



AX101 8-bit Low Cost Microcontroller

Engineering Specification

Version #3.2.1

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AX101 8-bit Low Cost Microcontroller

CPU Features

- High performance 8-bit RISC-based CPU
- Operating speed: DC – 50MHz (50MIPS max.)
- Operating voltage range: 3.0V ~ 3.6V.
- Compact instruction set. A total of 59 instructions
- All instructions are single cycle except branch instructions
- Fast interrupt response. 80ns internal interrupt response at DC - 50MHz
- 8 level deep hardware stack for subroutine linkage
- Support extended level subroutine linkage by software jump using data memory
- Multiple sources of interrupt capability

Memory

- Low power CMOS One-Time-Programming (OTP) technology
- 4K x 14-bit OTP ROM Program Memory
- 256 bytes of Data Memory (RAM)
- 10 bytes of General Purpose Register (GPR)
- Support Direct, Indirect addressing modes
- Provide one pointer for Indirect addressing
- Strong program code protection
- Dedicated 62x14-bit ROM space for product ID record
- All registers are memory-mapped

Interrupt Capability

- Timer0, Timer1 and Timer2 overflow interrupt capability
- UART, SPI, GPSI interrupt capability
- ADC convert finish interrupt capability
- Watchdog Timer overflow interrupt capability
- Eight External wakeup / interrupt capability on Port A (RA0), Port B (RB4, RB5, RB6, RB7) and Port C (RC1, RC2, RC3)
- Vectored software interrupt capability

Frequency and Power management

- Provide power saving mode: sleep mode and hold mode
- Provide 3 clock mode for system operation
 1. External crystal (4~50MHz) for system clock
 2. External crystal (32.768KHz) for RTC or system clock
 3. Internal RC oscillator (32KHz) for system clock
- Clock divide mode, divide 1, 4, 16, 64 selectable
- Support system clock switching from 0.5KHz to 50MHz

Flexible I/O

- 27 GPIO pins

- All pins can be individually programmable as I/O
- Inputs support TTL level
- All ports are internal pull-up selectable
- All ports have Schmitt Trigger input
- All ports support Programmable Sink/Source Current with values of 10mA and 24mA

Peripheral Features

- Timer0: 16-bit timer/counter with 7-bit prescaler
- Timer1: 8-bit timer/counter with 7-bit prescaler
- Timer1: support 12-bit PWM mode
- Timer2: 16-bit timer/counter
- Timer2: support PFM mode
- Synchronous Serial Port 1 (SSP1) support SPI interface
- Synchronous Serial Port 2 (SSP2) support GPSI and SPI interface
- Universal Asynchronous Receiver Transmitter (UART)
- Watchdog Timer uses on-chip 32KHz RC oscillator or 32.768KHz real-time-clock oscillator
- Built-in 10-bit ADC with 10 channels selectable
- Built-in 1 channel 10-bit DAC
- Power-On Reset
- Brown-Out Reset
- **MCLR_ Reset (MCLR_ active low signal)**

Packages

- LQFP48
- Die form

Programming and Debugging Support

- On-chip Serial In-System Programming support
- Support a serial Read-OTP mode, allow read out the top 64x14-bit of the ROM (OTP), which recorded the product information by user programming.

