MAX77960B/MAX77961B Evaluation Kit

Evaluates: MAX77960B/MAX77961B

General Description

The MAX77960B/MAX77961B evaluation kit (EV kit) is a fully assembled and tested surface-mount printed circuit board (PCB) that evaluates the MAX77960B/MAX77961B, 3A/6A USB Type-C® buck-boost chargers.

The MAX77960B/MAX77961B EV kit includes the IC evaluation board with integrated I2C communication interface and USB micro-B cable. Windows®-based graphical user interface (GUI) software is available for use with the EV kit and can be downloaded from Maxim's website at **www.maximintegrated.com/products/MAX77960B** (under the *Design Resources* tab) and **www.maximintegrated.com/products/MAX77961B** (under the *Design Resources* tab). Windows 7 or newer is required to use with the EV kit GUI software.

Features

- Evaluates the MAX77960B/MAX77961B USB Type-C Buck-Boost Chargers with Integrated FETs for 2S/3S Li-Ion Batteries
- Demonstrates 3.5V to 25.4V Input Operating Range
- Demonstrates Charging Up to 3A (MAX77960B)/6A (MAX77961B)
- Demonstrates USB-OTG Functionality
- Demonstrates JEITA Compliance with On-Board Dummy Thermistors
- Assembled and Tested
- I2C Serial Interface

*Ordering Information* **appears at end of data sheet.**
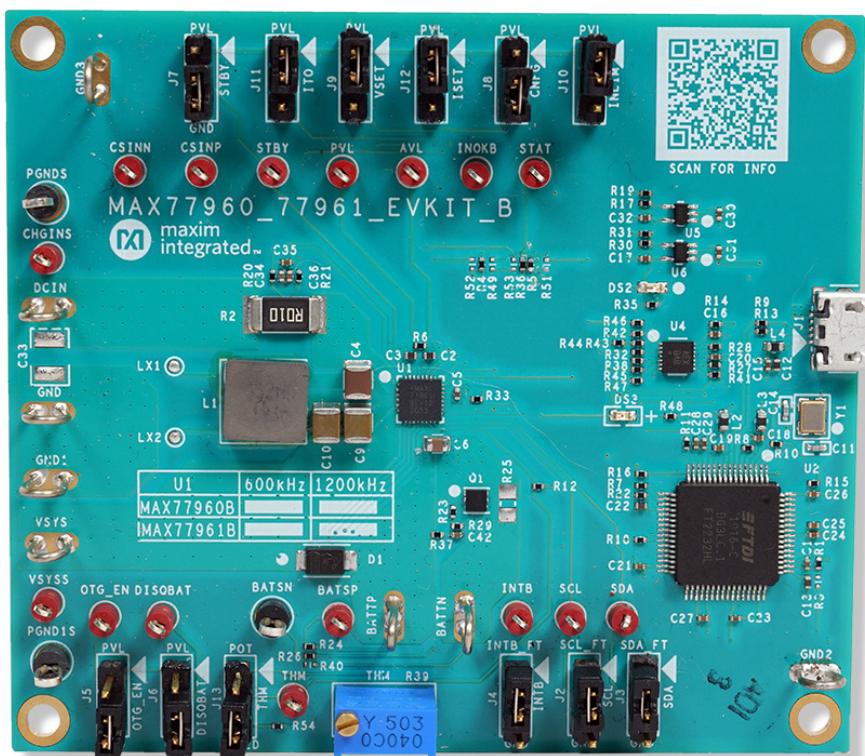
Figure 1. MAX77960B/MAX77961B EV Kit Photo

USB Type-C is a registered trademark of USB Implementers Forum.
Windows is a registered trademark and registered service mark of Microsoft Corporation.

maxim integrated™

MAX77960B/MAX77961B EV Kit Files

FILE	DESCRIPTION
MAX77960_MAX77961GUISetupX.X.X.exe	Installs all EV kit files on PC

MAX77960B/MAX77961B EV Kit Component List

PART	QTY	DESCRIPTION
MAX77960BEVKIT06# MAX77961BEVKIT06# MAX77960BEVKIT12# MAX77961BEVKIT12#	1	MAX77960B/ MAX77961B evaluation kit
USB high-speed A-to-B cable	1	USB Micro-B cable

Quick Start

Required Equipment

- MAX77960B/MAX77961B EV kit
- Adjustable DC power supply
- Battery or simulated battery
  - 2- or 3-cell Li-ion protected battery
  - Simulated battery or preloaded power supply
- Oscilloscope
- Two voltmeters
- Two ammeters
- Lab cables with appropriate current rating
- USB Micro-B cable
- PC with Windows 7 or newer operating system and USB port

Setup Overview

A typical bench setup for the MAX77960B/MAX77961B EV Kit is shown in Figure 2.

Procedure

The EV kit is fully assembled and tested. Follow the steps below to install the EV kit software, make required hardware connections, and start operation of the kit. The EV kit software can be run without hardware attached. Note that after communication is established the IC must still be configured correctly for desired operation mode. Make sure the PC is connected to the internet throughout the process so that the USB driver can be automatically installed.

Note: Do not turn on the DC power supply until all connections are made.

1) Visit **www.maximintegrated.com/products/MAX77960B** or **www.maximintegrated.com/products/MAX77961B** under the *Design Resources* tab to download the latest version of the MAX77960/MAX77961 EV kit GUI software. Save the software to a temporary folder and unpack the zip file.

2) Install the EV kit software on your computer by running the MAX77960_MAX77961GUISetupX.X.X.exe program inside the temporary folder. The program files are copied, and icons are created in the Windows **Start** menu. The software requires the .NET Framework 4.5 or later. If you are connected to the Internet, Windows automatically updates the .NET framework as needed.
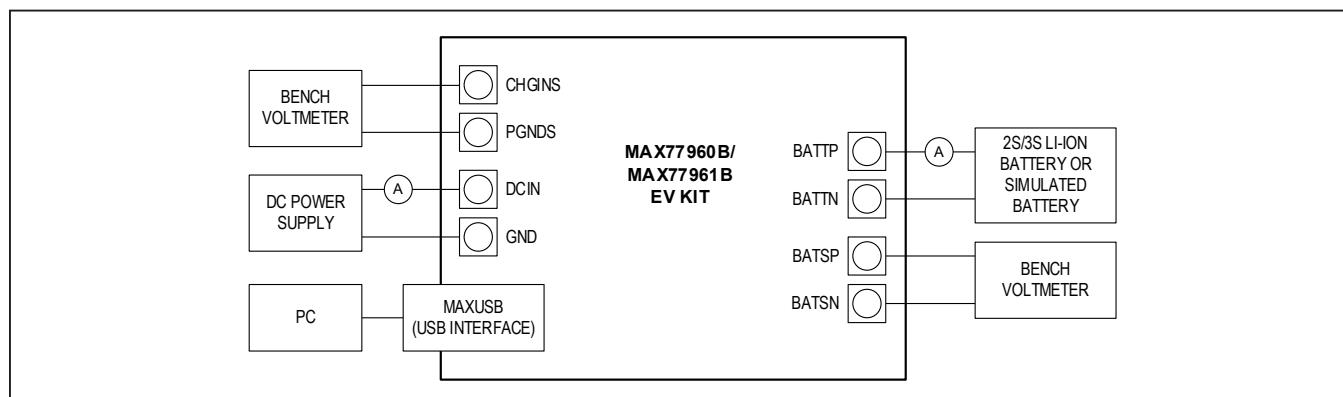

Figure 2. EV Kit Simple Block Diagram

3) The EV kit software launches automatically after installation, or alternatively, it can be launched by clicking on the icon in the Windows **Start** menu.

