

MOTOROLA

digitaldna

 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

	16 MHz		25 MHz		33.33 MHz		
Access Sequence	Read	Write	Read	Write	Read	Write	Notes
	Cycles	Cycles	Cycles	Cycles	Cycles	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, 813ns	11, 688ns	13, 520ns	11, 440ns	13, 390ns	11, 330ns	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 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[®] 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: 4 read/4 write Read Burst Mode - no 4-2-2-2 parity: Read Burst Mode - 5-3-3-3 parity: Write Burst Mode: 4-2-2-2 # of Sockets (max. 4 (1M x 8) capacity):

Parity: Yes, programmable (parity not available on MVME147-010A) EPROM: 16-bit, 32-pin DIP 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 use applications)	ſ			
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	6				
•	Typical Maximum				
+5V ± 5.0%:	3.5 A 5.0 A				
+12V ± 10.0%:	— 1.0 A (with off-board LAN transceiver)				
–12V \pm 10.0%:	100 mA —				
Hardware Support					
Multiprocessor Hardware Support:	4 mailbox interrupts, RMW, shared RAM				
Debug/Monitor	MVME147BUG				
(included):					
(included): Transition Module (optional):	MVME712M				
(included): Transition Module (optional): Board Size	MVME712M				
(included): Transition Module (optional): Board Size Height:	MVME712M 233.4 mm (9.187 in.)				
(included): Transition Module (optional): Board Size Height: Depth:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.)				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.)				
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(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.)				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement)	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ-				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of e ment) Mean:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of e ment) Mean: 95% Confidence:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) sight boards in accelerated stress environ- 190,509 hours 107,681 hours				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of e ment) Mean: 95% Confidence: Environmental	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental Temperature: 0° ford	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating C to +55° C, -40° C to +85° C ced air cooling				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating °C to +55° C, ced air cooling 5,000 m 15,000 m				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of e ment) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude: Humidity (NC):	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating °C to +55° C, -40° C to +85° C ced air cooling 5,000 m 5,000 m 15,000 m 5% to 90% 5% to 90%				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude: Humidity (NC): Vibration:	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating C to +55° C, -40° C to +85° C ced air cooling 5,000 m 15,000 m 5% to 90% 5% to 90% 2 Gs RMS, 6 Gs RMS,				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude: Humidity (NC): Vibration: 20–2	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating C to +55° C, -40° C to +85° C ced air cooling 5,000 m 15,000 m 5% to 90% 5% to 90% 2 Gs RMS, 6 Gs RMS, 2000 Hz random 20–2000 Hz random				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of ement) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude: Humidity (NC): Vibration: 20–2	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating C to +55° C, ced air cooling 5,000 m 15,000 m 5% to 90% 5% to 90% 2 Gs RMS, cool Hz random 20–2000 Hz random				
(included): Transition Module (optional): Board Size Height: Depth: Front Panel Height: Width: Demonstrated MTBF (based on a sample of e ment) Mean: 95% Confidence: Environmental Temperature: 0° ford Altitude: Humidity (NC): Vibration: 20-2	MVME712M 233.4 mm (9.187 in.) 160.0 mm (6.299 in.) 261.8 mm (10.3 in.) 19.8 mm (0.8 in.) eight boards in accelerated stress environ- 190,509 hours 107,681 hours Operating Nonoperating C to +55° C, ced air cooling 5,000 m 15,000 m 5% to 90% 5% to 90% 2 Gs RMS, 6 Gs RMS, 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		
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 mod- ules		
MVME147FWnn	Object of the debugger/monitor where <i>nn</i> =software version; requires software license		
Documentation			
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 http://www.motorola.com/ computer/literature.			



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 - Inmeuble THETA 3, avenue du Canada - BP304 91958 LES ULIS 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

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