



AX1003 8-bit CMOS Microcontroller

Engineering Specification

Version #2.0.0

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AX1003 8-bit High performance Microcontroller

High performance 8-bit RISC MCU

- DC-100MHz operation
- 30ns internal interrupt response
- Online upgrade capability to update program code directly from PC through USB
- Internal PLL can be adjusted by increasing frequency to achieve more processing power or by decreasing frequency to reduce power consumption (clock switching only 2 clocks)
- All instructions are single-cycled except branching and special-I instructions

CPU Features

- 79 compact instruction sets
- Special lread/lwrite instructions for memory access
- 3.0~3.6V operating voltage
- Support Hold/Sleep power-saving mode
- 8 level-deep hardware stack for subroutine linkage (extended levels of subroutine linkage are supported by software)

Program Memory and Data Memory

- 8KByte OTP program memory
- 4k x 16-bit SRAM instruction memory (Both Instruction execution and data buffering are supported)
- 256Byte SRAM data memory
- Provide 2 pointers for direct and indirect addressing
- Dedicate 32Byte ROM space for storing product ID

Fast and Deterministic Interrupt

- 16 vectored interrupts for Timer/CCP/Ports/USB/IrDA/ADC/SSP
- 8 single-pin external wakeup/interrupts capabilities on Port A and Port B
- 2 levels interrupt priority selection for all the hardware interrupt sources
- Software interrupt capability

Flexible I/O

- 36 GPIO pins with 4 full ports and 1 half port (4-pins)
- All pins can be individually programmable as I/O
- All pins are pull-up selectable
- TTL-level inputs with Schmitt Trigger
- 10mA/24mA programmable Sink/Source Current (high-drive current capable of driving DC motor and LED)

Hardware Peripheral Features

- Timer0: 8-bit timer/counter with 12-bit prescaler
- Timer1: 16-bit timer/counter with 12-bit prescaler
- Timer2: 8-bit timer with 8-bit period register, 12-bit prescaler and 4-bit postscaler
- Timers support Timer/Counter/CCP mode
- Internal 150MHz PLL
- Watchdog Timer with on-chip 32kHz RC oscillator
- Support external 1-12MHz crystal for oscillation
- USB clock adjusting mechanism allowing the system to operate at 48MHz/96MHz when employing USB
- Full-speed USB 1.1 device controller and PHY module
- SSP (Synchronous Serial Port) module supporting SPI/GPSI/I²S mode
- 8-channels of 10-bit SARADC
- 1-channel of 10-bit R2R DAC
- IrDA module supporting IrDA (4Mb/s max) and UART (3.686Mb/s)
- Built in analog rail-to-rail input comparator
- Power-On-Reset
- Brown-Out-Reset

Programming and Debugging Support

- In-System Programming (ISP) support
- In-System Debugging (ISD) support

Packages

- 64-pin LQFP (10mm x 10mm)
- DIE form

