

### 1.0 INTRODUCTION

This user's manual is for the XR21V1412 evaluation board rev 2.0 and describes the hardware setup required to operate the part.

### 2.0 OVERVIEW

The XR21V1412 evaluation board has one 32-QFN package on it. **Figure 1** shows a top view of XR21V1412 evaluation board layout.

FIGURE 1. TOP VIEW OF XR21V1412 EVALUATION BOARD LAYOUT

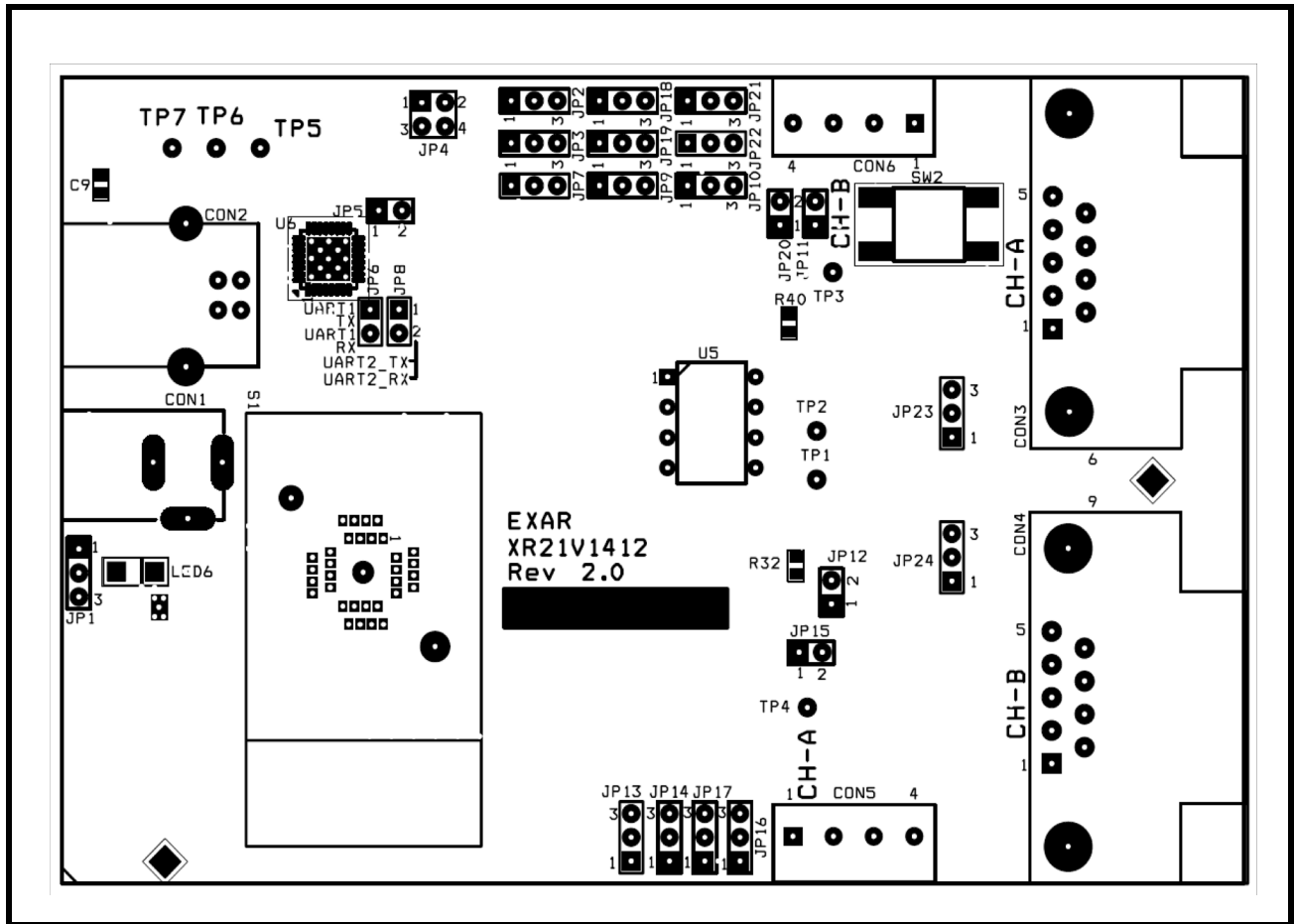
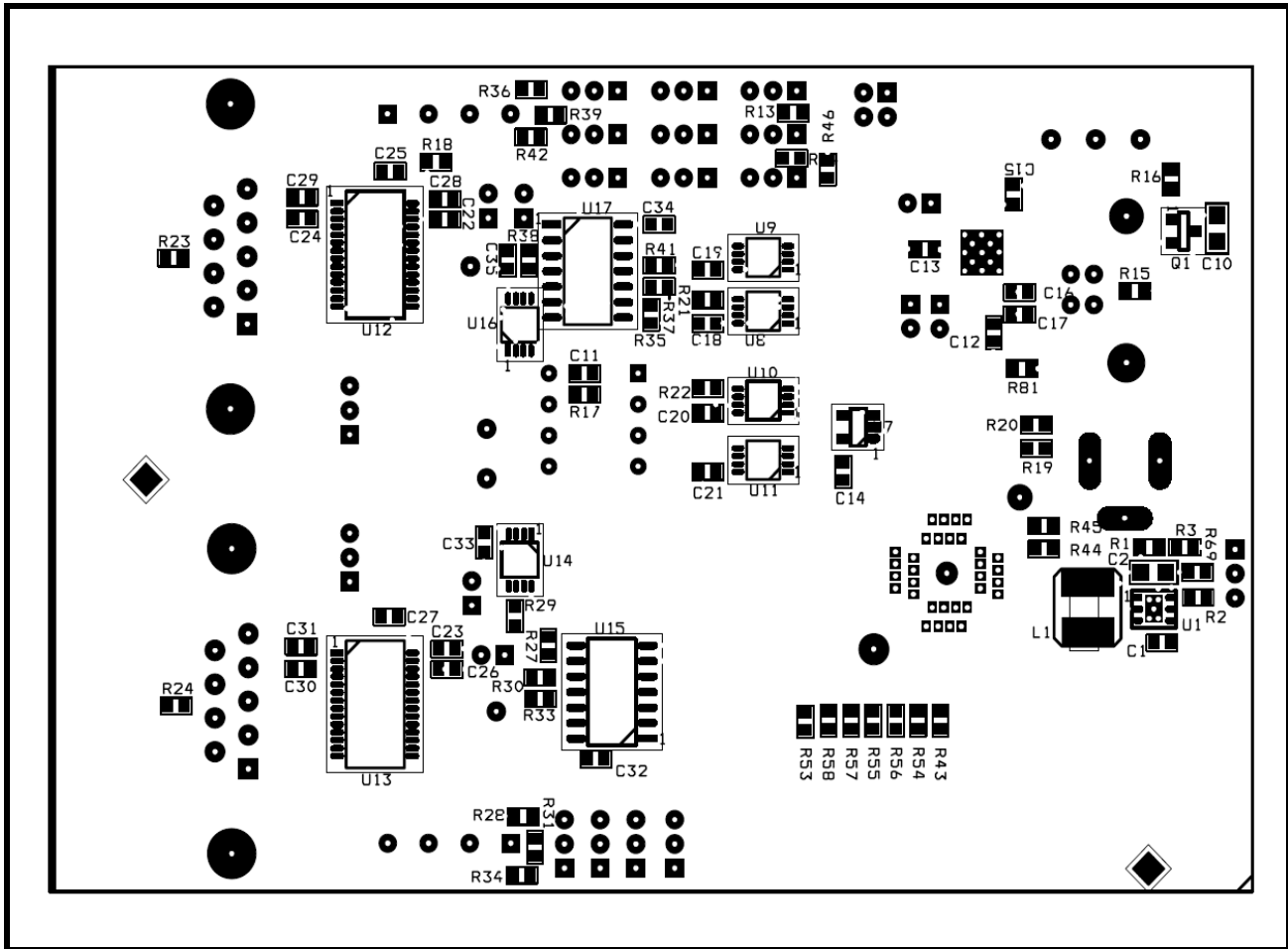


Figure 2 shows a bottom view of XR21V1412 evaluation board layout.

