Errata (Date Codes Before 9836)[1]

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

Errata (All Date Codes)[1]

- **Error in Half Carry Flag**
- **Error in Writing Reset Status Bits**
- **Wakeup from Sleep Executes Instructions Before the Interrupt is Serviced**
- **The SPI can Send Wrong Byte**
- **SPI Interrupt Flag can be Undefined After Reset**
- **Verifying EEPROM in System**
- **Serial Programming at Voltages below 3.0 Volts**
- **Wake-Up from Power Save without Global Interrupt Enabled**

Note: 1. This silicon revision has different errata for devices with date code marking before and after 9836.

These errata apply for devices with date code marking before 9836.

12. High Current Consumption at High V_{CC}

Some of the early samples have higher current consumption than specified. The current consumption in powerdown/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.

11. Leakage Current on Tristated I/O Pins

On some of the early samples tristated 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 effectivly have an input impedance of down to 300KΩ. 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 300KΩ per pin. Or use devices with date codes later than 9836.

10. 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 µA.

The higher leakage current, the lower is 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 4.5V. Or use devices with date code later than 9836.

8-Bit AVR® Microcontroller with 4K/8K bytes In-System Programmable Flash

AT90S/LS8535 Rev. D Errata Sheet

Rev. 1196B–01/99

These errata apply for rev D devices.

9. 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.

8. Wrong clearing of XTRF in MCUSR

The XTRF 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 XTRF in MCUCR.

7. Wake-up from Power Save Executes Instructions Before Interrupt

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 is not dependent of the executed interrupt.

6. 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.

5. SPI Interrupt Flag can be Undefined After Reset

In certain cases when there are transitions on the SCK pin during reset, or the SCK pin is left unconnected, the start-up value of the SPI interrupt flag is be unknown. If the flag is not reset before enabling the SPI interrupt, a pending SPI interrupt may be executed.

Problem Fix/Workaround

Clear the SPI interrupt flag before enabling the interrupt.

4. 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.

3. Verifying EEPROM in System

EEPROM verify in In-System Programming mode cannot operate with maximum clock frequency. This is independent of the SPI clock frequency.

Problem Fix/Workaround

Reduce the clock speed, or avoid using the EEPROM verify feature.

2. Serial Programming at Voltages below 3.0 Volts

At voltages below 3.0 Volts, serial programming might fail

Problem Fix/Workaround

Keep VCC at 3.0 Volts or higher during In-System Programming

1. Wake-Up from Power Save without Global Interrupt enabled

When a 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 neccessary

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