

User Guide

MP5416 Evaluation Kit (EVKT-5416)



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Overview

Introduction

The EVKT-5416 is an evaluation kit for the MP5416, a complete power management IC, which integrates four high-efficiency, step-down, DC/DC converters, five low dropout regulators, and flexible system configurations via I2C. The kit allows for quick evaluation of the PMIC and offers One-Time Programming (OTP) capabilities, which allows users to program custom configurations, supporting a wide range of designs.

Kit Contents

EVKT-5416 Kit contents: (Items below can be ordered separately)

#	Part Number	Item	Quantity
1	EV5416-R-00D	MP5416GR-CCCC Evaluation Board	1
2	EVKT-USBI2C-02	Includes one USB to I2C Dongle, one USB Cable, one ribbon cable	1
3	MP5416GR-CCCC	MP5416 IC which can be used for OTP programming	2
4	Tdrive-5416	USB Flash drive that stores the GUI installation file and supplemental documents	1
	GUI	USB Cable USB to I2C Dongle Ribbon Cable	ut Evaluation Board
		Load	put

Figure 1: EVKT-5416 Evaluation Kit Set-Up





Features and Benefits

The MP5416 is highly customizable. Users can program the PMIC via the MPS I2C GUI and One-Time Programming (OTP).

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

Features adjustable under each method are outlined below.

12C	ОТР					
 Current limit of buck 2 and 4 Slew rate (DVS Slew rate) Discharge (DISCHG) System enable (SYSEN) Software reset (SFRST) Read status and ID2 registers 	 Current limit of buck 1 and 3 Switching frequency LDORTC Output voltage Initial on/off Push-button timer Mode Power-on delay (RSTO delay) Automatic turn-on I2C slave address Soft start time Manual reset timer Phase shift delay Shorter key on/off Ramp cap Suffix number OTP version 					
Kit Specifications						
Features	Specification					
Supply for Board	3.5V - 5V					
Operating Input Voltage	2.8V - 5.5V					
Operating Systems Supported	Windows XP, 7 or later					
System Requirements	Minimum 22.2 MB free					
GUI Software	3 Register Controls: Buck, LDO, System					
EVB Size (L x W)	9.4 cm x 8.6 cm					



Section 1. Hardware Specifications

1.1 Personal Computer Requirements

The following must be minimally met to use the EVKT-5416.

- 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 EV5416-R-00D Specifications

The EV5416-R-00D is an evaluation board for the MP5416GR-CCCC. For more information, please refer to the EV5416-R-00D datasheet.



Feature	Specification
Supply for Evaluation Board	3.5V - 5V
Operating Input Voltage	2.8V - 5.5V
EVB Size (L x W)	9.4cm x 8.6cm

Figure 2: EV5416-R-00D Evaluation Board

1.3 EVKT-USBI2C-02 Specifications

The EVKT-USBI2C-02 refers to the dongle, which connects the EVB and the PC, and its supporting accessories. It provides I2C and PMBus capabilities. Together with 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 install the software.

Note: In the near future, this software can be downloaded from the MPS website. For now, it is provided on a USB flash drive.

- 1. Plug the USB flash drive into the computer using any available USB port.
- 2. Browse to the folder containing the thumb drive contents.
- 3. Double click the .exe file to open the set-up guide (see Figure 4).
- 4. Follow the prompts in the set-up guide.
- 5. Wait for status screen to verify that installation is complete (see Figure 5).

j号 Setup - MP5416 With OTP	
Select Destination Location Where should MP5416 With OTP be installed?	
Setup will install MP5416 With OTP into the following folder.	
To continue, click Next. If you would like to select a different folder, click	Browse.
C:\Program Files\MP5416 With OTP	Browse
At least 22.2 MB of free disk space is required.	
Next >	Cancel

Figure 4: MPS I²C GUI Set-Up Guide

Device Driver Installation Wiza	rd									
	Completing the Device Driver Installation Wizard									
	The drivers were successfully in	nstalled on this computer.								
	You can now connect your dev came with instructions, please r	rice to this computer. If your device ead them first.								
	Driver Name	Status								
	V Silicon Laboratories Inc	. Ready to use								
	< Back	Finish Cancel								

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 dongle.
- 2. Connect SCL, SDA, and GND (see Figure 6). If needed, refer to the datasheet for further clarification.
- Use the USB cable to connect the EVKT-USBI2C-02 dongle to the PC and follow the instructions below to set up the EVB.



