

MAX77813 Evaluation Kit

Evaluates: MAX77813

General Description

This evaluation kit (EV kit) provides a proven design to evaluate the MAX77813, a 2A buck-boost converter. Input voltage range is between 2.3V and 5.5V and output voltage range is from 2.6V to 5.14V. The factory default output voltage of this EV kit is set at 3.3V. Output voltage can be adjusted through the MINIQUSB interface board. The board enables communication with Windows®-compatible software to emulate an I²C interface.

Benefits and Features

- Proven PCB Reference Design and Layout
- Fully Assembled and Tested
- Accessible Test Points for EN, POK, and ILIM
- MINIQUSB Interface Board and User-Friendly GUI for Full Control

[Ordering Information](#) appears at end of data sheet.

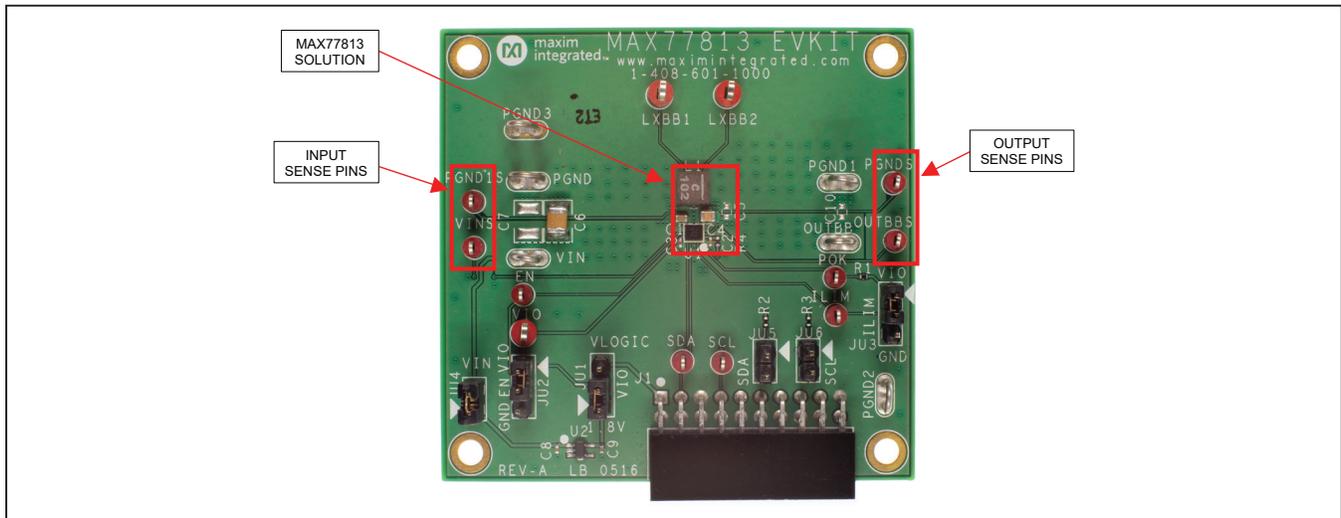


Figure 1. MAX77813 Evaluation Board

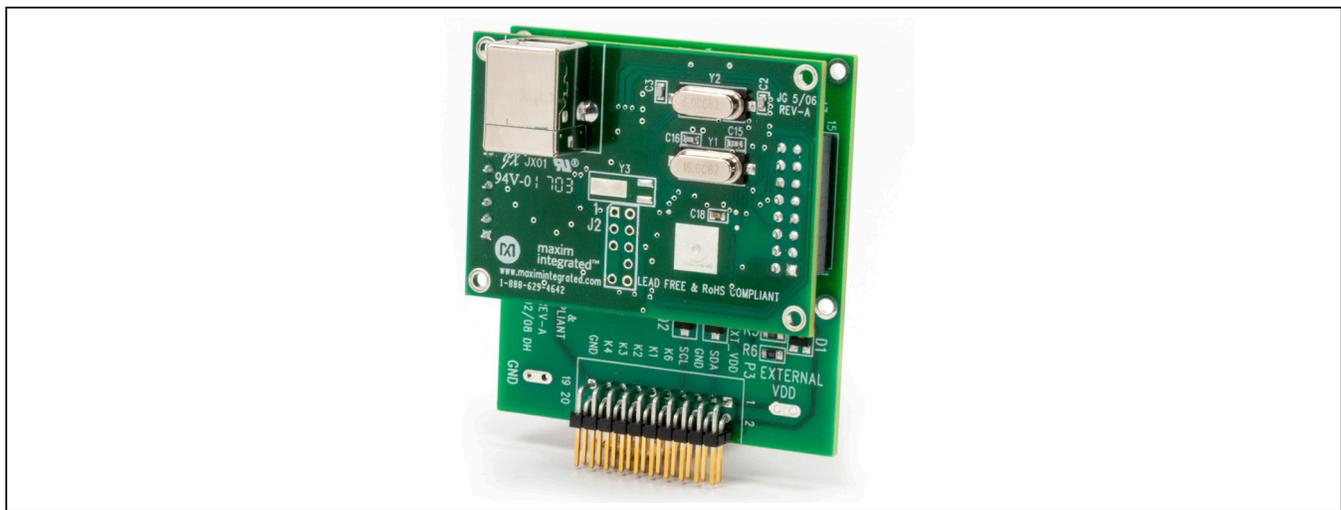


Figure 2. MINIQUSB Board

Windows is a registered trademark and registered service mark of Microsoft Corporation.

Quick Start

Follow this procedure to familiarize yourself with the EV kit.

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

Required Equipment

- MAX77813 EV kit
- MINIQUSB command module (optional, USB cable included)
- Adjustable DC power supply
- A 1.8V DC power supply (optional)
- Digital multimeters

Procedure

The EV kit is fully assembled and tested. Follow the steps below to verify board operation. Use twisted wires of appropriate gauge (20AWG) that are as short as possible to connect the load and power sources.

