UM11898

KITPF5300SKTEVM Evaluation board

Rev. 1 — 9 June 2023

Document Information

Information	Content
Keywords	Safety, SBC, automotive, low power, ASIL D, industrial
Abstract	This document is the user guide for the KITPF5300SKTEVM evaluation board.

Revision history

Revision	Date	Description
v.1	20230609	initial version

IMPORTANT NOTICE
For engineering development or evaluation purposes only

NXP provides the product under the following conditions:

This evaluation kit is for use of ENGINEERING DEVELOPMENT OR EVALUATION PURPOSES ONLY. It is provided as a sample IC pre-soldered to a printed-circuit board to make it easier to access inputs, outputs and supply terminals. This evaluation board may be used with any development system or other source of I/O signals by connecting it to the host MCU computer board via off-the-shelf cables. This evaluation board is not a Reference Design and is not intended to represent a final design recommendation for any particular application. Final device in an application heavily depends on proper printed-circuit board layout and heat sinking design as well as attention to supply filtering, transient suppression, and I/O signal quality.

The product provided may not be complete in terms of required design, marketing, and or manufacturing related protective considerations, including product safety measures typically found in the end device incorporating the product. Due to the open construction of the product, it is the responsibility of the user to take all appropriate precautions for electric discharge. In order to minimize risks associated with the customers' applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards. For any safety concerns, contact NXP sales and technical support services.

1   Introduction

This document is the user guide for the KITPF5300SKTEVM evaluation board. It is intended for engineers involved in the evaluation, design, implementation, and validation of the PF5300.

This document covers connecting the hardware, installing the software and tools, configuring the environment, and using the kit.

2   Finding kit resources and information on the NXP website

NXP Semiconductors provides online resources for this evaluation board and its supported device(s) on http://www.nxp.com.

The information page for the KITPF5300SKTEVM evaluation board is at http://www.nxp.com/KITPF5300SKTEVM. The information page provides overview information, documentation, software and tools, parametrics, ordering information and a **Getting Started** tab. The **Getting Started** tab provides quick-reference information applicable to using the KITPF5300SKTEVM evaluation board, including the downloadable assets referenced in this document.

3   Getting ready

Working with the KITPF5300SKTEVM requires the kit contents, additional hardware, and a Windows PC workstation with installed software.

3.1 Kit contents

- Assembled and tested evaluation board and preprogrammed FRDM-KL25Z microcontroller
- 3.0 ft USB-STD A to USB-B-mini cable
- Jumpers mounted on board

3.2 Additional hardware

In addition to the kit contents, the following hardware is necessary or beneficial when working with this kit.

- Power supply with a range of 3.3 V to 5.0 V

3.3 Minimum system requirements

This evaluation board requires a Windows PC workstation. Meeting these minimum specifications should produce great results when working with this evaluation board.

- USB-enabled computer with Windows 7 or Windows 10

3.4 Software

The software listed here must be installed before working with this evaluation board.

- NXP GUI installation package

UM11898

All information provided in this document is subject to legal disclaimers.

© 2023 NXP B.V. All rights reserved.

User manual

Rev. 1 — 9 June 2023

3 / 14

4 Getting to know the hardware

The KITPF5300SKTEVM provides a way to OTP programming the PF5300 and conduct basic power-up testing of a programmed part. Loading of the DC-DC converter is not allowed.

4.1 Board features

- VIN and PVIN connectors
- SW1 output capability up to 15 A
- Load slammer connector
- PGOOD output
- Emulation mode capabilities
- USB connection and GUI for register access, OTP emulation, and programming

