



Net186-EVAL-KT

Am186 ES and PCnet-ISA II Based Stand-Alone Evaluation Platform

DISTINCTIVE CHARACTERISTICS

- **Am186 ES-40 MHz Microcontroller**
 - 80C186 compatibility
 - Glueless interface to PSRAM, SRAM, FLASH, and ROM memory systems
 - Demultiplexed address/data bus
 - Two DMA channels
 - 32 programmable I/O (PIO) pins
- **Am79C961A PCnet-ISA II Ethernet Controller**
 - Single-chip Ethernet controller for direct interface to ISA and EISA buses
 - Supports IEEE 802.3/ANSI 8802-3 Ethernet standards
 - Supports full duplex operation on the 10Base-T, AUI and GPSI ports
 - Supports Magic Packet™ Technology for waking up remote Ethernet nodes
 - Software compatible with Am7990/Am79C90 LANCE™/CLANCE™ register and descriptor architecture
- **Communication Ports**
 - Two RS-232 serial ports driven by the Am186ES via two DB-9 DCE connectors
 - One 10Base-T Ethernet port driven by the PCnet-ISA II via an RJ-45 connector
- **Expansion Bus**
 - Am186 Expansion Interface
- **Memory**
 - One 512Kbytes SRAM
 - One 512Kbytes FLASH (Am29F400)
 - Capable of addressing up to 1Mbytes of FLASH software
 - E86MON monitor program with source code
 - Utility programs for PCnet-ISA II with source codes
 - PAL equations for board setup

GENERAL DESCRIPTION

The Net186 evaluation board meets the needs of customers working with embedded networking control applications using the Am186ES microcontroller and the PCnet-ISA II single-chip Ethernet controller. This board provides a complete stand-alone, microcontroller and Ethernet-based evaluation in a low-cost, exceptionally small form-factor product.

This evaluation board features the Am186ES, high-performance, 80C186-compatible, 16-bit embedded controller, and the PCnet-ISA II high performance, 16-bit, single-chip Ethernet controller for ISA.

The microcontroller section consists of the Am186ES, 512 Kbytes FLASH and 512 Kbytes SRAM. The Ethernet section consists of a PAL for glue logic and the Am79C961A PCnet-ISA II. The design takes advantages of the Bus Mastering capability of the PCnet-ISA II to achieve high performance and low system cost, while reducing the amount of software overhead on the microcontroller.

Communication with the Net186 can be accomplished through either one of the two RS-232 serial ports or through the high speed 10 Mbps Ethernet 10Base-T port.

Am186ES Microcontroller

The Am186ES microcontroller and its companion Am188ES microcontroller integrate the functions of the CPU, non-multiplexed address bus, three timers, a watchdog timer, chip selects, interrupt controller, two DMA controllers, PSRAM controller, asynchronous serial ports, programmable bus sizing, and programmable I/O (PIO) pins on one chip. Compared to the 80C186/188 microcontrollers, the Am186ES and the Am188ES microcontrollers can reduce the size, power consumption, and cost of embedded systems, while increasing reliability, functionality, and performance.

The Am186ES and Am188ES microcontrollers are part of the AMD E86 family embedded microcontrollers and

microprocessors based on the x86 architecture. The E86 family includes the 80C186, 80C188, 80L186, 80L188, Am186EM, Am188EM, Am186EMLV, and Am188EMLV microcontrollers, as well as the Am386™ SX, Am386™ DX, and Am486™ DE microprocessors.

