



卓荣集成电路科技有限公司  
AppoTech Limited

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*2004年重点推出:*

# **AX1000系列产品**

**Sub US\$4 100MIPS MCU+DSP**

**设计与生产4美元以下100MIPS的MCU+DSP**



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With advanced CMOS OTP technology, we have developed a cost effective, high performance and high reliability 8-bit MCU - AX1000 series. AX1001 is fabricated RISC-based combined with CMOS OTP process technology to facilitate high-speed communications.

### ★AX1001 PRODUCT CHARACTERISTICS

1. High-speed processor. 100 MIPS 8-bit MCU, 20 times faster than the same kind of products in the market
2. 30 million MAC operations per second, faster than the common digital signal processors.
3. 16KB OTP Memory
4. 8KB SRAM Data/Program Memory
5. 2KB SRAM Data Memory
6. External 8MB SRAM / FLASH / ROM
7. Full-speed USB 1.1
8. 88 I/O ports
9. Two Serdes which can support UART, GPSI, SPI, I<sup>2</sup>C & Modem. Max. can support eight UART
10. 30 ns Interrupt Response Time
11. Deterministic Timing. Use fix amount of clocks to execute DSP like instruction
12. CRC Generator

### ★AX1001 PRODUCT APPLICATIONS

- ◇ Digital Signal Processing (e.g. games, gateway)
- ◇ Tax control ECR (electronic cash register)
- ◇ Toys (voice recognition)
- ◇ Electronic Dictionary (voice recognition)
- ◇ Flash card reader / storage for digital camera
- ◇ Power-line Modem
- ◇ Ethernet gateway / router / switch
- ◇ USB Converter
- ◇ Motion JPEG for web cam
- ◇ IP Camera / Security Camera
- ◇ Mp3

AX1000系列的产品利用先进的CMOS OTP技术, 制造出低成本、高性能、高质素的8位微控制器。

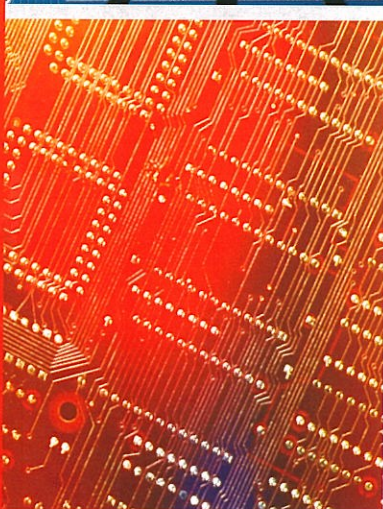
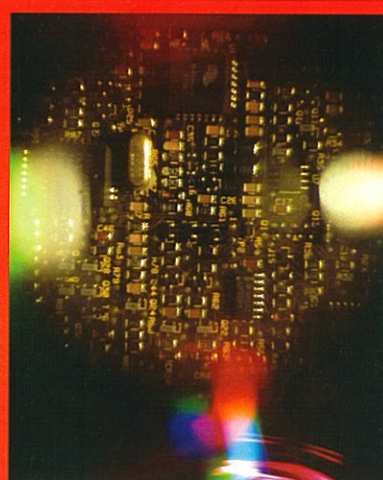
AX1001微控制器, 是卓荣科技采用了RISC的结构, 配合CMOS OTP的处理程序, 精心研制而成的高速沟通工具。

### ★AX1001的产品特点

- 1、快速处理器: 100MIPS的8位微控制器, 比同类型的微控制器快20倍;
- 2、每秒三千万MAC的运作, 比普通数字信号处理器的速度快;
- 3、16KB OTP内存;
- 4、8KB SRAM数据程序内存;
- 5、2KB SRAM数据内存;
- 6、外挂8MB SRAM / FLASH / ROM;
- 7、全速USB1.1模块, 可传递信息;
- 8、88个输入/输出端口;
- 9、两个并串转换器 (Serdes)。Serdes能够支持软件的操作, 支持UART, GPSI, SPI, I<sup>2</sup>C, Modem, 最多能支持8个UART;
- 10、中断反应时间 (Interrupt Response Time) 能达到30 ns;
- 11、Deterministic Timing。利用固定数量的计时器执行类似DSP的指令。
- 12、CRC产生器

### ★AX1001的产品应用

- ◇ 数字信号处理器 (例如游戏机, 网关)
- ◇ 税控发票机, 税控收款机, 外挂税控机
- ◇ 玩具 (语音听说功能)
- ◇ 电子字典 (语音听说功能)
- ◇ 数码相机闪存卡读卡器/储存器
- ◇ 电线上网
- ◇ 以太网网关/路由器/交换机
- ◇ USB转换器
- ◇ 实时JPEG格式压缩的网络摄像机
- ◇ 基于IP网络的摄像机/监视器
- ◇ Mp3