Figure 6: EVB to MPS I²C Dongle 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 3.5V and 5V, 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.
- 5. Press the P1 button on the EVB. The PMIC will enter the power on sequence automatically.

3.3 Software Set-Up

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

- 1. Start the software. It will automatically check the EVB connection.
 - If connection is successful, the address will be listed in the "Slave Address" (see Figure 7).



									De	tect 📔 🕳		×
Part Numbers Debug Tool	Help											
ADDRESS:		REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO	
69												
REGISTER CONTROL:												

Figure 7: Appearance of Address Shows Successful Connection

- If not, one of two warnings will appear at the bottom:
 - 1) "No Slave Found. Please Check the Connection!" This means that the evaluation board is not connected (see Figure 8).
 - 2) "Device is not available. Please check the Connection!" This means that the USB I2C dongle is not connected (see Figure 9).

										• ×
Part Numbers Debug Tool Help										
ADDRESS:	REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO
REGISTER CONTROL:										
	No S	lave Fo	und, Ple	ease che	eck the	connec	tion!			
No Slave Found, Please check the connection!	1									

Figure 8: Warning Indicates Unsuccessful Connection – Evaluation Board Not Connected



Part Numbers Debug Tool Help											
ADDRESS:	REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO	
REGISTER CONTROL:											
		Device	e is not a	vailable.	. Please	check the	connec	tion!			
Device is not available, Please check the connection!											

Figure 9: Warning Indicates Unsuccessful Connection – USBI2C Dongle is Not Connected

- 2. If connection is successful, proceed to Step 3. Otherwise, check connections between the EVB, dongle, and PC. Re-plug the USB into the computer and restart the GUI.
- 3. Select MP5416 UNLOCK from under Part Numbers. The Register Control menu will appear on the left side. I2C register values will be read automatically and displayed on the right (see Figure 10).

MP5416–5V POWER MANAGEMENT IC WI	TH I2C NO LOCK	ED V1.2							ect 🗕	□ ×
Part Numbers Debug Tool Help OTP										
ADDRESS:	REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO
69	CTL0(0x0)	8F	1	0	0	0	1	1	1	1
	CTL1(0x1)	87	1	0	0	0	0	1	1	1
	CTL2(0x2)	7F	0	1	1	1	1	1	1	1
	ILIMIT(0x3)	AA	1	0	1	0	1	0	1	0
	VSET1(0x4)	C0	1	1	0	0	0	0	0	0
	VSET2(0x5)	9C	1	0	0	1	1	1	0	0
SYSCTRL	VSET3(0x6)	C0	1	1	0	0	0	0	0	0
	VSET4(0x7)	E4	1	1	1	0	0	1	0	0
	VSET5(0x8)	DC	1	1	0	1	1	1	0	0
	VSET6(0x9)	28	0	0	1	0	1	0	0	0
	VSET7(0xa)	A8	1	0	1	0	1	0	0	0
	VSET8(0xb)	54	0	1	0	1	0	1	0	0
	Status1(0xd)	BF	1	0	1	1	1	1	1	1
	Status2(0xe)	0	0	0	0	0	0	0	0	0
	Status3(0xf)	0	0	0	0	0	0	0	0	0
	ID2(0x11)	80	1	0	0	0	0	0	0	0
									read a	.11
	•									

Figure 10: 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 of the item will appear on the right side (see Figure 11).



