

PRODUCT SUMMARY

SKY81452: Six-Channel, High Efficiency White LED Driver with Touch Screen Driver Supply

Applications

- Tablet PCs
- Notebook computers
- Monitors
- Portable TV/DVD players

Features

- Input voltage range: 2.5 V to 5.5 V
- Integrated 28 V boost converter
- Up to 91% efficiency
- Minimum off time: 50 ns
- Six current channels, 60 mA per channel
- Adjustable switching frequency: 600 kHz to 2 MHz
- Programmable boost current limit
- Accuracy matching: $\pm 1.5\%$ @ 30 mA
- Fade in/out feature for brightness control
- Touch panel bias output: 4.5 V to 25.0 V
- I²C interface control
- Direct PWM dimming (100 Hz to 50 kHz)
- Individual channel enable/disable, fault trigger point, and status programming
- Eight-bit/256 programmable analog dimming
- Ten-bit PWM duty control ($f_{\text{PWM}} = 100 \text{ Hz to } 25 \text{ kHz}$)
- Eight-bit PWM duty control ($25 \text{ kHz} < f_{\text{PWM}} \leq 50 \text{ kHz}$)
- Dimming mode selection (DPWM, analog)
- Programmable maximum LED current and boost oscillation frequency using external resistor setup
- Phase shift control
- System VSYNC input to synchronize/truncate PWM dimming (45 Hz to 300 Hz range)

- Fault protection and independent channel shutdown for:
 - Open or shorted LED(s)
 - Boost over-voltage and current protection
 - Over temperature condition
- Ultra small, low profile WLCSP (25-bump, 2.44 mm x 2.44 mm) package (MSL1, 260 °C per JEDEC J-STD-020)



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Description

The SKY81452 is a highly integrated, high efficiency LED backlight solution for tablets, notebook computers, monitors, and other portable devices.

An integrated boost converter provides a high voltage output for driving up to 28 V. Six precision current sinks are programmable up to 60 mA per string. The integrated boost regulator switching frequency is adjustable from 600 kHz to 2 MHz for system integration flexibility, which optimizes efficiency and minimizes external passive component requirements.

The SKY81452 supports Direct Pulse Width Modulation (DPWM) dimming and Analog Pulse Width Modulation (APWM). In the DPWM dimming mode, the output waveform follows the Pulse Width Modulation Input (PWMI) signal and the current level is set by I²C control and an external RSET resistor. In the APWM mode, the PWMI signal duty and the I²C brightness control signal are multiplied to control the output current level.

When the PWM pin is not used, it should be pulled high.

For system protection, the SKY81452 senses open or short LED conditions and over temperature events. High voltage current sink design prevents damage resulting from shorted LEDs. System faults are reported through the I²C interface.

The SKY81452 is available in a space saving 2.44 mm x 2.44 mm, 25-bump Wafer-Level Chip Scale Package (WLCSP). Typical application circuits are shown in Figure 1 (single cell input) and in Figure 2 (dual cell input).