4.2 Kit featured components

Figure 1 identifies important components on the board and Table 1 provides additional details about these components.
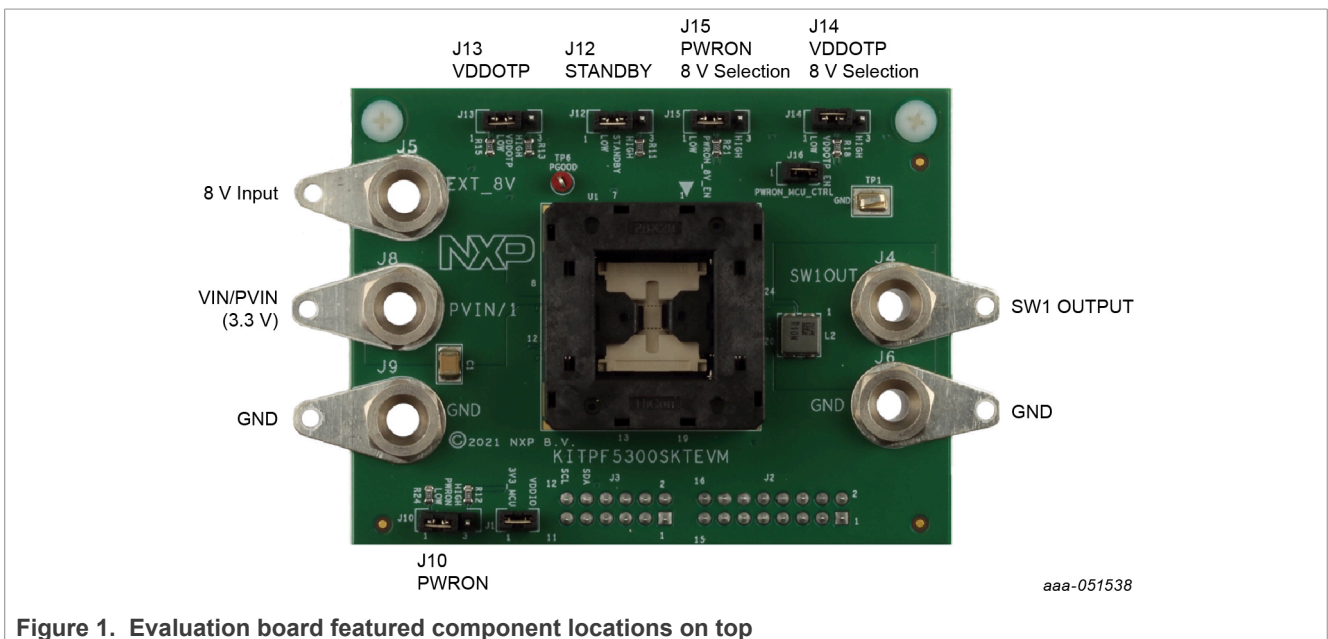
Figure 1. Evaluation board featured component locations on top

Table 1. Connector and jumper description

Position	Function	Description
J5	EXT_8V	8 V supply input needed for OTP programming
J8	VIN/PVIN	Input power supply (3.3 V)
J9, J6	GND	Ground
J4	Output Voltage	Output Voltage
J12	STANDBY	1-2: **Default**. STANDBY = GND 2-3: STANDBY = VDDIO
J10	PWRON Functional Control	Open: **Default**. PWRON controlled through J16. 1-2: PWRON = GND 2-3: PWRON = VDDIO Use only if J16 is open.
J13	VDDOTP Configuration	Open: **Default**. Use for OTP programming. 1-2: Connect to ground. 2-3: Pull up to VDDIO. Use if trying XFAILB functionality
J14	VDDOTP 8V Selection	1-2: Do not apply EXT_8V to VDDOTP/XFAILB pin 2-3: **Default**. Apply 8V_EXT to VDDOTP/XFAILB pin Open: If evaluating XFAILB functionality
J15	PWRON Configuration	Control PWRON voltage in relation to EXT_8V 1-2: Apply EXT_8V/2 to PWRON pin 2-3: **Default.** Apply EXT_8V to PWRON pin
J16	PWRON Connectivity	Open: PWRON controlled by J10 Closed: **Default**. PWRON controlled by J15/MCU.
J1	VDDIO supply	Closed: **Default**

4.3 Schematics, board layout, and bill of materials

The board schematics, board layout, and bill of materials are available at http://www.nxp.com/KITPF5300SKTEVM on the Overview tab under Get Started.

5 Installing and configuring software tools

5.1 Flashing or updating the GUI firmware

The KITPF5300SKTEVM is always delivered with the GUI firmware already flashed. If the MCU firmware is already flashed, the user can ignore this section. If it is specified that the user needs to update the firmware or if the firmware is malfunctioning, follow these instructions:

5.1.1 Flashing Freedom Board evaluation board firmware for Windows 7

Steps 1 and 2 are not required if **BOOTLOADER** is already loaded in the KITPF5300SKTEVM board. In that case, start from step 3.

