Backlight Driver Evaluation Board

EVAL-ADP5501

FEATURES

Input voltage 2.7 V to 4.8 V
Boost voltage up to 25 V
Up to 6 LEDs solution
Open-drain interrupt
Hard reset
ADP5501 evaluation software included
LabVIEW Runtime Engine from National Instruments
Ambient light sensor

GENERAL DESCRIPTION

ADP5501 evaluation board is used to exercise the features and functionality of the of theADP5501 backlight driver IC. The ADP5501 evaluation kit consists of a daughterboard and motherboard. Two 20-pin connectors (J11 and J12) are used to plug in the daughter board to the motherboard. The demo board assembly is powered via either J10 or the USB port, and includes a graphical user interface (GUI) to exercise the ADP5501 features. The motherboard houses the backlight LEDs (D12 through D17), power status LEDs (D19 through D21), a reset switch (S17), a 2.7 V regulator, a 3.3 V regulator, a 4.5 V regulator, and all the hardware necessary to power the IC and establish USB communication with a computer.

The motherboard is also equipped with jumpers (LK8, LK9, and LK10) to configure the board to use either external regulated voltages via J10, or to use the on-board regulators when plugged into the USB port. When using the USB port as the power source, LK8, LK9, and LK10 should have the jumpers placed across Pin 1 and Pin 2. When using external voltages, LK8, LK9, and LK10 should have the jumpers placed across Pin 2 and Pin 3.

Before using the evaluation board, see the ADP5501 data sheet for information about all features available on the device and about the use of register settings in various modes. Information about how to use the evaluation board and GUI software to test some key features of the ADP5501 is given in this document.

The ADP5501 IC is mounted on the daughterboard along with the light sensor, and some test points.

MOTHERBOARD LAYOUT

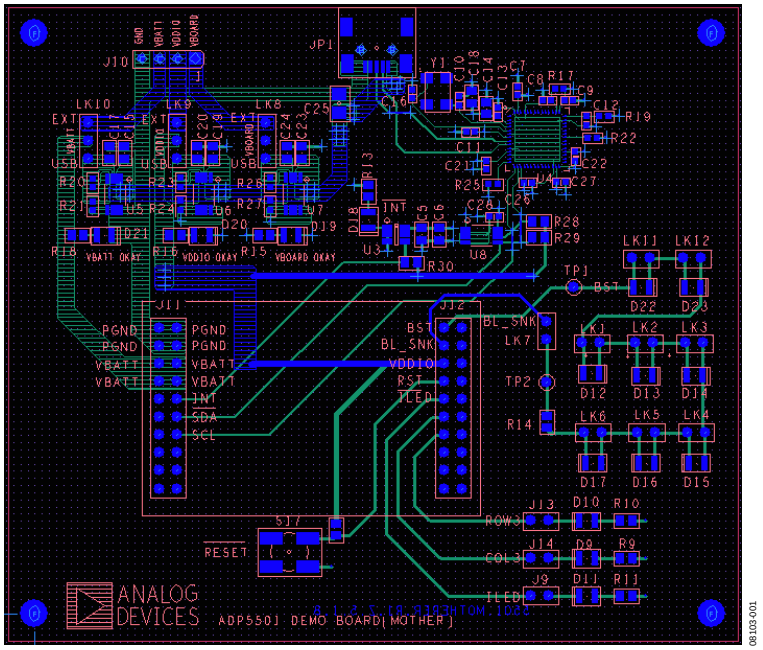

Figure 1. Motherboard

One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106, U.S.A.
Tel: 781.329.4700 **www.analog.com**
Fax: 781.461.3113

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REVISION HISTORY

6/09—Revision 0: Initial Version

Figure 2. Daughterboard

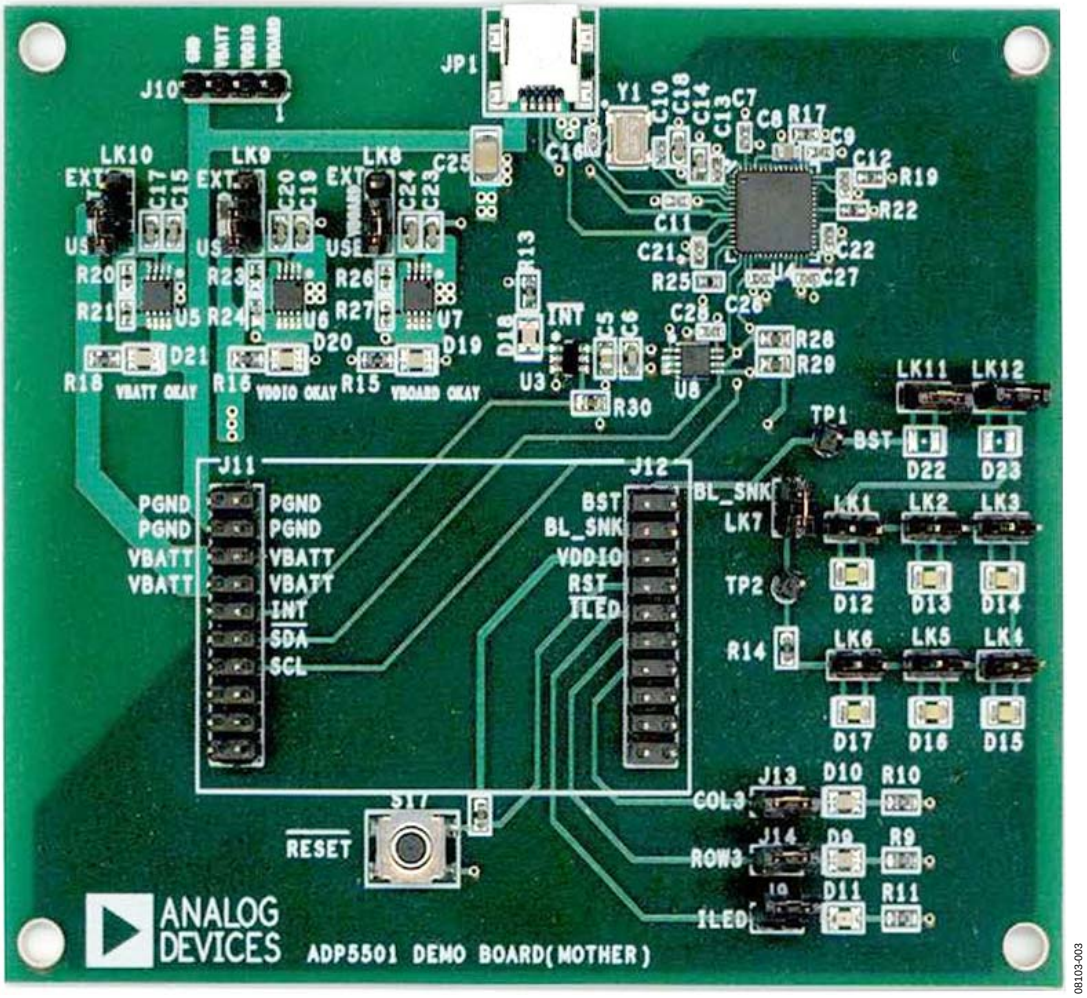

Figure 3. Evaluation Board Assembly

SOFTWARE INSTALLATION

The ADP5501 evaluation boards require two pieces of software. Both pieces are included on the evaluation package CD: **ADP5501setup.exe** and **LabVIEW_Runtime_Engine.exe**. Complete the following steps to install the software.

1. Insert the ADP5501 evaluation CD into the CD-ROM drive and run **ADP5501setup.exe**.
2. When the InstallShield welcome box appears (as shown in Figure 4), click **Next** to continue the installation.

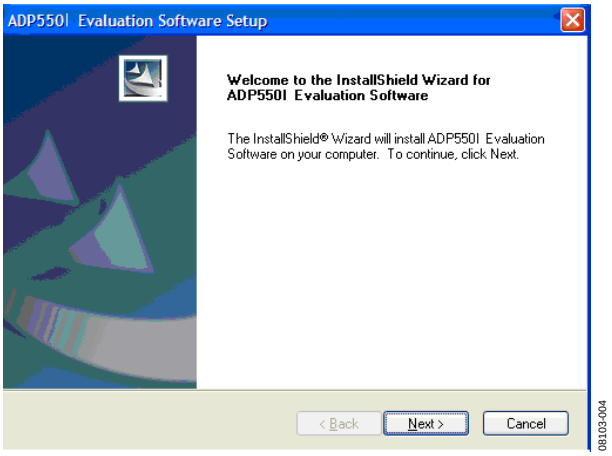

Figure 4. ADP5501 Evaluation Software

3. In the **License Agreement** box, click **Yes** to accept the license agreement.

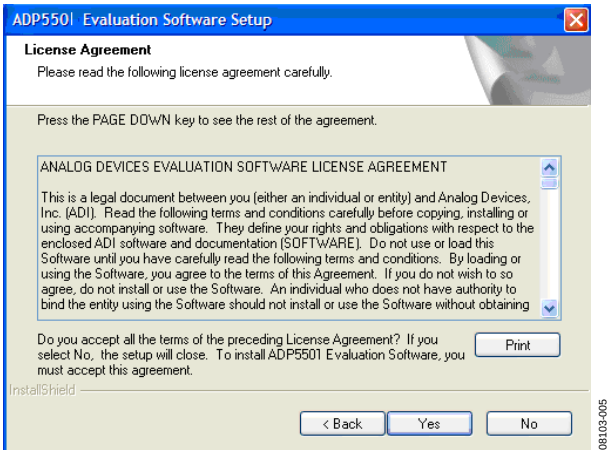

Figure 5. License Agreement

4. In the **Choose Destination Location** box, click **Next** to install the files to the default destination folder, or browse to choose a different file.