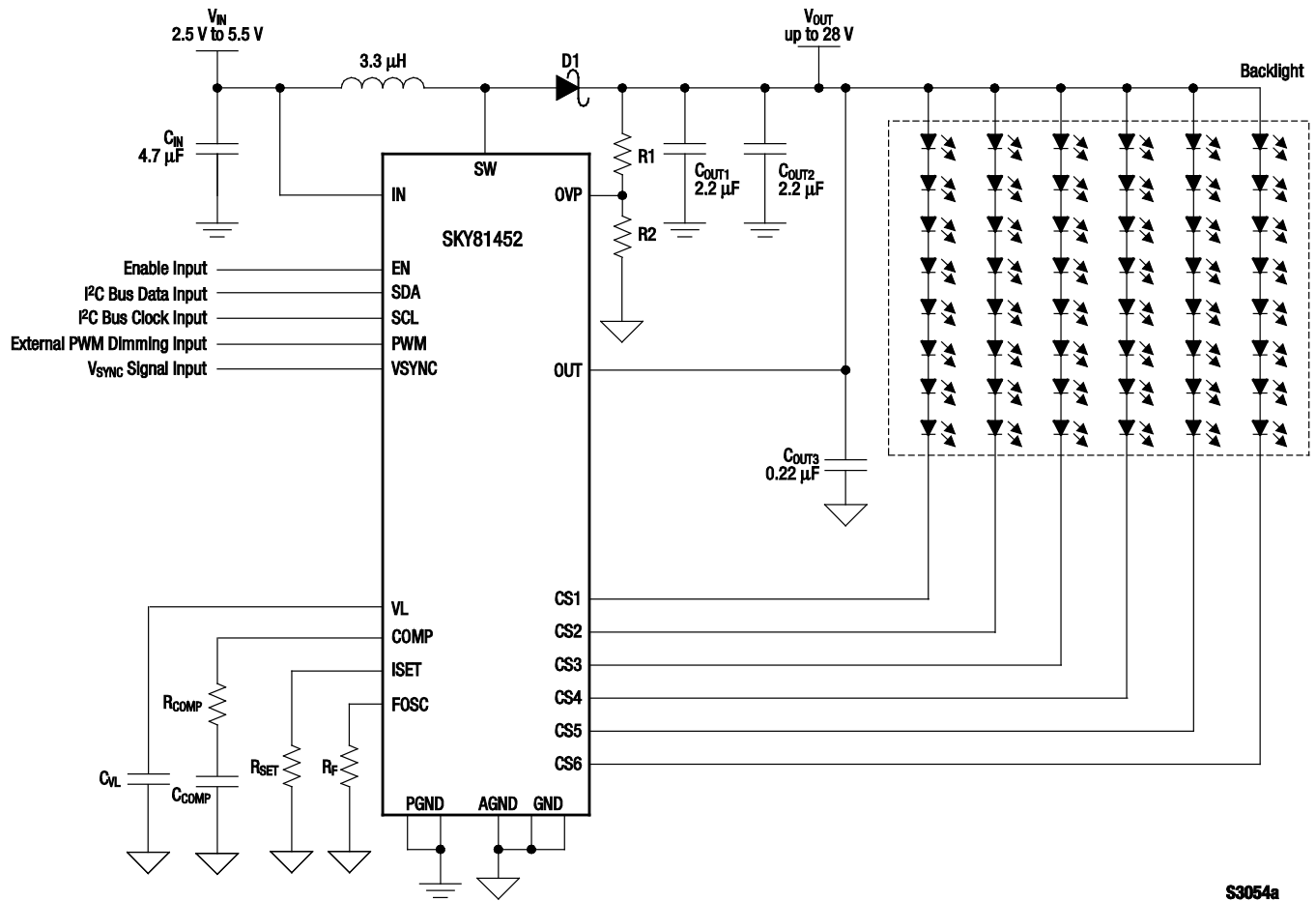
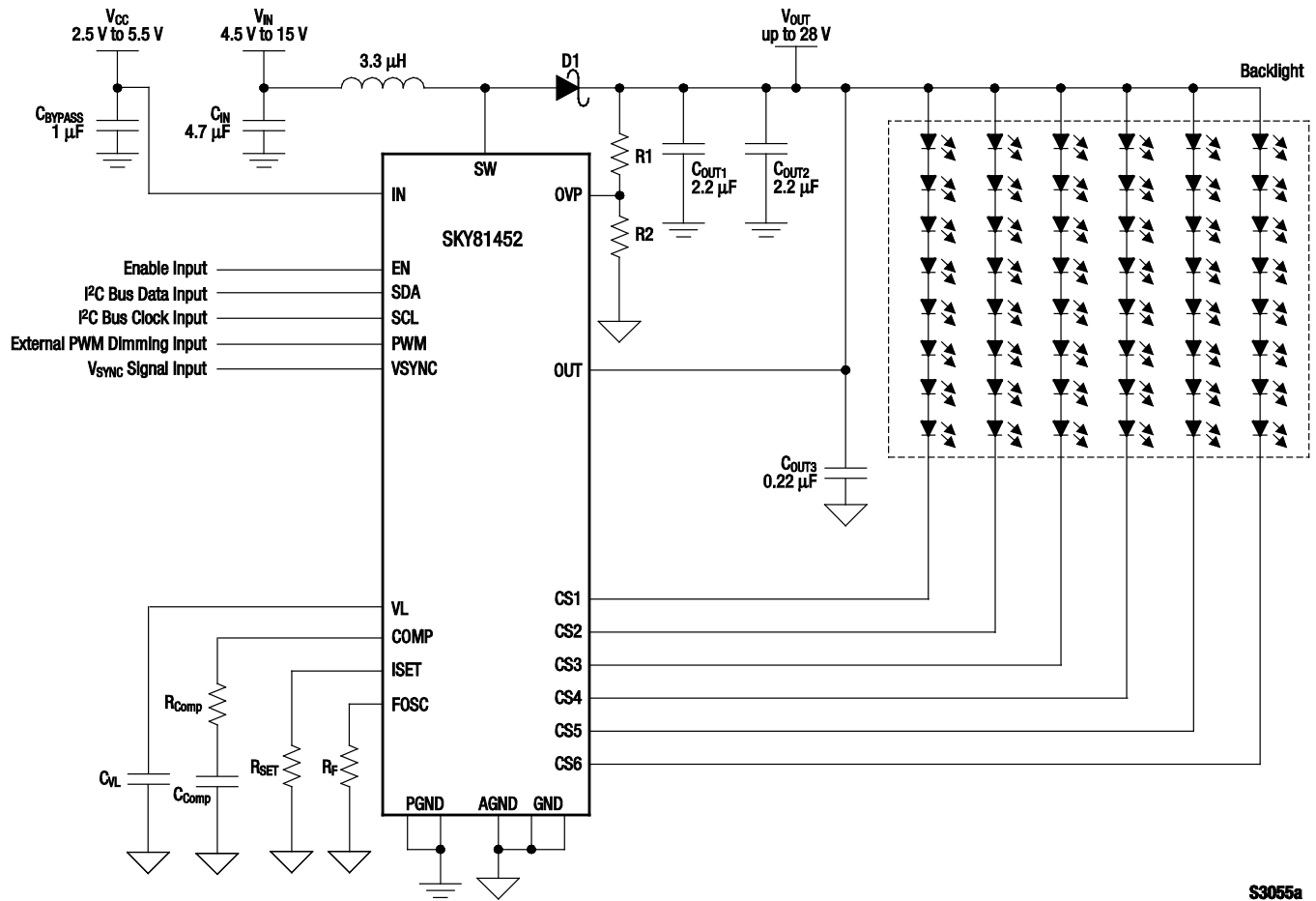


Figure 1. Typical Application Circuit (Single Cell Input)



S3055a

Figure 2. Typical Application Circuit (Dual Cell Input)

Ordering Information

Model Name	Manufacturing Part Number	Evaluation Board Part Number
SKY81452 LED Driver with Touch Screen Driver Supply	SKY81452-13-001 SKY81452-21-001 SKY81452-22-001	SKY81452-EVB

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