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# **XR17V354 and XR17V358**

## **Evaluation Board User Manual**

## Revision History

Document No.	Release Date	Change Description
1.0.1	June 2011	Legacy Exar EVB Manual
001UMR00	November 2018	For updated board - complete re-write.

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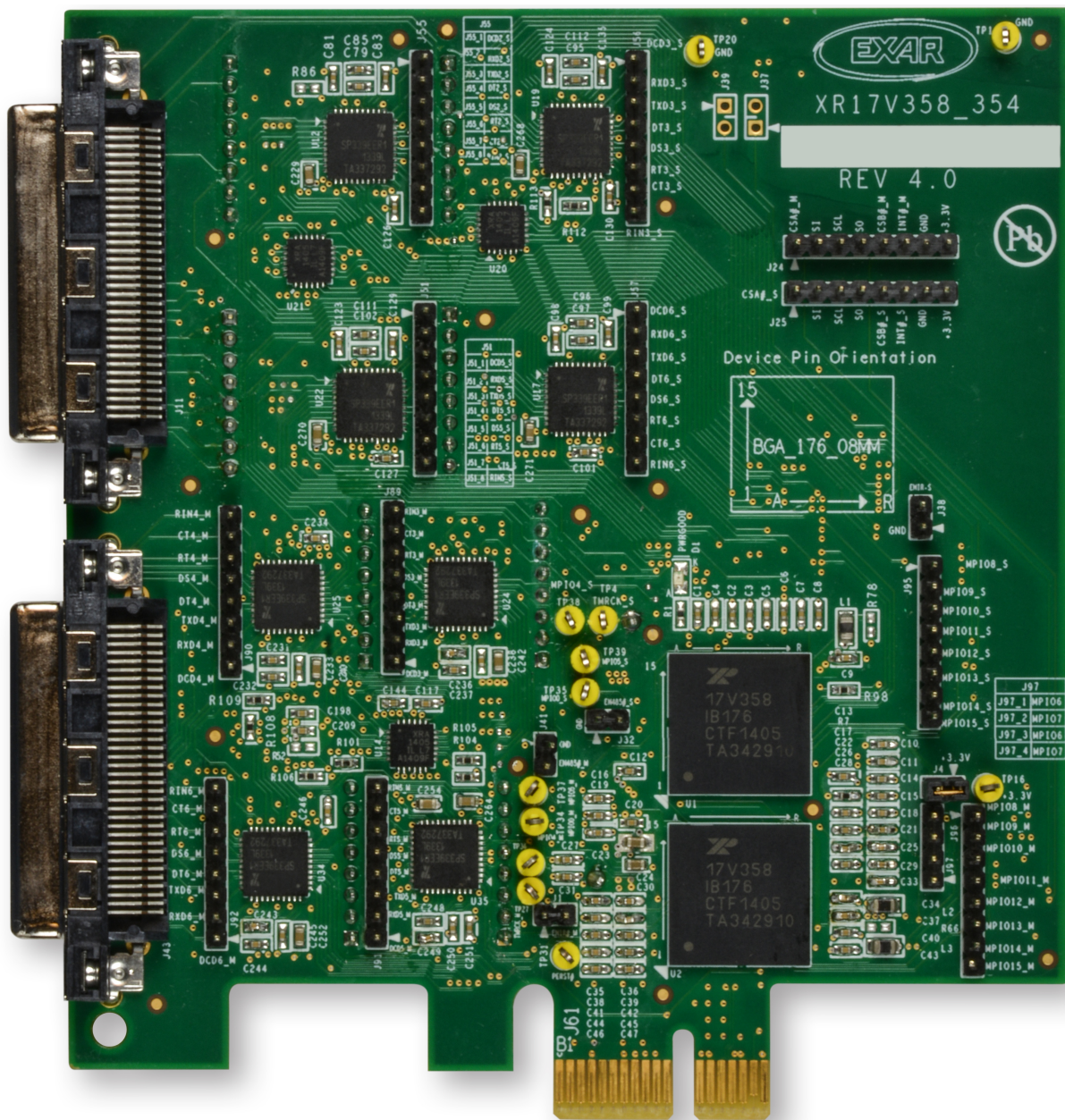
## Introduction

The XR17V354 and XR17V358 evaluation boards provide a platform to evaluate the features and performance of the XR17V354 and XR17V358. The XR17V354 and XR17V358 are 4-channel and 8-channel PCIe UARTs, respectively. They are available in the same package and are pin compatible, therefore they utilize the same evaluation board. The evaluation board revision is 4.0. This user manual gives an overview of the evaluation board and its available configurations. The available configurations are summarized in the ordering information section.

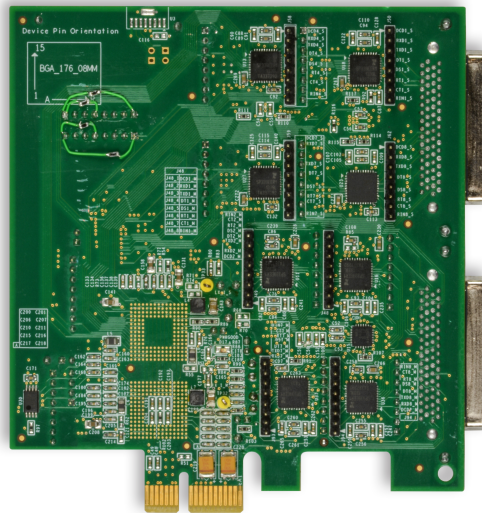
Please refer to the [XR17V354](#) and [XR17V358](#) datasheets for additional information about these devices.