FIGURE 2. BOTTOM VIEW OF XR21V1412 EVALUATION BOARD LAYOUT



**2.1 Evaluation Board Components**

**Table 1** below lists some of the components installed on the evaluation boards. The default setting is RS-232 mode.

**TABLE 1: COMPONENTS OF THE XR21V1412 EVALUATION BOARD**

UNIT	LOCATION	PART	FUNCTION
U1	Bottom	XRP6657-DFN6	Exar's voltage converter to step down voltage from 5V to 3.3V.
U5	Top	AT24C02B-PU-DIP8	I2C EEPROM.
U6	Top	XR21V1412IL32	Exar's 2 channel USB UART.
U7	Bottom	NC7SZ14M5X-SOT-23-5	Invert LowPower (suspend) signal.
U8	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXA signal into either RS-232 or RS-485 transceiver.
U9	Bottom	SN74LVC2G53DCTR-SM8	Switch RXA signal from either RS-232 or RS-485 transceiver.
U10	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXB signal into either RS-232 or RS-485 transceiver.
U11	Bottom	SN74LVC2G53DCTR-SM8	Switch RXB signal from either RS-232 or RS-485 transceiver.
U12	Bottom	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel A.
U13	Bottom	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel B.
U14	Bottom	SN74LVC2G66DCT-SM8	Multiplexer to select RS-485 direction control signal (RTSA# or DTRA#).
U15	Bottom	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel A.
U16	Bottom	SN74LVC2G66DCT-SM8	Multiplexer to select RS-485 direction control signal (RTSB# or DTRB#).
U17	Bottom	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel B.
CON1	Top	PJ-002A	Not installed. External power input.
CON2	Top	690-004-621-023	USB B-Type connector. Communication with USB host (USBD+, USBD-) and power source for evaluation board (V <sub>Bus</sub> ).
CON3	Top	182-009-113R161	RS-232 mode DB9 male connector for channel A.
CON4	Top	182-009-113R161	RS-232 mode DB9 male connector for channel B.
CON5	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel A.
CON6	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel B.
S1	Top	XR21V1412 QFN-32 Socket	Not installed. For internal test only.

## 2.2 Jumper Settings

### 2.2.1 Common jumpers

Common jumpers are those jumpers which should be set the same for both RS-232 and RS-485 mode. The **Table 2** shows the common jumpers setting on the evaluation board:

**TABLE 2: COMMON JUMPERS SETTINGS**

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP1	Top	Power source select	Not installed. Trace between pin 2&3. <ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects power from external power supply of 5V</li> <li>■ Jumper in 2&amp;3 selects power from USB V<sub>BUS</sub> power</li> </ul>
JP2	Top	SCL pull-up/pull-down resistor select	Jumper in 1&2 selects pull-up for SCL Jumper in 2&3 selects pull-down for SCL
JP3	Top	SDA pull-up/pull-down resistor select	Jumper in 1&2 selects pull-up for SDA Jumper in 2&3 selects pull-down for SDA
JP4	Top	I2C EEPROM header	Jumper in 1&2 connects SCL to I2C EEPROM Jumper in 3&4 connects SDA to I2C EEPROM <b>NOTE:</b> I2C EEPROM has not been programmed
JP5	Top	Power supply for XR21V1412	Not installed. Trace between pin 1&2
JP6	Top	UART side Channel A external loop-back header	Jumper in enables external loopback for channel A in the UART side <b>NOTE:</b> External loopback via this jumper can only be performed when the transceiver has been disabled.
JP8	Top	UART side Channel B external loop-back header	Jumper in enables external loopback for channel B in the UART side <b>NOTE:</b> External loopback via this jumper can only be performed when the transceiver has been disabled.
JP9	Top	Selects RS-232 or RS-485 mode for Channel A	Jumper in 1&2 selects RS-485 mode Jumper in 2&3 selects RS-232 mode (default)
JP10	Top	Selects RS-232 or RS-485 mode for Channel B	Jumper in 1&2 selects RS-485 mode Jumper in 2&3 selects RS-232 mode (default)

**2.2.2 Remote wakeup and jumper**

The SDA and SCL are used to specify whether Remote Wakeup and/or Bus Powered configurations are to be supported. These pins are sampled at power-up. The following **Table 3** describes how Remote Wakeup and Bus Powered support.

