



User Guide

MP2667 Evaluation Kit (EVKT-MP2667)

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Overview

Introduction

The EVKT-MP2667 is an evaluation kit for the MP2667. This board is designed for the MP2667, which is a highly integrated, single-cell Li-ion/Li-polymer battery charger with a system power path management function. Its layout accommodates most commonly used capacitors. The default function of this board is preset for charger mode and the charge full voltage is preset to 4.200V for a single-cell Li-ion battery.

Kit Contents

EVKT-MP2667 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	EV2667-G-00A	MP2667 evaluation board	1
2	EVKT-USBI2C-02-BAG	Includes one USB to I ² C USB communication interface, one USB cable, and one ribbon cable	1

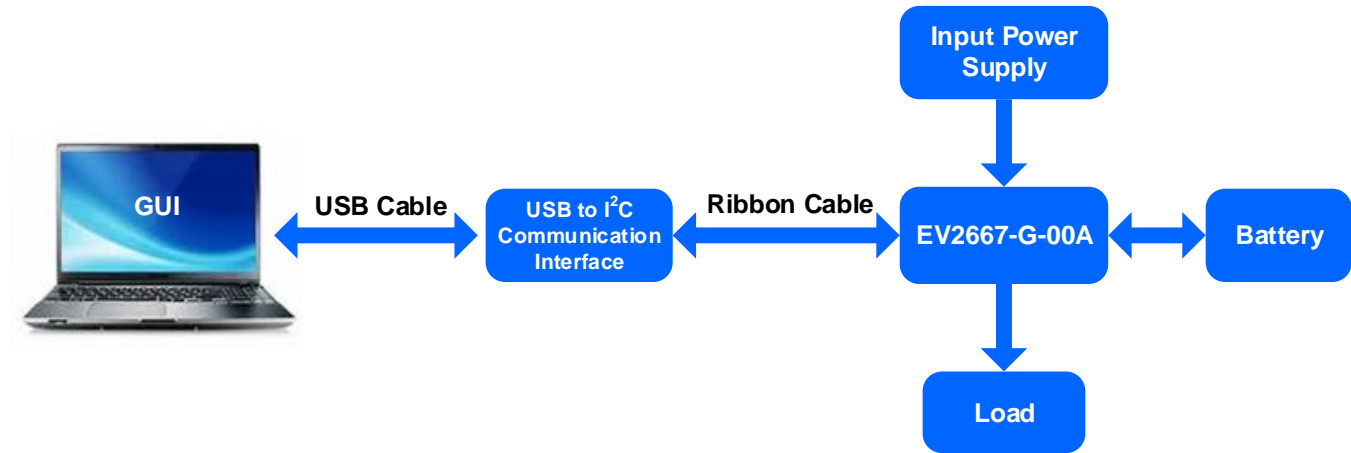


Figure 1: EVKT-MP2667 Evaluation Kit Set-Up

Features and Benefits

- Fully Autonomous Charger for Single-Cell Li-Ion/Li-Polymer Batteries
- Complete Power Path Management for Simultaneously Powering the System and Charging the Battery
 - Battery Voltage: 3.6V to 4.545V (Accuracy $\pm 0.5\%$)
 - Charge Current: 26mA to 1049mA (Accuracy $\pm 10\%$)
 - Input Current: 77mA to 993mA
 - 13V Maximum Voltage for the Input Source
- I²C Interface for Setting Charging Parameters and Status Reporting
- Fully Integrated
 - Power Switches: 300m Ω LDO MOSFET between IN and SYS, and 100m Ω battery MOSFET between SYS and BATT
 - No External Blocking Diode
- Built-In Robust Charging Protection
 - Battery Temperature Monitoring
 - Programmable Timer
 - On-Chip Thermal Limiting Regulation
- System Reset Function
- Built-In Battery Disconnection Function

\triangle All changes made in I²C mode will NOT be retained once the EVB is powered down.

