

User Guide

MP2672 Evaluation Kit (EVKT-MP2672)

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Overview

Introduction

The EVKT-MP2672 is an evaluation kit for the MP2672. This board is designed for MP2672, which is controlled by the GUI to enable the charging and discharging of the 2-cell battery. Its layout accommodates most commonly used components. The default function of this board is preset for host-mode and the battery regulation voltage is preset to 8.4V for the 2-cell Li-Ion battery.

Kit Contents

EVKT-MP2672 kit contents (items below can be ordered separately).

#	Part Number	Item	Quantity
1	EV2672-D-01A	MP2672 evaluation board	1
2	EVKT-USBI2C-02-BAG	Includes one USB to I²C USB communication interface, one USB cable, and one ribbon cable	1

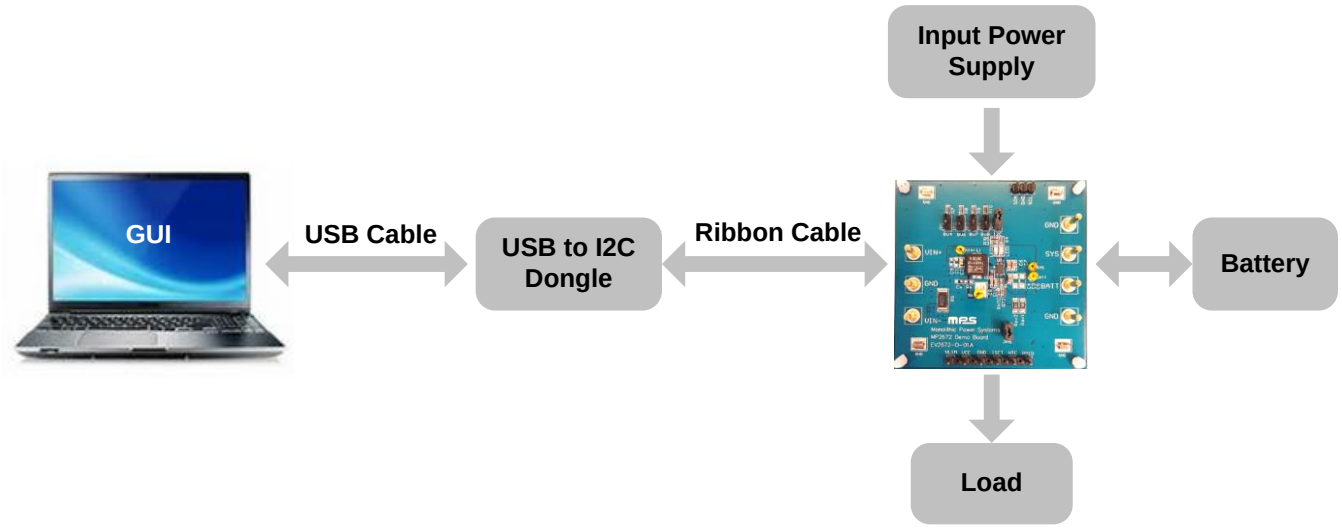


Figure 1: EVKT-MP2672 Evaluation Kit Set-Up

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Features and Benefits

- 4.5V to 6.0V Input Operation Voltage
- Up to 2A Programmable Charge Current for Battery with 2 Cells in Series
- Compatible with Host-Control and Standalone Mode
- NVDC Power Path Management
- Programmable Input Voltage Limit
- Programmable Charge Voltage with 0.5% Accuracy
- No External Sense Resistor Required
- Integrated Cell Balancing Circuit for Cell Mismatch
- Preconditioning for Fully Depleted Battery
- Flexible New Charging Cycle Initiation
- Charging Operation Indicator in Standalone Mode
- Missing Battery Detection in Host-Control Mode
- I²C Port for Flexible System Parameter Setting and Status Reporting in Host-Control Mode
- Negative Temperature Coefficient Pin for Temperature Monitoring Compliant with JEITA
- Built-in Charging Protection and Programmable Safety Timer
- MOSFET Cycle-by-Cycle Over-Current Protection
- Thermal Regulation and Thermal Shutdown

