Datasheet

MVME147

Single-Board Computer

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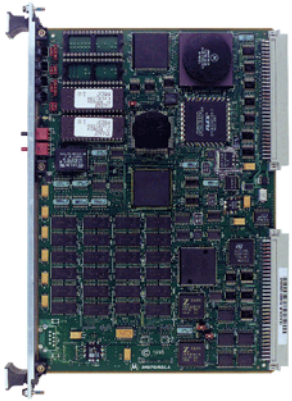
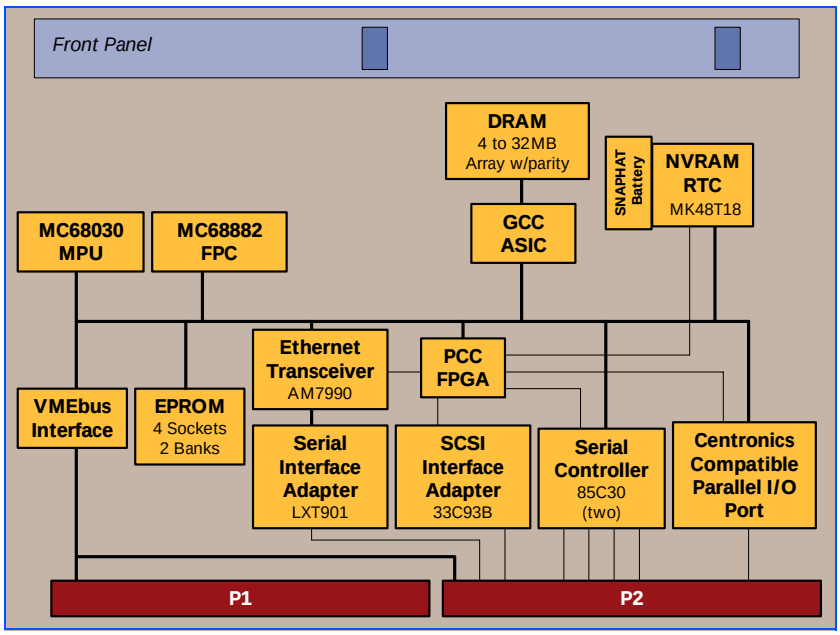


VMEbus single-board computer that eliminates the need for additional backplane modules

The MVME147 series is a family of VMEbus single-board computers. The on-board resources and peripheral controllers eliminate the need for additional modules in the VMEbus backplane thus reducing costs and freeing up valuable bus slots for additional functions.

The MVME147 series features an MC68030 enhanced 32-bit microprocessor. The MC68030 was the first general-purpose microprocessor with on-chip cache memory for both instructions and data, which increases the processor's efficiency by 20 to 40 percent. The MC68030 features a complete memory management unit (MMU) that provides the software protection and virtual memory functions critical to many applications.

- 16, 25, or 33.33 MHz MC68030 enhanced 32-bit microprocessor
- 16, 25, or 33.33 MHz MC68882 floating-point co-processor
- 4, 8, 16, or 32MB of shared DRAM, with programmable parity
- 4K x 8 SRAM and time-of-day clock with battery backup
- Four 28/32-pin ROM/PROM/EPROM/EEPROM sockets, 16 bits wide
- A32/D32 VMEbus master/slave interface with system controller function
- Four EIA-232-D serial communications ports
- Centronics compatible printer port
- Two 16-bit timers and watchdog timer
- SCSI bus interface with DMA
- Ethernet transceiver interface
- 4-level requester, 7-level interrupter, and 7-level interrupt handler for VMEbus
- On-board debugger and diagnostic firmware



MVME147 DETAILS

Access Sequence	16 MHz		25 MHz		33.33 MHz		Notes
	Read Cycles	Write Cycles	Read Cycles	Write Cycles	Read Cycles	Write Cycles	
MPU to Local DRAM							
No Parity	4	4	4	4	4	4	1, 2
Delayed Parity	N/A	N/A	4	4	4	4	1, 2
Parity	N/A	N/A	5	4	5	4	1, 2
MPU to Local ROM	9	9	13	13	16	16	1, 3
VMEbus to Local DRAM	13, 813 ns	11, 688 ns	13, 520 ns	11, 440 ns	13, 390 ns	11, 330 ns	4, 5
MPU to Global RAM							
VMEbus Master	6 + A	6 + A	9 + A	9 + A	12 + A	12 + A	5, 6
System Controller/Not Master	11 + B	11 + B	17 + B	17 + B	22 + B	22 + B	5, 7
Not System Controller/Not Master	9 + C	9 + C	15 + C	15 + C	19 + C	19 + C	5, 8

Notes:
1. No arbitration overhead.
2. Except RMW cycles where the MVME147 is required to obtain VMEbus mastership before RMW cycle can be started.
3. Device access time must be 200 ns or less.
4. DS0*/DS1* asserted DTACK* asserted.
5. Typical values. Actual values may be greater or less depending on the state of the slave device.
6. A = ta/T cycles.
7. B = (ta + tr)/T cycles.
8. C = (ta + tg)/T cycles.

ta = DS0*/DS1* to the assertion of DTACK* (slave access time).
tr = BRx* low to BBSY high and AS* high (bus requested and granted).
tg = BRx* low to BGINx* low and AS* high (bus requested and granted).
T = MPU clock period, 16 MHz = 62.5 ns, 25 MHz = 40 ns, 33.33 MHz = 30 ns

Transition Module

An optional MVME712M transition module is available to support the use of standard I/O connections for the MVME147 series. This module takes the I/O connections for the peripherals on board the MVME147 series from the P2 connection of the module to a transition module that has industry-standard connections.