\triangle Information written in OTP mode CANNOT be changed.

Adjustable features:

I ² C	OTP
<ul style="list-style-type: none"> • Battery regulation voltage • Fast-charge current • Discharge current • Terminal current • Input minimum voltage • Input current limit • Battery UVLO • Charge timer • Watchdog timer • Thermal regulation 	<ul style="list-style-type: none"> • Battery regulation voltage • Fast-charge current • Terminal current • Watchdog timer

Kit Specifications

Feature	Specification
Supply for Board	4.35V to 5.5V
Operating Input Voltage	4.35V to 5.5V
Operating Systems Supported	Windows XP, 7, and later
System Requirements	Minimum 22.2MB free
GUI Software	MP2667 V1.0

Section 1. Hardware Specifications

1.1 Personal Computer Requirements

The following minimum requirements must be met to use the EVKT-MP2667:

- Operating system of Windows XP, 7, or later
- Net Framework 4.0
- PC with a minimum of one available USB port
- At least 22.2MB of free space

1.2 EV2667-G-00A Specifications

The EV2667-G-00A is an evaluation board for the MP2667. For more information, refer to the EV2667-G-00A datasheet.



Figure 2: EV2667-G-00A Evaluation Board

Feature	Specification
Supply for Evaluation Board	4.35V to 5.5V
Operating Input Voltage	4.35V to 5.5V
EVB Size (LxW)	6.3cmx6.3cm

1.3 EVKT-USBI2C-02 Specifications

The EVKT-USBI2C-02 refers to the communication interface, which connects the EVB, the PC, and its supporting accessories. It provides I²C capabilities. Together with the eMotion System™ Virtual Bench Pro and I²C 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 I²C GUI. Follow the instructions below to install the software:

Note: This software can be downloaded from the [MPS website](#) or the following URL (<http://hz-coc-ebench/Installation/File.aspx?categoryID=7>).

1. Download and extract the zip package titled “I²C evaluation kit software for MP2667.”
2. Double-click the .exe file to open the set-up guide (see Figure 4).
3. Follow the prompts in the set-up guide.
4. Wait for the status screen to verify that installation is complete (see Figure 5).