⚠ *All changes made in I²C mode will NOT be retained once the EVB is powered down.*
⚠ *Information written in OTP mode CANNOT be changed.*

Adjustable features:

I²C	OTP
• Battery Regulation Voltage • Battery Pre-Charge Voltage • Cell Balance Start Threshold • Cell Voltage Mismatch Threshold • Fast Charge Current • Switching Frequency • Charge Timer	• Battery Regulation Voltage • Battery Pre-Charge Voltage • Cell Balance Start Threshold • Cell Voltage Mismatch Threshold • Fast Charge Current • Switching Frequency • Auto-Recharge_EN • Balance_EOC_EN • Thermal Regulation Threshold

Kit Specifications

Feature	Specification
Supply for Board	4.5V to 6.0V
Operating Input Voltage	4.5V to 6.0V
Charge Capability	2A (max) / 8.4V (I²C)
System Load Capability	2.5A (max) / BATT + 300mV (I²C)
Operating Systems Supported	Windows XP, 7, and later
System Requirements	Minimum 22.2 MB free
GUI Software	MP2672 V1.0

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Section 1. Hardware Specifications

1.1 Personal Computer Requirements

The following minimal requirements must be met to use the EVKT-MP2672:

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

1.2 EV2672-D-01A Specifications

The EV2672-D-01A is an evaluation board for the MP2672. For more information, refer to the EV2672-D-01A datasheet.



Figure 2: EV2672-D-01A Evaluation Board

Feature	Specification
Supply for Evaluation Board	4.5V to 6.0V
Operating Input Voltage	4.5V to 6.0V
Charge Capability	2A (max) / 8.4V (I^2C)
System Load Capability	2.5A (max) / 6.7V (I^2C)
EVB Size (L X W)	6.35cmx6.35cm

1.3 EVKT-USBI2C-02 Specifications

EVKT-USBI2C-02 refers to the communication interface that connects the EVB, the PC, and its supporting accessories. It provides I^2C capabilities. Together with MPS Virtual Bench Pro and I^2C 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

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Section 2. Software Requirements

2.1 Software Installation Procedure

Programming occurs through the MPS I²C GUI. Follow the instructions below to install the software:

Note: This software can be downloaded from the MPS website. Search for the MP2672 to find the download link.

1. Download and extract the zip package titled “I2C evaluation kit software for MP2672”.
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).