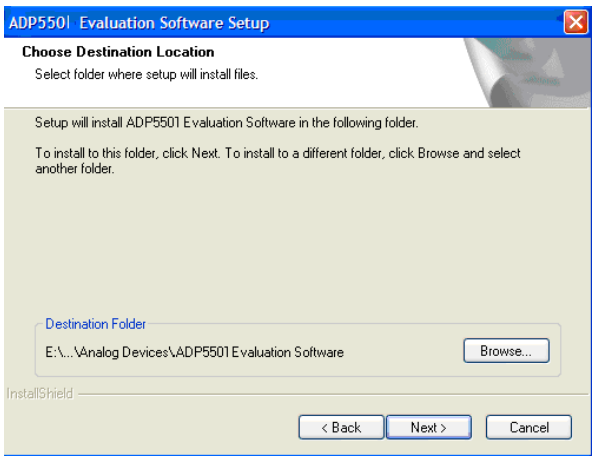

Figure 6. Destination Location

5. In the **Setup Type** box, select a type of setup and click **Next**.

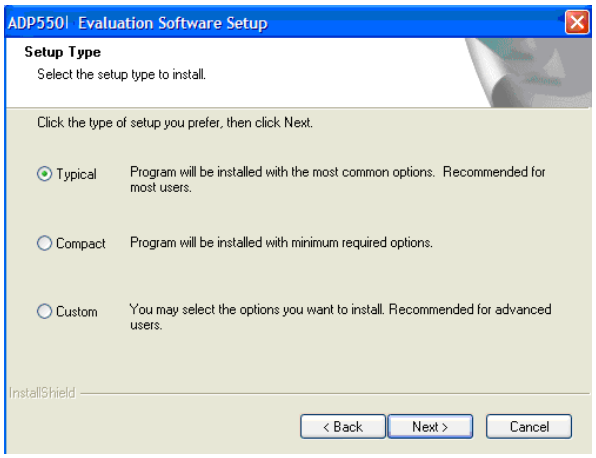

Figure 7. Setup Type

6. When the **Select Program Folder** box appears, click **Next** to add the program icons to the default program folder.

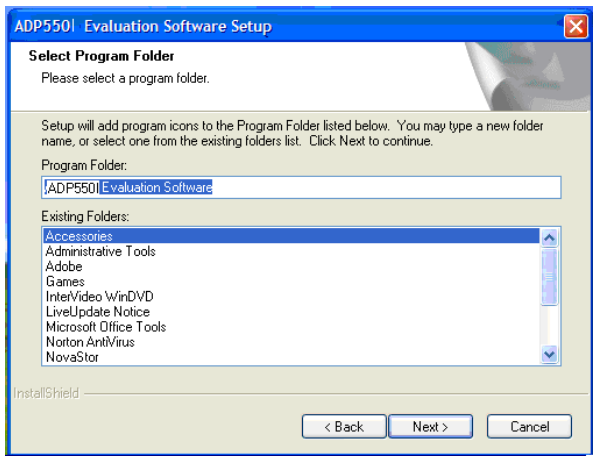

Figure 8. Program Folder Selection

7. After the program installs, the **InstallShield Wizard Complete** box appears. Click **Finish** to complete the installation.

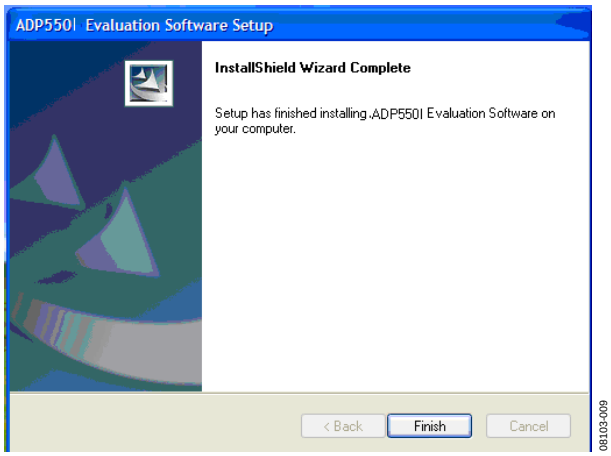

Figure 9. InstallShield Wizard Complete

LABVIEW RUNTIME ENGINE INSTALLATION

The LabVIEW Runtime Engine comes as a self-extracting archive and must be unzipped before installation. Complete the following procedure to install the engine.

1. Double-click the **LabVIEW_Runtime_Engine.exe** file. When the box shown in Figure 10 appears, click **OK** to continue.

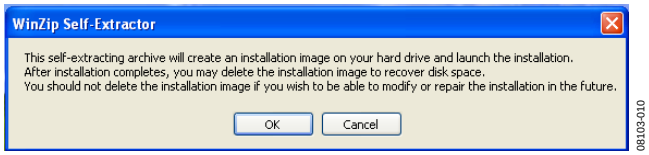

Figure 10. Labview Winzip Self-Extractor

2. In the next box, click **Unzip** to extract the files.

Figure 11. Labview Unzipped Files

3. When the message confirming that files have been unzipped appears, click **OK** to continue. The LabVIEW Runtime Engine installation should start immediately.