MP5416-5V POWER MANAGEMENT IC W	ITH I2C NO LOC	KED V1.2								
Part Numbers Debug Tool Help OTP										
ADDRESS:	REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO
69	CTL0(0x0)	8F	1	0	0	0	1	1	1	1
	CTL1(0x1)	87	1	0	0	0	0	1	1	1
	CTL2(0x2)	7F	0	1	1	1	1	1	1	1
REGISTER CONTROL:	ILIMIT(0x3)	AA	1	0	1	0	1	0	1	0
BUCKCONTROL	VSET1(0x4)	40	0	1	0	0	0	0	0	0
VSET1(0x4)	VSET2(0x5)	9C	1	0	0	1	1	1	0	0
ENBUCK1(D7)	VSET3(0x6)	C0	1	1	0	0	0	0	0	0
Disable Buck1(0) 🔹	VCET4(0x7)	E4	1	-		0	0	1	0	0
Buck1OutPutV(D0)	V3E14(0X7)	C4	1	1	1	0	0	1	0	
1.4V(1000000) ·	VSET5(0x8)	DC	1	1	0	1	1	1	0	0
VSET2(0x5)	VSET6(0x9)	28	0	0	1	0	1	0	0	0
ENBUCK2(D7)	VSET7(0xa)	A8	1	0	1	0	1	0	0	0
Enable Buck2(1) -	VSET8(0xb)	54	0	1	0	1	0	1	0	0
Buck2OutPutV(D0)	Status1(0vd)	RE	1	0	1	1	1	1	1	1
1.5V(0011100) *	Chatus2(Ove)	0	-		-	-	-	-	-	-
VSET3(0x6)	Status2(0xe)	0	0	0	0	0	0	0	0	0
ENBUCK3(D7)	Status3(0xf)	0	0	0	0	0	0	0	0	0
Enable Buck3(1) 🔹	ID2(0x11)	80	1	0	0	0	0	0	0	0
Buck3OutPutV(D0)										
1.4V(1000000) ·										
VSET4(0x7)								_		
ENBUCK4(D7)									rea	d all

Figure 11: Refer to Datasheet to Translate 0's and 1's

▲ All changes made via I2C will be restored to default values once the EVB is powered down. **3.4 Device Programming Instructions**

The MP5416-CCCC can be custom programmed. Follow the instructions outlined below to create and export customized configurations.

- 1. Using a computer, open the MPS GUI software. Make sure you have powered on the EVB.
- 2. Ensure connection between the EVB and computer (see Figure 6).
- 3. Select the "MP5416Unlocked" from under Part Numbers.
- 4. Disable buck1/buck2/buck3/buck4 and LDO2-LDO5.
- 5. Select the OTP option from under GUI (see Figure 12).

MP5416-5V POWER MANA	GEMENT IC	: W	ITH I2C NO LOO	CKED V1.2						D	etect 🗕	. 🗆 X
Part Numbers Debug Tool He	Ip OTP											
ADDRESS:	OTP		REGISTER	HEX	D7	D6	D5	D4	D3	D2	D1	DO
69			CTL0(0x0)	8F	1	0	0	0	1	1	1	1
			CTL1(0x1)	87	1	0	0	0	0	1	1	1
			CTL2(0x2)	7F	0	1	1	1	1	1	1	1
REGISTER CONTROL:			ILIMIT(0x3)	AA	1	0	1	0	1	0	1	0
			VSET1(0x4)	40	0	1	0	0	0	0	0	0
VSET1(0x4)			VSET2(0x5)	1C	0	0	0	1	1	1	0	0
ENBUCK1(D7)			VSET3(0x6)	40	0	1	0	0	0	0	0	0
Disable Buck1(0)	•		VSET4(0x7)	64	0	1	1	0	0	1	0	0
Buck1OutPutV(D0)			VSET5(0v8)	DC	1	1	-	1	1	1	0	0
1.4V(100000)	•		V3ET5(0x0)	20	-	-		-		-		
VSET2(0x5)			VSEI6(0X9)	28	0	0	1	U	1	0	0	0
Disable Rusk2(0)			VSET7(0xa)	A8	1	0	1	0	1	0	0	0
Disable buck2(0)			VSET8(0xb)	54	0	1	0	1	0	1	0	0
BUCK2OUTPUTV(DU)			Status1(0xd)	B0	1	0	1	1	0	0	0	0
VSET3(0x6)			Status2(0xe)	0	0	0	0	0	0	0	0	0
ENBUCK3(D7)			Status3(0xf)	0	0	0	0	0	0	0	0	0
Disable Buck3(0)	•		ID2(0x11)	80	1	0	0	0	0	0	0	0
Buck3OutPutV(D0)												
1.4V(1000000)	•											
VSET4(0x7)										_		
ENBUCK4(D7)		-									read	i all