1. Press the **RST** button and connect the USB cable into the SDA port on the Freedom board
   • A new **BOOTLOADER** device should appear on the left pane of the Windows Explorer
2. Drag and drop the file *MSD-DEBUG-FRDM-KL25Z_Pemicro_v118.SDA* into the **BOOTLOADER** drive

> **Note:** *Make sure to allow enough time for the firmware to be saved in the **BOOTLOADER***

3. Disconnect and reconnect the USB cable into the SDA port
   - This time, without pressing the **RST** button, the FRDM_KL25Z device should appear on the left pane of the Windows File Explorer as pictured in .
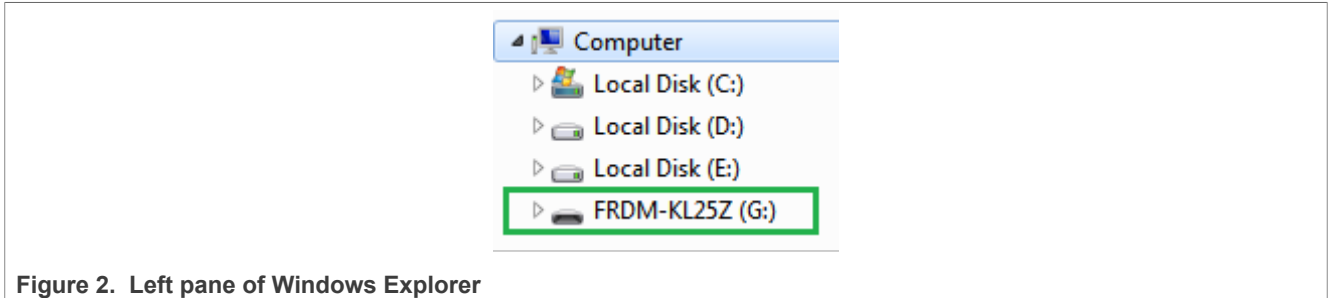

Figure 2. Left pane of Windows Explorer

4. Locate the file *nxp-gui-fw-frdmkl25z-usb_hid-pf5300_v0.3.bin* (or later version) from the package, and drag and drop the file into the FRDM_KL25Z device.
   Note: *Make sure to allow enough time for the firmware to be saved*
5. The Freedom board firmware is successfully loaded. Disconnect and reconnect the USB cable to the KL25Z USB port.

5.1.2 Flashing Freedom Board evaluation board firmware for Windows 10

1. Disable the storage services: Run the **Services**, double click on **Storage Service** from the resulting list, and press the **Stop** button.
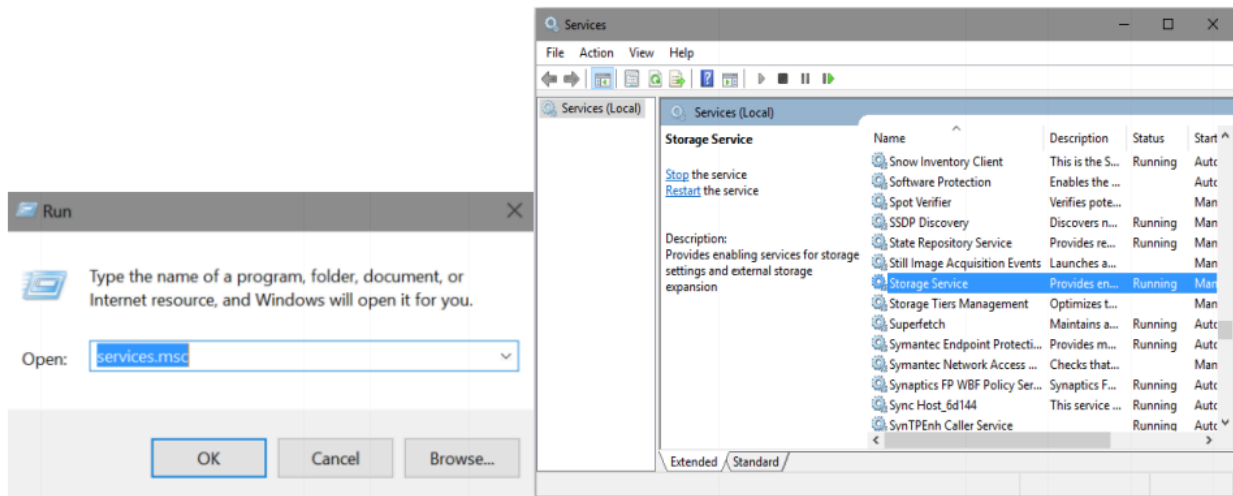
Steps 2 and 3 are not required if **BOOTLOADER** is already loaded in the KITPF5300SKTEVM board. In that case, start from step 4.

