## General Description

The MAX77801 evaluation kit demonstrates the IC 2A, buck-boost with I$^2$C capability. The EV kit enables user to evaluate MAX77801 performances with preprogrammed output voltage even without I$^2$C interface board (e.g., MINIQUSB). The two output voltages supported by default are 3.3V and 3.4V and it can be set by pulling DVS high/low. With I$^2$C interface board (additional order required if necessary), user can set output voltage from 2.6V to 4.1875V with 12.5mV step. The EV kit comes standard with the MAX77801EWP+ installed.

The MINIQUSB interface board can be used to enable PC communication through the USB interface board. Windows® 2000-, Windows XP®-, Windows Vista®-, and Windows 7-compatible software along with an extender board allows an IBM-compatible PC to use to the USB port to emulate an I$^2$C 2-wire inter-face. This menu-driven program offers a graphical user interface (GUI) with control buttons.

## Benefits and Features

● Kelvin Sense Pins at the Input and Output of the Regulator Ensure Accurate Efficiency Measurement

*Ordering Information appears at end of data sheet.*

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## Quick Start

### Required Equipment

● MAX77801 EV kit

● MINIQUSB command module (optional, USB cable included)

● Adjustable DC power supply

● 1.8V DC power supply (optional)
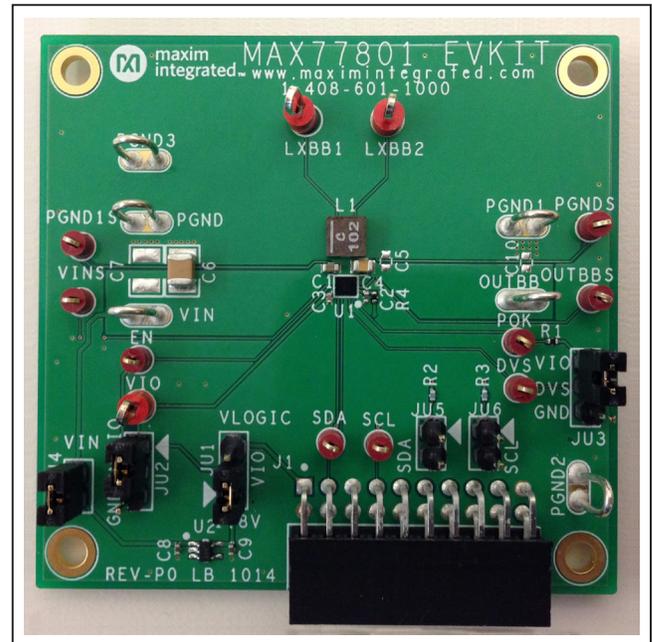
● Digital multimeters



Figure 1. MAX77801 Evaluation Board

## 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 I$^2$C 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 autorange 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 MAX77801.
7) Apply load for desired test. If reading register (e.g., reading status register) or writing register (e.g., programming specific output voltage) is required, then proceed to step 8.
8) Visit **www.maximintegrated.com/evkitsoftware** to download the latest version of the EV kit software, MAX77801Rxx.ZIP. Save the EV kit software to a temporary folder and uncompress 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 2.
12) The EV kit is now ready for testing.

## Detailed Description of Software

The GUI shown in Figure 2 is the main window of the MAX77801 EV kit software that provides a convenient means to control the MAX77801 IC. Use the mouse or press the Tab key to navigate through the GUI controls.

