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EXAR'S ST16C452 AND ST16C552 COMPARED WITH TI'S TL16C452

Author: PY

1.0 INTRODUCTION

This application note explains why Exar's ST16C452 is pin-to-pin compatible with TI's TL16C452, but Exar's ST16C552 is not pin-to-pin compatible with TI's TL16C452.

1.1 HARDWARE DIFFERENCES

The TI TL16C452 and Exar's ST16C452 and ST16C552 are all only available in the 68-pin PLCC package.

The TL16C452 has 4 pins that are different from the ST16C452 and ST16C552. Pins 9, 22, 42 and 61 are defined as GND pins on the TL16C452. Those same 4 pins are "No Connections" on the ST16C452. Therefore, the ST16C452 can be a direct drop-in to the TL16C452. But at those 4 pin locations, the ST16C552 has the RXRDYA#, TXRDYA#, TXRDYB#, and RXRDYB# outputs respectively. If unused, these outputs should be left floating and not connected to GND or they will be drawing a lot of current. Therefore, the ST16C552 is not pin-to-pin compatible with the TL16C452. But it is pin-to-pin compatible with the ST16C452 because they are "No Connections" at those 4 pins.

TABLE 1: HARDWARE PIN DIFFERENCES

PIN #	TL16C452	ST16C452	ST16C552
9	GND	No Connection	RXRDYA# Output
22	GND	No Connection	TXRDYA# Output
42	GND	No Connection	TXRDYB# Output
61	GND	No Connection	RXRDYB# Output

1.2 FIRMWARE DIFFERENCES**1.2.1 Firmware Differences Between the ST16C452 and TL16C452**

The ST16C452 is fully software compatible with the TL16C452.

1.2.2 Firmware Differences Between the ST16C552 and TL16C452

TABLE 2: ST16C552 AND TL16C452 REGISTER SET DIFFERENCES

A2:A0	R/W	ST16C552	TL16C452
LCR Bit-7 = 0			
001	R/W	Interrupt Enable Register (IER) • Bit-5 = Enable Power Down Mode	Interrupt Enable Register (IER) • Bit-5 = Not Used
010	R	Interrupt Status Register (ISR) • Bit-7 = FIFO's Enabled • Bit-6 = FIFO's Enabled	Interrupt Status Register (ISR) • Bit-7 = Not Used • Bit-6 = Not Used
010	W	FIFO Control Register (FCR) • Enable FIFO, Reset TX/RX FIFO, DMA Mode, RX Trigger Levels	N/A
100	R/W	Modem Control Register (MCR) • Bit-7 = Power Down	Modem Control Register (MCR) • Bit-7 = Not Used
101	R	Line Status Register (LSR) • Bit-7 = FIFO Data Error	Modem Control Register (LSR) • Bit-7 = Not Used

R = Read-Only, W = Write-Only, R/W = Read/Write

1.3 REPLACING THE TL16C452 WITH THE ST16C452 OR ST16C552

You can directly replace TI's TL16C452 with Exar's ST16C452 without any hardware or software changes.

When replacing the TL16C452 with the ST16C552, some hardware changes will be necessary. Also, the software should be updated to take advantage of the larger FIFO and enhanced features.

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