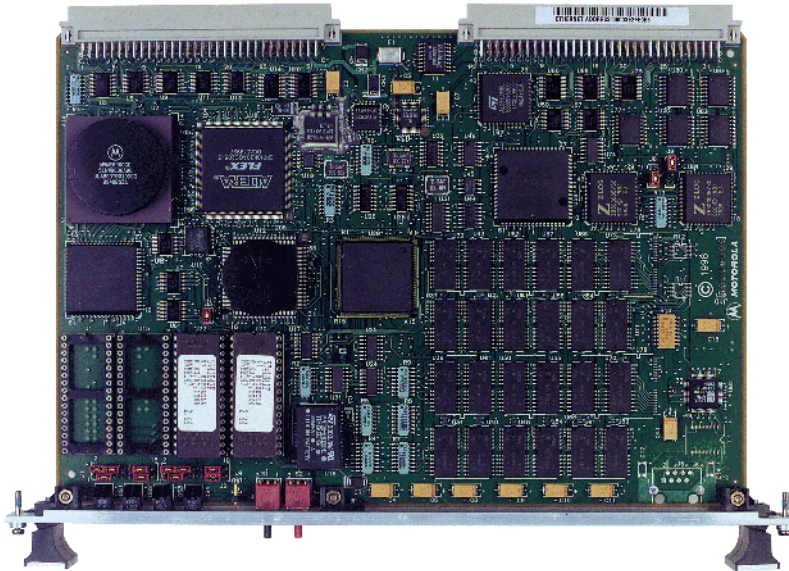


## MVME147

### VME Single-Board Computer

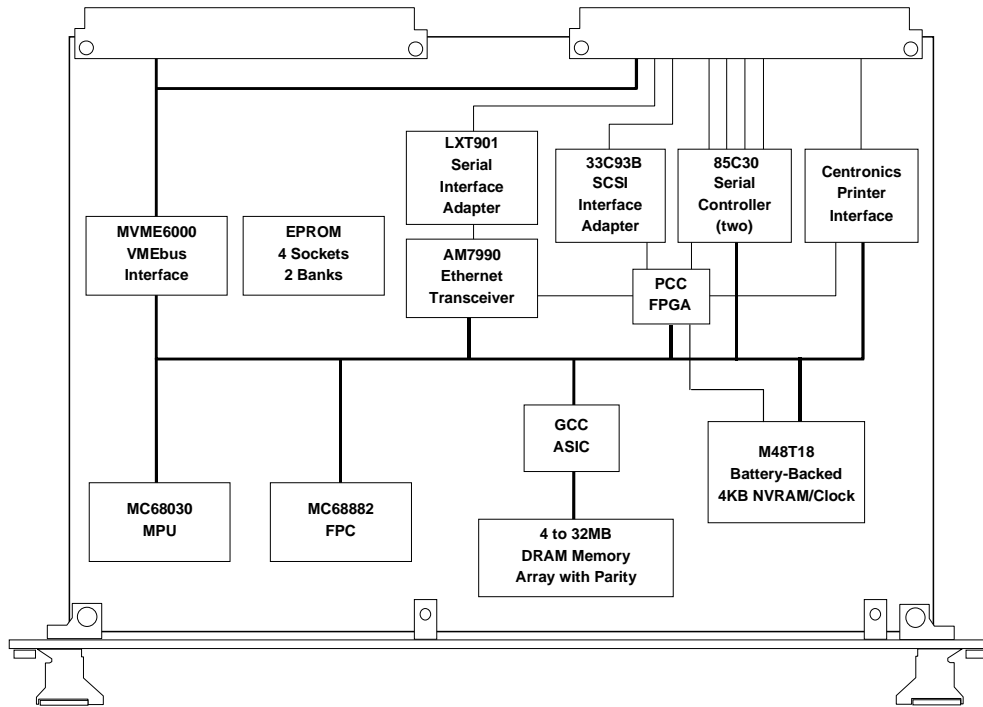


- ◆ 16, 25, or 33.33 MHz MC68030 enhanced 32-bit microprocessor
- ◆ 16, 25, or 33.33 MHz MC68882 floating-point co-processor
- ◆ 4, 8, 16, or 32MB of shared DRAM, with programmable parity
- ◆ 4K x 8 SRAM and time-of-day clock with battery backup
- ◆ Four 28/32-pin ROM/PROM/EPROM/EEPROM sockets, 16 bits 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

#### **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) which provides the software protection and virtual memory functions critical to many applications.



