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XR21V1414

EVB User Manual

Revision History

Document No.	Release Date	Change Description
034UMR00	July 19, 2024	**Updated:** ■ New template applied and general document revision. ■ "Components of the XR21V1414 Evaluation Board" table.
Rev. 1.0.0	2009	Initial release.

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Introduction

This document is used for the evaluation board (EVB) of the XR21V1414 device and describes the hardware setup required to operate this device.

Ordering Information

The following table lists the ordering part numbers for the evaluation board.

Table 1: EVB Ordering Part Numbers

Part Number	Description
XR21V1414IM-0A-EB	XR21V1414 Evaluation Board—RS-232 and RS-485 capable.
XR21V1414IM-0B-EB	XR21V1414 Evaluation Board—RS-232 capable

EVB Overview

The XR21V1414 EVB has one 48-TQFP package on it. The following figure shows a top view of XR21V1414 EVB layout.

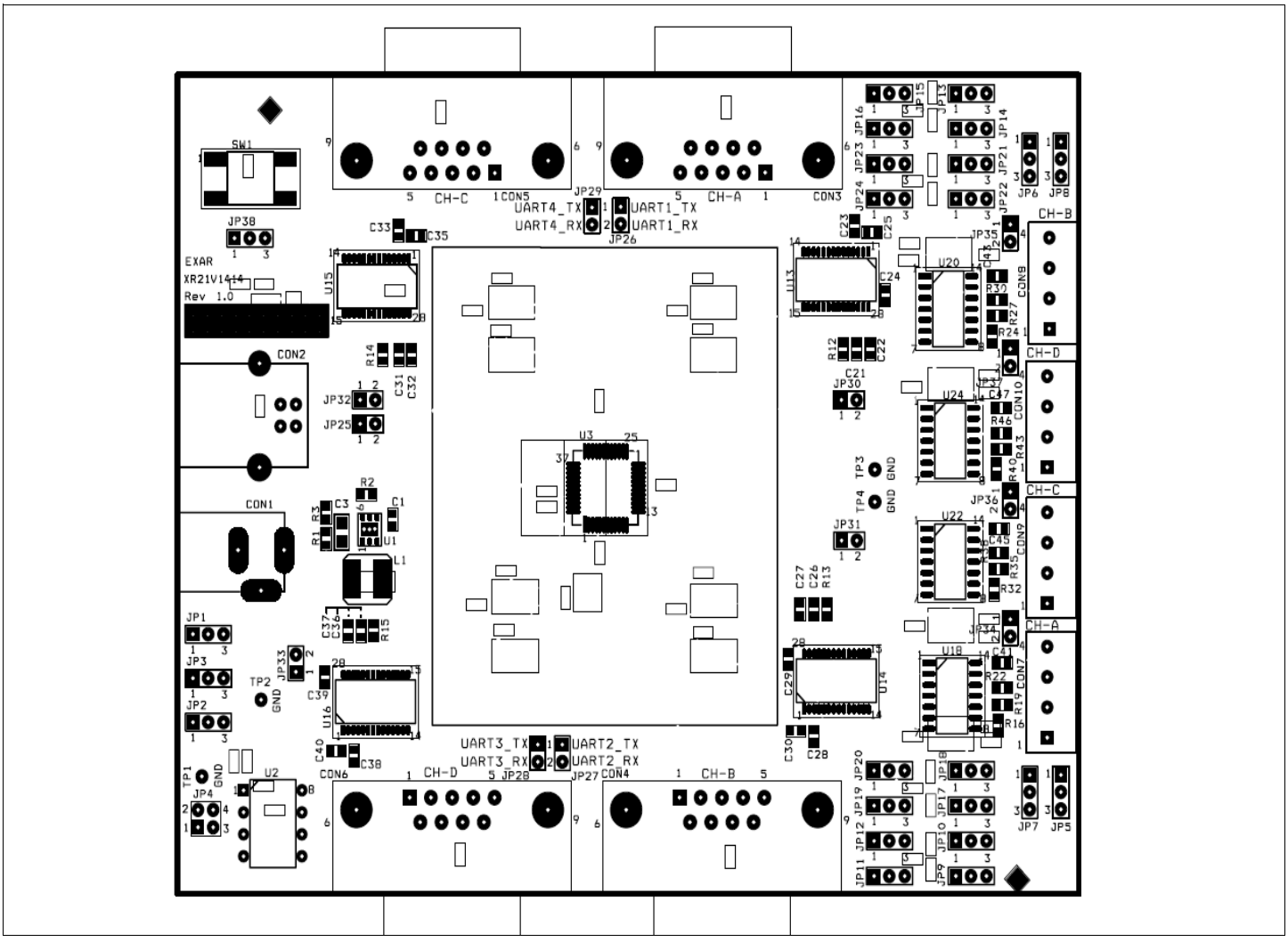

Figure 1: Top View of XR21V1414 EVB Layout

The following figure shows a bottom view of XR21V1414 EVB layout.

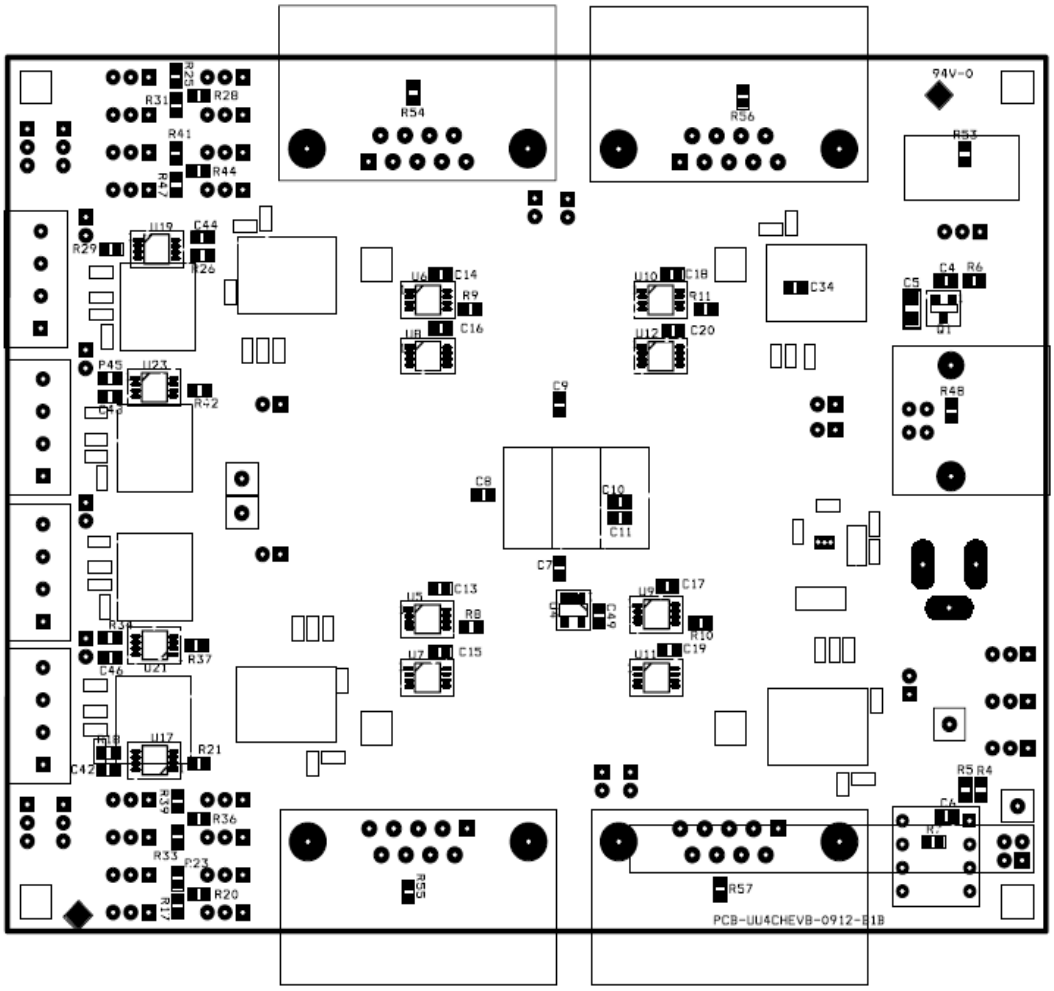

Figure 2: Bottom View of XR21V1414 EVB Layout

EVB Components

The following table lists some of the components installed on the EVB. The default setting is RS-232 mode.