Figure 12. Labview Runtime Engine Installation

4. Click **Next** to continue.

Figure 13. Labview Runtime Engine Installation

5. In the **Destination Directory** box, click **Next** to accept the default directory for the installation.

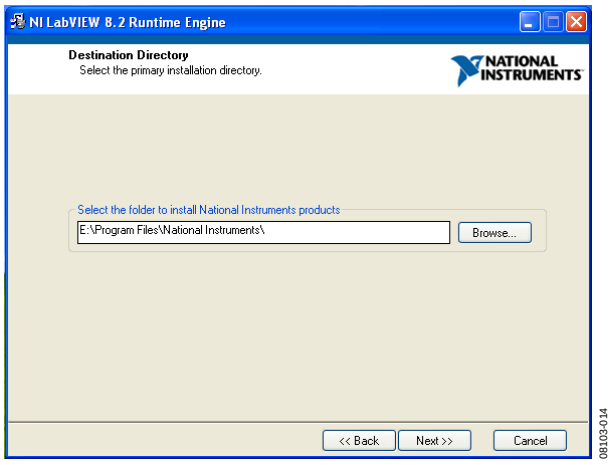

Figure 14. Destination Folder

6. In the **Features** box, click **Next** to install the LabVIEW Runtime Engine files.

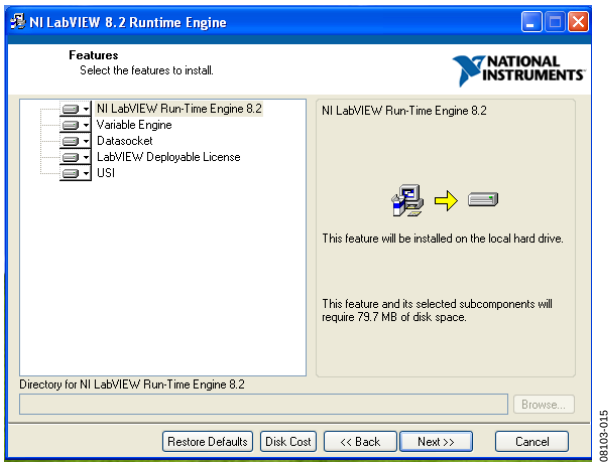

Figure 15. Feature Selection

7. In the **License Agreement** box, select **I accept the License Agreement(s)**, and click **Next**.

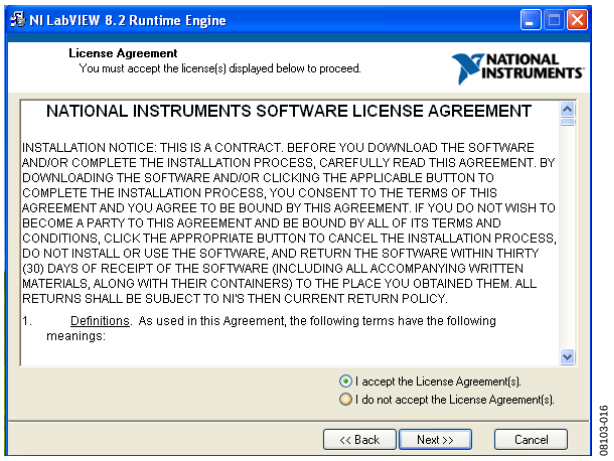

Figure 16. License Agreement

8. In the **Start Installation** box, click **Next**.

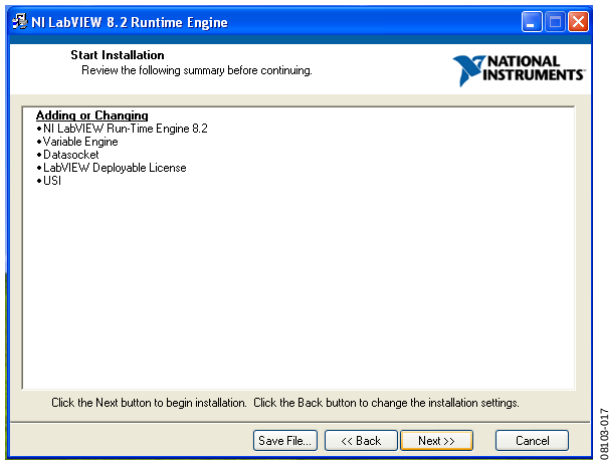

Figure 17. Installation Summary

9. When installation is complete, click **Finish**.

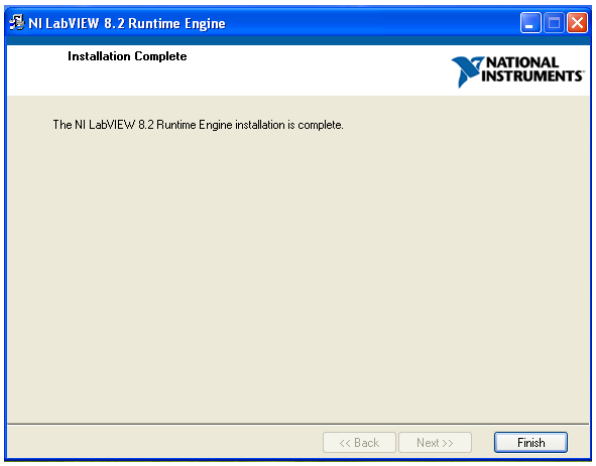

Figure 18. Installation Complete

10. Click **Restart** to restart the computer.

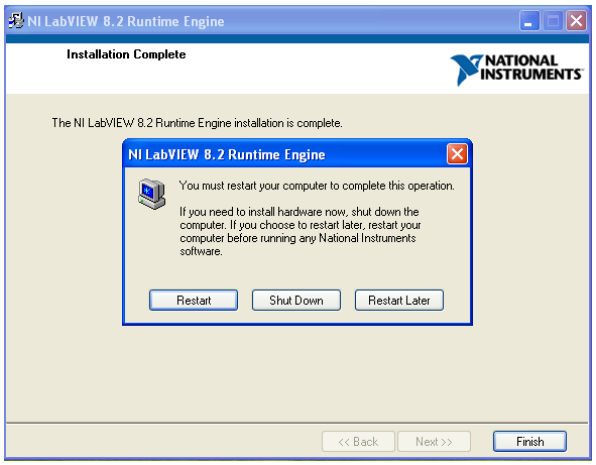

Figure 19. Restart

USB DRIVER INSTALLATION

1. Plug in the ADP5501 evaluation board to the computer using the provided USB cable. Once the system recognizes the board, the welcome box (shown in Figure 20) appears.
2. Select **No, not this time** and click **Next** to install the driver.

Figure 20. USB Driver

3. In the **Found New Hardware Wizard** box, click **Install software automatically (Recommended)**; then click **Next**.

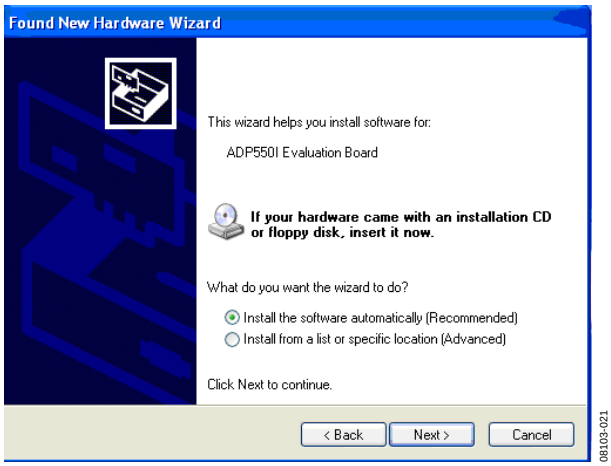

Figure 21. Driver Installation

4. When the message box shown in Figure 22 appears, click **Continue Anyway**.

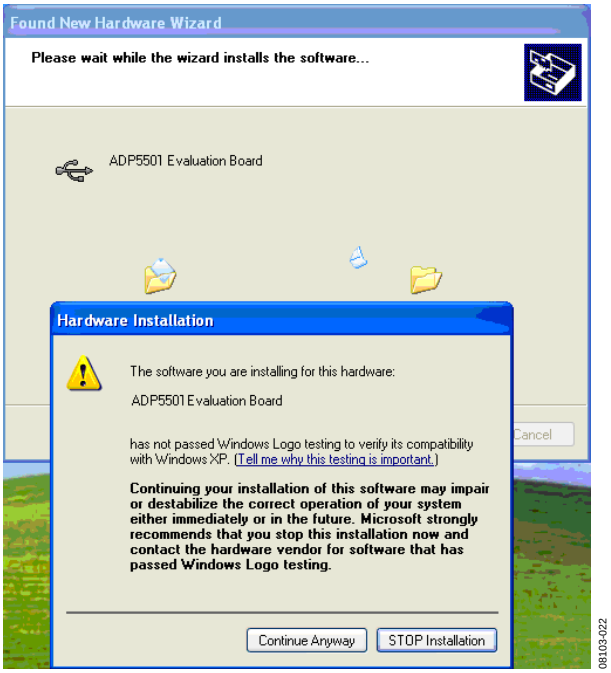

Figure 22. Logo Testing Message

5. When the message box shown in Figure 23 appears, click **Finish** to complete the driver installation.

Figure 23. Completion

USING THE SOFTWARE

1. Make sure that the ADP5501 evaluation board is plugged in before running the software. When the board is plugged in, the three supply LEDs (D19 through D21) should light up.
2. Click **Start>All Programs>Analog Devices>ADP5501 Evaluation Software**.

When the software detects the presence of the board USB interface, the message **I2C Interface Okay** displays at the bottom left side of the **ADP5501 Register Interface** window.

Check the USB connection/interface if a message appears stating **Firmware not downloaded USB communication error**.

Figure 24. Backlight Tab

SOFTWARE APPLICATION TABS

The ADP5501 software application consists of three tabs: **BackLight**, **RGB Light**, and **History**. The **BackLight** and **RGB Light** tabs are used to program register settings for the IC. The **History** tab allows the user to record a sequence of commands that can be converted into scripts later. This tab is most useful for software development.

Register Programming

To program a particular register using the **BackLight** or **RGB Light** tabs, click the SIM LED or pull down the tab of the register that needs to be programmed, and select the desired value or setting for that register. For example, to program Register 0x05 with 1.1 mA, pull down the green tab in Register 0x05 and scroll to 1.1 mA, then click the **Program 0x05** button. Once programmed, the values in the register can be read by clicking the **Read 0x05** button.

BACKLIGHT MENU

Brightness Level and Current Law

The application default setting for **BL Brightness Level** is **Daylight**, but this setting can be changed by clicking the drop-down list box to select another brightness level (**Office** or **Dark**).

There are also four current laws that can be selected in the **Backlight Fade Law** drop-down list box: **Linear**, **Square**, **Cubic1**, and **Cubic2**. Click the drop-down box to make a selection.

Backlight Current Programming

The backlight max current is the maximum current that the backlight current defaults to for a particular lighting environment or zone (**Daylight**, **OFFICE**, and **Dark**). To program the backlight max current, click the appropriate **Max Current** drop-down box and select the desired maximum current value. Then, click the program button on the same line as the drop-down box to program the register. There are three types of backlight max current that can be programmed: **Daylight**, **OFFICE,** and **Dark**. Repeat the procedure to program all three max currents, as needed (the backlight max current registers are 0x05, 0x07, and 0x09).

Dim Current Programming

The backlight DIM current is the current that the backlight defaults to when in DIM mode for a particular environment or zone (**Daylight**, **OFFICE**, and **Dark**). Dim currents can be programmed in the same manner as the backlight max currents; remember to click the program button to program the appropriate register (the dim current registers are 0x06, 0x08, and 0x0A).

Backlight Timings

The ADP5501 allows you to program backlight off timeout and dim timeout. Use Register 0x03 to program off and dim timeouts, which range from 10 seconds to 120 seconds.

Fade-in and fade-out times can also be programmed. Use Register 0x04 to program fade-in and fade-out time. Fade-in time and fade-out time each range from 0.3 seconds to 5.5 seconds.

See the ADP5501 data sheet for information about **OVP_EN**, **FOVR**, **AUT_LD_EN**, or any other bit functionality not described in this data sheet.

TURNING ON THE BACKLIGHT

Follow these steps to turn on, modify, and turn off the backlight:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. Set Bit 6 and Bit 7 of Register 0x00 high and then program these settings by clicking the **Program 0x00** button.
3. The backlight turns on and is driven by the current chosen as the maximum setting in Step 1.
4. To modify the backlight current, write a new current setting to Register 0x05.
5. To turn off the backlight, clear Bit 6 in Register 0x00.

BACKLIGHT TURN-ON WITH MANUAL DIM

Follow these steps to turn on, modify, and turn off the backlight with manual dim:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Daylight Dim Current** drop-down box, select a backlight dim current setting (for example, 5 mA); then program this setting by clicking the **Program 0x06** button.
3. Set Bit 6 and Bit 7 of Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight now turns on and is driven by the current chosen as the maximum setting in Step 1.
4. Set Bit 5 of Register 0x00 high; then program this setting by clicking the **Program 0x00** button. The backlight now dims to the current level chosen as the dim setting in Step 2.
5. To modify the backlight maximum and dim current settings, write new current settings to Register 0x05 and Register 0x06.
6. To return the backlight to its maximum setting, clear Bit 5 in Register 0x00.
7. To turn off the backlight, clear Bit 6 in Register 0x00.

BACKLIGHT TURN-ON WITH AUTOMATIC DIM

Follow these steps to turn on, modify, and turn off the backlight with automatic dim:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Daylight Dim Current** drop-down box, select a backlight dim current setting (for example, 5 mA); then program this setting by clicking the **Program 0x06** button.
3. From the **Backlight DIM Timer** drop-down box, select a backlight dim time (for example, 10 sec); then program this setting by clicking the **Program 0x03** button.
4. Set Bit 6 and Bit 7 in Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight now turns on and is driven by the current chosen as the maximum setting in Step 1. After the backlight turns on, the dim timer begins to count down. When the dim timer expires, Bit 5 of Register 0x00 is automatically set and the backlight dims to the current level chosen as the dim setting in Step 2.
5. To turn off the backlight at any time during the dim timer countdown, clear Bit 6 in Register 0x00.

