

Errata (All Date Codes)

- Incorrect Channels Change in Free Running Mode
- 32 kHz Oscillator may Fail at Higher Voltages
- Incorrect Start-up Time
- Lock Bits at High V_{CC} and Temperature
- Error in Half Carry Flag
- Error in Writing Reset Status Bits
- Wake-up from Sleep Executes Instructions before the Interrupt is Serviced
- The SPI can Send Wrong Byte
- Output Compare Output Value Corrupted by Writing to Port
- Serial Programming at Voltages below 3.0V
- Wake-up from Power Save without Global Interrupt Enabled
- UART Loses Synchronization if RXD Line is Low when UART Receive is Disabled

Errata (Date Codes before 9836)

- High Current Consumption at High V_{CC}
- Leakage Current on Tri-stated I/O Pins
- 32 kHz Oscillator

These errata apply for all rev D devices.

15. Incorrect Channel Changes in Free Running Mode

If the ADC operates in Free Running Mode and channels are changed by writing to ADMUX shortly after the ADC Interrupt Flag (ADIF in ADCSR) is set, the new setting in ADMUX may affect the ongoing conversion.

Problem Fix/Workaround

Use Single Conversion Mode when scanning channels, or avoid changing ADMUX until at least 0.5 ADC clock cycles after ADIF goes high.

14. 32 kHz Oscillator may Fail at Higher Voltages

When using an external 32 kHz crystal as asynchronous clock source for Timer2, the timer may count incorrectly at voltages above 4.0V.

Problem Fix/Workaround

Keep the supply voltage below 4.0V when clocking Timer2 from an external crystal.

13. Incorrect Start-up Time

When the FSTRT fuse is programmed, the start-up time from reset may still be 16 ms instead of 1 ms.

Problem Fix/Workaround

Leave the FSTRT fuse unprogrammed and design the system to allow a start-up time of 16 ms.

12. Lock Bits at High V_{CC} and Temperature

On some devices, the lock bits will not erase at high V_{CC} and temperature. In this situation, it will not be possible to reprogram the devices when the lock bits are set.

Problem Fix/Workaround

Lower V_{CC} below 4.0V at room temperature before you perform a chip-erase. Then the device will unlock, and it will be possible to reprogram the device at any V_{CC} .



8-bit AVR[®]
Microcontroller
with 8K Bytes
In-System
Programmable
Flash

AT90S/LS8535
Rev. D
Errata Sheet

Rev. 1196D-04/00



11. Error in Half Carry Flag

The half carry flag is undefined after executing the commands “ror”, “asr” and “lsr”.

Problem Fix/Workaround

Do not use the half carry flag value after executing the above instructions.

10. Error in Writing Reset Status Bits

The EXTRF flag in MCUSR will be cleared when clearing the PORF-flag. The flag does not get cleared by writing a “0” to it.

Problem Fix/Workaround

Finish the test of both flags before clearing any of them. Clear both flags simultaneously by writing “0” to both PORF and EXTRF in MCUCR.

9. Wake-up from Sleep Executes Instructions before the Interrupt is Serviced

When waking up from power save, some instructions are executed before the interrupt is called. If the device is woken up by an external interrupt, 2 instruction cycles are executed. If it is woken up by the asynchronous timer, 3 instructions are executed before the interrupt.

Problem Fix/Workaround

Make sure that the first two or three instructions following sleep are not dependent on the executed interrupt.

8. The SPI can Send Wrong Byte

If the SPI is in Master mode, it will restart the old transfer if new data is written on the same clock edge as the previous transfer is finished.

Problem Fix/Workaround

When writing to the SPI, first wait until it is ready, then write the byte to transmit.

7. Output Compare Output Value Corrupted by Writing to Port

When writing to the PORTD I/O location, the OC1A and OC1B output compare values will assume the values written to bits 5 and 4, respectively. This means that even when writing to another bit in the same port register (such as a read-modify-write to another pin in the same port), the output compare values will be affected. Effectively, if the output compare function is used, the other pins in the same port cannot be changed, unless the intention is to write the output compare values simultaneously.

