

APPLICATION NOTE

ABSTRACT

The objective of this application note is to show the specifics of Philips SC16C650A and the comparison to other industry standard 16C650. This application note is also applicable to SC16C654/654D.

AN10164 SC16C650A application note

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SC16C650A application note

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The objective of this application note is to show the differences between Philips SC16C650A and other industry standard devices from Exar. In most cases the Philips SC16C650A is a direct drop-in replacement, but because software drivers vary from application to application, occasionally a minor software change may be required. This application note will point out areas to check if proper operation is not observed.

This application note is also applicable to Philips SC16C654.

1. CLEARING OF TRANSMIT EMPTY INTERRUPT

If the transmit FIFO is empty and the interrupt on transmit FIFO empty is enabled (IER bit 1), the UART will generate a hardware interrupt. This hardware interrupt can be cleared by either reading the ISR register, or by writing a byte into the transmit FIFO, however if the software does not write at least one byte into the transmit FIFO, then the transmit empty interrupt cannot be set again.

2. READING ISR REGISTER

Whenever reading the ISR register the LCR bit 7 must be set to 0.

3. DOUBLE XON/XOFF CONTROL CHARACTERS

The SC16C650A only supports single character XON/XOFF flow control.

4. CLEARING RECEIVE INTERRUPT BY READING THE RECEIVE CHARACTER

If receive holding interrupt is enabled (IER register bit 0 = 1), upon receiving a character the UART will generate a receive interrupt. To clear this interrupt the software must read the ISR register and the received character.

5. DISABLE RECEIVE DATA TIMEOUT INTERRUPT

When the receive holding interrupt is enabled (IER bit 0 = 1), and the receiver receives a number of characters the software must read the receive FIFO before the receive timeout interrupt is generated (refer to the data sheet to calculate the timeout). If the receive timeout interrupt is generated, in order to disable it the software must read all the data in the receive FIFO before disabling the receive holding interrupt.

6. SC16C650A TRANSMIT EMPTY INTERRUPT BEHAVIOR

Transmit empty interrupt generation and deactivation is based on trigger levels; upon receiving a transmit empty interrupt, the software must fill up the transmit FIFO up to the programmed trigger level.

7. SC16C650A PC MODE

Philips SC16C650A does not support PC mode.

8. TXRDY BEHAVIOR IN DMA MODE 1

The $\overline{\text{TXRDY}}$ pin of the Philips SC16C650A goes LOW based on the trigger levels set by FCR register bit 5 and 4 (see data sheet for details). This feature allows the Philips SC16C650A to do block DMA transfer (similar to TI devices).

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Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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