# MAX77847 Evaluation Kit

**Evaluates: MAX77847**

## General Description

The MAX77847 evaluation kit (EV kit) is a fully assembled and tested printed circuit board (PCB) that demonstrates the capabilities of MAX77847 in the Wafer-Level Packaging (WLP) package. It is a highly efficient high-performance buck-boost regulator with a switching current limit of 4.5A/3.6A and an industry-leading quiescent current of 14µA for battery-powered applications. The IC supports an input voltage range from 1.8V to 5.5V and an output voltage range from 1.8V to 5.2V. The output voltage can be set using the SEL pin, and dynamic voltage scaling can be achieved using the GPI pin without using the I²C interface.

The I²C interface is optional. However, it allows changing the output voltage dynamically in 50mV steps. In addition, the I²C interface also allows selecting the switching current limit, ramp-up/ramp-down slew rate, Forced PWM Mode Operation (FPWM) operation, and monitoring protection status for overcurrent, overvoltage, and thermal shutdown protection for the part. MAXUSB_INTERFACE# allows the use of a Windows® based graphical-user interface (GUI) and a detailed register-based interface to exercise all the features of the IC. The EV kit is compatible with any version of MAX77847 IC (MAX77847BEWL+ is the default version installed on the EV kit).

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## Check List

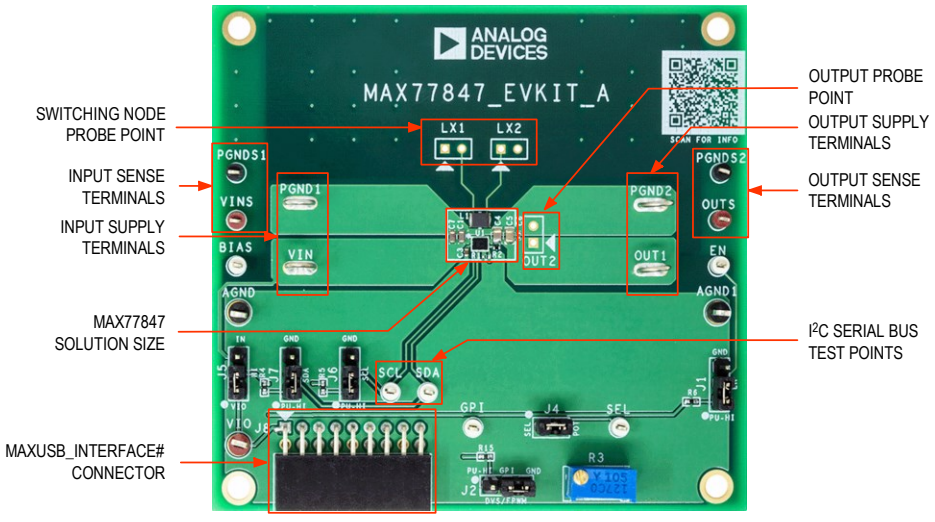
- MAX77847 EV kit
- MAXUSB_INTERFACE# (USB to I²C interface)
- USB Type-A to Micro-USB cable.
- Windows®-based GUI for MAX77847
  - Can be downloaded from Analog Devices website at ***https://www.analog.com/en/products/max77847.html*** (under the **Tools & Simulations** tab). Windows® 7 or newer Windows® operating system is required to use the EV kit software.

## Features and Benefits

- Proven PCB Reference Design and Layout
- Fully Assembled and Tested
- Sense points for High-Accuracy measurements
- Probe sockets for sensitive nodes
- Adjustable startup voltage using a potentiometer (R3)
- I²C header to use external I²C interface
- MAXUSB_INTERFACE# supports using the Windows®-based GUI
- Provision for external logic level support using $V_{IO}$ header

***Ordering Information* appears at end of data sheet**

## MAX77847 Evaluation Kit Board Photo




*319-101020; Rev 0; 8/23*

## EV Kit Default Configuration

The default configuration of the MAX77847 EV Kit is based on the default jumper settings given in *Table 2*, and the default values of the I²C registers are as follows.

- SEL is connected to a potentiometer (R3). Desired output voltage would need to be configured*.
- Peak Switching Current Limit = 4.5A.
- Dynamic Voltage Scaling (DVS) HIGH output voltage is configured as 3.6V default. It has to be configured through the Windows-based graphical user interface(GUI) using MAXUSB_INTERFACE#.
- GPI Pin is configured as FPWM Enable Pin.
- MAX77847BEWL+ is configured in Auto-Skip Mode with Active Discharge Enabled.
- MAX77847BEWL+(MAX77847AEWL+) buck-boost converter is enabled (disabled). The EV kit comes populated with MAX77847BEWL+ by default.

**The output voltage at startup can only be configured from 2.3V to 5.2V. The part can be configured for output voltage from 1.8V to 5.5V in 50mV steps using the GUI with MAXUSB_INTERFACE#.*

## Table 1. MAX77847 EV Kit Specifications

| PARAMETER | CONDITIONS | MIN | TYP* | MAX | UNITS |
|---|---|---|---|---|---|
| Input Voltage Range** | $V_{IN}$ ≥ 2.3V or $V_{OUT}$ ≥ 2.3V | 1.8 | | 5.5 | V |
| Output Voltage Range** | $V_{IN}$ ≥ 2.3V or $V_{OUT}$ ≥ 2.3V, Selectable through $R_{SEL}$, Default = 3.3V ($R_{SEL}$ = 0Ω) | 1.8 | | 5.2 | V |
| Input Voltage Undervoltage Lockout (UVLO) | $V_{IN}$ Rising | 1.70 | 1.75 | 1.80 | V |
| | $V_{IN}$ Falling | 1.63 | 1.68 | 1.73 | V |
| Quiescent Current | EN = HIGH, FPWM = LOW, $T_J$ = -40°C to +85°C, No Switching | | 14 | 35 | µA |
| | EN = HIGH, FPWM = HIGH, $T_J$ = -40°C to +125°C | | 3 | | mA |
| Output Current | | | | 3 | A |
| Operating Input Voltage Range | | 1.8 | | 5.5 | V |

**Typicals are at $V_{IN}$ = +3.8V, $V_{OUT}$ = +3.3V, $R_{SEL}$ short to AGND, $T_J$~$T_A$ = +25°C.*

*** Bias Voltage should be a minimum of 2.3V for best operation of MAX77847. Thus, input voltage or output voltage should be greater than or equal to 2.3V.*

## Table 2. Jumper Connection Guide

| JUMPER | NODE | SHUNT POSITION | FUNCTION |
|---|---|---|---|
| J1 | EN | 1-2* | Connects EN to Logic High voltage through 100kΩ resistor to enable MAX77847. |
| | | 2-3 | Connects EN to GND to disable MAX77847. |
| J2 | GPI | 1-2 | Connects GPI to Logic High voltage through 15kΩ resistor to enable FPWM/DVS. |
| | | 2-3* | Connects GPI to GND to disable FPWM/DVS. |
| J4 | SEL | 1-2* | Connects SEL pin to Potentiometer (R3) to select the output voltage. |
| | | Not Installed | Connects SEL pin to GND through 0Ω resistor (not populated by default) for default output voltage = 3.3V. |

| JUMPER | NODE | SHUNT POSITION | FUNCTION |
|---|---|---|---|
| J5 | Logic High | 1-2 | Selects Logic High Pull Up voltage to $V_{IO}$ which should be applied externally, for operation with $I^2C$ interface. |
| | | 2-3* | Selects Logic High Pull Up voltage to be same as input voltage $V_{IN}$, for Standalone Operation. |
| J6 | SCL | 1-2* | Connects SCL pin to Logic High voltage through a 2.2kΩ resistor. |
| | | 2-3 | Connects to SCL pin to GND. |
| J7 | SDA | 1-2* | Connects SDA pin to Logic High voltage through a 2.2kΩ resistor. |
| | | 2-3 | Connects SDA pin to GND. |

**Default Option*

## Quick Start Guide

### Required Equipment

- MAX77847 EV kit
- Adjustable DC Power Supply
- Digital Multimeter
- Handheld Multimeter
- Electronic Load
- MAXUSB_INTERFACE# for $I^2C$ serial interface (optional)
- USB Type-A to Micro-USB cable (optional)
- Windows®-based PC with MAX77847 EV Kit GUI (optional)

### Setup Overview

The overview can be found in the following sections. See *MAX77847 Evaluation Kit Board Photo*, *Figure 1* (MAX77847 Typical Application Circuit) and *Figure 2* for the typical test setup that can be used to evaluate the EV kit.