2. Press the **RST** button and connect the USB cable to the SDA port on the Freedom board.
   - A new **BOOTLOADER** device appears on the left pane of the Windows File Explorer.
3. Drag and drop the file *MSD-DEBUG-FRDM-KL25Z_Pemicro_v118.SDA* into the **BOOTLOADER** drive.
   Note: *Make sure to allow enough time for the firmware to be saved in the **BOOTLOADER***.
4. Disconnect and reconnect the USB cable to the SDA port.
   - This time without pressing the **RST** button, the FRDM_KL25Z device should appear on the left pane of the Windows File Explorer as pictured in .

UM11898
All information provided in this document is subject to legal disclaimers.
© 2023 NXP B.V. All rights reserved.

User manual
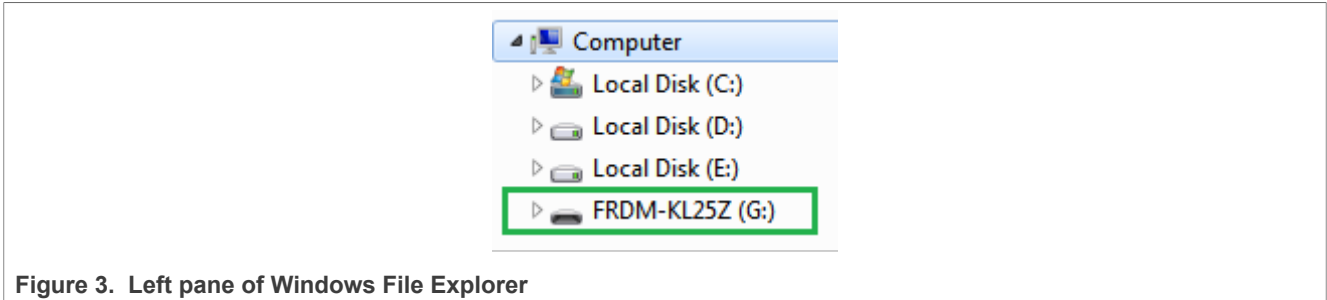**Rev. 1 — 9 June 2023**

6 / 14

Figure 3. Left pane of Windows File Explorer

5. Locate the file *nxp-gui-fw-frdmkl25z-usb_hid-pf5300_v0.3* (or later version) from the package, and drag and drop the file into the FRDM_KL25Z device.
   Note: *Make sure to allow enough time for the firmware to be saved.*
6. The Freedom board firmware is successfully loaded. Disconnect and reconnect the USB cable to the FRDM-KL25Z microcontroller USB port.

5.2 Installing the GUI software package

Once the KIT is ready and the NXPGUI_Dev is installed, launch the KIT from your windows search bar and click to launch.

To install the PF5300 NXP GUI, download or obtain the NXPGUI package, unzip, and open the **1-NXP_GUI_Setup** folder:

Double click on the setup file and follow the instructions.

When installation is finished, search the application on the windows search bar as "NXPGUI_Dev".

6 PF5300 NXP GUI

Once the kit is ready and the **NXPGUI** software is installed, use the Windows search bar to find the GUI. Click the search result to launch it.

