A New Direction in Mixed-Signal

Introduction

This user's manual is for the XR21B1424IV64-0A-EVB evaluation board. The XR21B1424IV64-F shares a common evaluation board with the XR21B1422IL40-F. The main difference between the XR21B1424IV64-F and the XR21B1422IL40-F is the number of UART channels. The XR21B1424IV64-F has 4 UART channels. The XR21B1422IL40-F has 2 UART channels. The only USB UART device installed on the XR21B1424IV64-0A-EVB evaluation board is the XR21B1424IV64-F.

Table 1: Evaluation Board Ordering Part Numbers

Device Ordering Part Number	Evaluation Board Ordering Part Number	Device Package	Device Location
XR21B1424IV64-F	XR21B1424IV64-0A-EVB	64-pin LQFP	U7
XR21B1422IL40-F	XR21B1422IL40-0A-EVB	40-pin QFN	U6

Evaluation Board Overview

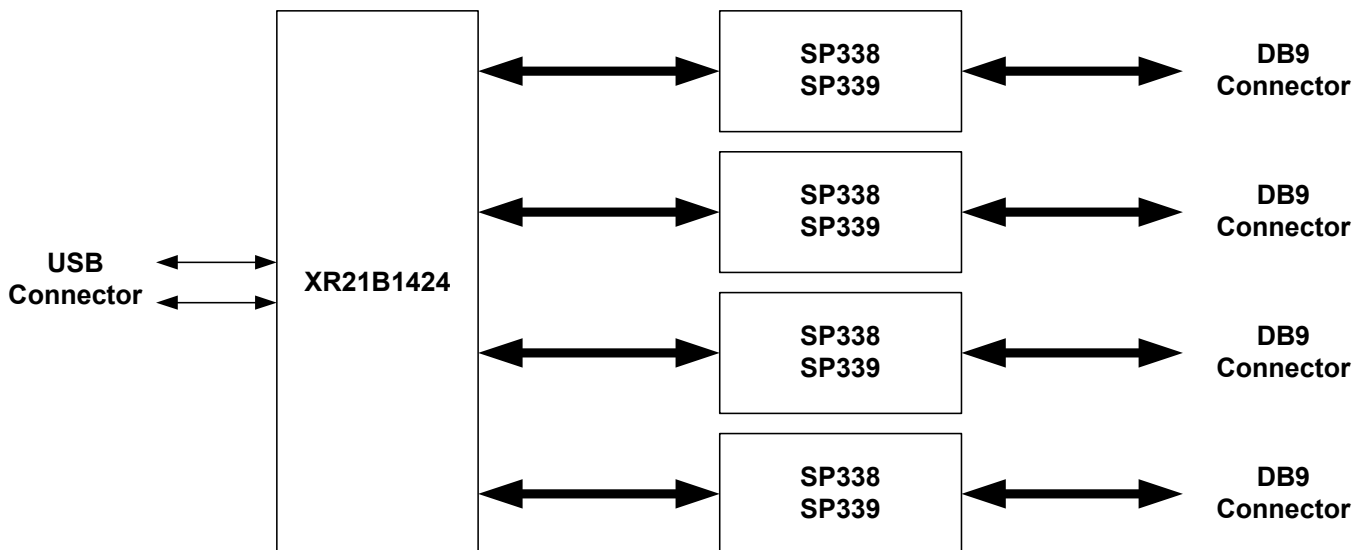A block diagram of the evaluation board is shown in Figure 1 below.

Figure 1: Evaluation Board Block Diagram

In addition to the XR21B1424IV64-F, there are Exar SP339 Multiprotocol transceivers on this evaluation board. The SP339 can be configured for Loopback, RS-232, Half-Duplex RS-485 or Full-Duplex RS-485/422 Modes. The default setting when shipped from the factory is RS-232 mode.