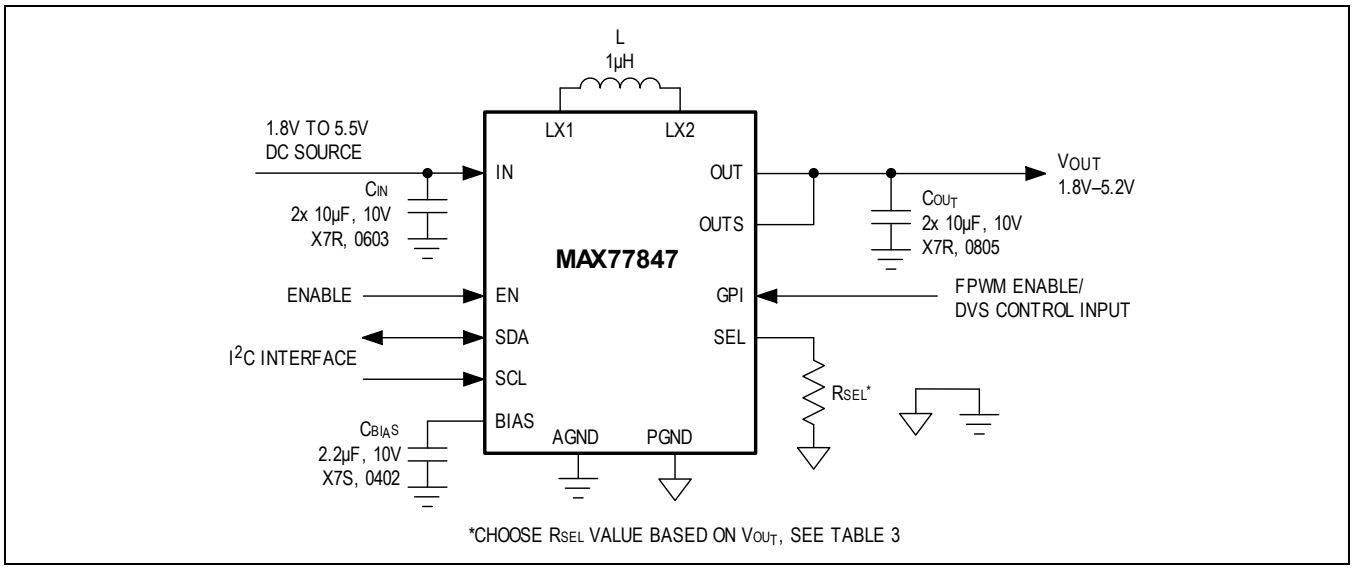



*Figure 1. MAX77847 Typical Application Circuit*

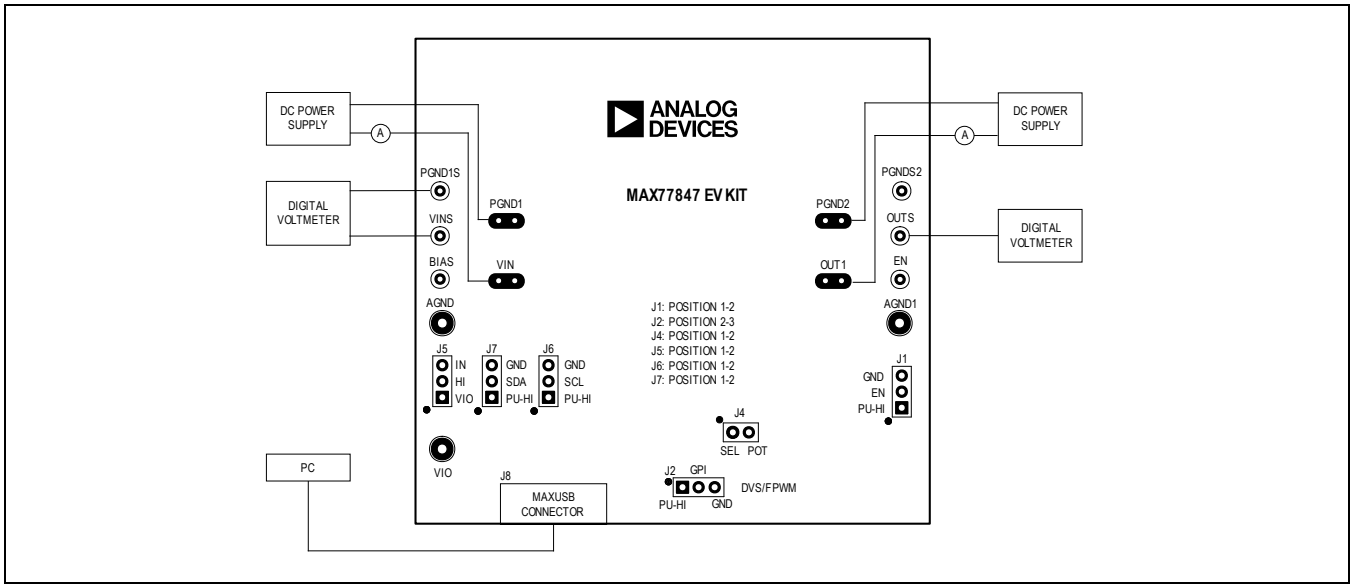



*Figure 2. MAX77847 EV Kit Board Connections*

## Procedure

The MAX77847 EV kit is fully assembled and tested. The EV kit can be operated without MAXUSB_INTERFACE and the I²C interface if installed with MAX77847BEWL+. Follow the steps for instructions on standalone operation.

1. Ensure the EV Kit has the correct jumper connections, as shown in *Table 2*.
2. Make sure J5 is in position 2-3 between IN and HI.
3. Connect a voltmeter (DVM1) to VINS, and PGNDS sense points to measure the input voltage.
4. Connect a voltmeter (DVM2) to OUTS, and PGNDS sense points to measure the output voltage.
5. Disconnect jumper J4, which connects the SEL pin to the potentiometer (R3). Use a handheld multimeter configured in resistance measurement mode and connect between pin 2 of J4 (labelled POT) and AGND/AGND1 test point.
6. Turn the potentiometer (R3) to get the minimum possible resistance which should be as close to 0Ω as possible. Disconnect the handheld multimeter and place the jumper J4 back. This ensures that the part starts up with the default output voltage of 3.3V.
7. Connect an adjustable power supply set to 0V to input power terminals $V_{IN}$ and PGND1 through an input ammeter. Set the power supply current limit to 100mA and power supply voltage to 3.8V.
8. Turn on the Power Supply and ensure the input current measures around 20µA and the output voltage is the default output voltage of 3.3V.
9. Short the input ammeter and increase the power supply current limit to 10A. Connect an electronic load to the output terminals OUT and PGND2 and increase the load current to evaluate the MAX77847 buck-boost converter.

The following steps describe the connection and evaluation of the MAX77847EVKIT# using the MAXUSB_INTERFACE# and the Windows-based GUI. It is an optional step if the EV kit is populated with MAX77847BEWL+. However, it is required to use the GUI if the desired output voltage is below 2.3V. It is imperative to use the following procedure if the EV kit is populated with MAX77847AEWL+. See the *Ordering Information* table to ensure the EV Kit is populated with the desired part.

The MAX77847 EV kit comes populated with 2.2kΩ pull-up resistors (R4 and R5) for I²C serial interface signals SDA and SCL. Follow the below steps to install the appropriate Windows-based GUI and communicate with the EV kit using the MAXUSB_INTERFACE#.

