Z8F32240100ZCOG

Z8 Encore! XP® F3224 Series Development Kit

User Manual

⚠️ **Warning:** DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

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Document Disclaimer

Overview

This document describes the features of the Z8 Encore! XP F3224 Series Development Kit (Z8F32240100ZCOG) and provides instructions to setup the hardware and to install the software drivers and development tools needed to start building applications.

The development board features the Z8F3224 MCU with 32KB internal Flash in a 44-pin QFN package operating at 20MHz. Z8F3224 serial peripheral devices (SPI, I2C, UART) can be used to interface with the 64Mb serial Flash (SPI) and optical sensor (I2C) available on the development board, or external devices (header pins).   Refer to the Z8 Encore! XP® F3224 Series Product Specification (PS0381) available for download at www.zilog.com for information on these and other F3224 peripheral devices.

Subsequent sections of this document guide you through the following tasks:

- Download and Install the ZDS II Software and Documentation – see page 4
  - Installing the Encore! Smart Cable Driver – see Appendix B. Installing the Encore! Smart Cable Driver on page 16
- Connect F3224 Series Dev Board to PC – see page 5
- Start Z8F3224 Demonstration Program – see page 7

Further details, including memory configurations, jumper settings, and a listing of sample projects can be found in the Z8F3224 Sample Projects section on page 12.

Figure 1 shows an image of the F3224 Series Development Kit.

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Figure 1. The F3224 Series Development Kit

Kit Contents

Table 1 lists the contents of the F3224 Series Development Kit.

Table 1. Z8F32240100ZCOG Contents

Item	Description	Quantity
1	F3224 Series Development Board	1
2	Encore! Smart Cable	1
3	6-wire ribbon cable	1
4	A (male) to Mini-B USB cable	2
5	F3224 Series Development Kit Flyer (FL0193)	1

Kit Features

The key features of the F3224 Series Development Kit are:

- F3224 Series Development Board, which includes:
    - Z8F3224QN020XK MCU in 44-pin QFN package operating at 20 MHz
    - UART port J3
    - Test points and headers
    - Four LEDs (Power and Port Display)
    - Two pushbuttons (Reset and Test)
    - Smart Cable Debug Interface J5
- Encore! Smart Cable (ESC)
- ZDS II development tools, sample projects, and documentation available free for download

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System Requirements

The F3224 Series Development Board supports the following operating systems:

- Microsoft Windows 7, (32-bit/64-bit)

- Microsoft Windows 8 (32-bit/64-bit)

- Microsoft Windows 10 (32-bit/64-bit)

Download and Install ZDSII SW and Docs

Observe the following steps to install ZDS II software and documentation.

Note: If you have already downloaded and installed the ZDS II – Z8 Encore! <version> development tools and documentation by following the procedure on the paper insert in your kit (FL0193), then you're ready for Appendix B. Installing the Encore! Smart Cable Driver on page 16.

1. Prior to connecting the Z8 Encore! XP F3224 Series Development Board to your development PC, download ZDS II for Z8 Encore! v5.6.0 (or later) from the Zilog Software Downloads category in the Zilog website.

2. When your download is complete, unzip the file to your local drive, then double-click the installation file named `ZDS2_Z8Encore!_<version>.exe`, and follow the on-screen instructions.

3. When the ZDS II installation is complete, click the supporting documentation link on Zilog Software Downloads. This will download the documentation installer as a ZIP file. Unzip and double click on `docs_Z8Encore!_<version>.exe` and follow the on-screen instructions.

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Connect F3224 Series Dev Board to PC

Observe the following procedure to connect the F3224 Series Development Board to your PC.

⚠**Caution**:   The USB Smart Cable can be configured to supply power to the F3224 Series Development Board, or an external power source may be used to power the board. When external power is used, be sure to disconnect or turn off the external power source before connecting or disconnecting the Encore! Smart Cable from the development board.

1. Connect one end of the ribbon cable to the Encore! Smart Cable ensuring the ridge on the ribbon cable's female connector is aligned with the notch in the shrouded male connector on the Smart Cable as shown in Figure 2.

