



## **User Guide**

**MP2762A Evaluation Kit (EVKT-MP2762A)**

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## Overview

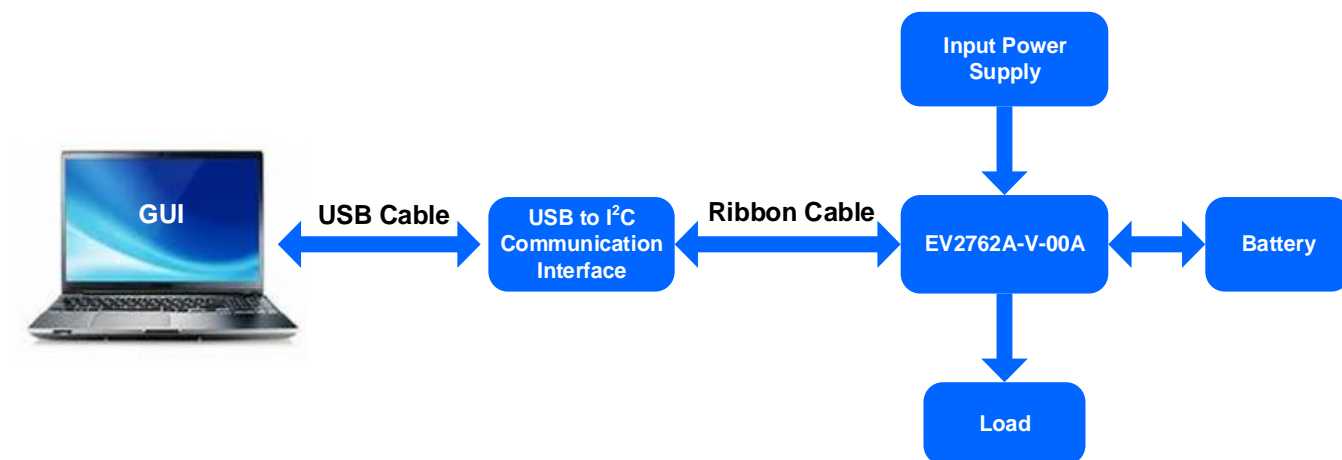
### Introduction

This EVKT-MP2762A is an evaluation kit for the MP2762A, a buck or boost charger with narrow voltage DC (NVDC) and USB On-the-Go (OTG) functionality. Its layout accommodates most common capacitors. The default function of this board is preset for charger mode, and the full-charge voltage is preset to 8.4V for a dual-cell battery. In charge mode, the MP2762A automatically operates in buck or boost mode, according to the input and battery voltage.

### Kit Contents

EVKT-MP2762A kit contents (items below can be ordered separately, and the GUI installation file and supplemental documents can be downloaded from the MPS website):

#	Part Number	Item	Quantity
1	EV2762A-V-00A	MP2762A evaluation board	1
2	EVKT-USB12C-02 bag	Includes one USB to I <sup>2</sup> C communication interface, one USB cable, and one ribbon cable	1



**Figure 1: EVKT-MP2762A Evaluation Kit Set-Up**

## Features and Benefits

- 4V to 21V Operating Input Voltage Range
- Up to 28V (20ns) Sustainable Voltage
- 6A Buck or Boost Charger
- Up to 5V, 3A USB On-the-Go (OTG)
- Up to 6A Configurable Input Current Limit
- Up to 6A Configurable Charge Current
- Up to 9V Configurable Charge-Full Voltage
- Configurable Input Voltage Limit
- Configurable Output Current Limit Available in OTG Mode
- 600kHz, 800kHz, 1MHz Configurable Switching Frequency in Each Phase
- Dual-Phase Interleaving Available in Buck Mode
- Narrow Voltage DC (NVDC) Power Path Management
- High Integration
  - Fully Integrated Power Switches
  - Built-In Robust Charging Protection, including Battery Temperature Monitoring and Configurable Timer
  - Input Current and Battery Current Monitoring via the IAM/IBM Pin
  - System Power Indication via the PSYS Pin
  - Input Power Source Status Indication Pin
- Safety
  - Thermal Regulation and Thermal Shutdown
  - Battery Over-Voltage Protection (OVP)
  - Input/System OVP
  - Comprehensive Fault and Status Reports in the I<sup>2</sup>C Interface
  - Short-Circuit Protection (SCP) Available in OTG Mode
- I<sup>2</sup>C Interface for Flexible Parameter Control
- Available in a QFN-30 (4mmx5mm) Package