**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 underline** refers to items from the Windows® operating system.

1. Install the MAX77847 EV kit GUI. Refer to the product webpage at ***https://www.analog.com/max77847evkit.html*** and click the **Tools & Simulations** tab. Click on the link under the Software Development to download the latest MAX77847 EV kit software. Save the software installation file to a temporary folder and decompress the zip file. Install the EV kit software on your computer by running the .EXE installer and follow the on-screen instructions to complete the installation.
2. Turn off the input power supply connected in step 4.
3. Connect jumper J5 between positions 1-2 to power the Logic High rail from MAXUSB_INTERFACE#, as mentioned in *Table 2*.
4. Ensure SW1 and SW2 are in the ON position for all the switches on the MAXUSB_INTERFACE# board. This enables I2C mode on the MAXUSB_INTERFACE#.
5. **Important:** Ensure the VL jumper (J5) on the MAXUSB_INTERFACE# is set to position 2-3 to set the output of MAXUSB_INTERFACE# LDO to 1.8V. This provides the pull-up voltage for SDA, SCL, EN and GPI pins. Setting this incorrectly to 3.3V could potentially damage the MAX77847 IC.
6. Connect the MAXUSB_INTERFACE# to the EV kit using the connector J8. Connect the MAXUSB_INTERFACE# to your PC's USB port using a USB Type-A to Micro-USB cable.
7. Turn on the input power supply set to the typical input voltage of 3.8V.
8. On the PC, open the GUI and click the **Device** button in the menu bar. Click the **Connect** button in the **Device** button's drop-down list. A small pop-up window would appear showing the device and the slave address. Select the device and click **Connect**. Once the device responds, the GUI status changes to **Connected** in the bottom right corner of the GUI window.
9. Click on **Read Once** in the top menu of the **Buck-Boost** Tab. The device settings should update in the **Buck-Boost** tab. Change the output voltage by moving the slider in the **Output Voltage Setting (Low)** section to the desired value in the GUI. Click on the **Write** button next to the slider. **NOTE:** The bias voltage for MAX77847 should be a minimum of 2.3V, as mentioned in *Table 1*. Thus, it is important to ensure that either the input or the output voltage is a minimum of 2.3V.
10. Confirm on DVM2 that the software command to change the output voltage was successful. If so, the I2C serial interface is confirmed to be working.
11. This concludes the Quick Start procedure. Users are now encouraged to explore the device and its register settings with the GUI software. For more information about the GUI, see the *EV Kit Software* section.

## Detailed Description of Hardware

MAX77847 EV kit should be used with the following documents:

- MAX77847 Data Sheet
- MAX77847 EV Kit Data Sheet (this document)

These documents, or links to them, are included in the MAX77847 EV kit Package. For the latest versions of the documents, refer to *https://www.analog.com/en/products/max77847.html*.

The EV kit demonstrates the operation of MAX77847, a high-efficiency, high-performance buck-boost regulator with an industry-leading quiescent current of 14µA for battery-powered applications. The IC can support input voltage from 1.8V to 5.5V with an adjustable output voltage between 1.8V to 5.2V with 50mV steps.

The IC features an SEL pin to configure the default output voltage and the I2C slave address. A configurable GPI pin allows the user to use it as an FPWM Mode enable input or a DVS enable input to change the output voltage between two output voltages without the I2C interface.

The EV kit is equipped with input (VIN, PGND1) and output power terminals (OUT1, PGND2) and sense points for critical nodes for an extensive evaluation of the performance of MAX77847. The EV kit includes a connector (J8) for connecting to MAXUSB_INTERFACE# to enable the user to change the settings of MAX77847 using an optional Windows®-based GUI. A detailed description of their functionality can be found in the following sections.

### MAXUSB_INTERFACE#

The MAXUSB_INTERFACE, and the companion EV kit GUI software allow users to easily change the MAX77847's register settings with a Windows® PC. Before connecting the MAXUSB_INTERFACE# to the EV kit's MAXUSB_INTERFACE# connector (J8), make sure that the MAXUSB_INTERFACE# is configured with the following settings:

- SW1, SW2 to ON position (This enables the $I^2C$ mode on the MAXUSB_INTERFACE#).
- $V_L$ jumper (J5) to 1.8V (This sets the MAXUSB_INTERFACE#'s $V_{IO}$ voltage to align with the logic levels of the MAX77847).
  - **Warning:** Setting this incorrectly to 3.3V could damage the MAX77847 IC.

The MAXUSB_INTERFACE# also includes an on-board LDO that can supply the necessary voltage to $V_{IO}$. If you use the MAXUSB_INTERFACE#, disconnect any external $V_{IO}$ supply from the EV kit, and ensure header jumper J5 is connected between EN and $V_{IO}$ (position 1-2).

### Setting the Output Voltage

The MAX77847 supports output voltages from 1.8V to 5.2V. The MAX77847 EV kit is equipped with a potentiometer (R3) connected to the SEL pin to adjust the output voltage when the part is enabled by making the EN pin HIGH for MAX77847BEWL+ (EN bit HIGH for MAX77847AEWL+). *Table 3* lists the values of resistor $R_{SEL}$ connected between the SEL pin and ground for configuring the output voltage for startup. If a standalone resistor is used as $R_{SEL}$, it is recommended to have a maximum tolerance of 1%.

**Note:** The output voltage at startup is limited to 2.3V to 5.2V due to the bias voltage requirement listed in *Table 1*. Once the buck-boost converter output rises to the desired voltage between 2.3V to 5.2V, the output voltage can be set from 1.8V to 5.2V using the Windows®-based GUI, which communicates to the MAX77847 using the MAXUSB_INTERFACE#. The details about the functionality of the Windows®-based GUI can be found in the *EV Kit Software* section.

## Table 3. MAX77847 $R_{SEL}$ Selection Table

| $R_{SEL}$(kΩ) | $V_{OUT}$ (V) | SLAVE ADDRESS (7bit) |
|---|---|---|
| Short (0) | 3.3 | 110 0111b (0x67) |
| 4.99 | 2.3 | |
| 5.90 | 2.5 | |
| 7.15 | 2.6 | |
| 8.45 | 2.7 | |
| 10.0 | 2.8 | |
| 11.8 | 2.9 | |
| 14.0 | 3.0 | |
| 16.9 | 3.4 | |
| 20.0 | 3.6 | |
| 23.7 | 3.8 | |
| 28.0 | 4.0 | |
| 34.0 | 4.2 | |
| 40.2 | 4.5 | |
| 47.5 | 5.0 | |

| $R_{SEL}$(kΩ) | $V_{OUT}$ (V) | SLAVE ADDRESS (7bit) |
|---|---|---|
| 56.2 | 5.2 | |
| 66.5 | 3.3 | 110 1111b (0x6F) |
| 80.6 | 2.3 | |
| 95.3 | 2.5 | |
| 113 | 2.6 | |
| 133 | 2.7 | |
| 162 | 2.8 | |
| 192 | 2.9 | |
| 226 | 3.0 | |
| 267 | 3.4 | |
| 324 | 3.6 | |
| 383 | 3.8 | |
| 452 | 4.0 | |
| 536 | 4.2 | |
| 634 | 4.5 | |
| 768 | 5.0 | |
| 909 or Open | 5.2 | |

## High-Temperature Testing

The MAX77847 is rated for operation under junction temperatures upto +125°C. Note that not all components on the EV kit are rated for temperatures this high. Some ceramic and tantalum capacitors experience extra leakage when put under temperatures higher than they are rated, for and the supply current readings for the EV kit might be higher than expected. The MAXUSB_INTERFACE# is also not rated for operation at +125°C. Double-check the components on the EV kit if testing at +125°C ambient or junction temperatures. Consider replacing these components if the IC operation is at +125°C ambient or junction temperature is an important use case. See the *MAX77847 EV Kit Bill of Materials* section for the component list. List of capacitors not rated for +125°C: C2.

### Critical Node Measurement (LX1, LX2, OUT)

The EV kit provides socket test points for measurement of critical nodes such as LX1, LX2 and OUT1. These probe points are shown in *Figure 2*. It is important to use a probe with a pig-tail connector attached and connected directly to the test points, as shown in *Figure 3*. The pig-tail connector minimizes the ground loop inductance for the measurement, thereby minimizing high frequency noise coupling. This method gives the most accurate results for measuring output voltage ripple, switching waveforms, and load transient response.

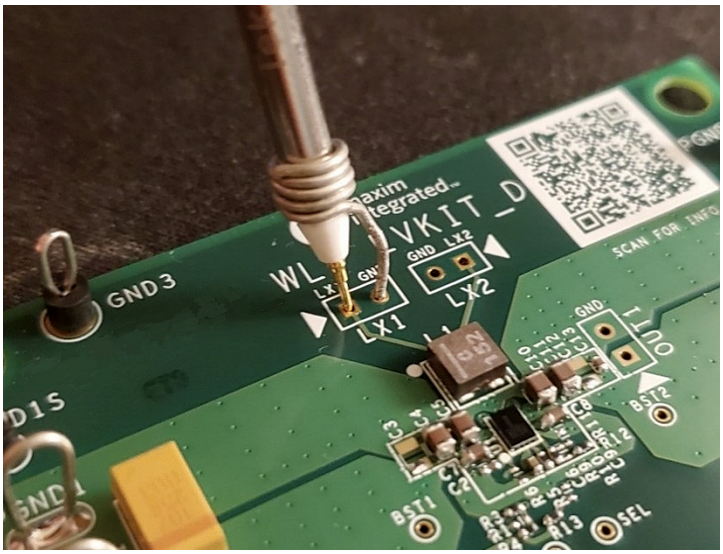



*Figure 3. Critical Node Measurement*

### Efficiency Measurement

The MAX77847 buck-boost converter shows excellent efficiency performance for a wide load range. The MAX77847 EV kit has sense pins for accurately measuring input voltage (VINS, PGNDS1) and output voltage (OUTS, PGNDS2). It is important to use these pins for the most accurate results for efficiency, load regulation and line regulation tests.