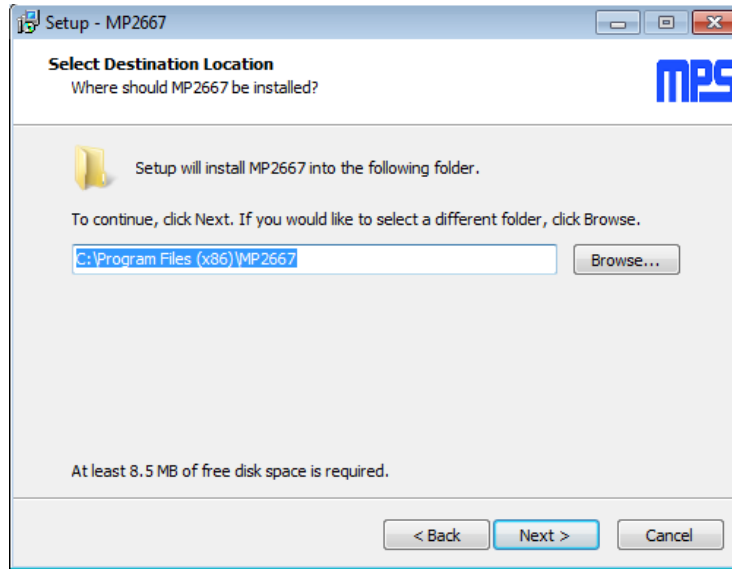


Figure 4: I²C GUI Set-Up Guide

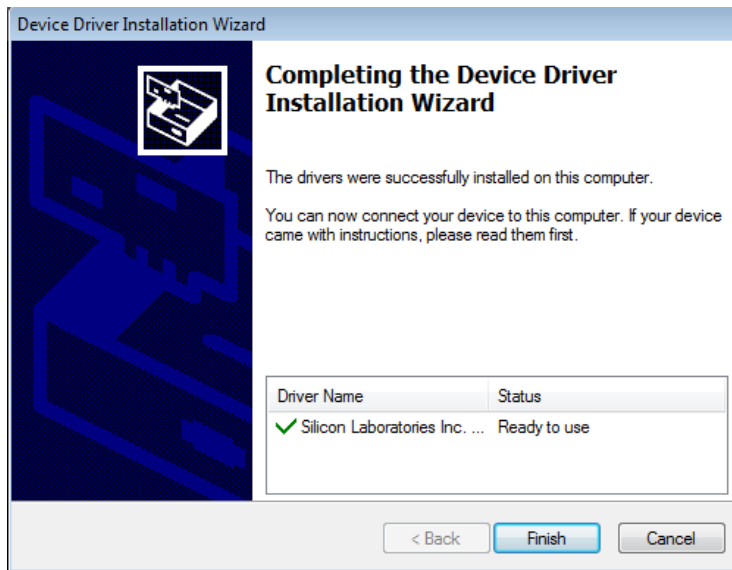


Figure 5: Driver Set-Up Success

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). If necessary, refer to the datasheet for further clarification.



Figure 6: EVB to MPS I²C Communication Interface Wire Connection

3.2 Powering Up the EVB

1. Connect the positive and negative terminals of the load to the SYS and GND pins, respectively.
2. Connect the positive and negative terminals of the battery to the VBATT and GND pins, respectively. If it is a battery simulator, preset the battery voltage between 0V and 4.545V, then turn it off. Connect the battery simulator output to the VBATT and GND pins, respectively.
3. Preset the power supply output between 4.35V and 5.5V, then turn off the power supply. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Make sure the battery voltage is present (if a battery simulator is used, turn on the battery emulator). Turn the power supply on. The IC will power up automatically.

Reminder: If the battery simulator is connected, be sure to turn on the battery emulator first, before the input supply in the start-up sequence.

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 will automatically check the EVB connection.
 - If the connection is successful, both the USB and MP2667 Demo Board statuses will appear as “Connected” (see Figure 7).