*⚠ All changes made in I<sup>2</sup>C mode are not retained once the EVB shuts down.*

*⚠ Information written in OTP mode cannot be changed.*

Adjustable features are outlined below:

I <sup>2</sup> C	OTP
<ul style="list-style-type: none"> <li>• Input Voltage Limit</li> <li>• Input Current Limit</li> <li>• Fast-Charge Current</li> <li>• Pre-Charge Current</li> <li>• Charge Termination Current</li> <li>• Battery Charge Voltage Regulation</li> <li>• Battery Recharge Threshold</li> <li>• Battery Impedance Compensation</li> <li>• Junction Temperature Regulation</li> <li>• Pre-Charge Threshold</li> <li>• OTG Voltage Regulation</li> <li>• OTG Current Limit</li> <li>• Configuration Register</li> <li>• OTG/System Under-Voltage (UV) Threshold</li> <li>• OTG/System Over-Voltage (OV) Threshold</li> <li>• PROCHOT Setting</li> </ul>	<ul style="list-style-type: none"> <li>• Input Current Limit</li> <li>• Input Voltage Limit</li> <li>• Fast-Charge Current</li> <li>• Pre-Charge</li> <li>• Charge Termination Current</li> <li>• Battery Charge Voltage Regulation</li> <li>• Battery Recharge Threshold</li> <li>• Pre-Charge Threshold</li> <li>• OTG Voltage Regulation</li> <li>• OTG Current Limit</li> <li>• Configuration Register</li> <li>• System/OTG UV Threshold</li> <li>• System/OTG OV Threshold</li> <li>• PROCHOT Setting</li> </ul>

## Kit Specifications

Features	Specification
Supply for Board	4V to 21V
Operating Input Voltage	4V to 21V
Battery Charge Voltage Regulation	8.4V (I <sup>2</sup> C-configurable)
Operating Systems Supported	Windows XP, 7, or later
System Requirements	Minimum 8.6MB free
GUI Software	MP2762A V1.3

## Section 1. Hardware Specifications

### 1.1 Personal Computer Requirements

The following minimum conditions must be met to use the EVKT-MP2762A:

- Operating system of Windows XP, 7, or later
- Net Framework 4.0
- PC with a minimum of one available USB port
- At least 8.6MB of free space

### 1.2 EV2762A-V-00A Specifications

The EV2762A-V-00A is an evaluation board for the MP2762A. For more information, refer to the EV2762A-V-00A datasheet.



Figure 2: EV2762A-V-00A Evaluation Board

Feature	Specification
Supply for the Evaluation Board	4V to 21V
Operating Input Voltage	4V to 21V
Battery Charge Voltage Regulation	8.4V (I <sup>2</sup> C-configurable)
EVB Size (LxW)	8.7cmx7.5cm

### 1.3 EVKT-USBI2C-02 Specifications

The EVKT-USBI2C-02 refers to the USB to I<sup>2</sup>C communication interface device, which connects the EVB, the PC, and its supporting accessories. It provides I<sup>2</sup>C capabilities. Together with MPS's Virtual Bench Pro and GUI tools, it provides a quick and easy way to evaluate the performance of MPS digital products. For more details, refer to the EVKT-USBI2C-02 datasheet.



Figure 3: EVKT-USBI2C-02 Communication Interface

## Section 2. Software Requirements

### 2.1 Software Installation Procedure

Programming occurs through the MPS I<sup>2</sup>C GUI. Follow the instructions below to install the software:

*Note: This software can be downloaded from the MPS website.*

1. Download and extract the zip package titled “Programming+Tool-MP2762A+V1.3”.
2. Double-click the .exe file to open the set-up guide (see Figure 4). If a protection window comes up, click “More info,” then click “Run anyway.”
3. Follow the prompts in the set-up guide.
4. Wait for the status screen to verify that installation is complete (see Figure 5).