- 1) Ensure that the EV kit has the correct jumper settings, as shown in [Table 1](#).
- 2) Connect the MINIQUSB interface board (if I²C control is required to test).
- 3) Preset the DC power supply to 3.8V. Turn off the power supply. Do not turn on the power supply until all connections are completed.

- 4) Connect the EV kit to the power supply and meters. Adjust the ammeters to their largest current range to minimize their series impedance. Do not allow the ammeters to operate in their auto-range mode. If current readings are not desired, short across the ammeters.
- 5) Turn on the power supply.
- 6) Switch JU2 to VIO (1-2) to enable the MAX77813.
- 7) Apply load for desired test.
If reading the register (e.g., reading status register) or writing to the register (e.g., programming specific output voltage) is required, then:
- 8) Visit www.maximintegrated.com/products/MAX77813 under the *Design Resources* to download the latest version of the EV kit software, MAX77813Rxx.ZIP. Save the EV kit software to a temporary folder and unpack the ZIP file.
- 9) Install the EV kit software on your computer by running the INSTALL.EXE program inside the temporary folder. The program files are copied, and icons are created in the Windows **Start | Programs** menu.
- 10) Connect the USB cable from the PC to the MINIQUSB board.
- 11) Start the EV kit software by opening its icon in the **Start | Programs** menu. The EV kit software main window appears, as shown in [Figure 3](#).
- 12) The EV kit is now ready for testing.

