progression). This simple, high-speed interface allows efficient real-time management of LEDs via microcontrollers or control systems.

The ZLED7012's features include integrated soft-start circuitry to protect against excessive in-rush current during power-on and a low-current shutdown mode that reduces quiescent current consumption to approximately 1µA (typical) by disconnecting the load from the input when the EN/SET pin is low for a specified time.

Features

- Low quiescent current in low-current shutdown mode: 1µA typical; <2µA maximum

- Integrated thermal shutdown protection prevents damage by shutting down the ZLED7012 if the die junction temperature exceeds 160°C (typical)

- Fixed charge pump switching frequency: 1MHz (typ.)

- Soft-start feature protects against excessive inrush current during power-on

Benefits

- Current matching accuracy: ±0.9% (typical)

- One-pin on/off or brightness control for up to four LEDs via a simple PCC serial interface—no pulse-width modulation or additional control circuit needed

- 14 programmable current levels for achieving real-time control of effects such as LED fade-out or sudden changes in brightness

- Low EMI and back-injected noise because the charge pump is not inductor-based

- Very few external components needed for operation

- Flexible design enables diverse LED applications: up to 20mA per channel

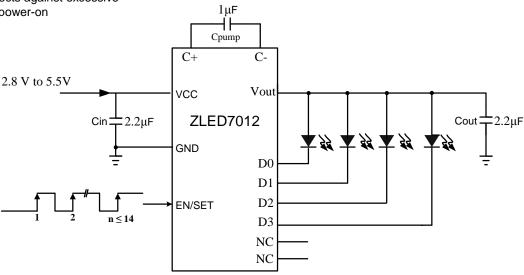- LED driver family concept with low-voltage six-channel LED driver ZLED7022

Available Support

- Evaluation Kit

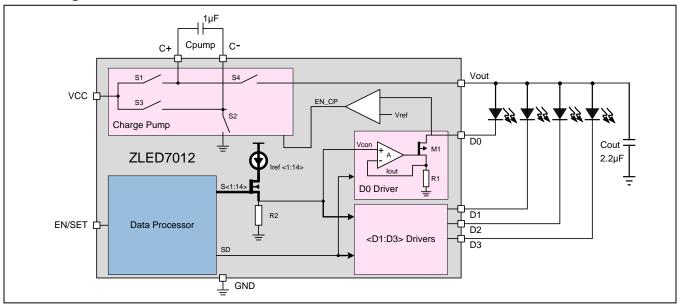## Physical Characteristics

- Voltage supply: 2.8V to 5.5V DC

- Operating temperature: -40°C to 85°C

- Small footprint 12-pin UTQFN package (2mm×2mm)

ZLED7012 Application Circuit

Block Diagram

Ordering Information

Product Sales Code	Description	Package
ZLED7012ZI1R	ZLED7012 – Low-Voltage Four-Channel LED Driver	UTQFN12 (2x2)mm Tape & Reel
ZLED7012KIT-E1	ZLED7012 Evaluation Board	Kit

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(Disclaimer Rev.1.01 Jan 2024)

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