19-4455; Rev 0; 2/09

MAX8831 Evaluation Kit

Evaluates: MAX8831

General Description

The MAX8831 evaluation kit (EV kit) is a fully assembled and tested PCB for evaluating the MAX8831 white LED step-up converter. The MAX8831 EV kit operates from an input supply range of 2.7V to 5.5V and is controlled by an I²C interface. The MAX8831 features a 60mA, 28V PWM DC-DC step-up converter with five low-dropout LED current regulators. Each of the five current regulators accommodates up to 9 series LEDs (depending on LED string forward voltage), and are independently programmed using an I²C interface. The I²C interface controls all operational aspects of the current regulators, including on/off state, LED current, ramp-up/ramp-down timers, and blink rate timers (LED3, LED4, and LED5).

The MAX8831 EV kit also includes Windows® 2000/XP- and Windows Vista®-compatible software that provides a simple graphical user interface (GUI) for exercising the features of the MAX8831. The MAX8831 EV kit features an I²C interface to control the LED current, ramp-up/ramp-down time, and blink on/off time. To control the MAX8831 EV kit from a PC, order the CMAXQUSB command module along with the MAX8831 EV kit.

Ordering Information

PART	TYPE
MAX8831EVKIT+	EV Kit

+Denotes lead(Pb)-free and RoHS compliant.

Features

- **28V Step-Up DC-DC Converter**
- **I²C Interface Control**
- **Two 25.25mA LED Strings (LED1, LED2) for Display Backlighting**
  - **I²C-Programmable Output Current (50µA to 25.25mA)**
  - **128-Step Logarithmic Dimming**
  - **Individually Programmable Ramp (Up/Down) Timers**
- **Three 5mA LED Strings for Keypad Lighting**
  - **I²C-Programmable Output Current (50µA to 5mA)**
  - **32-Step Logarithmic Dimming**
  - **Individually Programmable Ramp (Up/Down) Timers**
  - **Individual Blink Rate and Duty-Cycle Timers**
- **RGB LED Module**
- **Alternative Power Supply (VIN2) for LED3, LED4, and LED5 Strings**
- **Open/Short LED and Open-Circuit Diode Detection**
- **Thermal Shutdown and Output Overvoltage Protection**
- **Lead(Pb)-Free and RoHS Compliant**
- **Fully Assembled and Tested PCB**

Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	1µF ±10%, 6.3V X5R ceramic capacitor (0402) Taiyo Yuden JMK105BJ105K
C2	1	1µF ±10%, 35V X5R ceramic capacitor (0603) Taiyo Yuden GMK107BJ105K
C3	1	0.1µF ±10%, 16V X5R ceramic capacitor (0402) TDK C1005X5R1C104K
C4	1	0.22µF ±10%, 16V X5R ceramic capacitor (0402) TDK C1005X5R1C224K
C5	1	1µF ±10%, 25V X5R ceramic capacitor (0603) TDK C1608X5R1E105K

DESIGNATION	QTY	DESCRIPTION
D1	1	500mA, 40V Schottky diode (SOD323) Central Semi CMDSH05-4
D2–D17	16	White LEDs Nichia NSSW061AT
D18–D44	27	White LEDs Nichia NHSW046AT
D45	1	RGB LED module Lumex SML-LX3632SISUGSBC
J1	1	2 x 10 right-angle receptacle Methode M65S-R220-11-01W
JU1–JU5, JU9, JU10, JU11	8	5-pin headers Sullins PEC36SAAN Digi-Key S1012E-36-ND

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MAX8831 Evaluation Kit

Component List (continued)

DESIGNATION	QTY	DESCRIPTION
JU6, JU7, JU8	3	2-pin headers Sullins PEC36SAAN Digi-Key S1012E-36-ND
JU12, JU13	2	3-pin headers Sullins PEC36SAAN Digi-Key S1012E-36-ND
L1	1	10µH ±20% inductor TOKO 1098AS-100M (DE2812C Series, 0.92A, 290mΩ, 3mm x 3.2mm x 1.2mm)

DESIGNATION	QTY	DESCRIPTION
R1–R4	0	Not installed, resistors (0402) R1 and R2 are open; R3 and R4 are PCB short
U1	1	White LED step-up converter (16 WLP) Maxim MAX8831EWE+
—	1	PCB: MAX8831 Evaluation Kit+

Component Suppliers

SUPPLIER	PHONE	WEBSITE
Central Semiconductor Corp.	631-435-1110	www.centralsemi.com
Digi-Key Corp.	800-344-4539	www.digikey.com
Lumex Inc.	800-278-5666	www.lumex.com
Methode Electronics	708-867-6777	www.methode.com
Nichia Corp.	248-352-6575	www.nichia.com
Sullins Electronics Corp.	760-744-0125	www.sullinselectronics.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com
TOKO America, Inc.	847-297-0070	www.tokoam.com

Note: *Indicate that you are using the MAX8831 when contacting these component suppliers.*

MAX8831 EV Kit Files

FILE	DESCRIPTION
INSTALL.EXE	Installs the EV kit files on your computer
MAX8831.EXE	Application program
FTD2XX.INF	USB device driver file
UNINST.INI	Uninstalls the EV kit software

Quick Start

Recommended Equipment

- MAX8831 EV kit
- Adjustable 5V power supply capable of delivering 1A (PS1)
- One digital multimeter (DMM1)
- A user-supplied Windows 2000/XP- or Windows Vista-compatible PC with a spare USB port
- CMAXQUSB command module (USB cable included)

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV kit software. Text in **bold and underlined** refers to items from the Windows operating system.

Procedure

The MAX8831 EV kit is a fully assembled and tested surface-mount board. Follow the steps below and Figure 1 to set up and verify the MAX8831 and board operation. **Note:** If any of the jumpers (JU1–JU11) are removed while the step-up converter is on ($V_{OUT} > V_{IN}$), an open

