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Datasheet

MVME167PA

Single-Board Computer

MOTOROLA
intelligence everywhere™



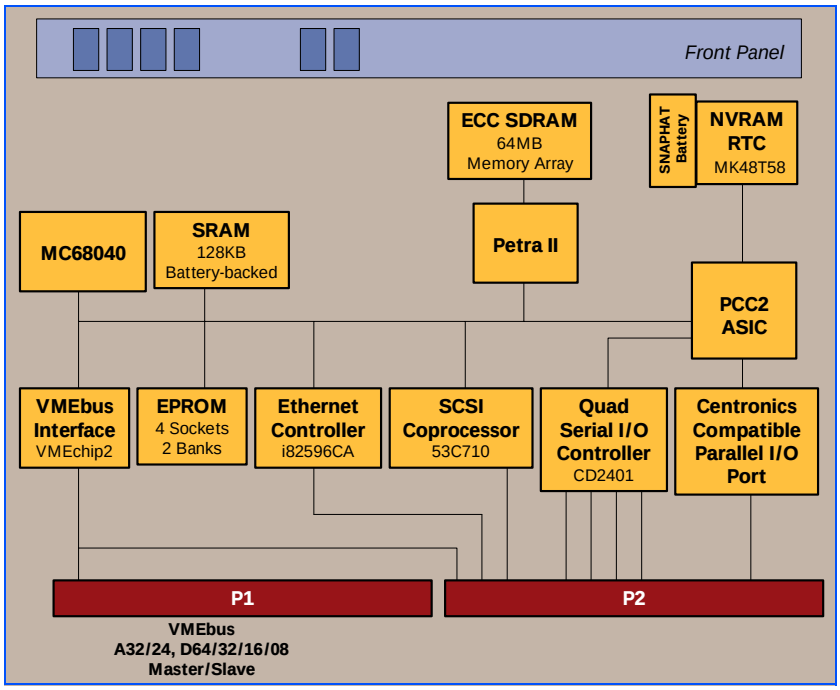
High-performance single-board computer in a CISC-based system

Motorola's MVME167PA single-board computer represents the functionality, flexibility and performance of a CISC-based system. Based on the Motorola MC68040, the MVME167PA combines a microprocessor with the memory management and floating-point units. This outstanding processing speed and floating-point performance makes the MVME167PA an ideal solution for scientific and industrial applications.

The inclusion of the Petra application-specific integrated circuit (ASIC), which replaces functions formerly implemented in the MCECC chip, improves the performance of the memory subsystem. Memory configuration switches enable the customer to tailor memory size for applications requiring smaller memory configurations.

The MVME167PA's compatibility with existing M68000 family software offers CISC-based software environments the ability to realize near-RISC performance levels while maintaining object code compatibility with existing software platforms.

- 33 MHz MC68040 32-bit microprocessor with 8KB of cache, MMU, and FPU
- Full 32-bit master/slave VMEbus interface
- High-performance DMA supports VMEbus D64 and local bus memory burst cycles
- 64MB configurable SDRAM with ECC option
- On-board SCSI and Ethernet interfaces
- 4MB on-board ROM/EPROM
- Four serial ports (EIA-232-D) and one parallel port
- Four 32-bit timers and one watchdog timer
- 8KB of NVRAM with real-time clock/calendar
- Remote Reset/Abort/Status control functions
- Completely programmable for maximum integration flexibility



MVME167PA DETAILS

MVME167PA Memory Map					
Address Range	**Devices Accessed**	**Port Size**	**Size**	**Software Cache Inhibit**	**Notes**
$00000000–SDRAMsize	User Programmable (On-board SDRAM)	D32	SDRAMsize	No	1, 2
SDRAMsize–$FF7FFFFF	User Programmable (VMEbus)	D32/D16	3GB	No	3, 4
$FF800000–$FFBFFFFF	ROM	D32	4MB	No	1
$FFC00000–$FFDFFFFF	Reserved	—	2MB	—	5
$FFE00000–$FFE1FFFF	SRAM	D32	128KB	No	—
$FFE20000–$FFEFFFFF	SRAM (repeated)	D32	896KB	No	—
$FFF00000–$FFFEFFFF	Local I/O Devices	D8–D32	1MB	Yes	3
$FFFF0000–$FFFFFFFF	User Programmable (VMEbus A16)	D32/D16	64KB	No	2, 4

Notes:
1. On-board EPROM appears at $00000000–$003FFFFF following a local bus reset. The EPROM appears at 0 until the ROM0 bit is cleared in the VMEchip2. The ROM0 bit is located at address $FFF40030 bit 20. The EPROM must be disabled at 0 before the SDRAM is enabled. The VMEchip2 and SDRAM map decoders are disabled by a local bus reset.
2. This area is user-programmable. The suggested use is shown in the table. The SDRAM decoder is programmed in the Petra chip, and the local-to-VMEbus decoders are programmed in the VMEchip2.
3. Size is approximate.
4. Cache inhibit depends on devices in area mapped.
5. This area is not decoded. If these locations are accessed and the local bus timer is enabled, the cycle times out and is terminated by a TEA signal.

