

PRODUCT SUMMARY

SKY81298: 2.4 A Three-Channel Flash LED Driver with I²C 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 ($3.3\text{ V} < V_{IN} < 3.6\text{ V}$, $V_F = 3.3\text{ V}$); > 85% LED efficiency at 1 A ($3.4\text{ V} < V_{IN} < 3.9\text{ V}$, $V_F = 3.3\text{ V}$)
- 2.75 MHz switching frequency
- Soft-start and input current limit
- Separate flash enable/flash inhibit
- Programmable blinking LED notification
- Industry standard 1 MHz I²C 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)

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.

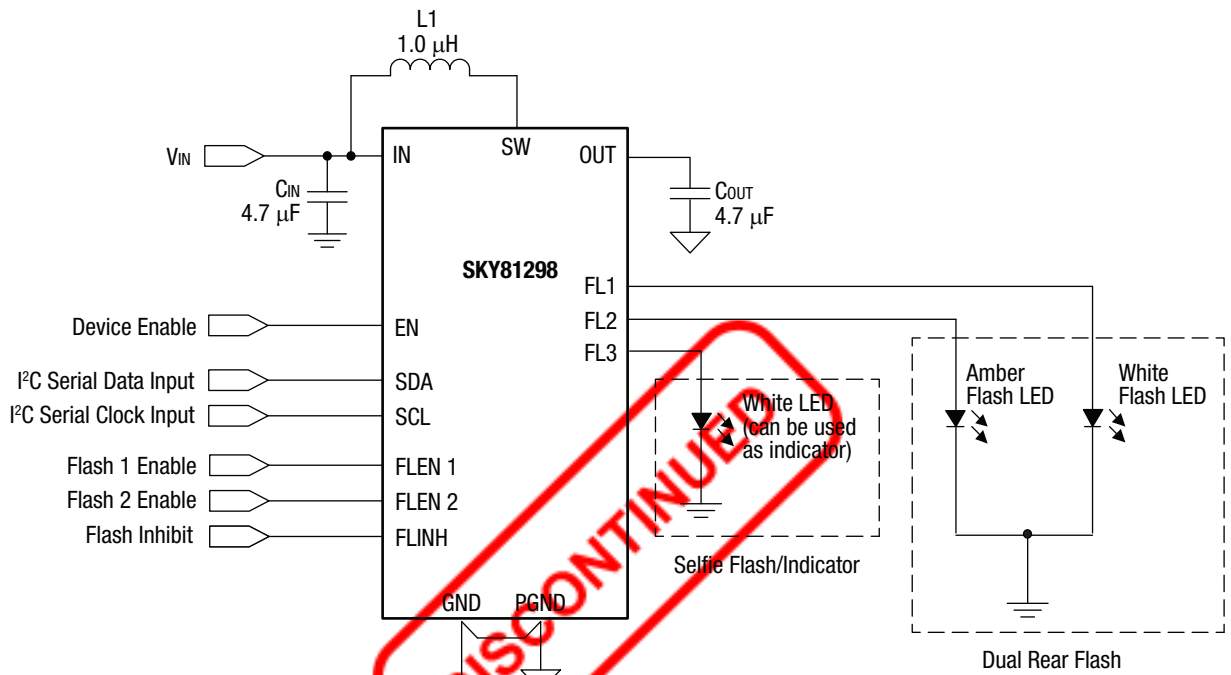
An industry standard I²C digital interface is used to program the SKY81298 LED Flash and Movie modes. Device operations are fully configurable; Movie and Flash current level, current limits, and fault reporting are managed through I²C. Also included are separate flash enable inputs to initiate the flash 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.

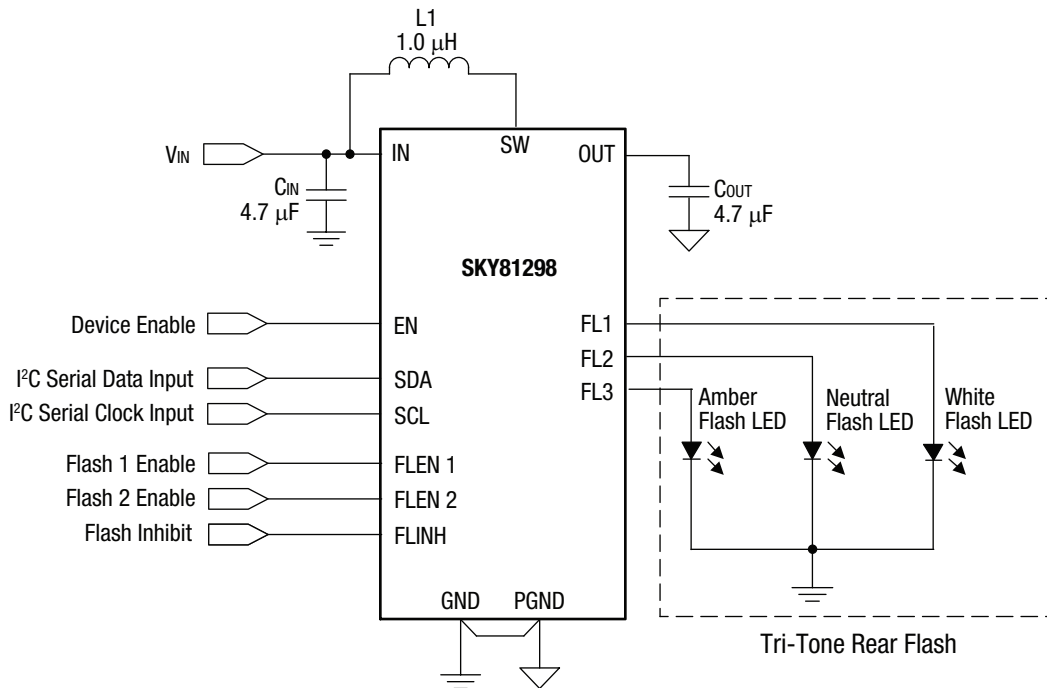


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Figure 1a. SKY81298 Typical Application Diagram for Dual Rear Flash and Front Selfie Flash



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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



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