### MVME147 Details

Access Sequence	16 MHz		25 MHz		33.33 MHz		Notes
	Read Cycles	Write Cycles	Read Cycles	Write Cycles	Read Cycles	Write Cycles	
<b>MPU to Local DRAM</b>							
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
<b>MPU to Local ROM</b>	9	9	13	13	16	16	1, 3
<b>VMEbus to Local DRAM</b>	13, 813ns	11, 688ns	13, 520ns	11, 440ns	13, 390ns	11, 330ns	4, 5
<b>MPU to Global RAM</b>							
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 200ns 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 = 62.5ns, 25 MHz = 40ns, 33.33 MHz = 30ns

### 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<sup>®</sup> SYSTEM V/68 and VMEexec<sup>®</sup> environments. Debugger/monitor firmware is included on the board.

### Software Support

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

## 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: 4 read/4 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): 4 (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: 4, 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, bps max.: 19.2K  
Sync Baud Rate, bps 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: 4 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
Altitude:	5,000 m	15,000 m
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: EN50082-1

## Safety

All printed wiring boards (PWBs) are manufactured with a flammability rating of 94V-0 by UL recognized manufacturers.

## 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
<b>Related Products</b>	
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
MVME147FWnn	Object of the debugger/monitor where <i>nn</i> =software version; requires software license
<b>Documentation</b>	
VME147A/IH1	MVME147 Installation and Use Manual
V147BUGA1/UM1 and V147BUGA2/UM1	147Bug User's Manual, Volumes 1 and 2
V147PA/LT1	MVME147 "PCC-prime" customer letter
VME712MA/IH2	MVME712 Transition Module Installation and Use
Documentation is available for on-line viewing and ordering at <a href="http://www.motorola.com/computer/literature">http://www.motorola.com/computer/literature</a> .	



**MOTOROLA**

[www.motorola.com/computer](http://www.motorola.com/computer)  
1-800-759-1107

Motorola Computer Group  
2900 S. Diablo Way  
Tempe, AZ 85282

## Regional Sales Offices

### Canada & Central Pan America

400 Matheson Blvd. West  
Mississauga, Ontario  
L5R 3M1 Canada  
905-507-7200

### Eastern Pan America

120 Turnpike Rd, 1st Floor  
Southborough, MA 01772  
508-357-8260

### Western Pan America

1150 Kifer Road, Suite 100  
Sunnyvale, CA 94086  
408-991-8634

### Asia Pacific and Japan

40/F Nat West Tower  
Times Square, 1 Matheson St  
Causeway Bay, Hong Kong  
852-2966-3210

### East Mediterranean

6 Kremenetski Street  
Tel Aviv 67899 Israel  
972-3-568-4388

### France

Zone Technopolis - Immeuble  
THETA 3, avenue du Canada - BP304  
91958 LES ULLIS  
Courtaboeuf Cedex, France  
+33 (0) 1 64 86 64 24

### Germany

Hagenauer Strasse 47  
D-65203 Wiesbaden, Germany  
+49 (0) 611-3611 604

### Benelux

De Waal 26, 5684 PH Best  
PO Box 350, 5680 AJ Best  
Netherlands  
+31 (0) 4993 61250

### Nordic

Dalvagen 2  
S-169 56 Solna, Sweden  
+46 (0) 8 734 8880

### United Kingdom

London Road, Old Basing,  
Basingstoke, Hampshire  
RG24 7JL England  
+44 (0) 1256 790555

Motorola and the stylized M logo are registered trademarks and the Intelligence Everywhere logo, Digital DNA and the Digital DNA logo are trademarks of Motorola, Inc. VMEexec is a trademark of Motorola, Inc., which may be registered in some jurisdictions. UNIX is a registered trademark of the Open Group in the U.S. and other countries. Centronics is a registered trademark of Centronics Data Corporation. All other product or service names are the property of their respective owners.

This datasheet identifies products, their specifications, and their characteristics, which may be suitable for certain applications. It does not constitute an offer to sell or a commitment of present or future availability, and should not be relied upon to state the terms and conditions, including warranties and disclaimers thereof, on which Motorola may sell products. A prospective buyer should exercise its own independent judgement to confirm the suitability of the products for particular applications. Motorola reserves the right to make changes, without notice, to any products or information herein which will, in its sole discretion, improve reliability, function, or design. Motorola does not assume any liability arising out of the application or use of any product or circuit described herein; neither does it convey any license under its patent or other intellectual property rights or under others. This disclaimer extends to any prospective buyer, and it includes Motorola's licensee, licensee's transferees, and licensee's customers and users. Availability of some of the products and services described herein may be restricted in some locations.

© Reg. U.S. Pat. & Tm. Off.

Copyright 1996, 2001 Motorola, Inc. MV147-D4 7/01