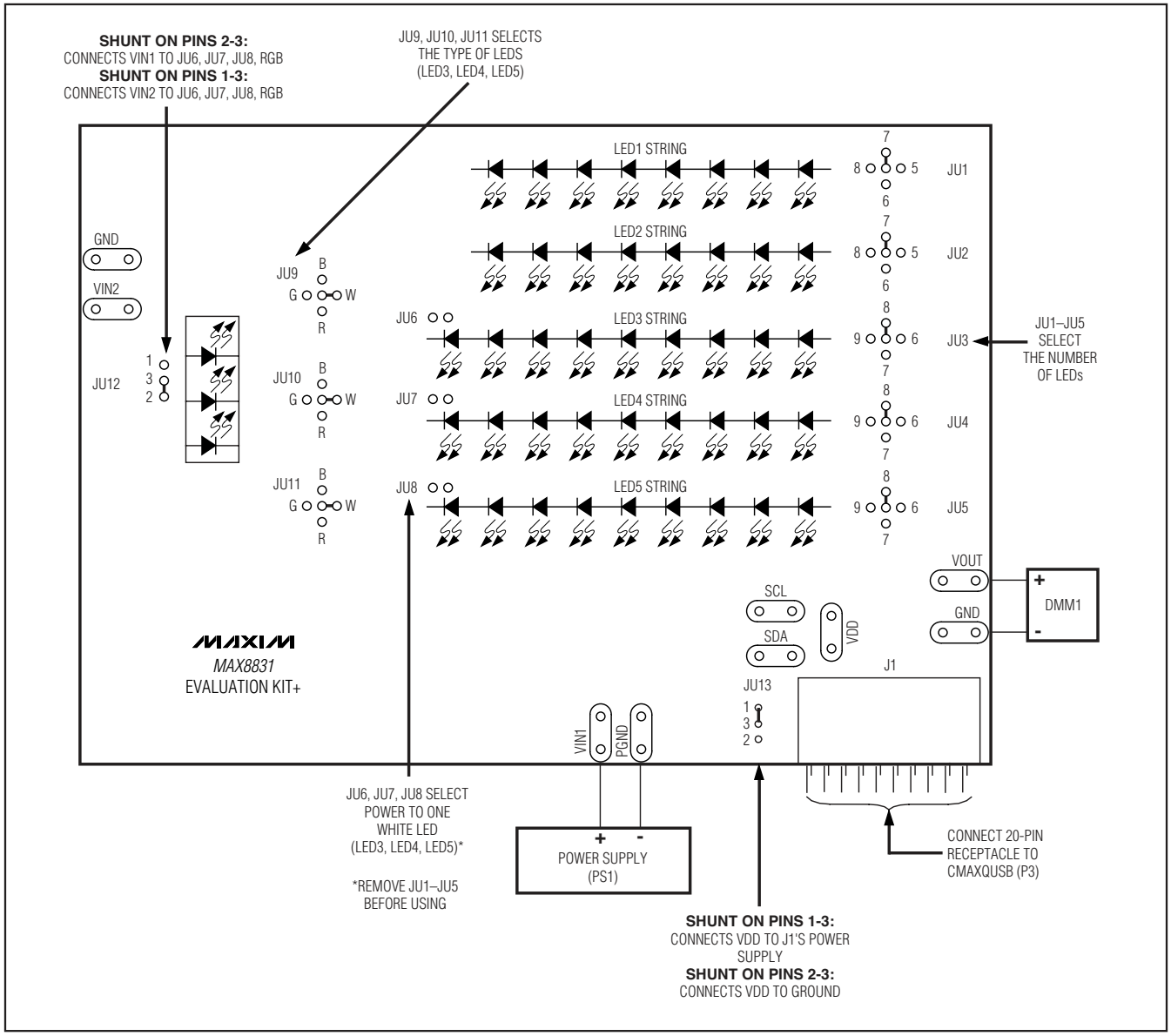

Figure 1. Initial Test Procedure Setup for MAX8831 EV Kit

LED fault occurs. Verify that the step-up converter is off ($V_{OUT} \le V_{IN}$) before configuring a jumper setting.

1) Visit **www.maxim-ic.com/evkitsoftware** to download the latest version of the EV kit software, 8831Rxx.ZIP. Save the EV kit software to a temporary folder and uncompress the ZIP file.
2) Install the EV kit software on your computer by running the INSTALL.EXE program inside the temporary folder. The program files are copied and icons are created in the Windows **Start | Programs** menu.
3) Connect the USB cable from the PC to the CMAXQUSB command module. A **Building Driver Database** window pops up in addition to a **New Hardware Found** message when installing the USB driver for the first time. If you do not see a window that is similar to the one described above after 30s, remove the USB cable from the board and recon-

nect it. Administrator privileges are required to install the USB device driver on Windows.

4) Follow the directions of the **Add New Hardware Wizard** to install the USB device driver. Choose the **Search for the best driver for your device** option. Specify the location of the device driver to be **C:\Program Files\MAX8831** (default installation directory) using the **Browse** button. During device driver installation, Windows may show a warning message indicating that the device driver does not contain a digital signature. This is not an error condition and it is safe to proceed with installation.
5) Preset the power supply (PS1) to 5V. Turn off the power supply. **Do not turn on the power supply until all connections are completed.**
6) On the CMAXQUSB command module, ensure that the shunt on jumper JU1 is in the 3.3V position and the pullup resistors (R5 and R6) are enabled by SW1.
7) Verify that the jumpers on the MAX8831 EV kit are configured as shown in Table 1.
8) Carefully connect the boards by aligning the 20-pin connector of the MAX8831 EV kit with the 20-pin header of the CMAXQUSB interface board. Gently press them together.
9) Connect the positive lead of DMM1 to VOUT and the negative lead to GND.
10) Connect the positive lead of PS1 to VIN1 and the negative lead to PGND.
11) Turn on the power supply (PS1).
12) Verify that the voltage read by DMM1 is approximately 5V.
13) Start the MAX8831 EV kit software by opening its icon at **Start | Programs | MAX8831 EVALUATION KIT**
14) Normal device operation is verified when **Command Module Connected, Device Connected** is displayed at the top of the MAX8831 EV kit main window (Figure 2).
15) Configure the **Brightness Control** tab, as shown in Figure 2.
16) Verify that LED1 and LED2 both have 7 LEDs on and that LED3, LED4, and LED5 have 8 LEDs on for each string. Note the ramp-up times for LED1–LED5.
17) Select the corresponding **On/Off** checkbox to disable LED1–LED5. Note the ramp-down times for LED1–LED5. Wait until the voltage read by DMM1 is 5V before proceeding.
18) Select **8192** for both **Up Time(ms)** and **Down Time(ms)** for LED1–LED5, as shown in Figure 3.
19) Select the corresponding **On/Off** checkbox to enable LED1–LED5. Note that the ramp-up times for LED1–LED5 increased.
20) Select the corresponding **On/Off** checkbox to disable LED1–LED5. Note the ramp-down times for LED1–LED5. Wait until the voltage read by DMM1 is 5V before proceeding.
21) Select **64** for both **Up Time(ms)** and **Down Time(ms)** for LED3, LED4, and LED5.
22) Select **1024** for both **Off Time(ms)** and **On Time(ms)** for LED3, LED4, and LED5, as shown in Figure 4.
23) Check the **Enabled Blink** checkboxes and corresponding **On/Off** checkboxes for LED3, LED4, and LED5 to enable the blink control.
24) Verify that LED3, LED4, and LED5 are blinking and that the on and off times are the same.
25) Select the corresponding **On/Off** checkbox to disable LED3, LED4, and LED5. Wait until the voltage read by DMM1 is 5V before proceeding.

Table 1. Default Jumper Settings (JU1–JU13)

JUMPER	DEFAULT SHUNT POSITION
JU1	Center pin and 7
JU2	Center pin and 7
JU3	Center pin and 8
JU4	Center pin and 8
JU5	Center pin and 8
JU6	Not installed
JU7	Not installed
JU8	Not installed
JU9	Center pin and W
JU10	Center pin and W
JU11	Center pin and W
JU12	2-3
JU13	1-3

Table 2. RGB Configuration

JUMPER	DEFAULT SHUNT POSITION
JU9	Center pin and B
JU10	Center pin and G
JU11	Center pin and R

26) Remove the shunts on JU9, JU10, and JU11 and install according to Table 2.

27) Select the corresponding **On/Off** checkbox to enable LED3, LED4, and LED5.

28) Verify that RGB LED module D45's red, blue, and green LEDs are blinking and the on and off times are the same.

29) Select the corresponding **On/Off** checkbox to disable LED3, LED4, and LED5.

When evaluation of the MAX8831 EV kit is completed, use the following steps to power down the EV kit:

1) Turn off the power supply (PS1).

2) Disconnect all test leads from the EV kit.

Detailed Description of Software

User-Interface Panel

The MAX8831 EV kit uses the CMAXQUSB command module for an I²C interface to control the MAX8831 configurations. The MAX8831 EV kit software displays four tabs to set the MAX8831 configurations: **Brightness Control**, **Ramp Rate Control**, **Blink Control**, and **Status**. Changes to the controls followed by a **Write/Write All** updates the appropriate registers of the MAX8831. After any write or read operation, the related command and data sent are shown in the top-left box.

Brightness Control Tab

The **Brightness Control** tab sheet (Figure 2) provides on/off control and LED current control for the LED1–LED5 strings. LED1 and LED2 are programmable from 50µA to 25.25mA in 128 logarithmic steps. LED3, LED4, and LED5 are programmable from 50µA to 5mA in 32 logarithmic steps.