**Warning:** It is important not to connect the electronic load or DC power supply to the sense pins. These pins and their traces are not designed for carrying large amounts of current and are only designed to measure voltages. Drawing large currents through these pins can damage the EV kit and exhibit sub-optimal performance due to higher resistance. Use input supply terminals (VIN, PGND1) for connecting to input supply and output terminals (OUT1, PGND2) for connecting to electronic load, as shown in *Figure 2*.

## Table 4. Usage of Critical Test Points

| LOAD TRANSIENT, OUTPUT RIPPLE | LOAD REGULATION, LINE REGULATION, $V_{OUT}$ ACCURACY | EFFICIENCY | | SWITCHING NODE | |
|---|---|---|---|---|---|
| | | OUTPUT VOLTAGE | INPUT VOLTAGE | LX1 | LX2 |
| $V_{OUT}$ (OUT1) | $V_{OUT}$ (OUTS, PGNDS2) | $V_{OUT}$ (OUTS, PGNDS2) | $V_{IN}$ (INS, PGNDS1) | LX1 (LX1) | LX2 (LX2) |

## EV Kit Software

The graphical user interface (GUI) software allows for a quick, easy, and thorough evaluation of the MAX77847. The GUI and the MAXUSB_INTERFACE#, drive the I2C communication with the EV kit. Every control in the GUI corresponds directly to a register within the MAX77847. Refer to the *Register Map* section of the MAX77847 IC data sheet for a complete description of the registers. See *Figure 4* for a screenshot of the GUI upon the first opening of the software.

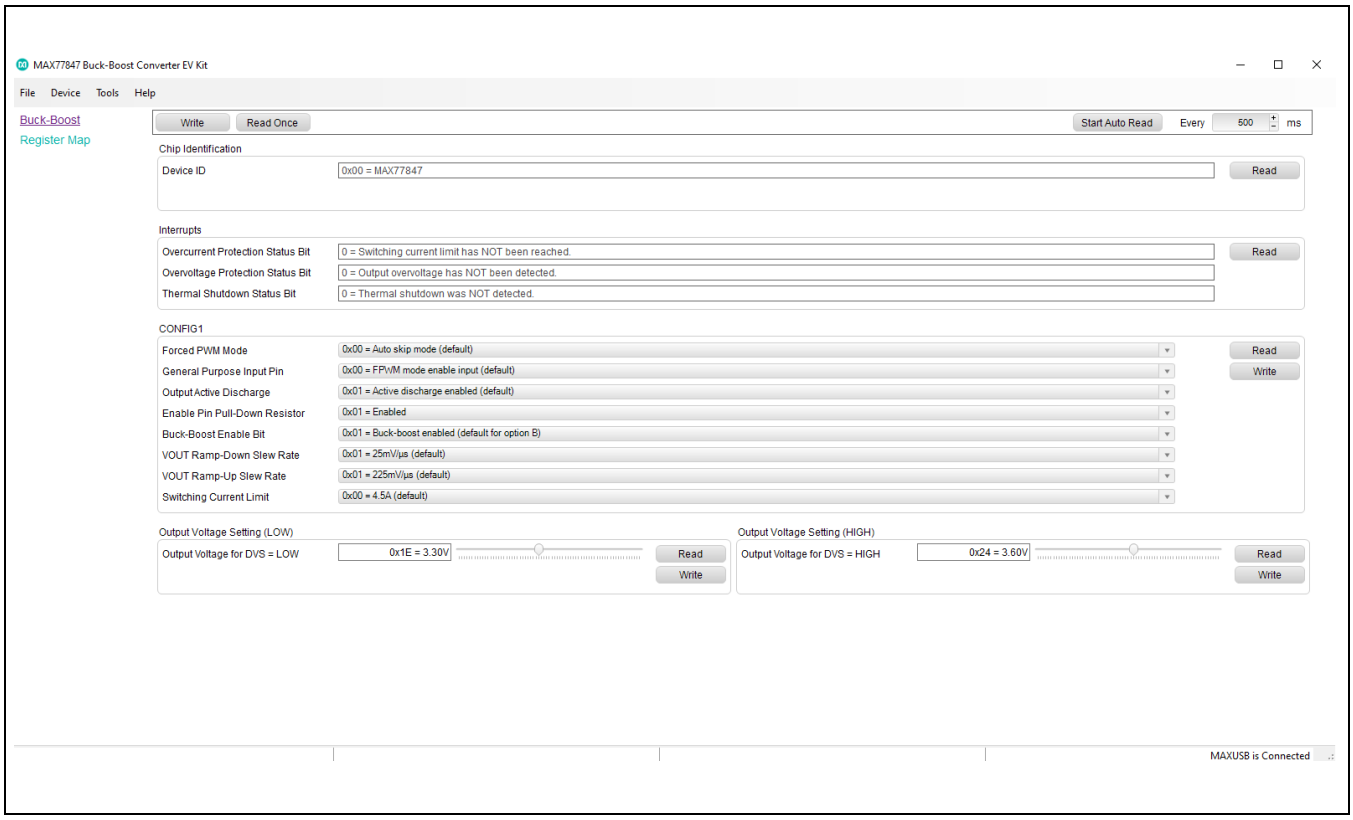



*Figure 4. MAX77847 EV Kit GUI Software Buck-Boost Tab*

### Installation

Visit the product webpage at *https://www.analog.com/en/products/max77847.html* and click on the **Tools and Simulations** tab. Click on the link under Software Development to download the latest MAX77847 EV kit software. Save the EV kit software installation file to a temporary folder and decompress the ZIP file. Install the EV kit software on your computer by running the .EXE installer and follow the on-screen instructions to complete the installation.

### Windows Driver

After plugging in the MAXUSB_INTERFACE# to the PC with a Micro-USB cable for the first time, wait for 30 seconds, for Windows® to automatically install the necessary drivers.

### Connecting the GUI to MAXUSB_INTERFACE#

Confirm that the MAXUSB_INTERFACE# is connected to the PC and the EV kit and is set up as described in the *Procedure* section. Open the GUI and click **Device** in the upper left corner of the GUI window. Click **Connect** in the drop-down menu. If you have multiple MAXUSB_INTERFACE# adapters or Future Technology Devices International (FTDI) devices connected to your PC, the **Port Synchronization** menu appears, as shown in *Figure 5*. Select the port corresponding to the MAXUSB_INTERFACE# attached to the MAX77847 EV kit and click **Connect**.

As shown in Figure 6, the **Device Synchronization** menu opens once the MAX77847 IC responds (voltages on the IN and EN pins must be valid on the MAX77847 IC for it to respond). The I²C address is shown in the MAX77847 ICs 7-bit slave address. The address changes based on the EV kit's $R_{SEL}$ configuration. Table 3 details the different slave addresses based on $R_{SEL}$ value. Click **Connect and Read**. The text at the bottom right of the GUI window changes from **MAXUSB is Disconnected** to **Connected**.

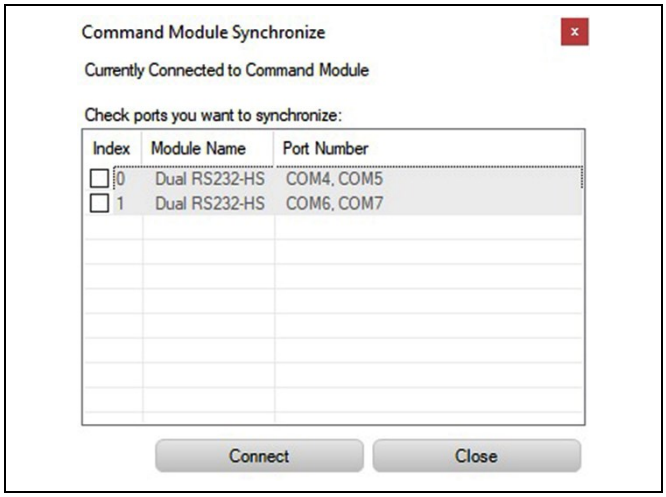



*Figure 5. Port Synchronization Menu*

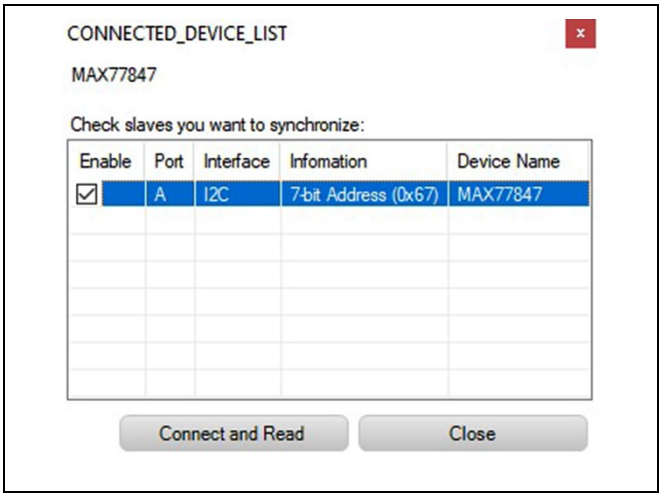



*Figure 6. Device Synchronization Menu*

## Configuration

The **Buck-Boost** tab (Figure 4) of the GUI displays information and the status of the IC on the EV kit as well as all available register settings. It is divided into five different sections: **Chip Identification, Interrupts, CONFIG1, Output Voltage Setting (LOW)** and **Output Voltage Setting (HIGH)**.

