

UM2914

User manual

Graphical user interface (GUI) for EV-VNF1048F

Introduction

The STSW-EV-VNF1048F is the graphical user interface (GUI) dedicated to set and control the EV-VNF1048F using an EV-SPC582B programmed with a specific firmware able to create an advanced controller for a MOSFET in high side configuration, designed for the implementation of an intelligent high side switch for 12 V, 24 V and 48 V automotive applications.

Figure 1. STSW-EV-VNF1048F	graphical	user i	nterface
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💯 EFuse Evaluation Board GUI		– 🗆 X
Exit Communication View Settings Service Help	(C) Copyright 2020, STMicroelectronics, ADG BODY&IGaN Macr	ro Division CT
EFuse Evaluation Board Tx:::-:	:::- Image: Consequences of the use of this application WDC trigger	. GSBN FS Operation mode: uC: . Restarts 0 uC: device: ???
Standard Control SPI Control Regs SPI History Device Info		
Settings		Device Mode WAKEUPM
Low Current ByPass OFF		UNLOCKED
Disable OUT Mode 0FF		GU_STDBY
Nominal Time 1 s		WDG TIME
		ENABLE WD 10.0 ms Send Timing 50 ms
THresHolds		
OVC (mV) 6		· · · · · · · · · · · · · · · · · · ·
HSC (mV) 20 -		0.00 300.0
VDS (mV) 300 -	Measurement	Diagnosis
NTC (mV) 110 92		-Warning/Error Flags
	VSense 0.00 mV	OVC Warning VS Under Voltage DEV OverTemp.
	VSense_HSHT U.UU mV	WD FAIL Fuse Latched NTC OverTemp.
		CP Low ByPass_Sat Locked
SelfTest	V03 0.000 V	OVC HSHT VGS_LOW
No selection		VDS_MAX
Current (mV) VDS (mV) StuckOn (mV)		Class Outro Flags
Vm 00.0 Vm 00.0 Vm 00.0		
		Global Status Byte
START SelfTest STOP SelfTest		GSBN RST SPIE AUTOON DIAGS DE OVC FS
		Hex Value:
		L
Cannot found Demo Board! Check USB cable		

1 Get software

Search on www.st.com, STSW-VNF1048 and in the "Tools & Software" section, get the software (GUI + Firmware) following the procedure.

2 Software installation

2.1 Firmware

Refer to the EV-SPC582B user manual.

2.2 GUI

Launch EFuse_Setup.exe



Figure 2. Setup wizard

• Following step by step the wizard you will be able to install the GUI Efuse. To continue the installation you have to accept the terms of the license agreement:

Figure 3. License agreement

👼 EFuse Evaluation Board 0.8 Setup 🦳	×
Please review the licence terms before installing the software	E
LICENSE AGREEMENT	^
This License Agreement ("Agreement") is displayed for You to read prior downloading and using the Licensed Software. If You choose not to agree we these provisions, do not download or install the enclosed Licensed Software and the related documentation and design tools. By using the Licensed Software, You are agreeing to be bound by the terms conditions of this Agreement. Do not use the Licensed Software until You he read and agreed to all the following terms and conditions. The use of Licensed Software implies automatically the acceptance of the following ter- and conditions	r to with vare and ave the rms
I ✓ I accept the terms of the License Agreement	¥
Nullsoft Install System v2.46	
< Back Next >	Cancel

• Next you have to choose installation folder:

Figure 4. Installation folder setup

💫 EFuse Evaluation Board 0.8 Setup	_		\times
Choose Install Location			-
Choose the folder in which to install EFuse Evaluation Board 0.8.			To
Setup will install EFuse Evaluation Board 0.8 in the following folder. folder, click Browse and select another folder. Click Install to start t	To install in a he installatio	a differer n.	nt
Destination Folder			
hics\EFuse\STMicroelectronics\EFuse\STMicroelectronics\EFuse\	Brov	wse	
Space required: 10.0MB Space available: 297.6GB			
Nullsoft Install System v2.46			
< Back	Install	Car	ncel

• The installation continues to the end:

Figure 5. Copying files

💫 EFuse Evaluation Board 0.8 Setup —	\times
Installing Please wait while EFuse Evaluation Board 0.8 is being installed.	
Execute: C:\Program Files (x86)\STMicroelectronics\EFuse\STMicroelectronics\EFuse\ST	Microe
Extract: FTD2XX.dll 100% Extract: ConfigGUI.ini 100% Extract: CDM21228_Setup.exe 100% Output folder: C:\Program Files (x86)\STMicroelectronics\EFuse\STMicroelectronics\E Create folder: C:\Users\gianfranco zuccaro\AppData\Roaming\Microsoft\Windows\St Create shortcut: C:\Users\gianfranco zuccaro\AppData\Roaming\Microsoft\Windows. Create shortcut: C:\Users\gianfranco zuccaro\AppData\Roaming\Microsoft\Windows. Create shortcut: C:\Users\gianfranco zuccaro\AppData\Roaming\Microsoft\Windows. Create shortcut: C:\Users\gianfranco zuccaro\AppData\Roaming\Microsoft\Windows. Create shortcut: C:\Users\gianfranco zuccaro\Desktop\EFuse_EvalBoad.lnk Created uninstaller: C:\Program Files (x86)\STMicroelectronics\EFuse\STMicroelectronics\EFuse\	·····
Nullsoft Install System v2.46	ancel

• Before ending the installation you will be proposed to install FTDI drivers. Skip this step if you want to install them at a different time (drivers could be obtained from the ftdichip website) or if they are already installed.

FTDI CDM Drivers			
	FTDI CDM Drivers		
~	Click 'Extract' to unpack version 2.12.28.2 of FTDI's Windows driver package and launch the installer.		
$\langle \rangle$			
	www.ftdichip.com		
	< Back Extract Cancel		

Figure 6. FTDI installation (1/4)

Figure 7. FTDI installation (2/4)



Figure 8. FTDI installation (3/4)

Device Driver In	stallation Wizard
License Ag	reement
Ń	To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key.
	IMPORTANT NOTICE: PLEASE READ CAREFULLY BEFORE INSTALLING THE RELEVANT SOFTWARE: This licence agreement (Licence) is a legal agreement between you (Licensee or you) and Future Technology Devices International Limited of 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, Scotland (UK Company Number SC136640) (Licensor or we) for use of driver software provided by the Licensor(Software).
	BY INSTALLING OR USING THIS SOFTWARE YOU AGREE TO THE $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
	 I accept this agreement Save As Print
	< Back Next > Cancel

• To complete the FTDI installation the following dialog is shown to confirm the drivers were successfully installed.

Figure 9. FTDI installation (4/4)

Device Driver Installation Wizard						
	Completing the De Installation Wizar	evice Driver d				
	The drivers were successfully installed on this computer.					
	You can now connect your device to this computer. If your device came with instructions, please read them first.					
	FTDI CDM Driver Packa	Ready to use				
	✓ FTDI CDM Driver Packa	Ready to use				
< Back Finish Cancel						

3 GUI description

The main form contains 4 tabs for device control

Figure 10. Tabs for device control

477	EFuse Evaluation Boa	ard GUI				
Exi	t Communication	View	Settings	Service	Help	(C) Copyright 2020, STMicroelectronic
E 	Fuse Evaluatio	n Boa	ard	5	7	Tx: :::::::::::::
re	v. 0.8 May 2020		1	ife.augme	ented	STMicroelectronics assumes no responsibility for the consequences of the use of this ap
ſ	tandard Control SPI (Control R	egs SPI H	listory De	vice Inl	0

It is also embedded communication traffic monitor, showing communicated data between GUI and MCU.

3.1 Main menu

Figure 11. Main menu



It contains the following actions:

- · Communication: possibility to Reset communication traffic and clear counters
- View: SPI registers overview
- Settings: allow to configure periodical refresh of registers
- Service: generic SPI frame allows to send a customizable SPI frame to device

Figure 12. Generic SPI frame



3.2 Status strip

Icons show the interface status between FTDI and GUI.

Figure 13. Status strip						
Cannot found Demo Board! Check USB cable						
Board connected and ready						

- board not connected
- normal application operation (communication between MCU and GUI correctly established)

3.3 Device diagnostic/communication

It shows SPI traffic detail (Tx and Rx).

Figure 14. Diagnostic / communication panel

'	Tx::::::: 0 Bx:::::: 0	N 2 🏄		Board Status HWLO PIN DIAG PIN	-]
	STMicroelectronics assumes no responsibility for the conseque	nces of the use of this	s application	WDC trigger		j



Enable/Disable periodical reading of status registers and GSB

Refresh all registers (both control and status)

Clear all status registers

Board status section shows the status of the device pin HWLO and DIAG.