Figure 2. Connecting the 6-Circuit Ribbon Cable to the Encore! SmartCable

2. Connect the other end of the ribbon cable to Debug Connector J5 on the Development Board. Ensure that Pin 1 on the ribbon cable (red stripe) is aligned with Pin 1 on the target connector (square pad), as highlighted in Figure 3.

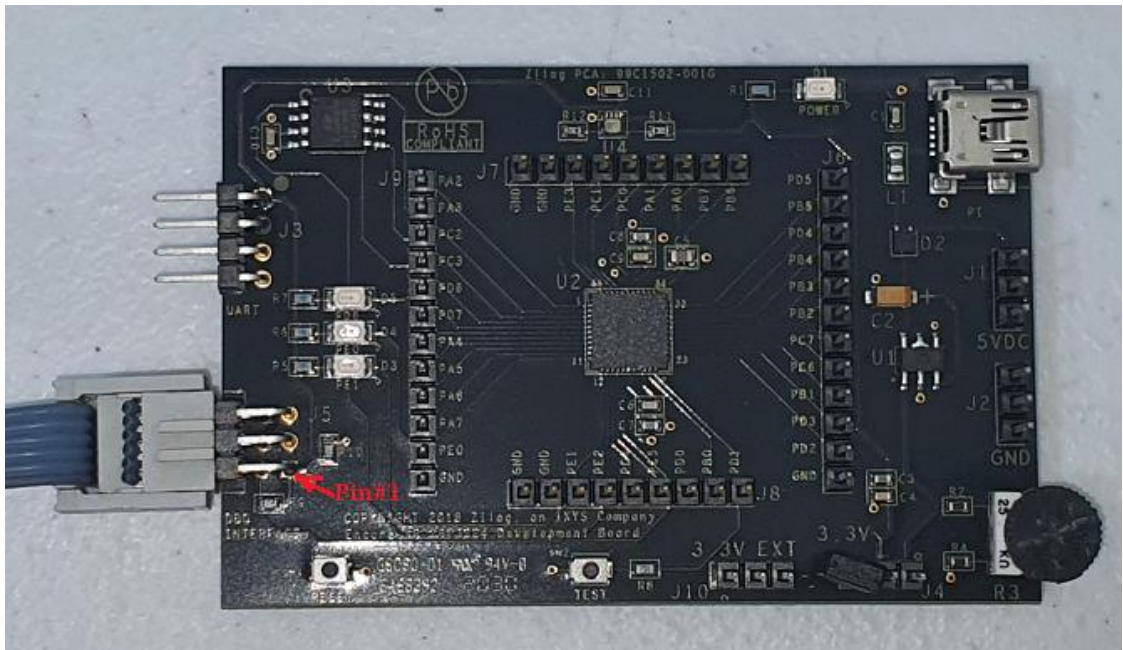**Z8 Encore! XP® F3224 Series Development Kit**
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Figure 3. Debug Connector J5

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Start Z8F3224 Demonstration Program

The F3224 Series Development Kit includes a sample program that demonstrates a blinking LED application with a UART console. An optional terminal emulation program and a 3rd Party USB to TTL Serial converter (not supplied) maybe used to display the messages and send characters to the application.   In this instance, the terminal program must be configured for 57600-8-N-1 with no flow control, as described in the Terminal Emulation Configuration section on page 10. To get started with the Z8F3224 demonstration, observe the following procedure.

1. Launch ZDS II by navigating from the Windows Start menu to **Programs → Zilog ZDS II – Z8 Encore! <version> → ZDS II – Z8 Encore! <version>**.

2. From the File menu in ZDS II, select **Open Project** and navigate to the following folder:

    `<ZDS Install>\samples\XP_F3224\XP_F3224_LedBlink_C`

3. Select the `ledblink.zdsproj` project from within the `XP_F3224_LedBlink_C` folder and click **Open.**

4. From the **Build** menu, select **Set Active Configuration** to open the Select Configuration dialog box.

5. Select **Debug**, then click **OK** to close the Select Configuration dialog box.

6. From the Project menu in ZDS II, select **Settings** to open the Project Settings dialog box. In the Project Settings dialog box, click the **Debugger** tab.