VMEbus Interface

Another design advantage of the MVME167PA is the use of a second-generation application-specific integrated circuit (ASIC). The ASIC interfaces the MVME167PA to the VMEbus for higher levels of quality, reliability and functionality.

In addition to controlling the system's VMEbus functions, the VMEbus interface ASIC also includes a local bus to/from the VMEbus DMA controller, VME board support features, as well as a global control and status register (GCSR) for microprocessor communications over the VMEbus. The MVME167PA also provides support for the VME D64 specification within the VMEbus interface, further enhancing system performance.

Transition Module

An optional MVME712M transition module is available to support the use of standard I/O connections for the MVME167PA. This module takes the I/O connections for the peripherals on board the MVME167PA from the P2 connection of the module to a transition module that has industry-standard connections.

Development Software

Development software for the MVME167PA includes the on-board debugger/monitor firmware and driver packages. Object and source code is available for application development. Firmware is included on the board.

Kernel and Operating System Software Support

Integrated Systems, Inc.:	pSOS+
Lynx Real-Time Systems, Inc.:	LynxOS
Microware Systems Corporation:	OS-9
Microtec:	VRTX32
Wind River Systems, Inc.:	VxWorks

SPECIFICATIONS

Processor

Type:	MC68040
Clock Frequency:	33 MHz

Memory

Synchronous Dynamic RAM

Capacity:	64MB
Read Burst Mode:	4-1-1-1
Write Burst Mode:	2-1-1-1
Shared:	VMEbus/Local Bus

EPROM (44-pin PLCC) 16 bit

# of Sockets (Max. Capacity):	Four (512K x 16)
Capacity:	4MB

VMEbus (IEEE 1014)

Addressing Capabilities: Master/Slave	A16, A24, A32
Data Transfer Capabilities: Master/Slave	D08, D16, D32, D64, BLK, UAT
Arbiter:	RR/PRI
Interrupt Handler:	IRQ 1–7
Interrupt Generator:	Any 1 of 7
System Controller:	Yes, jumperable
Location Monitor:	Four, LMA32

SCSI Bus

Controller:	53C710
Asynchronous:	5.0MB/s
Synchronous:	10.0MB/s
Local Bus DMA:	Yes, with local bus burst

Ethernet

Controller:	i82596CA
Local bus DMA:	Yes

TOD Clock

TOD Clock Device:	MK48T58; 8KB NVRAM

Timers

Timers:	Four 32-bit, 1µsec resolution

Serial Ports

Controller:	CD2401
Console:	Four (EIA-232-D DTE)
Async Baud Rate:	38.4Kb/s max.
Sync Baud Rate:	64Kb/s max.
Local bus DMA:	Yes

Power Dissipation

Maximum:	23 watts
+5V ±5%:	3.3 A max.; 2.97 A typical @ 33 MHz
+12V ±10%:	1.0 A (max., with off-board LAN transceiver)
–12V ±10%:	100 mA (typical)

Hardware Support

Multiprocessing Hardware Support:	Four mailbox interrupts, RMW, shared RAM
Debug/Monitor (included):	MVME167FW
Transition Module (optional):	MVME712M

Board Size

Card Height:	233.4 mm (9.2 in.)
Card Depth:	160.0 mm (6.3 in.)
Front Panel Height:	261.8 mm (10.3 in.)
Front Panel 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	–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

Safety

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

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 A; Immunity: EN55024

ORDERING INFORMATION

Part Number	Description
MVME167PA-36SE	33 MHz, 64MB SDRAM, SCSI, Ethernet
Related Products	
MVME712M	Four DB-25 female serial port connectors, Centronics parallel port connector, DB-15 Ethernet connector, SCSI connector, and P2 adapter
MVME712P2	P2 adaptor module from VME backplane to cabling for transition modules
Documentation	
V167PA/IH	MVME167P Single-Board Computer Installation and Use
V1X7PA/PG	MVME1X7P Single-Board Computer Programmer's Reference Guide
Documentation is available for online viewing and ordering at http://www.motorola.com/computer/literature	

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MV167-D7 02/03

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