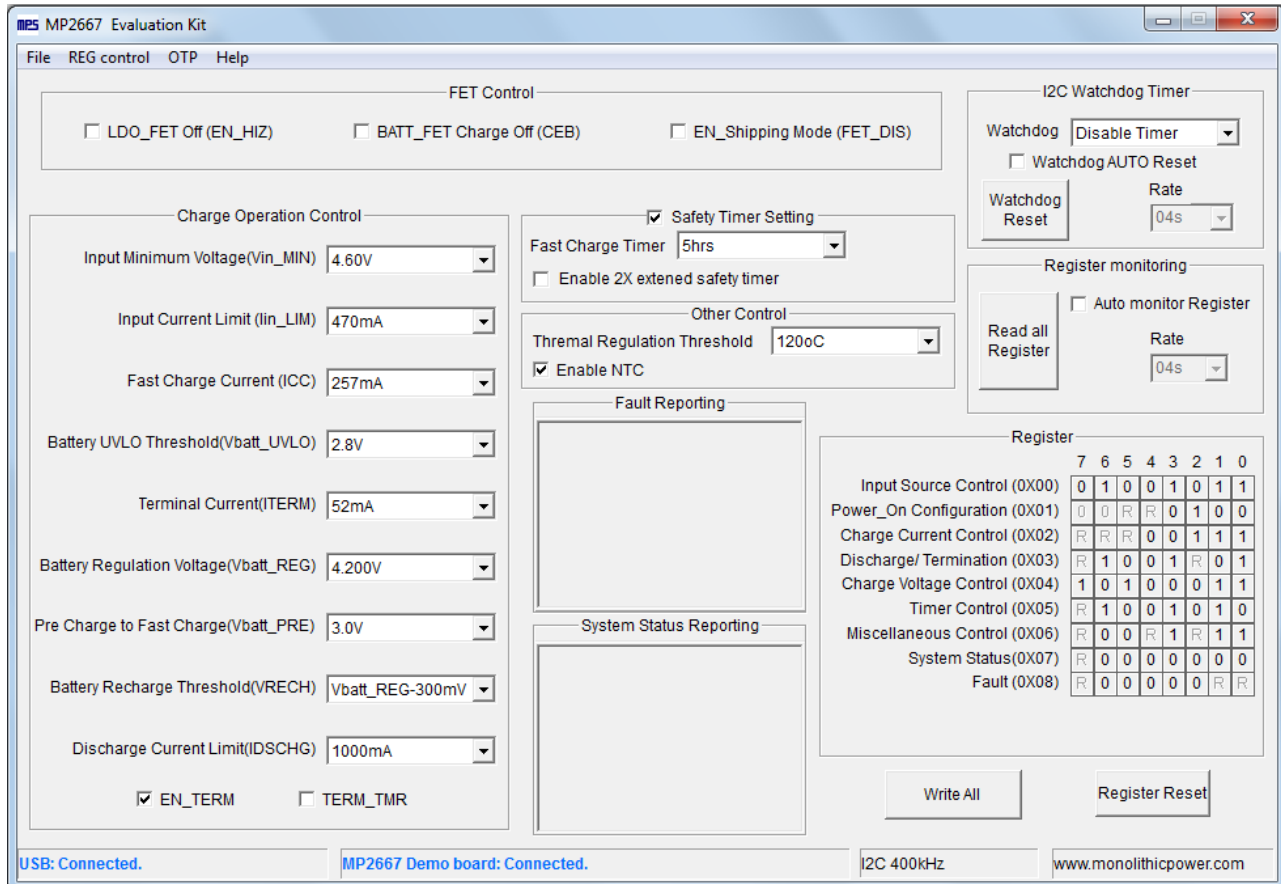


Figure 7: USB and MP2667 Demo Board Show as Connected

- If not, they will appear as “Not Connected” in red. Check the connections between the EVB, communication interface, and PC. Re-plug the USB into computer.
 - MP2667 Demo Board “Not Connected” means that the evaluation board is not connected correctly.
 - USB “Not Connected” means that the USB I²C communication interface is not connected correctly.
2. Click the “Read All Registers” button to read the I²C register values. The default values are displayed (see Figure 7).
 3. Find the item to be changed, and select the desired value from the drop-down menu.
 4. Click the “Write All” button to update values. The changed information of the item will be downloaded to the IC.

⚠ All changes made via I²C will be restored to default values once the EVB is powered down.

3.4 Device Programming Instructions

The MP2667-xxxx is an OTP part. Follow the instructions outlined below to create and export customized configurations:

1. Using a computer, open the MPS GUI software. Ensure the EVB is powered on.
2. Check the connection between the EVB and computer.
3. Select “OTP View” in the toolbar (see Figure 8).

