UM11768 BYLink multiprocessor demo board user manual

Rev. 1 — 7 April 2022 User manual

Document information

Information	Content
Keywords	FS8500, PF5024, PF5020, PMIC, BYLINK, power sequencing, safety, fault management, multiprocessor, camera application, ADAS
Abstract	The BYLink multiprocessor demo board user guide is intended for engineers involved in the evaluation or development of a BYLink system involving an NXP PMIC, such as one from the FS8500 device family or the PF502x device family.

Revision history

Rev	Date	Description
1	20220407	Initial version.

1 Introduction

The BYLink multiprocessor demo board user guide is intended for engineers involved in the evaluation or development of a BYLink system involving an NXP PMIC, such as one from the FS8500 device family or the PF502x device family. This document contains all of the information required to evaluate the BYLink concept. The 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 BYLink Multiprocessor demo board is at https://www.nxp.com/products/product-information/product-programs/bylink-system-power-platform:BYLINK

The information page offers documentation for system overview, software, tools, and parameters. It also provides ordering information and a Getting Started tab. The Getting Started tab provides quick-reference information applicable to using the BYLink Multiprocessor demo board, including the downloadable assets referenced in this document.

2.1 Collaborate in the NXP community

The NXP community is for sharing ideas and tips, asking and answering technical questions, and receiving input on just about any embedded design topic. Access the NXP community at http://community.nxp.com.

3 Getting ready

Working with the BYLink Multiprocessor demo board requires the kit contents, additional hardware, and a Windows PC workstation with software installed.

3.1 Kit contents

The KITPF5200SKTEVM kit contains the following items:

- 3.0 ft USB-STD A to USB-B-mini cable
- Jumpers mounted on board
- Quick Start Guide

3.2 Additional hardware

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

- 12 V power supply with a current limit set initially to 2.0 A

3.3 Windows PC workstation

This evaluation board requires a Windows PC workstation:

- USB-enabled computer with Windows 7 or Windows 10

3.4 Software

The following software must be installed on the PC workstation prior to using the BYLink Multiprocessor demo board.

• BYLink NXP GUI installation package

4 Getting to know the hardware

4.1 Kit overview

The BYLink multiprocessor demo board kit provides an integrated platform for evaluating designs based on NXP's FS8500 and PF502x PMIC device families. All PMIC features can be accessed and monitored in a test environment.

The kit hardware consists of the BYLink multiprocessor demo board and the USB cable required to connect the board to the PC.

Connectors, jumpers, and switches on the board can be used to configure an evaluation environment that meets specific design requirements. The board also contains LEDs and test points that provide a means of monitoring performance in real time.

4.2 BYLink multiprocessor demo board features

- Connector for power supply input
- Connector and test point for PMIC regulators
- OTP emulation and PWRON
- USB to I2C protocol for easy connection to software GUI
- LEDs, green and red, that indicate signal or regulator status

4.3 BYLink multiprocessor demo board featured components

Figure 1 shows the location of key BYLink multiprocessor demo board components.