7. On the Debugger page, select **Z8F32240100ZCOG** from the Target list, then select **EncoreSmartCable** from the Debug Tool drop-down menu, as shown in Figure 4.
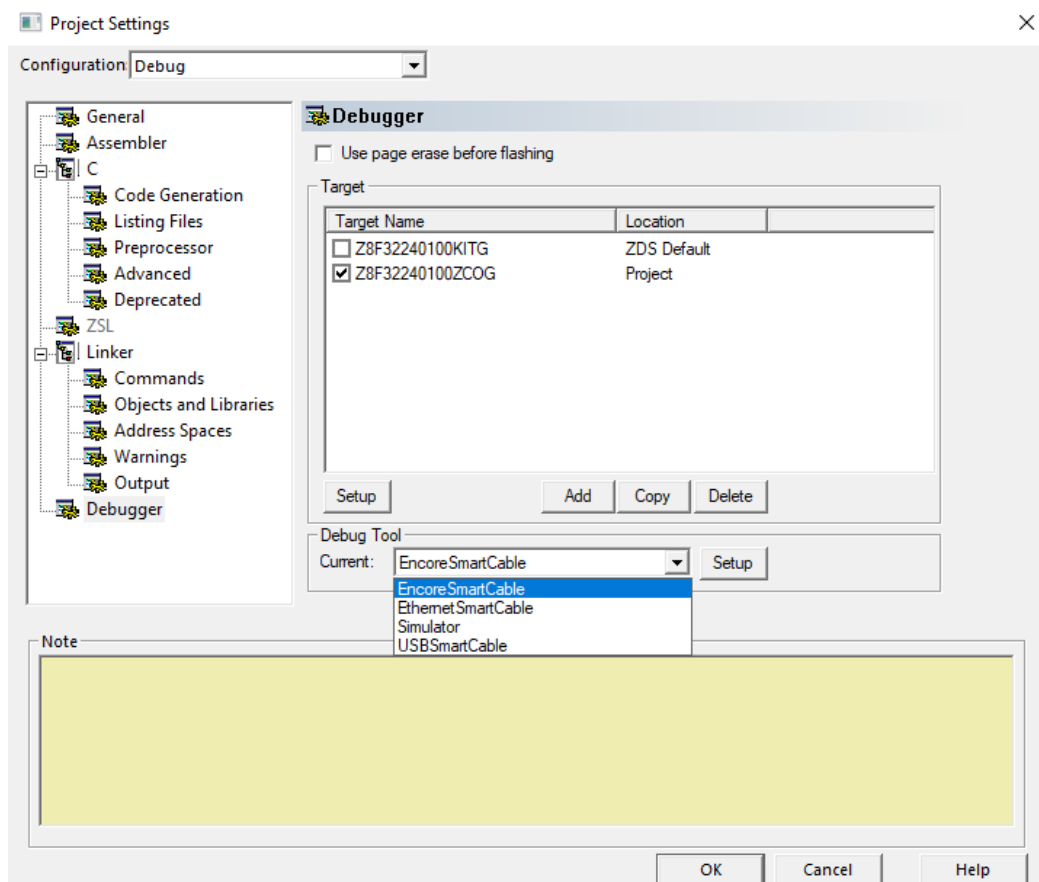
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Figure 4. Select Z8F32240100ZCOG and EncoreSmartCable

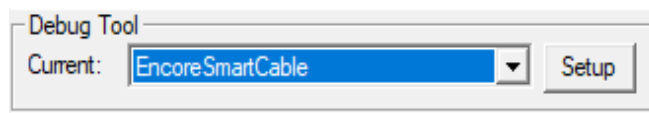8. Click Setup on Figure 5 below to open the Setup USB Communication dialog.