Table 1. Jumper Settings

JUMPER	NODE OR FUNCTION	SHUNT POSITION	FUCNTION
JU1	VIO	1-2*	VIO is supplied from an onboard 1.8V LDO (U1)
		2-3	VIO is supplied from MINIQUSB board
JU2	EN	1-2	Connecting EN to VIO (MAX77813 is enabled)
		2-3*	Connecting EN to GND (MAX77813 is disabled)
JU3	ILIM	1-2	Connecting ILIM to VIO, inductor current is limited by high current limit level
		2-3*	Connecting ILIM to VIO, inductor current is limited by low current limit level
JU4	Input for Onboard LDO	OPEN	Disconnect onboard LDO input
		1-2*	Inboard LDO is supplied from VIN
JU5	SDA Pull Up	OPEN*	No pull-up for SDA
		1-2	SDA pin is pulled up to VIO through 2.2kΩ
JU6	SCL Pull Up	OPEN*	No pull-up for SCL
		1-2	SCL pin is pulled up to VIO through 2.2kΩ

*Default position.

Detailed Description of Software

The GUI shown in [Figure 3](#) is the main window of the EV kit software that provides a convenient means to control the IC. Use the mouse to navigate through the GUI controls.

The EV kit software main window consists of group boxes, checkboxes, and pushbuttons of the CHIP ID read, STATUS of alarm, configuration Register 1 and 2, and the VOUT setting register. Refer to the register descriptions in the data sheet for more information.

Detailed Description of Hardware

The MAX77813 EV kit demonstrates the MAX77813 buck-boost. It regulates output from input voltage ranges from 2.3V to 5.5V. Programmable output range is from 2.6V to 5.14V with 20mV step. The EV kit is suited with a general DC input. By connecting an external MINIQUSB, and launching the EV kit software, the user can adjust the output voltage and check the status of the buck-boost on the EV kit GUI. [Table 1](#) lists jumpers and associated functions that are available on the EV kit.