Once the NXP GUI is opened and the kit selection window shown in Figure 4 is displayed, check for the following settings and click **OK.**
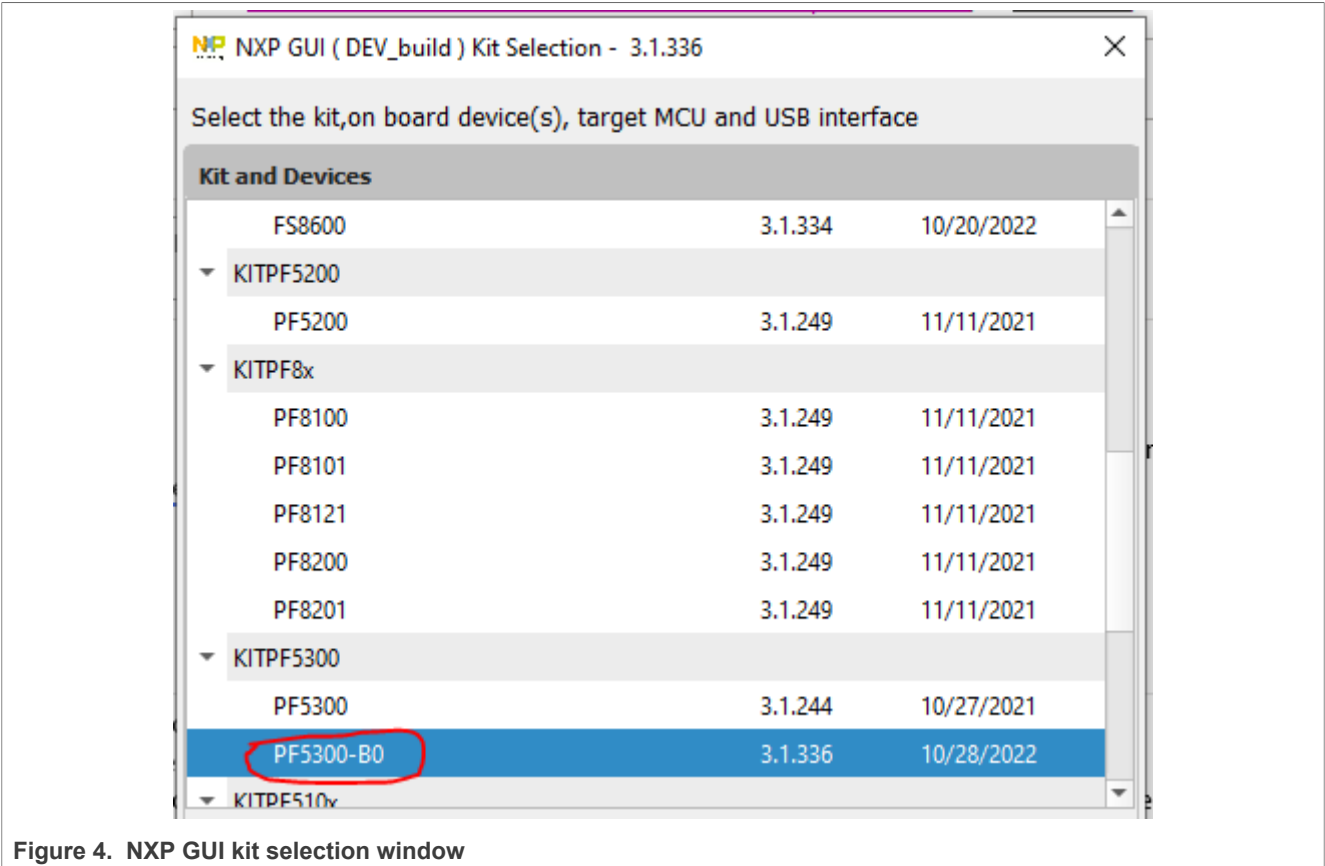
Figure 4. NXP GUI kit selection window