Figure 5. Setup EncoreSmartCable

9. Verify that a Serial Number is displayed in the Setup USB Communication dialog as shown in Figure 6. If multiple Encore! Smart Cables are connected to the PC, click the chevron to display the serial number of each Smart Cables and select which to use when programming or debugging the target. If no serial numbers are displayed, verify that the Encore! Smart Cable is attached to the PC and see Appendix B. Installing the Encore! Smart Cable Driver for instructions on installing the necessary device drivers.

Figure 6. Setup USB Communication

10. Click OK on the Setup USB Communication above and on the Project Settings dialog box.

11. If you are prompted to rebuild any affected files, click **Yes**. Otherwise, choose **Build** from the menu bar, then click **Rebuild All.**

12. To run the application, select **Go** from the Debug menu. As a result, LEDs D3, D4, and D5 will blink in sequence.

13. After the application has started, UART output should be visible in the terminal application program, as shown in Figure 7.

Figure 7. UART Output Using Terminal Application program

Terminal Emulation Configuration

A communications program such as HyperTerminal or TeraTerm can be used on Windows systems to view messages from the F3224 Series Development Board. The following procedure examines how to configure TeraTerm for the Z8F3224 demonstration project.

1. Connect a 3rd Party USB to TTL Serial converter to J3 on the Development Board using the following connections.

Table 2. USB to TTL Serial converter connection

Z8F3224 Board	USB to TTL Serial Converter
J3-1 VCC	3.3V
J3-2 RXD	TXD
J3-3 TXD	RXD
J3-4 GND	GND

2. Connect the other end to your PC.

3. In TeraTerm, choose **Setup >Serial Port** then, if your PC has a serial interface, select the COM port assigned to your serial port. If you do not have a serial port on your PC, use a USB-to-serial adapter (not included in the kit).

4. From the Windows Control Panel, navigate via the **Device Manager** to **Ports (COM & LPT)** to determine the correct COM port assigned to your adapter. Configure this port to reflect the following settings:

> – 57600 bps
> – 8 data bits
> – No parity
> – 1 stop bit
> – No flow control

5. In TeraTerm, click the **New Setting** button to connect to the F3224 Series Development Board. When connected, you should be able to see the demonstration program menu shown in .

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ZDSII Flash Loader Utility

A Flash Loader utility can be accessed from the Tools menu in Zilog Developer Studio. With the Flash Loader, you can program the Z8F3224 MCU directly using the hex code generated from the ZDS II IDE Figure 8 presents an example.
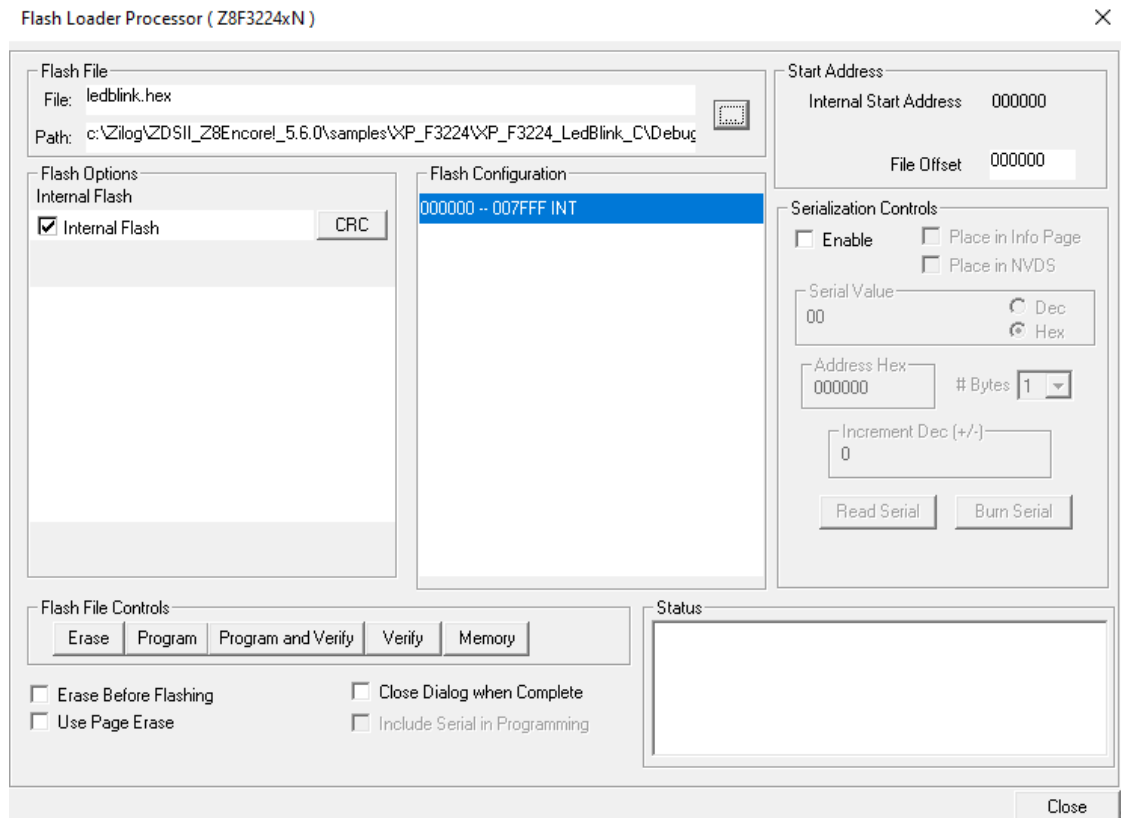

