

APPLICATION NOTE

ABSTRACT

The objective of this application note is to show the specifics of Philips SC16C550 and the comparison to other industry standard 16C550. This application note is also applicable to SC16C2550, SC16C2552 and SC16C554/554D.

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The objective of this application note is to show the differences between Philips SC16C550 and other industry standard devices from Exar and TI. In most cases the Philips SC16C550 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 areas to check if proper operation is not observed.

This application note is also applicable to Philips SC16C2550, SC16C2552 and SC16C554/554D since these devices are just the dual channel or quad channel equivalent of Philips SC16C550.

1. READING THE ISR REGISTER

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

2. 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.

3. ADDITIONAL ENHANCED REGISTER

Our 16C550 device includes an enhanced register that is not available in the competitor devices. This extra register allows users to do auto hardware and software flow control. Because of the presence of this register, it may cause software to detect the device as a 16C650.

4. CLEARING RECEIVE INTERRUPT BY READING THE RECEIVE CHARACTER

If the 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, the software must read all the data in the receive FIFO before disabling the receive ready interrupt.

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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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