Note: To avoid the kit selection window on every launch, check the box **Use this configuration and do not ask again***.*
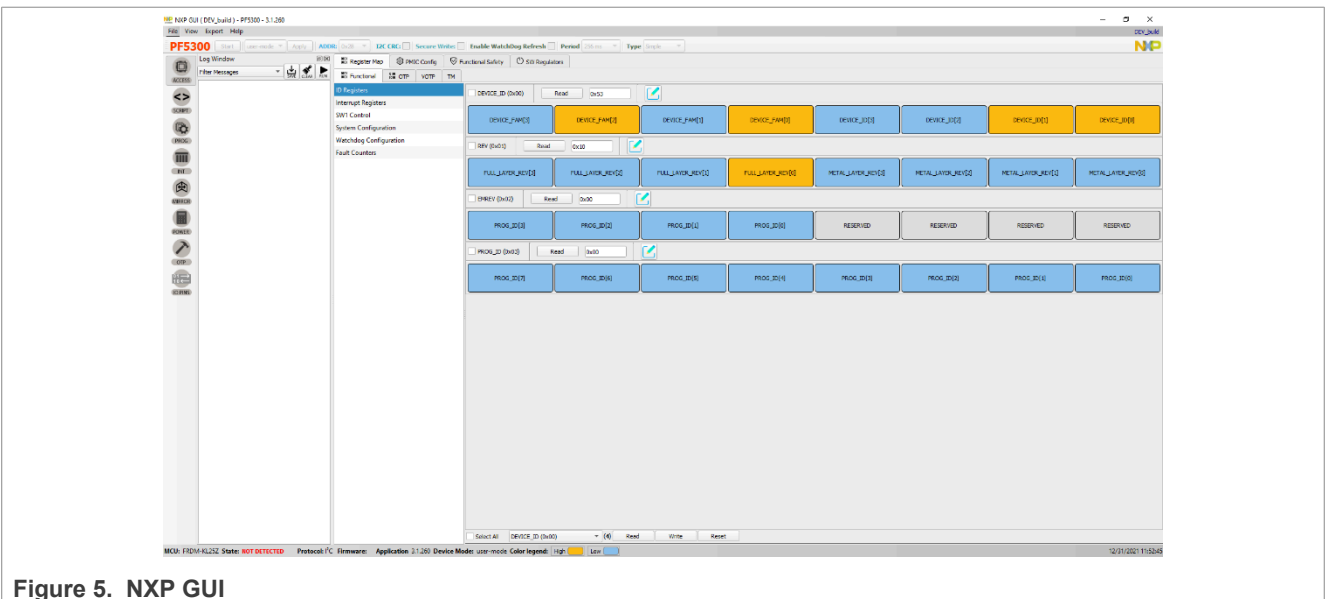
The window shown in Figure 5 opens.

Figure 5. NXP GUI

UM11898

User manual

Rev. 1 — 9 June 2023

8 / 14

7 Configuring the hardware

Once the user has installed the NXP GUI, follow these instructions to quickly power up the board.

Powering up the board with pre-programmed OTP configuration

1. Make sure that the board has the right jumper configuration per Table 1 and Figure 6.
2. Ensure that SW4 is in the NORMAL position.
3. Verify that the FRDM-KL25Z microcontroller is plugged in, and the USB cable on the FRDM-KL25Z microcontroller USB connector side is attached. It is important that the USB cable is connected to a PC, because the cable enables communication with the NXP GUI and provides the VDDIO reference for the IC.
4. Apply VIN and PVIN with PWRON = 0.
5. Move J10 from 1-2 to 2-3 to turn on the PF53.
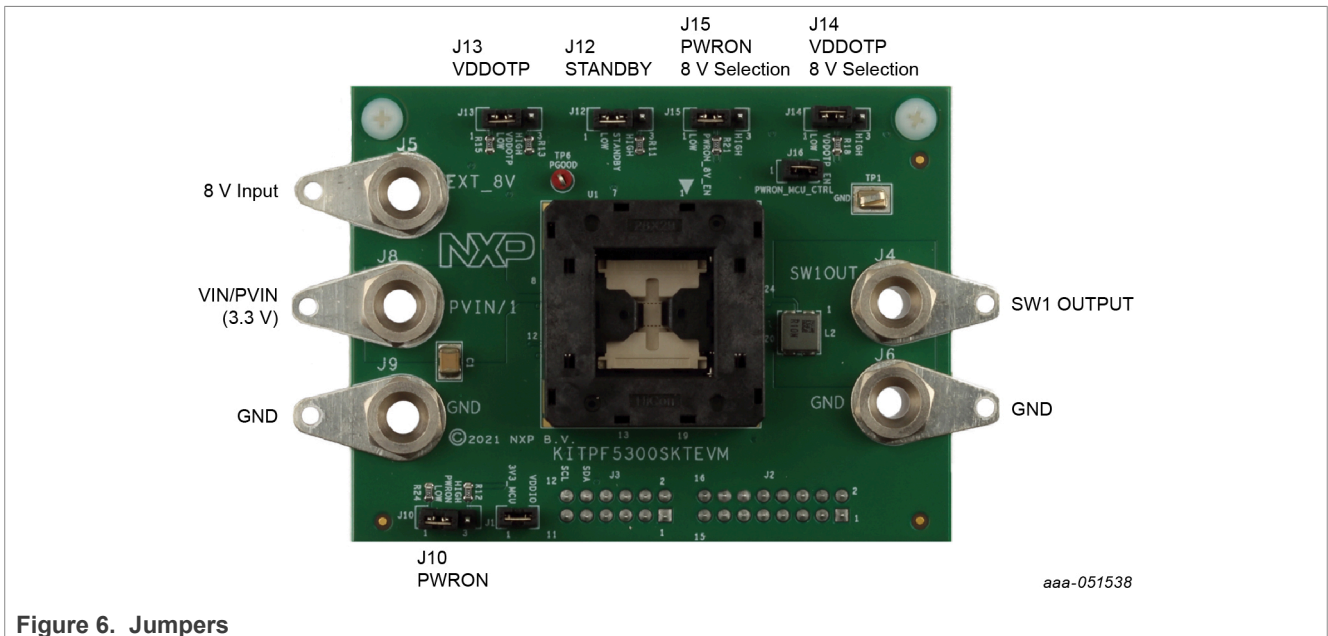6. Open the GUI and communicate as required.