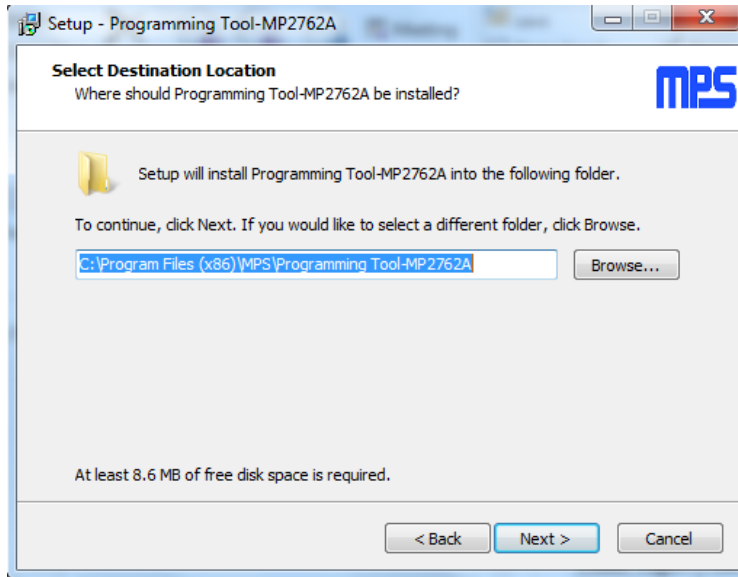


Figure 4: MPS I<sup>2</sup>C GUI Set-Up Guide

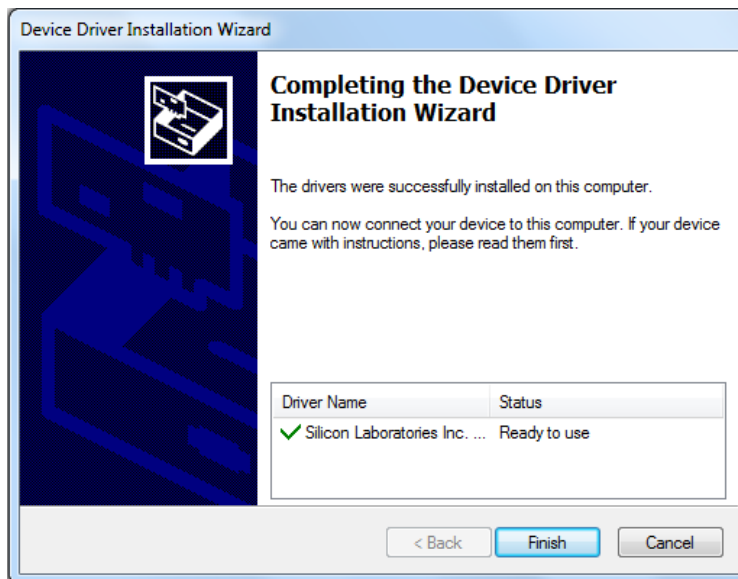


Figure 5: Driver Set-Up Success

## Section 3. Evaluation Kit Test Set-Up

### 3.1 Hardware Set-Up

The hardware must be properly configured prior to use. Follow the instructions below to set up the EVB:

1. Locate the proper wires to connect the EVB to the EVKT-USBI2C-02 communication interface.
2. Connect SCL, SDA, and GND (see Figure 6). Refer to the MP2762A datasheet for further clarification.



