

# AX2002 8-bit CMOS Microcontroller



## High Performance 8-bit RISC MCU

- DC-100MHz operation
- Compatible with 8051
- 50ns internal interrupt response at 100 MIPS
- All instructions are single-cycled except branching instructions
- Two data pointers for indirect addressing

## Program Memory and Data Memory

- 32K Bytes OTP program memory
- 16K Bytes instruction SRAM used for program and/or data memory
- 8K Bytes SRAM for data memory, access by MOVX
- 256 Bytes internal data SRAM
- 512K Bytes External Memory Interface (EMI), support DMA to on-chip SRAM

## Interrupt Features

- 31 vectored interrupts
- 3 levels interrupt priority
- External wakeup/interrupt capabilities on Port 1 (7 GPIO pins) and USB PHY
- 2 levels interrupt priority selection for all the hardware interrupt sources except Watchdog and LVD where they occupy the third level

## Flexible I/O

- 56 GPIO pins in 7 ports
- All GPIO pins can be individually programmable as input or output
- All GPIO pins are internally pull-up selectable
- CMOS/TTL-level Schmitt triggered inputs
- All GPIO pins are 8mA sink/source current output driving

## Digital Peripheral Features

- 2 16-bit timers compatible with 8051's timer0 and timer1
- 2 multi-function 16-bit timers, support Capture and PWM mode
- 2 8-bit timers, support Capture mode
- 1 16-bit special function timer, support PFM
- Watchdog Timer with on-chip 4MHz RC oscillator
- 2 high-speed full-duplex UART
- 1 high-speed SPI, support DMA

- 1 GPSI interface, support DMA
- 4 channels IIS interface, support DMA
- 1 TDM interface with AC97 and PCM mode, support DMA
- 1 Slave Parallel Port with 256 bytes buffer
- 2 programmable linear feedback shift registers
- 1 CRC16 FIFO
- 1 ECC FIFO
- 1 Viterbi encoder and 1 Viterbi decoder
- 1 DCT/IDCT engine, support DMA
- 1 16-bit MAC engine, support DMA. Max frequency is 2 MAC per 3 system clock cycles
- 1 LCD timing control generator, can drive 480 x 360 LCD Panel, support RGB and TTL interface
- Full-speed USB 2.0 OTG controller module with 5 endpoints (including endpoint 0) and 512 bytes FIFO. FIFO size of each endpoint can be configured

## Analog Peripheral Features

- 4~20MHz Crystal Oscillator
- 4MHz RC oscillator
- Full-speed USB 2.0 OTG PHY
- 40~200MHz Flexible PLL-based clock generator
- 8-channel 12-bit Successive Approximation Register ADC
- Rail-to-Rail differential/Single-Ended inputs Instrumentation Amplifier
- FM signal Inverter Amplifier
- 1 channel 8 levels Low Voltage Detector
- Power-on reset
- 3.3V to 1.8V Low Drop-Out regulator

## Programming and Debugging Support

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

## Power Supply

- AVDD, VDDIO, PLLVDD is 3.0-3.6V
- VDDCORE is 1.6-2.0V

## Packages

- 80-pin LQFP (10mm x 10mm)
- 48-pin LQFP (7mm x 7mm)
- DIE form

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