Figure 6. Jumpers

Powering up the board in Debug mode

Debug mode allows the user to modify OTP mirror registers before powering up. This facilitates exercising different features of the PF5300 while deciding on the best configuration for a given application.

1. Ensure that jumpers in the board are configured per Table 1
2. Connect the FRDMKL25Z board to the socketed board.
3. Connect the mini-USB cable from the USB port of the KL25Z to the PC that will run the GUI
4. Apply 8 V to the EXT_8V connector J5.
5. Apply 3.3 V to the VIN/PVIN connector J8
6. Open the GUI and click **Start** in the top-left
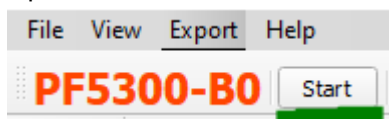
7. Select **Test Mode** from the menu selection as shown below, then click **Apply**.
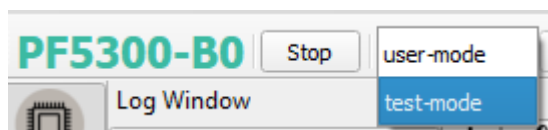
8. Go to the PROG tab in the left side selection
9. Select the programming source – either from a script file, or to use the existing GUI configuration
10. Click on the **Program** button to program the OTP fuses with the selected configuration.

To verify functionality of the programmed part:

1. Turn off EXT_8V.
2. Move J15 to 1-2.
3. Apply EXT_8V and check the output voltage.

8 Legal information

8.1 Definitions

Draft — A draft status on a document indicates that the content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included in a draft version of a document and shall have no liability for the consequences of use of such information.

8.2 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. NXP Semiconductors takes no responsibility for the content in this document if provided by an information source outside of NXP Semiconductors.

In no event shall NXP Semiconductors be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, NXP Semiconductors' aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of NXP Semiconductors.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using NXP Semiconductors products, and NXP Semiconductors accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the NXP Semiconductors product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

NXP Semiconductors does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using NXP Semiconductors products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). NXP does not accept any liability in this respect.

Terms and conditions of commercial sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nxp.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. NXP Semiconductors hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of NXP Semiconductors products by customer.

Suitability for use in automotive applications — This NXP product has been qualified for use in automotive applications. If this product is used by customer in the development of, or for incorporation into, products or services (a) used in safety critical applications or (b) in which failure could lead to death, personal injury, or severe physical or environmental damage (such products and services hereinafter referred to as "Critical Applications"), then customer makes the ultimate design decisions regarding its products and is solely responsible for compliance with all legal, regulatory, safety, and security related requirements concerning its products, regardless of any information or support that may be provided by NXP. As such, customer assumes all risk related to use of any products in Critical Applications and NXP and its suppliers shall not be liable for any such use by customer. Accordingly, customer will indemnify and hold NXP harmless from any claims, liabilities, damages and associated costs and expenses (including attorneys' fees) that NXP may incur related to customer's incorporation of any product in a Critical Application.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Evaluation products — This product is provided on an "as is" and "with all faults" basis for evaluation purposes only. NXP Semiconductors, its affiliates and their suppliers expressly disclaim all warranties, whether express, implied or statutory, including but not limited to the implied warranties of non-infringement, merchantability and fitness for a particular purpose. The entire risk as to the quality, or arising out of the use or performance, of this product remains with customer.