## Reference Documentation

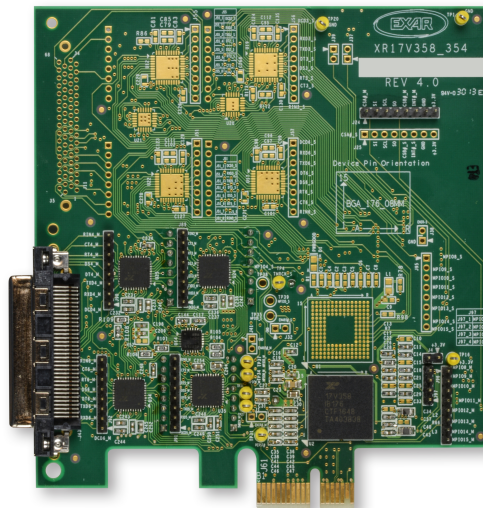
Please refer to the [XR17V354](#) and [XR17V358](#) datasheets for additional information about these devices.



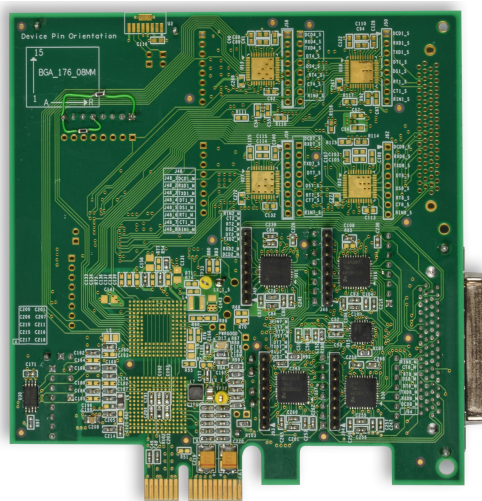
**Figure 1: Top View of the XR17V358IB-E8-EVB**



**Figure 2:** Bottom View of the XR17V358IB-E8-EVB



**Figure 3:** Top View of the XR17V358IB-0A-EVB



**Figure 4:** Bottom View of the XR17V358IB-0A-EVB

## Ordering Information

**Table 1: Evaluation Board Ordering Part Number**

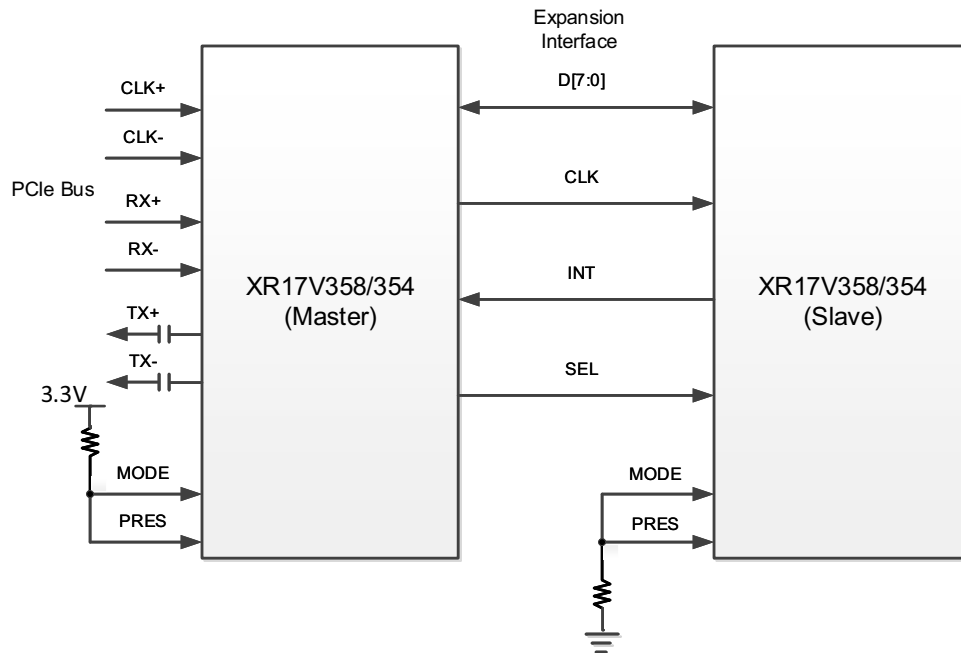
Evaluation Board	Description
XR17V354IB-0A-EVB	A single 4-channel XR17V354 PCIe UART and four SP339 Transceivers are installed.
XR17V354IB-E4-EVB	Two 4-channel XR17V354 PCIe UARTs and eight SP339 Transceivers are installed in a master / slave configuration.
XR17V354IB-E8-EVB	A master 4-channel XR17V354 PCIe UART, a slave 8-channel XR17V358 PCIe UART and twelve SP339 Transceivers are installed.
XR17V358IB-0A-EVB	A single 8-channel XR17V358 PCIe UART and eight SP339 Transceivers are installed.
XR17V358IB-E4-EVB	A master 8-channel XR17V358 PCIe UART, a slave 4-channel XR17V354 PCIe UART and twelve SP339 Transceivers are installed.
XR17V358IB-E8-EVB	Two 8-channel XR17V358 PCIe UARTs and sixteen SP339 Transceivers are installed in a master / slave configuration.

1. Refer to [www.exar.com/XR17V354](http://www.exar.com/XR17V354) and [www.exar.com/XR17V358](http://www.exar.com/XR17V358) for most up-to-date Ordering Information.