Click **Read Once** at the top of the GUI window to update all the register values currently stored on the MAX77847. After changing the setting values in the GUI software, click **Write** on the top of the GUI window to apply all settings to MAX77847's registers. Alternatively, click **Read** on each setting's section to obtain the setting values of that section currently stored on the MAX77847's registers. After changing the setting values in the GUI software, click **Write** in the corresponding setting section to apply the new settings for the section to the MAX77847's registers.

The **Chip Identification** section (Figure 7) shows the **Device ID** for MAX77847. It can be different based on different versions of the IC and is a read-only parameter.


*Figure 7. Chip Identification Section of the MAX77847 GUI Software*

The **Interrupts** section (Figure 8) displays the status of all the protection features on MAX77847, which include overcurrent protection, overvoltage protection and thermal protection and are stored in the *STAT* register. If any of the fields are set to 1, it means that the protection feature has detected the corresponding fault event. The status of these interrupts should be monitored regularly while evaluating the MAX77847, and their values can be updated by clicking the **Read** button in this section. Alternatively, one can click on **Start Auto Read** on the top of the GUI window and periodically read all the registers in the specified time interval, as shown in Figure 4.

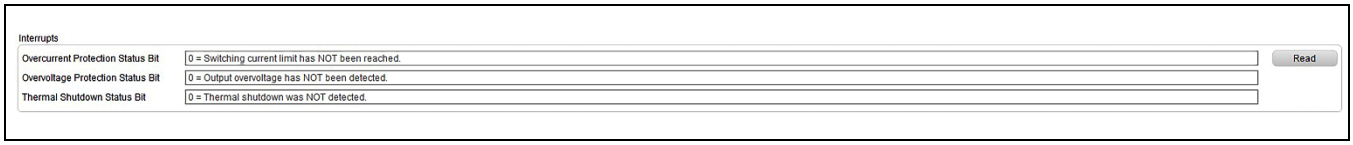



*Figure 8. Interrupts Section of the MAX77847 GUI Software*

The **CONFIG1** section (*Figure 9*) lists all the parameters of the MAX77847 that can be changed to suit the user's application needs. These values are stored in the *CFG* register. The default values of the registered are marked in the brackets. This section gives the user ability to configure forced-PWM mode (FPWM), output active discharge, internal pull-down resistor for EN pin, output voltage ramp up/down slew rate, switching current limit, GPI pin functionality, and enable/disable the Buck-Boost converter output. Click **Read** to obtain the setting stored on the IC, and click **Write** to apply the new settings to the IC.

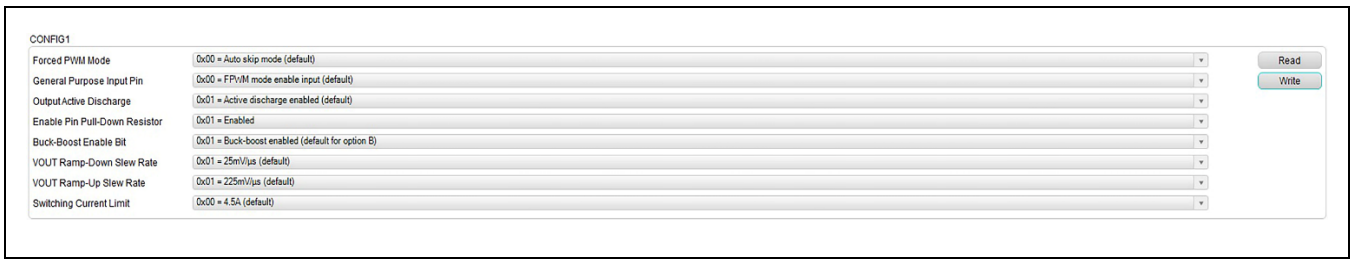



*Figure 9. CONFIG1 Section of the MAX77847 GUI Software*

The **Output Voltage Setting (LOW)** section (*Figure 10*) is used to select the output voltage of the Buck-Boost converter from 1.8V to 5.2V. When the Buck-Boost output is first enabled, the output voltage is determined by the $R_{SEL}$ value on the SEL pin, as shown in *Table 3*, which is limited from 2.3V to 5.2V. Once the Buck-Boost output is enabled, the GUI can then be used to program the output voltage from 1.8V to 5.2V. See *Setting the Output Voltage* section for more details about configuring the output voltage.

The output voltage selected in this section corresponds to the buck-boost output voltage by default and when the GPI pin is pulled LOW externally (*GPI_CFG* = 1). Click **Read** to obtain the setting stored on the IC, and click **Write** to apply the new settings to the IC.

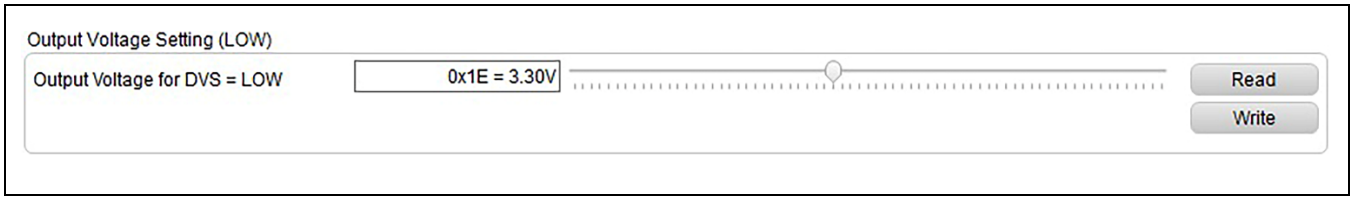



*Figure 10. Output Voltage Setting (LOW) Section of the MAX77847 GUI Software*

The **Output Voltage Setting (HIGH)** section (*Figure 11*) is used to program the buck-boost output voltage when the GPI pin is HIGH. This voltage defaults to 3.6V, as shown in *Figure 11* but can be changed once the buck-boost output is enabled and settled to the correct value. When the GPI pin is configured as a DVS input (*GPI_CFG* = 1) in the *CFG* register from the **CONFIG1** section listed above, the IC changes the output voltage to the output voltage set in the **Output Voltage Setting (HIGH)** section when the GPI pin is pulled HIGH externally. This gives the user the functionality to command DVS using external signals.

The output voltage ramp up/down slew rate set in the *CFG* register in the **CONFIG1** section above determines the slew transition rate from DVS LOW voltage to DVS HIGH voltage and vice-versa. Click **Read** to obtain the setting stored on the IC and click **Write** to apply the new settings to the IC.

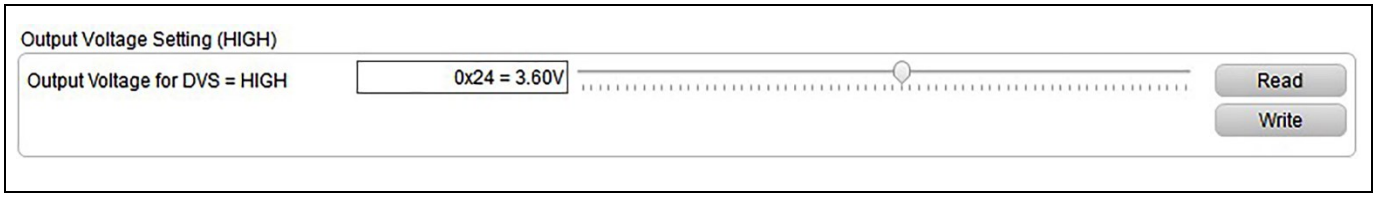



*Figure 11. Output Voltage Setting (HIGH) section of the MAX77847 GUI software*

### Register Map

The **Register Map** tab of the GUI shows the detailed register map of MAX77847. The latest values in the registers can be displayed by clicking the **Read All** button at the top of the Register Map tab window. Click on individual bits to show the name and description of the specific field.