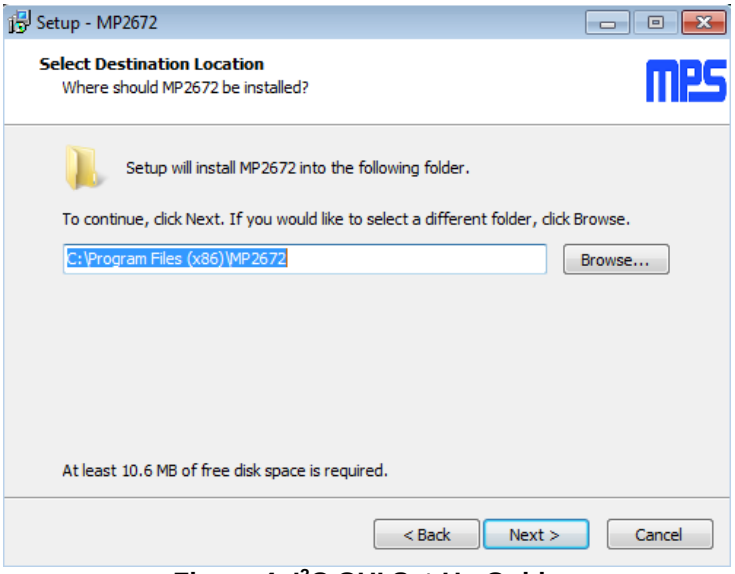


Figure 4: I²C GUI Set-Up Guide

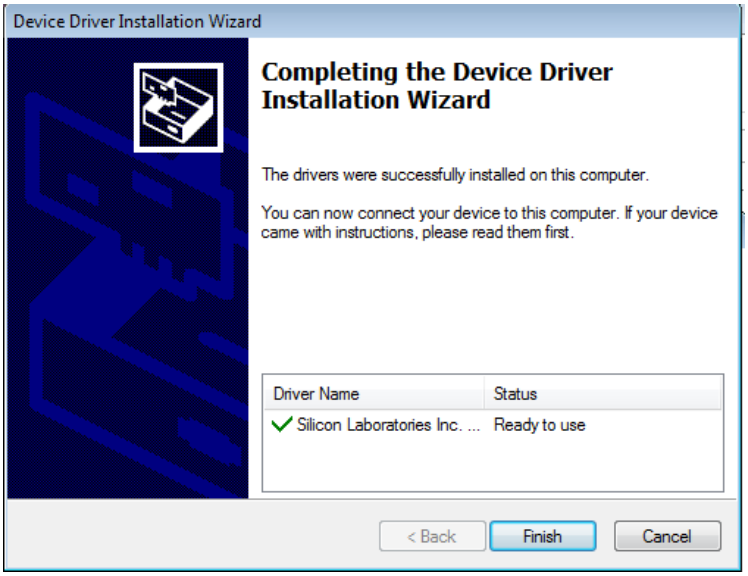


Figure 5: Driver Set-Up Success

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Section 3. Evaluation Kit Test Set-up

3.1 Hardware Setup

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 datasheet for further clarification.

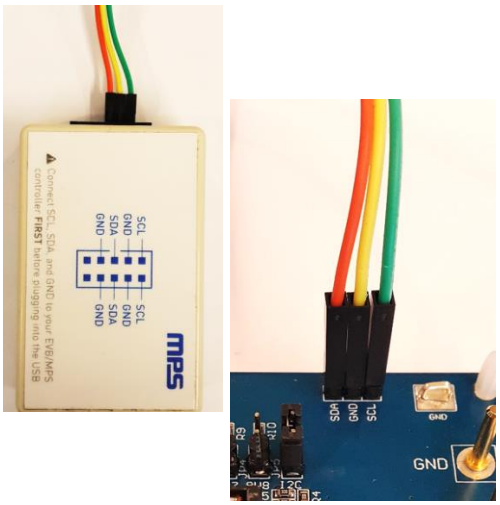


Figure 6: EVB to MPS I²C Communication Interface Wire Connection

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 BATT and GND pins, respectively. If it is a battery emulator, preset the battery voltage between 0V and 9.0V, then turn it off. Connect the battery emulator output to the BATT and GND pins, respectively.
3. Preset the power supply output between 4.5V and 6.0V, then turn off the power supply. Connect the positive and negative terminals of the power supply to the VIN and GND pins, respectively.
4. Make sure the battery voltage is present (if a battery emulator is used, turn on the battery emulator). Turn the power supply on. The IC automatically powers up.

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 EVKT-USBI2C-02 and MP2672 Demo Board statuses will show as "Connected" (see Figure 7).

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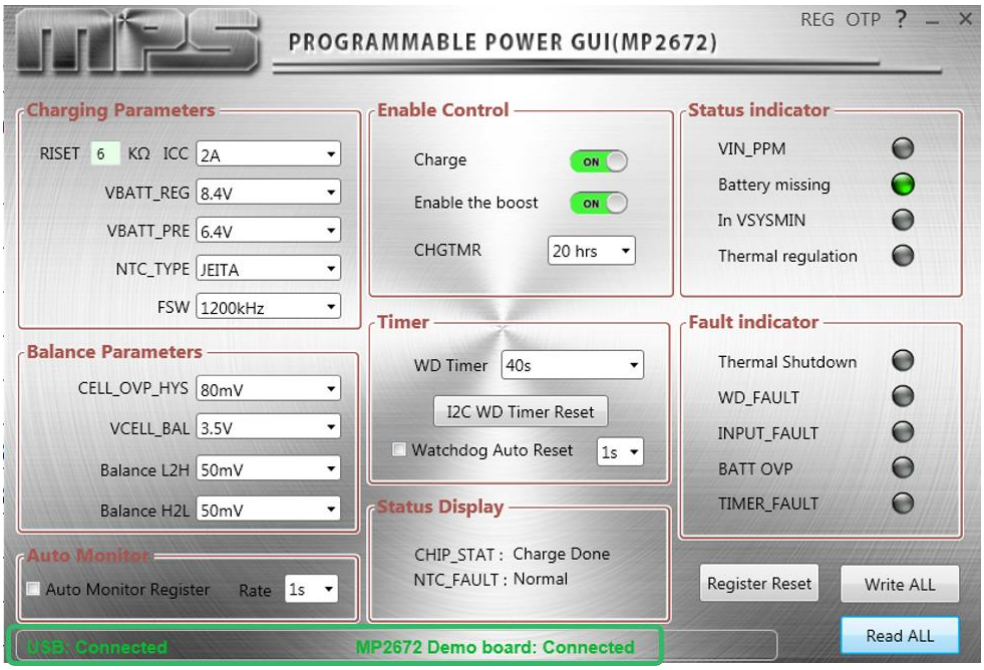


