

**PRODUCT SUMMARY**

# SKY81298: 2.4 A Three-Channel Flash LED Driver with I<sup>2</sup>C Control Interface

## Applications

- LED photo flash with Movie/Torch mode
- Tri/dual tone LED for color compensation
- “Selfie” flash for front-facing camera (PIP enabled)
- Smartphones/tablets

## Features

- Input voltage range: 2.5 V to 5.5 V
- Each channel can program up to 1.5 A with 12 mA step size; up to 2.4 A total combined output current
- > 90% LED efficiency at 250 mA (3.3 V < V<sub>IN</sub> < 3.6 V, V<sub>F</sub> = 3.3 V); > 85% LED efficiency at 1 A (3.4 V < V<sub>IN</sub> < 3.9 V, V<sub>F</sub> = 3.3 V)
- 2.75 MHz switching frequency
- Soft-start and input current limit
- Separate flash enable/flash inhibit
- Programmable blinking LED notification
- Industry standard 1 MHz I<sup>2</sup>C programming
  - Flash and Movie mode current
  - Input voltage monitor with programmable thresholds
  - Current read-back in input voltage monitor operation
  - Programmable safety timer
  - Fault read back
- Fault protection
  - Integrated safety timer
  - Over-voltage (open LED, open circuit)
  - Short circuit
  - Over-temperature protection
  - Flash mode input voltage monitor
  - Open-drain fault output
- Temperature range: –40 °C to +85 °C
- Small WLCSP (16-bump, 1.903 × 1.903 × 0.605 mm, 0.4 mm pitch) package (MSL1, 260 °C per JEDEC J-STD-020)



Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04–0074.

## Description

The SKY81298 is a high-efficiency, high-current boost converter with three independently programmable constant current outputs. The device is optimized for LED flash applications implementing tri-tone flash LED color compensation, or dual rear LED flash plus single front LED flash to support “selfie” pictures taken from the front-facing camera. The SKY81298 uses a single DC/DC boost and only one inductor to support all three LED outputs, and all LED outputs may be enabled simultaneously to support up to a total of 2.4 A total LED current.

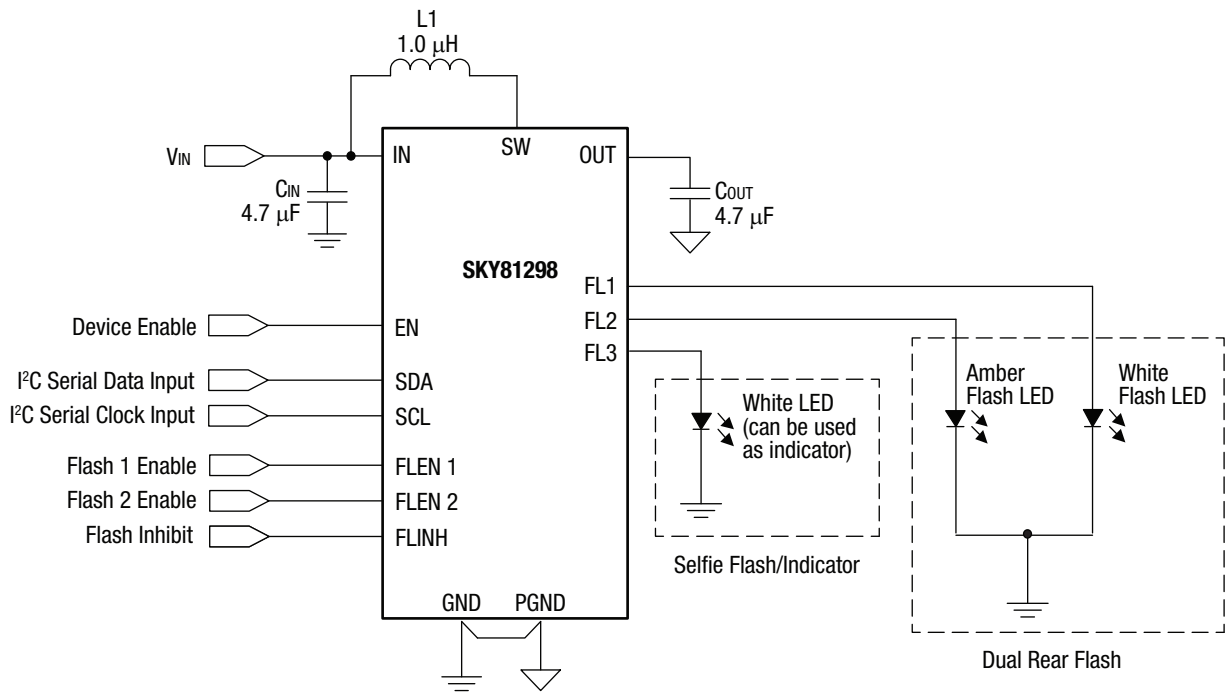
The SKY81298 maintains the flash LED output current using a DC-DC step-up converter with a bypass function to maximize efficiency under all load conditions. The flash current for each channel can be programmed up to 1.5 A at 12 mA step. The device uses a common cathode (current source) topology to allow a direct flash LED cathode connection to the ground plane which facilitates LED heat dissipation. The total combined output current for flash outputs is 2.4 A.