## Evaluation Board Overview

This evaluation board has a x1 PCIe connector and will work in any x1, x4 or x16 PCI slot. Up to 16 UART ports can be tested on this evaluation board when 2 XR17V358 are installed. The PCI interface of the master device is connected directly to the PCIe connector. The master device communicates with the slave device via MaxLinear's proprietary expansion interface, illustrated in Figure 5. The PCIe interface on the slave device is not used and should be unconnected.



**Figure 5: PCIe and Expansion Interface**

With the configuration shown below, the XR17V35x Windows device driver allows the Device Manager / Port Settings tab to control the transceiver modes, slew and termination settings. A block diagram of the XR17V358IB-E8-EVB that uses this configuration is shown in Figure 6. The device Manager / Port Settings tab is shown in Figure 8.

### MPIO Connections:

MPIO3 of both XR17V35x master and slave are pulled-up. Optionally, they connect to the EN pins of their respective transceivers.

MPIO1 of master XR17V35x is connected to CS of first XRA1405

MPIO2 of master XR17V35x is connected to CS of second XRA1405

MPIO1 of slave XR17V35x is connected to CS of third XRA1405

MPIO2 of slave XR17V35x is connected to CS of fourth XRA1405

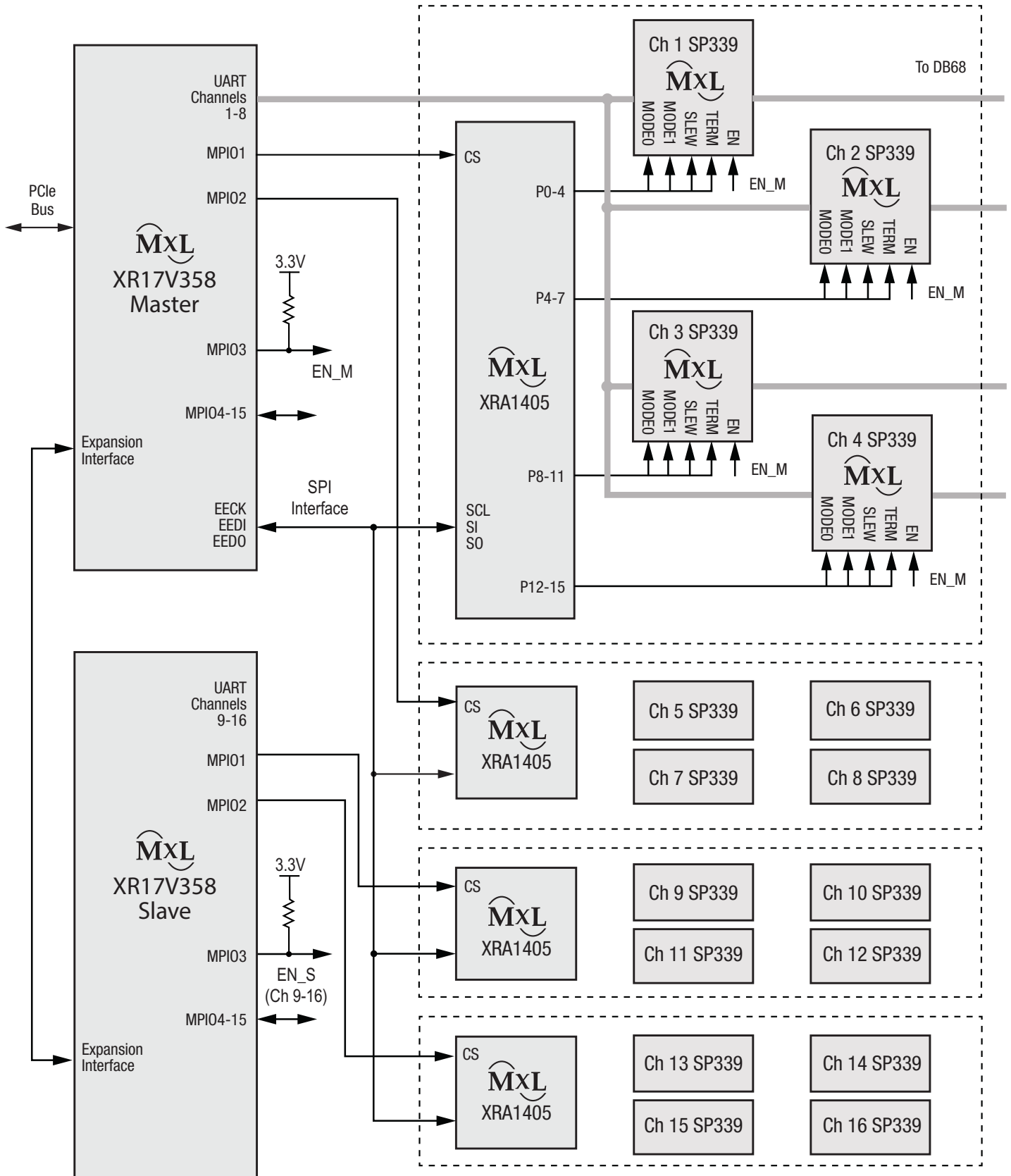
Optional: MPIO3 of master is connected to EN pin of transceivers on master ports and MPIO3 of slave is connected to EN pin of transceivers on slave ports. These MPIO3 pins are pulled up and the Port Settings tab cannot be used to disable the transceivers.