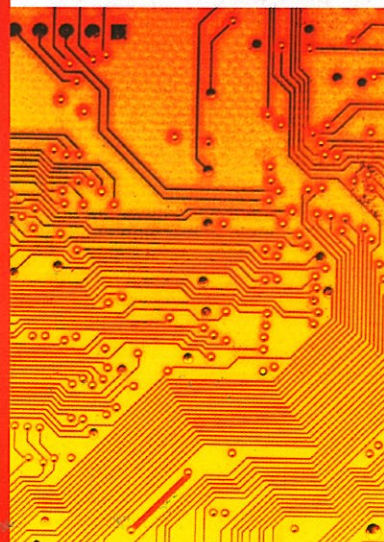
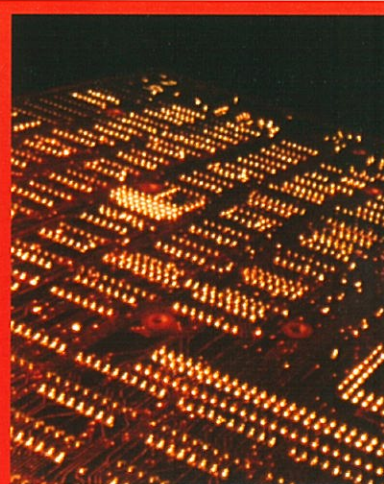
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## ★AX1001 MAJOR FUNCTIONS

1. RISC processor (Harvard architecture)
2. Digital processor
3. Timer. On-chip functions include two 8-bit timers, a 16-bit timer and a real-time clock, they are using 12-bit prescaler to support different operating modes such as Capture, Compare and PWM
4. An Analog comparator. If adding external passive components can be used as low battery detector. Support ADC
5. PWM. 10-bit PWM to execute DAC
6. Power saving mode: 2.5V/3.3V, (use PLL multiplier & 32KHz-100MHz oscillator) Two Power-save modes with multi-source wakeup capability on Port B, C and D
7. Comparator. Support ADC
8. Multi-input wakeup
9. A Power-on reset. Reset the device upon power-up
10. Brown-out reset. Reset the device during low power supply voltage
11. A Watchdog Timer with on-chip RC oscillator and 12-bit prescaler to timeout the device
12. 24mA high current output drive capability

## ★AX1001的主要功能

- 1、RISC处理器 (采用‘哈佛结构’);
- 2、数字处理器;
- 3、计时器。包括两个8位的计时器, 一个16位的计时器和一个实时计时器, 都是采用12位的预分频器支持不同的操作模式 (Capture, Compare和PWM);
- 4、模拟比较器。如果在模拟比较器上加上外置被动组件, 就可以变成一个低电量的探测器, 支持模拟和数字转换(Analog to Digital Converter);
- 5、PWM。采用10位PWM执行数字和模拟转换 (DAC);
- 6、省电模式: 采用2.5V / 3.3V 操作, PLL 乘法, 32KHz-100MHz 晶体振荡器, 在接口B、C、D里有两个多源唤醒功能, 可节省电源;
- 7、比较器 (Comparator);
- 8、多输入唤醒功能;
- 9、上电后重置功能。当电源接上后所有装置会自动重置;
- 10、断电重置。当电源不足时, 所有装置会自动重置;
- 11、看门狗。看门狗配合了芯片上RC振荡器和12位预分设器, 能够暂停装置的运作;
- 12、高电流输出驱动性能: 24mA。







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### ★AX1001 COMPETITIVE ADVANTAGES

1. High-speed processor. 100 MIPS 8-bit MCU, 20 times faster than the same kind of products in the market
2. 30 million MAC operations per second, faster than the common digital signal processors.
3. 2 in 1 chip. AX1001 combines the characteristics of MCU and DSP into a single chip.
4. 30ns Interrupt Response Time, which is faster than most of the microcontrollers in the market.
5. Competitive pricing. Price below US\$4.
6. To satisfy customers' needs, we use different software to support USB, GPSI, SPI, I<sup>2</sup>C, UART, SMART CARD and SERIAL communication modes.
7. High flexibility to support external ROM / FLASH / SRAM.
8. DMA. DMA can be executed at the same time in every memory system, including CPU execution, USB & Data SRAM transmission, External SRAM / FLASH / ROM & Data SRAM transmission, OTP & Data SRAM transmission.
9. 88 I/O ports.

### ★AX1001的产品优势

- 1、快速处理器.100 MIPS的8位微控制器, 比同类型的微控制器快20倍;
- 2、每秒三千万MAC的运作, 比普通数字信号处理器的速度快;
- 3、MCU跟DSP的优点合二为一, 一片AX1001芯片可替代二个芯片 (MCU+DSP)
- 4、中断反应时间 (Interrupt Response Time) 只需要30 ns, 比在市场出售的微控制器都低;
- 5、价格便宜, 低于4美元;
- 6、针对客户的二次开发设计方便。我们的芯片能够根据客户的要求, 用不同的软件去支持USB, GPSI, SPI, I<sup>2</sup>C, UART, SMART CARD及日本的SERIAL通讯模式;
- 7、高扩展性: 可以支持外挂ROM / FLASH / SRAM;
- 8、DMA. 所有记忆系统之间都有DMA.四个记忆系统可同时进行, 包括CPU运作, USB和DATA SRAM的传送, 外挂 SRAM/ FLASH/ ROM和数据 SRAM的传送, OTP和数据 SRAM的传送;
- 9、88个输入/输出端口。