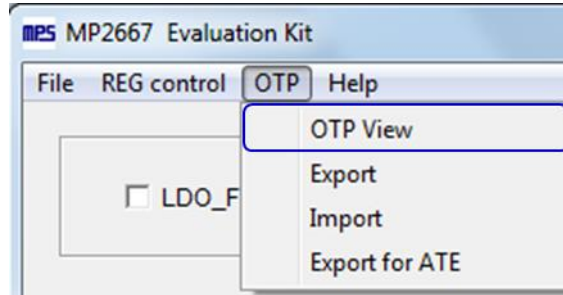


Figure 8: Select OTP

4. Enter a new table (see Figure 9). Any of the highlighted parameters can be changed.

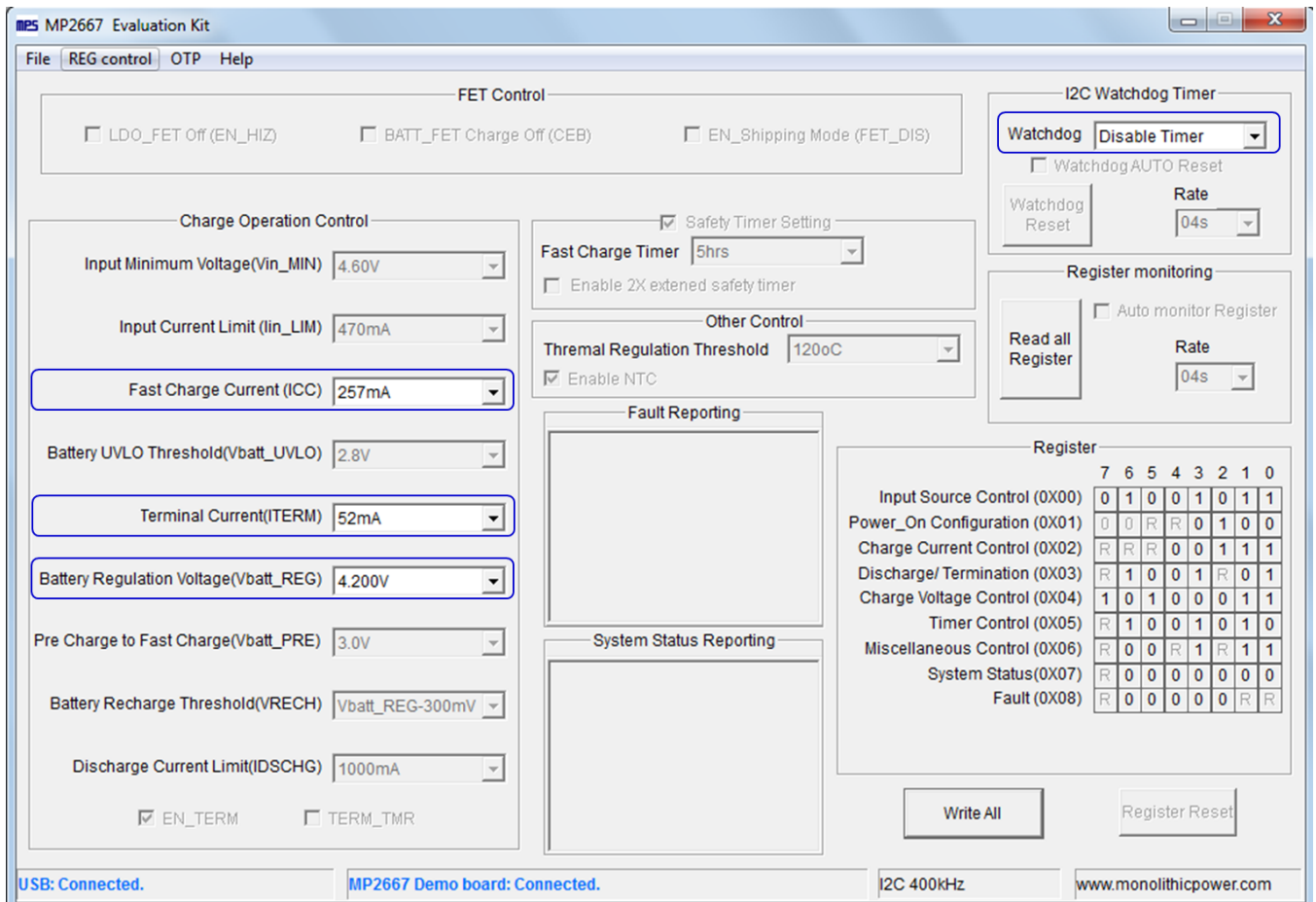


Figure 9: Adjustable Parameters in OTP Mode

5. Select values from the drop-down menus. Be sure all the parameters are populated before exporting. Export the configuration by clicking “Export” in the toolbar (see Figure 10).