4) Make jumper connections based on the Default Position column in Table 1. Change it later when evaluating more features. If evaluation is with a 3-cell Li-ion battery or equivalent simulated battery (for MAX-77960BEVKIT06# and MAX77961BEVKIT06# only), place J8 in 2-3 position so that the MAX77960B/MAX77961B are configured for 3-cell.

5) Use the USB cable provided with the EV kit to connect the EV kit to the PC's USB port.

6) Connect a 2- or 3-cell Li-ion battery or simulated battery to the connectors labeled BATTP and BATTN.

7) Connect a DC power supply to the connectors labeled DCIN and GND.

8) Launch the MAX77960/MAX77961 GUI software.

9) Select **Device** > **Connect** from the window options to connect to the EV kit.

Table 1. Jumper Connection Guide

JUMPER NUMBER	PCB SILKSCREEN	DEFAULT POSITION	FUNCTION
J2	SCL	1-2	1-2: Connects SCL with the on-board MAXUSB (USB-to-I^{2}C interface) to allow communication with the GUI software. 2-3: Disconnects SCL from the on-board MAXUSB.
J3	SDA	1-2	1-2: Connects SDA with the on-board MAXUSB to allow communication with the GUI software. 2-3: Disconnects SDA from the on-board MAXUSB.
J4	INTB	1-2	1-2: Connects INTB with the on-board MAXUSB to allow communication with the GUI software. 2-3: Disconnects INTB from the on-board MAXUSB.
J5	OTG_EN	2-3	1-2: Connects OTG_EN to PVL. OTG function is enabled. 2-3: Connects OTG_EN to GND. OTG function enable is controlled by MODE[3:0] bitfield.
J6	DISQBAT	2-3	1-2: Connects DISQBAT to PVL. Q_{BAT} FET is disabled. 2-3: Connects DISQBAT to GND. Q_{BAT} FET is controlled by the DISIBS bit and power-path state machine/internal logic control.
J7	STBY	2-3	1-2: Connects STBY to PVL. DC-DC is disabled. 2-3: Connects STBY to GND. DC-DC is controlled by STBY_EN bit and power-path state machine/internal logic control.
J8	CNFG	1-2	1-2: Connects CNFG to PVL. Number of serially connected battery cells is configured as 2S. 2-3: Connects CNFG to R5. MAX77960BEVKIT06# and MAX77961BEVKIT06#: Number of serially connected battery cells is configured as 3S. MAX77960BEVKIT12# and MAX77961BEVKIT12#: Number of serially connected battery cells is configured as 2S.
J9	VSET	1-2	1-2: Connects VSET to PVL. Default charge termination voltage is same as decode of reset value of CHG_CV_PRM[5:0]. 2-3: Connects VSET to R49. Default charge termination voltage is programmed by R49.

Table 1. Jumper Connection Guide (continued)

JUMPER NUMBER	PCB SILKSCREEN	DEFAULT POSITION	FUNCTION
J10	INLIM	1-2	1-2: Connects INLIM to PVL. Default input current limit is same as decode of reset value of CHGIN_ILIM[6:0]. 2-3: Connects INLIM to R51. Default input current limit is programmed by R51.
J11	ITO	1-2	1-2: Connects ITO to PVL. Default top-off charge current is same as decode of reset value of TO_ITH[2:0]. 2-3: Connects ITO to R52. Default top-off charge current is programmed by R52.
J12	ISET	1-2	1-2: Connects ISET to PVL. Default fast-charge current is same as decode of reset value CHGCC[5:0]. 2-3: Connects ISET to R53. Default fast-charge current is programmed by R53.
J13	THM	2-3	1-2: Connects THM to potentiometer R39. Adjust resistance of R39 to emulate resistance change of a 10kΩ thermistor at different temperature. 2-3: Connects THM to a fixed 10kΩ resistor. This emulates resistance of a 10kΩ thermistor at 25°C.

Detailed Description of Software

The MAX77960/MAX77961 GUI software provides an easy-to-use interface to control the function blocks of the IC.

Software Installation

Double-click the **MAX77960_MAX77961GUISetup-X.X.X.exe** icon to begin the installation process. Follow the prompts to complete the installation. The evaluation software can be uninstalled in the **Add/Remove Programs** tool in the **Control Panel**. After the installation is complete, open the **Maxim Integrated/MAX77960_ MAX77961** folder and run **MAX77960_MAX77961.exe** or select it from the program menu. Figure 3 shows a splash screen containing information about the evaluation kit that appears while the program is loading.

Establish Communication

Power up the MAX77960B/MAX77961B by connecting a 2- or 3-cell Li-ion battery or simulated battery at BATTP/ BATTN. Open the GUI software and select **Device > Connect**. A window should pop up showing that a slave address 0xD2 has been found. If not, check the USB connection and power. Choose **Read and Close** and the status bar displays "Connected" to signify active communication. An example of a successful connection is shown in Figure 4.
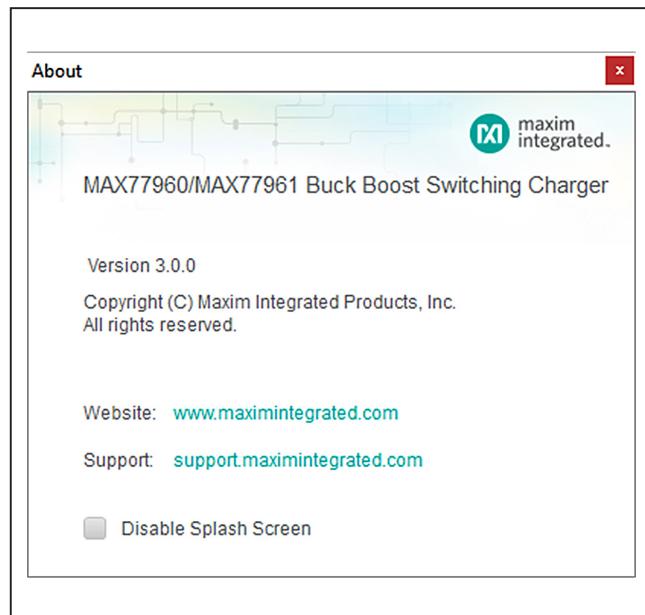

Figure 3. EV Kit Splash Screen

Main Display

Status bits and programmable functions of the charger can be accessed through the interface tabs in the left column of the window (Figure 5).
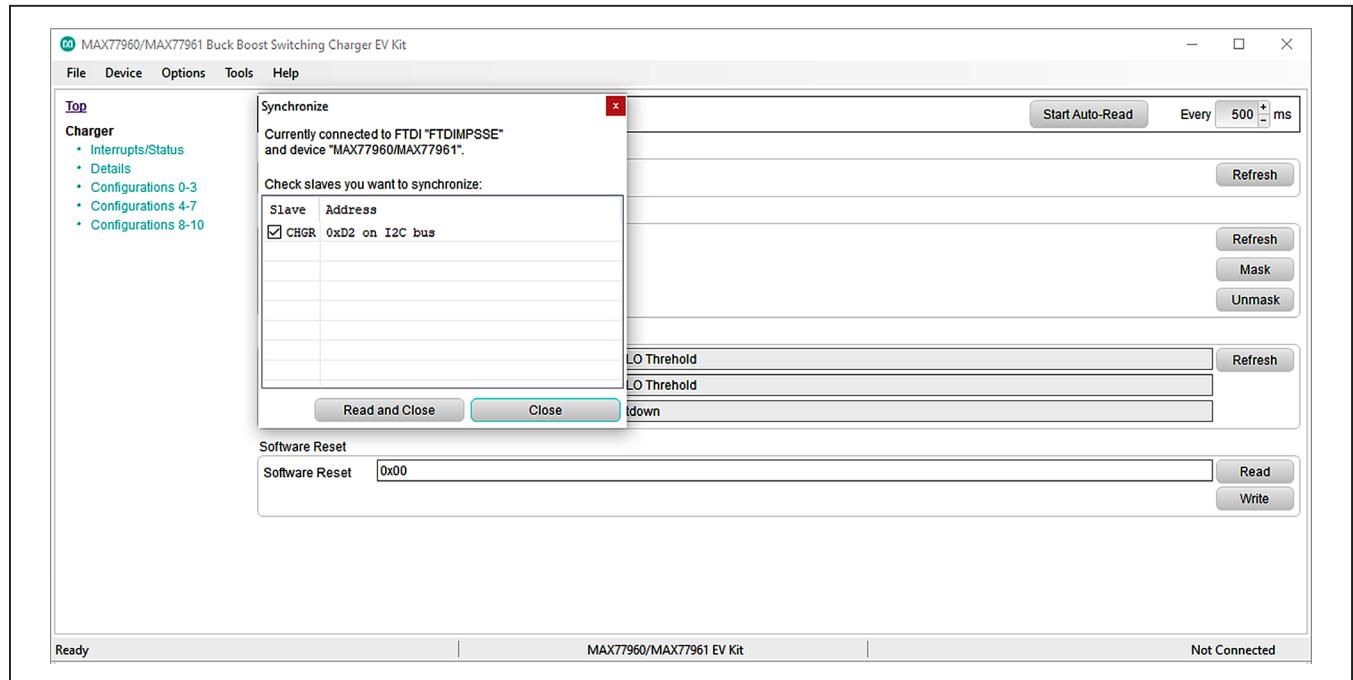