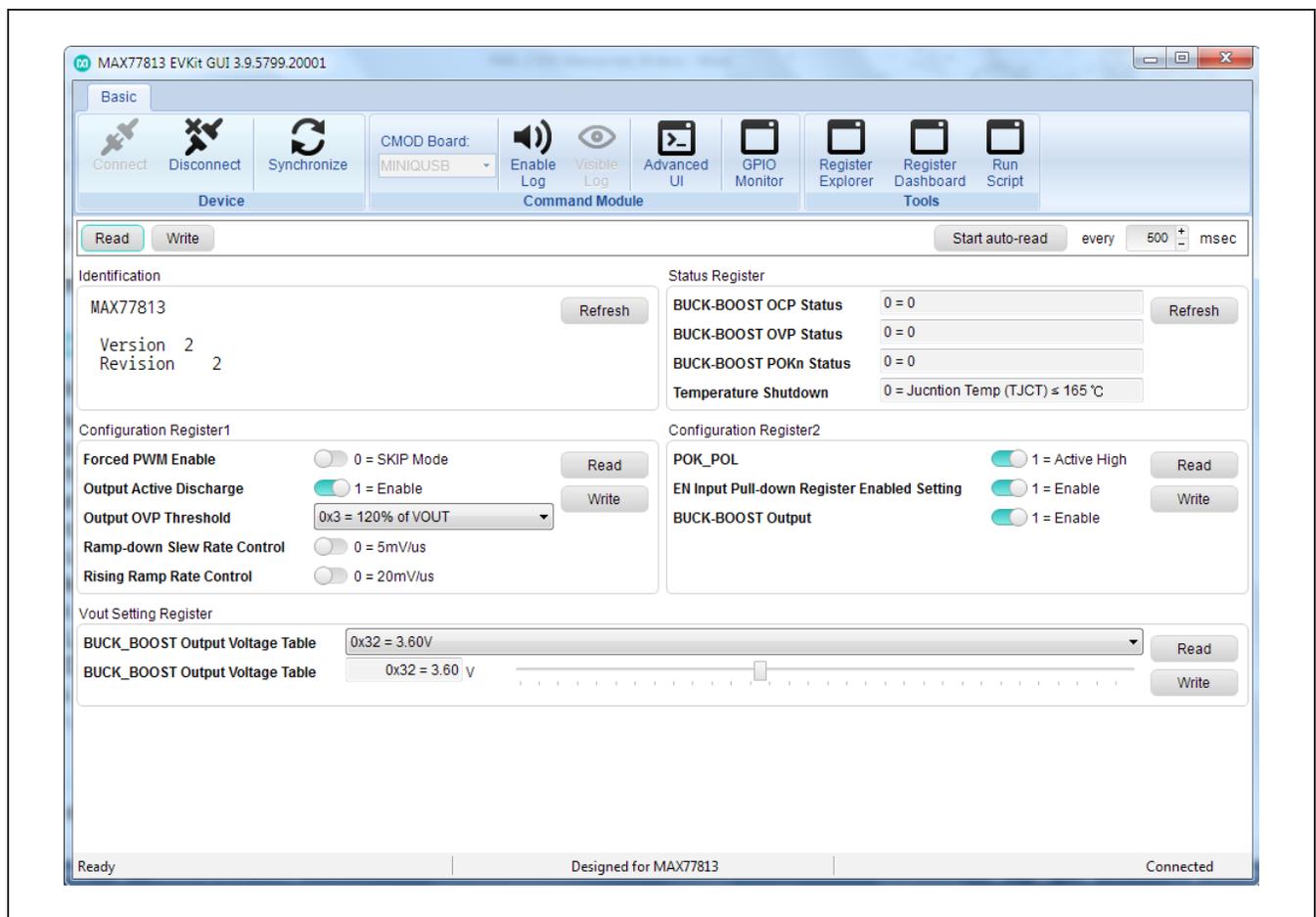


Figure 3. MAX77813 Evaluation Kit Software Window (CHIPID/STATUS/CONFIG Tab)

Component List

PART	QTY	DESCRIPTION
C1	1	10 μ F \pm 5%, 6.3V X5R ceramic capacitor (0603), TDK CGB3C1X5R0J106M065AC
C2, C8, C9	3	1 μ F \pm 10%, 6.3V X5R ceramic capacitor (0402), MURATA GRM155R60J105KE19
C3	1	0.1 μ F \pm 10%, 10V X5R ceramic capacitor (0402), TAIYO-YUDEN LMK105BJ104KV-F
C4	1	47 μ F \pm 20%, 6.3V X5R ceramic capacitor (0805), TDK C2012X5R0J476M125AC
J1	1	Right angle connector, 20-pins, SULLINS ELECTRONICS CORP. PPTC102LJBN-RC
JU1, JU2, JU3	3	Straight connector, 3-pins, SAMTEC TSW-103-07-L-S
JU4, JU5, JU6	3	Straight connector, 2-pins, SAMTEC TSW-102-07-T-S
L1	1	1 μ H \pm 20%, ISAT = 8.7A, DCR = 13.25m Ω , COILCRAFT XAL4020-102ME
R1	1	100k Ω \pm 1%, resistor (0402)
R2, R3	2	2.2k Ω \pm 1%, resistor (0402)
R4	1	0 Ω , resistor (0402)
U1	1	Buck-boost (20-WLP), MAX77813EWP33+
U2	1	Voltage regulator, MAX8511EXK18+
—	1	PCB: MAX77813 EVALUATION KIT

Component Suppliers

SUPPLIER	PHONE	WEBSITE
TDK	847-803-6100	www.comopnent.tdk.com
MURATA	770-436-1300	www.murata-northamerica.com
TAIYO-YUDEN	603-669-7587	www.t-yuden.com
SULLINS ELECTRONICS CORP.	760-774-0125	www.sullinselectronics.com
SAMTEC	800-726-8329	www.samtec.com
COILCRAFT	847-639-6400	www.coilcraft.com