**TABLE 3: REMOTE WAKEUP AND POWER MODES**

SDA	SCL	REMOTE WAKE-UP SUPPORT	POWER MODE	COMMENTS
1	1	No	Self-Powered	Default, if no EEPROM is present
1	0	No	Bus-Powered	
0	1	Yes	Self-Powered	
0	0	Yes	Bus-Powered	

The following **Table 4** shows jumpers related to remote wakeup.

**TABLE 4: REMOTE WAKEUP JUMPERS SETTINGS**

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP7	Top	Select remote control wakeup signal for Channel A	Jumper in 1&2 selects UART RS-232 transceiver (RI#) signal Jumper in 2&3 selects push-button (default)
SW2	Top	Generate remote wakeup signal	Push once to generate one remote wakeup signal

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**2.2.3 RS-232 mode jumpers (Default setting is RS-232 mode)**

The XR21V1412 evaluation board is set in RS-232 mode by default. The following **Table 5** jumper settings apply to the RS-232 mode:

**TABLE 5: JUMPER SETTINGS FOR RS-232 MODE**

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP11	Top	Power supply for RS-232 transceiver of Channel A	Not installed. Trace between pin 1&2
JP12	Top	Power supply for RS-232 transceiver of Channel B	Not installed. Trace between pin 1&2

**2.2.4 RS-485 mode jumpers**

The following **Table 6** jumper setting applies to the RS-485 mode:

**TABLE 6: JUMPER SETTINGS FOR RS-485 MODE**

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP15	Top	Power supply for RS-485 transceiver of Channel A	Not installed. Trace between pin 1&2
JP13	Top	Select Channel A RTS or DTR direction control for TX	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects RTS based direction control for TX</li> <li>■ Jumper in 2&amp;3 selects DTR based direction control for TX</li> </ul>
JP14	Top	Select Channel A direction control for RX and TX or always for RX	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects common direction control for RX and TX (half-duplex)</li> <li>■ Jumper in 2&amp;3 enables RX always (full-duplex)</li> </ul>
JP16	Top	Channel A select for half duplex or full duplex mode	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects for half duplex mode (CON5 pins 1-2)</li> <li>■ Jumper in 2&amp;3 selects for full duplex mode (CON5 pins 1-4)</li> </ul>
JP17	Top	Channel A select for half duplex or full duplex mode	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects for half duplex mode (CON5 pins 1-2)</li> <li>■ Jumper in 2&amp;3 selects for full duplex mode (CON5 pins 1-4)</li> </ul>
JP20	Top	Power supply for RS-485 transceiver of Channel B	Not installed. Trace between pin 1&2
JP18	Top	Select Channel B RTS or DTR direction control for TX	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects RTS based direction control for TX</li> <li>■ Jumper in 2&amp;3 selects DTR based direction control for TX</li> </ul>
JP19	Top	Select Channel B direction control for RX and TX or always for RX	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects common direction control for RX and TX (half-duplex)</li> <li>■ Jumper in 2&amp;3 enables RX always (full-duplex)</li> </ul>

**TABLE 6: JUMPER SETTINGS FOR RS-485 MODE**

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP21	Top	Channel B select for half duplex or full duplex mode	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects for half duplex mode (CON6 pins 1-2)</li> <li>■ Jumper in 2&amp;3 selects for full duplex mode (CON6 pins 1-4)</li> </ul>
JP22	Top	Channel B select for half duplex or full duplex mode	<ul style="list-style-type: none"> <li>■ Jumper in 1&amp;2 selects for half duplex mode (CON6 pins 1-2)</li> <li>■ Jumper in 2&amp;3 selects for full duplex mode (CON6 pins 1-4)</li> </ul>

**3.0 DRIVERS AND SUPPORT**

For any questions about this evaluation board, software drivers or technical support, send an e-mail to [uarttechsupport@exar.com](mailto:uarttechsupport@exar.com).

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