

LANTRONIX®



xPico® Wi-Fi® Shield User Guide

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Revision History

Date	Rev.	Comments
April 2014	A	Initial Document.
April 2014	B	Updated product name.

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1: Introduction

About this User Guide

This user guide provides the information needed to use the Lantronix® xPico® Wi-Fi® Shield to connect to an xPico Wi-Fi embedded device server to an Arduino® microcomputer board, and is intended for engineers who are responsible for including the xPico Wi-Fi devices with their product.

Additional Documentation

Visit the Lantronix web site at www.lantronix.com/support/documentation for the latest documentation and the following additional documentation.

Document	Description
<i>xPico Wi-Fi Shield Quick Start Guide</i>	Instructions for getting the xPico Wi-Fi module up and running on the Arduino computer board.
<i>xPico Wi-Fi Embedded Device Server Product Brief</i>	Provides a quick reference to xPico Wi-Fi technical specifications.
<i>xPico Wi-Fi Embedded Device Server User Guide</i>	Provides information needed to configure, use, and build applications on the xPico Wi-Fi unit.
<i>xPico Wi-Fi Shield Application Note</i>	Provides example software for use with the Arduino computer boards.
<i>xPico Integration Guide</i>	Provides hardware development requirements for integrating an xPico Wi-Fi module into a new board design.

2: xPico Wi-Fi Shield

The Lantronix xPico Wi-Fi Shield (part number XPCW1001000AR-K) is an Arduino compatible expansion module that can help you quickly prototype a design using Wi-Fi with an Arduino computer board.

Wi-Fi Kit Contents

- W xPico Wi-Fi Module
- W xPico Wi-Fi Shield
- W 2 dBi Swivel Type Antenna

xPico Wi-Fi Shield Description

The Lantronix xPico Wi-Fi Shield expansion module provides a simple means to add a feature rich and low power xPico Wi-Fi module to an Arduino computer board.

The Lantronix xPico Wi-Fi Shield uses power supplied by the Arduino computer board. The module board includes all necessary regulators to power the 3.3V xPico Wi-Fi module. The Lantronix xPico Wi-Fi Shield has the following features:

- W One serial port connected to the Arduino computer board
- W One mini-type B USB device port with an integrated USB-to-serial converter. The USB-to-serial converter can be connected to the xPico Wi-Fi module's second serial port via a board jumper setting.
- W A second mini-type B USB device port is available for direct connection to the xPico Wi-Fi device port.

Note: *The USB device port function will be enabled on a future firmware release.*

- W Access to all logic level IO signals on the xPico Wi-Fi device via header pins

The Lantronix xPico Wi-Fi Shield is a true IEEE 802.11 b/g/n-compliant solution that interoperates with other b and n type devices without impacting network operation.

Another benefit of the Lantronix xPico Wi-Fi Shield is that it simplifies code development by not requiring the use of the Arduino Wi-Fi software libraries as the connection manager is built into the device.

The figure below shows the xPico Wi-Fi Shield, and highlights all of the various connectors and configuration jumpers. The following table lists each of the connectors and jumper headers along with their function. Further description and pin assignments are included in subsequent sections.