*Figure 4. MAX77960B/MAX77961B Communication Window*
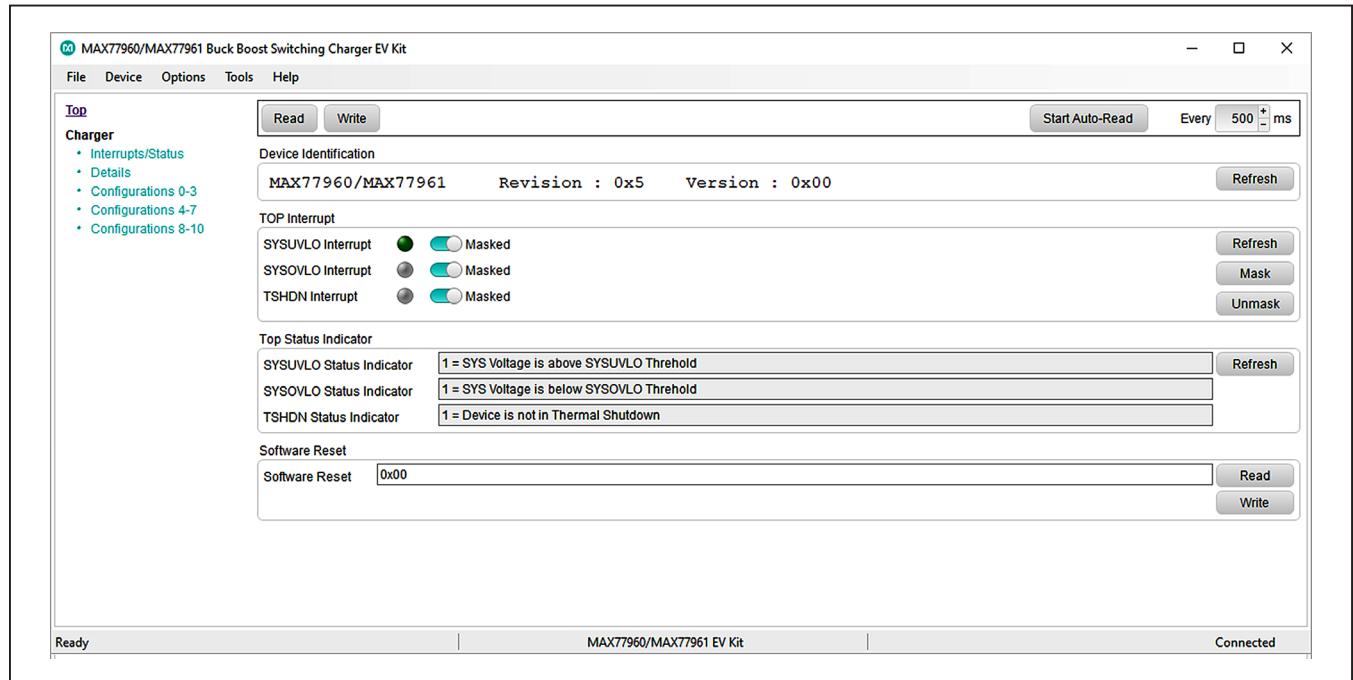
Figure 5. MAX77960B/MAX77961B Top-Level Registers

Register Write Access

Modification of the charger registers are locked by default to prevent arbitrary changes. Therefore, changes made to the charger registers in the locked state are not applied to the EV kit. To unlock register writing, select the **0x3 = Unlocked** option in the **Charger Settings Protection** dropdown menu from the **Charger Configurations 6** register in the **Configuration 4-7** tab, and then click **Write** (Figure 6). Read the register and the **Charger Settings Protection** setting should remain in the **0x3 = Unlocked** state to signify open register access.

From this point onwards, modifications written to any of the registers apply to the EV kit. For example, the **CHGIN Input Current Limit** can be changed in the **Charger Configurations 8** register by selecting the required value and clicking **Write** (Figure 7), but only after the registers have been unlocked.

Detailed Description of Hardware

Battery Charger Test Setup

1) Connect a 2- or 3-cell Li-Ion battery or simulated battery between BATTP and BATTN.

2) Adjust voltage and current limits of the DC power supply to 5.0V and 3.0A. Output of the power supply is off.

3) Connect the power supply between DCIN and GND on the EV kit board.

4) Open the EV kit GUI and connect to the EV kit.

5) In the **Configuration 4-7** tab, set **Charger Settings Protection** in the **Charger Configurations 6** register to **0x3 = Unlocked**. Click **Write** to send the command to the charger.
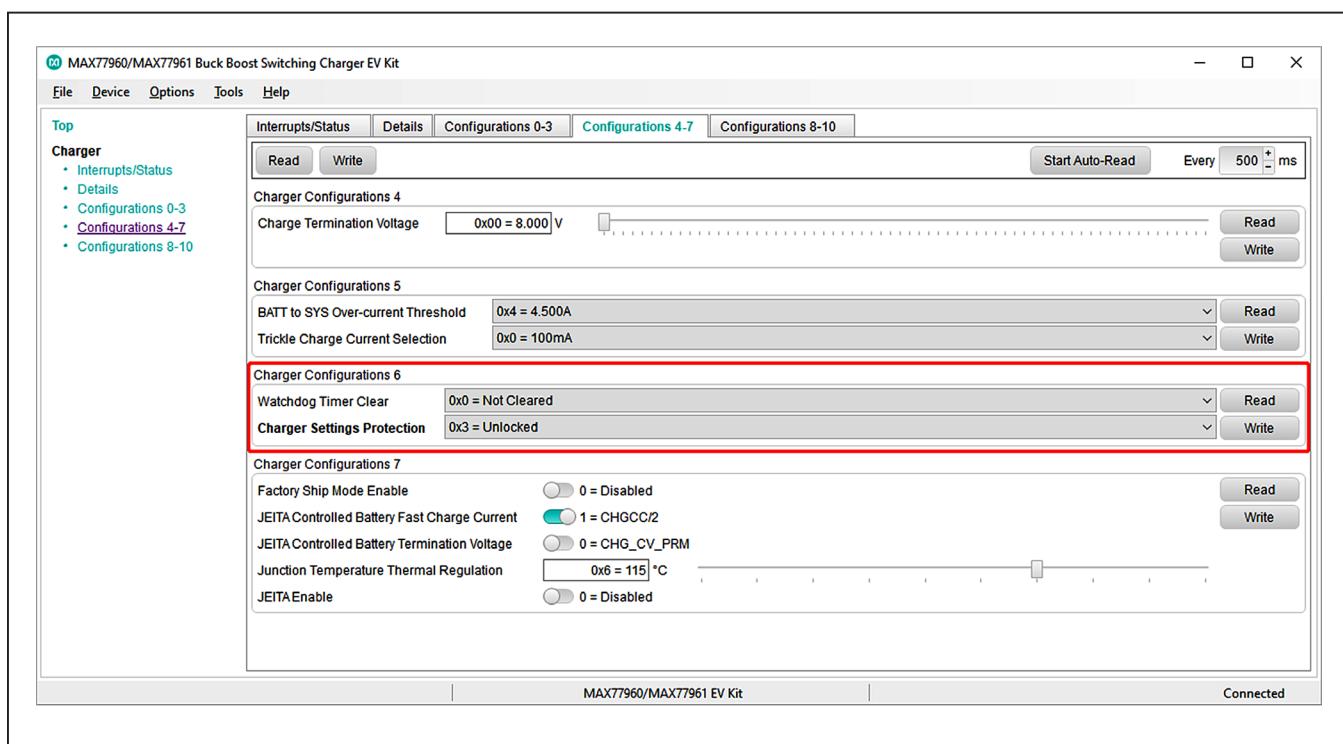

