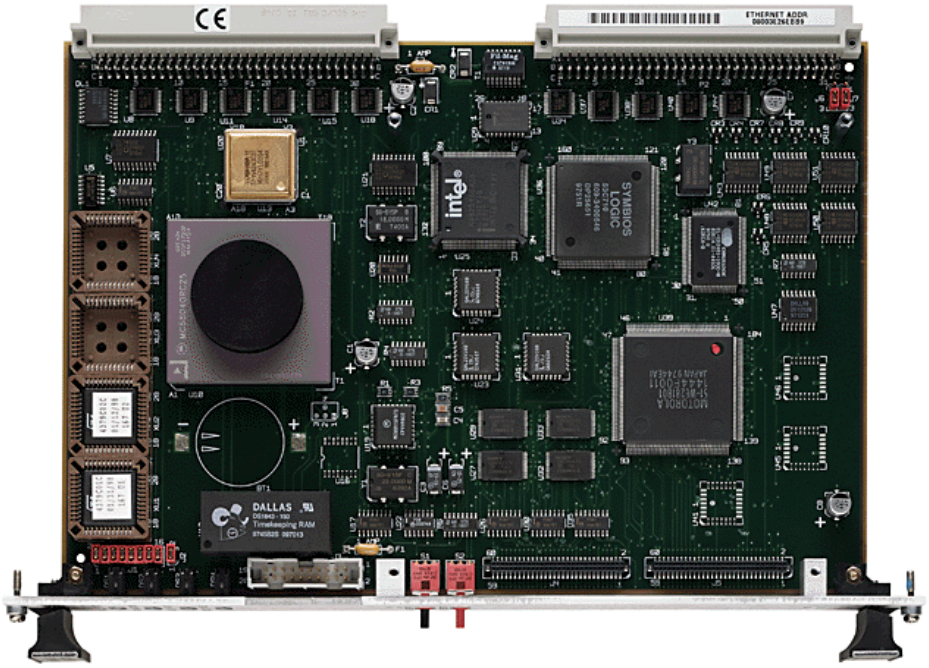
MOTOROLA COMPUTER GROUP

Board Level Products

MVME167
SINGLE BOARD COMPUTER



Advantages

Motorola's MVME167 single board computer represents the pinnacle of functionality, flexibility, and performance in a CISC-based system. Based on the most powerful CISC microprocessor available, Motorola's MC68040, the MVME167 combines a microprocessor with the memory management and floating-point units to achieve 26 MIPS at 25 MHz and 40 MIPS at 33 MHz. This outstanding processing speed and floating-point performance makes the MVME167 an ideal solution for scientific and industrial applications.

The MVME167'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.

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Features

- 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
- 4, 8, 16, 32 or 64MB on-board DRAM, four-way interleaved, with programmable parity checking or Error Checking and Correction (ECC) option
- On-board SCSI interface with 32-bit local bus burst DMA
- On-board Ethernet interface with 32-bit local bus DMA
- Four 44-pin sockets for up to 4MB on-board ROM/EPROM
- Four EIA-232-D serial ports implemented with quad serial I/O processor
- 8-bit, bidirectional, Centronics® compatible 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
- Low power consumption—less than 20 watts typical
- 27.7 MIPS @ 25 MHz
- 36.8 MIPS @ 33 MHz

Ordering Information

Part Number	Description
MVME167-001*y*	25 MHz, 4MB DRAM, parity
MVME167-002*y*	25 MHz, 8MB DRAM, parity
MVME167-003*y*	25 MHz, 16MB DRAM, parity
MVME167-004*y*	25 MHz, 32MB DRAM, parity
MVME167-031*y*	33 MHz, 4MB ECC DRAM
MVME167-032*y*	33 MHz, 8MB ECC DRAM
MVME167-033*y*	33 MHz, 16MB ECC DRAM
MVME167-034*y*	33 MHz, 32MB ECC DRAM

Note: *y* indicates product revision level if any; for example, "-001A."

Related Products

MVME712A	Four DB-9 female serial port connectors, one RJ-11 connector, Centronics parallel port connector, and P2 adapter
MVME712AM	Same as MVME712A, includes 2400 baud modem
MVME712B	DB-15 Ethernet connector and SCSI connector
MVME712P2	P2 adaptor module from VME backplane to cabling for transition modules
MVME712-012	Same as MVME712A but with DIN connector at P2 for use with MVME946 chassis