Table 2: Components of the XR21V1414 EVB

Unit	Location	Part	Function
U1	Top	XRP6657IHBTR-F-DFN6	MaxLinear's voltage converter to step down voltage from 5V to 3.3V.
U2	Top	AT24C02B-PU-DIP8	I^2C EEPROM.
U3	Top	XR21V1414IM48	MaxLinear's four-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	MaxLinear's RS-232 transceiver for channel A.
U14	Top	SP3245EEY-L-TSSOP-28	MaxLinear's RS-232 transceiver for channel B.
U15	Top	SP3245EEY-L-TSSOP-28	MaxLinear's RS-232 transceiver for channel C.
U16	Top	SP3245EEY-L-TSSOP-28	MaxLinear'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	MaxLinear'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	MaxLinear'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	MaxLinear's RS-485 transceiver for channel C.
U23	Bottom	SN74LVC2G66DCT-SM8	Mutiplexer to select RS-485 direction control signal (RTSD# or DTRD#).
U24	Top	SP3497EEN-L-NSOIC14	MaxLinear's RS-485 transceiver for channel D.
CON1	Top	PJ-002A	External power input.
CON2	Top	61400416121	USB B-Type connector. Communication with USB host (USBD+, USBD-) and power source for evaluation board (VBus).
CON3	Top	618009211721	RS-232 mode DB9 male connector for channel A.
CON4	Top	618009211721	RS-232 mode DB9 male connector for channel B.
CON5	Top	618009211721	RS-232 mode DB9 male connector for channel C.
CON6	Top	618009211721	RS-232 mode DB9 male connector for channel D.
CON7	Top	ED555/4DS	RS-485 mode 4×1 terminal block for channel A.
CON8	Top	ED555/4DS	RS-485 mode 4×1 terminal block for channel B.
CON9	Top	ED555/4DS	RS-485 mode 4×1 terminal block for channel C.
CON10	Top	ED555/4DS	RS-485 mode 4×1 terminal block for channel D.

Note:

- 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 is added on the evaluation board.
- An external pull-up is required on any GPIO pins used as an input. In the suspend mode, the internal pull-up resistor is disabled and the input is floating if there is no external pull-up resistor. The external pull-ups are not added to the GPIOs used as inputs on this evaluation board.

Jumper Settings

Common jumpers

Common jumpers are those jumpers which should be set the same for both RS-232 and RS-485 mode. The following table lists the common jumpers setting on the EVB.

Table 3: Common Jumpers Settings

Jumper	Location	Function	Comment
JP1	Top	Power source select	Not installed. Trace between pins 2 and 3. Jumper in pins 1 and 2 selects power from external power supply of 5V. Jumper in pins 2 and 3 selects power from USB V_{BUS} power.
JP2	Top	SCL pull-up/pull-down resistor select	Jumper in pins 1 and 2 selects pull-up for SCL. Jumper in pins 2 and 3 selects pull-down for SCL.
JP3	Top	SDA pull-up/pull-down resistor select	Jumper in pins 1 and 2 selects pull-up for SDA. Jumper in pins 2 and 3 selects pull-down for SDA.
JP4	Top	I^2C EEPROM header	Jumper in pins 1 and 2 connects SCL to I^2C EEPROM. Jumper in pins 3 and 4 connects SDA to I^2C EEPROM. **Note:** I^2C EEPROM has not been programmed.
JP5	Top	Selects RS-232 or RS-485 mode for channel A	Jumper in pins 1 and 2 selects RS-485 mode. Jumper in pins2 and 3 selects RS-232 mode (default).
JP6	Top	Selects RS-232 or RS-485 mode for channel B	Jumper in pins 1 and 2 selects RS-485 mode. Jumper in pins 2 and 3 selects RS-232 mode (default).
JP7	Top	Selects RS-232 or RS-485 mode for channel C	Jumper in pins 1and 2 selects RS-485 mode. Jumper in pins 2and 3 selects RS-232 mode (default).
JP8	Top	Selects RS-232 or RS-485 mode for channel D	Jumper in pins 1 and 2 selects RS-485 mode. Jumper in pins 2 and 3 selects RS-232 mode (default).
JP25	Top	Power supply for XR21V1414	Not installed. Trace between pins 1 and 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.
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.