Also under the **Brightness Control** tab is the power-supply selector for LED3, LED4, and LED5. If the output voltage of the step-up converter is chosen to supply LED3, LED4, and LED5, verify that **Boost Convert** is selected in the **Boost Control** section (Figure 2). If an alternate supply (VIN2) is chosen to supply LED3, LED4, and LED5, verify that the **External Source** is

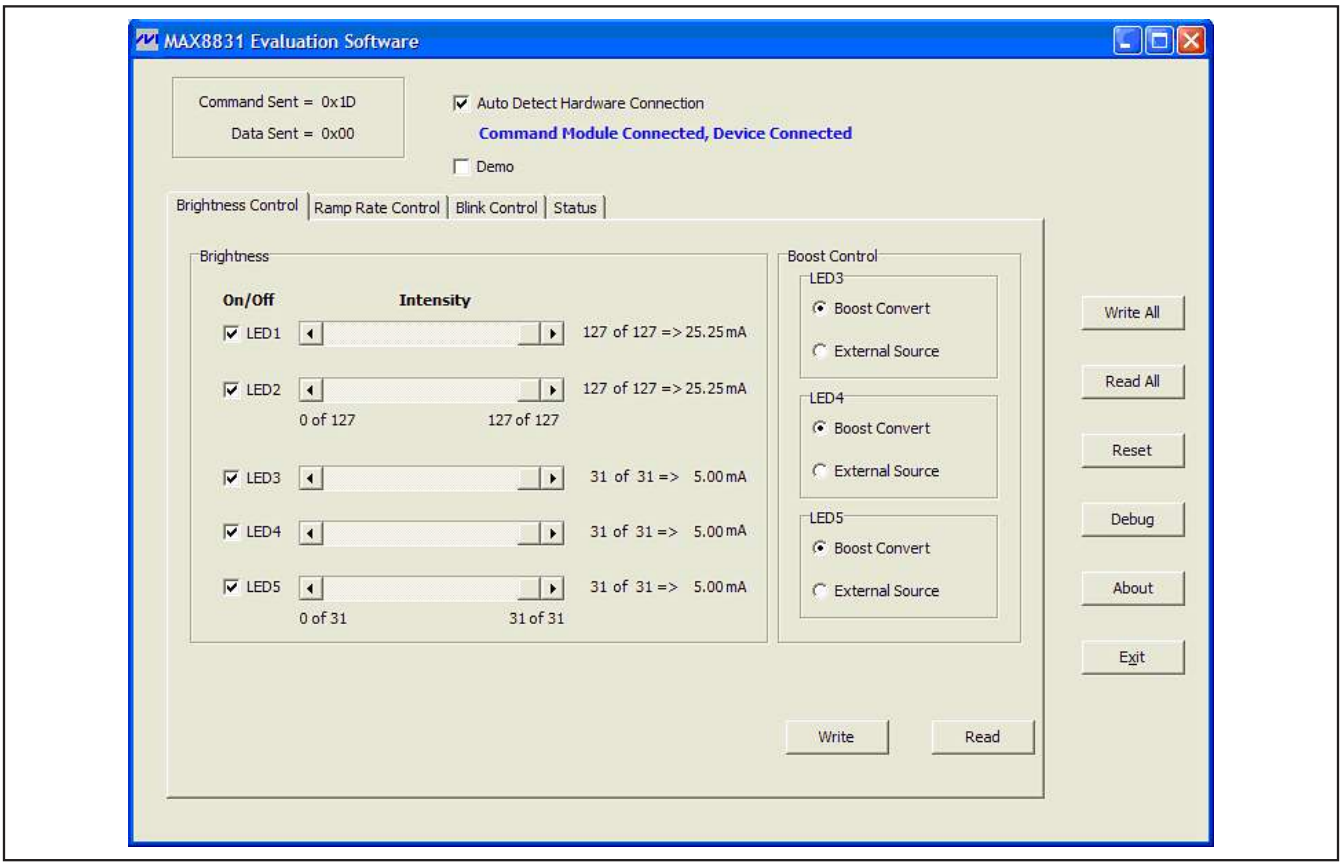

Figure 2. Brightness Control Tab

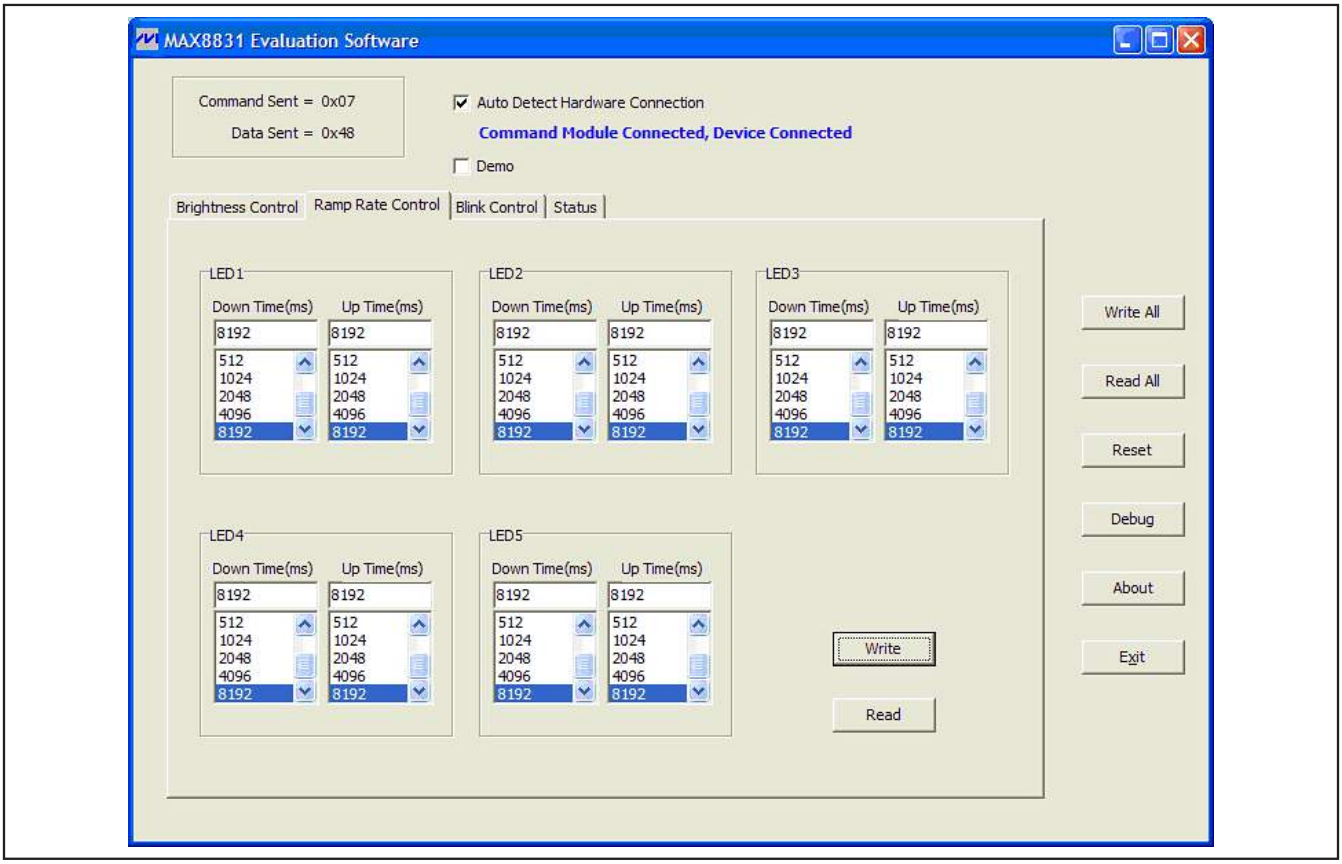

Figure 3. Ramp Rate Control Tab

selected in the **Boost Control** section. See Table 3 for jumper settings and the *Using an Alternate Power Supply (VIN2, LED3, LED4, and LED5)* section for more details. By default, the MAX8831 EV kit software selects **Boost Convert**.

Ramp Rate Control Tab

The **Ramp Rate Control** tab sheet (Figure 3) provides independent ramp-up and ramp-down times for each LED current regulator. Both the ramp-up and ramp-down times have eight different settings ranging from 64ms to 8192ms.