Related Documentation

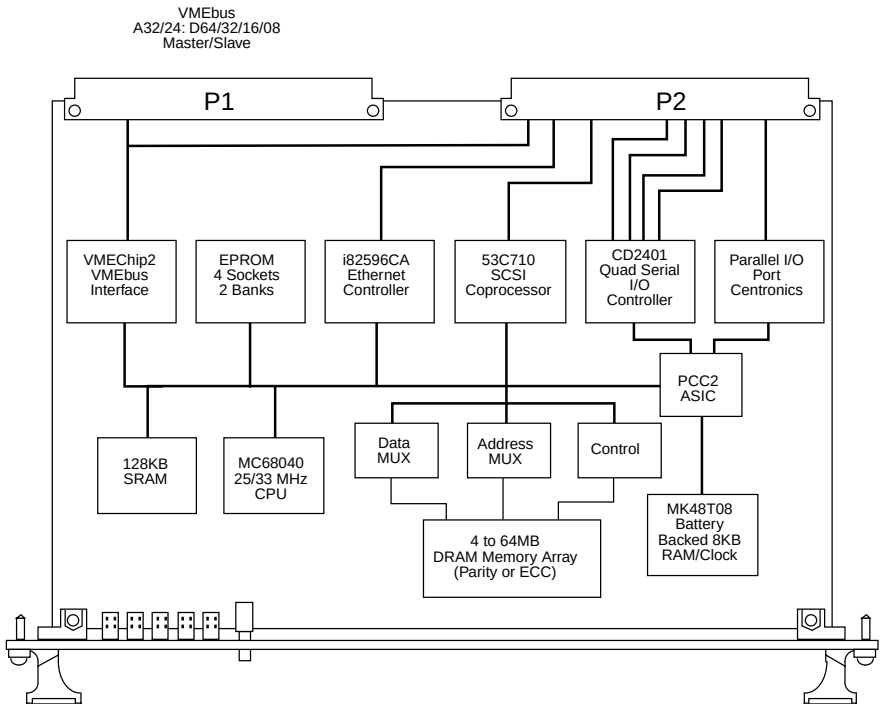
68-MVME167SET	Manual Set for use with the MVME167
68-1X7DS	Includes user's manuals for each of the peripheral controllers used on the MVME167 Series

MVME167 Memory Map

Address Range	Devices Accessed	Port Size	Size	Software Cache Inhibit	Notes
$00000000–DRAMsize	User Programmable (On-Board DRAM)	D32	DRAMsize	No	1, 2
DRAMsize–$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 DRAM is enabled. The VMEchip2 and DRAM map decoders are disabled by a local bus reset.
2. This area is user-programmable. The suggested use is shown in the table. The DRAM decoder is programmed in the MEM040 or MCECC 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.



MVME167 block diagram

VMEbus Interface

Another design advantage of the MVME167 is the use of a second generation Application Specific Integrated Circuit (ASIC). The ASIC interfaces the MVME167 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. The MVME167 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 MVME167 Series. These modules take the I/O connections for the peripherals on-board the MVME167 Series from the P2 connection of the module to a transition module that has industry standard connections.

Expansion Memory

Expansion memory is available for field upgrades. Two types of expansion are possible. The first requires replacing the existing memory mezzanine with a new module. The second requires the addition of a second mezzanine module, requiring a second VMEbus slot.

Development Software

Development software for the MVME167 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.

The Motorola Commitment

With the MVME167, Motorola continues its commitment to meeting your needs with leading edge technology. Adherence to industry standards and open architecture provides the maximum in hardware and software compatibility, while facilitating system customization and expansion.

This commitment is evident in the MVME167. Combining the high performance of the MC68040 microprocessor and integral floating-point unit with its support of existing MC68000-based software, the MVME167 single board computer offers the widest range of flexibility, functionality, and performance available for today's systems integration and OEM marketplace.

Specifications

MVME167 Single Board Computer

Processor

Type:	MC68040
Clock Frequency:	25 or 33 MHz
MIPS (Dhrystone 1.1):	27.7 @ 25 MHz, 36.8 @ 33 MHz
MFLOPs:	3.5 @ 25 MHz, 4.5 @ 33 MHz

Memory

Parity Dynamic RAM

Capacity:	4, 8, 16, 32 or 64MB
Wait States:	2/3/0 (read no parity/read parity/write)
Read Burst Mode:	4-1-1-1/5-1-1-1 (no parity/parity)
Write Burst Mode:	2-1-1-1
Shared:	VMEbus/Local Bus

ECC Dynamic RAM

Capacity:	4, 8, 16, 32 or 64MB
Wait States:	3/0 (read/write)
Read Burst Mode:	5-1-1-1
Write Burst Mode:	2-1-1-1
Shared:	VMEbus/Local Bus

EPROM (32-pin PLCC) 16 bit

# of Sockets (Max. Capacity):	4 (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:	NCR53C710
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:	M48T08; 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

Board Size

Card Height:	9.2 in. (233.4 mm)
Card Depth:	6.3 in. (160.0 mm)
Front Panel Height:	10.3 in (261.8 mm)
Front Panel Width:	0.8 in. (19.8 mm)

Power Dissipation

Maximum:	23 watts
+5V ±5%:	4.5A max.; 3.0A typical @25 MHz
+12V ±10%:	1.0A (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

Environmental

Temperature (operating):	0 C to +55° C
Temperature (storage):	–40° C to +85° C
Vibration (operating):	6 Gs RMS, 20–2000 Hz random
Altitude (operating):	15,000 feet
Humidity (noncondensing):	5% to 90%

Regulatories

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

Demonstrated MTBF

Mean:	147,507
90% Confidence:	85,522

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®

For more information, visit our World Wide Web site at **http://www.mcg.mot.com**
For fax-back service dial **1-800-682-6128** in the U.S. and **602-438-4636** outside of the U.S.
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Data Sheet: MV167-D2