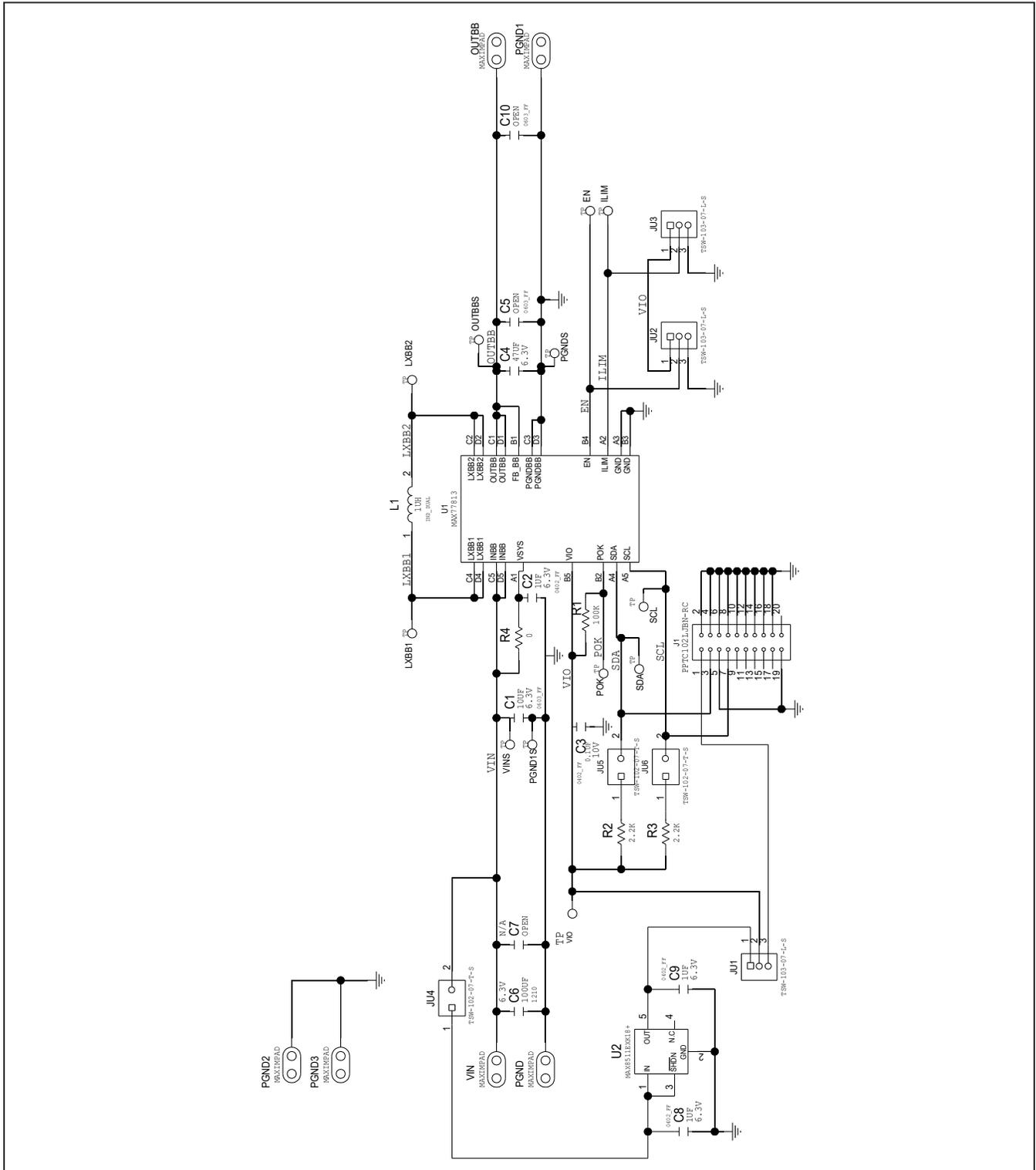
Note: Indicate that you are using the MAX77813 when contacting these component suppliers.