Blink Control Tab

The **Blink Control** tab sheet (Figure 4) provides blink-on and blink-off times for the LED3, LED4, and LED5 current regulators. Each LED string is independent of each other and features individual enable/disable control for the blink function. The blink **Off Time** provides four different settings ranging from 1024ms to 8192ms. The blink **On Time** provides four different settings ranging from 256ms to 2048ms. See the *Combining Blink Timer and Ramp Functions* section when combining the blink control with ramp-up/ramp-down control.

Status Tab

As shown in the **Status** tab sheet (Figure 5), the **STAT1** and **STAT2** read-only registers monitor the MAX8831 operating state and fault status. These registers indicate any short/open LED, output overvoltage, an open Schottky diode, and overtemperature. The **STAT1** and **STAT2** indicators require a **Read** if a fault or event has occurred, in which case the corresponding indicator flag turns red. A second **Read** clears the status bit if the fault or event is no longer present.

The **CHIP_ID1** and **CHIP_ID2** registers provides die type and mask revision information.

_Detailed Description of Hardware

The MAX8831 EV kit features a 60mA, 28V PWM DC-DC step-up converter with five low-dropout LED current regulators. Each of the five current regulators accommodate up to 9 series LEDs (depending on the LED string forward

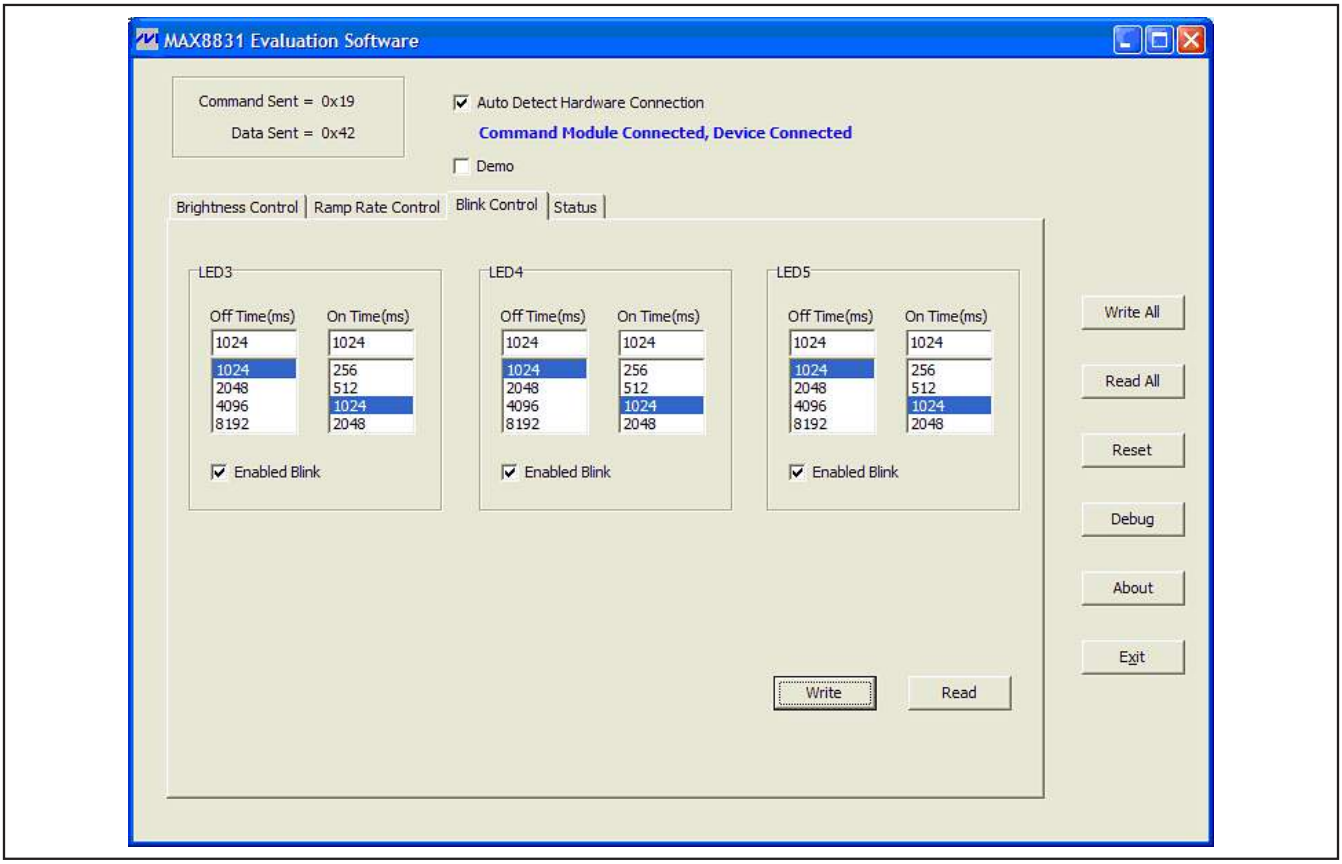

Figure 4. Blink Control Tab

voltage) and are independently controlled using the MAX8831 EV kit software. The MAX8831 EV kit controls all operational aspects of the current regulators, including on/off state, LED current, ramp-up/ramp-down timers, and blink rate timers (LED3, LED4, and LED5 only).

High-Current Regulators (LED1, LED2)

The MAX8831 EV kit contains two low-dropout (200mV, max), 25.25mA linear current regulators (LED1, LED2) that can each drive up to 9 series LEDs (depending on the LED string forward voltage) for display backlighting functions. Each high-current regulator is independently enabled and is programmable from 50µA to 25.25mA in 128 logarithmic steps (Figure 2) using the MAX8831 EV kit software. Additionally, the MAX8831 EV kit software programs the ramp-up and ramp-down timers for each regulator to one of eight different timing settings. Refer to the *MAX8831 I²C Registers* section in the MAX8831 IC data sheet for details on I²C control of the high-current regulators.

Low-Current Regulators (LED3, LED4, and LED5)

The MAX8831 EV kit also contains three low-dropout (150mV, max), 5mA linear current regulators (LED3, LED4, and LED5) that can each drive up to 9 series LEDs. Each current regulator is independently enabled and is programmable from 50µA to 5mA in 32 logarithmic steps (Figure 2) using the MAX8831 EV kit software. The MAX8831 EV kit software also controls individual ramp-up/ramp-down timers and individual blink-on/blink-off timers. Both the ramp and blink features can be individually enabled/disabled. Refer to the *LED3, LED4, and LED5 Blink Control Registers* section in the MAX8831 IC data sheet for details.

Using an Alternate Power Supply (VIN2, LED3, LED4, and LED5)

The LED3, LED4, and LED5 low-current regulators can be powered from an alternate external power supply. To install an alternate power supply at VIN2, first remove the shunts on JU3, JU4, and JU5 and then