Figure 12: Select OTP, Located in Task Bar

6. Wait for a table to load (see Figure 13). You can change any parameters listed.

	MP5416																	
OTP Items	Description	Buck	1	Buck	2	Buck	3	Buck	4	LDORT	С	LDO2		LDO3		LDO4	LDC	05
Switching Frequency	MHz	1.5																•
Output Voltage	V		•		•		•		•		•		•		•	•		•
Initial On/Off	ON/OFF	ON	•	ON	•	ON	•	ON	•	Always On	Ŧ	ON	•	ON .	•	ON 🔻	ON	•
MODE	Auto PFM/PWM	AutoPF	•	AutoPF	•	AutoPF	•	AutoPF	•	N/A								Ŧ
Power On Delay/Time Slot	ms		•		•		•		•	Always On	Ŧ		•		•	•		•
Automatic Turn-On	YES/NO	NO																•
PushButton Timer	Second																	•
RSTODELAY	ms																	•
Buck1 PEAK Current Limit	A																	•
Buck3 PEAK Current Limit	А																	•
IIC Slave Address	Address																	•
Soft start time	1/0	N/A	Ŧ	Default	•	N/A												*
Manual reset timer	1/0	N/A			Ŧ	Default	•	N/A										Ŧ
phase shift delay	1/0	Default	•	Default	•	Default	•	Default	•	N/A								Ŧ
Shorter Key On/Off	1/100 scale	0																•
Ramp Cap	pF	Default																•
Suffix number																		
OTP Version		0000																•
												WRITE				EXPORT		

Figure 13: Parameters that can be Adjusted in OTP Mode

7. Select values from the drop-down menus. Note that the WRITE and EXPORT buttons are active only when all the parameters are populated (see Figure 14).

						MP54	16)										
OTP Items	Description	Buck	1	Buck	2	Buck	3	Buck	4	LDORT	С	LDO	2	LDO	3	LDO4	LC	20
Switching Frequency	MHz	1.5																
Output Voltage	v	1.2	•	1.5	•	1.8	•	3.3	•	1.1	•	1.1	•	2.9	*	1.8 .	2.9	
Initial On/Off	ON/OFF	ON	•	ON	•	ON	•	ON	•	Always On	Ŧ	ON	•	ON	*	ON .	• ON	
MODE	Auto PFM/PWM	FPWM	•	FPWM	•	FPWM	•	FPWM	•	N/A								
ower On Delay/Time Slot	ms	0ms/0	•	2ms/1	•	4ms/2	•	6ms/3	•	Always On	Ŧ	2ms/1	•	4ms/2	•	6ms/3	8ms/	4
Automatic Turn-On	YES/NO	YES																
PushButton Timer	Second	2																
RSTODELAY	ms	10																
Buck1 PEAK Current Limit	А	6.8A																
Buck3 PEAK Current Limit	А	5.6A																
IIC Slave Address	Address	69																
Soft start time	1/0	N/A	~	Default	•	N/A												
Manual reset timer	1/0	N/A			*	Default	•	N/A										
phase shift delay	1/0	Default	•	Default	•	Default	•	Default	•	N/A								
Shorter Key On/Off	1/100 scale	0																
Ramp Cap	pF	21pF																
Suffix number		0055																
OTP Version		0000																

Figure 14: Fully Populated Table and Active "Write" and "Export" Buttons

8. Export the configuration by clicking EXPORT. Find a location for the exported file and click "OK". Your configurations will be saved in a text file (see Figure 15).



					MP54	16	5											
OTP Items	Description	Buck	1	Buck2	Buck	3	Bue	:k4	LDOR	тс	LDO	2	LDO	3	LDO	4	LDO	5
Switching Frequency	MHz	1.5																•
Output Voltage	V	1.2	•	1.5 •	1.8	•	3.3	•	1.1	•	1.1	•	2.9	•	1.8	-	2.9	•
Initial On/Off	ON/OFF	ON	•	ON 🔻	ON	•	ON	•	Always On	Ŧ	ON	•	ON	•	ON	•	ON	•
MODE	Auto PFM/PWM	FPWM	-	Browse Fo	r Folder					?								Ŧ
Power On Delay/Time Slot	ms	0ms/0	▼ Please choose the folder /1 ▼ 4ms/2 ▼ 6ms/3														8ms/4	*
Automatic Turn-On	YES/NO	YES		Please cho	ose the rolde	er											,	•
PushButton Timer	Second	2			_													•
RSTODELAY	ms	10		My Documents														•
Buck1 PEAK Current Limit	А	6.8A		🖃 😼 My Computer														•
Buck3 PEAK Current Limit	А	5.6A		± 4	Winxp (C: Local Disk	:) c (D:)												•
IIC Slave Address	Address	69			Local Disk	(E:)	- /5->											•
Soft start time	1/0	N/A	Ŧ		DVD-RAM	e (G:)	e(r:))											Ŧ
Manual reset timer	1/0	N/A		± [Control P	anel				~								Ŧ
phase shift delay	1/0	Default	÷	<						>								Ŧ
Shorter Key On/Off	1/100 scale	0		Make Ne	w Folder		Ok	:	Cano	el:								•
Ramp Cap	pF	21pF																•
Suffix number		0055																_
OTP Version		0000																*
											WRIT	E			EXPO	RT		