Ordering Information

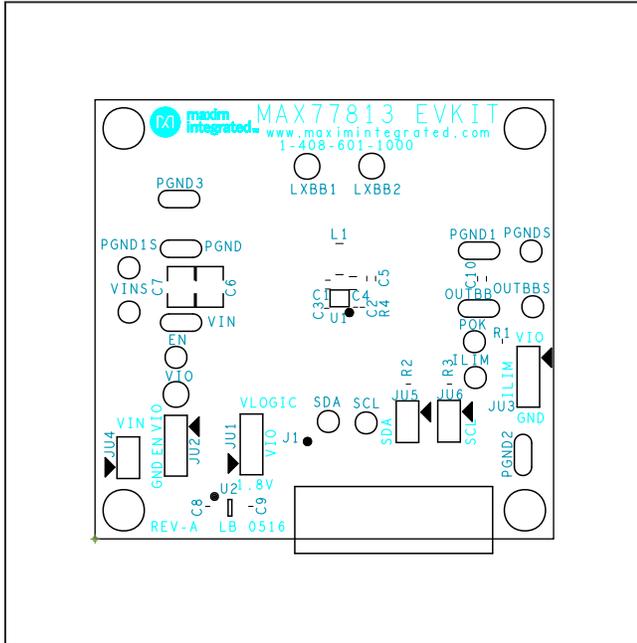
PART	TYPE
MAX77813EVKIT#	EV Kit

#Denotes a RoHS-compliant device that may include lead(Pb) that is exempt under the RoHS requirements.