BACKLIGHT TURN-ON WITH AUTOMATIC TURN-OFF

Follow these steps to turn on and turn off the backlight with automatic turn-off:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Backlight OFF Timer** drop-down box, select a backlight turn-off time (for example, 10 sec); then program this setting by clicking the **Program 0x03** button.
3. Set Bit 6 and Bit 7 of Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight now turns on and is driven by the current chosen as the maximum setting in Step 1. After the backlight turns on, the off timer begins to count down. When the off timer expires, the backlight turns off, and Bit 6 in Register 0x00 is automatically cleared.
4. To turn off the backlight at any time during the off timer countdown, clear Bit 6 in Register 0x00.

BACKLIGHT TURN-ON WITH AUTOMATIC DIM AND AUTOMATIC OFF

Follow these steps to turn on and turn off the backlight with automatic dim and automatic off:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Daylight Dim Current** drop-down box, select a backlight dim current setting (for example, 5 mA); then program this setting by clicking the **Program 0x06** button.
3. From the **Backlight DIM Timer** drop-down box, select a backlight dim time (for example, 10 sec). From the **Backlight OFF Timer** drop-down box, select a backlight off time (for example, 10 sec). Then program these settings by clicking the **Program 0x03** button.
4. Set Bit 6 and Bit 7 of Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight now turns on and is driven by the current chosen as the maximum setting in Step 1. After the backlight turns on, the dim timer begins to count down. When the dim timer expires, Bit 5 in Register 0x00 is set automatically, and the backlight dims to the current level chosen as the dim setting in Step 2. When the backlight is at the dim setting, the off timer begins to count down. After the off timer expires, the backlight turns off, and Bit 5 and Bit 6 in Register 0x00 are cleared automatically.
5. To turn off the backlight at any time during the dim or off timer count, clear Bit 6 in Register 0x00.

BACKLIGHT TURN-ON/TURN-OFF WITH FADE IN/ FADE OUT

Follow these steps to turn on and turn off the backlight with fade in and fade out:

1. From the **Daylight Max Current** drop-down box, select a backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Backlight Fade IN Time** drop-down box, select a backlight fade-in time (for example, 3 sec). From the **Backlight Fade OUT Time** drop-down box, select a backlight fade-out time (for example, 3 sec). Then program these settings by clicking the **Program 0x04** button.
3. From the **Backlight Fade Law** drop-down box, select a backlight fading scheme (for example, square); then program this setting by clicking the **Program 0x02** button.
4. To turn on and fade in the backlight, set Bit 6 and Bit 7 in Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight begins to turn on and fade into the current chosen as the maximum setting in Step 1.
5. To turn off and fade out the backlight, clear Bit 6 in Register 0x00 and program this setting by clicking the **Program 0x00** button. The backlight begins to turn off and fade out to zero current.

The fade timers can be used with the off timers and dim timers for fade transitions (on to dim, dim to on, and dim to off). You can try different fade laws and fade-in/fade-out times to decide which ones you want.

BACKLIGHT ZONE ADJUSTMENT (MANUAL)

Follow these steps to manually adjust the backlight:

1. From the **Daylight Max Current** drop-down box, select a daylight zone backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Office Max Current** drop-down box, select an office zone backlight maximum current setting (for example, 10 mA); then program this setting by clicking the **Program 0x07** button.
3. From the **Dark Max Current** drop-down box, select a dark zone backlight maximum current setting (for example, 3 mA); then program this setting by clicking the **Program 0x09** button.
4. Set Bit 6 and Bit 7 in Register 0x00 high and then program these settings by clicking the **Program 0x00** button. The backlight begins to turn on in the daylight operating zone and is driven by the current chosen in Step 1.
5. From the **Backlight Level Control** drop-down box, select the office operating zone; then program this setting by clicking the **Program 0x02** button. The backlight changes to the office operating zone and is driven by the current chosen in Step 2.
6. From the **Backlight Level Control** drop-down box, select the dark operating zone; then program this setting by clicking the **Program 0x02** button. The backlight changes to the dark operating zone and is driven by the current chosen in Step 3.

You can also enable the fade timers for smooth transition between operating zones.

Comparator Trip Reference Programming

The ADP5501 has two comparator trip reference registers and two comparator hysteresis registers. Use the appropriate drop-down list boxes to program the trip references and the hysteresis values. Trip reference values are expressed in μA or lux. Make sure that accurate values are chosen for the correct lighting environment. The comparator does not trip if the values are not within the brightness range of the lighting environment.

L3 Comp En and **L2 Comp En** must be set, along with **CMP AutoEN**, before the photosensor can control the backlight brightness.

Use the F**ilter time** drop-down box at the bottom left of the tab to increase the number of photosensor readings necessary to switch from one zone to another. The filter time also reduces the potential for backlight flickering. This number is programmable from 80 ms minimum up to 10 seconds (see the ADP5501 data sheet for more details on sensor operation).

L3 Comp lvl and **L2 Comp lvl** are used in conjunction with the Force RD bit of Register 0x0C to determine the photosensor reading during a force read. Make sure that **CMP AutoEN** is cleared during a force read (see the ADP5501 data sheet for details on FORCE_RD).

BACKLIGHT ZONE ADJUSTMENT (AUTOMATIC VIA AMBIENT LIGHT SENSING)

The ADP5501 contains an ambient light sensor input that measures the output current of an external photosensor. The ADP5501 can switch between backlight operating zones based on ambient light conditions. You can set threshold points for switching among the operating zones.

To control automatic backlight adjustment based on ambient light conditions, complete the following these steps using the **BackLight Config** tab:

1. From the **Daylight Max Current** drop-down box, select a daylight zone backlight maximum current setting (for example, 30 mA); then program this setting by clicking the **Program 0x05** button.
2. From the **Office Max Current** drop-down box, select an office zone backlight maximum current setting (for example, 10 mA); then program this setting by clicking the **Program 0x07** button.
3. From the **Dark Max Current** drop-down box, select a dark zone backlight maximum current setting (for example, 3 mA); then program this setting by clicking the **Program 0x09** button.
4. From the **L2 (Office) Comparator Trip Point** drop-down box, select a threshold for switching between daylight and office operation (for example, 32 μA); then program this setting by clicking the **Program 0x0D** button.
5. From the **L2 (Office) Comparator Hysteresis** drop-down box, select a hysteresis level for switching between daylight and office operation (for example, 4 μA); then program this setting by clicking the **Program 0x0E** button.
6. From the **L3 (Dark) Comparator Trip Point** drop-down box, select a threshold for switching between office and dark operation (for example, 15 μA); then program this setting by clicking the **Program 0x0F** button.
7. From the **L3 (Dark) Comparator Hysteresis** drop-down box, select a hysteresis level for switching between daylight and office operation (for example, 4 μA); then program this setting by clicking the **Program 0x10** button.
8. Set Bit 0 and Bit 1 in Register 0x0C high and then program these settings by clicking the **Program 0x0C** button.
9. Set Bit 3 in Register 0x02 high; then program this setting by clicking the **Program 0x02** button.
10. Set Bit 6 and Bit 7 in Register 0x00 high; then program these settings by clicking the **Program 0x00** button. The backlight turns on in the daylight operating zone and is driven by the current chosen in Step 1.

If you move your finger close to the photosensor (D2) on the daughterboard, the backlight automatically switches to the office operating zone and is driven by the current chosen in Step 2.

If you move your finger even closer to the photosensor (D2) on the daughterboard, the backlight automatically switches to the dark operating zone1 and is driven by the current chosen in Step 3.

To adjust the ambient light sensor response time, change response time values in the **ALS Filter time** drop-down box, and then program this setting by clicking the **Program 0x0C** button.

You can also enable the fade timers for smooth transition between operating zones.

Experiment with these thresholds (see Step 4 and Step 6 in this section) to determine what works best in the given ambient light. A poorly lit office environment may require lower threshold points.