PCnet-ISA II Ethernet Controller

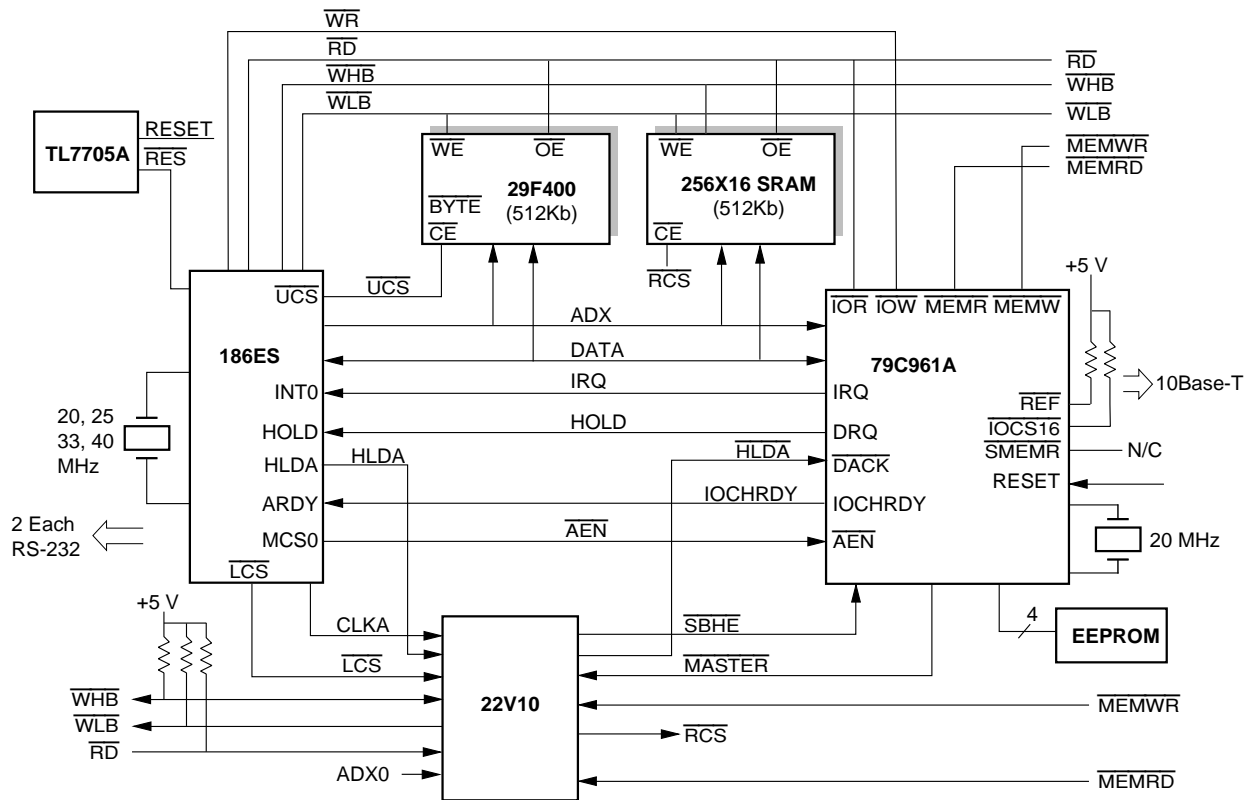
The Am79C961A PCnet-ISA II Ethernet controller, a single-chip Ethernet controller, is a highly integrated *bus-mastering* Ethernet controller with a built in ISA bus and PHY layer (Manchester Encoder/Decoder and 10Base-T transceiver). The 16-bit ISA interface makes an ideal straightforward connection to an x186 style local bus. The PCnet-ISA II has two features which, while not implemented in the Net186, would be very useful for certain embedded networking control applications: full duplex operation (making it possible to transmit and receive packets at the same time, for a combined bidirectional data transfer rate of up to 20 Mbps) and Magic

Packet Technology (making it possible to remotely wake up a sleeping system on an Ethernet node).

The PCnet-ISA II is available in either 132-pin PQFP (plastic quad flat package) or 144-pin TQFP (thin quad flat package). The Net186 is available in the 144-pin TQFP, specifically designed to reduce part count and cost, and to address applications where higher system throughput is desired.

The PCnet-ISA II Ethernet controller is part of the AMD PCnet family of single-chip Ethernet controllers based on the original LANCE/CLANCE architecture. Other members include the Am79C965 PCnet-32 (for VL or other general 32-bit bus environments) and the Am79C970A PCnet-PCI II (for PCI bus environments). Like the PCnet-ISA II, the PCnet-32 and the PCnet-PCI II are 10 Mbps Ethernet controllers. The last member of the PCnet family is the Am79C971 PCnet-FAST, a 10/100 Mbps Ethernet controller.

BLOCK DIAGRAM



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