### SPI Interface:

EECK pin of **master** XR17V35x is connected to SCL pin of all XRA1405

EEDI pin of **master** XR17V35x is connected to SI pin of all XRA1405

EEDO pin of **master** XR17V35x is connected to SO pin of all XRA1405



**Figure 6: XR17V358IB-E8-EVB Block Diagram**

## Transceiver Control Connections:

The XRA1405 outputs are sequentially (P0 to P15) connected to the MODE0, MODE1, SLEW and TERM pins of each SP339 transceiver as shown in Table 2:

**Table 2: XRA1405 to SP339 Connections**

XRA1405 #	XRA1405 Pin	SP339 Channel / COM Port	SP339 Pin	XRA1405 #	XRA1405 Pin	SP339 Channel / COM Port	SP339 Pin
1 (Master)	P0	1	MODE0	3 (Slave)	P0	9	MODE0
	P1		MODE1		P1		MODE1
	P2		SLEW		P2		SLEW
	P3		TERM		P3		TERM
	P4	2	MODE0		P4	10	MODE0
	P5		MODE1		P5		MODE1
	P6		SLEW		P6		SLEW
	P7		TERM		P7		TERM
	P8	3	MODE0		P8	11	MODE0
	P9		MODE1		P9		MODE1
	P10		SLEW		P10		SLEW
	P11		TERM		P11		TERM
	P12	4	MODE0		P12	12	MODE0
	P13		MODE1		P13		MODE1
	P14		SLEW		P14		SLEW
	P15		TERM		P15		TERM
2 (Master)	P0	5	MODE0	4 (Slave)	P0	13	MODE0
	P1		MODE1		P1		MODE1
	P2		SLEW		P2		SLEW
	P3		TERM		P3		TERM
	P4	6	MODE0		P4	14	MODE0
	P5		MODE1		P5		MODE1
	P6		SLEW		P6		SLEW
	P7		TERM		P7		TERM
	P8	7	MODE0		P8	15	MODE0
	P9		MODE1		P9		MODE1
	P10		SLEW		P10		SLEW
	P11		TERM		P11		TERM
	P12	8	MODE0		P12	16	MODE0
	P13		MODE1		P13		MODE1
	P14		SLEW		P14		SLEW
	P15		TERM		P15		TERM

## System Set-Up / Powering Up

### Jumpers

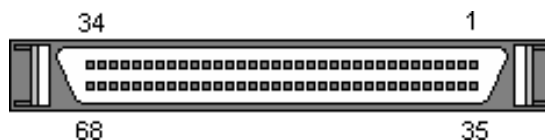
Jumpers are factory installed per Table 3 to configure the EVB for operation. Jumpers may be added or removed per the description. Refer to the product Data Sheets for additional information.

**Table 3: Factory Settings**

Jumper	Label	Factory Setting	Description
J1		No jumper	Master ENIR# disabled
J41		No jumper	Master EN485# disabled
J38		No jumper	Slave ENIR# disabled
J32		No jumper	Slave EN485# disabled
J37		No jumper	Transmit data to IR module not populated
J39		No jumper	Receive data to IR module not populated
J4	XR17V354IB-0A-EVB	No jumper	Master PRES slave not present
	XR17V354IB-E4-EVB	Jumper 1-2	Master PRES slave present
	XR17V354IB-E8-EVB	Jumper 1-2	Master PRES slave present
	XR17V358IB-0A-EVB	No jumper	Master PRES slave not present
	XR17V358IB-E4-EVB	Jumper 1-2	Master PRES slave present
	XR17V358IB-E8-EVB	Jumper 1-2	Master PRES slave present

### Pin-out Connectors

For RS-232 mode, signals on the evaluation board go to the SCSI type ultra micro DB68 connector. Figure 7 shows the DB68 connector on the board, and Table 4 shows the pin-out. The evaluation boards come with fan-out cables.



**Figure 7: DB68 Connector**

**Table 4: DB68 Pin-out**

Pin Number	Signal Name	Pin Number	Signal Name	Pin Number	Signal Name	Pin Number	Signal Name
1	RXD7	18	RXD3	35	RXD8	52	RXD4
2	CT7	19	CT3	36	CT8	53	CT4
3	RIN7	20	RIN3	37	RIN8	54	RIN4
4	RT7	21	RT3	38	RT8	55	RT4
5	DCD7	22	DCD3	39	DCD8	56	DCD4
6	DT7	23	DT3	40	DT8	57	DT4
7	DS7	24	DS3	41	DS8	58	DS4
8	TXD7	25	TXD3	42	TXD8	59	TXD4
9	GND	26	GND	43	GND	60	GND
10	TXD5	27	TXD1	44	TXD6	61	TXD2
11	DS5	28	DS1	45	DS6	62	DS2
12	DT5	29	DT1	46	DT6	63	DT2
13	DCD5	30	DCD1	47	DCD6	64	DCD2
14	RT5	31	RT1	48	RT6	65	RT2
15	RIN5	32	RIN1	49	RIN6	66	RIN2
16	CT5	33	CT1	50	CT6	67	CT2
17	RXD5	34	RXD1	51	RXD6	68	RXD2

For RS-422/485 mode, signals on the evaluation board go to headers. Table 5 shows the header name for each channel; Table 6 shows the pin-out used for each RS485/422 header.

**Table 5: RS485/422 Headers for Each Channel**

Channel Number	Header Number	Channel Number	Header Number
Master 1	J48	9 (Slave 1)	J50
Master 2	J49	10 (Slave 2)	J55
Master 3	J89	11 (Slave 3)	J56
Master 4	J90	12 (Slave 4)	J58
Master 5	J91	13 (Slave 5)	J51
Master 6	J92	14 (Slave 6)	J57
Master 7	J93	15 (Slave 7)	J59
Master 8	J94	16 (Slave 8)	J62

**Table 6: RS485/422 Header Pin-Out**

Pin Number	RS485 Half Duplex	RS485 / RS422 Full Duplex	RS-232 Test Point
1	TX- / RX-	TX-	DCD
2	TX+ / RX+	TX+	RXD
3	-	RX+	TXD
4	-	RX-	DT
5	-	-	DS
6	-	-	RT
7	-	-	CT
8	-	-	RIN

## MPIO Pins and Test Points

The MPIO pins of both the master and slave devices are connected to test points or test headers on the evaluation board. Refer to page 6 of the evaluation board schematic and Table 7 below for details. Note that an external pullup is recommended for each unused MPIO pins configured as an input.