Figure 2 on the next page show the top view and bottom view of the evaluation board with all of the components, connectors and headers labeled. A higher resolution PDF file for the top and bottom views are also included on the CD that is shipped with the evaluation board.
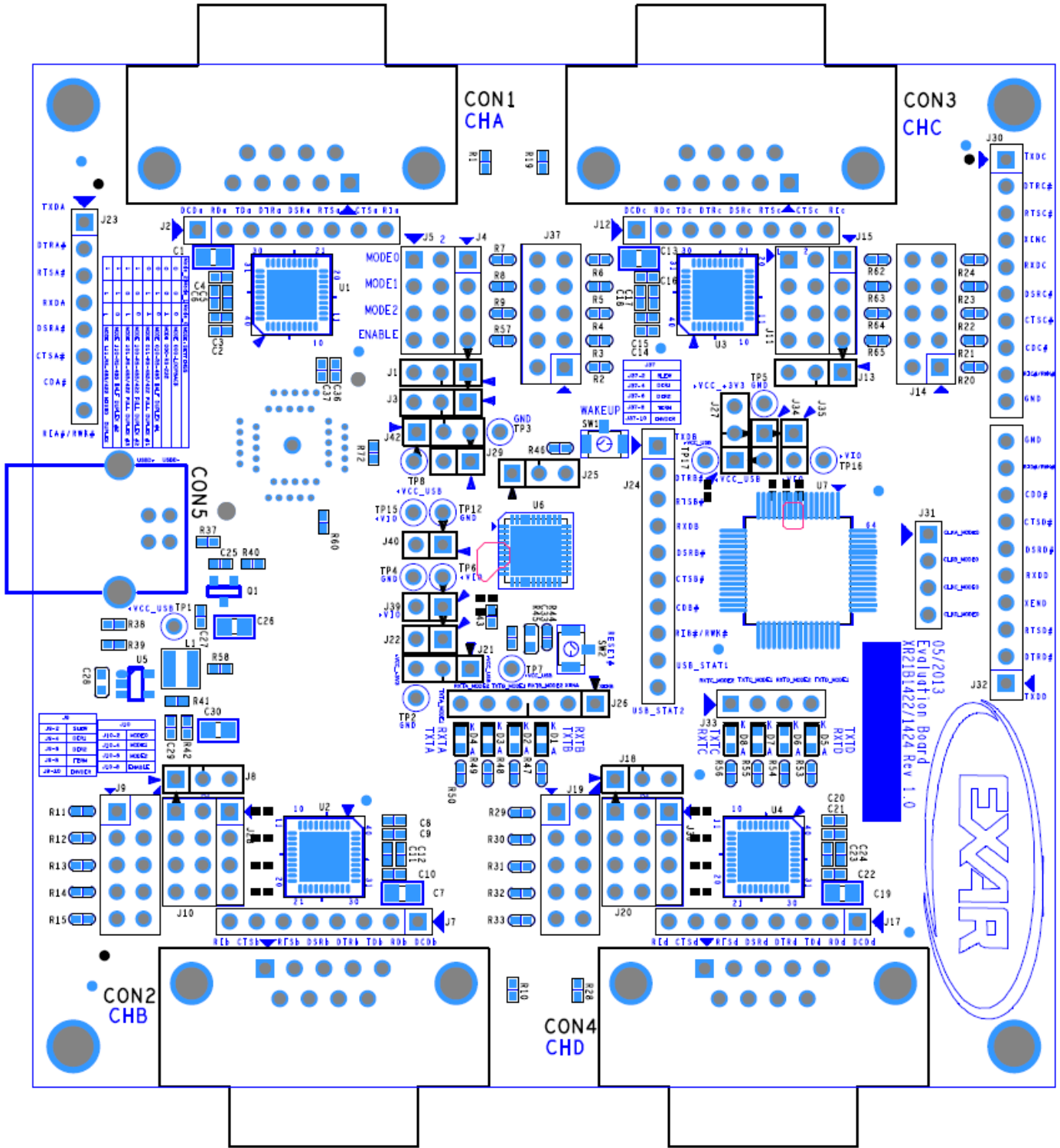
exar.com/XR21B1421
Rev 1A

Figure 2: Top View of Evaluation Board

Hardware Configurations

This sections describes the default settings when shipped from the factory and the requirements for changing modes.