Figure 8. An Example Flash Loader Screen

Z8F3224 Sample Projects

A number of sample projects are included with the ZDS II – Z8 Encore! v5.6.0 software, which can be downloaded for free from the Zilog website. These sample projects will be accessible upon installation of ZDS II – Z8 Encore! v5.6.0; their locations are listed in Table 3.

Table 3. Z8F3224 MCU Sample Projects

Description	Installed Location
ledblink	\samples\XP_F3224\XP_F3224_LedBlink_C
	\samples\XP_F3224\XP_F3224_LedBlink_asm
SerialFlash	\samples\XP_F3224\XP_F3224_SerialFlash

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There is an LED on the top side of the ESC enclosure. When ESC is powered up, it shines steady yellow light to indicate that power is on and that the device was recognised by USB host and enabled to be used as USB device. If host was unable to enumerate the ESC the LED will stay off.

Table 4. F3224 Series Development Kit Documentation

Description	Document ID	Installed Location
F3224 Series Product Specification	PS0381	Documentation\Chip_Documentation
F3224 Series Development Kit User Manual	UM0291	Documentation\Tools_Documentation
eZ8 CPU User Manual	UM0128	Documentation\Chip_Documentation
Z8 Encore! Design for Debug	TN0036	Documentation\Tools_Documentation
Encore! Smart Cable User Manual	UM0294	Documentation\Tools_Documentation
USB SmartCable User Manual	UM0181	Documentation\Tools_Documentation
Opto-Isolated USB SmartCable User Manual	UM0195	Documentation\Tools_Documentation
Ethernet SmartCable User Manual	UM0207	Documentation\Tools_Documentation