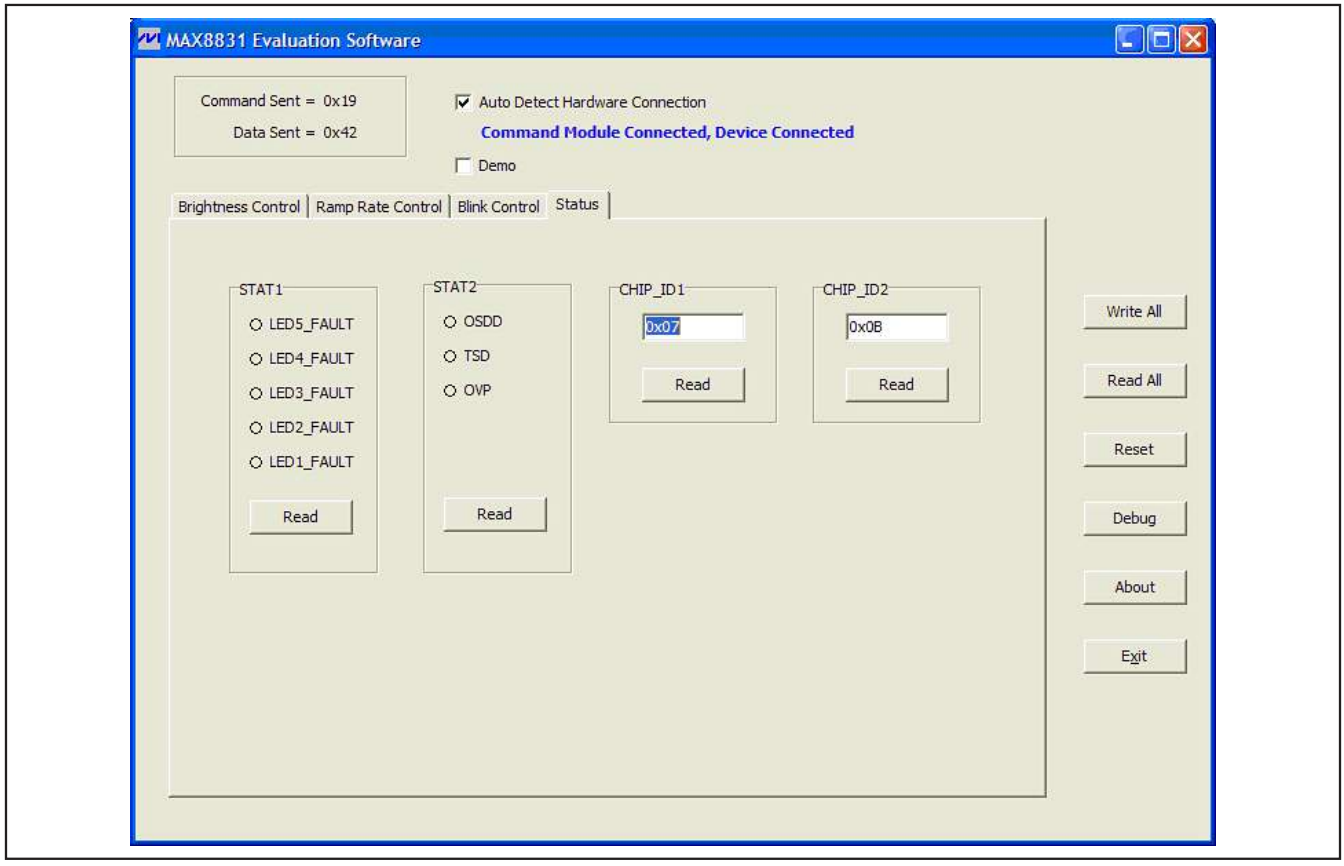

Figure 5. Status Tab

install jumpers on JU6, JU7, and JU8 and install a shunt across pins 1-3 of JU12. After the jumpers are properly configured, select **External Source** in the MAX8831 EV kit software (Figure 2). An external power supply can now be connected to VIN2. Ensure that the voltage at VIN2 is high enough to satisfy V_F of the LED plus 150mV of current regulator dropout voltage.

If **Boost Convert** (Figure 2) is selected for LED3, LED4, and LED5, and LED1 and LED2 are not enabled, the step-up converter does not turn on when LED3, LED4, or LED5 are enabled.

On/Off Control

Each current regulator can be independently enabled and disabled through the appropriate **On/Off** checkbox in the MAX8831 EV kit software. A checked box enables the corresponding LED current regulator. Overvoltage, open Schottky diode, and thermal shutdown faults automatically disable all LED current regulators.

Off, Shutdown, and Standby

The MAX8831 is considered off when VIN1 is below the UVLO threshold and V_{DD} is below 1.6V. When VIN1 is above the UVLO threshold and with V_{DD} low, the IC enters the shutdown state and disables its internal reference. During shutdown, the MAX8831 holds all registers in reset, the step-up converter and all LED current drivers are off, and supply current is reduced to 0.1µA (typ). LX and LED1–LED5 are high impedance when the step-up converter is off.

While the IC's n-channel MOSFET is turned off, the step-up regulator's output (V_{OUT}) is connected to IN through the external inductor and Schottky diode.

With a valid supply voltage applied to V_{DD} (> 1.6V) and with V_{IN} above V_{UVLO}, the IC enters a standby condition, whereby it is ready to accept I^2C commands. The step-up converter turns on when any current regulator (LED1–LED5) is enabled.

Table 3. Jumper Settings (JU1–JU13)

JUMPER	MAX8831 EV KIT DEFAULT SHUNT POSITION	FUNCTION
JU1	Center pin and 7	Connect the center pin of JU1 to one of the pins labeled 8, 7, 6, or 5 to select the respective number of LEDs for the LED1 string. JU1 connects the output of the step-up converter to the anode of the first LED (D2, D3, D4, or D5) in the LED1 string.
JU2	Center pin and 7	Connect the center pin of JU2 to one of the pins labeled 8, 7, 6, or 5 to select the respective number of LEDs for the LED2 string. JU2 connects the output of the step-up converter to the anode of the first LED (D10, D11, D12, or D13) in the LED2 string.
JU3	Center pin and 8	Connect the center pin of JU3 to one of the pins labeled 9, 8, 7, or 6 to select the respective number of LEDs for the LED3 string. JU3 connects the output of the step-up converter to the anode of the first LED (D18, D19, D20, or D21) in the LED3 string. **Note:** JU3 and JU6 cannot be installed at the same time.
JU4	Center pin and 8	Connect the center pin of JU4 to one of the pins labeled 9, 8, 7, or 6 to select the respective number of LEDs for the LED4 string. JU4 connects the output of the step-up converter to the anode of the first LED (D27, D28, D29, or D30) in the LED4 string. **Note:** JU4 and JU7 cannot be installed at the same time.
JU5	Center pin and 8	Connect the center pin of JU5 to one of the pins labeled 9, 8, 7, or 6 to select the respective number of LEDs for the LED5 string. JU5 connects the output of the step-up converter to the anode of the first LED (D36, D37, D38, or D39) in the LED5 string. **Note:** JU5 and JU8 cannot be installed at the same time.
JU6	Not installed	Install a shunt on JU6 to connect VIN1 or VIN2 (selected by JU12, see the *Using an Alternate Power Supply (VIN2, LED3, LED4, and LED5)* section) to the anode of D26. **The shunt on JU3 must be removed first before installing a shunt on JU6.** Remove the shunt on JU6 and then install a shunt on JU3 to connect the LED3 string to the output of the step-up converter. **Note:** JU6 and JU3 cannot be installed at the same time.
JU7	Not installed	Install a shunt on JU7 to connect VIN1 or VIN2 (selected by JU12, see the *Using an Alternate Power Supply (VIN2, LED3, LED4, and LED5)* section) to the anode of D35. **The shunt on JU4 must be removed first before installing a shunt on JU7.** Remove the shunt on JU7 and then install a shunt on JU4 to connect the LED4 string to the output of the step-up converter. **Note:** JU7 and JU4 cannot be installed at the same time.
JU8	Not installed	Install a shunt on JU8 to connect VIN1 or VIN2 (selected by JU12, see the *Using an Alternate Power Supply (VIN2, LED3, LED4, and LED5*) section) to the anode of D44. **The shunt on JU5 must be removed first before installing a shunt on JU8.** Remove the shunt on JU8 and then install a shunt on JU35 to connect the LED5 string to the output of the step-up converter. **Note:** JU8 and JU5 cannot be installed at the same time.
JU9	Center pin and W	Connect the center pin of JU9 to the pin labeled W to select white LEDs for the LED3 string. Connect the center pin of JU9 to the pin labeled B to select the blue LED in the RGB LED module (D45) for the LED3 string. Connect the center pin of JU9 to the pin labeled G to select the green LED in the RGB LED module (D45) for the LED3 string. Connect the center pin of JU9 to the pin labeled R to select the red LED in the RGB LED module (D45) for the LED3 string.