**Table 7: Test Points**

TP#	Signal	Description
TP1	GND	Digital Ground
TP4	TRMCK (Slave)	Timer / counter external clock input
TP16	+3.3V	V <sub>CC</sub>
TP20	GND	Digital Ground
TP27	TMRCK (Master)	Timer / counter external clock input
TP31	PERST#	PCIe System Reset
TP32	1V2 Buck Output (Master)	Regulated 1.2 V output
TP33	1V2 Buck Output (Slave)	Regulated 1.2 V output
TP34	MPIO0 (Master)	Timer output (when enabled)
TP35	MPIO0 (Slave)	Timer output (when enabled)
TP36	MPIO4 (Master)	General Purpose MPIO Test Point
TP37	MPIO5 (Master)	General Purpose MPIO Test Point
TP38	MPIO4 (Slave)	General Purpose MPIO Test Point
TP39	MPIO5 (Slave)	General Purpose MPIO Test Point

## Power

Power is connected when the PCIe board is plugged into the computer's PCIe bus. Each XR17V354 and XR17V358 has an internal buck regulator that is powered by the PCIe bus 3.3V supply and produces a 1.2V output. This 1.2V output may be used to drive the 1.2V power required by the same XR17V35x, or alternatively the 1.2V may be supplied externally. If using an external 1.2V supply, a 250 ohm pull-down resistor is recommended on the VCC12 pin per the January 2012 Errata.

The PWRGD of each XR17V35x illuminates an LED when its buck regulator is within regulation.

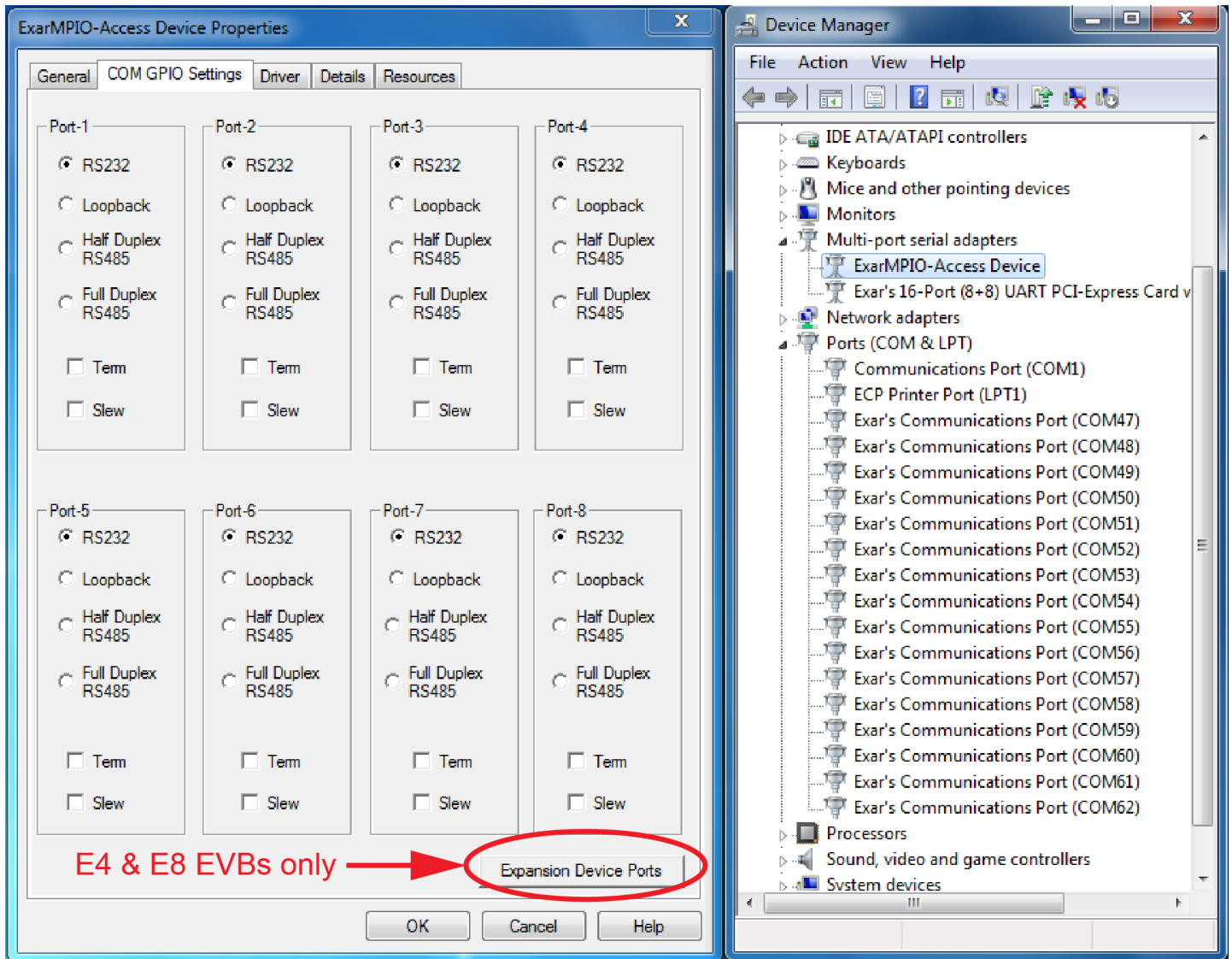
## Software

### Software Drivers

Custom software drivers for Windows and Linux are available from MaxLinear at [www.exar.com/design-tools/software-drivers](http://www.exar.com/design-tools/software-drivers). For Linux, please refer to [Application Note AN-225](#) Installing and Testing a PCI / PCIe UART Serial Port Using a Custom MaxLinear Driver in Linux.