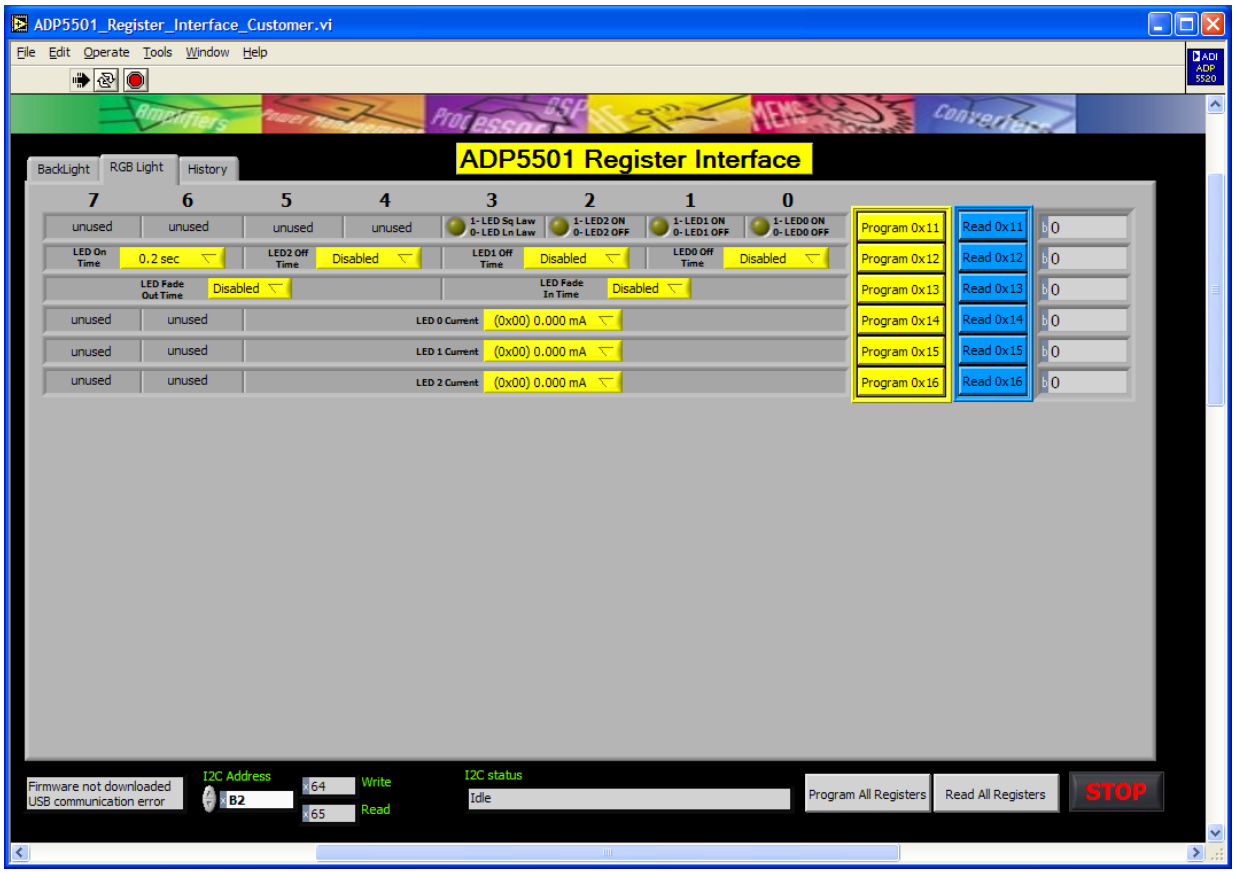

Figure 25. RGB Light Tab

RGB APPLICATION MENU

Jumper Configuration

J9, J13, and J14 on the motherboard must have jumpers placed for the RGB LEDs to light up.

RGB Current Setting

Before turning on the RGB lights, Register 0x14 through Register 0x16 must be programmed with the desired LED current value. For each current, click the drop-down list box, select the setting, and click the corresponding program button to program the register; an LED does not turn on if its current is set at 0.

After the RGB setup is done, proceed with the current law, time on and time off, and fade in and fade out programming, if needed. After configuration is complete, activate the RGBs by setting Bits[2:0] of Register 0x11 (see the ADP5501 data sheet for details on RGB operation).

RGB LED TURN-ON/TURN-OFF

Follow these steps to turn the RGB LED on and off:

1. On the motherboard, place a jumper on J9, J13, and J14.
2. On the **RGB Light Config** tab, from the **LED 0 Current** drop-down box, select the LED 0 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x14** button.
3. From the **LED 1 Current** drop-down box, select the LED 1 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x15** button.
4. From the **LED 2 Current** drop-down box, select the LED 2 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x16** button.
5. Set Bit 0, Bit 1, and Bit 2 in Register 0x11 high; then program these settings by clicking the **Program 0x11** button.
6. On the **BackLight Config** tab, set Bit 7 in Register 0x00 high; then program this setting by clicking the **Program 0x00** button. All three auxiliary LEDs turn on.
7. To turn off an LED, clear Bit 0, Bit 1, and/or Bit 2 in Register 0x11 on the **RGB Light Config** tab.
8. To modify the sink current in each LED, change the settings in Register 0x14, Register 0x15, and Register 0x16.

RGB LIGHT TURN-ON/TURN-OFF WITH FADE IN/FADE OUT

Follow these steps to turn the RGB LED on and off with fade in and fade out:

1. On the motherboard, place a jumper on J9, J13, and J14.
2. On the **BackLight Config** tab, set Bit 7 in Register 0x00 high; then program this setting by clicking the **Program 0x00** button.
3. On the **RGB Light LEDs Config** tab, from the **LED 0 Current** drop-down box, select the LED 0 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x14** button.
4. From the **LED 1 Current** drop-down box, select the LED 1 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x15** button.
5. From the **LED 2 Current** drop-down box, select the LED 2 sink current setting (for example, 14 mA); then program this setting by clicking the **Program 0x16** button.
6. From the **LED (ALL) Fade OUT Time** drop-down box, select a fade-out time (for example, 1.8 sec). In the **LED (ALL) Fade IN Time** drop-down box, select a fade-in time (for example, 1.8 sec). Then program these settings by clicking the **Program 0x13** button.
7. Set Bit 3 (square fade) in Register 0x11 high. Set Bit 0, Bit 1, and Bit 2 in Register 0x11 high. Then program these settings by clicking the **Program 0x11** button. All three auxiliary LEDs start to turn on and fade into the current programmed levels.
8. To turn off and fade out the LEDs, clear Bit 0, Bit 1, and Bit 2 in Register 0x11; then program these settings by clicking the **Program 0x11** button. All three auxiliary LEDs start to turn off and fade out to zero.

Experiment with different fade-in/fade-out times.

RGB LED BLINKING

Follow these steps to program auxiliary LED blinking:

1. On the motherboard, place a jumper on J9, J13, and J14.
2. On the **BackLight Config** tab, set Bit 7 in Register 0x00 high; then program this setting by clicking the **Program 0x00** button.
1. On the **RGB Light Config** tab, in the **LED 0 Current** drop-down box, select the LED 0 sink current (for example, 14 mA); then program this setting by clicking the **Program 0x14** button.
2. From the **LED 1 Current** drop-down box, select the LED sink current (for example, 14 mA); then program this setting by clicking the **Program 0x15** button.
3. From the **LED 2 Current** drop-down box, select the LED 2 sink current (for example, 14 mA); then program this setting by clicking the **Program 0x16** button.
4. From the **LED (All) ON Timer** drop-down box, select a blink on time (for example, 1.2 sec).
5. From the **LED 2 OFF Timer** drop-down box, select a blink off time for LED 2 (for example, 1.2 sec).
6. From the **LED 1 OFF Timer** drop-down box, select a blink off time for LED 1 (for example, 1.2 sec).
7. From the **LED 0 OFF Timer** drop-down box, select a blink off time for LED 0 (for example, 1.2 sec).
8. Then program these settings by clicking the **Program 0x12** button.
9. Set Bit 0, Bit 1, and Bit 2 in Register 0x11 high; then program these settings by clicking the **Program 0x11** button. All three auxiliary LEDS start to blink on and off.

You can also enable the fade timers for smooth transition between on and off.

History Tab

The **History** tab is used to record command sequences that can be used later as script files. To start recording commands, click the **Enable Command History log** button.

After the sequence of commands is recorded, this list can be dumped into a file and used later as input to execute these commands without having to repeat the commands one by one. This feature, in essence, can automate certain functions that can be used later or repeatedly; it is mostly useful for software development.