The EV kit software main window consists of two tabs, **CHIPID/STATUS/CONFIG** (Figure 2) and VOUT_DVS

(Figure 3). The **CHIPID/STATUS/CONFIG** tab sheet provides group boxes, checkboxes, and pushbuttons of the CHIP ID read, STATUS of alarm, CONFIG1, and CONFIG2. VOUT_DVS tab sheet provides access to control OUTPUT voltage depending on DVS pin status. Refer to register description in the MAX77801 data sheet.
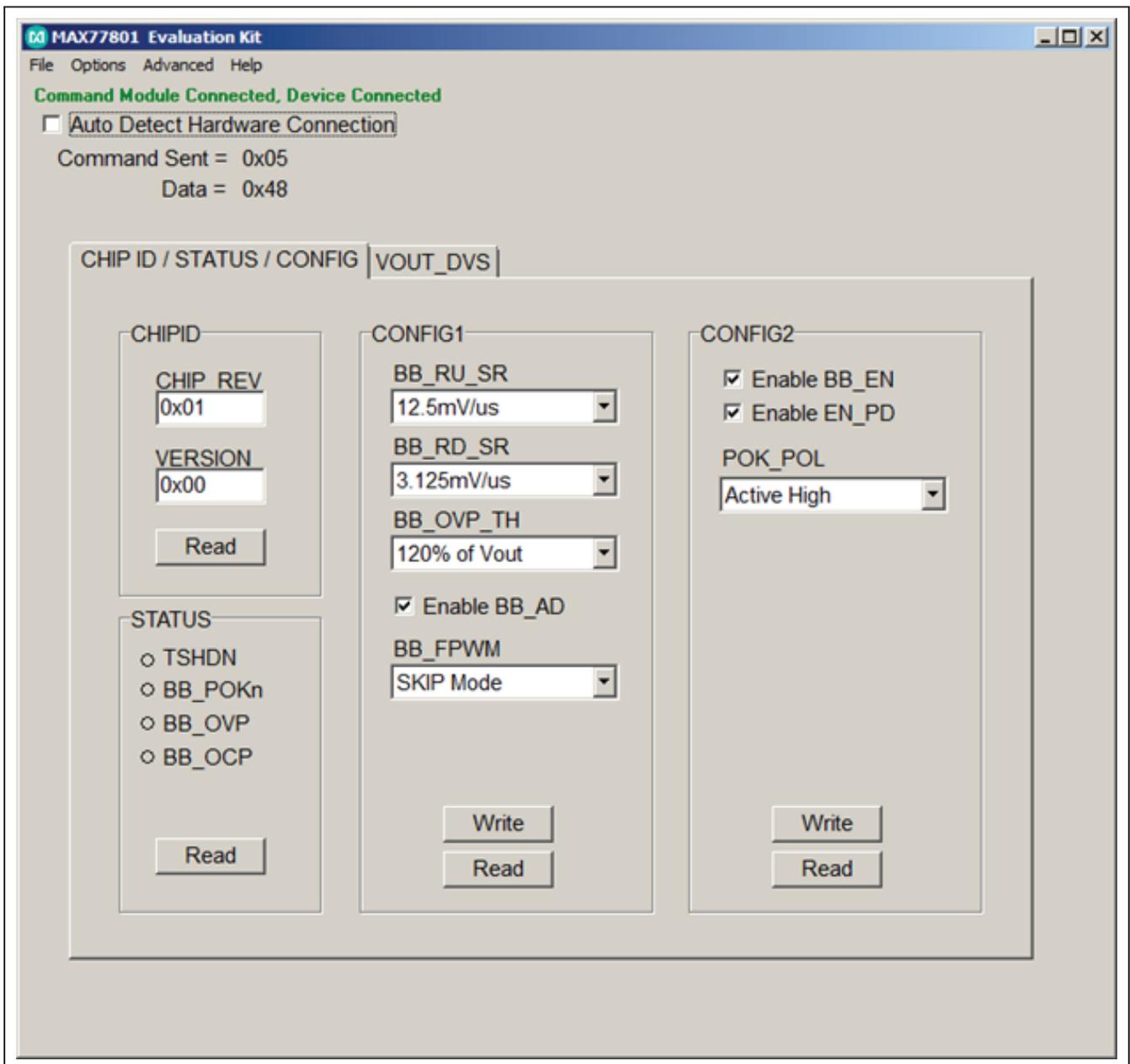