Figure 2-1 xPico Wi-Fi Shield Connectors and Jumpers

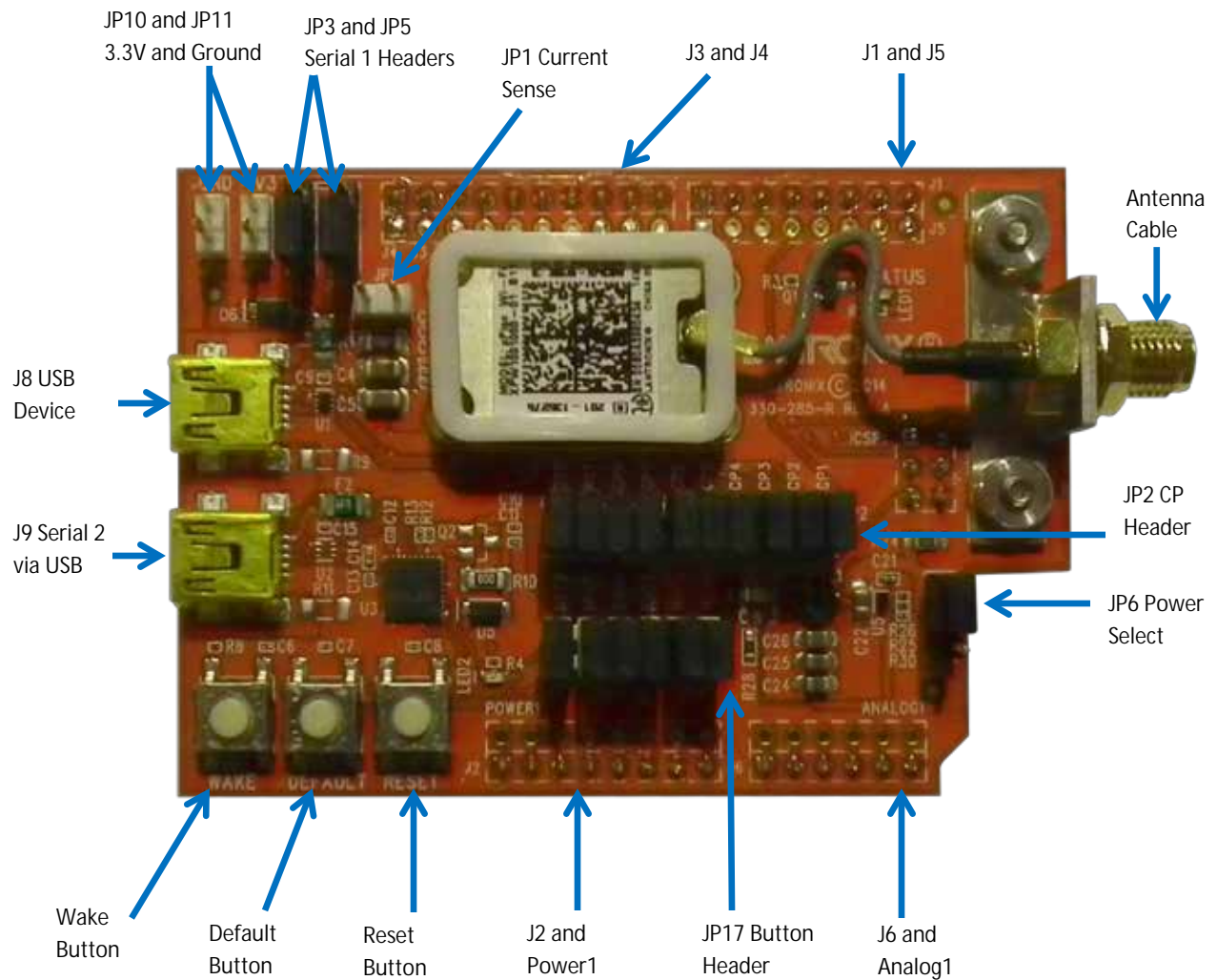


Table 2-1 xPico Wi-Fi Shield Connectors, Header and Switches

JP	Position	Label	Function	Default
J7			xPico module socket.	
J8			Mini USB Type B connects to the xPico module USB device port. Note device port will be enabled on a future software release.	
J9			Mini USB Type B connects to the xPico module serial port 2 through a USB to serial converter and the JP17 jumper headers.	
JP1	1-2	UUT PWR	Connects to 0.301 ohm current sense resistor R1. Measure voltage on JP1 to calculate module power	Uninstalled

JP	Position	Label	Function	Default
JP17	1-2	WLAN LED	Install to use WLAN LED	Installed
JP17	3-4	WAKE	Install to use wake-up input and button, SW1	Installed
JP17	5-6	RXD2	Install to route xPico Wi-Fi module second serial port to J9 via the on board USB to serial converter	Installed
JP17	7-8	TXD2	Install to route xPico Wi-Fi module second serial port to J9 via the on board USB to serial converter	Installed
JP17	9-10	DEFAULT S	Install to use Defaults input and button, SW2	Installed
JP17	11-12	RESET	Install to use Hardware Reset input and button, SW3	Installed
JP3	2-3	TX	Install position 2-3 to connect xPico module TXD1 to Arduino computer board serial RX. Install position 1-2 to connect xPico module RXD1 to Arduino computer board serial RX.	Installed
JP5	2-3	RX	Install position 2-3 to connect xPico module RXD1 to Arduino computer board serial TX. Install position 1-2 to connect xPico module TXD1 to Arduino computer board serial TX.	Installed
JP2	1-2	CP1	Breakout header for CP1, pin 2 does not connect anywhere else on the board.	Installed
JP2	3-4	CP2	Breakout header for CP2	Installed
JP2	5-6	CP3	Breakout header for CP3	Installed
JP2	7-8	CP4	Breakout header for CP4	Installed
JP2	9-10	CP5	Breakout header for CP5	Installed
JP2	11-12	CP6	Breakout header for CP6	Installed
JP2	13-14	CP7	Breakout header for CP7	Installed
JP2	15-16	CP8	Breakout header for CP8	Installed
JP2	17-18	RTS1	Header for RTS1, pin 18 does not connect anywhere else on the board.	Installed
JP2	19-20	CTS1	Header for CTS1, pin 20 does not connect anywhere else on the board.	Installed
JP6	1-2	Power	Install pins 1-2 to power shield board from Arduino computer board	Installed
JP10	1-2	3.3V	3.3V power generated by the on board regulator	Not installed

