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EXAR'S XR88C92/192 COMPARED WITH PHILIP'S SCC2692

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1.0 INTRODUCTION

This application note describes the major difference between Exar's XR88C92/192 with Philips's SCC2692. These devices are very similar, with a few hardware, firmware-related and bus timing differences.

1.1 HARDWARE DIFFERENCES

- The Philips SCC2692 and Exar XR88C92/192 are both available in three footprints: 44-pin PLCC, 44-pin QFP and 40-pin DIP. Additionally, the SCC2692 is also available in a 28-pin DIP. In the PLCC, QFP and 40-DIP packages, the Exar and Philips DUARTs are pin-to-pin compatible.
- The Exar's 44-pin TQFP package is the same size and has the same pitch as the Philips' 44-pin QFP package. But they differ in the package thickness and the lead length. See the list below:

	Exar	Philips
Thickness:	1.4mm	1.75mm
Lead Length, Lp:	0.45mm < Lp < 0.75mm	0.55mm < Lp < 0.95mm

1.2 FIRMWARE DIFFERENCES

All the internal registers in the SCC2692 and XR88C92/192 are identical with only a few exceptions:

- The XR88C92/192 has an additional mode register, Mode Register 0 (Watch dog timer, RX and TX trigger levels and extended baud rate tables), for channels A and B while the SCC2692 does not.
- Since the XR88C92/192 has a larger FIFO than the SCC2692, the selectable transmit and receive trigger levels are different.
- At the address offset of 0x2 and 0xA, the SCC2692 has a read-only BRG Test Register and 1X/16X Test Register, respectively, while these offsets are reserved for the XR88C92/192.
- The XR88C92/192 has a Miscellaneous Command in the CRA and CRB register bits 7-4 that has a different function than the SCC2692. When 0xB is written to the upper nibble of CRA or CRB, the XR88C92/192 sets the MR pointer to MR0, but this has no effect on the SCC2692.

1.3 BUS TIMING DIFFERENCES

- The XR88C92/192 is faster than the SCC2692. For example, the data access time (from -CS low to data valid) during a read is a maximum of 32 ns for the XR88C92/192, whereas it is a maximum of 175 ns for the SCC2692.

1.4 Summary of Differences

In the table below, some differences between the XR88C92/192 and SCC2692 are summarized.

Table 1: Differences Between Exar's XR88C92/192 with Philips's SCC2692

Differences	XR88C92/192	SCC2692
Data Bus Standard	Intel	Intel
Power Supply Operation	**3.3 and 5 V**	5 V only
Max Operating Current	**3 mA @ 3.3 V** **6 mA @ 5 V**	10 mA @ 5 V
Max Frequency on XTAL1	**24 MHz**	4 MHz
Max Data Rate	**1 Mbps**	125 Kbps
Operating Temperature Range	Commercial and Industrial	Commercial and Industrial
Package	44-TQFP, 44-PLCC, 40-PDIP	44-PQFP, 44- PLCC, 40-PDIP, 28-DIP
44-(T)QFP package thickness	**1.4 mm**	1.75 mm
44-(T)QFP package max lead lengths	**0.75 mm**	0.95 mm
TX FIFO Size	**8 (XR88C92)** **16 (XR88C192)**	1
RX FIFO Size	**8 (XR88C92)** **16 (XR88C192)**	3
TX FIFO Trigger Levels	**8, 4, 6, 1 (XR88C92)** **16, 8, 12, 1(XR88C192)**	1
RX FIFO Trigger Levels	**1, 3, 6, 8 (XR88C92)** **1, 6, 12, 16 (XR88C192)**	1, 3

1.5 Replacing the SCC2692 with the XR88C92/192

You can directly replace the Philips SCC2692 with Exar's XR88C92/192 without any hardware changes if using either the 44-TQFP, 44-PLCC or 40-PDIP packages. Hardware changes will be necessary to upgrade from the 28-DIP package because the XR88C92/192 is not available in that package.

Since the XR88C92/192 has a larger Transmit and Receive FIFO, the software will need to be updated to take advantage of the features of the XR88C92/192. The XR88C92/192 allows the hardware designer to choose either a 5 or 3.3 V power supply instead of being forced to use a 5 V power supply only. Also, the XR88C92/192 has a lower power consumption than the SCC68692.

The XR88C92/192 can accept up to a 24 MHz frequency on XTAL1 and is capable of operating up to a data rate of 1 Mbps whereas the SCC2692 can only accept up to a 4 MHz frequency on XTAL1 and only operating up to a data rate of 125 Kbps.

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