1.0 INTRODUCTION

This user's manual is for the XR21V1414 evaluation board. It will describe the hardware setup required to operate the part.

2.0 OVERVIEW

The XR21V1414 evaluation board has one 48-TQFP package on it. **Figure 1** shows a top view of XR21V1414 evaluation board layout.

FIGURE 1. TOP VIEW OF XR21V1414 EVALUATION BOARD LAYOUT

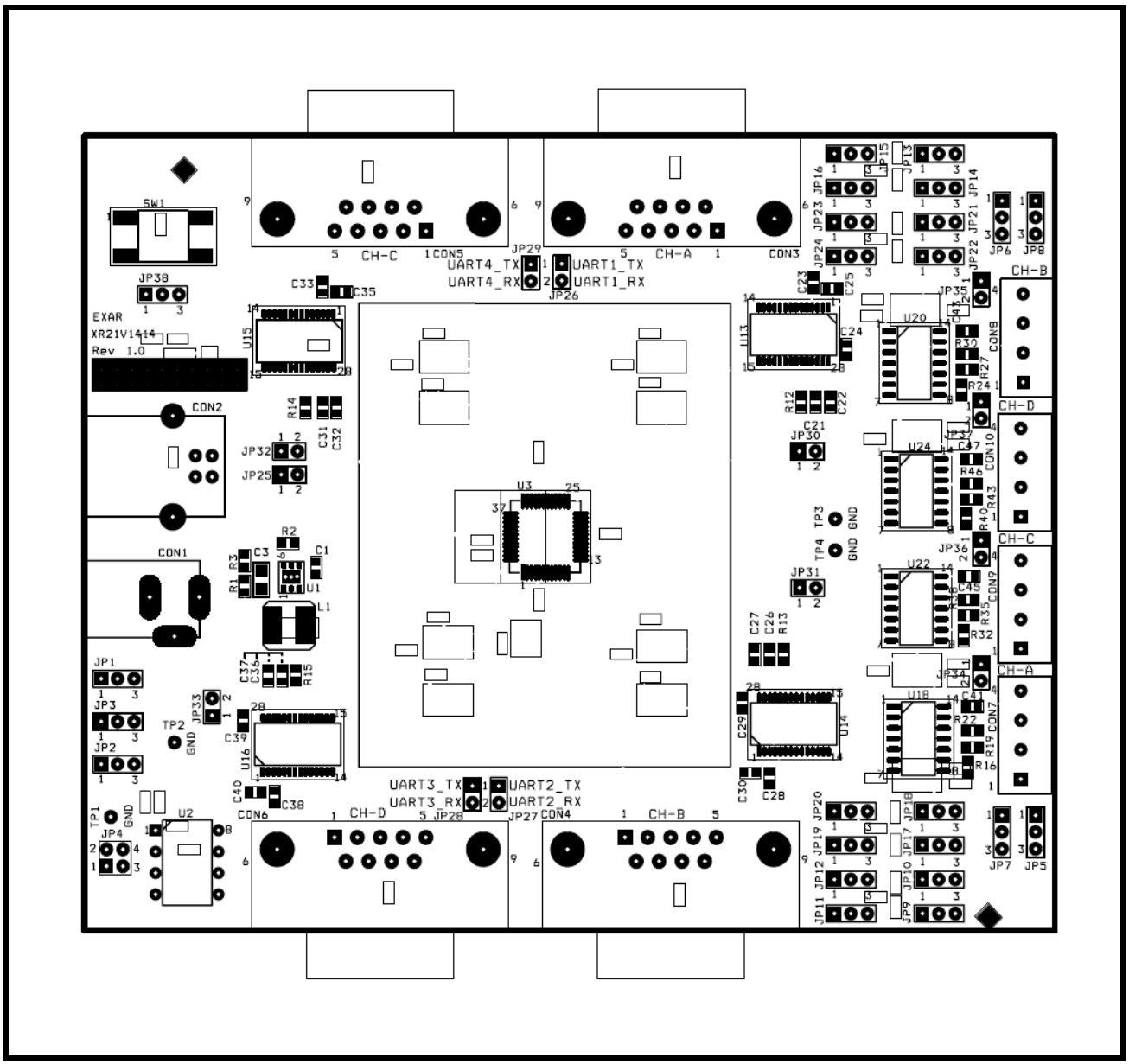
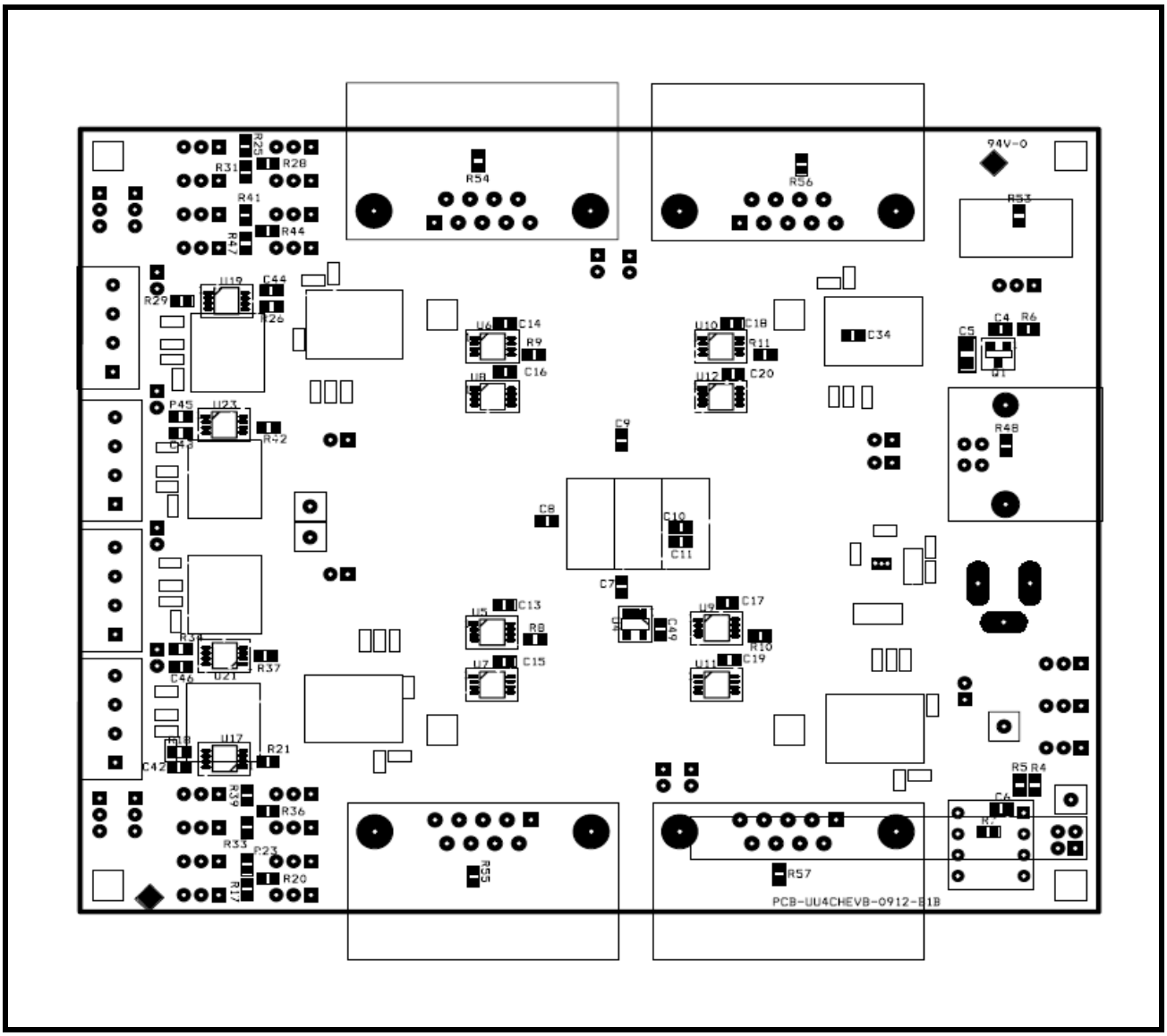


Figure 2 shows a bottom view of XR21V1414 evaluation board layout.