## Windows Device Manager / Port Settings Tab

After loading the Windows driver, access the Device Manager as shown in Figure 8 (right side). From there, open the ExarMPIO-Access Device as shown in Figure 8 (left side) to see the Port Settings. Here the transceiver mode, slew rate and RS-485 receiver termination enable can be selected. See the [SP339E](#) datasheet for more. Click on the Expansion Device Ports button on the lower right to see the slave ports for E4 and E8 EVBs. For 0A EVBs, there are no Expansion Device Ports.



1. Loopback mode occurs at the transceiver, not at the UART.
2. Slew control applies to RS-232, RS485 Half and Full Duplex. Term applies to RS-485 Half and Full Duplex. See [SP339](#) datasheet for more.

**Figure 8: Device Manager / Port Setting tab example**

After the ports are set, they can be tested using any serial testing tool or MaxLinear's Super GUI which can be found from the XR17V358 product page, under Design Tools / Evaluation Hardware and Software, Software Drivers.

Please note: When designing your own board, all hardware connections listed in the Evaluation Board Overview section are required for the MaxLinear custom driver to enable the COM GPIO settings in Figure 8. If any of these connections are missing, this tab will be blank.

## XR17V354 and XR17V358 EVB Schematics

The schematic for the XR17V358IB-E8-EVB can be found on [www.exar.com/XR17V358](http://www.exar.com/XR17V358) under the documentation tab, under schematics. The XR17V358IB-0A-EVB uses the same schematic, except the slave components are not populated. The XR17V358IB-E4-EVB uses the same schematic, except the slave PCIe UART is the XR17V354 (the XR17V358 is pin compatible to the XR17V354) and the transceivers for channels 5-8 are not populated.

For the XR17V354 EVBs, again the pin compatibility with the XR17V358 is used. The slave components on the XR17V354IB-0A-EVB are not populated, the XR17V354 is installed as the master and the master's channel 5-8 transceivers are not populated. For the XR17V354IB-E4-EVB, a master XR17V354 and a slave XR17V354 is installed; channel 5-8 transceivers are not populated. For the XR17V354IB-E8-EVB, a master XR17V354 is installed and its channel 5-8 transceivers are not populated.

See the Bill of Materials section for more regarding populated components for XR17V354IB-0A-EVB, XR17V358IB-0A-EVB and XR17V358IB-E8-EVB. See product page for design guidelines for the XR17V354 and XR17V358.