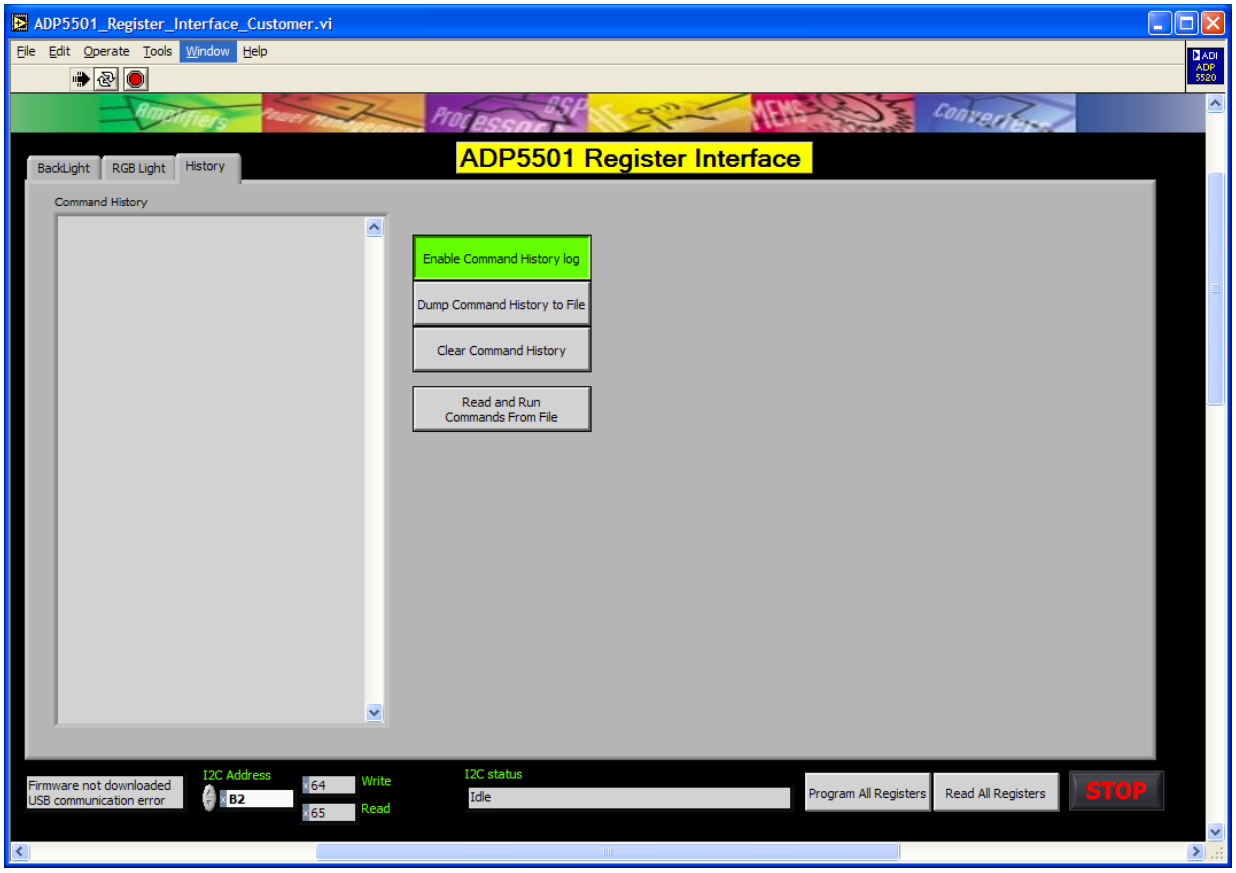

Figure 26. History Tab

SCHEMATICS AND LAYOUT

DAUGHTERBOARD SCHEMATIC

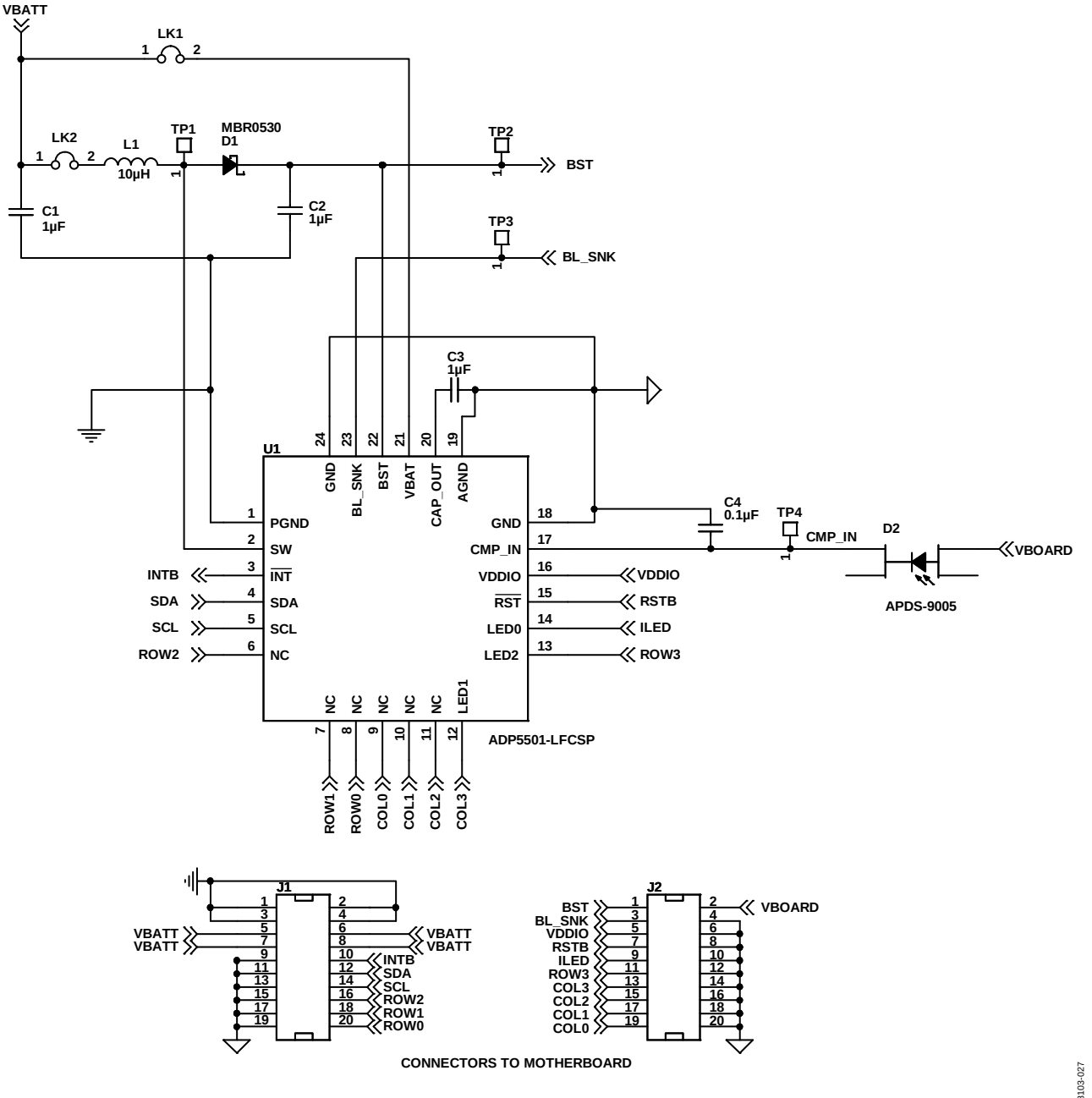

Figure 27.

DAUGHTERBOARD LAYOUT

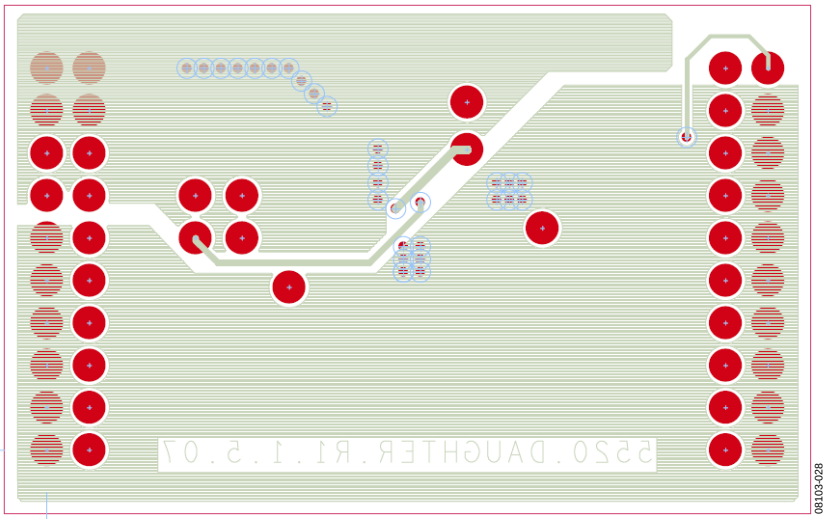

Figure 28.

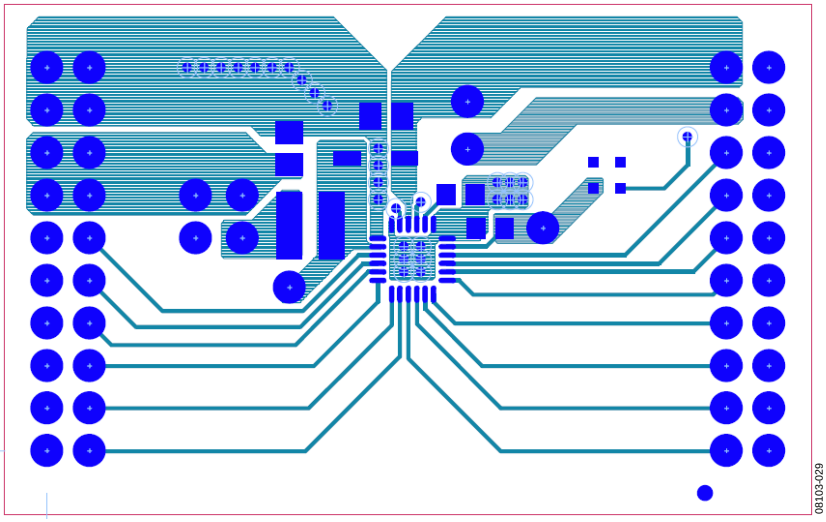

Figure 29.