*Figure 2. MAX77801 Evaluation Kit Software Window (CHIPID/STATUS/CONFIG Tab)*
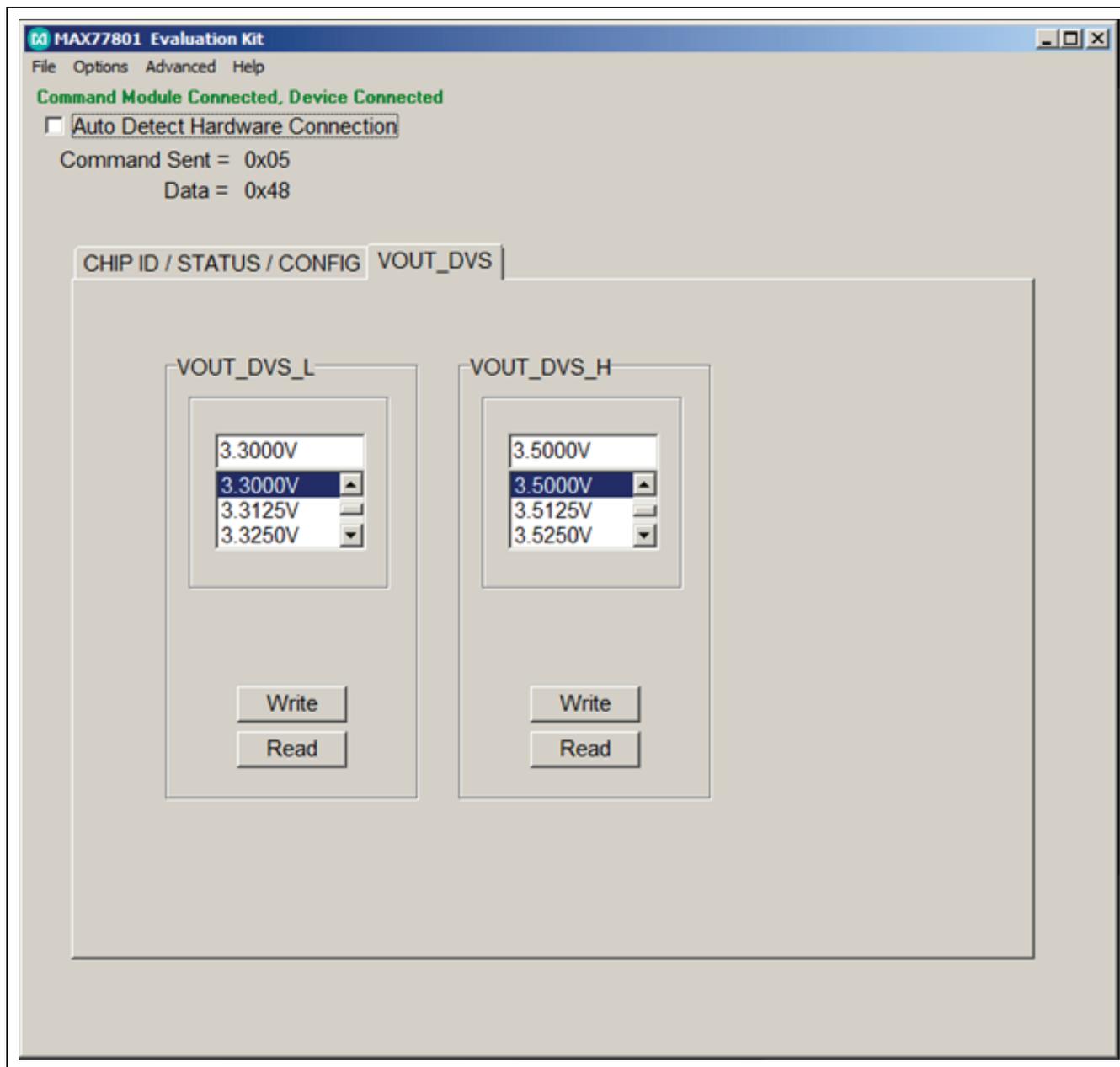
Figure 3. MAX77801 Evaluation Kit Software Window (VOUT_DVS Tab)

## Detailed Description of Hardware

The MAX77801 EV kit demonstrates the MAX77801 buck-boost. It regulates output from input voltage ranges from 2.3V to 5.5V. Programmable output range is from 2.6V to 4.1875V with 12.5mV 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 output voltage can be reported the status of buck-boost on the EV kit GUI. Table 1 lists jumpers and associated functions that are available on the EV kit.

