

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 ($f_{PWM} = 100$ Hz to 25 kHz)
- Eight-bit PWM duty control (25 kHz $< f_{PWM} \leq 50$ 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)



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 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).

PRODUCT SUMMARY • SKY81452 SIX-CHANNEL BOOST LED DRIVER WITH TOUCH SCREEN DRIVER SUPPLY

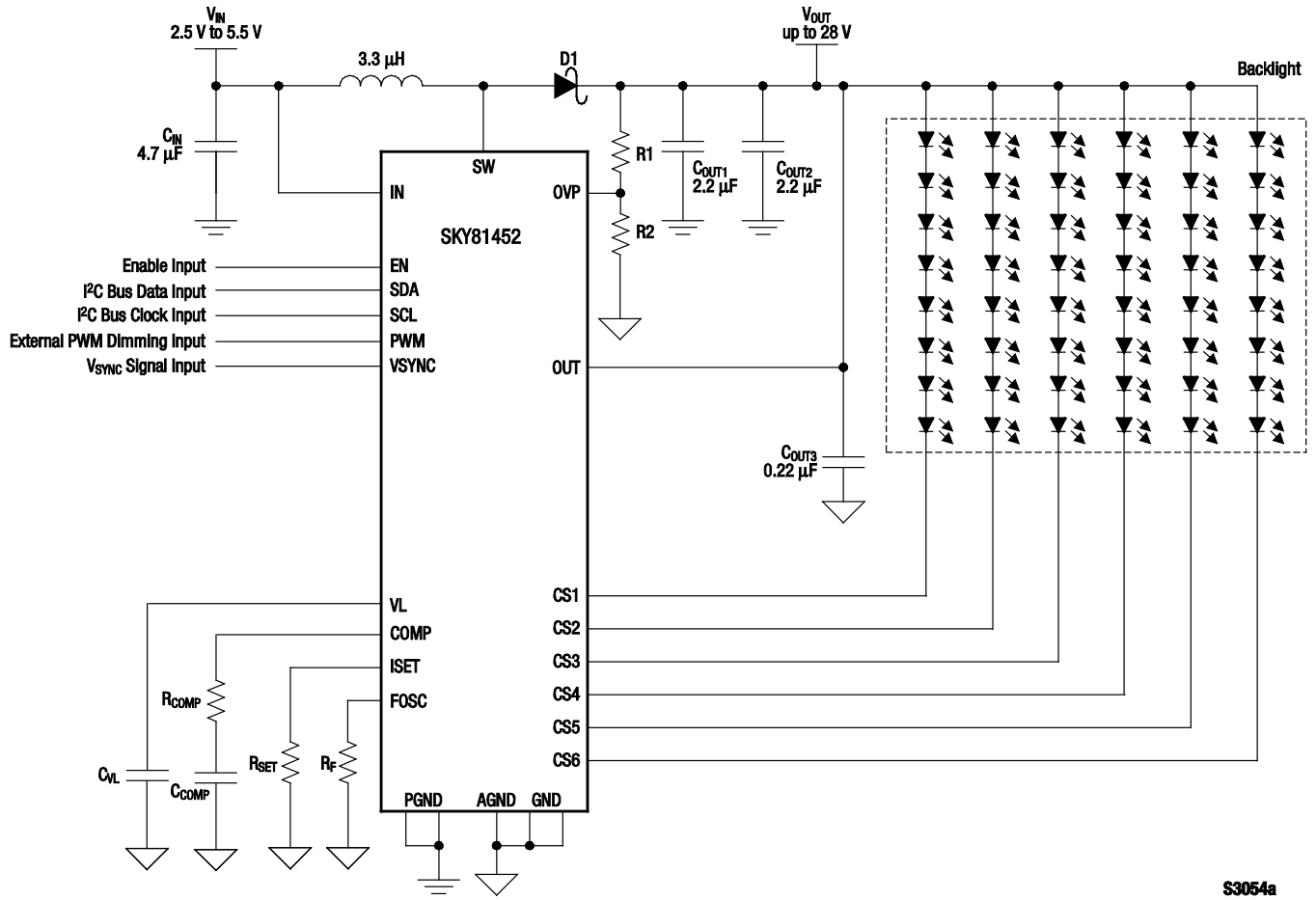
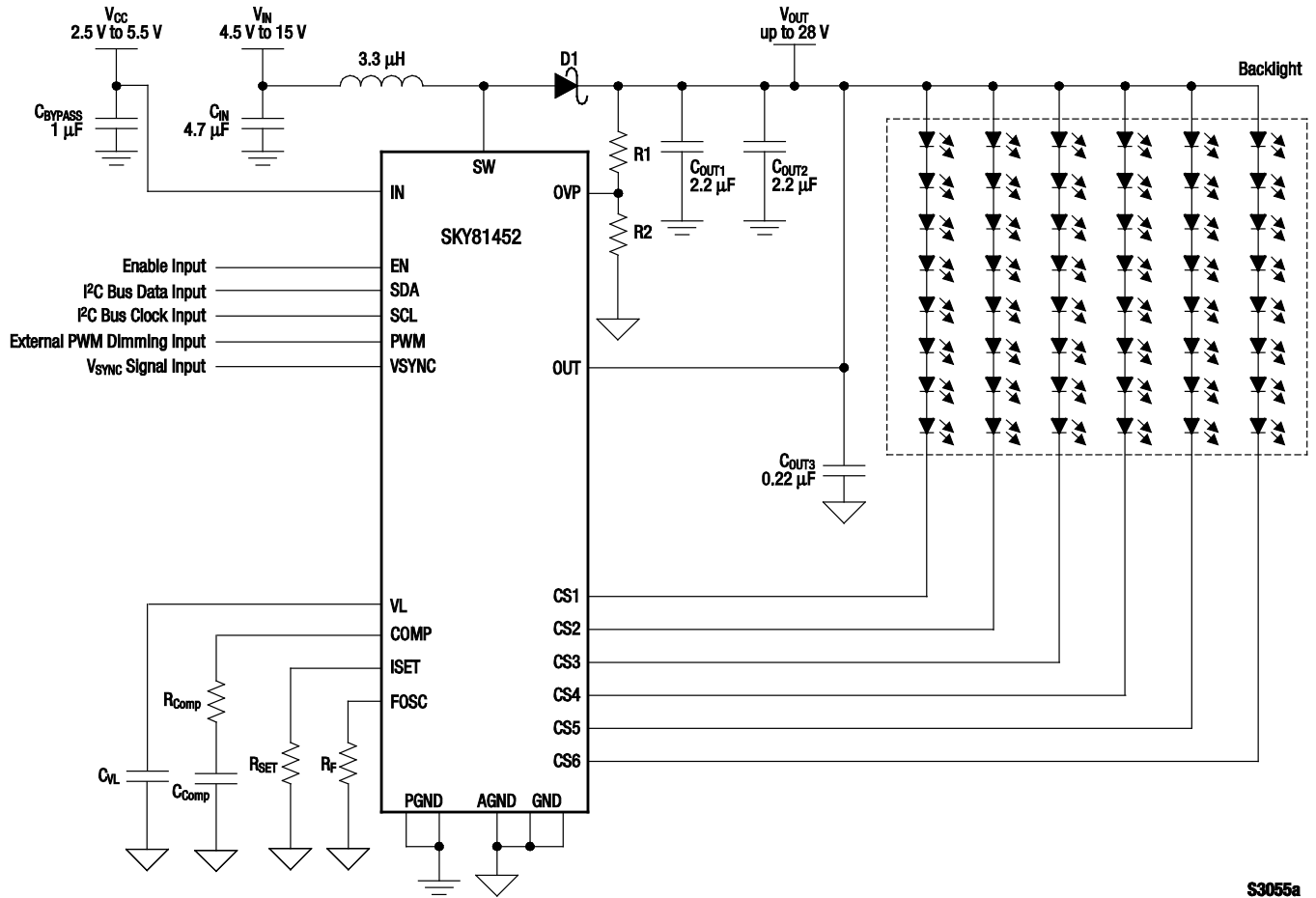


Figure 1. Typical Application Circuit (Single Cell Input)

S3054a



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

Copyright © 2013 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, the Skyworks symbol, and "Breakthrough Simplicity" 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, are incorporated by reference.