

MP8869W Evaluation Kit (EVKT-8869W) NOT RECOMMENDED FOR NEW DESIGNS, REFER TO EVKT-8869S USER GUIDE



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Overview

Introduction

The EVKT-8869W is an evaluation kit for the MP8869W. The MP8869W is a highly integrated, highfrequency, synchronous, step-down switcher with an I²C control interface. The MP8869W is optimized to support up to 12A continuous/15A peak output current over an input supply range from 3V to 18V with excellent load and line regulation. By using the I²C, users can set the current limit, slew rate, enable, power-saving mode, and output voltage. This device also features telemetry, which provides output voltage and output current monitoring via the I²C.

Kit Contents

EVKT-8869W kit contents: (items below can be ordered separately).

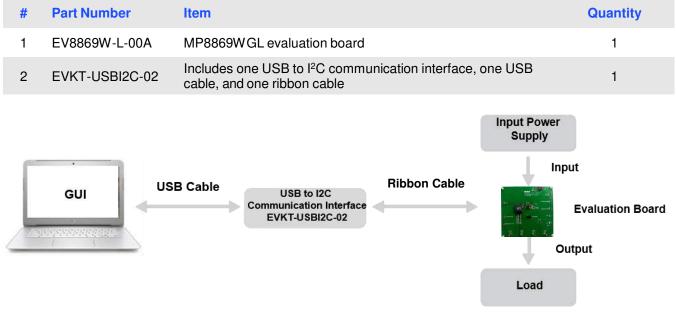


Figure 1: EVKT-8869W Evaluation Kit Set-Up



Features and Benefits

The MP8869W is highly customizable. Users can program the MP8869W via the MPS I²C GUI.

 $\underline{\wedge}$ All changes made in ${}^{\beta}C$ mode will NOT be retained once the EVB is powered down.

Adjustable features:

I²C

- Adjustable output
- Adjustable slew rate
- Selectable OVP, OCP mode
- Selectable PFM mode
- PG deglitch time
- Selectable frequency
- Soft stop
- Adjustable current limit
- Output current monitor
- System enable (EN bit)
- Status indication: OC, OTEW, OT, PG

Kit Specifications

Features	Specification
Supply for Board	3V to 18V
Operating Input Voltage	3V to 18V
Output Voltage (Vout)	1V
Continuous Output Current (Iout)	12A
Peak Output Current (Iout)	15A
Operating Systems Supported	Windows XP, 7, or later
System Requirements	Minimum 22.2MB free
GUI Software	3 register controls: VSEL, System1, System2
EVB Size (LxW)	8.5cmx8.5cm

NOT RECOMMENDED FOR NEW DESIGNS, REFER TO EVKT-8869S USER GUIDE Section 1. Hardware Specifications

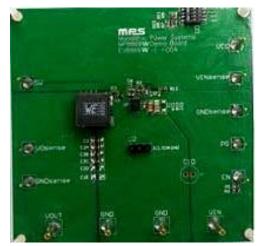
1.1 Personal Computer Requirements

The following must be met to use the EVKT-8869W:

- 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 EV8869W-L-00A Specifications

The EV8869W-L-00A is an evaluation board for the MP8869WGL. For more information, refer to the EV8869W-L-00A datasheet.



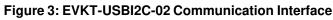
Feature	Specification
Supply for Evaluation Board	3V to 18V
Operating Input Voltage	3V to 18V
Output Voltage (Vour)	1V
Continuous Output Current (IOUT)	12A
Peak Output Current (IOUT)	15A
EVB Size (LxW)	8.5cmx8.5cm

Figure 2: EV8869W -L-00A Evaluation Board

1.3 EVKT-USBI2C-02 Specifications

The EVKT-USBI2C-02 communication interface connects the EVB, the PC, and its supporting accessories. It provides I²C and PMBus capabilities. Together with the MPS 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.







Section 2. Software Requirements

2.1 Software Installation Procedure

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

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

- 1. Visit the MP88xx I²C GUI page at https://www.monolithicpower.com/en/i2c-tool.html.
- 2. Click the "Download" button in the upper right-hand corner.
- 3. Once the download has completed, 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."
- 4. Follow the prompts in the set-up guide.
- 5. Wait for the status screen to verify that installation is complete (see Figure 5).