3.4 Standard control

Figure 15. Standard control

97 EFuse Evaluation Board GUI			- ×
Exit Communication View Settings Service Help	(C) Copyright 2020, STMicroelectronics, ADG BODY&IGaN Ma	acro Division CT	
EFuse Evaluation Board	::: 0 ::: 0	us 	GSBN FS Operation mode: Bestats 0 uC :
rev. 0.8 May 2020 Ilife.ougmented STMicroelectronics assumes	no responsibility for the consequences of the use of this application WDC trigge	· 1	device: ???
Standard Control SPI Control Regs SPI History Device Info			
Settings			Device Mode WAKEUPM
Low Current ByPass OFF			UNLOCKED
Disable OUT Mode			GO_STDBY
Nominal Time			WDO TIME
		F ENABLE WD	10.0 ms Send Timing 50 ms •
		•	The second se
HSC (mV) 20 -		0.00	300.00
VDS (mV) 300 -	Measurement	Diagnosis	
NTC (mV) 110.92 x		-Warning/Error Flags-	
	VSense 0.00 mV	OVC Warning	VS Under Voltage DEV OverTemp.
	VSense_HSHT 0.00 mV	WD FAIL	Fuse Latched NTC OverTemp.
	NTC 0.000 V	CP Low	ByPass_Sat Locked
SelfTest	VDS 0.000 V	OVC	HSHT VGS_LOW
No selection 💌	Vout 0.00V	VDS_MAX	
Current (mV) VDS (mV) StuckOn (mV) 0.00 mV 0.00 mV 0.00 mV			Clear Status Flags
		Global Status Byte	
START SelfTest STOP SelfTest		GSBN BST	SPIE AUTOON DIAGS DE OVC ES
			Hex Value:
Cannot found Demo Board! Check USB cable			

This main tab shows the main device features, giving the possibility to apply different device modes, enable HS gate, execute self-test, set different thresholds and select diagnostic data to be periodically read and displayed or stopped.

3.4.1 Watchdog

Figure 16. Watchdog

		WDG TIME
V ENABLE WD	10.0 ms Send Timing	50 ms 🔻
0.00		●■ ■ 300.0 (

Period for Watchdog (WD) serving is adjustable by item "WDG TIME".

WD serving is applied by refreshing the WD_TRIG bit in one of the control registers.

Enabled WD – Enable/disable WD serving by refreshing the WD_TRIG bit

There is also the possibility to set the WD refresh time sent by MCU through a dedicated bar and button ("Send Timing"). This allows the testing of device WD timeout failure.

3.4.2 Settings

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Figure 17. Settings
Settings
Low Current ByPass 0FF
HS Gate OFF
Disable OUT Mode OFF
Nominal Time 1 s

- Low Current Bypass:enables/disables the embedded P-channel Bypass setting bit 3 of the Control Registers 1
- HS Gate: enables/disables the external MOSFET setting bit 4 of Control Register 1

т

- Disable OUT Mode: configures the Watchdog behavior in Locked state setting bit 2 of Control Register 3
- **Nominal Time**: Configures the fuse nominal time setting bits from 23 to 16 of Control Register 2.

3.4.3 Threshold

Figure 18. Thresholds

6	•
20	•
300	•
110.92	•
	6 20 300 110.92

- OVC: Configures the value of Nominal Overcurrent Threshold setting bits from 15 to 11 of Control Register 2
- + HSC: Configures the threshold for Hard Short Circuit Latch-off setting bits from 10 to 7 of Control Register 2
- VDS: Configures the threshold for External MOSFET desaturation shut-down setting bits from 6 to 2 of Control Register 2
- NTC: Configures a threshold for External MOSFET overtemperature shutdown via NTC setting bits from 8 to 5 of Control Register 3

3.4.4 Self-test

[]

StuckOn (mV)
Vm 00.0
STOP SelfTest

Allow to select Self-test to be executed (setting bit from 7 to 6 of Control Register 1) and to start and stop the test (setting bit 9 and bit 8 of Control Register 1).

A feedback about test result is also showed (value of Status register 5, 6, 7).

3.4.5 Measurements

Figure 20. Measurements

Measurement				
VSense	0.00 mV			
VSense_HSHT	0.00 mV			
NTC	0.000 V			
VDS	0.000 V			
VOut	0.00 V			
Tj	0.0 C*			

This section gives a status of the following status register:

- VSense: bits from 14 to 2 of Status Register 2
- Vsense_HSHT: bits from 11 to 2 of Status Register 8
- NTC: bits from 11 to 2 of Status Register 3
- VDS: bits from 22to 13 of Status Register 4
- VOut: bits from 11 to 2 of Status Register 4
- Tj: bits from 22 to 13 of Status Register 3

3.4.6 Log

Different set of registers to be periodically read from device.

3.4.7 Diagnosis

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Diagnostic data are refreshed according to the diagnostic mode selected.

Figure 21. Diagnosis										
Diagı	nosis									
Warn	ing/Erro	Flags-								
	OVC Warr	ning	VS U	nder Voltag	e	DE	V O ve	erTemp		
	WD FAI	L	Fu	se Latched		NT	COve	erTemp		
	CP Low	,	By	Pass_Sat			Lock	ed		
	OVC			HSHT			/GS_I	_0W		
	VDS_MA	X								
Clear Status Flags										
Globa	Global Status Byte									
	GSBN	RST	SPIE	AUTOON	DIA	āS	DE	OVC	FS	
	0	0	0	0	0		0	0	0	
			1	lex Valu	e:					

Figure 21. Diagnosis

"Clear Status Flag" button clears the bit of the related errors in the status register.