# XR17V354EVB / XR17V358EVB PCB

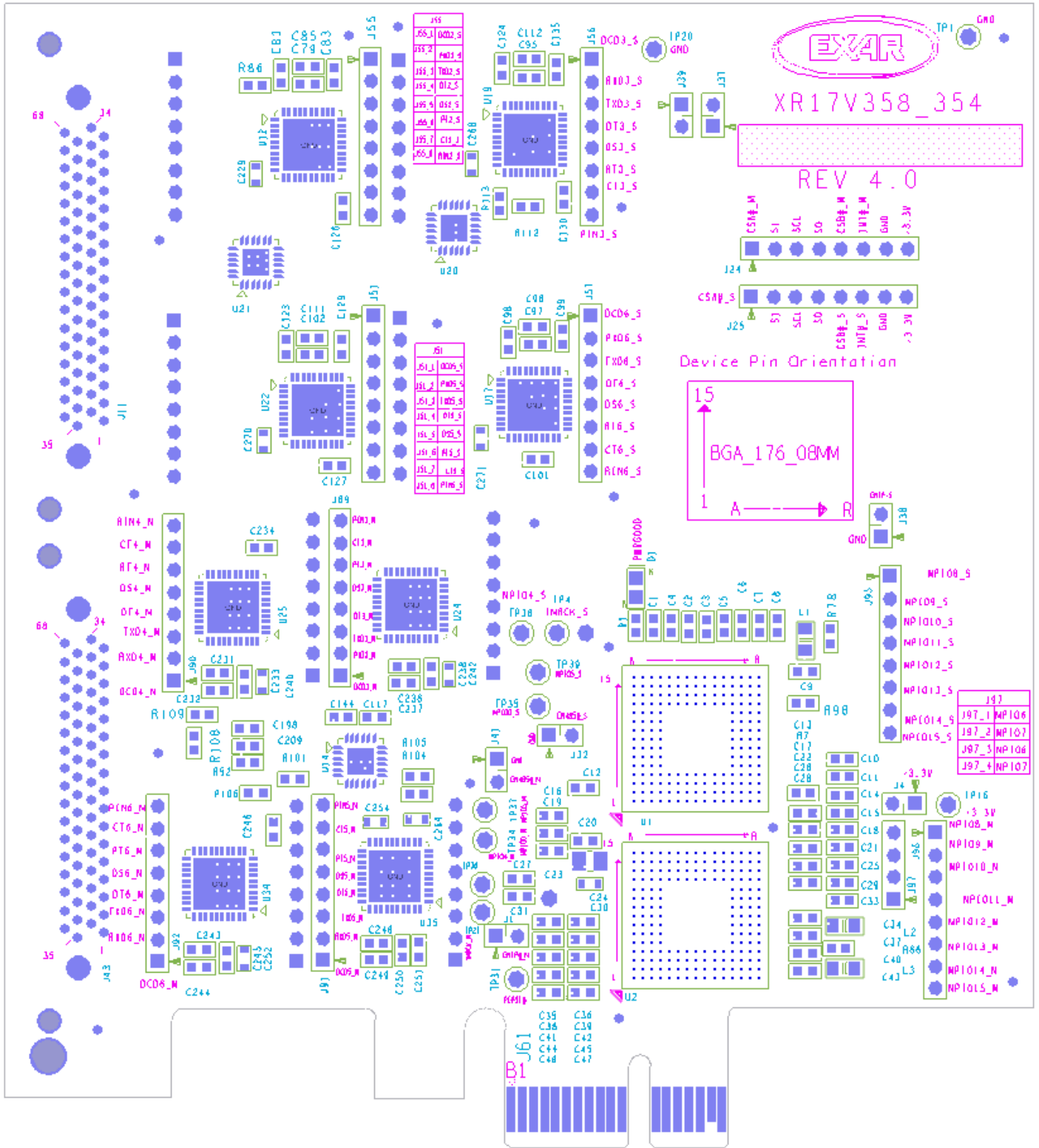


Figure 9: XR17V354 / XR17V358 EVB Top Silkscreen

## XR17V354 / XR17V358 EVB Bill of Materials

**Table 8: XR17V358IB-0A-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
1	97	C11, C12, C13, C14, C16, C17, C18, C19, C20, C21, C22, C23, C27, C28, C29, C31, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C78, C79, C80, C82, C84, C86, C88, C93, C100, C104, C106, C108, C117, C121, C136, C138, C144, C152, C160, C161, C162, C165, C168, C169, C171, C174, C177, C178, C183, C186, C187, C189, C191, C192, C193, C196, C198, C200, C201, C203, C204, C205, C206, C207, C209, C210, C211, C214, C215, C216, C217, C218, C231, C232, C233, C234, C235, C236, C237, C238, C239, C241, C243, C244, C245, C246, C247, C248, C249, C250, C251, C253, C255, C256, C257, C258, C259, C260, C261, C262, C263, C265	CAP CER 0.1UF 16V X7R 0402	Wurth 885012205037
2	3	C24, C30, C208	CAP CER 10UF 6.3V X5R 0603	Wurth 855012106006
3	1	C188	CAP CER 47UF 6.3V X5R 0805	Wurth 885012107006
4	1	C219, C220	CAP TANT 10UF 16V 10% 1411	Kemet T491B106K016AT
5	8	C228, C230, C240, C242, C252, C254, C264, C266	CAP CER 1UF 16V X7R 0603	Wurth 885012206076
6	1	D17	LED RED CLEAR CHIP SMD 0603	Lite-on LTST-C190CKT
7	5	J1, J4, J41	CONN HEADER 2MM SINGLE STR 2 POS	Wurth 62000211121
8	1	J43	CONN CHAMP RECPT RTANG 68POS PCB	TE Connectivity, Amp 5796055-1
9	10	J24, J48, J49, J89, J90, J91, J92, J93, J94, J96	CONN HEADER 2MM SINGLE STR 8 POS	Wurth 62000811121
10	1	J97	CONN HEADER 2MM SINGLE STR 4POS	Wurth 62000411121
11	3	L2, L3, L6	FERRITE BEAD 1 KOHM 0805 1LN	Wurth 742792096
12	1	L7	FIXED IND 4.7UH 1A 200 MOHM SMD	Wurth 744029004
13	1	R84	RES SMD 475 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4750X
14	16	R7, R97, R100, R101, R104, R105, R106, R107, R108, R109, R54, R87, R88, R91, R99, R103	RES SMD 4.7K OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4701X
15	1	R102	RES SMD 191 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF1910X
16	11	TP1, TP4, TP16, TP20, TP27, TP31, TP32, TP33, TP34, TP36, TP37	TEST POINT PC MINI .040"D YELLOW	Keystone 5004
17	1	U2	Octal PCI Express UART	MaxLinear XR17V358IB176-F

**Table 8: (Continued)XR17V358IB-0A-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
18	8	U11, U16, U24, U25, U34, U35, U36, U37	RS232/RS485/RS422 Transceiver with Internal Termination	MaxLinear SP339EER1-L
19	2	U14, U15	XRA1405_QFN24	MaxLinear XRA1405IL24-F
20	1	U30	IC EEPROM 1K SPI 2MHZ 8TSSOP	Microchip AT93C46E-TH-B