## Table 1. Jumper Functions

| JUMPER | NODE OR FUNCTION | SHUNT POSITION | FUNCTION |
|--------|------------------|----------------|----------|
| 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 (MAX77801 is enabled) |
| | | 2-3* | Connecting EN to GND (MAX77801 is disabled) |
| JU3 | DVS | 1-2 | Connecting DVS to VIO, output voltage is set by VOUT_DVS_H register |
| | | 2-3* | Connecting DVS to GND, output voltage is set by VOUT_DVS_L register |
| JU4 | Input for onboard LDO | OPEN | Disconnect onboard LDO input |
| | | 1-2* | Inboard LDO is supplied from VIN |
| JU5 | SDA pullup | OPEN* | No pullup for SDA |
| | | 1-2 | SDA pin is pulled up to VIO through 2.2kΩ |
| JU6 | SCL pullup | OPEN* | No pullup for SCL |
| | | 1-2 | SCL pin is pulled up to VIO through 2.2kΩ |

*Default position.

## Component List

| PART | QTY | DESCRIPTION |
|------|-----|-------------|
| C1 | 1 | 10µF ±5%, 6.3V X5R ceramic capacitor (0603) TDK CGB3C1X5R0J106M065AC |
| C2, C8, C9 | 3 | 1µF ±10%, 6.3V X5R ceramic capacitors (0402) Murata GRM155R60J105KE19 |
| C3 | 1 | 0.1µF ±10%, 10V X5R ceramic capacitor (0402) Taiyo-Yuden LMK105BJ104KV-F |
| C4 | 1 | 47µF ±20%, 6.3V X5R ceramic capacitor (0805) TDK C2012X5R0J476M125AC |
| C5, C7, C10 | 0 | Capacitors, not installed |
| C6 | 0 | 100µF capacitor, not installed |
| J1 | 1 | 20-pin, right-angle connector Sullins PPTC102LJBN-RC |

| PART | QTY | DESCRIPTION |
|------|-----|-------------|
| JU1, JU2, JU3 | 3 | 3-pin straight connectors Samtec TSW-103-07-L-S |
| JU4, JU5, JU6 | 3 | 2-pin straight connectors Samtec TSW-102-07-T-S |
| L1 | 1 | 1µH ±20% inductor, $I_{SAT}$ = 8.7A, DCR = 13.25mΩ Coilcraft XAL4020-102ME |
| R1 | 1 | 100kΩ ±1% resistor (0402) |
| R2, R3 | 2 | 2.2kΩ ±1% resistors (0402) |
| R4 | 1 | 0Ω resistor (0402) |
| U1 | 1 | Buck-boost (20 WLP) Maxim MAX77801EWP+ |
| U2 | 1 | Voltage regulator (5 SC70) Maxim MAX8511EXK18+ |
| — | 1 | PCB: MAX77801EVKIT |