Figure 7: EVKT-USBI2C-02 and MP2672 Demo Board Show as Connected

- 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 the computer.
  - MP2672 Demo Board “Not Connected” means that the evaluation board is not connected correctly.
  - USB “Not Connected” means that the USB I^2C communication interface is not connected correctly.

2. Click the “Read All Registers” button to read the I^2C 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 the I^2C will be restored to default values once the EVB is powered down.*

3.4 Device Programming Instructions

The MP2672 is an OTP part. Follow the instructions outlined below to create and export customized configurations:

1. Use a computer to 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).

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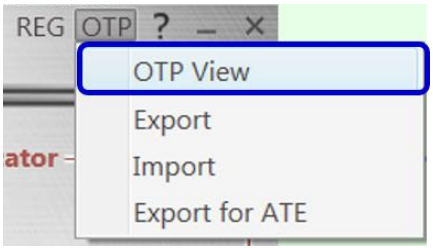


Figure 8: Select OTP

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

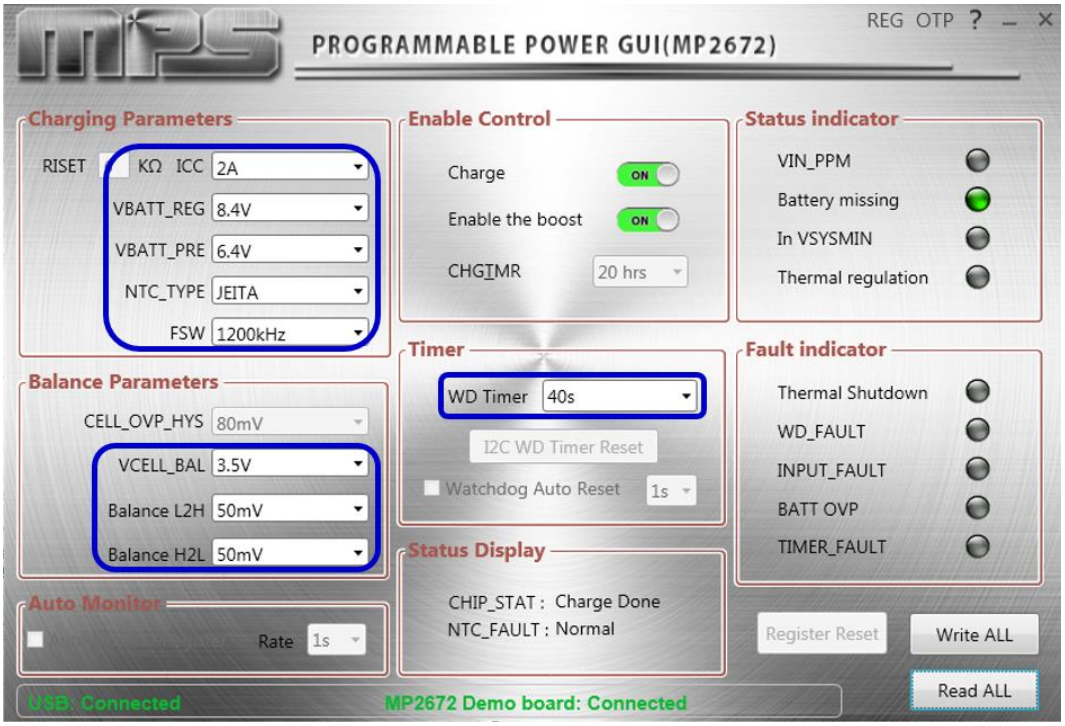


Figure 9: Adjustable Parameters in OTP Mode

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”