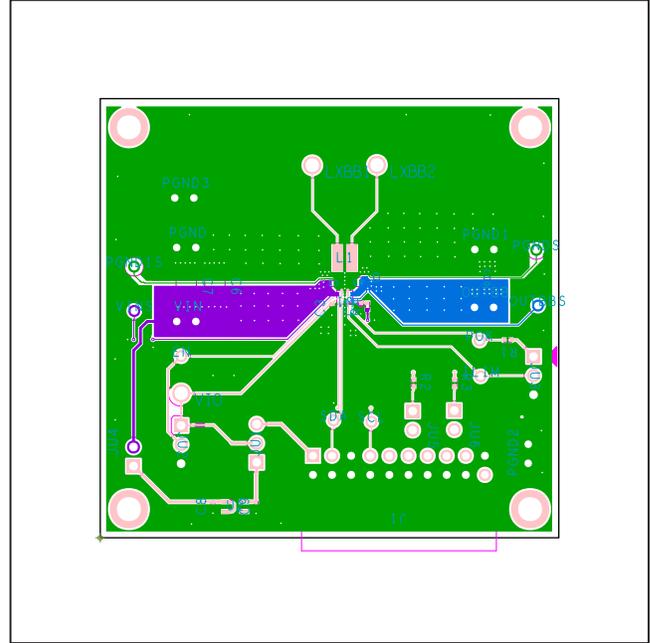
MAX77813 EV Kit Schematic



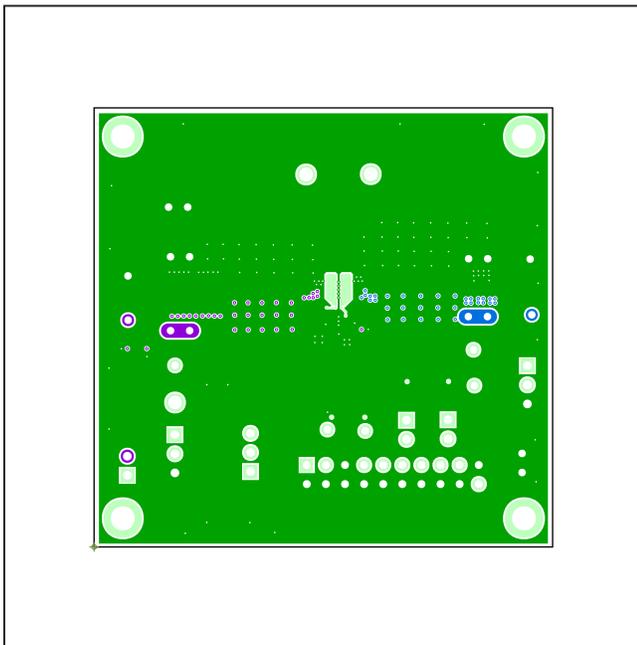
MAX77813 EV Kit PCB Layouts



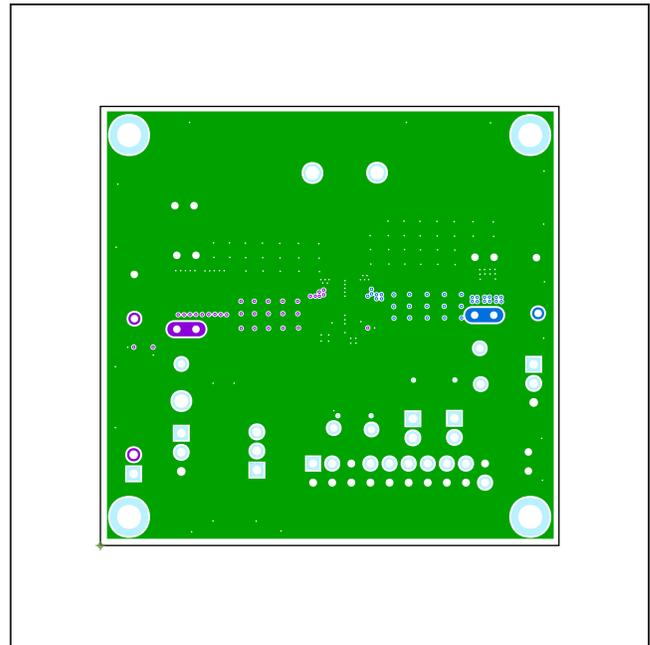
MAX77813 EV Kit Component Placement Guide—Top Side