In no event shall NXP Semiconductors, its affiliates or their suppliers be liable to customer for any special, indirect, consequential, punitive or incidental damages (including without limitation damages for loss of business, business interruption, loss of use, loss of data or information, and the like) arising out the use of or inability to use the product, whether or not based on tort (including negligence), strict liability, breach of contract, breach of warranty or any other theory, even if advised of the possibility of such damages.

Notwithstanding any damages that customer might incur for any reason whatsoever (including without limitation, all damages referenced above and all direct or general damages), the entire liability of NXP Semiconductors, its affiliates and their suppliers and customer's exclusive remedy for all of the foregoing shall be limited to actual damages incurred by customer based on reasonable reliance up to the greater of the amount actually paid by customer for the product or five dollars (US$5.00). The foregoing limitations, exclusions and disclaimers shall apply to the maximum extent permitted by applicable law, even if any remedy fails of its essential purpose.

Translations — A non-English (translated) version of a document, including the legal information in that document, is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Security — Customer understands that all NXP products may be subject to unidentified vulnerabilities or may support established security standards or specifications with known limitations. Customer is responsible for the design and operation of its applications and products throughout their lifecycles to reduce the effect of these vulnerabilities on customer's applications and products. Customer's responsibility also extends to other open and/or proprietary technologies supported by NXP products for use in customer's applications. NXP accepts no liability for any vulnerability. Customer should regularly check security updates from NXP and follow up appropriately.

Customer shall select products with security features that best meet rules, regulations, and standards of the intended application and make the ultimate design decisions regarding its products and is solely responsible for compliance with all legal, regulatory, and security related requirements concerning its products, regardless of any information or support that may be provided by NXP.

NXP has a Product Security Incident Response Team (PSIRT) (reachable at PSIRT@nxp.com) that manages the investigation, reporting, and solution release to security vulnerabilities of NXP products.

8.3 Trademarks

Notice: All referenced brands, product names, service names, and trademarks are the property of their respective owners.

NXP — wordmark and logo are trademarks of NXP B.V.

Kinetis — is a trademark of NXP B.V.

SafeAssure — is a trademark of NXP B.V.

UM11898

All information provided in this document is subject to legal disclaimers.

© 2023 NXP B.V. All rights reserved.

User manual

Rev. 1 — 9 June 2023

12 / 14

Tables

Figures

UM11898
All information provided in this document is subject to legal disclaimers.
© 2023 NXP B.V. All rights reserved.

User manual
Rev. 1 — 9 June 2023

13 / 14

Contents

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Power Management IC Development Tools *category:*

Click to view products by NXP *manufacturer:*

Other Similar products are found below :

EVB-EP5348UI BQ25010EVM ISL80019AEVAL1Z ISLUSBI2CKIT1Z ISL8002AEVAL1Z ISL91108IIA-EVZ MAX8556EVKIT MAX15005AEVKIT+ ISL28022EVKIT1Z STEVAL-ISA008V1 DRI0043 KITPF8100FRDMEVM EVB-EN6337QA SAMPLEBOXILD8150TOBO1 MAX18066EVKIT# AP62300WU-EVM KITA2GTC387MOTORCTRTOBO1 AEK-MOT-TK200G1 EVLONE65W STEVAL-ILH006V1 STEVAL-IPE008V2 STEVAL-IPP001V2 STEVAL-ISA013V1 STEVAL-ISA067V1 STEVAL-ISQ002V1 TPS2306EVM-001 TPS2330EVM-185 TPS40001EVM-001 SECO-HVDCDC1362-15W-GEVB BTS7030-2EPA LT8638SJV#WPBF LTC3308AIV#WTRPBF TLT807B0EPV BTS71033-6ESA EV13N91A EASYPIC V8 OVER USB-C EV55W64A CLICKER 4 FOR STM32F4 EASYMX PRO V7A FOR STM32 CLICKER 4 FOR PIC18F Si8285_86v2-KIT PAC52700EVK1 NCP-NCV51752D2PAK3LGEVB ISL81807EVAL1Z AP33772S-EVB EVALM7HVIGBTPFCINV4TOBO1 903-0300-000 902-0173-000 903-0301-000 ROA1286023/1