Figure 6: EVB to MPS I<sup>2</sup>C Communication Interface Wire Connection

### 3.2 Powering Up the EVB

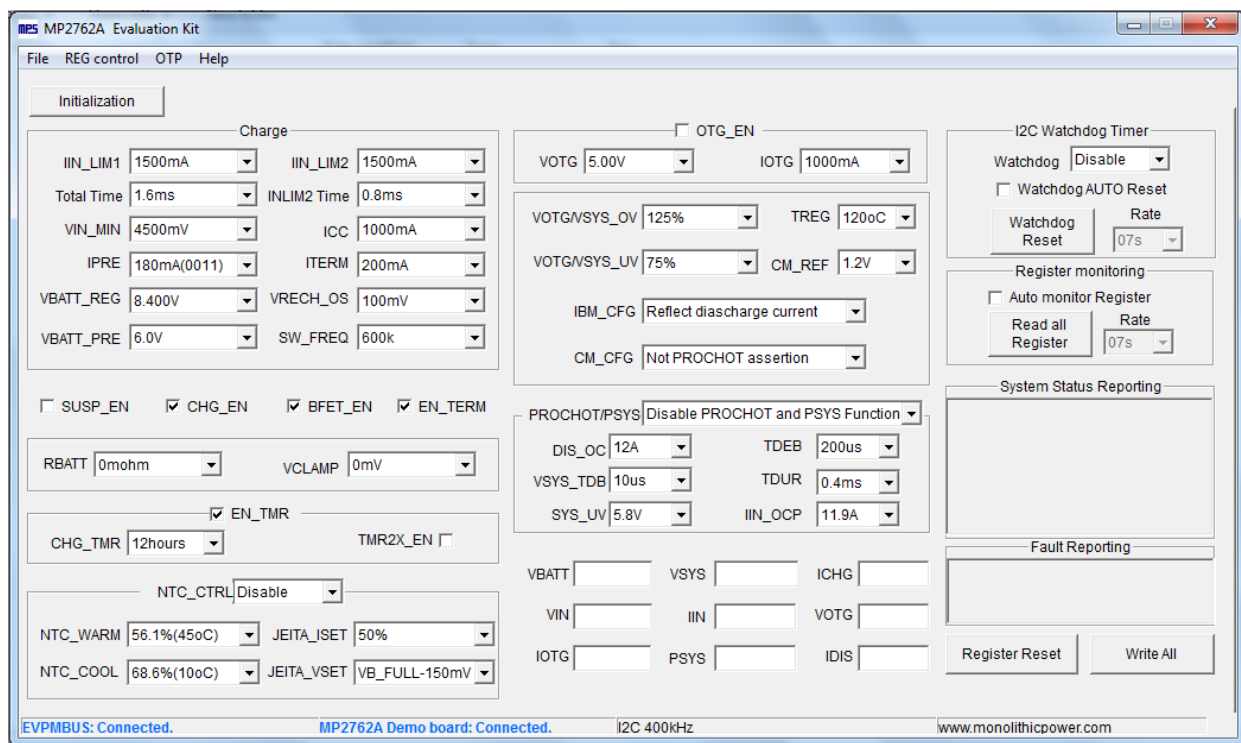
1. Connect the load terminals to:
  - a. Positive (+): VSYS
  - b. Negative (-): PGND
2. Connect the battery terminals to:
  - a. Positive (+): VBATT
  - b. Negative (-): PGND
3. If using a battery simulator, preset the battery voltage between 0V and 9V, then turn it off.
4. Connect the battery simulator output terminals to:
  - a. Positive (+): BATT
  - b. Negative (-): PGND
5. Preset the power supply output between 4V and 21V, then turn off the power supply.
6. Connect the power supply terminals to:
  - a. Positive (+): VIN
  - b. Negative (-): PGND
7. Ensure the battery voltage is present (if using a battery simulator, turn on the battery simulator).
8. Turn the power supply. The IC should start up automatically.



## 3.3 Software Set-Up

After connecting the hardware according to the steps above, follow the steps below to use the GUI software:

1. Start the software. It should check the EVB connection automatically.
  - If the connection is successful, both the USB and the MP2762A demo board statuses will be listed as “Connected” in blue (see Figure 7).