Table 3. Jumper Settings (JU1–JU13) (continued)

JUMPER	MAX8831 EV KIT DEFAULT SHUNT POSITION	FUNCTION
JU10	Center pin and W	Connect the center pin of JU10 to the pin labeled W to select white LEDs for the LED4 string. Connect the center pin of JU10 to the pin labeled B to select the blue LED in the RGB LED module (D45) for the LED4 string. Connect the center pin of JU10 to the pin labeled G to select the green LED in the RGB LED module (D45) for the LED4 string. Connect the center pin of JU10 to the pin labeled R to select the red LED in the RGB LED module (D45) for the LED4 string.
JU11	Center pin and W	Connect the center pin of JU11 to the pin labeled W to select white LEDs for the LED5 string. Connect the center pin of JU11 to the pin labeled B to select the blue LED in the RGB LED module (D45) for the LED5 string. Connect the center pin of JU11 to the pin labeled G to select the green LED in the RGB LED module (D45) for the LED5 string. Connect the center pin of JU11 to the pin labeled R to select the red LED in the RGB LED module (D45) for the LED5 string.
JU12	2-3	Install a shunt across pins 2-3 to connect VIN1 to the anodes of D45, D26, D35, and D44 when shunts are installed on JU6, JU7, and JU8. Install a shunt across pins 1-3 to connect VIN2 to the anodes of D45, D26, D35, and D44 when shunts are installed on JU6, JU7, and JU8.
JU13	1-3	Install a shunt across pins 1-3 to connect VDD to J1's power supply. Install a shunt across pins 2-3 to connect VDD to ground.

Note: *If any of the jumpers (JU1–JU11) are removed while the step-up converter is on ($V_{OUT} > V_{IN}$), an open LED fault occurs. Verify that the step-up converter is off ($V_{OUT} \leq V_{IN}$ before configuring a jumper setting.*

Combining Blink Timer and Ramp Functions

When using the ramp functionality of LED3, LED4, and LED5, in combination with the blink timer, it is recommended to keep the ramp-up timer shorter than the blink-on timer and the ramp-down timer shorter than the blink-off timer. Failing to comply with this restriction results in LED_ current not reaching maximum value during blink-on time, and LED_ current not returning to minimum current before turning off during the blink-off time. Refer to Figures 3 and 4, and the *Combining BLINK Timer and RAMP Functions* section in the MAX8831 IC data sheet for more details.

System States and Fault Handling

The MAX8831 EV kit software implements two fault registers (STAT1, STAT2) to provide users with fault indication. The STAT1 register indicates a fault condition for each LED_ string, whether a shorted or open LED_ fault has occurred. In the event of an LED_ fault, the corresponding bit in the STAT1 register is latched and the ON/OFF control bit for that current regulator is cleared. An I^2C read of the STAT1 register causes all STAT1 bits to be cleared. If the fault is persistent, then the corresponding bit in the STAT1 register is set again. All open/short fault monitors are subject to a 16ms blanking period to ensure that the MAX8831 does not respond to a false fault occurrence.

The second status register (STAT2) reports the following global system faults: output overvoltage protection detection (OVP), thermal shutdown detection (TSD), and open Schottky diode detection (OSDD). Bit 0 (OVP) of the STAT2 register is updated to a 1 to indicate that an OVP event has occurred. Bit 1 (TSD) of the STAT2 register is updated to a 1 to indicate that thermal shutdown has occurred. Bit 2 (OSDD) of the STAT2 register is updated to a 1 to indicate that an open Schottky diode event has occurred.

If a TSD, OVP, or OSDD fault occurs, the IC enters standby mode, the step-up converter stops switching, and all the current regulators are shut down by clearing their ON/OFF control bits. Once standby occurs, the IC will

not transition back to the on state until an I²C command enabling one or more current regulators is received.

Refer to Figure 5 and the state diagram (Figure 4) in the MAX8831 IC data sheet for more details.

I²C Interface

The MAX8831 operates as an I²C slave that receives and sends data through an I²C-compatible 2-wire interface. The MAX8831 EV kit connects to the CMAXQUSB command module to create an I²C serial interface between the IC and a PC preinstalled with the MAX8831 EV kit software. The I²C interface controls all operational aspects of the current regulators, including on/off state, LED current, ramp-up/ramp-down timers, and blink rate timers (LED3, LED4, and LED5 only). Refer to the *MAX8831 I²C Registers* section in the MAX8831 IC data sheet for more details.

Pullup resistors, typically 4.7kΩ, are required on SDA and SCL. The CMAXQUSB contains two pullup resistors (R5 and R6) that are engaged by SW1. If the CMAXQUSB is not used, pullup resistors may need to be installed for resistors R1 and R2.