3 Setup - MPS IIC Interface	- • •
Select Destination Location Where should MPS IIC Interface be installed?	
Setup will install MPS IIC Interface into the following folder.	
To continue, dick Next. If you would like to select a different folder, dick	Browse.
C:\Program Files (x86)\MPS IIC Interface	Browse
At least 13.1 MB of free disk space is required.	
Next >	Cancel

Figure 4: MPS I²C GUI Set-Up Guide





Figure 5: MPS I²C GUI Set-Up Success

Section 3. Evaluation Kit Test Set-Up

3.1 Hardware Set-Up

The hardware must be configured properly prior to use. Use the USB cable to connect the EVKT-USBI2C-02 communication interface to the PC, and 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 needed, refer to the datasheet for further clarification.

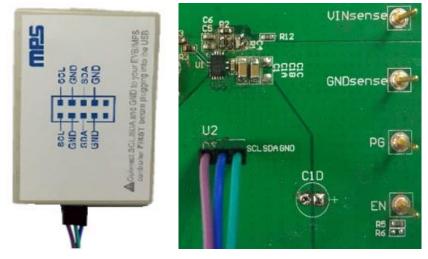


Figure 6: EVB to MPS I²C Communication Interface Wire Connection

3.2 Powering Up the EVB

- 1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
- 2. Preset the power supply output between 3V to 18V, then turn off the power supply.
- 3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
- 4. Turn the power supply on. The MP8869W will enter the power-on sequence automatically.

3.3 Software Set-Up

After connecting the hardware according to the above steps, 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, the address will be listed in the "Slave Address" (see Figure 7).



🜃 MPS IIC GUI-MP8861 2.85V - 18V, 6A, High-Efficiency, Wide-Input, Synchronous Step-Down Converter with Integrate... 👝 😐 🔜

•	MP8843 MP8845 MP8869 MP8861 MP8869	1) N 2 (00)	•	Monolithic	Powe	r Sys	D tems	M	P88	6 <mark>1 </mark>	c G	UI
	MP8869 MP8868	d Soft Stop	•	SlaveAddr	64				Scan		VAL	D
	MP8867	Irite		ReadBox								
-	MP8865 MP8864			System Control								
-	MP8864 MP8846			regName	D7	D6	D5	D4	D3	D2	D1	D
	MP8847		27	VSEL	NA	NA	NA	NA	NA	NA	NA	NA
	WIF 0047	Write		SysCntlreg1	NA	NA	NA	NA	NA	NA	NA	NA
		LJ		SysCntlreg2	NA	NA	NA	NA	NA	NA	NA	NA
SysC	Contireg1			Output Current	NA	NA	NA	NA	NA	NA	NA	NA
Enal	ble	Enabled	8 .	Output Voltage	NA	NA	NA	NA	NA	NA	NA	NA
Go_	Bit	Go_Bit = 0	-	ID1	NA	NA	NA	NA	NA	NA	NA	NA
Slev	v Rate	5mV/us (100)		Status	NA	NA	NA	NA	NA	NA	NA	NA
100000	9 Mode 9 Mode le	Auto Recovery Mo Hiccup Mode (1) Auto PFM/PWM M Write	•					Rea	4	E	dit Re	gs

Figure 7: Appearance of Address Indicates Successful Connection

- If not, a warning will appear at the bottom. There are two warnings users can expect (see Figure 8). Each warning means there is an invalid connection.
 - 1) "EVB is disconnected" means that the evaluation board is not connected.
 - "Communication Board is disconnected" means that the USB I²C communication interface is not connected.

	SysCntlreg2 PG Deglitch Switch	24us (11) 500kHz (00)	-	Monolithic I	Powe	r Sys	D tems	M	2 <mark>886</mark>	59W	IIC	GL		
	Soft Stop Current Limit	Disabled Soft Stop	-	SlaveAddr	00		•		Scan		INVAL	D	Invalid Slav	e Addr
	Current Linit	Write		ReadBox System Control										
	VSEL			regName	D7	D6	D5	D4	D3	D2	D1	DC		
	V_BOOT	I2C Control Loop M	lode 👻	VSEL	NA	NA	NA	NA	NA	NA	NA	NA		
	Reference	0.825 V	4	SysCntlreg1	NA	NA	NA	NA	NA	NA	NA	NA		
		Write		SysCntlreg2	NA	NA	NA	NA	NA	NA	NA	NA		
		Wille		Output Current	NA	NA	NA	NA	NA	NA	NA	NA		
	SysCntireg1			Output Voltage	NA	NA	NA	NA	NA	NA	NA	NA		
	Enable	Enabled		ID1	NA	NA	NA	NA	NA	NA	NA	NA		
	Go_Bit	Go_Bit = 0	· •	Status	NA	NA	NA	NA	NA	NA	NA	NA		
	Slew Rate	5mV/us (100)						Read		E	dit Reg	15		
	OVP Mode	Auto Recovery Mod	de(1 👻											
	OCP Mode	Hiccup Mode (1)	-											
	Mode	Auto PFM/PWM Mo	ode (🔻											
munication		Write												