Problem Fix/Workaround

Avoid updating the other port bits when using the output compare function.

6. Serial Programming at Voltages below 3.0V

At voltages below 3.0V, serial programming might fail.

Problem Fix/Workaround

Keep V_{CC} at 3.0V or higher during In-System Programming.

5. Wake-up from Power Save without Global Interrupt Enabled

When an asynchronous timer interrupt is used to wake up the part from power save, the part will wake up even if global interrupts are disabled.

Problem Fix/Workaround

No workaround necessary.

4. UART Loses Synchronization if RXD Line is Low when UART Receive is Disabled

The UART will detect a UART start bit and start reception even if the UART is not enabled. If this occurs, the first byte after re-enabling the UART will be corrupted.

Problem Fix/Workaround

Make sure that the RX line is high at start-up and when the UART is disabled. An external RS232-level converter keeps the line high during start-up.

In addition to the above, these errata apply for devices with date code marking before 9836.

3. High Current Consumption at High V_{CC}

Some of the early samples have higher current consumption than specified. The current consumption in power-down/power save mode is 100 to 500 μA at 6V, rather than the specified 50 μA . The current consumption increases exponentially with supply voltage, and is strongly varying from sample to sample.

Problem Fix/Workaround

Use devices with date codes later than 9836.

2. Leakage Current on Tri-stated I/O Pins

On some of the early samples tri-stated I/O pins may source up to 20 μA and sink up to 6 μA at 6V supply voltage. This means that input pins will effectively have an input impedance of down to 300K Ω . This may cause an unfortunate input offset voltage, particularly noticeable for the ADC and analog comparator pins.

Problem Fix/Workaround

Drivers for the analog and digital input signals to the MCU must be designed to drive a load of 300K Ω per pin. Or use devices with date codes later than 9836.

1. 32 kHz Oscillator

On some of the early samples, the 32 kHz oscillator does not start at high voltages. This is dependent on the leakage current on the PC6 (TOSC1) pin, which can be up to 20 μ A.

The higher the leakage current, the lower the failure voltage for the oscillator. A failing oscillator may in

some cases be kickstarted with an external capacitance.

Problem Fix/Workaround

Lower the operating voltage below 4.0V or use devices with a date code later than 9836.



Atmel Headquarters

Corporate Headquarters
2325 Orchard Parkway
San Jose, CA 95131
TEL (408) 441-0311
FAX (408) 487-2600

Europe

Atmel U.K., Ltd.
Coliseum Business Centre
Riverside Way
Camberley, Surrey GU15 3YL
England
TEL (44) 1276-686-677
FAX (44) 1276-686-697

Asia

Atmel Asia, Ltd.
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimhatsui
East Kowloon
Hong Kong
TEL (852) 2721-9778
FAX (852) 2722-1369

Japan

Atmel Japan K.K.
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
TEL (81) 3-3523-3551
FAX (81) 3-3523-7581

Atmel Operations

Atmel Colorado Springs
1150 E. Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
TEL (719) 576-3300
FAX (719) 540-1759

Atmel Rousset

Zone Industrielle
13106 Rousset Cedex
France
TEL (33) 4-4253-6000
FAX (33) 4-4253-6001

Fax-on-Demand

North America:
1-(800) 292-8635
International:
1-(408) 441-0732

e-mail

literature@atmel.com

Web Site

<http://www.atmel.com>

BBS

1-(408) 436-4309

© Atmel Corporation 2000.

Atmel Corporation makes no warranty for the use of its products, other than those expressly contained in the Company's standard warranty which is detailed in Atmel's Terms and Conditions located on the Company's web site. The Company assumes no responsibility for any errors which may appear in this document, reserves the right to change devices or specifications detailed herein at any time without notice, and does not make any commitment to update the information contained herein. No licenses to patents or other intellectual property of Atmel are granted by the Company in connection with the sale of Atmel products, expressly or by implication. Atmel's products are not authorized for use as critical components in life support devices or systems.

Marks bearing ® and/or ™ are registered trademarks and trademarks of Atmel Corporation.

Terms and product names in this document may be trademarks of others.



Printed on recycled paper.

1196D-04/00/xM