**Figure 7: Connected USB and MP2762A Demo Board**

- If the connection is unsuccessful, they will be listed as “Not Connected” in red. Check the connections between the EVB, communication interface, and PC. Re-plug the USB into the computer.
    - If the MP2762A demo board is listed as “Not Connected,” this means that the evaluation board is not connected correctly.
    - If the USB is listed as “Not Connected,” this means that the USB I<sup>2</sup>C communication interface is not connected correctly.
2. Click the “Read All Register” button to read the I<sup>2</sup>C register values. The default values should be displayed (see Figure 7).
  3. Find the item to be changed, then select a value from the drop-down menu.
  4. Click the “Write All” button to update the values. The item’s changed information should be downloaded to the IC.

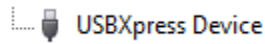
*⚠ All changes made via the I<sup>2</sup>C are restored to default values once the EVB shuts down.*

### 3.4 Troubleshooting Tips

#### EVKT-USBI2C-02

If the USBI2C-02 driver is not properly installed, manual installation is required. Follow the steps below:

*Note: Check the driver version. Find “USBXpress Device” in the Device Manager under USB controllers.*



*Right-click and view properties. Ensure the driver version matches the newest version. If the PC is running Windows 10, Windows 10 may automatically install the older USB driver, which is not compatible. The correct driver version should be newer than 6.7.2.0 (see Figure 8).*

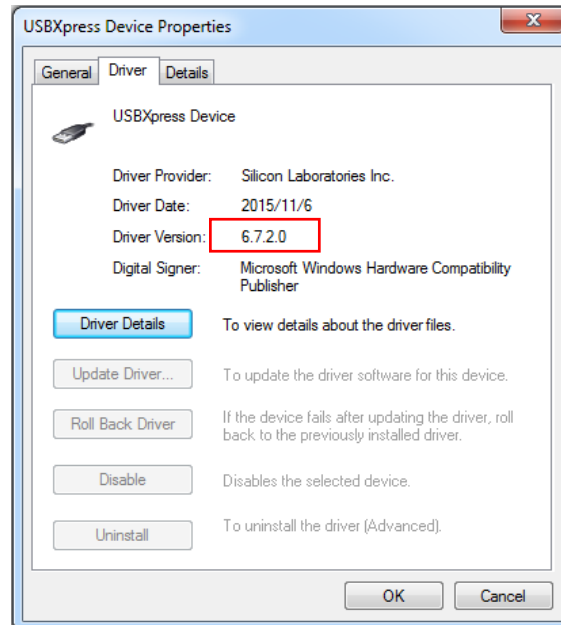
1. Install the correct USBXpress “.exe” file.

Choose either the 32-bit or 64-bit operating system.

32-bit: USBXpressInstaller\_x86.exe

64-bit: USBXpressInstaller\_x64.exe

2. Connect the EVKT-USBI2C-02 communication interface to the PC with a USB cable.



**Figure 8: Determining the Driver Software**

#### No Supply

The IC’s input pin has an under-voltage lockout (UVLO) detection circuit. If the input voltage ( $V_{IN}$ ) is below the UVLO rising threshold, the charging function is disabled.

#### No Charging Event

If the IC detects that  $V_{IN}$  is below the UVLO falling threshold (device enters a no supply state), or over-temperature protection (OTP) is triggered (device enters a shutdown state), the IC switches from charge mode to battery supplement mode, and the system is powered by the battery.

#### Thermal Recovery

If the die temperature exceeds the thermal protection threshold, the device enters a shutdown state. Once the die temperature decreases, the IC starts up again and resumes normal operation.

## Section 4. Ordering Information

The components of the evaluation kit can be purchased separately, depending on user needs.

Part Number	Description
EVKT-MP2762A	Complete evaluation kit
<b>Contents of EVKT-MP2762A</b>	
EV2762A-V-00A	MP2762A evaluation board, which allows users to access the I <sup>2</sup> C
EVKT-USBI2C-02 bag	Includes one USB to I <sup>2</sup> C communication interface, one USB cable, and one ribbon cable

**Order directly from [MonolithicPower.com](https://www.MonolithicPower.com) or our distributors.**

## REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	2/8/2021	Initial Release	-

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