Figure 8: Warning Indicates Unsuccessful Connection



- 2. If the connection is successful, proceed to Step 3. Otherwise, check the connections between the EVB, communication interface, and PC. Re-plug the USB into the computer and restart the GUI.
- Click the "Part Select" button to select the MP8869W (see Figure 7). The default GUI window is for the MP8861. The Register Control menu will appear on the left side. I²C register values will be read and displayed on the right side after clicking the "Read" button (see Figure 9).

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Disabled Soft Stop 👻	SlaveAddr	64				Scan		VAH	5
LS Valley 14A 🗸	SlaveAudi.							1000	_
Write	ReadBox								
	System Control								
	regName	D7	D6	D5	D4	D3	D2	D1	D0
I2C Control Loop Mode 👻	VSEL	1	0	0	1	1	1	1	0
0.825 V 👻	SysCntlreg1	1	0	1	0	0	1	1	0
Write	SysCntlreg2	1	1	0	0	0	0	0	1
	Output Current	0	0	0	0	0	0	0	0
	Output Voltage	0	0	0	0	0	0	0	0
Enabled -	ID1	1	0	0	0	0	0	1	1
Go Bit = 0 👻	Status	0	0	0	0	0	0	0	1
5mV/us (100) -					Rea	H	E	dit Re	gs
Auto Recovery Mode(1 👻									~
Hiccup Mode (1) 🔹									
Auto PFM/PWM Mode (👻									
	30us (11) * 500kHz (00) * Disabled Soft Stop * LS Valley 14A * Write I2C Control Loop Mode * 0.825 V * Write Enabled * Go_Bit = 0 * 5mV/us (100) * Auto Recovery Mode(1 * Hiccup Mode (1) *	500kHz (00) • Disabled Soft Stop • Ls Valley 14A • Write SlaveAddr: 12C Control Loop Mode • 0.825 V • Write System Control regName VSEL 0.825 V • Write Output Current Output Voltage ID1 SmVlus (100) • Hiccup Mode (1) • Hurder FMIPFWM Mode (• •	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write SlaveAddr: 64 • 0.825 V • Write System Control Virite 1 SysChriteg1 1 SysChriteg2 1 Uppt Current 0 0 Output Voltage 0 1 SmV/us (100) • Auto Recovery Mode(1 + • Hiccup Mode (1) •	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write SlaveAddr: 64 • 825 V • Write System Control Virtie 0 System Control • 0.825 V • Write 0 System Control • System Control<	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write StaveAddr: 12C Control Loop Mode • • 0.825 V • Write System Control Enabled • Go, Bit = 0 • Sm/us (100) • Auto Recovery Mode(1) • Auto Recovery Mode(1) • Auto PHMPWVM Mode (• •	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write • I2C Control Loop Mode • • 0.825 V • Write • Enabled • Go, Bit = 0 • SmV/us (100) • Auto Recovery Mode(1) • Auto PEMMEVM Mode (1) •	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write SlaveAddr: 64 • can IZC Control Loop Mode • • ReadBox • Write D7 D6 D5 D4 D3 • • Can Write 0 0 1 1 0 0 0 0 0 Write 0 0 0 1 1 0 0 0 0 0 Write 0 0 0 0 0 0 0 0 0 Syschrifeg1 1 0 0 0 0 0 0 0 0 0 0 0 Syschrifeg2 1 1 0 0 0 0 0 0 0 0	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write Scan IZC Control Loop Mode • • 0.825 V • Write D7 D6 D5 D4 D3 D2 Write System Control Write D 0 0 1 1 1 1 SysChriteg1 1 0 1 0 0 1 SysChriteg2 1 1 0 0 0 0 0 Output Corrent 0 0 0 0 0 0 0 0 SmV/us (100) • Auto Recovery Mode(1 • • Hiccup Mode (1) •	30us (11) • 500kHz (00) • Disabled Soft Stop • LS Valley 14A • Write • VVrite • IZC Control Loop Mode • 0.825 V • Write • Write • VWrite • Vivite • Vivite • System Control • Vivite • Vivite • System Control • Vivite • System Control • System Control • Vivite • Vivite • System Control • System

Figure 9: Values from I²C Shown in Table

- 4. Find the item you want to change, and select the desired value from the drop-down menu.
- 5. Click the "Read All" button to update values. The changed information will appear on the right side (see Figure 10).

