Zykronix
INCORPORATED

Intel's® new Tillamook processors up to 266 MHz

Intel® 430TX chipset

256/512K Synchronous Pipeline Burst cache

On-board PCI C&T 69000 Flat Panel VGA controller

Ultra DMA/33 IDE controller

ACPI (Advanced Configuration Power Interface) support

Two serial and one parallel ports (16550 & IEEE1284)

USB and IrDA on-board support

Support for Windows® CE, 95, NT

PCI Ultra-IDE supports up to 2 Enhanced IDE drives

Floppy controller supporting 2.8 MB floppy drives

PCI and ISA mezzanine connectors for expansion

Less than 7 watts power consumption

-25° to +70° C operating temperature range

Two year warranty

Monster
IX

OVERVIEW

The Little Monster IX is a high-performance, Tillamook (Pentium) based Single Board Computer in a versatile very small Euro-card form factor (only 4" x 6"). Based on the new, highly integrated Intel 430TX PCIset, the Little Monster IX (LM IX) combines Pentium® processor performance with an impressive array of on-board functions including Flat Panel VGA controller, Ultra-IDE, floppy controller, USB, serial and parallel ports. A watchdog timer for critical applications is also included.

With its on-board switching voltage regulator, the LM IX runs a complete range of new Intel Pentium® processors (Tillamook) with MMX™ technology at speeds of 200MHz, 233MHz and 266MHz and is easily Upgradable to even higher speeds. For added power and performance, the LM IX has up to 512 KB Pipeline Burst L2 cache and up to 128 MB SDRAM via one-144 SO-DIMM socket and 16 or 32 MB of lightning-fast SDRAM memory soldered on the board.

The LM IX's advanced Chips & Technologies 69000 Flat Panel controller incorporates 2MB of integrated SDRAM memory, which can support up to 83 MHz operation. The LM IX's VGA graphics controller is designed to support high performance graphics and video acceleration for all supported display resolutions, display types, and color modes. There is no compromise in performance operating in 8, 16, or 24-bpp color modes allowing true acceleration while displaying up to 16.7M colors and display resolutions up to 1280 X 1024.

The LM IX comes with a full set of I/O features including two USB connectors. Also, the LM IX has an integrated PCI Bus Master Enhanced IDE controller with support for the new Ultra DMA33 protocol, which doubles ATA-2 Hard Disk Drive data transfer rates to 33MB/Sec. while maintaining full backwards compatibility with existing PIO Mode 3, PIO Mode 4 and DMA Mode 2 devices.

Fully compliant with the Microsoft PC 97 standard at both the hardware and BIOS levels, the LM IX comes with support for intelligent Hardware Monitoring features, which continuously check the thermal status of the CPU.

Main features:

- **Optimized Intel MMX™ Performance**

  The LM IX is using the Intel Tillamook Pentium processor technology (Die form) in a Multi-chip Module. Split core voltage devices are supported allowing use of Pentiums with performance up to 266 MHz.

- **4th Generation Intel Pentium chipset optimized for performance**

  The LM IX utilizes the advanced features of the Intel 430TX PCIset to optimize the unrivaled performance of the Intel Pentium® processor with MMX™ technology. Intel 82430TX PCIset supports Intel's new Dynamic Power Management Architecture (DPMA), Concurrent PCI (PCI 2.1), and USB.

- **Lightning-Fast SDRAM Performance**

  The LM IX supports the new generation of SDRAM (Synchronous Dynamic Random Access Memory) via its on-board memory and the 144-pin SO-DIMM socket. SDRAM delivers an added boost to overall system performance by increasing the CPU-to-memory data transfer rate to 528MB/Sec. compared to 264MB/Sec. for conventional EDO DRAM.

- **Advance BIOS**

  The LM IX comes standard with AWARD or System Soft BIOS. The BIOS is user configurable to boot an operating system residing in a HDD, floppy drive or PCMCIA drive. The LM IX supports popular PC operating systems such as Windows 95 and Windows NT. Zykronix provides extended support for these operating systems and offers Windows 95 and Windows NT as an orderable option.

- **Ultra-fast L2 Cache**

  Supports up to 512KB Pipeline Burst L2 direct-mapped, write-back cache. The Tillamook Pentium processor contains 16 Kbytes of internal Level 1 (L1) cache memory. Level 2 (L2) cache is provided on the LM IX Multi-Chip Module for 256 or 512Kbytes of Synchronize Pipelined Burst Static Memory.

- **Versatile Main Memory Support**

  Accepts up to 96MB of SDRAM using one SO-DIMM's of 8, 16, 32, 64MB and on-board memory.

- **ISA & PCI Expansion Slots**

    16-bit ISA and 32-bit PCI expansion slots provide all the room you need to install a full range of add-on cards.

- **Enhanced PCI Bus Master IDE Controller with Ultra DMA/33 Support**

    The Integrated Enhanced PCI Bus Master IDE controller features two dual channel connectors that accept up to four Enhanced IDE devices, including CD-ROM and Tape Backup Drives, as well as Hard Disk Drives supporting the new Ultra DMA/33 protocol which doubles data transfer rates to 33MB/Sec. Standard PIO Mode 3, PIO Mode 4 and DMA Mode 2 devices are also supported.