JP	Position	Label	Function	Default
JP11	1-2	GND	Board signal ground.	Not installed
J3, J1, J6, J2, ICSP1			Connectors to mate to Arduino computer board. See schematic below.	
J4, J5, Analog1, Power1,			Test point through hole pads for Arduino computer board mating connectors. See schematic below.	

Serial Port 1

Serial port 1 of the xPico Wi-Fi embedded device server has the signals TXD1, RXD1. These signals are connected to the serial port on the Arduino computer board. Jumpers JP3 through JP5 allow you to change whether the xPico Wi-Fi module is DTE or DCE. If the xPico Wi-Fi module is connected to an MCU board, the jumpers should be connected 2-3. The RTS1 and CTS1 signals connect to header JP2, but do not connect to the Arduino computer board.

xPico Wi-Fi Pin	Arduino Pin JP3,JP5: 2-3	Arduino Pin JP3,JP5:1-2
RXD1 (7)	TX1 (J1 pin 2)	RX1 (J1 pin 1)
TXD1 (10)	RX1 (J1 pin 1)	TX1 (J1 pin 2)

Serial Port 2

Serial port 2 of the xPico Wi-Fi device has the signals TXD2 and RXD2. These signals go through jumpers JP17 pins 5 to 6 and 7 to 8. If the jumpers are installed the serial port is routed to an on-board USB to serial converter, which then connects to USB connector J9 on the board.

In order to access the unit through the J9 USB port, you will need to install the USB-to-serial VCP driver from FTDI on your PC. It is available in the installation directory of the Lantronix® DeviceInstaller™ utility, 4.3.0.2 and later versions, for installation. It can also be obtained from the FTDI website provided below. Once installed, you will be able to view the xPico boot messages as well as provide command inputs through any PC terminal program, such as Tera Term.

Download FTDI USB-to-serial drivers at this website: <http://www.ftdichip.com/Drivers/VCP.htm>

Antenna Port

The xPico Wi-Fi Shield includes a bracket for mounting the U.FL to reverse polarity SMA RF cable included with the kit. Follow the procedure below when installing the antenna cable.

- w Connect the U.FL cable to the module
- w Place the plastic retaining clip over the module
- w Install the module into the socket.
- w Install the external antenna to the SMA end of the RF cable.

Note: Install or remove the module and antenna connections only while the module is powered off.

Power Supply

The Lantronix xPico Wi-Fi Shield is powered from the Arduino computer board when a jumper is installed to JP6 position 1 to 2. There is an option to power the board from the USB connectors when the board is run stand alone. If the board is run stand alone with no mating computer board, install the jumper on JP6 to position 2-3.

LEDs

The xPico Wi-Fi Shield includes several LEDs for signal and unit status. The table below lists all of the LEDs and their functions.

Table 2-2 LEDs Signals

LED	Function
LED1/STATUS	Orange: LED blinks with patterns indicating module status. See the <i>xPico Wi-Fi Embedded Device Server User Guide</i> for a full description of the status LED blink patterns
LED2/LINK JP17 1-2	Orange: LED is ON when the device is associated with an access point (on the STA interface.)
LED8/POWER	Blue: 3.3V Power is on

USB

There are two USB connectors on the xPico Wi-Fi Shield. The J9 connector connects to xPico Wi-Fi module serial port 2 via a USB to serial converter.

The xPico Wi-Fi has a USB device-side port that is connected to J8.

The USB device port will be enabled with a future firmware update.

SPI and CP

The SPI and CP pins can be connected to the Arduino computer board with the jumpers on JP2. Please refer to the *xPico Wi-Fi Embedded Device Server User Guide* for details on how to use the SPI and CP ports.