Figure 6. Charger Register Write Access

6) Program the appropriate charger settings for your system. In the **Configuration 8-10** tab, set **CHGIN Input Current Limit** in the **Charger Configurations 8** register. Press **Write** to send the command to the charger. Note that the maximum setting of **CHGIN Input Current Limit** for the MAX77960B is **0x40 = 3150mA**.

7) In the **Configuration 0-3** tab, set **Fast Charge Current** in the **Charger Configurations 2** register. Press **Write** to send the command to the charger. Note that the maximum setting of **Fast Charge Current** for the MAX77960B is **0x21 = 3000mA**.

8) In the **Charger Configuration 0** register of the **Configuration 0-3** tab, set **Smart Power Selector** to **0x5 = Charger = On, OTG = Off, and DCDC = On** and click **Write** to enable charger mode.

9) Turn on the DC power supply's output to enable charging.

10) Use data log equipment to log the charge current and battery voltage profile while charging a 2- or 3-cell Li-ion battery.
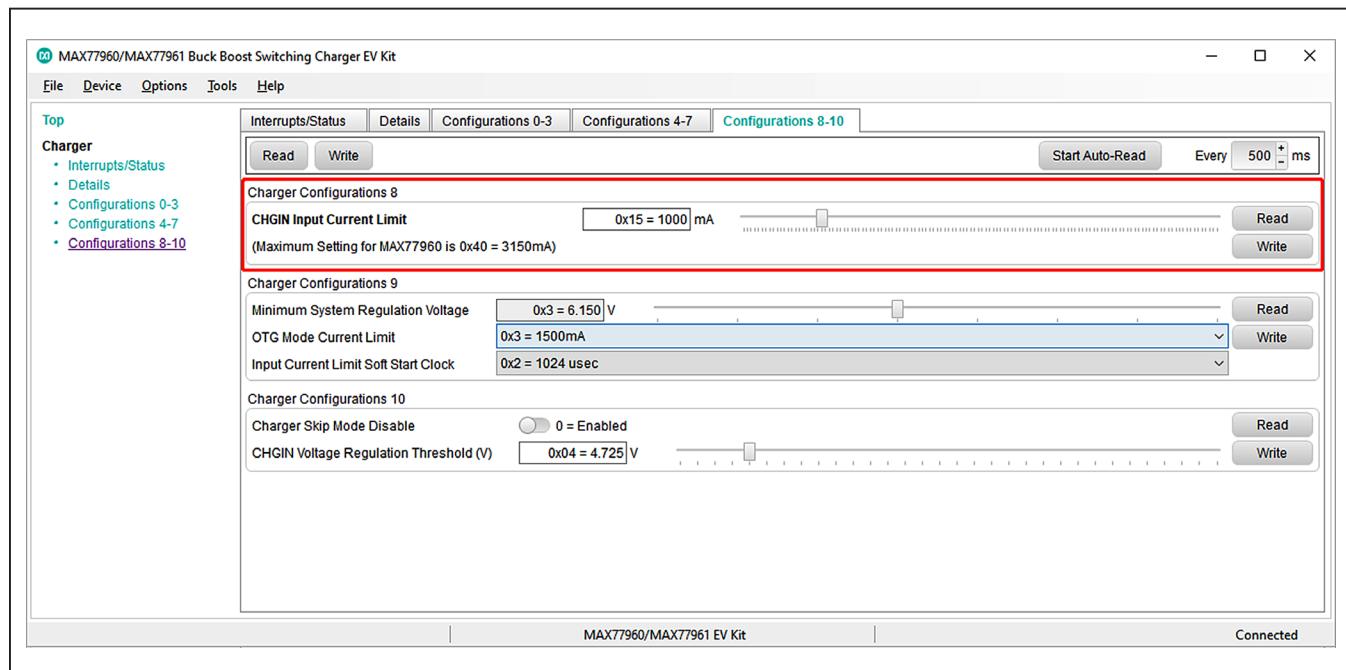

Figure 7. Change CHGIN Input Current Limit after Unlocking Charger Settings Protection

Component Suppliers

SUPPLIER	PHONE	WEBSITE
MURATA	770-436-1300	www.murata-northamerica.com
SAMTEC	800-726-8329	www.samtec.com
SULLINS ELECTRONICS CORP	760-774-0125	www.sullinselectronics.com
TAIYO-YUDEN	603-669-7587	www.t-yuden.com
TDK	847-803-6100	www.tdk.com
VISHAY	408-970-5852	www.vishay.com
COILCRAFT	847-639-6400	www.coilcraft.com
PANASONIC	800-344-2112	https://na.industrial.panasonic.com
FUTURE TECHNOLOGY DEVICES INTL LTD	503-547-0988	www.ftdichip.com

Note: *Indicate that you are using the MAX77960B/MAX77961B when contacting these component suppliers.*

Ordering Information

PART	TYPE
MAX77960BEVKIT06# MAX77961BEVKIT06#	EV Kit
MAX77960BEVKIT12# MAX77961BEVKIT12#	EV Kit

#Denotes RoHS compliant.