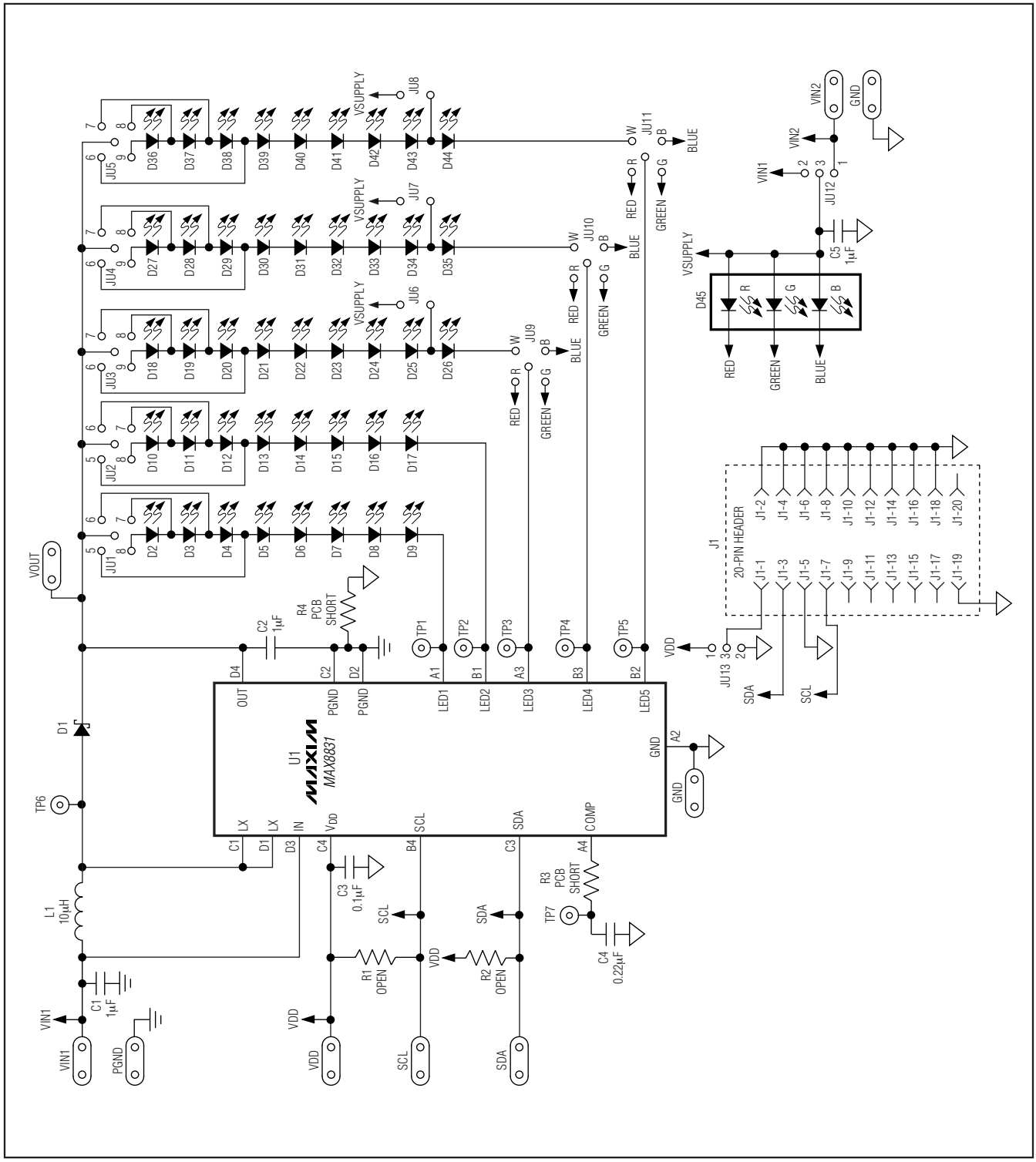

Figure 6. MAX8831 EV Kit Schematic

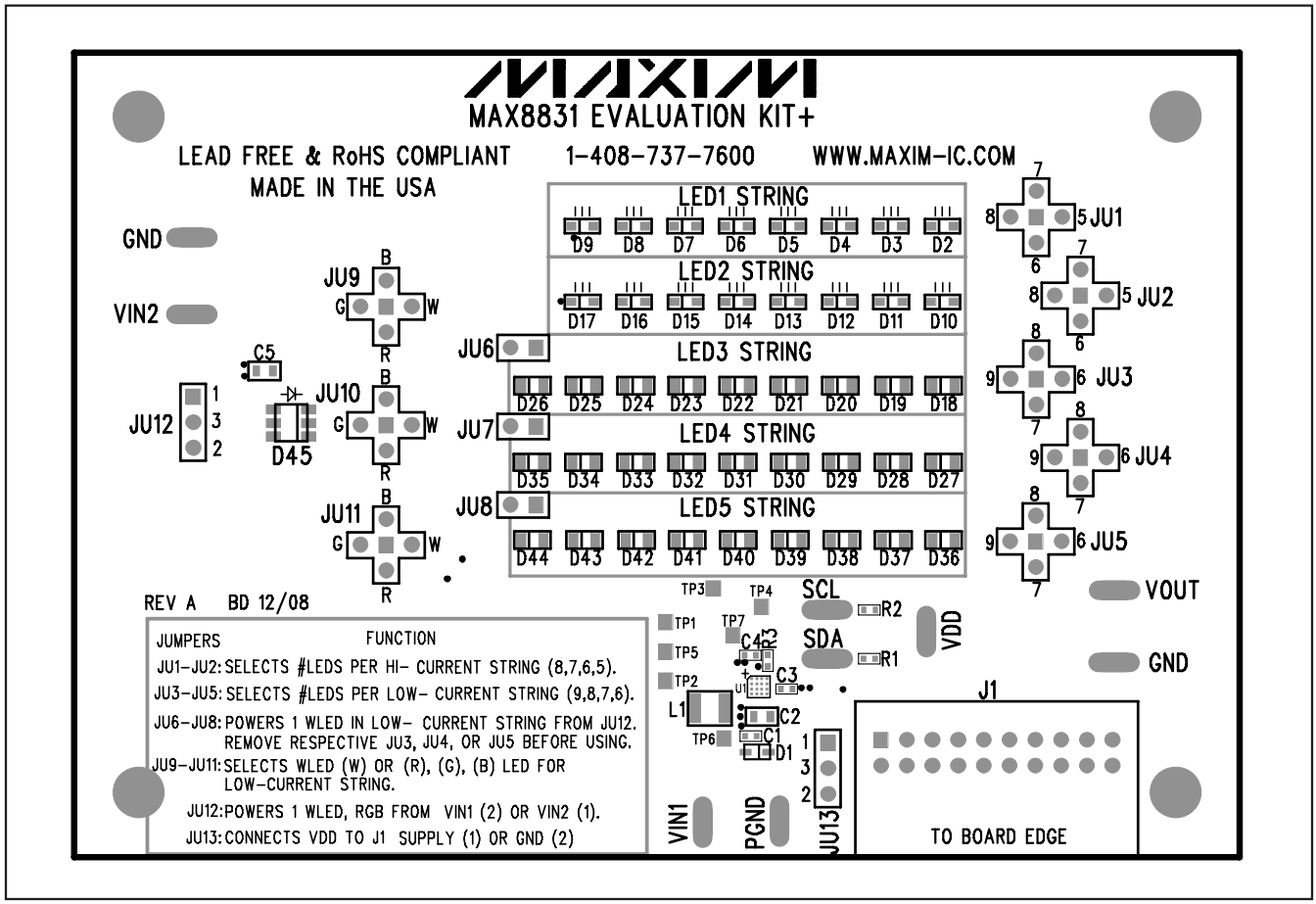

Figure 7. MAX8831 EV Kit Component Placement Guide—Component Side

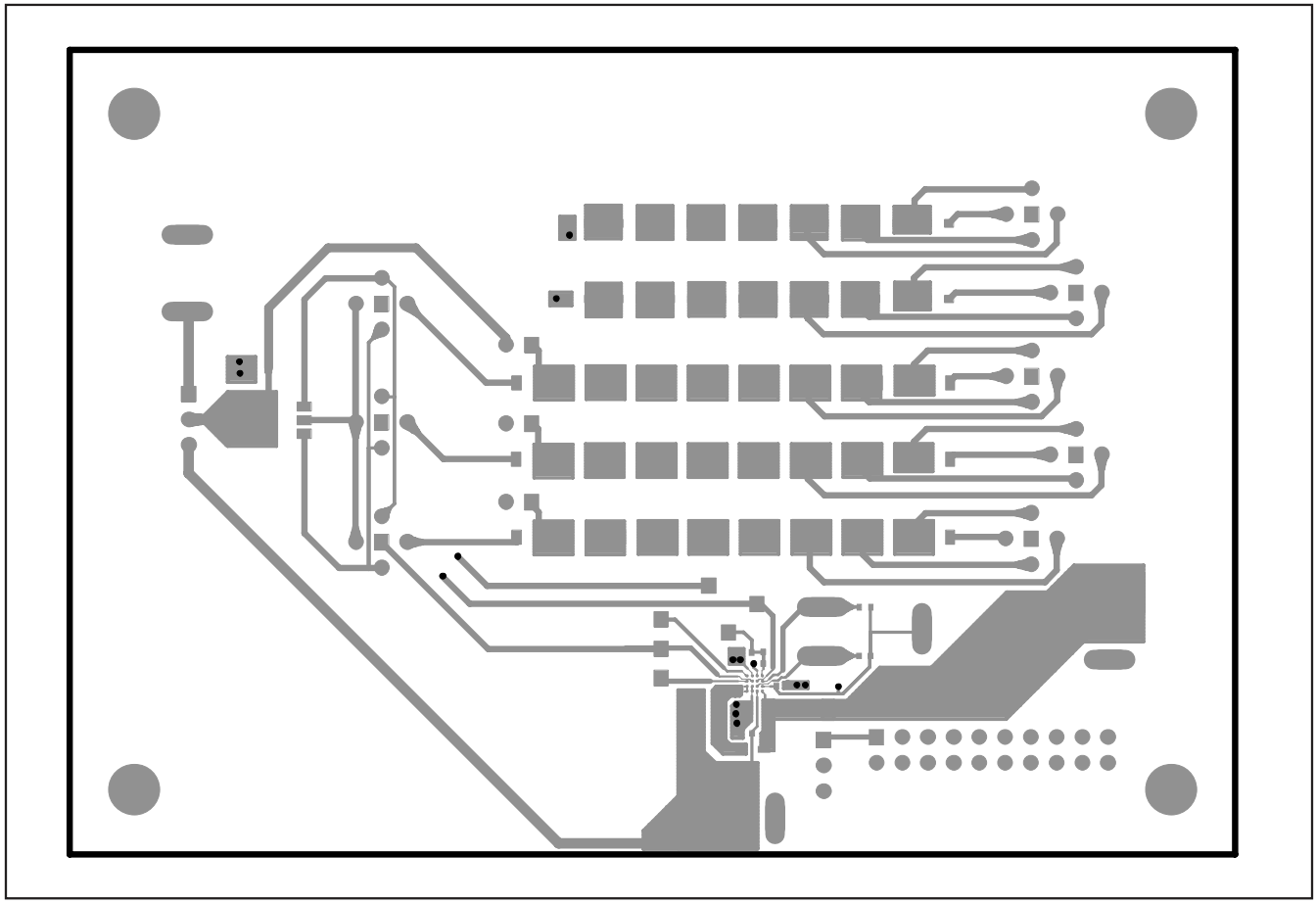