The connections to the Arduino computer board are as show in the following table:

xPico Wi-Fi Pin	JP2 Jumper	Arduino Pin
CP1 (35)	1-2	None
CP2/SPI INT# (26)	3-4	J5 pin 4
CP3/SPI MISO (28)	5-6	ICSP1 pin 1
CP4/SPI_MOSI (30)	7-8	ICSP1 pin 4
CP5 (32)	9-10	J3-J4 pin 9
CP6 (34)	11-12	J3-J4 pin 10

xPico Wi-Fi Pin	JP2 Jumper	Arduino Pin
CP7/SPI_SCK (27)	13-14	ICSP pin 3
CP8/SPI_CS (3)	15-16	J3-J4 pin 3
RTS1 (5)	17-18	None
CTS1 (16)	19-20	None

xPico Wi-Fi Shield Schematic

Figure 2-2 xPico Wi-Fi Shield Schematic (1 of 6)

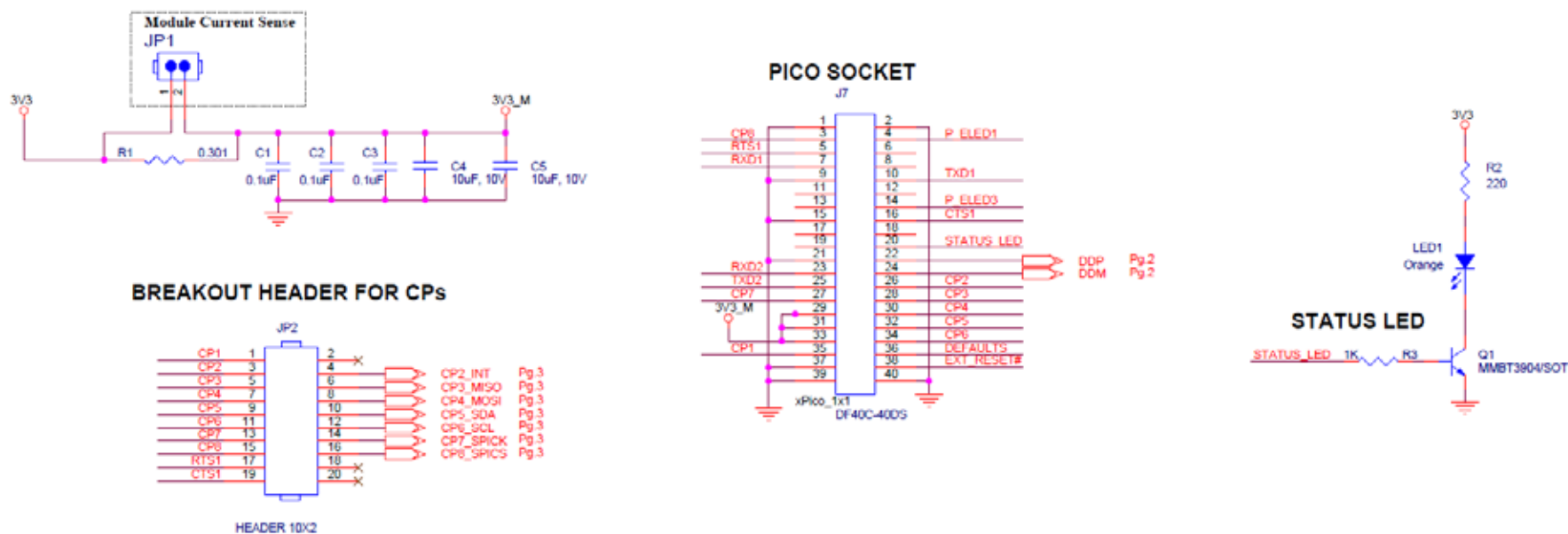


Figure 2-3 xPico Wi-Fi Shield Schematic (2 of 6)