MAX77960B_06 EV Kit Bill of Materials

REF_DES	QTY	MFG PART #	DESCRIPTION
AVL, BATSP, CHGINS, CSINN, CSINP, DISQBAT, INOKB, INTB, OTG_EN, PVL, SCL, SDA, STAT, STBY, THM, VSYSS	16	5000	RED MINI TESTPOINTS
BATTN, BATTP, DCIN, GND, GND1-GND3, VSYS	8	9020 BUSS	WIRE, BUSS 20G PLATED SOLID COPPER
BATSN, PGND1S, PGNDS	3	5011	BLACK BIG TESTPOINTS
C1, C15, C18-C21, C23-C29, C35	14	GRM155R71A104JA01	CAP+, 0.1µF, 10%, 6.3V, X5R, 0402
C2, C3, C12, C13, C22	5	GRM155R61A475MEAA	CAP+, 4.7µF, 20%, 10V, X5R, 0402
C4	1	GRM32ER7YA106KA12	CAP+, 10µF, 10%, 35V, X7R, 1210
C5	1	GRM155C81E105KE11	CAP+, 1µF, 10%,25V, X6S, 0402
C6	1	TMK212BBJ106KG-T	CAP+, 10µF, 10%, 25V, X5R, 0805
C7, C8	2	GRM155R71C224KA12	CAP+, 0.22µF, 10%,16V, X7R, 0402
C9, C10	2	TMK325ABJ476MM	CAP+, 47µF, 20%, 25V, X5R,1210
C11, C14	2	GRM1555C1H270JA01	CAP+, 27pF, 5%, 50V, COG, 0402
C16, C17, C30-C32	5	C0402C105K8PAC	CAP+, 1µF, 10%, 10V, X5R, 0402
C34, C36	2	GRM155R71H153KA12	CAP+, 0.015µF, 20%, 50V, X7R, 0402
C42	1	GRM155R71E473K	CAP+, 0.047µF, 10%, 25V, X7R, 0402
D1	1	PMEG4050EP	DIODE+, SCH, 40V, 5A, SOD-128
DS2	1	LTST-C190CKT	LED+, SURFACE MOUNT, RED OSLON 2.2V, 350mA, 3X3MM
DS3	1	LTST-C190KFK	LED+, SURFACE MOUNT, ORANGE
J1	1	10118193-0001LF	RCPT+, MICRO B USB 2.0,5 POS
J2-J13	12	TSW-103-07-T-S	HEADER+, 3POS,. 100", SNGL, TIN R/A, TH
L1	1	PA5007.332NLT	INDUCTOR+, 3.3µH, 20%, 10A
L2-L4	3	BLM18AG601SN1	FERRITE-BEAD, 600nH, 0.5A, 0603 µH, 20%, 5.8A, 4.1 x 4.1MM
Q1	1	DMN3016LFDE	TRAN, NCH, 10A, 30V
R1, R7, R14-R16, R18, R22, R24, R26, R32, R33 R43, R44, R46, R47	14	ERJ-2GE0R00	RES+, 0Ω, 0%, 0402

MAX77960B_06 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	DESCRIPTION
R2	1	CRA2512-FZ-R010ELF	RES+, 0.01Ω, 1%, 3W, 2512
R4, R36	2	CRCW0402200KFK	RES+, 200KΩ, 1%, 0402
R5	1	CRCW04028K66FK	RES+, 8.66KΩ, 1%, 0402
R6	1	CRCW04024R70FK	RES+, 4.7Ω, 1%, 0402
R8	1	CRCW040212K0FK	RES+, 12KΩ, 1%, 0402
R9, R13	2	CRCW040227R0FK	RES+, 27Ω, 1%, 0402
R10	1	CRCW04021M00FK	RES+, 1MΩ, 1%, 0402
R11, R23	2	CRCW04021K00FK	RES+, 1KΩ, 1%, 0402
R12, R54	2	CRCW040210K0FK	RES+, 10KΩ, 1%, 0402
R17	1	CRCW04024752FK	RES+, 47.5KΩ, 1%, 0402
R19, R31, R41, R45	4	CRCW0402100KFK	RES+, 100KΩ, 1%, 0402
R20, R21	2	CRCW04024752FK	RES+, 10Ω, 1%, 0402
R27, R28	2	CRCW04024K70FK	RES+, 4.7KΩ, 1%, 0402
R29	1	ERJ-2GEJ474	RES+, 470KΩ, 5%, 0402
R30	1	CRCW0402169KFK	RES+, 169KΩ, 1%, 0402
R35	1	CRCW0402470RFK	RES+, 470Ω, 1%, 0402
R37	1	ERJ-2RKF2203	RES+, 220KΩ, 1%, 0402
R38, R42	2	CRCW04022K20FK	RES+, 2.2KΩ, 1%, 0402
R39	1	3296Y-1-503LF	RES+, POT, 50KΩ
R48	1	ERJ-2GEJ132	RES+, 1.3KΩ, 5%, 0402
U1	1	MAX77960BEFV06+	MAX77960BEFV06+
U2	1	FT2232HL	FT2232HL
U4	1	MAX14611	MAX14611ETD+
U5, U6	2	MAX8512	MAX8512EXK+
Y1	1	7M-12.000MAAJ	CRYSTAL+, SMT,12MHz, +/-30PPM
C33, C37, C38, C40, C41	5	OPEN	N/A
R25	1	OPEN	RES+, 0Ω, 0%, 0805
R3, R40, R49, R51-R53	6	OPEN	N/A

MAX77961B_06 EV Kit Bill of Materials

REF_DES	QTY	MFG PART #	DESCRIPTION
AVL, BATSP, CHGINS, CSINN, CSINP, DISQBAT, INOKB, INTB, OTG_EN, PVL, SCL, SDA, STAT, STBY, THM, VSYSS	16	5000	RED MINI TESTPOINTS
BATTN, BATTP, DCIN, GND, GND1-GND3, VSYS	8	9020 BUSS	WIRE, BUSS 20G PLATED SOLID COPPER
BATSN, PGND1S, PGNDS	3	5011	BLACK BIG TESTPOINTS
C1, C15, C18-C21, C23-C29, C35	14	GRM155R71A104JA01	CAP+, 0.1µF, 10%, 6.3V, X5R, 0402
C2, C3, C12, C13, C22	5	GRM155R61A475MEAA	CAP+, 4.7µF, 20%, 10V, X5R, 0402
C4	1	GRM32ER7YA106KA12	CAP+, 10µF, 10%, 35V, X7R, 1210
C5	1	GRM155C81E105KE11	CAP+, 1µF, 10%, 25V, X6S, 0402
C6	1	TMK212BBJ106KG-T	CAP+, 10µF, 10%, 25V, X5R, 0805
C7, C8	2	GRM155R71C224KA12	CAP+, 0.22µF, 10%, 16V, X7R, 0402
C9, C10	2	TMK325ABJ476MM	CAP+, 47µF, 20%, 25V, X5R,1210
C11, C14	2	GRM1555C1H270JA01	CAP+, 27pF, 5%, 50V, COG, 0402
C16, C17, C30-C32	5	C0402C105K8PAC	CAP+, 1µF, 10%, 10V, X5R, 0402
C34, C36	2	GRM155R71H153KA12	CAP+, 0.015µF, 20%, 50V, X7R, 0402
C42	1	GRM155R71E473K	CAP+, 0.047µF, 10%, 25V, X7R, 0402
D1	1	PMEG4050EP	DIODE+, SCH,40V,5A, SOD-128
DS2	1	LTST-C190CKT	LED+, SURFACE MOUNT, RED OSLON 2.2V, 350mA, 3X3MM
DS3	1	LTST-C190KFK	LED+, SURFACE MOUNT, ORANGE
J1	1	10118193-0001LF	RCPT+, MICRO B USB 2.0, 5 POS
J2-J13	12	TSW-103-07-T-S	HEADER+, 3 POS,. 100", SNGL, TIN R/A, TH
L1	1	PA5007.332NLT	INDUCTOR+, 3.3µH, 20%, 10A
L2-L4	3	BLM18AG601SN1	FERRITE-BEAD, 600nH, 0.5A, 0603 µH, 20%, 5.8A, 4.1 x 4.1MM
Q1	1	DMN3016LFDE	TRAN, NCH,10A, 30V
R1, R7, R14-R16, R18, R22, R24, R26, R32, R33, R43, R44, R46, R47	14	ERJ-2GE0R00	RES+, 0Ω,0%,0402
R2	1	CRA2512-FZ-R010ELF	RES+, 0.01Ω, 1%, 3W, 2512
R4, R36	2	CRCW0402200KFK	RES+, 200KΩ, 1%, 0402
R5	1	CRCW04028K66FK	RES+, 8.66KΩ, 1%, 0402
R6	1	CRCW04024R70FK	RES+, 4.7Ω, 1%, 0402
R8	1	CRCW040212K0FK	RES+, 12KΩ, 1%, 0402