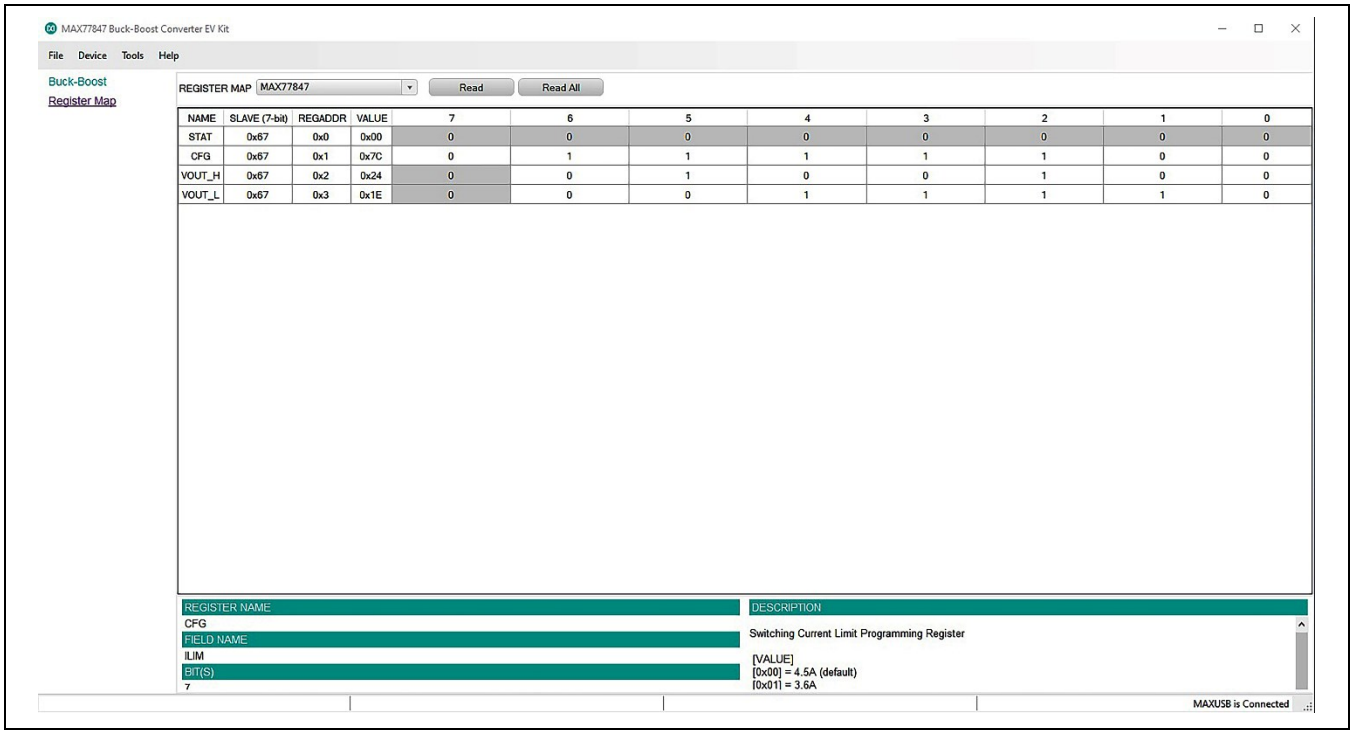



*Figure 12. MAX77847 EV Kit GUI Software Register Map Tab*

## Ordering Information

| PART | U1 IC | DEFAULT OUTPUT VOLTAGE | TYPE |
|---|---|---|---|
| MAX77847EVKIT# | MAX77847BEWL+ | 3.3V | EV Kit |

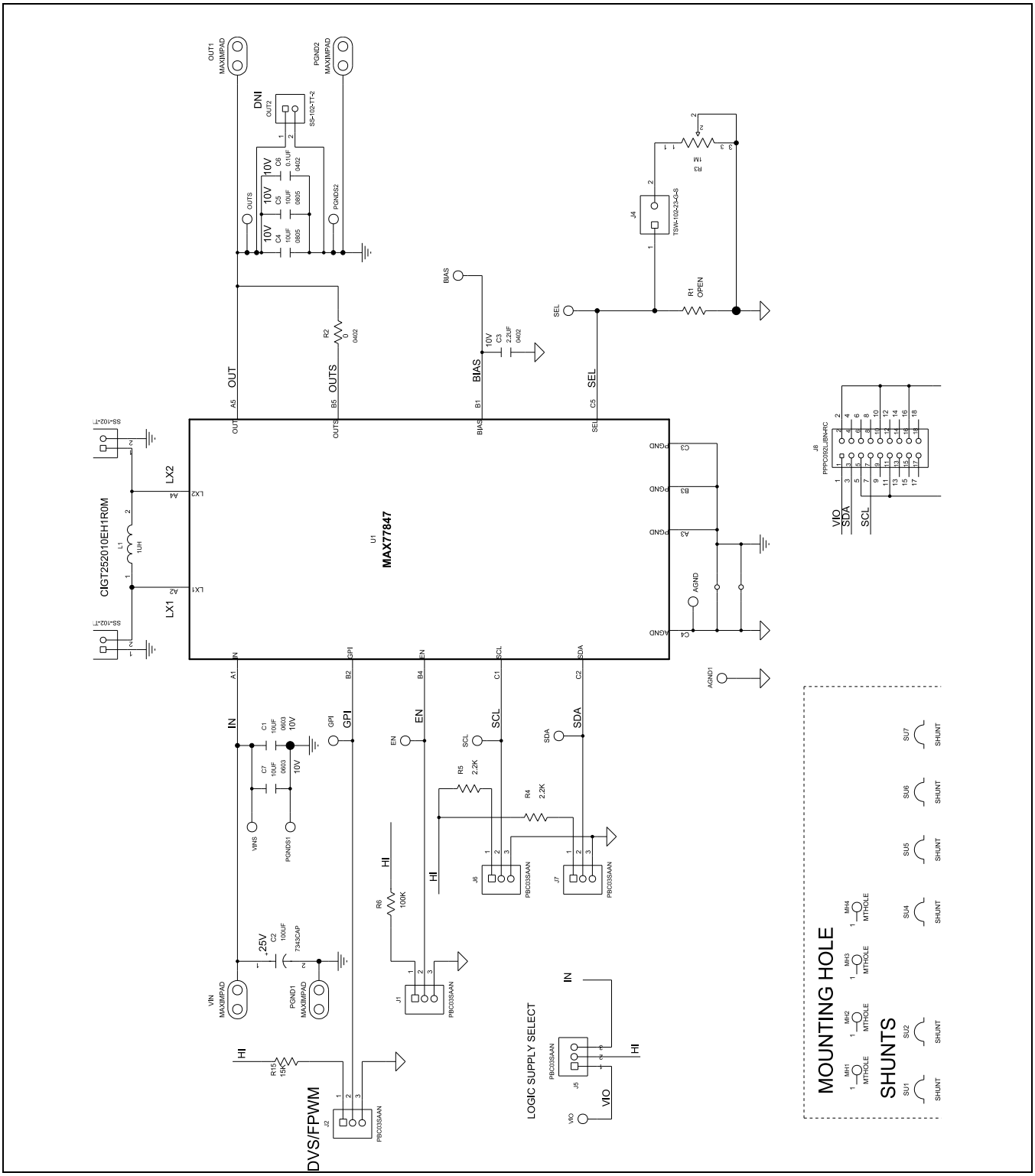
*#Denotes RoHS-compliant.*

## MAX77847 EV Kit Bill of Materials

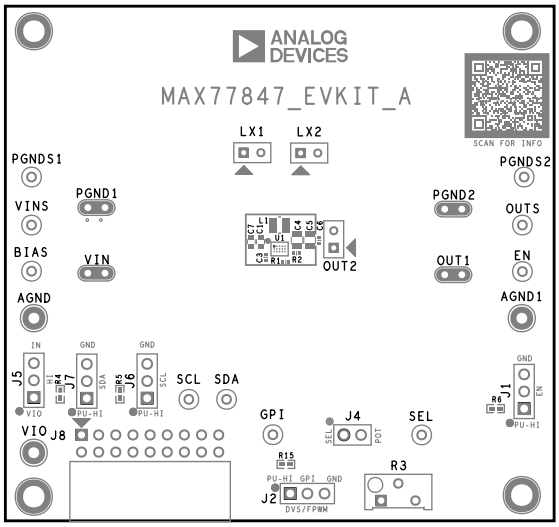
| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| 1 | AGND, AGND1 | — | 2 | 5011 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; |
| 2 | BIAS, EN, GPI, SCL, SDA, SEL | — | 6 | 5002 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; WHITE; PHOSPHOR BRONZE WIRE SILVER; |
| 3 | C1, C7 | — | 2 | GRM188D71A106MA73Z | MURATA | 10UF | CAP; SMT (0603); 10UF; 20%; 10V; X7T; CERAMIC |
| 4 | C2 | — | 1 | T491X107K025A | KEMET | 100UF | CAP; SMT (7343-43); 100UF; 10%; 25V; TANTALUM |
| 5 | C3 | — | 1 | C1005X7S1A225K050BC | TDK | 2.2UF | CAP; SMT (0402); 2.2UF; 10%; 10V; X7S; CERAMIC |
| 6 | C4, C5 | — | 2 | CL21B106KPQNNN; LMK212AB7106KG; C0805X106K8RACAUTO; GRM21BR71A106KA73; C2012X7R1A106K125AC; GMC21X7R106K10NT | SAMSUNG; TAIYO YUDEN; KEMET; MURATA; TDK; CAL-CHIP ELECTRONIC INC. | 10UF | CAP; SMT (0805); 10UF; 10%; 10V; X7R; CERAMIC |
| 7 | C6 | — | 1 | GRM155R71A104KA01; C1005X7R1A104K050BB; C0402C104K8RAC | MURATA; TDK; KEMET | 0.1UF | CAP; SMT (0402); 0.1UF; 10%; 10V; X7R; CERAMIC |
| 8 | J1, J2, J5-J7 | — | 5 | PBC03SAAN | SULLINS | PBC03SAAN | CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 3PINS; -65 DEGC TO +125 DEGC |
| 9 | J4 | — | 1 | TSW-102-23-G-S | SAMTEC | TSW-102-23-G-S | CONNECTOR; THROUGH HOLE; SINGLE ROW; STRAIGHT; 2PINS; -55 DEGC TO +125 DEGC |
| 10 | J8 | — | 1 | PPPC092LJBN-RC | SULLINS ELECTRONICS CORP | PPPC092LJBN-RC | CONNECTOR; FEMALE; THROUGH HOLE; PPP SERIES; RIGHT ANGLE; 18PINS |
| 11 | L1 | — | 1 | CIGT252010TM1R0ML | SAMSUNG | 1UH | INDUCTOR; SMT (1008); SHIELDED; 1UH; 20%; 5.3A ; |