MOTHERBOARD SCHEMATIC

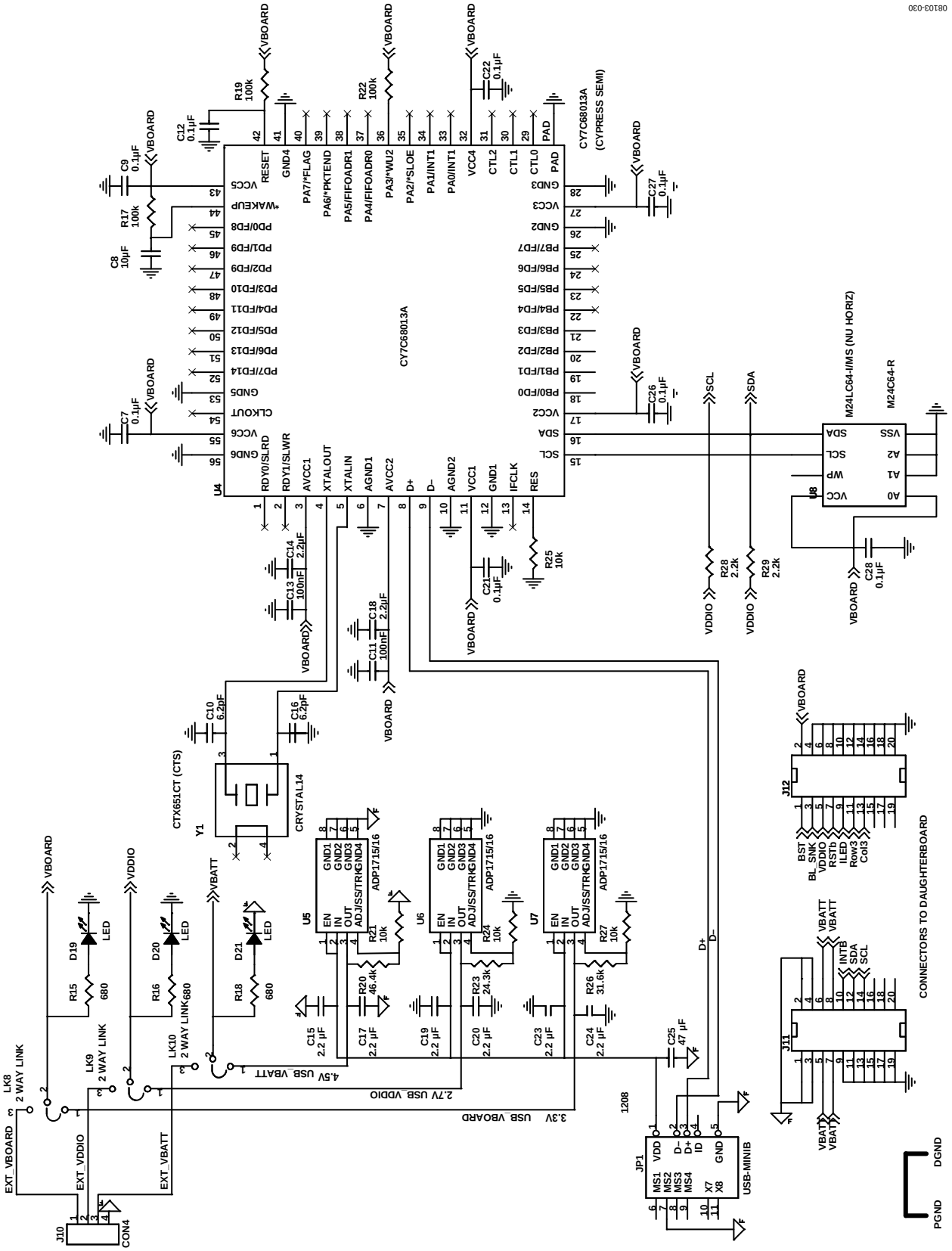

Figure 30.

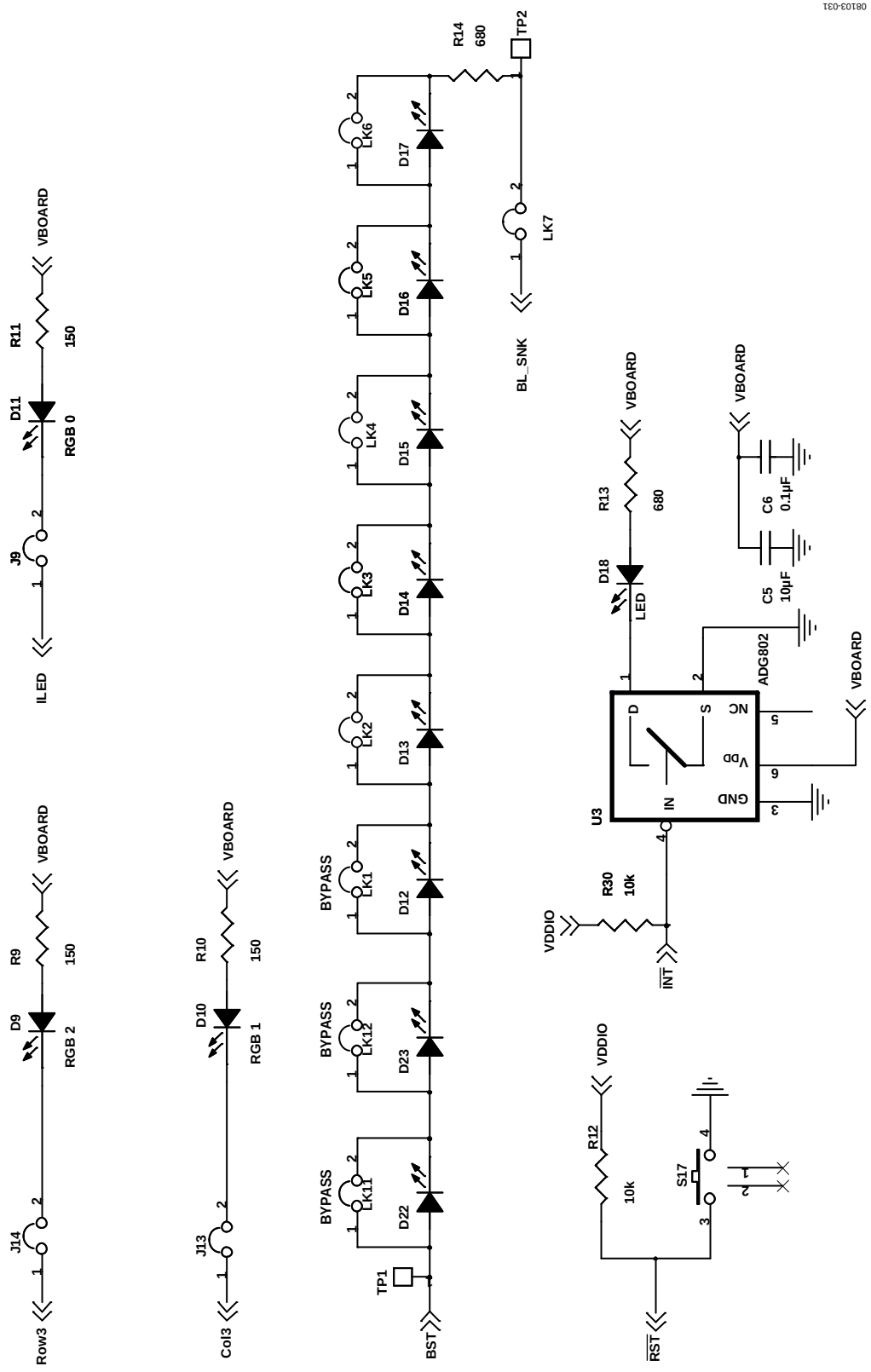
08103-031
VBOARD
R11
150
D11
RGB 0
J9
ILED
R9
150
D9
RGB 2
J14
Row3
R10
150
D10
RGB 1
J13
Col3
BYPASS
LK1
D12
LK2
D13
LK3
D14
LK4
D15
LK5
D16
LK6
D17
LK7
R14
680
TP2
BL_SNK
BYPASS
LK11
D22
LK12
D23
TP1
BST
R13
680
D18
LED
C6
0.1µF
C5
10µF
ADG802
U3
D
S
NC
VDD
GND
IN
R30
10k
VDDIO
INT
R12
10k
S17
RST

Figure 31.