Appendix A
Schematic Diagrams

Figures 9 through 10 present schematic diagrams of the F3224 Series Development Board.
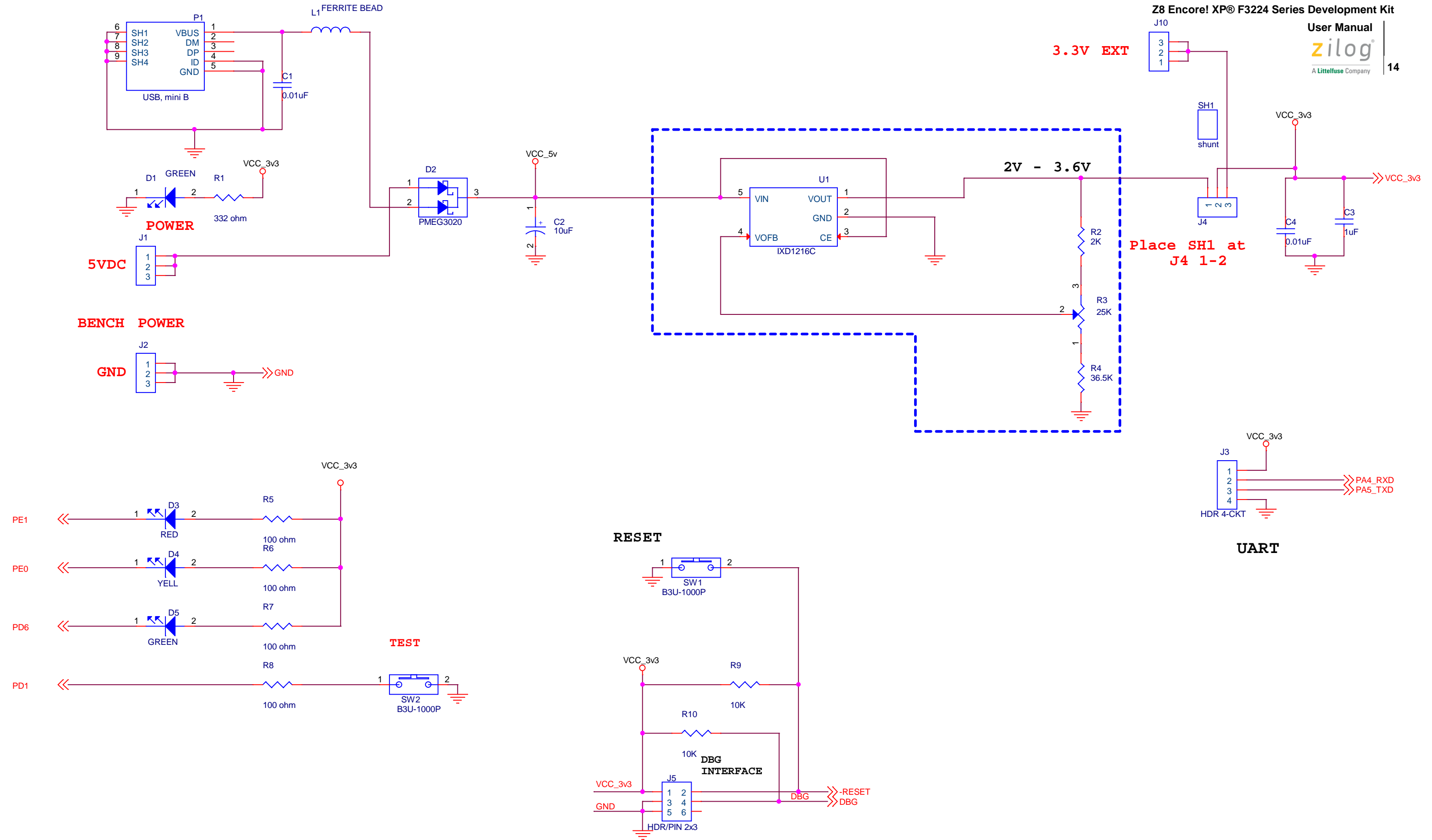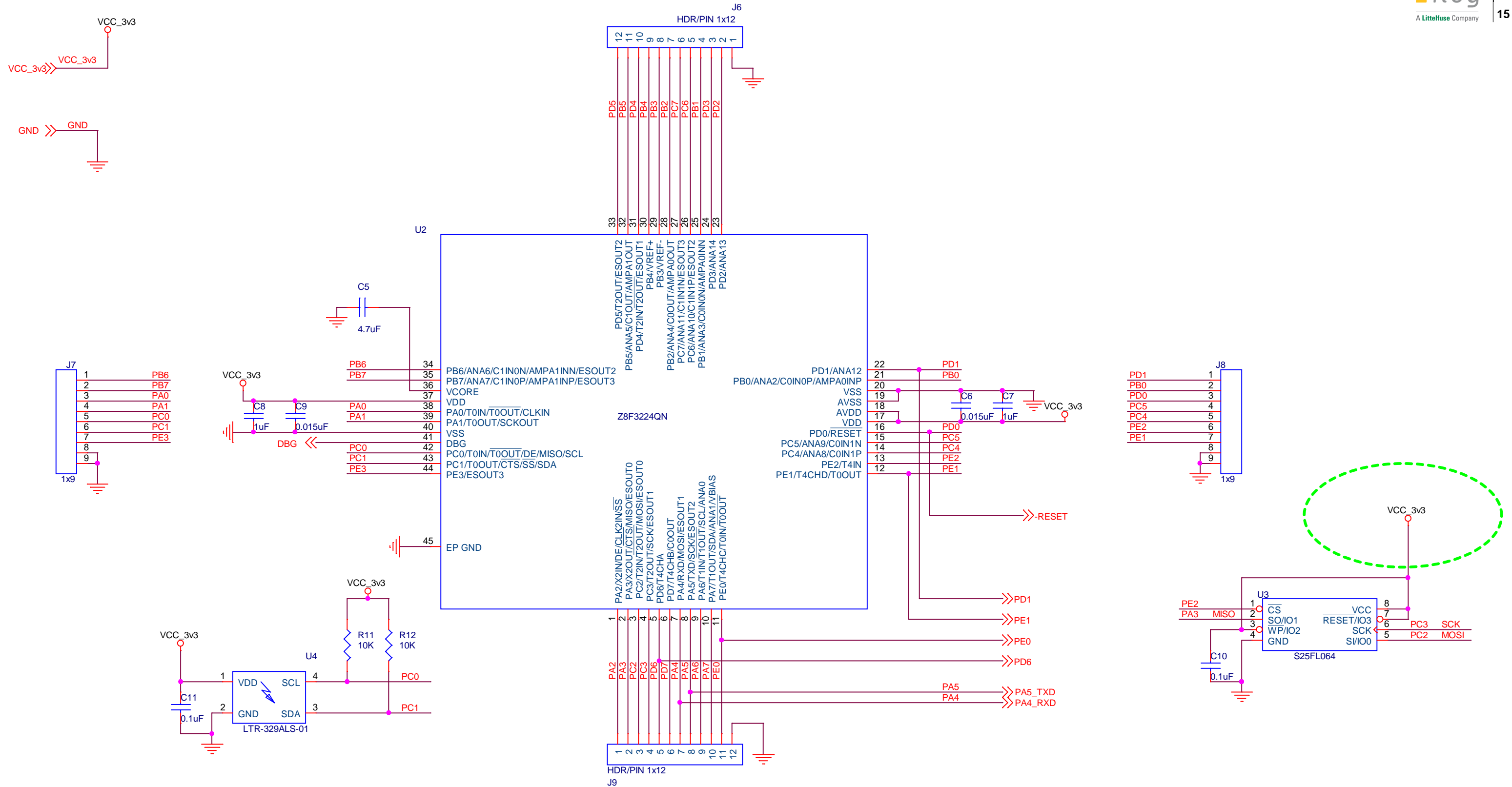
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Figure 9

Figure 10

Appendix B
Installing the Encore! SmartCable Driver

Note: You might have done the driver installation on ZDSII – Z8 Encore! 5.6.0 installation, when the check box is selected on below screen shot and clicked **Finish**. If so, you don't need to do the following below steps, but there is no harm proceeding

1. Navigate to Start >All Programs >ZiLOG ZDSII – Z8 Encore! 5.6.0

2. Right click on Install Encore! SmartCable Driver and select Run as administrator

3. Click on **Yes** button on the User Account Control prompt that appears

4. Click on **Yes** button on the Encore! SmartCable Driver Installation prompt to install the driver software

5. Select **Next** button that appears

6. Select the **Finish** button

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Revision History

Each instance in this document's revision history reflects a change from its previous edition. For more details, refer to the corresponding page(s) or appropriate links furnished in the table below.

Date	Revision Level	Description	Page
Apr 2021	01	Original issue.	All

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