| 12 | OUT1, PGND1, PGND2, VIN | — | 4 | 9020 BUSS | WEICO WIRE | MAXIMPAD | EVK KIT PARTS; MAXIM PAD; WIRE; NATURAL; SOLID; WEICO WIRE; SOFT DRAWN BUS TYPE-S; 20AWG |
| 13 | OUTS, VINS | — | 2 | 5000 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; |

| ITEM | REF_DES | DNI/DNP | QTY | MFG PART # | MANUFACTURER | VALUE | DESCRIPTION |
|---|---|---|---|---|---|---|---|
| 14 | PGNDS1, PGNDS2 | — | 2 | 5001 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; BLACK; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH; |
| 15 | R2 | — | 1 | RC0402JR-070RL; CR0402-16W-000RJT | YAGEO PHYCOMP; VENKEL LTD. | 0 | RES; SMT (0402); 0; 5%; JUMPER; 0.0630W |
| 16 | R3 | — | 1 | 3296Y-1-105LF | BOURNS | 1M | RES; THROUGH HOLE-RADIAL LEAD; 1M; 10%; +/-100PPM/DEGC; 0.5W |
| 17 | R4, R5 | — | 2 | CRCW04022K20JN | VISHAY DALE | 2.2K | RES; SMT (0402); 2.2K; 5%; +/-200PPM/DEGK; 0.0630W |
| 18 | R6 | — | 1 | ERJ-2RKF1003 | PANASONIC | 100K | RES; SMT (0402); 100K; 1%; +/-100PPM/DEGC; 0.1000W |
| 19 | R15 | — | 1 | ERJ-2GEJ153 | PANASONIC | 15K | RES; SMT (0402); 15K; 5%; +/-200PPM/DEGC; 0.1000W |
| 20 | SU1, SU2, SU4-SU7 | — | 6 | S1100-B; SX1100-B; STC02SYAN | KYCON; KYCON; SULLINS ELECTRONICS CORP. | SX1100-B | TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT; PHOSPHOR BRONZE CONTACT=GOLD PLATED |
| 21 | U1 | — | 1 | MAX77847BEWL+ | ANALOG DEVICES | MAX77847 | EVKIT PART - IC; 5.5V INPUT 3.1A SWITCHING CURRENT BUCK-BOOST CONVERTER; WLP15 |
| 22 | ASSY1 | — | 1 | MAXUSB_INTERFACE# | MAXIM | MAXUSB_ INTERFACE# | EVKIT PART-MODULE; KIT; MAXUSBINTERFACE; DUAL-PORT USB-TO-SERIAL INTERFACE BOARD |
| 23 | VIO | — | 1 | 5010 | KEYSTONE | N/A | TEST POINT; PIN DIA=0.125IN; TOTAL LENGTH=0.445IN; BOARD HOLE=0.063IN; RED; PHOSPHOR BRONZE WIRE SIL; |
| 24 | PCB | — | 1 | MAX77847 | MAXIM | PCB | PCB:MAX77847 |
| 25 | LX1, LX2, OUT2 | DNP | 0 | SS-102-TT-2 | SAMTEC | SS-102-TT-2 | IC-SOCKET; SIP; STRAIGHT; PRECISION MACHINED SOCKET STRIP; OPEN FRAME; 2PINS; 100MIL |
| 26 | R1 | DNP | 0 | N/A | N/A | OPEN | RESISTOR; 0402; OPEN; FORMFACTOR |
| **TOTAL** | | | **47** | | | | |