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

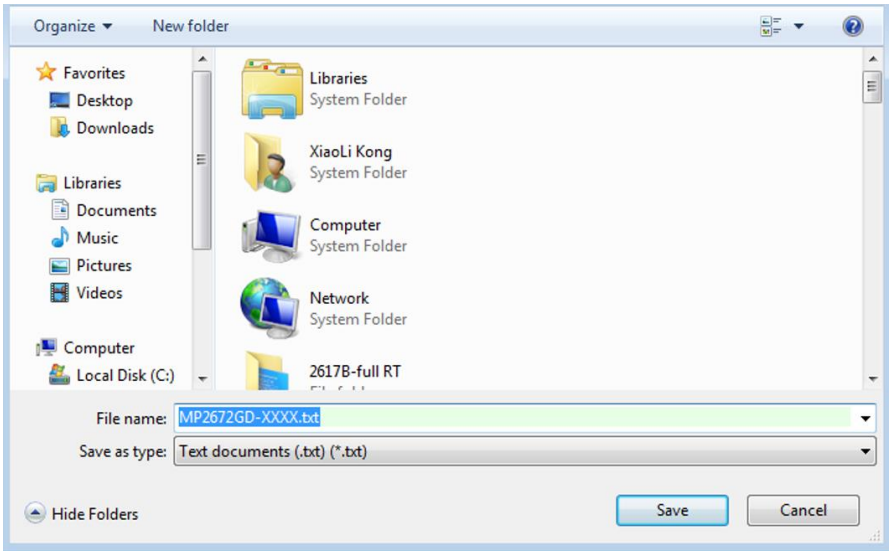


Figure 11: Exporting a File

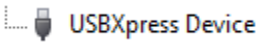
7. Send this file to an MPS FAE to apply for the customized “xxxx” code.

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. 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 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.

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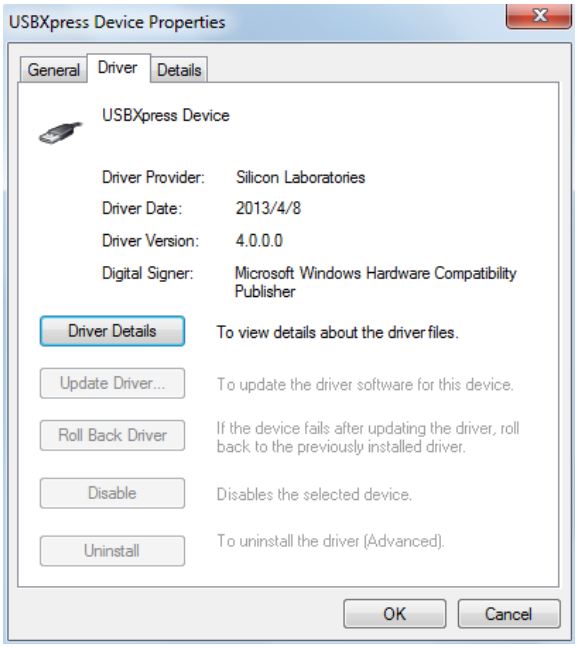


Figure 12: Correct Driver Version is 4.0.0.0

No Supply

The IC's input pin has an under-voltage lockout (UVLO) detection circuit. If the input voltage (V_{IN}) is lower than 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 (PWM converter enters shutdown state), the IC switches to charge-suspend mode, and the system is powered by the battery.

Thermal Recovery

If the MP2672 (PWM converter) 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.

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Section 4. Ordering Information

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

Part Number	Description
EVKT-MP2672	Complete evaluation kit
Contents of EVKT-MP2672	
EV2672-D-01A	MP2672-xxxx evaluation board allowing users to perform I^2C
EVKT-USBI2C-02-BAG	Includes one USB to I^2C 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.

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