MOTHERBOARD LAYOUT

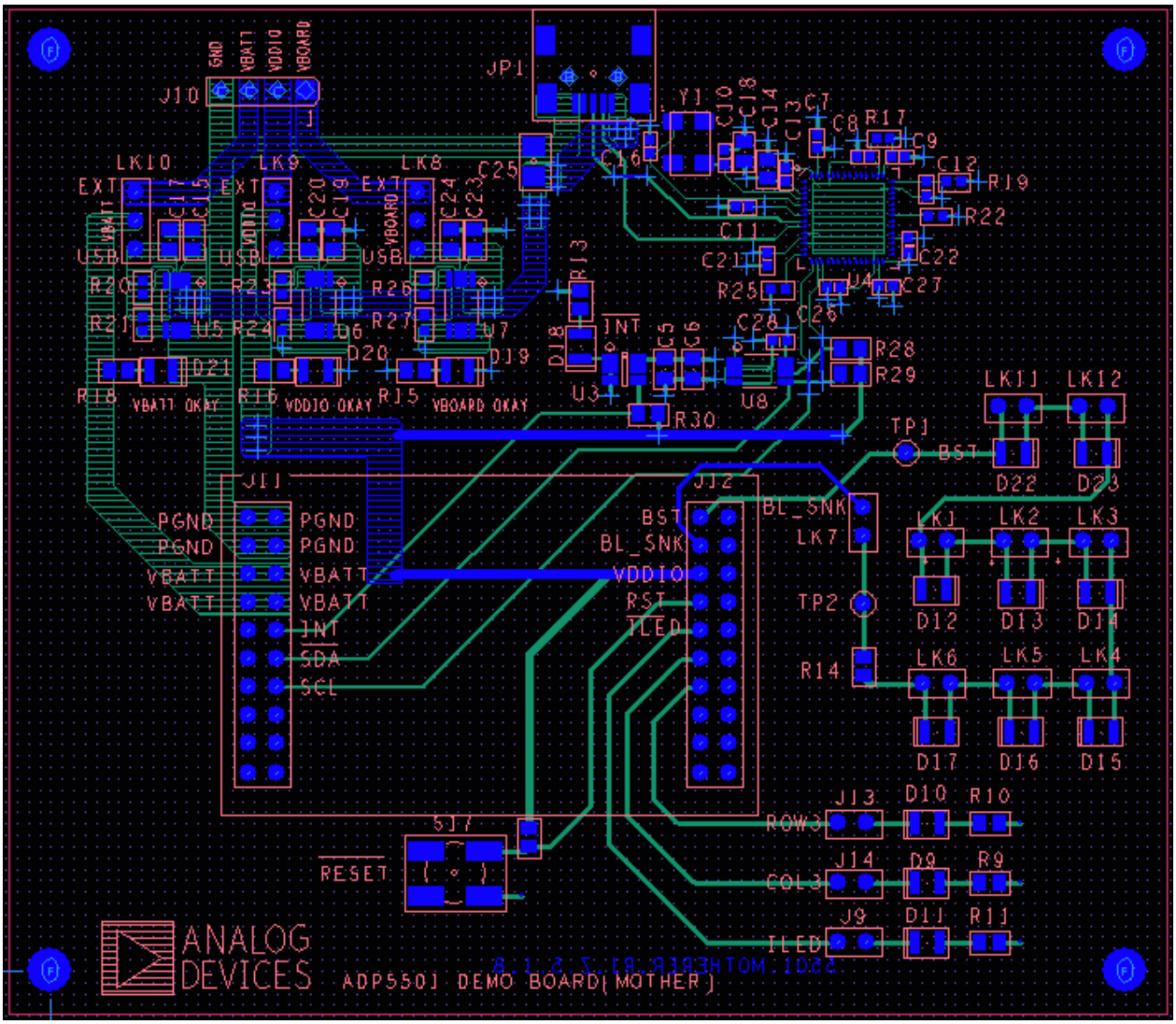

Figure 32. Top Layer

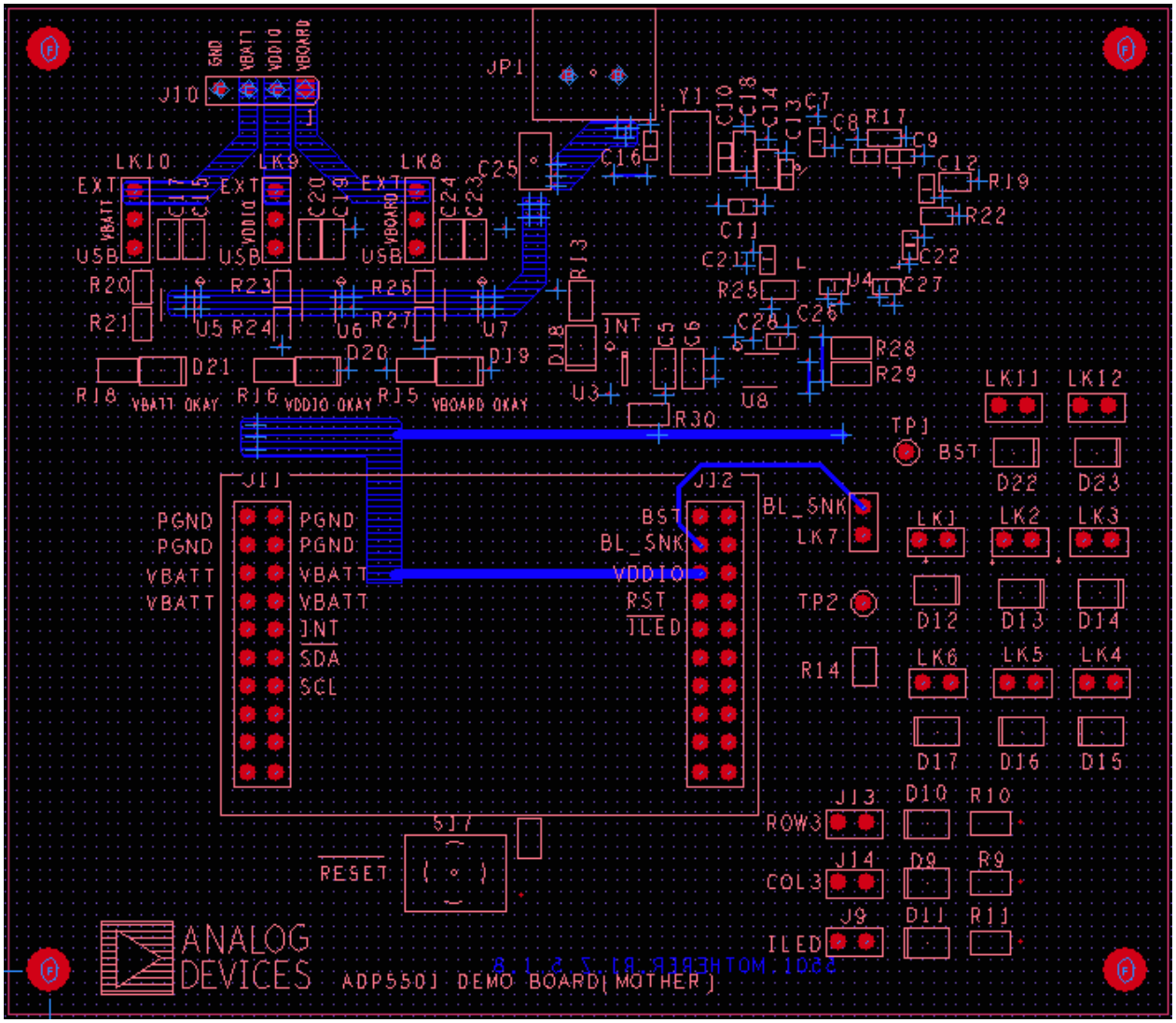

Figure 33. Bottom Layer

ORDERING INFORMATION

BILL OF MATERIALS (DAUGHTERBOARD)

Table 1.

Qty	Reference Designator	Description	Manufacturer/Part Number
2	C1, C3	Capacitor MLCC, 1 µF, 16 V, 0603, X5R	Murata/GRM188R61C105K
1	C2	Capacitor MLCC, 1 µF, 50 V, 0805, X7R	Murata/GRM21BR71H105K
1	C4	Capacitor MLCC, 0.1 µF, 25 V, 0603, X7R	Murata/GRM188R71E104KA01
1	D1	Schottky rectifier, 40 V, 1A	On Semiconductor/MBR140SFT1G
1	D2	Miniature surface-mount ambient light sensor	Avago/APDS-9005
2	J1, J2	Socket strip connector	Samtec/SSW-110-03-G-D
2	LK1, LK2	36-position connector header	Sullins Electronics/PEC36SAAN
1	L1	Inductor, 4.7 µH	Coilcraft/LPS4012-472MLB
4	TP1, TP2, TP3, TP4	36-position connector header	Sullins Electronics/PEC36SAAN
1	U1	ADP5501	Analog Devices/ADP5501ACPZ-RL

BILL OF MATERIALS (MOTHERBOARD)

Table 2.

Qty	Reference Designator	Description	Manufacturer/Part Number
4	C5, C6, C8	Capacitor MLCC, 10 µF, 16 V, 0805, X5R	Murata/GRM21BR61C106K
13	C7, C9, C11, C12, C13, C21, C22, C26, C27, C28	Capacitor MLCC, 0.10 µF, 16 V, 0603, X5R	Murata/GRM188R61C104KA
8	C14, C15, C17, C18, C19, C20, C23, C24	Capacitor MLCC, 2.2 µF,16 V, 0603, X5R	Murata/ GRM188R61C225K
1	C25	Capacitor MLCC, 47 µF,16 V, 1210, X5R	Murata/GRM32ER61C476K
2	C10, C16	Capacitor MLCC, 6.2 pF, 50 V, 0603, X5R	Murata/GRM1885C1H6R2DZ01D
17	S17	Push-button switch	ITT/C&K Div/KT11P3JM34LFS/KSC321JLFS
6	D12, D13, D14, D15, D16, D17, D22, D23	White LED	Lite-On/LTW-170TK
10	D9, D18	Red LED	Lumex/SML-LXT0805IW-TR
4	D10, D19, D20, D21	Green LED	Lumex/SML-LXT0805GW-TR
1	D11	Blue LED	Lumex/SML-LX0805USBC-TR
1	U3	ADG802	Analog Devices/ADG802BRTZ-REEL7
3	U5, U6, U7	ADP1715	Analog Devices/ADP1715ARMZ-R7
1	U4	IC MCU USB PERIPH HI SPD-56QFN	Cypress Semi/CY7C68013A
1	U8	Serial EEPROM	Microchip/24LC64
2	J11, J12	72-position connector header	Sullins Electronics/PEC36DAAN
1	J10	36-position connector header	Sullins Electronics/PEC36SAAN
1	JP1	USB connector	Hirose Electric/UX60-MB-5ST
3	LK8, LK9, LK10	36-position connector header	Sullins Electronics/PEC36SAAN
8	LK1, LK2, LK3, LK4, LK5, LK6, LK7, LK11, LK12, J9, J13, J14	36-position connector header	Sullins Electronics/PEC36SAAN
1	Y1	Crystal 24 MHz	CTS/ CTX651CT
3	R17, R19, R22	Resistor, 100 kΩ, 0402	Vishay/CRCW0402100KFKE
4	R21, R24, R25, R27	Resistor, 10 kΩ, 0402	Vishay/CRCW040210K0FKE
1	R20	Resistor, 46.4 kΩ, 0402	Vishay/CRCW040246K4FKE
1	R23	Resistor, 24.3 kΩ, 0402	Vishay/CRCW040224K3FKE
1	R26	Resistor, 31.6 kΩ, 0402	Vishay/CRCW040231K6FKE
2	R28, R29	Resistor, 2.2 kΩ, 0805	Vishay/CRCW08052K21FKE
12	R13, R15, R16, R18	Resistor, 681 Ω 0603	Vishay/CRCW0603681RFKE
4	R9, R10, R11, R14	Resistor, 0 Ω, 0603	Vishay/CRCW06030000Z0E
2	R12, R30	Resistor, 10 kΩ, 0603	Vishay/CRCW060310K0FKE
2	TP1, TP2	36-position connector header	Sullins Electronics/PEC36SAAN

ORDERING GUIDE

Model	Description
ADP5501-EVALZ[1]	Evaluation Board

[1]Z = RoHS Compliant Part.

ESD CAUTION

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

NOTES

EB08103-0-6/09(0)