MAX77961B_06 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	DESCRIPTION
R9, R13	2	CRCW040227R0FK	RES+, 27Ω, 1%, 0402
R10	1	CRCW04021M00FK	RES+, 1MΩ, 1%, 0402
R11, R23	2	CRCW04021K00FK	RES+, 1KΩ, 1%, 0402
R12, R54	2	CRCW040210K0FK	RES+, 10KΩ, 1%, 0402
R17	1	CRCW04024752FK	RES+, 47.5KΩ, 1%, 0402
R19, R31, R41, R45	4	CRCW0402100KFK	RES+, 100KΩ, 1%, 0402
R20, R21	2	CRCW04024752FK	RES+, 10Ω, 1%, 0402
R27, R28	2	CRCW04024K70FK	RES+, 4.7KΩ, 1%, 0402
R29	1	ERJ-2GEJ474	RES+, 470KΩ, 5%, 0402
R30	1	CRCW0402169KFK	RES+, 169KΩ, 1%, 0402
R35	1	CRCW0402470RFK	RES+, 470Ω, 1%, 0402
R37	1	ERJ-2RKF2203	RES+, 220KΩ, 1%, 0402
R38, R42	2	CRCW04022K20FK	RES+, 2.2KΩ, 1%, 0402
R39	1	3296Y-1-503LF	RES+, POT, 50KΩ
R48	1	ERJ-2GEJ132	RES+, 1.3KΩ, 5%, 0402
U1	1	MAX77961BEFV06+	MAX77961BEFV06+
U2	1	FT2232HL	FT2232HL
U4	1	MAX14611	MAX14611ETD+
U5, U6	2	MAX8512	MAX8512EXK+
Y1	1	7M-12.000MAAJ	CRYSTAL+, SMT,12MHz, ±30PPM
C33, C37, C38, C40, C41	5	OPEN	N/A
R25	1	OPEN	RES+, 0Ω, 0%, 0805
R3, R40, R49, R51-R53	6	OPEN	N/A

MAX77960B_12 EV Kit Bill of Materials

REF_DES	QTY	MFG PART #	DESCRIPTION
AVL, BATSP, CHGINS, CSINN, CSINP, DISQBAT, INOKB, INTB, OTG_EN, PVL, SCL, SDA, STAT, STBY, THM, VSYSS	16	5000	RED MINI TESTPOINTS
BATTN, BATTP, DCIN, GND, GND1-GND3, VSYS	8	9020 BUSS	WIRE, BUSS 20G PLATED SOLID COPPER
BATSN, PGND1S, PGNDS	3	5011	BLACK BIG TESTPOINTS
C1, C15, C18-C21, C23-C29, C35	14	GRM155R71A104JA01	CAP+, 0.1μF, 10%, 6.3V, X5R, 0402
C2, C3, C12, C13, C22	5	GRM155R61A475MEAA	CAP+, 4.7μF, 20%, 10V, X5R, 0402
C4	1	GRM32ER7YA106KA12	CAP+, 10μF, 10%, 35V, X7R, 1210
C5	1	GRM155C81E105KE11	CAP+, 1μF, 10%,25V, X6S, 0402
C6	1	TMK212BBJ106KG-T	CAP+, 10μF, 10%, 25V, X5R, 0805
C7, C8	2	GRM155R71C224KA12	CAP+, 0.22μF, 10%,16V, X7R, 0402
C9, C10	2	TMK325ABJ476MM	CAP+, 47μF, 20%, 25V, X5R,1210
C11, C14	2	GRM1555C1H270JA01	CAP+, 27pF, 5%, 50V, COG, 0402
C16, C17, C30-C32	5	C0402C105K8PAC	CAP+, 1μF, 10%, 10V, X5R, 0402
C34, C36	2	GRM155R71H153KA12	CAP+, 0.015μF, 20%, 50V, X7R, 0402
C42	1	GRM155R71E473K	CAP+, 0.047μF, 10%, 25V, X7R, 0402
D1	1	PMEG4050EP	DIODE+, SCH, 40V, 5A, SOD-128
DS2	1	LTST-C190CKT	LED+, SURFACE MOUNT, RED OSLON 2.2V, 350mA, 3X3MM
DS3	1	LTST-C190KFK	LED+, SURFACE MOUNT, ORANGE
J1	1	10118193-0001LF	RCPT+, MICRO B USB 2.0,5 POS
J2-J13	12	TSW-103-07-T-S	HEADER+, 3POS,. 100", SNGL, TIN R/A, TH
L1	1	PA5003.152NLT	INDUCTOR+, 1.5μH, 20%, 10.5A
L2-L4	3	BLM18AG601SN1	FERRITE-BEAD, 600nH, 0.5A, 0603 μH, 20%, 5.8A, 4.1 x 4.1MM
Q1	1	DMN3016LFDE	TRAN, NCH, 10A, 30V
R1, R7, R14-R16, R18, R22, R24, R26, R32, R33 R43, R44, R46, R47	14	ERJ-2GE0R00	RES+, 0Ω, 0%, 0402

MAX77960B_12 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	DESCRIPTION
R2	1	CRA2512-FZ-R010ELF	RES+, 0.01Ω, 1%, 3W, 2512
R4, R36	2	CRCW0402200KFK	RES+, 200KΩ, 1%, 0402
R5	1	ERJ-2RKF6982	RES+, 69.8KΩ, 1%, 0402
R6	1	CRCW04024R70FK	RES+, 4.7Ω, 1%, 0402
R8	1	CRCW040212K0FK	RES+, 12KΩ, 1%, 0402
R9, R13	2	CRCW040227R0FK	RES+, 27Ω, 1%, 0402
R10	1	CRCW04021M00FK	RES+, 1MΩ, 1%, 0402
R11, R23	2	CRCW04021K00FK	RES+, 1KΩ, 1%, 0402
R12, R54	2	CRCW040210K0FK	RES+, 10KΩ, 1%, 0402
R17	1	CRCW04024752FK	RES+, 47.5KΩ, 1%, 0402
R19, R31, R41, R45	4	CRCW0402100KFK	RES+, 100KΩ, 1%, 0402
R20, R21	2	CRCW04024752FK	RES+, 10Ω, 1%, 0402
R27, R28	2	CRCW04024K70FK	RES+, 4.7KΩ, 1%, 0402
R29	1	ERJ-2GEJ474	RES+, 470KΩ, 5%, 0402
R30	1	CRCW0402169KFK	RES+, 169KΩ, 1%, 0402
R35	1	CRCW0402470RFK	RES+, 470Ω, 1%, 0402
R37	1	ERJ-2RKF2203	RES+, 220KΩ, 1%, 0402
R38, R42	2	CRCW04022K20FK	RES+, 2.2KΩ, 1%, 0402
R39	1	3296Y-1-503LF	RES+, POT, 50KΩ
R48	1	ERJ-2GEJ132	RES+, 1.3KΩ, 5%, 0402
U1	1	MAX77960BEFV12+	MAX77960BEFV12+
U2	1	FT2232HL	FT2232HL
U4	1	MAX14611	MAX14611ETD+
U5, U6	2	MAX8512	MAX8512EXK+
Y1	1	7M-12.000MAAJ	CRYSTAL+, SMT,12MHz, +/-30PPM
C33, C37, C38, C40, C41	5	OPEN	N/A
R25	1	OPEN	RES+, 0Ω, 0%, 0805
R3, R40, R49, R51-R53	6	OPEN	N/A

