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MVME167P

Single-Board Computer

- 25 or 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
- 16, 32 or 64MB configurable SDRAM, with ECC option
- On-board SCSI and Ethernet interfaces
- Up to 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

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

Motorola's MVME167P single-board computer represents the functionality, flexibility, and performance of a CISC-based system. Based on the Motorola MC68040, the MVME167P combines a microprocessor with the memory management and floating-point units. This outstanding processing speed and floating-point performance makes the MVME167P an ideal solution for scientific and industrial applications.

The inclusion of the new "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 MVME167P'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.

MVME167P Details

MVME167P 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–	SRAM	D32	128KB	No	—

$FFE1FFFF					
$FFE20000–$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 MVME167P is the use of a second-generation application-specific integrated circuit (ASIC). The ASIC interfaces the MVME167P 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 VMEbus DMA controller, VME board support features, as well as global control and status register (GCSR) for microprocessor communications over the VMEbus. The MVME167P also provides support for the VME D64 specification within the VMEbus interface, further enhancing system performance.

Transition Modules

Optional MVME712 series transition modules are available to support the use of standard I/O connections for the MVME167P series. These modules take the I/O connections for the peripherals on-board the MVME167P series from the P2 connection of the module to a transition module that has industry-standard connections.

Development Software

Development software for the MVME167P series 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.

Specifications

Processor

Type: MC68040

Clock Frequency: 25 or 33 MHz

Memory

Synchronous Dynamic RAM

Capacity: 16, 32 or 64MB
Wait States: 2/3/0 (read no parity/read parity/write)
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: 4, 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: 38.4K bps max.
Sync Baud Rate: 64K bps max.
Local bus DMA: Yes

Power Dissipation

Maximum: 23 watts
+5V ± 5%: 2.5 A max.; 2.25 A typical @ 25 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): MVME712 Series

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:	–5° C to +55° C	–40° C to +85° C
Altitude:	5,000 m	15,000 m
Humidity (non-condensing):	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: EN50082-1

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®

Ordering Information

Part Number	Description
All models contain a MC68040 processor, SCSI and Ethernet.	
MVME167P-24SE	25 MHz, 16MB SDRAM
MVME167P-25SE	25 MHz, 32MB SDRAM
MVME167P-34SE	33 MHz, 16MB SDRAM
MVME167P-35SE	33 MHz, 32MB SDRAM
MVME167P-36SE	33 MHz, 64MB SDRAM
Related Products	
MVME712B	DB-15 Ethernet connector and SCSI connector
MVME712P2	P2 adaptor module from VME backplane to cabling for transition modules

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