Help									
		-			9				
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30us (11) 👻				- /	841	000	2014		C 111
500kHz (00) 🗸	Monolithic P	owe	r Sys	tems	IVII	-00	9944		GUI
Disabled Soft Stop 👻	SlaveAddr:	64		•		Scan		VALI	
LS Valley 14A +									
Write	ReadBox								
	System Control								
	regName	D7	D6	D5	D4	D3	D2	D1	D0
I2C Control Loop Mode 👻	VSEL	1	0	0	1	1	1	1	0
0.825 V 👻	SysCntlreg1	0	0	1	0	0	1	1	0
Write	SysCntlreg2	1	1	0	0	0	0	0	1
	Output Current	0	0	0	0	0	0	0	0
	Output Voltage	0	0	0	0	0	0	0	0
Disabled 👻	ID1	1	0	0	0	0	0	1	1
Go Bit = 0 -	Status	0	0	0	0	0	0	0	0
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Figure 10: Refer to Datasheet to Translate 0s and 1s



 \triangle All changes made via the l²C will be restored to default values once the EVB is powered down.

3.4 Troubleshooting Tips

Note: USBI2C-02 and USBI2C-01 drivers are not compatible. USBI2C-02 uses USBXpress and USBI2C-01 uses Cyusb3. USBI2C-02 is the recommended device for MPS PMBus and I²C.

EVKT-USBI2C-01

If the USBI2C-01 driver is not properly installed, manual installation is required. Follow the steps below:

- 1. Open the Device Manager and select "Update Driver Software" (see Figure 11).
- 2. Click "Browse My Computer for Driver Software," find the downloaded driver, and install.

EVKT-USBI2C-02

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

Note: Check driver version. Find "USBXpress Device" in the Device Manager under USB controllers.

🔲 🏺 USBXpress Device

Right-click and view properties. Check to make sure the driver version matches the newest version (see Figure 12).

1. Install the correct USBXpress ".exe" file.

Choose either 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.

No Supply

The MP8869W's input pin has an under-voltage lockout (UVLO) detection circuit. If the input voltage (AVIN) is lower than the UVLO rising threshold, the MP8869W's functions are disabled.

Shutdown Event

If the MP8869W detects that the input voltage is lower than the UVLO falling threshold (enter no supply state) or over-temperature protection is triggered (enter power-off state), the MP8869W switches to no supply state or power-off state, regardless of the current state.

Thermal Recovery

If the MP8869W is in a power-off state due to the die temperature exceeding the thermal protection threshold, the MP8869W enters a power-on sequence once the die's temperature decreases.

Shutdown Sequence

When the input voltage is lower than the UVLO falling threshold or the IC is over-temperature, the MP8869W immediately begins the shutdown sequence.



ces
abService
Update Driver Software
Disable
Uninstall
Scan for hardware changes
Properties

Figure 11: Updating the Driver Software

USBXpress Device Propert	ies	×
General Driver Details	Events	
USBXpress Devi	ice	
Driver Provider:	Silicon Laboratories Inc.	
Driver Date:	11/6/2015	
Driver Version:	6.7.2.0	
Digital Signer:	Microsoft Windows Hardware Compatibility Publisher	
Driver Details	View details about the installed driver files.	
Update Driver	Update the driver for this device.	
Roll Back Driver	If the device fails after updating the driver, roll back to the previously installed driver.	
Disable Device	Disable the device.	
Uninstall Device	Uninstall the device from the system (Advanced)	
	OK Cancel	

Figure 12: Correct Driver Version



Section 4. Ordering Information

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

EVKT-8869W Complete evaluation kit Contents of EVKT-8869W MP8869WGL evaluation board
EV8869W-L-00A MP8869WGL evaluation board
EVKT-USBI2C-02 Includes one USB to I ² C communication interface, one USB cable, and one ribbon cable

Order directly from MonolithicPower.com.