## 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 | 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 MAX77801 when contacting these component suppliers.*
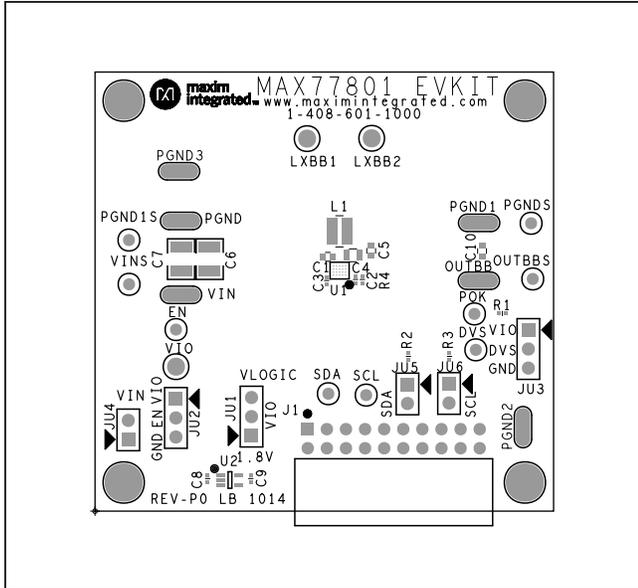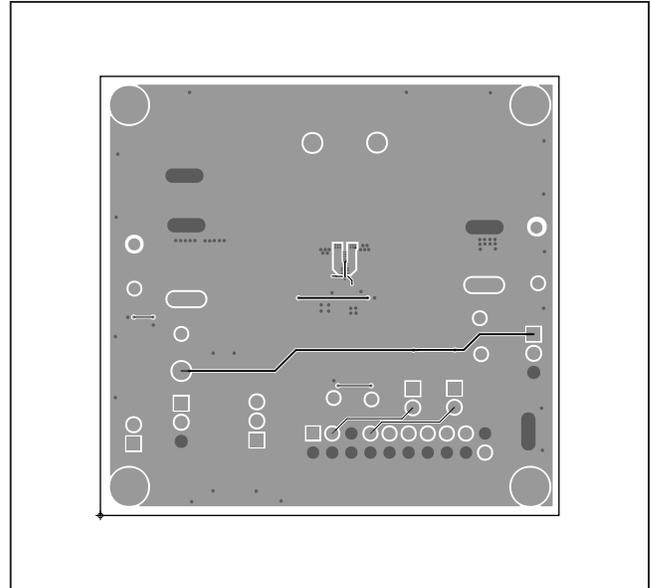
*Figure 4. MAX77801 EV Kit Schematic*

Figure 5. MAX77801 EV Kit Component Placement Guide–Top Side



Figure 6. MAX8971 EV Kit PCB Layout–Top Side
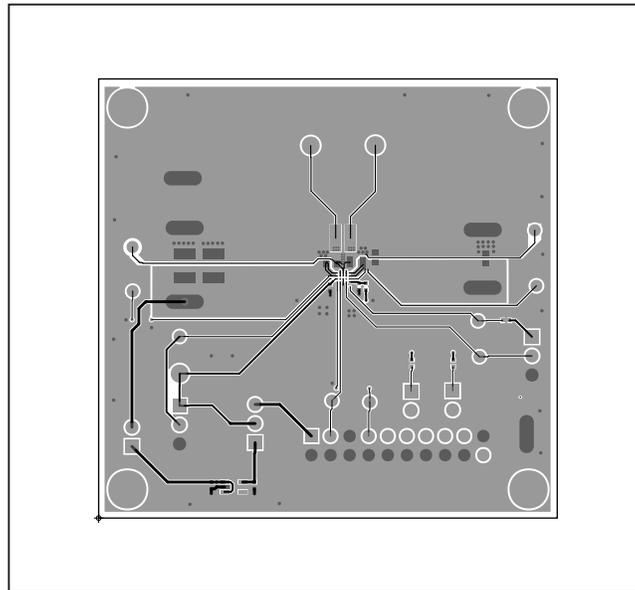


Figure 7. MAX8971 EV Kit PCB Layout–Bottom Side

## Ordering Information

| PART | TYPE |
|------|------|
| MAX77801EVKIT# | EV kit |
| MINIQUSB+ | Command module |

*#Denotes RoHS compliant.*
*+Denotes a lead(Pb)-free/RoHS-compliant package.*

## Revision History

| REVISION NUMBER | REVISION DATE | DESCRIPTION | PAGES CHANGED |
|---|---|---|---|
| 0 | 2/15 | Initial release | — |

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