Development Software

Development software for the MVME147 series includes the on-board debugger/monitor firmware and driver packages for the UNIX SYSTEM V/68 and VMEexec environments. Debugger/monitor firmware is included on the board.

Software Support

Integrated Systems, Inc.:	pSOS+
Lynx Real-Time Systems, Inc.:	LynxOS
Microware Systems Corporation:	OS-9
Microtec Research, Inc.:	VRTX-32
Wind River Systems, Inc.:	VxWorks

SPECIFICATIONS

Processor

Microprocessor:	MC68030
Co-processor:	MC68882
Clock Frequency:	16, 25 or 33.33 MHz

Memory

Main Memory:	Dynamic RAM
Capacity:	4, 8, 16, or 32MB
Single Cycle Accesses:	Four read/four write
Read Burst Mode - no parity:	4-2-2-2
Read Burst Mode - parity:	5-3-3-3
Write Burst Mode:	4-2-2-2
Parity:	Yes, programmable (parity not available on MVME147-010A)
EPROM:	16-bit, 32-pin DIP
# of Sockets (max. capacity):	Four (1M x 8)
Capacity:	4MB

VMEbus ANSI/VITA 1-1994 VME64 (IEEE STD 1014)

DTB Master:	A16–A32; D08–D32
DTB Slave:	A16–A32; D08–D32, UAT
Arbiter:	RR/PRI
Interrupt Handler:	IRQ 1–7
Interrupt Generator:	Any 1 of 7
System Controller:	Yes, jumperable
Location Monitor:	Four, LMA32

Ethernet

Controller:	AM7990
Local bus DMA:	Yes
Connector:	Routed to P2

SCSI Bus

Controller:	33C93B
Local Bus DMA:	Yes
Asynchronous (8-bit mode):	1.5MB/s
Synchronous (8-bit mode):	4.0MB/s
Connector:	Routed to P2

Clock/Timers

TOD Clock Device:	M48T18; 4KB NVRAM (available for user applications)
Timers/Counters:	Two 16-bit, one watchdog

Serial Ports

Controller:	85C30
Number of ports:	Four
Configuration:	EIA-232 DTE
Async Baud Rate, b/s max.:	19.2K
Sync Baud Rate, b/s max.:	19.2K
Connector:	Routed to P2

Power Requirements

	Typical	Maximum
+5V ±5.0%:	3.5 A	5.0 A
+12V ±10.0%:	—	1.0 A (with off-board LAN transceiver)
–12V ±10.0%:	100 mA	—

Hardware Support

Multiprocessor Hardware Support:	Four mailbox interrupts, RMW, shared RAM
Debug/Monitor (included):	MVME147BUG
Transition Module (optional):	MVME712M

Board Size

Height:	233.4 mm (9.187 in.)
Depth:	160.0 mm (6.299 in.)
Front Panel Height:	261.8 mm (10.3 in.)
Width:	19.8 mm (0.8 in.)

Demonstrated MTBF

(based on a sample of eight boards in accelerated stress environment)

Mean:	190,509 hours
95% Confidence:	107,681 hours

Environmental

	Operating	Nonoperating
Temperature:	0° C to +55° C, forced air cooling	–40° C to +85° C
Humidity (NC):	5% to 90%	5% to 90%
Vibration:	2 Gs RMS, 20–2000 Hz random	6 Gs RMS, 20–2000 Hz random

Electromagnetic Compatibility (EMC)

Intended for use in systems meeting the following regulations:

U.S.: FCC Part 15, Subpart B, Class A (non-residential)

Canada: ICES-003, Class A (non-residential)

This product was tested in a representative system to the following standards:

CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

ORDERING INFORMATION

Part Number	Description
All modules include four serial ports and one parallel port.	
MVME147-010A	16 MHz, 4MB DRAM, no parity, SCSI
MVME147-011A	25 MHz, 4MB DRAM, Ethernet and SCSI
MVME147-012A	25 MHz, 8MB DRAM, Ethernet and SCSI
MVME147-013A	25 MHz, 16MB DRAM, Ethernet and SCSI
MVME147-014A	25 MHz, 32MB DRAM, Ethernet and SCSI
MVME147-022A	33.33 MHz, 8MB DRAM, Ethernet and SCSI
MVME147-023A	33.33 MHz, 16MB DRAM, Ethernet and SCSI
MVME147-024A	33.33 MHz, 32MB DRAM, Ethernet and SCSI
Related Products	
MVME712M	Four DB-25 female serial port connectors, Centronics parallel port connector, DB-15 Ethernet connector, SCSI connector, and P2 adapter
MVME712P2	Adapter module from VME backplane to cabling for transition modules
MVME147FW*nn*	Object of the debugger/monitor where *nn*=software version; requires software license
Documentation	
VME147A/IH	MVME147 Installation and Use Manual
V147BUGA1/UM and V147BUGA2/UM	147Bug User's Manual, Volumes 1 and 2
VME712MA/IH	MVME712 Transition Module Installation and Use
Documentation is available for online viewing and ordering at http://www.motorola.com/computer/literature	

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