FIGURE 2. BOTTOM VIEW OF XR21V1414 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 XR21V1414 EVALUATION BOARD

UNIT	LOCATION	PART	FUNCTION
U1	Top	XRP6657IHBTR-F-DFN6	Exar's voltage converter to step down voltage from 5V to 3.3V.
U2	Top	AT24C02B-PU-DIP8	I2C EEPROM.
U3	Top	XR21V1414IM48	Exar's 4 channel USB UART.
U4	Bottom	NC7SZ14M5X-SOT-23-5	Invert LowPower (suspend) signal.
U5	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXA signal into either RS-232 or RS-485 transceiver.
U6	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXB signal into either RS-232 or RS-485 transceiver.
U7	Bottom	SN74LVC2G53DCTR-SM8	Switch RXA signal from either RS-232 or RS-485 transceiver.
U8	Bottom	SN74LVC2G53DCTR-SM8	Switch RXB signal from either RS-232 or RS-485 transceiver.
U9	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXC signal into either RS-232 or RS-485 transceiver.
U10	Bottom	SN74LVC2G53DCTR-SM8	Switch UART TXD signal into either RS-232 or RS-485 transceiver.
U11	Bottom	SN74LVC2G53DCTR-SM8	Switch RXC signal from either RS-232 or RS-485 transceiver.
U12	Bottom	SN74LVC2G53DCTR-SM8	Switch RXD signal from either RS-232 or RS-485 transceiver.
U13	Top	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel A.
U14	Top	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel B.
U15	Top	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel C.
U16	Top	SP3245EEY-L-TSSOP-28	Exar's RS-232 transceiver for channel D.
U17	Bottom	SN74LVC2G66DCT-SM8	Mutiplexer to select RS-485 direction control signal (RTSA# or DTRA#).
U18	Top	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel A.
U19	Bottom	SN74LVC2G66DCT-SM8	Mutiplexer to select RS-485 direction control signal (RTSB# or DTRB#).
U20	Top	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel B.
U21	Bottom	SN74LVC2G66DCT-SM8	Mutiplexer to select RS-485 direction control signal (RTSC# or DTRC#).
U22	Top	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel C.
U23	Bottom	SN74LVC2G66DCT-SM8	Mutiplexer to select RS-485 direction control signal (RTSD# or DTRD#).

TABLE 1: COMPONENTS OF THE XR21V1414 EVALUATION BOARD

UNIT	LOCATION	PART	FUNCTION
U24	Top	SP3497EEN-L-NSOIC14	Exar's RS-485 transceiver for channel D.
CON1	Top	PJ-002A	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_{Bus}).
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	182-009-113R161	RS-232 mode DB9 male connector for channel C.
CON6	Top	182-009-113R161	RS-232 mode DB9 male connector for channel D.
CON7	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel A.
CON8	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel B.
CON9	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel C.
CON10	Top	ED555/4DS	RS-485 mode 4X1 terminal block for channel D.

NOTES:*1) An external pull-up is required on the LOWPOWER pin for proper functionality. The external pull-up is not shown in the evaluation board schematics, but has been added on the evaluation board. 2) An external pull-up is required on any GPIO pins that is used as an input. In the suspend mode, the internal pull-up resistor is disabled and the input will be floating if there is no external pull-up resistor. The external pull-ups have not been added to the GPIOs used as inputs on this evaluation board.*