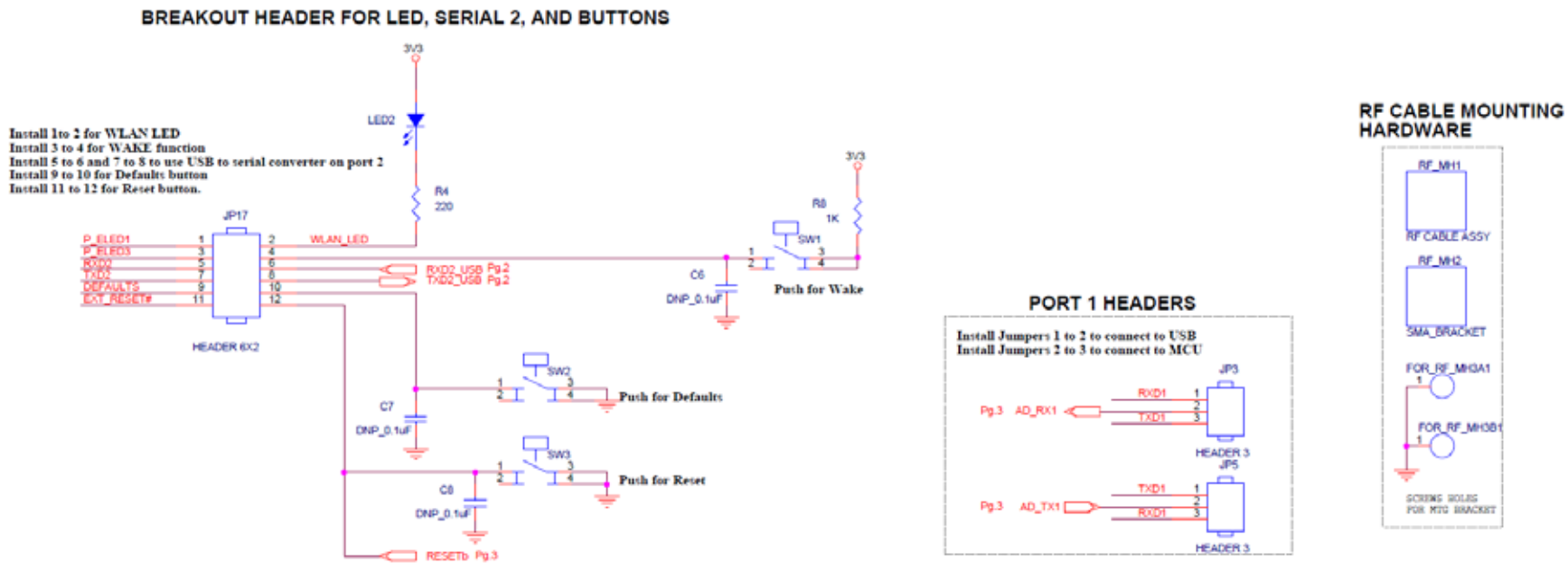


Figure 2-4 xPico Wi-Fi Shield Schematic (3 of 6)

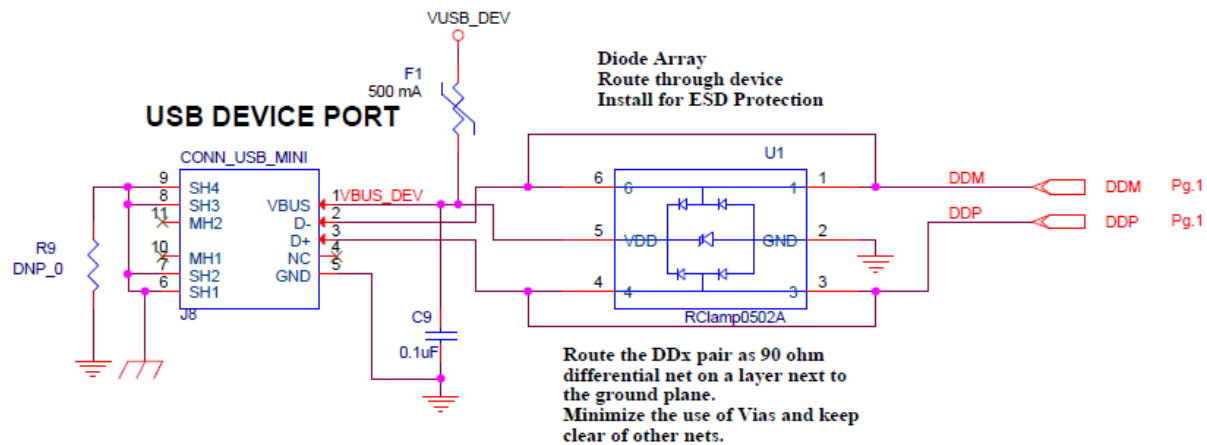


Figure 2-5 xPico Wi-Fi Shield Schematic (4 of 6)