Figure 8. MAX8831 EV Kit PCB Layout—Component Side

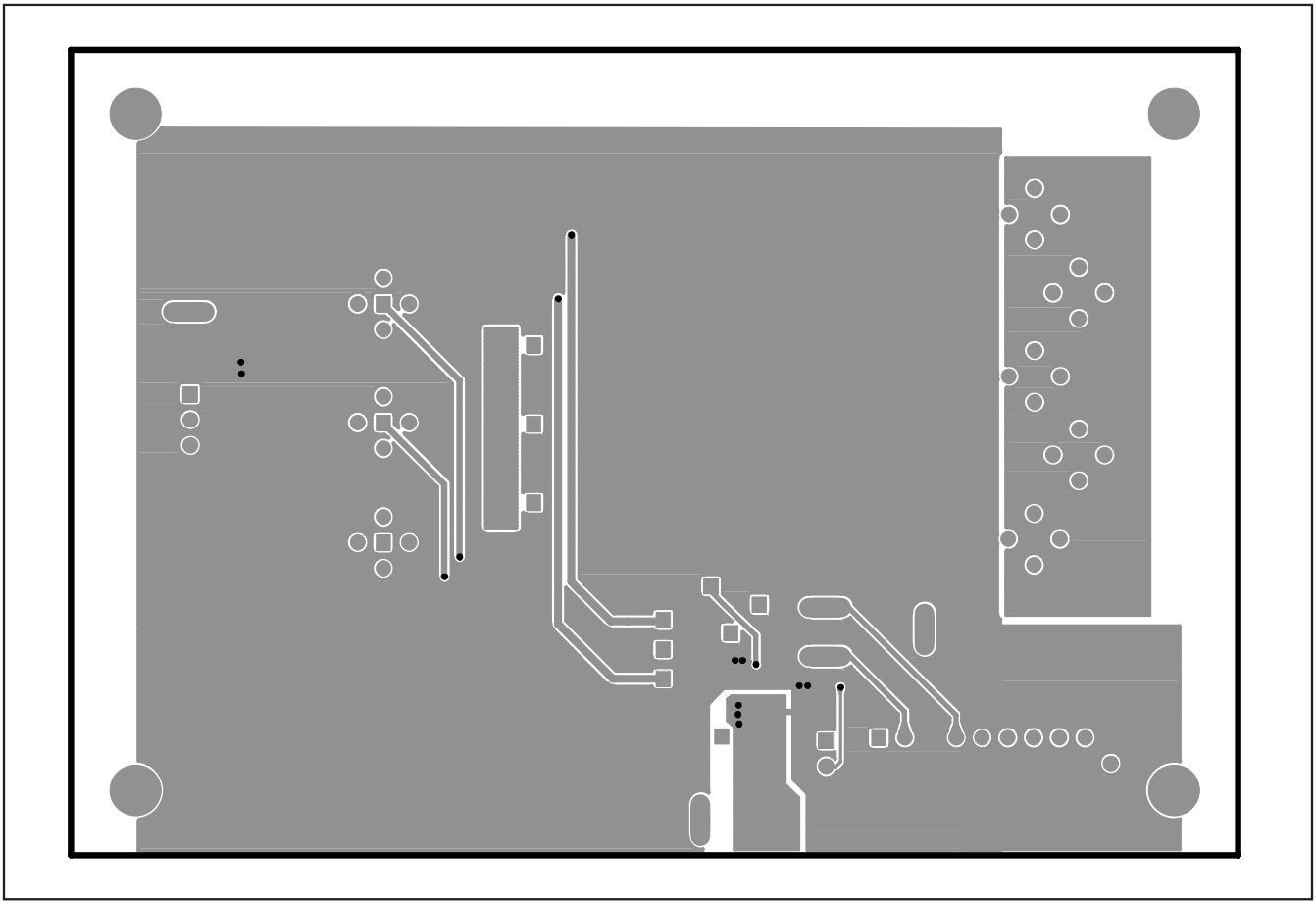

Figure 9. MAX8831 EV Kit PCB Layout—Solder Side

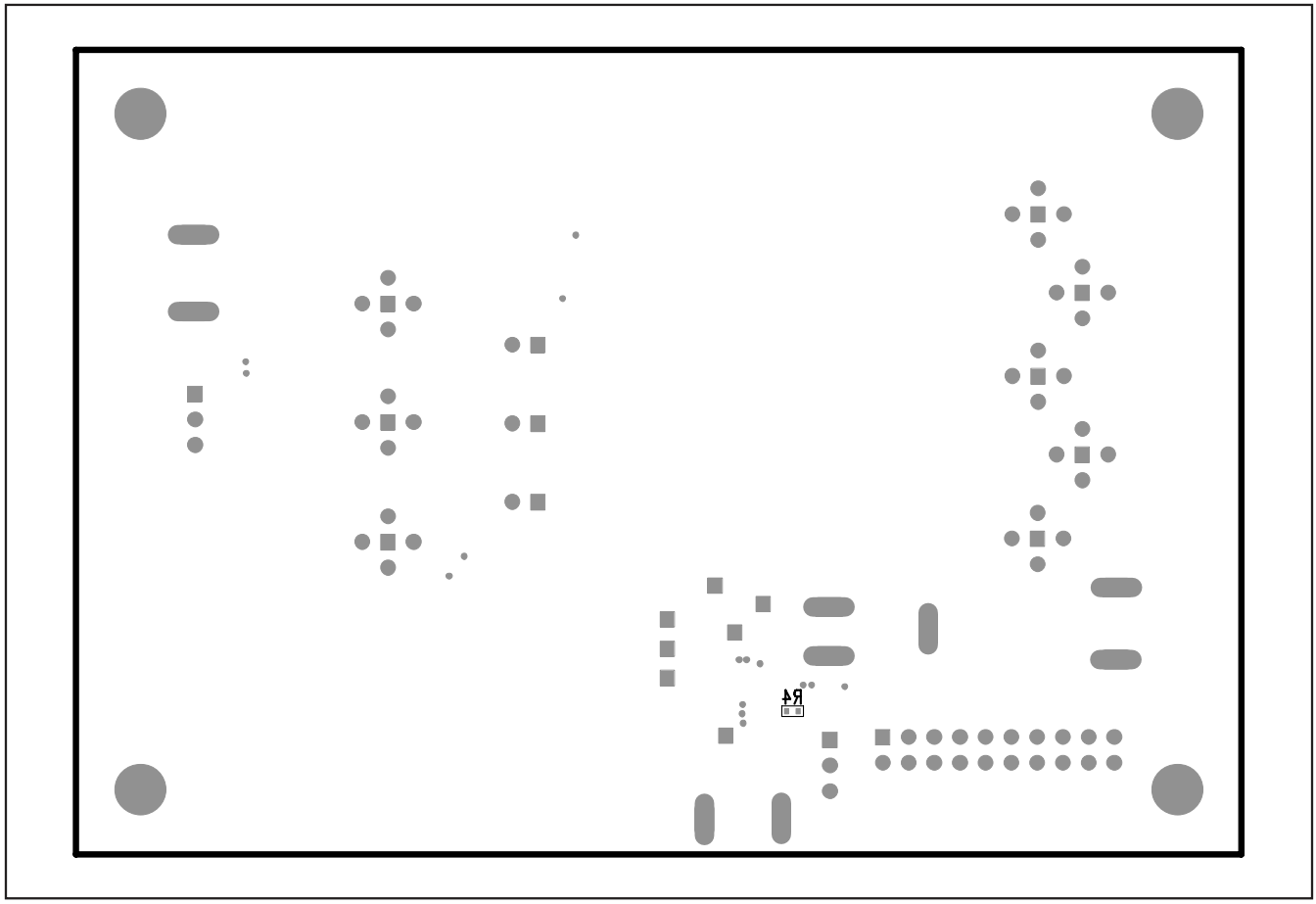

Figure 10. MAX8831 EV Kit Component Bottom Placement Guide—Solder Side