MAX77813 EV Kit PCB Layout—Top Side

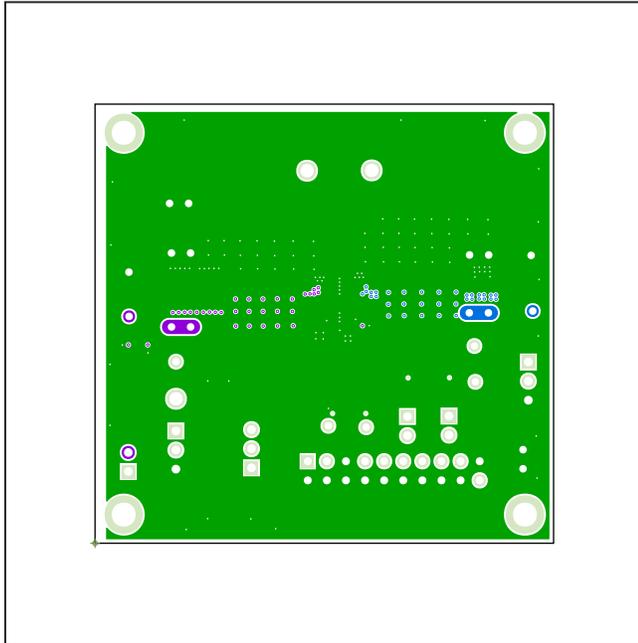


MAX77813 EV Kit PCB Layout—Layer 2

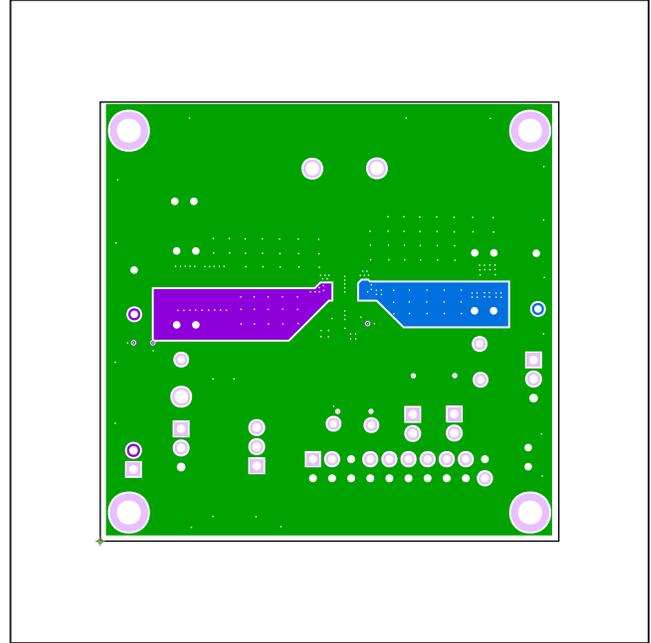


MAX77813 EV Kit PCB Layout—Layer 3

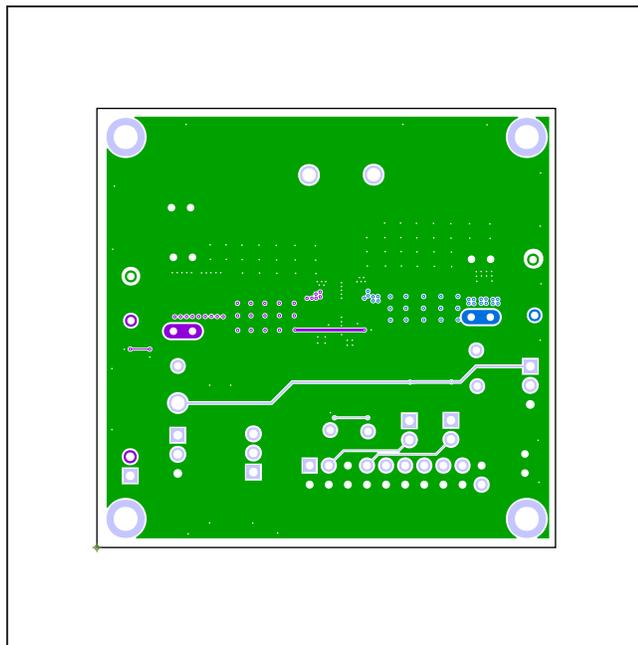
MAX77813 EV Kit PCB Layouts (continued)



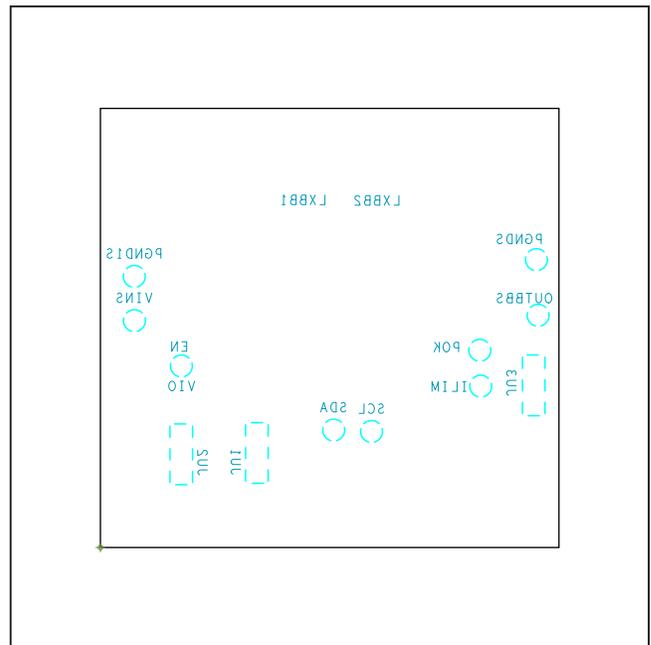
MAX77813 EV Kit PCB Layout—Layer 4



MAX77813 EV Kit PCB Layout—Layer 5



MAX77813 EV Kit PCB Layout—Bottom Layer



MAX77813 EV Kit PCB Layout—Silk Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	12/18	Initial release	—

For pricing, delivery, and ordering information, please visit Maxim Integrated's online storefront at <https://www.maximintegrated.com/en/storefront/storefront.html>.

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