- **Super Multi I/O**

    The Integrated National 87338 Plug and Play super I/O chip features two high-speed 16550A compatible serial ports, one IR port, one EPP/ECP capable parallel port, and one FDD connector.

- **USB Support**

    The emerging Universal Serial Bus (USB) will provide a common interface to slower speed peripherals in the future. Functions such as keyboard, serial ports, printer port and mouse ports will be consolidated into the USB, greatly simplifying the cabling requirements of future computers. The LM IX provides two USB ports through the optional Zykronix USB slice. USB will be supported in the BIOS and operating systems such as Windows NT and Windows 97.

- **IrDA Connector**

    An IrDA connector for wireless infrared connections is available on board.

- **Advance Flat Panel VGA controller**

    The Chips & Technologies New 69000 Flat Panel controller with 2Mbytes of SDRAM supports up to 1280 x 1024 display resolution.

Specifications:

MultiChip Module featuring Tillamook CPU, cache, and chipset
   Up to 266 MHz processing power
   256K or 512K synchronous level 2 cache

16 or 32MBytes expandable to 96MBytes on board SDRAM
   64 bit wide DRAM interface
   144 pin SO-DIMM connector for field memory expansion

Stackable and self-configuring PCI
   Up to 4 PCI bus masters
   Full DMA and IRQ support

Stackable ISA
   Up to 8 ISA bus masters
   Full DMA and IRQ support

Flash BIOS with protection
   256Kbytes
   Holds BIOS, POST, PCIBIOS, Plug & Play, Video BIOS
   Boot Block protection
   Upgradeable from floppy

Real Time Clock
   Battery or capacitor backup
   Battery life of 2 years - removable standard battery

Watchdog
   Programmable as OFF, or in 1.5 second steps to greater than 300
   seconds

I/O

Dual PCI IDE controller

Supports up to 4 Ultra-IDE drives
Transfer rates to 33MB/Sec.
Fully compliant with ATA-2
PCI Bus Mastering

Super I/O System

Two serial ports, which are full modem control
Fully compatible with 16550A
FIFO on each port
One port may be IrDA, Infrared Data capable

Bi-directional parallel port
DMA capable
EPP & ECP (IEEE 1284 level 2) compliant

Floppy Disk Controller
DMA control
Support for 3.5" & 5.25"drives

Video

Chips and Technologies 69000 controller

83 MHz SDRAM operation
Simultaneous Flat Panel and CRT support
2MBytes integrated SDRAM video memory
Hardware Windows Acceleration
Flat Panels up to 1280 x 1024 resolution
256 Gray shades on STN displays
16.7M colors on STN displays
Power management support
Power sequencing support
3.3V or 5V display interface

Power

Advanced Power Management
Major subsystems may be powered down
System Management Interrupts for power control

On-board Power Module
Voltages monitored and reported
5V operation only
Polarity & Over current protection

Thermal management
Temperature sensor on MCM
Processor throttling to prevent over-heating
Temperature sensing coupled with power management

Operating Environment

Temperature & Humidity
-25 to +70 °C operating temperature range
-40 to +80 °C non-operating temperature range
8 to 85 % Relative Humidity range
26 °C maximum wet bulb temperature
20 °C maximum rate of change of temperature per hour
(Maximum rate of change of temperature must be less than that which causes condensation)

Shock & Vibration
3G Vibration from 50 Hz to 1 kHz
100G Shock

Board Dimensions

PCB Dimension 4" X 6"/ 100mm X 150mm

Reliability & MTBF

>40,000 hours (MIL-HDBK-217F)
10-layer PCB construction with full power and ground planes
MTTR: 5 minutes (based on board replacement)
Highly reliable construction

Ordering Information

The LM IX with 200 MHz processor, 256K Pipelined Burst Cache, 32 Mbytes SDRAM,
Two serial ports, Parallel port, Floppy, IDE and Flat Panel VGA controller would be ordered as:
LM9-P1C1M2V2B1

Choose one option from each category:

CPU options:

P1	200 MHz Pentium processor
P2	233 MHz Pentium processor
P3	266 MHz Pentium processor
P4	300 MHz Pentium processor

Cache options:

C1	256KB Pipelined Burst Cache
C2	512KB Pipelined Burst Cache

Memory options:

M1	16 Mbytes SDRAM
M2	32 Mbytes SDRAM
M3	48 Mbytes SDRAM
M4	64 Mbytes SDRAM
M5	80 Mbytes SDRAM
M6	96 Mbytes SDRAM

Video options:

V1	No VGA on-board
V2	C & T 69000 controller with 2 MB SDRAM on-board

BIOS options:

B1	Normal BIOS
B2	Windows CE BIOS

Warranty

Two years with an optional 5-year extension.
Call Zykronix for full warranty information.