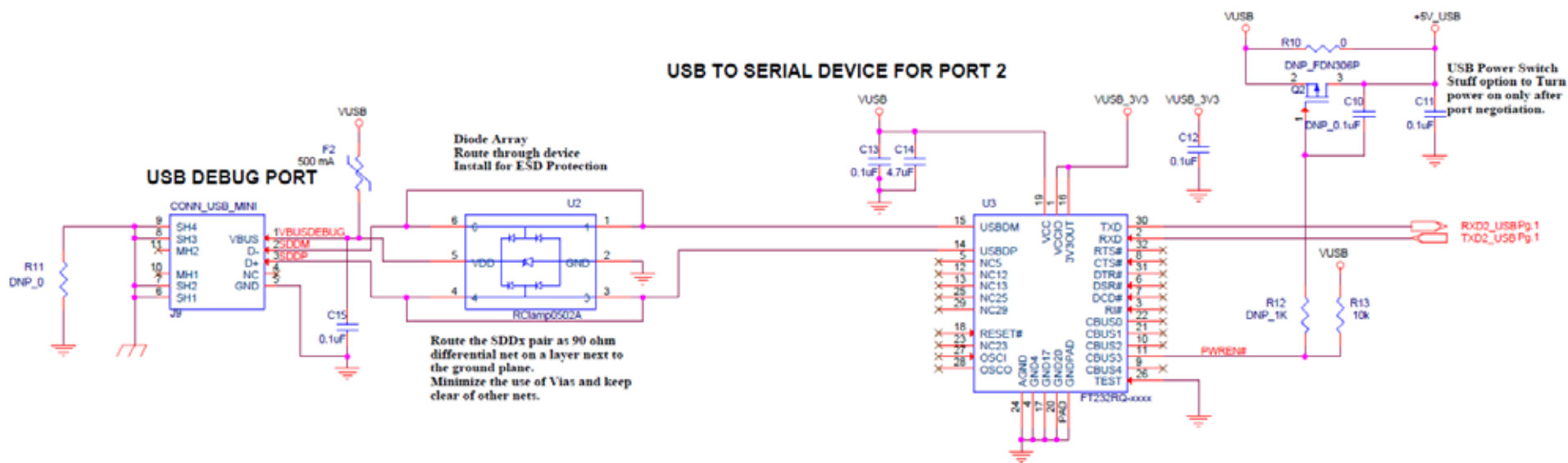


Figure 2-6 xPico Wi-Fi Shield Schematic (5 of 6)

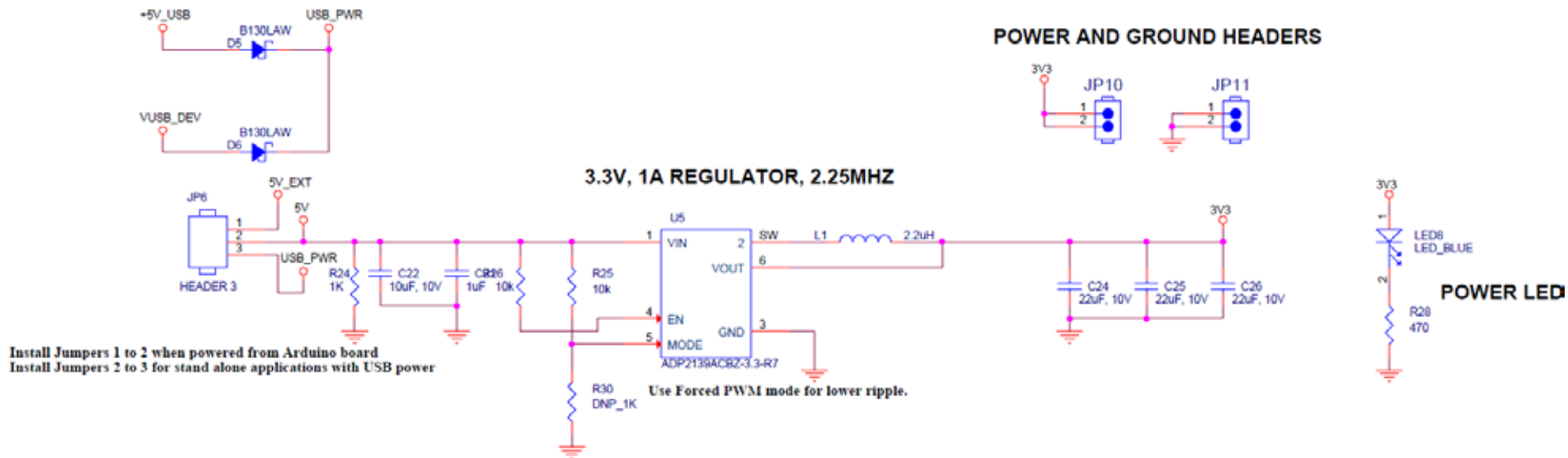


Figure 2-7 xPico Wi-Fi Shield Schematic (6 of 6)