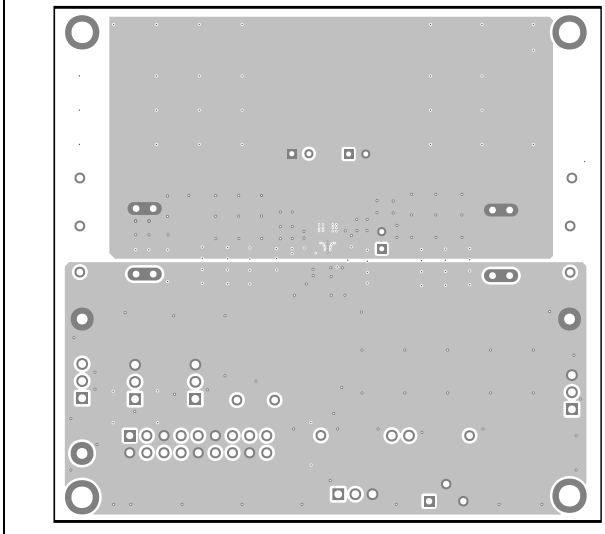
## MAX77847 EV Kit Schematic Diagram



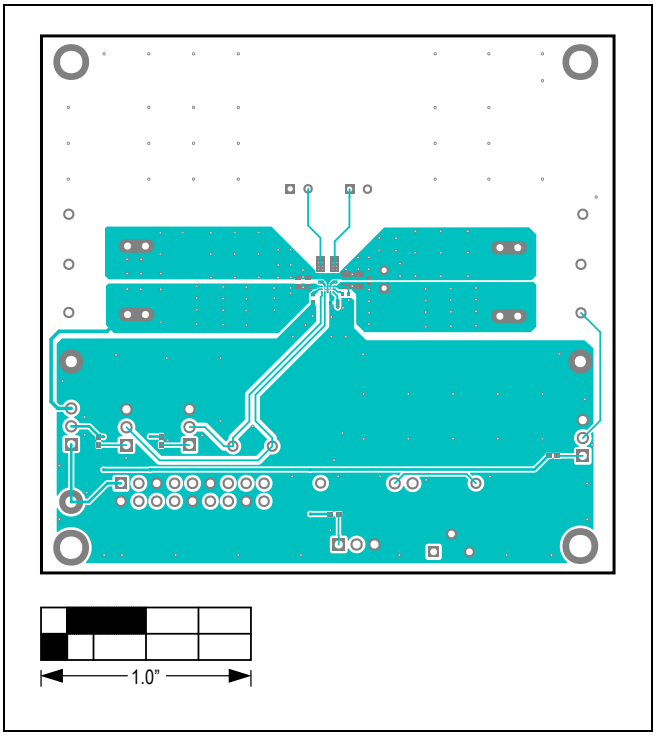
## MAX77847 EV Kit PCB Layout Diagrams



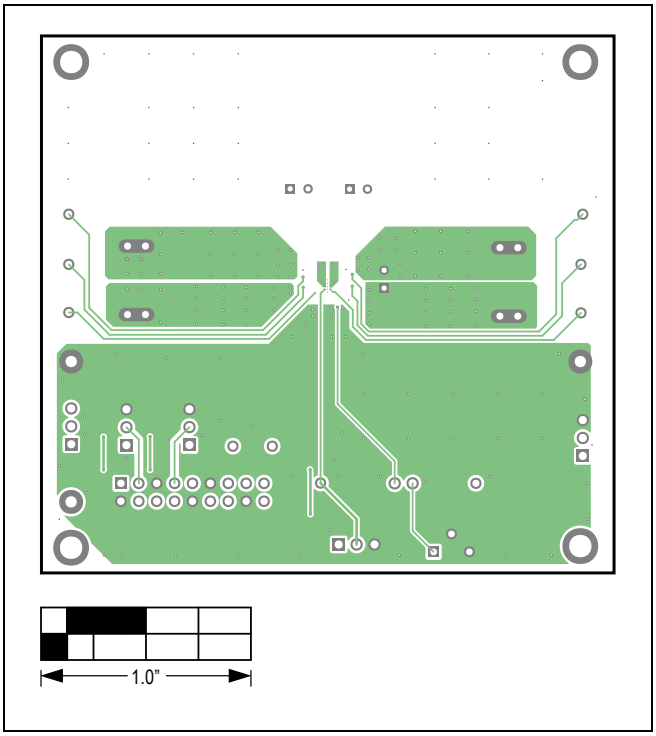

*MAX77847 EV Kit Component Placement Guide—Top Silkscreen*




*MAX77847 EV Kit PCB Layout—Layer 2*

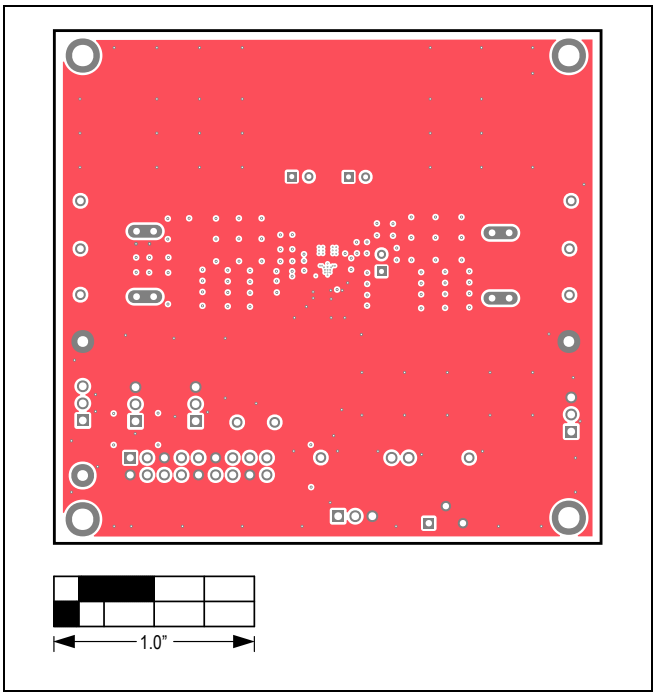



*MAX77847 EV Kit PCB Layout—Top View*

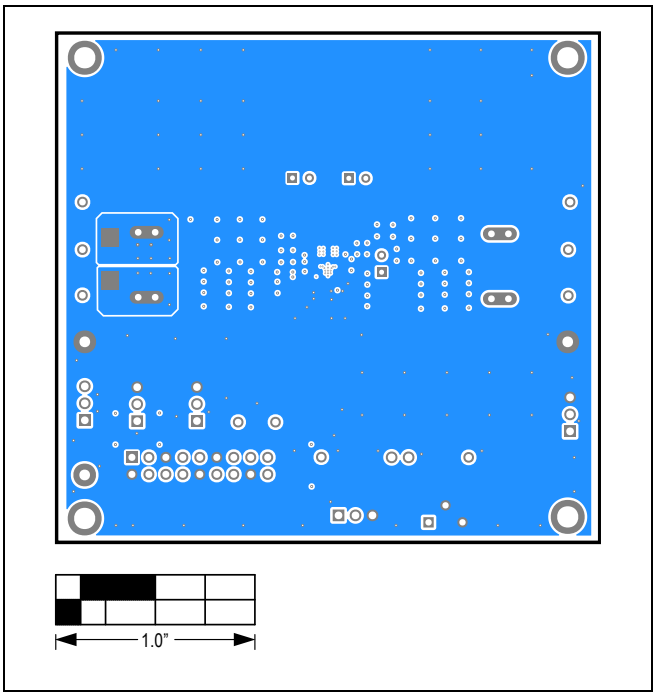



*MAX77847 EV Kit PCB Layout—Layer 3*

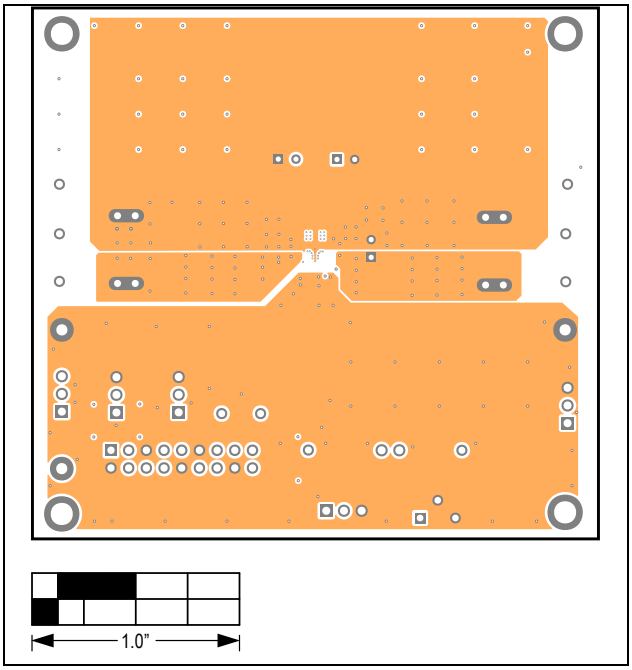
## MAX77847 EV Kit PCB Layout (continued)



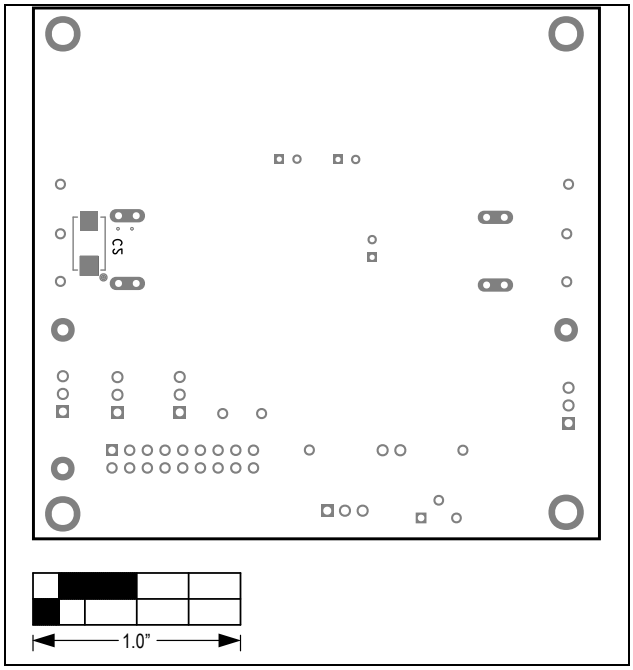

*MAX77847 EV Kit PCB Layout—Layer 4*




*MAX77847 EV Kit PCB Layout—Bottom View*




*MAX77847 EV Kit PCB Layout—Layer 5*




*MAX77847 EV Kit PCB Layout—Bottom Silkscreen*

## Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|---|---|---|---|
| 0 | 08/23 | Initial release | — |