XR21B1424 Power Configurations

When shipped from the factory, the XR21B1424 is configured for bus-powered mode and uses the 5V from the USB VBUS pin. The default jumper settings are shown in Table 2.

Table 2: Default Jumper Settings

Jumper Setting	Description
J27 - 1 & 2	Connects 5V from VBUS to VCC_REG (pin 13). A regulated 3.3V output will be available on the VCC pin (pin 12).
J35 - 1 & 2	Connects regulated 3.3V from VCC pin to VIO. The output voltage of the UART/GPIO pins will be 3.3V.

If not using the 5V from VBUS, an external 3.3V can be supplied to VCC_REG via J27 pin 2.

GPIO Configurations

GPIOA0/RIA#/RWKA#

When shipped from the factory, the GPIOA0/RIA#/RWKA# pin is connected to the push-button switch (SW1). SW1 can be used to test the remote wake-up functionality. The default jumper settings are shown in Table 3.

Table 3: Default Jumper Setting for GPIOA0/RIA#/RWKA#

Jumper Setting	Description
J25 - 2 & 3	GPIO0/RI#/RWK# connected to SW1. Can be used for remote wake-up.

Changing the header to J25 1&2 will connect the GPIOA0/RIA#/RWKA# pin to the SP338/SP339 transceiver.

GPIO0-GPIO5

Besides GPIO0 of channel A, GPIO0-GPIO5 of all UART channels are connected directly to the SP339 transceiver. There are headers installed for easy access to these signals. If testing with these pins without the SP339 transceiver, the SP339 should be disabled by removing the jumpers listed in Table 4.

Table 4: Default setting for SP339 Transceiver

Jumper Setting	Description
J5 - 7 &8	USB_STAT2 enables/disables the SP339 transceiver for channel A. When this jumper is removed, the internal pull-down resistor for the ENABLE pin disables the SP339.
J10 - 7 &8	USB_STAT2 enables/disables the SP339 transceiver for channel B.When this jumper is removed, the internal pull-down resistor for the ENABLE pin disables the SP339.
J11 - 7 &8	USB_STAT2 enables/disables the SP339 transceiver for channel C.When this jumper is removed, the internal pull-down resistor for the ENABLE pin disables the SP339.
J20 - 7 &8	USB_STAT2 enables/disables the SP339 transceiver for channel D.When this jumper is removed, the internal pull-down resistor for the ENABLE pin disables the SP339.

GPIO6/CLK

When shipped from the factory, the GPIO6/CLK pin is floating. If using this pin as a CLK function, the signal can be captured via the J31 header. If using this pin to control the MODE0 pin of the SP339, install jumpers for the appropriate channels listed in Table 5. The software driver/application will need to control the state of this pin.

Table 5: Default Jumper Setting for GPIO6/CLK

Jumper Setting	Description
J5 - 1& 2	Not installed. GPIOA6/CLKA is not connected to the MODE0 pin of the SP339.
J10 - 1& 2	Not installed. GPIOB6/CLKB is not connected to the MODE0 pin of the SP339.
J11 - 1& 2	Not installed. GPIOC6/CLKC is not connected to the MODE0 pin of the SP339.
J20 - 1& 2	Not installed. GPIOD6/CLKD is not connected to the MODE0 pin of the SP339.

GPIO7/RS485

When shipped from the factory, the GPIO7/RS485 pin is floating. This pin can be used to control the DIR1 pin of the SP339 when the SP339 is configured for half-duplex RS-485 mode. If using this pin to control the DIR1 pin of the SP339, install jumpers for the appropriate channels listed in Table 6. The software driver/application will need to enable the half-duplex direction control feature for this pin.