The high-frequency 2.75 MHz DC-DC boost switching frequency allows the use of a small external inductor and output capacitor, which makes the SKY81298 ideally suited for small battery-powered applications. A startup control circuit automatically senses the flash LED forward voltage at any programmed output current setting and determines the most efficient operation mode.

An industry standard I<sup>2</sup>C digital interface is used to program the SKY81298 LED Flash and Movie modes. Device operations are fully configurable; Movie and Flash current level, current limits, and fault reporting are managed through I<sup>2</sup>C. Also included are separate flash enable inputs to initiate the flash operation and a flash inhibit input either to reduce the flash current to Movie-mode levels or to shut off the flash current during high battery demand conditions. The flash enable inputs can be configured to control different flash LEDs as required by the system designer.

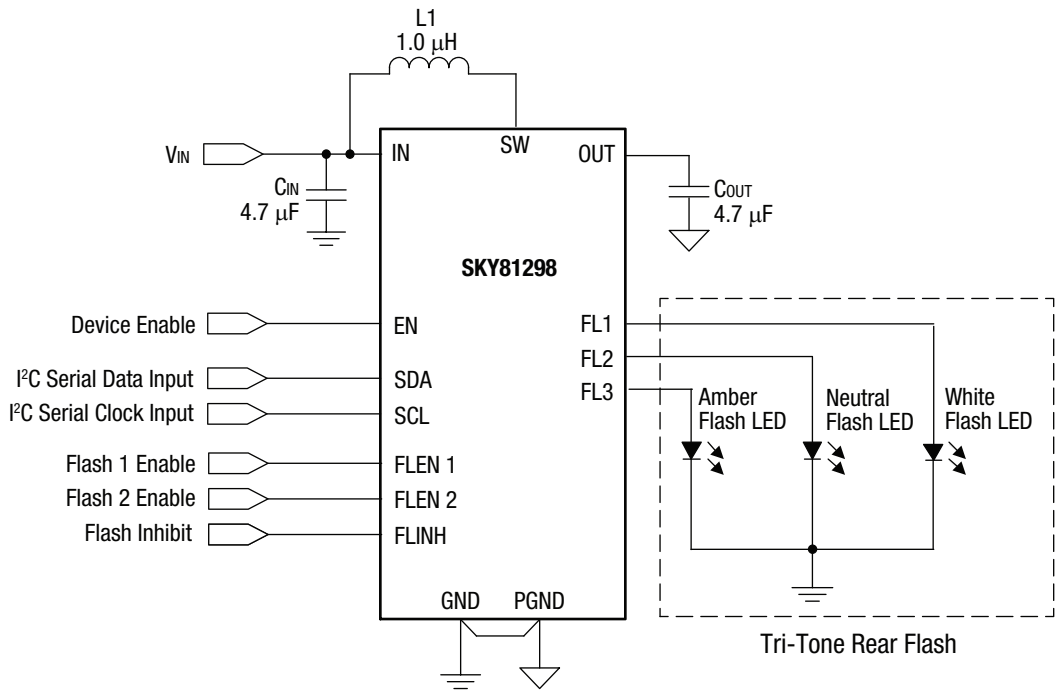
The SKY81298 is available in a small 1.903 × 1.903 × 0.605 mm, 16-bump Wafer-Level Chip Scale (WLCSP) package.

The typical application circuits are shown in Figures 1a and 1b.



t0691

Figure 1a. SKY81298 Typical Application Diagram for Dual Rear Flash and Front Selfie Flash



t0692

Figure 1b. SKY81298 Typical Application Diagram for Tri-tone Rear Flash

## Ordering Information

Model Name	Total Output Current	With Vin Monitor Function	With Blinking Function	Manufacturing Part Number
SKY81298-11	2.4 A	Yes	Yes	SKY81298-11-001
SKY81298-12	2.4 A	Yes	No	SKY81298-12-001
SKY81298-13	2.4 A	No	Yes	SKY81298-13-001
SKY81298-14	2.4 A	No	No	SKY81298-14-001
SKY81298-21	2 A	Yes	Yes	SKY81298-21-001
SKY81298-22	2 A	Yes	No	SKY81298-22-001
SKY81298-23	2 A	No	Yes	SKY81298-23-001
SKY81298-24	2 A	No	No	SKY81298-24-001

Copyright © 2015 Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks and the Skyworks symbol are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at [www.skyworksinc.com](http://www.skyworksinc.com), are incorporated by reference.