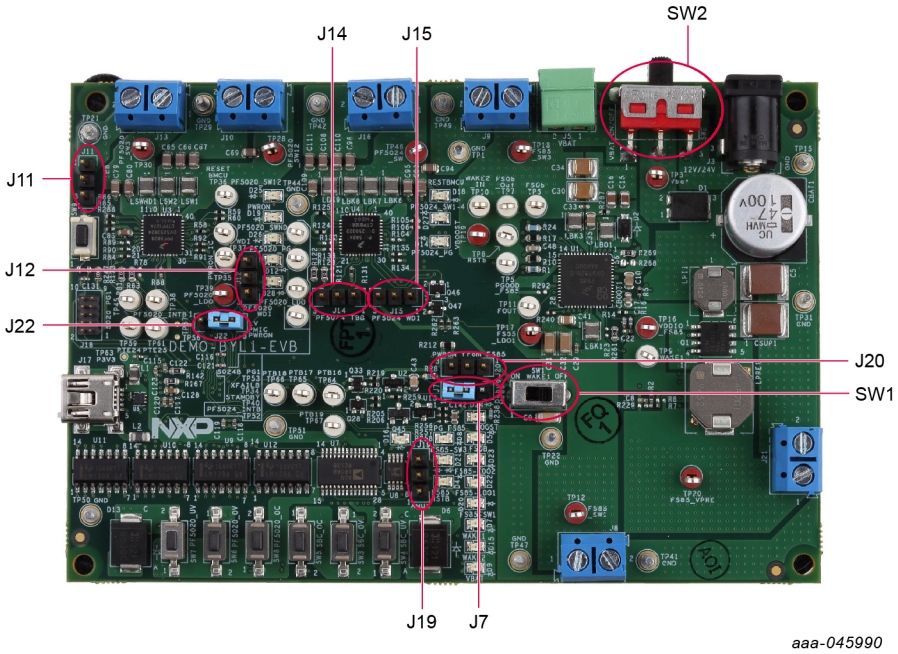

Figure 1. Jumper and switch details

Table 1. Jumper and switch details

Name	Function	Pin number	Jumper/pin function	Default
J7	Debug Mode	"1-2"	DBG voltage 5V	"2-3"
		"2-3"	DBG voltage to GND (default)	
J19	AMUX	"1-2"	AMUX disabled	Unconnected
		"2-3"	AMUX enabled (default)	
J22	LV PMIC PWRON	"1-2"	PWRON from MCU	"1-2"
		"2-3"	PWRON from FS85 (default)	
J20	PWRON from FS85	"1-2"	PWRON from Wake1 control	Unconnected
		"2-3"	PWRON from FS85_LDO1 (default)	
J14	PF5024 TBB	"1-2"	TBB mode disabled (default)	Unconnected
		"2-3"	TBB mode enabled	
		open	MCU has control of this pin	
J15	PF5024 WDI	"1-2"	WDI short to low (default)	Unconnected
		"2-3"	WDI short to high	
J11	PF5020 TBB	"1-2"	TBB mode disabled (default)	Unconnected
		"2-3"	TBB mode enabled	
		open	MCU has control of this pin	
J12	PF5020 WDI	"1-2"	WDI short to low (default)	Unconnected

Table 1. Jumper and switch details...*continued*

		"2-3"	WDI short to high	
SW1				
Position	**Function**	**Description**		**Default**
"1-2"	Wake1 closed	Wake1 pin connected to VSUP		"2-3"
"2-3"	Wake1 open	Wake1 pin not connected to VSUP (default)		
SW2				
Position	**Function**	**Description**		**Default**
"1-2"	VBAT on/off	VBAT on from J5, off from J3		"1-2"
"2-3"	VBAT on/off	VBAT on from J3, off from J5 (default)		

4.4 Schematic, board layout and bill of materials

The schematic, board layout and bill of materials for the BYLink multiprocessor demo board are available at http://www.nxp.com/DEMO-BYL1-EVB.

5 Installing and configuring software and tools

Installation and configuration of the software is described in great detail in sections 3 and 4 of the User Guide available at http://www.nxp.com/docs/en/user-guide/UG10029.pdf.

6 Setting up and running the BYLink Multiprocessor demo board

6.1 Setting and starting up the board

The procedure for setting up the BYLink Multiprocessor demo board is as follows:

1. Make sure that the board has the jumpers configured in their default positions as shown in Figure 1. The default configuration enables the board to be fully controlled by the MCU and the GUI.
2. Connect the power supply to J5 (VBAT and GND). The power supply should be set to an initial value of 12 V and current limited to 2.0 A.
3. Verify that the USB cable between the demo board and the PC is securely connected. This connection is critical because the USB port not only serves as a communication channel between the PC and the board, but also provides voltages and references to some onboard circuits.
4. Switch SW1 from the middle position to the left position 1-2 to connect VBAT to the 12 V supply.
5. If power is connected to J3, switch SW1 from the middle position to the right position 2-3.

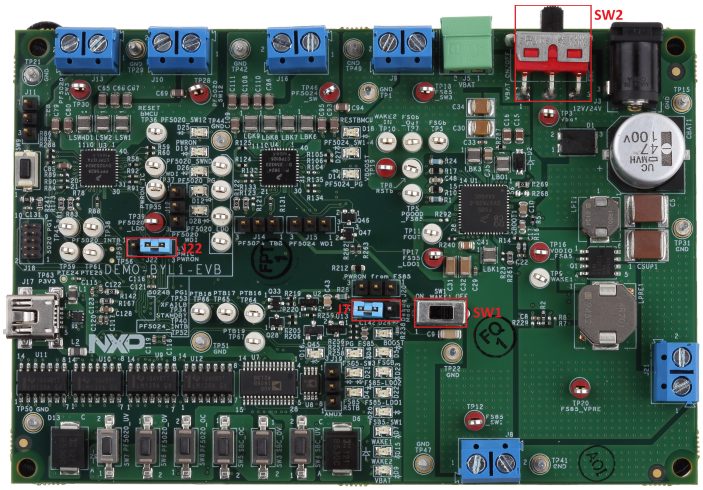

Figure 2. BYLink demo board picture

7 References

[1] Detailed information on BYlink — https://www.nxp.com/products/product-information/product-programs/bylink-system-power-platform:BYLINKI

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.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental damage. NXP Semiconductors and its suppliers accept no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

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.

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.

Suitability for use in non-automotive qualified products — Unless this data sheet expressly states that this specific NXP Semiconductors product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. NXP Semiconductors accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without NXP Semiconductors' warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond NXP Semiconductors' specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies NXP Semiconductors for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond NXP Semiconductors' standard warranty and NXP Semiconductors' product specifications.

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.

Tables

Tab. 1. Jumper and switch details 4

Figures

Fig. 1. Jumper and switch details 4

Fig. 2. BYLink demo board picture 6

Contents

1 Introduction 2
2 Finding kit resources and information on the NXP website 2
2.1 Collaborate in the NXP community 2
3 Getting ready 2
3.1 Kit contents 2
3.2 Additional hardware 2
3.3 Windows PC workstation 2
3.4 Software 3
4 Getting to know the hardware 3
4.1 Kit overview 3
4.2 BYLink multiprocessor demo board features 3
4.3 BYLink multiprocessor demo board featured components 3
4.4 Schematic, board layout and bill of materials 5
5 Installing and configuring software and tools 5
6 Setting up and running the BYLink Multiprocessor demo board 5
6.1 Setting and starting up the board 5
7 References 6
8 Legal information 7

For more information, please visit: http://www.nxp.com
For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 7 April 2022
Document identifier: UM11768