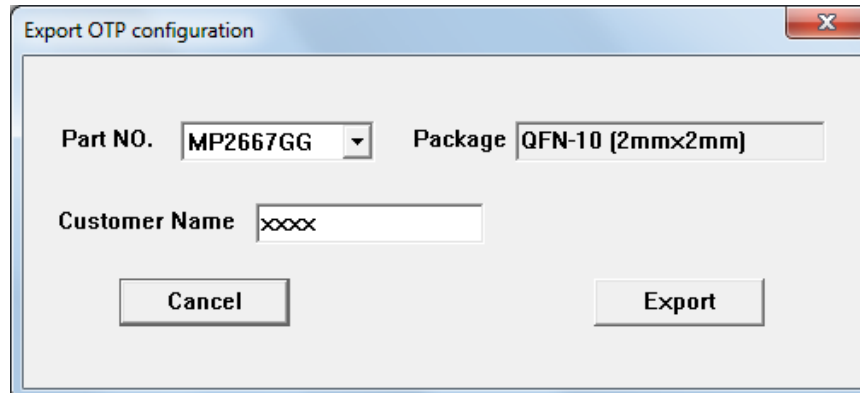


Figure 10: Select “Export”

- Find a location for the exported file, and click “Save.” The customized configurations will be saved in a .txt file (see Figure 11).