**Table 9: XR17V358IB-E8-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
1	185	C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C25, C26, C27, C28, C29, C31, C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C117, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C132, C133, C134, C135, C136, C137, C138, C139, C140, C144, C152, C160, C161, C162, C163, C164, C165, C166, C168, C169, C171, C174, C177, C178, C180, C182, C183, C186, C187, C189, C191, C192, C193, C195, C196, C198, C199, C200, C201, C203, C204, C205, C206, C207, C209, C210, C211, C214, C215, C216, C217, C218, C231, C232, C233, C234, C235, C236, C237, C238, C239, C241, C243, C244, C245, C246, C247, C248, C249, C250, C251, C253, C255, C256, C257, C258, C259, C260, C261, C262, C263, C265	CAP CER 0.1UF 16V X7R 0402	Wurth 885012205037
2	6	C24, C30, C131, C141, C158, C208	CAP CER 10UF 6.3V X5R 0603	Wurth 855012106006
3	2	C143, C188	CAP CER 47UF 6.3V X5R 0805	Wurth 885012107006
4	2	C219, C220	CAP TANT 10UF 16V 10% 1411	Kemet T491B106K016AT
5	16	C228, C229, C230, C240, C242, C252, C254, C264, C266, C267, C268, C269, C270, C271, C272, C273	CAP CER 1UF 16V X7R 0603	Wurth 885012206076
6	2	D1, D17	LED RED CLEAR CHIP SMD 0603	Lite-on LTST-C190CKT
7	5	J1, J4, J32, J38, J41	CONN HEADER 2MM SINGLE STR 2 POS	Wurth 62000211121
8	2	J11, J43	CONN CHAMP RECPT RTANG 68POS PCB	TE Connectivity, Amp 5796055-1
9	20	J24, J25, J48, J49, J50, J51, J55, J56, J57, J58, J59, J62, J89, J90, J91, J92, J93, J94, J95, J96	CONN HEADER 2MM SINGLE STR 8 POS	Wurth 62000811121
10	1	J97	CONN HEADER 2MM SINGLE STR 4POS	Wurth 62000411121
11	6	L1, L2, L3, L5, L6, L8	FERRITE BEAD 1 KOHM 0805 1LN	Wurth 742792096
12	2	L4, L7	FIXED IND 4.7UH 1A 200 MOHM SMD	Wurth 744029004
13	2	R1, R84	RES SMD 475 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4750X
14	29	R7, R97, R98, R100, R101, R104, R105, R106, R107, R108, R109, R110, R111, R112, R113, R114, R115, R116, R117, R54, R83, R87, R88, R89, R90, R91, R92, R99, R103	RES SMD 4.7K OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4701X

**Table 9: XR17V358IB-E8-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
15	1	R102	RES SMD 191 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF1910X
16	14	TP1, TP4, TP16, TP20, TP27, TP31, TP32, TP33, TP34, TP35, TP36, TP37, TP38, TP39	TEST POINT PC MINI .040"D YELLOW	Keystone 5004
17	1	U1	Octal PCI Express UART	MaxLinear XR17V358IB176-F
18	1	U2	Octal PCI Express UART	MaxLinear XR17V358IB176-F
19	16	U11, U12, U13, U16, U17, U18, U19, U22, U23, U24, U25, U27, U34, U35, U36, U37	RS232/RS485/RS422 Transceiver with Internal Termination	MaxLinear SP339EER1-L
20	4	U14, U15, U20, U21	XRA1405_QFN24	MaxLinear XRA1405IL24-F
21	1	U30	IC EEPROM 1K SPI 2MHZ 8TSSOP	Microchip AT93C46E-TH-B

**Table 10: XR17V354IB-0A-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
1	90	C11, C12, C13, C14, C16, C17, C18, C19, C20, C21, C22, C23, C27, C28, C29, C31, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C78, C80, C82, C84, C86, C93, C100, C104, C106, C108, C117, C121, C144, C152, C161, C162, C165, C168, C169, C171, C174, C177, C178, C183, C186, C187, C189, C191, C192, C193, C196, C198, C200, C201, C203, C204, C205, C206, C207, C209, C210, C211, C214, C215, C216, C217, C218, C231, C232, C233, C234, C235, C236, C237, C238, C239, C241	CAP CER 0.1UF 16V X7R 0402	Würth 885012205037
2	3	C24, C30, C208	CAP CER 10UF 6.3V X5R 0603	Würth 855012106006
3	1	C188	CAP CER 47UF 6.3V X5R 0805	Würth 885012107006
4	2	C219, C220	CAP TANT 10UF 16V 10% 1411	Kemet T491B106K016AT
5	4	C228, C230, C240, C242	CAP CER 1UF 16V X7R 0603	Würth 885012206076
6	1	D17	LED RED CLEAR CHIP SMD 0603	Lite-on LTST-C190CKT
7	5	J1, J4, J41	CONN HEADER 2MM SINGLE STR 2 POS	Würth 62000211121
8	1	J43	CONN CHAMP RECPT RTANG 68POS PCB	TE Connectivity, Amp 5796055-1
9	6	J24, J48, J49, J89, J90, J96	CONN HEADER 2MM SINGLE STR 8 POS	Würth 62000811121
10	1	J97	CONN HEADER 2MM SINGLE STR 4POS	Würth 62000411121
11	3	L2, L3, L6	FERRITE BEAD 1 KOHM 0805 1LN	Würth 742792096
12	1	L7	FIXED IND 4.7UH 1A 200 MOHM SMD	Würth 744029004
13	1	R84	RES SMD 475 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4750X
14	15	R7, R97, R100, R101, R104, R105, R54, R87, R88, R91, R99, R103	RES SMD 4.7K OHM 1% 1/10W 0402	Panasonic ERJ-2RKF4701X
15	1	R102	RES SMD 191 OHM 1% 1/10W 0402	Panasonic ERJ-2RKF1910X
16	11	TP1, TP16, TP20, TP27, TP31, TP32, TP34, TP36, TP37	TEST POINT PC MINI .040"D YELLOW	Keystone 5004
17	1	U2	Quad PCI Express UART	MaxLinear XR17V354IB176-F
18	4	U11, U16, U24, U25	RS232/RS485/RS422 Transceiver with Internal Termination	MaxLinear SP339EER1-L

**Table 10: XR17V354IB-0A-EVB Bill of Materials**

Item	Qty	Reference Designator	Description	Manufacturer / Part Number
19	3	U14	XRA1405_QFN24	MaxLinear XRA1405IL24-F
20	1	U30	IC EEPROM 1K SPI 2MHZ 8TSSOP	Microchip AT93C46E-TH-B



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