MAX77961B_12 EV Kit Bill of Materials

| REF_DES	QTY	MFG PART #	DESCRIPTION
AVL, BATSP, CHGINS, CSINN, CSINP, DISQBAT, INOKB, INTB, OTG_EN, PVL, SCL, SDA, STAT, STBY, THM, VSYSS	16	5000	RED MINI TESTPOINTS
BATTN, BATTP, DCIN, GND, GND1-GND3, VSYS	8	9020 BUSS	WIRE, BUSS 20G PLATED SOLID COPPER
BATSN, PGND1S, PGNDS	3	5011	BLACK BIG TESTPOINTS
C1, C15, C18-C21, C23-C29, C35	14	GRM155R71A104JA01	CAP+, 0.1µF, 10%, 6.3V, X5R, 0402
C2, C3, C12, C13, C22	5	GRM155R61A475MEAA	CAP+, 4.7µF, 20%, 10V, X5R, 0402
C4	1	GRM32ER7YA106KA12	CAP+, 10µF, 10%, 35V, X7R, 1210
C5	1	GRM155C81E105KE11	CAP+, 1µF, 10%,25V, X6S, 0402
C6	1	TMK212BBJ106KG-T	CAP+, 10µF, 10%, 25V, X5R, 0805
C7, C8	2	GRM155R71C224KA12	CAP+, 0.22µF, 10%,16V, X7R, 0402
C9, C10	2	TMK325ABJ476MM	CAP+, 47µF, 20%, 25V, X5R,1210
C11, C14	2	GRM1555C1H270JA01	CAP+, 27pF, 5%, 50V, COG, 0402
C16, C17, C30-C32	5	C0402C105K8PAC	CAP+, 1µF, 10%, 10V, X5R, 0402
C34, C36	2	GRM155R71H153KA12	CAP+, 0.015µF, 20%, 50V, X7R, 0402
C42	1	GRM155R71E473K	CAP+, 0.047µF, 10%, 25V, X7R, 0402
D1	1	PMEG4050EP	DIODE+, SCH, 40V, 5A, SOD-128
DS2	1	LTST-C190CKT	LED+, SURFACE MOUNT, RED OSLON 2.2V, 350mA, 3X3MM
DS3	1	LTST-C190KFK	LED+, SURFACE MOUNT, ORANGE
J1	1	10118193-0001LF	RCPT+, MICRO B USB 2.0,5 POS
J2-J13	12	TSW-103-07-T-S	HEADER+, 3POS,. 100", SNGL, TIN R/A, TH
L1	1	PA5003.152NLT	INDUCTOR+, 1.5µH, 20%, 10.5A
L2-L4	3	BLM18AG601SN1	FERRITE-BEAD, 600nH, 0.5A, 0603 µH, 20%, 5.8A, 4.1 x 4.1MM
Q1	1	DMN3016LFDE	TRAN, NCH, 10A, 30V
R1, R7, R14-R16, R18, R22, R24, R26, R32, R33 R43, R44, R46, R47	14	ERJ-2GE0R00	RES+, 0Ω, 0%, 0402

MAX77961B_12 EV Kit Bill of Materials (continued)

REF_DES	QTY	MFG PART #	DESCRIPTION
R2	1	CRA2512-FZ-R010ELF	RES+, 0.01Ω, 1%, 3W, 2512
R4, R36	2	CRCW0402200KFK	RES+, 200KΩ, 1%, 0402
R5	1	ERJ-2RKF6982	RES+, 69.8KΩ, 1%, 0402
R6	1	CRCW04024R70FK	RES+, 4.7Ω, 1%, 0402
R8	1	CRCW040212K0FK	RES+, 12KΩ, 1%, 0402
R9, R13	2	CRCW040227R0FK	RES+, 27Ω, 1%, 0402
R10	1	CRCW04021M00FK	RES+, 1MΩ, 1%, 0402
R11, R23	2	CRCW04021K00FK	RES+, 1KΩ, 1%, 0402
R12, R54	2	CRCW040210K0FK	RES+, 10KΩ, 1%, 0402
R17	1	CRCW04024752FK	RES+, 47.5KΩ, 1%, 0402
R19, R31, R41, R45	4	CRCW0402100KFK	RES+, 100KΩ, 1%, 0402
R20, R21	2	CRCW04024752FK	RES+, 10Ω, 1%, 0402
R27, R28	2	CRCW04024K70FK	RES+, 4.7KΩ, 1%, 0402
R29	1	ERJ-2GEJ474	RES+, 470KΩ, 5%, 0402
R30	1	CRCW0402169KFK	RES+, 169KΩ, 1%, 0402
R35	1	CRCW0402470RFK	RES+, 470Ω, 1%, 0402
R37	1	ERJ-2RKF2203	RES+, 220KΩ, 1%, 0402
R38, R42	2	CRCW04022K20FK	RES+, 2.2KΩ, 1%, 0402
R39	1	3296Y-1-503LF	RES+, POT, 50KΩ
R48	1	ERJ-2GEJ132	RES+, 1.3KΩ, 5%, 0402
U1	1	MAX77961BEFV12+	MAX77961BEFV12+
U2	1	FT2232HL	FT2232HL
U4	1	MAX14611	MAX14611ETD+
U5, U6	2	MAX8512	MAX8512EXK+
Y1	1	7M-12.000MAAJ	CRYSTAL+, SMT,12MHz, +/-30PPM
C33, C37, C38, C40, C41	5	OPEN	N/A
R25	1	OPEN	RES+, 0Ω, 0%, 0805
R3, R40, R49, R51-R53	6	OPEN	N/A

MAX77960B/MAX77961B EV Kit Schematic Diagram

EVKIT PART NUMBER	U1 PART NUMBER	MAXIMUM CHARGING CURRENT	U1 SWITCHING FREQUENCY	L1	R5
MAX77960BEVKIT06#	MAX77960BEFV06+	3A	600kHz	3.3µH	8.66kohm
MAX77961BEVKIT06#	MAX77961BEFV06+	6A	600kHz	3.3µH	8.66kohm
MAX77960BEVKIT12#	MAX77960BEFV12+	3A	1.2MHz	1.5µH	69.8kohm
MAX77961BEVKIT12#	MAX77961BEFV12+	6A	1.2MHz	1.5µH	69.8kohm

MAX77960B/MAX77961B EV Kit Schematic Diagram (continued)

MAX77960B/MAX77961B EV Kit PCB Layout Diagrams

MAX77960B/MAX77961B EV Kit PCB Layout—Silkscreen Top

MAX77960B/MAX77961B EV Kit PCB Layout—Inner Layer 2
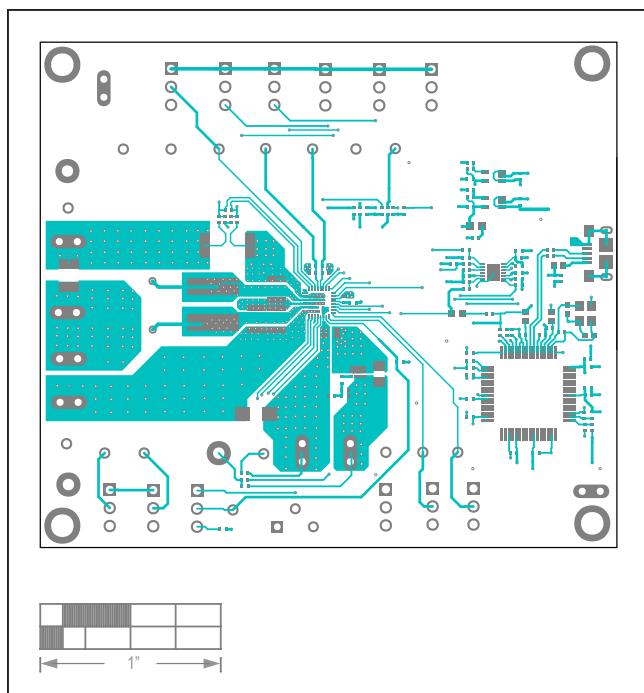
MAX77960B/MAX77961B EV Kit PCB Layout—Top Layer
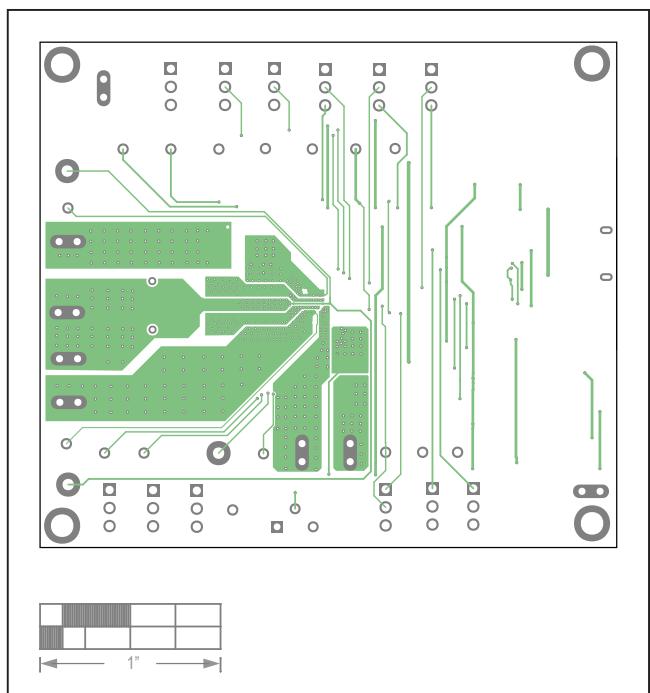
*MAX77960B/MAX77961B EV Kit PCB Layout—Inner Layer 3*