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. ■ Jumper in 1&2 selects power from external power supply of 5V ■ Jumper in 2&3 selects power from USB V_{BUS} power
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 ***NOTE:*** *I2C EEPROM has not been programmed*
JP5	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)
JP6	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)
JP7	Top	Selects RS-232 or RS-485 mode for Channel C	Jumper in 1&2 selects RS-485 mode Jumper in 2&3 selects RS-232 mode (default)
JP8	Top	Selects RS-232 or RS-485 mode for Channel D	Jumper in 1&2 selects RS-485 mode Jumper in 2&3 selects RS-232 mode (default)
JP25	Top	Power supply for XR21V1414	Not installed. Trace between pin 1&2
JP26	Top	UART side Channel A external loop-back header	Jumper in enables external loopback for channel A in the UART side ***NOTE:*** *External loopback via this jumper can only be performed when the transceiver has been disabled.*
JP27	Top	UART side Channel B external loop-back header	Jumper in enables external loopback for channel B in the UART side ***NOTE:*** *External loopback via this jumper can only be performed when the transceiver has been disabled.*

TABLE 2: COMMON JUMPERS SETTINGS

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP28	Top	UART side Channel C external loop-back header	Jumper in enables external loopback for channel C in the UART side **NOTE:** *External loopback via this jumper can only be performed when the transceiver has been disabled.*
JP29	Top	UART side Channel D external loop-back header	Jumper in enables external loopback for channel D in the UART side **NOTE:** *External loopback via this jumper can only be performed when the transceiver has been disabled.*

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
JP38	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
SW1	Top	Generate remote wakeup signal	Push once to generate one remote wakeup signal

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

The XR21V1414 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
JP30	Top	Power supply for RS-232 transceiver of Channel A	Not installed. Trace between pin 1&2
JP31	Top	Power supply for RS-232 transceiver of Channel B	Not installed. Trace between pin 1&2
JP32	Top	Power supply for RS-232 transceiver of Channel C	Not installed. Trace between pin 1&2
JP33	Top	Power supply for RS-232 transceiver of Channel D	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
JP34	Top	Power supply for RS-485 transceiver of Channel A	Not installed. Trace between pin 1&2
JP9	Top	Select Channel A RTS or DTR direction control for TX	Jumper in 1&2 selects RTS based direction control for TX Jumper in 2&3 selects DTR based direction control for TX
JP10	Top	Select Channel A direction control for RX and TX or always for RX	Jumper in 1&2 selects common direction control for RX and TX Jumper in 2&3 enables RX always
JP11	Top	Channel select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP12	Top	Channel select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP35	Top	Power supply for RS-485 transceiver of Channel B	Not installed. Trace between pin 1&2
JP13	Top	Select Channel B RTS or DTR direction control for TX	Jumper in 1&2 selects RTS based direction control for TX Jumper in 2&3 selects DTR based direction control for TX
JP14	Top	Select Channel B direction control for RX and TX or always for RX	Jumper in 1&2 selects common direction control for RX and TX Jumper in 2&3 selects common direction control for RX always
JP15	Top	Channel B select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode

TABLE 6: JUMPER SETTINGS FOR RS-485 MODE

JUMPERS	LOCATION	FUNCTIONS	COMMENTS
JP16	Top	Channel B select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP36	Top	Power supply for RS-485 transceiver of Channel C	Not installed. Trace between pin 1&2
JP17	Top	Select Channel C RTS or DTR direction control for TX	Jumper in 1&2 selects RTS based direction control for TX Jumper in 2&3 selects DTR based direction control for TX
JP18	Top	Select Channel C direction control for RX and TX or always for RX	Jumper in 1&2 selects common direction control for RX and TX Jumper in 2&3 selects common direction control for RX always
JP19	Top	Channel C select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP20	Top	Channel C select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP37	Top	Power supply for RS-485 transceiver of Channel D	Not installed. Trace between pin 1&2
JP21	Top	Select Channel D RTS or DTR direction control for TX	Jumper in 1&2 selects RTS based direction control for TX Jumper in 2&3 selects DTR based direction control for TX
JP22	Top	Select Channel D direction control for RX and TX or always for RX	Jumper in 1&2 selects common direction control for RX and TX Jumper in 2&3 selects common direction control for RX always
JP23	Top	Channel D select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode
JP24	Top	Channel D select for half duplex or full duplex mode	Jumper in 1&2 selects for half duplex mode Jumper in 2&3 selects for full duplex mode

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.

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