

AT75C220

SMART INTERNET APPLIANCE PROCESSOR - ETHERNET



A high-performance processor for professional Internet appliance applications such as the Ethernet IP phone.

Image: Postscriptum

- Single-chip solution for Internet appliances with Ethernet connectivity
- Simultaneously handles application processing and two Ethernet interfaces
- Applications include Ethernet IP phones, secure Extranets and professional Internet appliances
- Single-chip solution reduces system cost
- Programmable standard product for fast time-to-market
- Proven technology
- Based on 32-bit ARM7TDMI™ processor core and multi-layer AMBA™ architecture
- Includes 16-bit fixed-point OakDSPCore® and two Ethernet 10/100 Mbps MAC interfaces
- 88K bytes of integrated fast RAM for DSP core
- Two USARTs with FIFO and modem control lines
- Codec interface
- Flexible External Bus Interface with programmable chip selects
- 24 general-purpose I/O pins
- 208-lead PQFP package



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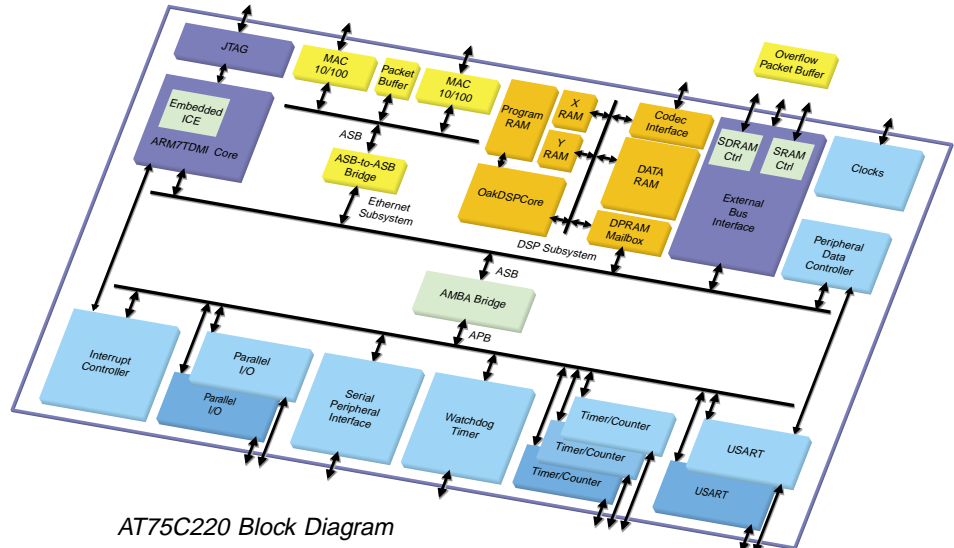
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The Atmel AT75C220 Smart Internet Appliance Processor - Ethernet (SIAPTTM-E) is built around an ARM7TDMI microcontroller core, with an autonomous DSP co-processor and dual-port Ethernet 10/100 Mbps MAC interface. It delivers unmatched performance coupled with low power consumption. In a typical Ethernet IP phone application, the DSP handles the voice processing functions (voice compression, acoustic echo cancellation, etc.), while the dual-port Ethernet MAC connects to the two Ethernet PHYs that link to the network and to the local PC.



AT75C220 Block Diagram

ARM7TDMI Core

The ARM7TDMI is a 3-stage pipeline, 40 MHz, 32-bit RISC processor. It has two instruction sets, the 32-bit ARM set for maximum performance, and the 16-bit Thumb[®] set for maximum code density. The CPU has seven operating modes, each with dedicated banked registers for fast exception handling.

DSP Subsystem

The DSP subsystem of the AT75C220 comprises:

- an OakDSPCore running at 60 MIPS
- 2K x 16 of X-RAM and 2K x 16 of Y-RAM
- 16K x 16 of general-purpose data RAM
- 24K x 16 of loadable program RAM
- a 256 x 16 dual-port RAM mailbox for MCU-DSP communication
- a codec interface

The local X- and Y-RAM allows the DSP subsystem to reach its maximum processing rate. The large local data RAM enables complex DSP algorithms to be implemented, such as a G723.1 or G729E voice codec interface. The integrated codec interface allows the connection of most industrial voice, multimedia or data codecs.

Dual Ethernet Interface

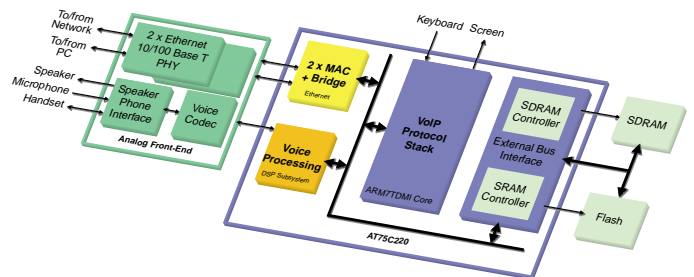
The dual 10/100 Mbps Ethernet MAC interface gives unmatched flexibility in applications. In particular it enables an IP phone to be inserted into an existing Ethernet connection with no additional cabling.

Applications Software

The AT75C220 is supported by a comprehensive range of software at OS, DSP and Application levels.

OS Level

The AT75C220 is supplied with a customized port of the Linux[®] kernel including a TCP/IP stack.



AT75C220 External Connections

DSP Level

A wide range of DSP functions for voice and audio processing is available, including modules for G723.1 and G729E voice codecs, silence compression and echo cancellation.

Application Level

Application software from third parties or Atmel partners includes support for popular communication protocols (H323 telephony, POP-3/SMTP e-mail), connection processes, audio software, etc.

Development Tools

The AT75C220 is supplied with a dedicated development board. The industry-standard ARM7TDMI and OakDSPCore are supported by state-of-the-art development tools.



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