3.4.8 Device mode

Figure 22. Device mode

De	evice Mode	WAKEUPM
	UNLOCKED	
	LOCKED	-
	GO_STDBY	

Device mode can be set by dedicated buttons.

Figure 23. HWLO PIN button

H₩LO PIN

"HWLO PIN" button enables/disables device HWLO pin.

3.5 Registers access

The Tab "SPI Control Regs" contains the RAM control and status registers. The Tab "Device Info" allows reading of the ROM device part. Applicable controls for RAM registers:

- 1. Button \square read register content from device
- 2. Button W store content of displayed register to device.
- 3. Button C apply read&clear action on selected register
- 4. Mouse clicking on particular registry bits change bit value for write operation (if possible).

Figure 24. SPI control register



SPI history form 3.6

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Display communications frames applied over GUI.

🐖 EFuse Evaluation Board GUI			– 🗆 X
Exit Communication View Settings Service Help	(C) Copyright 2020, STMicroelectronics, ADG B	ODY&IGaN Macro Division CT	
EFuse Evaluation Board		Board Status HWLO PIN · DIAG PIN ·	GSBN FS Operation mode: Restarts O devicer 222
116-cougmented STMicroelectronics assumes no responsi	bility for the consequences of the use of this application	WDC trigger .	device. III
Standard Control SPI Control Regs SPI History Device Info			1
<pre>logs messages of SPI communication except for watched trigger (= gui SB1,SB5,SB6,SB7,SB2 Bead 1 0 (</pre>	Status Reg1 Addr. bx11 23 0 22 0 0 23 0 0 24 0 0 25 0 0 26 0 0 27 0 0 28 0 0 29 0 0 19 0 0 19 0 0 19 0 0 11 SUV 0 12 HVALO_ST 0 13 LOCKEDM 0 14 VASELT 0 12 HVALO_ST 0 13 LOCKEDM 0 14 VASLOW 0 15 BYPASSAT 0 16 OVC 0 17 FUSE LatCH 0 18 OVFAL 0 19 VOS_LOW 0 2 P.LOW <t< td=""><td><</td><td>Control Register Chi Regi Addr. 0x01 23 0 22 0 21 0 20 0 21 0 20 0 19 0 18 0 17 0 16 0 15 0 14 0 13 0 12 0 13 0 14 0 13 0 12 0 13 0 14 0 15 0 16 0 17 0 18 0 19 5.T_START 10 EN 11 GOSTBY 12 0 13 5.S_T_STOP 14 0utCtt 15 S_T_CFG3 16 S_T_CFG4 <td< td=""></td<></td></t<>	<	Control Register Chi Regi Addr. 0x01 23 0 22 0 21 0 20 0 21 0 20 0 19 0 18 0 17 0 16 0 15 0 14 0 13 0 12 0 13 0 14 0 13 0 12 0 13 0 14 0 15 0 16 0 17 0 18 0 19 5.T_START 10 EN 11 GOSTBY 12 0 13 5.S_T_STOP 14 0utCtt 15 S_T_CFG3 16 S_T_CFG4 <td< td=""></td<>
Cannot found Demo Board! Check USB cable			

Figure 25. SPI history form

Button erase all communication history from log window.

A control register and a status register can be selected for easy access.

3.7 Device Info

This form shows the device ROM and can be refreshed with the dedicated button.

Figure 26. ROM memory map

ROM M	emory N	ap Device			
					📑 Refresh
A de	014	WD bit nos 2		222	
Aur.	0814	WD bit pos. 2			
Adr:	0x13	WD bit pos. 1	0 0 0 0 0 0 0	???	
Adr:	0x11	WD Type 1	0 0 0 0 0 0 0	???	
6	010	CDId-		222	
Adr.	UXIU	SPI mode			
Adr:	A0x0	Silicon Ver.	0 0 0 0 0 0 0	???	
Adr:	0x05	Device No. 4	0 0 0 0 0 0 0 0	???	
Adr:	0x04	Device No. 3	00000000	???	
Adr	0x03	Device No. 2	0 0 0 0 0 0 0 0	222	
A de	002	Device No. 1		222	
Aaf:	0802	Device No. 1		***	
Adr:	0x01	Device Family		???	
Adr:	0x00	Company Code	0 0 0 0 0 0 0 0	???	

Revision history

Table 1. Document revision history

Date	Revision	Changes
28-Sep-2021	1	Initial release.

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