Figure 15: Various Locations Available to Export To

9. Wait for a status screen (see Figure 16).

						MP54	116	6											
OTP Items	Description	Buck	1	Buck	2	Buck	3	Buck	4	LDORT	C	LDO	2	LDO	3	LDO4	ŀ	LDO	5
Switching Frequency	MHz	1.5																	
Output Voltage	V	1.2	•	1.5	•	1.8	•	3.3	•	1.1	•	1.1	•	2.9	*	1.8	•	2.9	•
Initial On/Off	ON/OFF	ON	•	ON	•	ON	•	ON	•	Always On	-	ON	•	ON	•	ON	•	ON	•
MODE	Auto PFM/PWM	FPWM	•	FPWM	•	FPWM	*	FPWM	•	N/A									Ŧ
Power On Delay/Time Slot	ms	0ms/0	•	2ms/1	•	4ms/2	•	6ms/3	•	Always On	Ŧ	2ms/1	•	4ms/2	*	6ms/3	•	8ms/4	*
Automatic Turn-On	YES/NO	YES																	•
PushButton Timer	Second	2																	*
RSTODELAY	ms	10																	*
Buck1 PEAK Current Limit	А	6.8A						R											*
Buck3 PEAK Current Limit	А	5.6A				_		Ľ	9										*
IIC Slave Address	Address	69					Ехр	ort Succes:	,										*
Soft start time	1/0	N/A	Ŧ	Default	•	N/A		ОК											Ŧ
Manual reset timer	1/0	N/A			Ŧ	Default	Ţ	IV/A											Ŧ
phase shift delay	1/0	Default	•	Default	•	Default	•	Default	•	N/A									Ŧ
Shorter Key On/Off	1/100 scale	0																	
Ramp Cap	pF	21pF																	*
Suffix number		0055																	
OTP Version		0000																	*
												WRIT	re			EXPOR	т		

Figure 16: Status Screen Indicates Success

- 10. Rename the file if you would like to refer to it at a later time. Otherwise, this file will be overwritten the next time you perform OTP and export to the same location.
- 11. Check parameters carefully.



 \triangle Once the information is written to the MP5416-CCCC, it cannot be changed.

12. Click the WRITE button. A window should pop up (see Figure 17).

	MP5416																	
OTP Items	Description	Buck	1	Buck	2	Buck	3	Buck	4	LDORT	c	LDO2	LDO	D 3	LDO	4	LDO	5
Switching Frequency	MHz	1.5																•
Output Voltage	v	1.2	•	1.5	•	1.8	•	3.3	•	1.1	•	1.1 •	2.9	*	1.8	•	2.9	•
Initial On/Off	ON/OFF	ON	•	ON	•	ON	•	ON	*	Always On	Ŧ	ON 🔻	ON	*	ON	*	ON	•
MODE	Auto PFM/PWM	FPWM	•	FPWM	•	FPWM	•	FPWM	•	N/A								-
Power On Delay/Time Slot	ms	0ms/0	•	2ms/1	•	4ms/2	•	6ms/3	•	Always On	Ŧ	2ms/1 •	4ms/2	•	6ms/3	•	8ms/4	•
Automatic Turn-On	YES/NO	YES																•
PushButton Timer	Second	2																•
RSTODELAY	ms	10																•
Buck1 PEAK Current Limit	А	6.8A	V	Varnine														•
Buck3 PEAK Current Limit	А	5.6A		The input	uolt	age muct b	6	24 (26 EV	n to r		cuc	read						•
IIC Slave Address	Address	69		And the	OTP	program is	NOT	reversible.	Are	you sure to	pro	gram?						•
Soft start time	1/0	N/A				Ye	5	، ۲	٧o	1								
Manual reset timer	1/0	N/A																Ŧ
phase shift delay	1/0	Default	•	Default	•	Default	•	Default	•	N/A								Ŧ
Shorter Key On/Off	1/100 scale	0																•
Ramp Cap	pF	21pF																•
Suffix number		0055																
OTP Version		0000																•
												WRITE			EXPOR	т		

Figure 17: Important Warning – User Must Increase Voltage

- 13. Increase the input voltage to a value between 6.2V and 6.5V.
- 14. Click "Yes" to write. Alternatively, click "No" if adjustments are needed.
- 15. Wait for a status screen (see Figure 18).