MAX77960B/MAX77961B EV Kit PCB Layout Diagrams (continued)
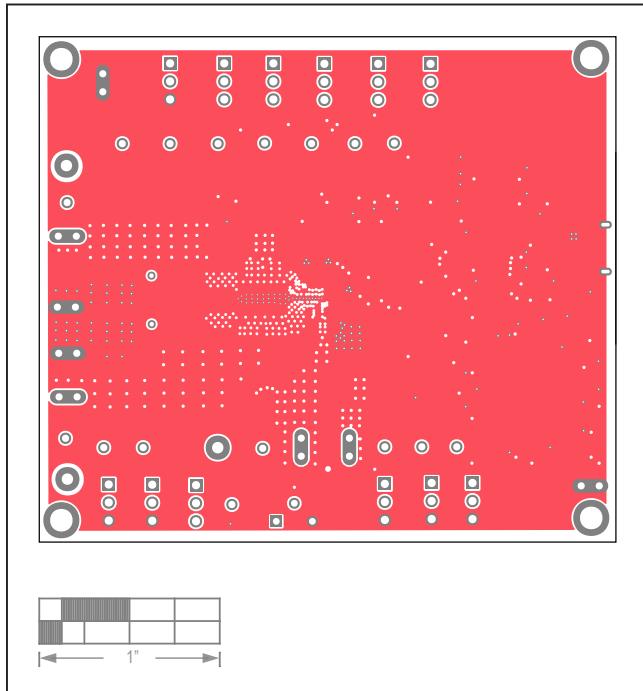
MAX77960B/MAX77961B EV Kit PCB Layout—Inner Layer 4
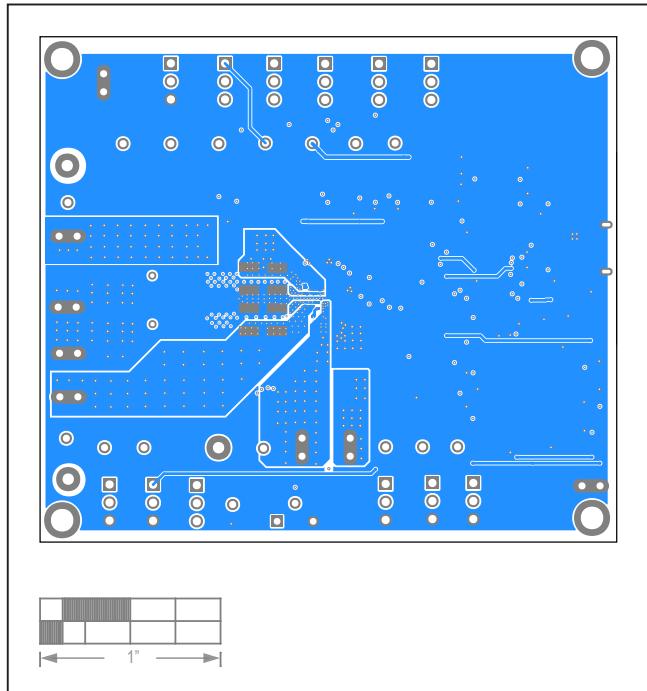
MAX77960B/MAX77961B EV Kit PCB Layout—Bottom Layer
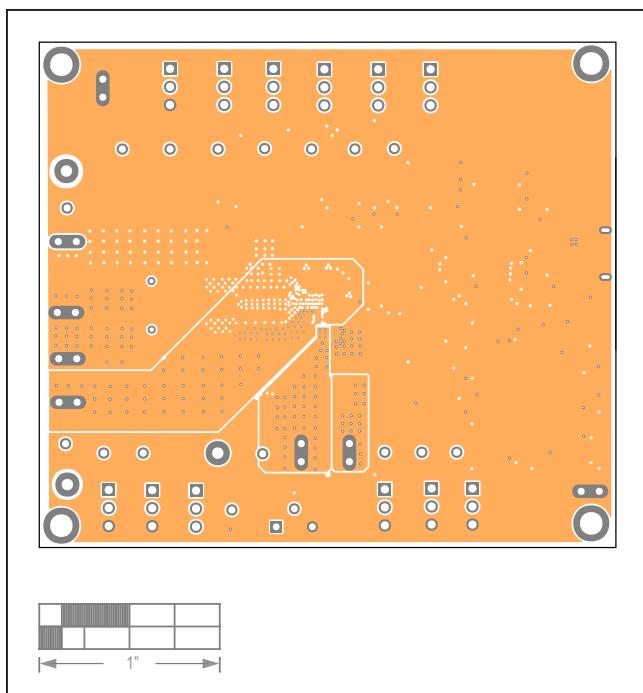
MAX77960B/MAX77961B EV Kit PCB Layout—Inner Layer 5
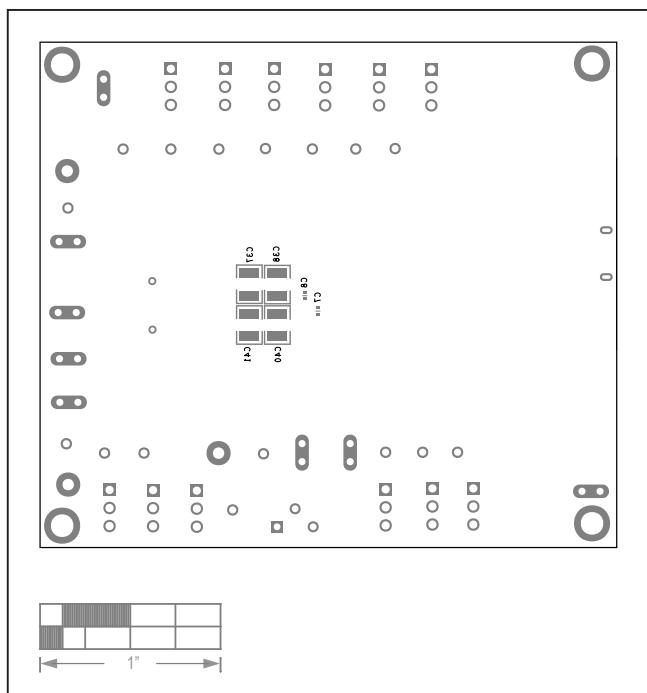
MAX77960B/MAX77961B EV Kit PCB Layout—Silkscreen Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	7/21	Initial release	—