Table 6: Default Jumper Setting for GPIO7/RS485

Jumper Setting	Description
J3 - 1& 2	Not installed. GPIOA7/RS485A is not connected to the DIR1 pin of the SP339.
J10 - 1& 2	Not installed. GPIOB7/RS485B is not connected to the DIR1 pin of the SP339.
J11 - 1& 2	Not installed. GPIOC7/RS485C is not connected to the DIR1 pin of the SP339.
J20 - 1& 2	Not installed. GPIOD7/RS485D is not connected to the DIR1 pin of the SP339.

GPIO8/TXT

When shipped from the factory, the GPIO8/TXT pin is floating. This pin can be used to control the MODE1 pin of the SP339. If using this pin to control the MODE1 pin of the SP339, install jumpers for the appropriate channels listed in Table 7. The software driver/application will need to control the state of this pin.

Table 7: Default Jumper Setting for GPIO8/TXT

Jumper Setting	Description
J5 - 3 & 4	Not installed. GPIOA8/TXTA is not connected to the MODE1 pin of the SP339.
J10 - 3 & 4	Not installed. GPIOB8/TXTB is not connected to the MODE1 pin of the SP339.
J11 - 3 & 4	Not installed. GPIOC8/TXTC is not connected to the MODE1 pin of the SP339.
J20 - 3 & 4	Not installed. GPIOD8/TXTD is not connected to the MODE1 pin of the SP339.

GPIO9/RXT

When shipped from the factory, the GPIO9/RXT pin is floating. This pin can be used to control the MODE2 pin of the SP339. If using this pin to control the MODE2 pin of the SP339, install jumpers for the appropriate channels listed in Table 8. The software driver/application will need to control the state of this pin.

Table 8: Default Jumper Setting for GPIO9/RXT

Jumper Setting	Description
J5 - 5 & 6	Not installed. GPIOA9/RXTA is not connected to the MODE2 pin of the SP339.
J10 - 5 & 6	Not installed. GPIOB9/RXTB is not connected to the MODE2 pin of the SP339.
J11 - 5 & 6	Not installed. GPIOC9/RXTC is not connected to the MODE2 pin of the SP339.
J20 - 5 & 6	Not installed. GPIOD9/RXTD is not connected to the MODE2 pin of the SP339.

SP338/SP339 Mode Selection

When shipped from the factory, the SP338/SP339 transceivers are configured in the RS-232 mode. Table 9 shows the RS-232 settings for the SP339.

Table 9: SP339 RS-232 Mode Pin Configurations

Mode	Configuration
MODE0	1
MODE1	0
MODE2	0

There are 2 sets of headers for each UART channel for configuring the mode of the SP339 transceiver. For example, channel A uses J5 and J4. For the RS-232 mode, there is a jumper from J5 pin 2 to J4 pin 1. Refer to the table in the schematic or the SP339 datasheet for the different configurations.

By default, the ENABLE of the SP339 transceiver is controlled by the USB_STAT2 pin of the XR21B1424.

Half-duplex, Full-Duplex and Mixed Duplex RS-485/422 modes

In the RS-485 half-duplex, full-duplex and mixed duplex modes, the DIR1 pin of the SP338/SP339 enables or disables the RS-485/422 line drivers. The DIR1 pin can be controlled by the XR21B1424 using the GPIO7/RS485 or GPIO5/RTS#/RS485 output pins. The GPIO7/RS485 or GPIO5/RTS#/RS485 pin can be selected via J21. Refer to the datasheet for details for selecting and enabling the Automatic Transceiver Enable feature for the GPIO7/RS485 or GPIO5/RTS#/RS485 pins.

Software and Technical Support

Software drivers and test applications should be included in the CD that accompanies the evaluation board. Send any questions that you may have to UARTtechsupport@exar.com.

Revision History

Revision	Date	Description
1A	April 2014	Initial release.

For Further Assistance:

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