						MP54	116)										
OTP Items	Description	Buck	1	Buck	2	Buck	3	Buck	4	LDOR	тс	LDO2	2	LDO	3	LDO	4	LDO
Switching Frequency	MHz	1.5																
Output Voltage	V	1.2	•	1.5	•	1.8	•	3.3	•	1.1	•	1.1	•	2.9	•	1.8	•	2.9
Initial On/Off	ON/OFF	ON	•	ON	•	ON	•	ON	•	Always On	Ŧ	ON	•	ON	•	ON	•	ON
MODE	Auto PFM/PWM	FPWM	•	FPWM	•	FPWM	•	FPWM	•	N/A								
ower On Delay/Time Slot	ms	0ms/0	•	2ms/1	•	4ms/2	•	6ms/3	•	Always On	Ŧ	2ms/1	•	4ms/2	•	6ms/3	•	8ms/4
Automatic Turn-On	YES/NO	YES																
PushButton Timer	Second	2																
RSTODELAY	ms	10																
uck1 PEAK Current Limit	А	6.8A				_												
uck3 PEAK Current Limit	A	5.6A						2	9									
IIC Slave Address	Address	69					Flus	h success!										
Soft start time	1/0	N/A	Ŧ	Default	•	N/A		ОК										
Manual reset timer	1/0	N/A			Ŧ	Default		N/A										
phase shift delay	1/0	Default	•	Default	•	Default	•	Default	•	N/A								
Shorter Key On/Off	1/100 scale	0																
Ramp Cap	pF	21pF																
Suffix number		0055																
OTP Version		0000																



Figure 18: Screen Indicates that Configurations have been Written to MP5416-CCCC

16. Click OK and turn off power.

The remaining steps are optional and instruct how to check that new configurations have been programmed.

Optional:

- 17. Adjust the input voltage to 3.5 5V.
- 18. Repeat steps 1-3 from this section.

19. If done correctly, new configurations will be shown in the table on the left hand side.

Notes:

- Unlike in I2C, not all of the configurations you set in OTP mode will be displayed until you write to MP5416-CCCC and power cycle.
- After OTP, you:
 - Are still able to change values using I2C.
 - Do not need to press P1 while powering on the board.
- If you try to perform OTP on a previously programmed device, the GUI software will allow you to proceed normally. However, your configurations will NOT be saved.

3.5 Troubleshooting Tips

• EVKT-USBI2C-02 Driver Problem

In case that the USBI2C-02 driver is not properly installed, manual installation is required. Follow the steps below.

- Install the correct ".exe" file according to the windows operation system.
 32-bit: \EVKT-USBI2C-02 USB Driver\USBXpressInstaller_x86.exe.
 64-bit: \EVKT-USBI2C-02 USB Driver\USBXpressInstaller_x64.exe.
- 2. Connect the Dongle to the PC with a USB cable.
- 3. Find "USBXpress Device" in the Device Manager.

🔲 🏺 USBXpress Device

If the PC is running Windows 10, check the driver version of USBXpress Device. Windows 10 will automatically install the older USB driver, which is not compatible. The correct driver version is 4.0.0.0 (see Figure 19).

No Supply

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

• Shutdown Event



Figure 19: Correct Driver Version is 4.0.0.0



If the PMIC 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 PMIC switches to no supply state or power-off state, regardless of the current state.

• Thermal Recovery

If the MP5416 is in a power-off state due to the die temperature exceeding the thermal protection threshold, the PMIC enters a power-on sequence when 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 PMIC enters the shutdown sequence directly.



Section 4. Ordering Information

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

Description
Complete evaluation kit
MP5416GR-CCCC Evaluation Board allowing users to perform OTP
Includes one USB to I2C Dongle, one USB Cable, one ribbon cable
2 additional MP5416 ICs which can be used for OTP programming
USB Flash drive that stores the GUI installation file and supplemental documents

Order directly from MonolithicPower.com or our distributors.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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