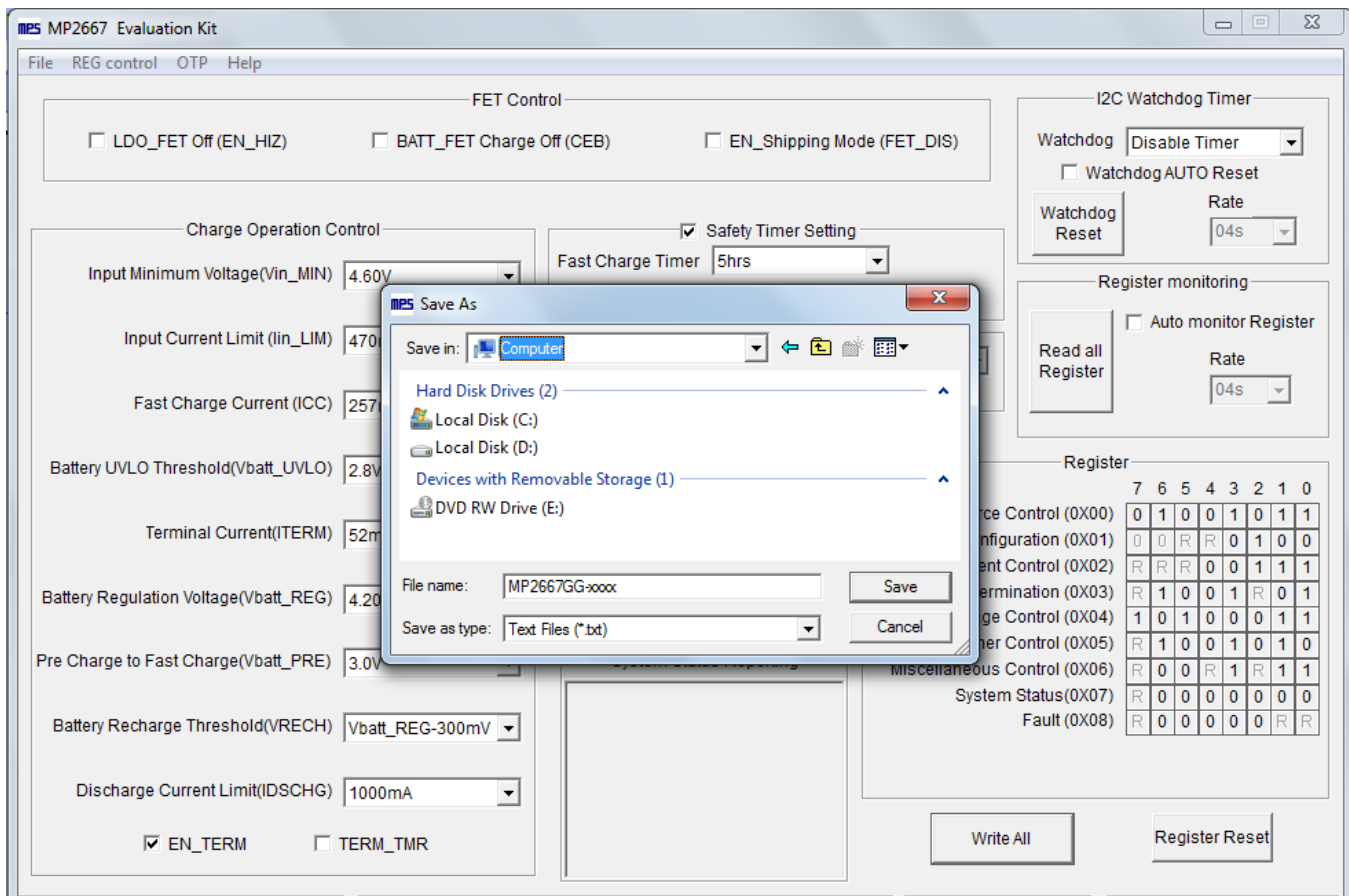


Figure 11: Various Locations Available to Export To

- Send this file to an MPS FAE to apply for the customized “xxxx” code.

3.5 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. Check to make sure 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 is 4.0.0.0 (see Figure 12).

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 the USB cable.

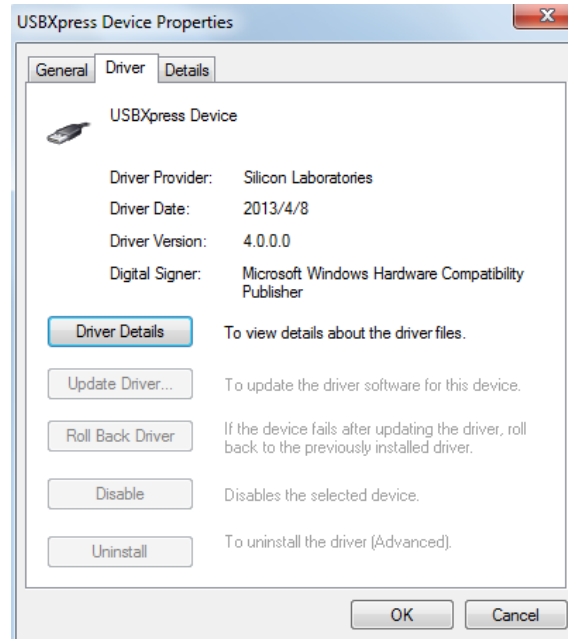


Figure 12: Correct Driver Version is 4.0.0.0

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 the input voltage is below the UVLO falling threshold (enter no supply state) or over-temperature protection is triggered (enter shutdown state), the IC switches to supplement mode, powered by the battery.

Thermal Recovery

If the MP2667 is in a shutdown state due to the die temperature exceeding the thermal protection threshold, the IC powers on again once the die temperature decreases.

Section 4. Ordering Information

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

Part Number	Description
EVKT-MP2667	Complete evaluation kit
Contents of EVKT-MP2667	
EV2667-G-00A	MP2667-xxxx evaluation board
EVKT-USBI2C-02-BAG	Include one USB to I ² C USB communication interface, one USB cable, and one ribbon cable
Online Resources	Include datasheet, user guide, product brief, and GUI

Order directly from MonolithicPower.com or our distributors.