Remote Wake-up and Jumper

The SDA and SCL are used to specify whether remote wake-up and/or bus powered configurations are supported. These pins are sampled at power-up. The following table lists the remote wake-up and bus powered support.

Table 4: Remote Wake-up 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 lists the jumpers related to remote wake-up.

Table 5: Remote Wake-up Jumpers Settings

Jumper	Location	Function	Comments
JP38	Top	Select remote control wakeup signal for channel A	Jumper in pins 1 and 2 selects UART RS-232 transceiver (RI#) signal. Jumper in pins 2 and 3 selects push-button.
SW1	Top	Generate remote wakeup signal	Push once to generate one remote wake-up signal.

RS-232 Mode Jumpers

The following table lists the jumper settings that apply to the RS-232 mode. The XR21V1414 EVB is set in RS-232 mode by default.

Table 6: Jumpers Settings for RS-232 Mode

Jumper	Location	Function	Comments
JP30	Top	Power supply for RS-232 transceiver of channel A	Not installed. Trace between pins 1 and 2.
JP31	Top	Power supply for RS-232 transceiver of channel B	Not installed. Trace between pins 1 and 2.
JP32	Top	Power supply for RS-232 transceiver of channel C	Not installed. Trace between pins 1 and 2.
JP33	Top	Power supply for RS-232 transceiver of channel D	Not installed. Trace between pins 1 and 2.

RS-485 Mode Jumpers

The following table lists the jumper settings that apply to the RS-485 mode.

Table 7: Jumpers Settings for RS-485

Jumper	Location	Function	Comments
JP34	Top	Power supply for RS-485 transceiver of channel A	Not installed. Trace between pins 1 and 2.
JP9	Top	Select channel A RTS or DTR direction control for Tx	Jumper in pins 1 and 2 selects RTS based direction control for Tx. Jumper in pins 2 and 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 pins 1 and 2 selects common direction control for Rx and Tx. Jumper in pins 2 and 3 enables Rx always.
JP11	Top	Channel select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP12	Top	Channel select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP35	Top	Power supply for RS-485 transceiver of channel B	Not installed. Trace between pins 1 and 2.
JP13	Top	Select channel B RTS or DTR direction control for Tx	Jumper in 1 and 2 selects RTS based direction control for Tx. Jumper in 2 and 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 and 2 selects common direction control for Rx and Tx. Jumper in 2 and 3 selects common direction control for Rx always.
JP15	Top	Channel B select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP16	Top	Channel B select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP36	Top	Power supply for RS-485 transceiver of channel C	Not installed. Trace between pins 1 and 2.
JP17	Top	Select channel C RTS or DTR direction control for Tx	Jumper in pins 1 and 2 selects RTS based direction control for Tx. Jumper in pins 2 and 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 pins 1 and 2 selects common direction control for Rx and Tx. Jumper in pins 2 and 3 selects common direction control for Rx always.
JP19	Top	Channel C select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP20	Top	Channel C select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode.
JP37	Top	Power supply for RS-485 transceiver of channel D	Not installed. Trace between pins 1 and 2.
JP21	Top	Select channel D RTS or DTR direction control for Tx	Jumper in pins 1 and 2 selects RTS based direction control for Tx. Jumper in pins 2 and 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 pins 1 and 2 selects common direction control for Rx and Tx. Jumper in pins 2 and 3 selects common direction control for Rx always.
JP23	Top	Channel D select for half duplex or full duplex mode	Jumper in pins 1 and 2 selects for half duplex mode. Jumper in pins 2 and3 selects for full duplex mode
JP24	Top	Channel D select for half duplex or full duplex mode	Jumper in pins1 and 2 selects for half duplex mode. Jumper in pins 2 and 3 selects for full duplex mode

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