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Datasheet

MVME177PA

Single-Board Computer

MOTOROLA
intelligence everywhere™



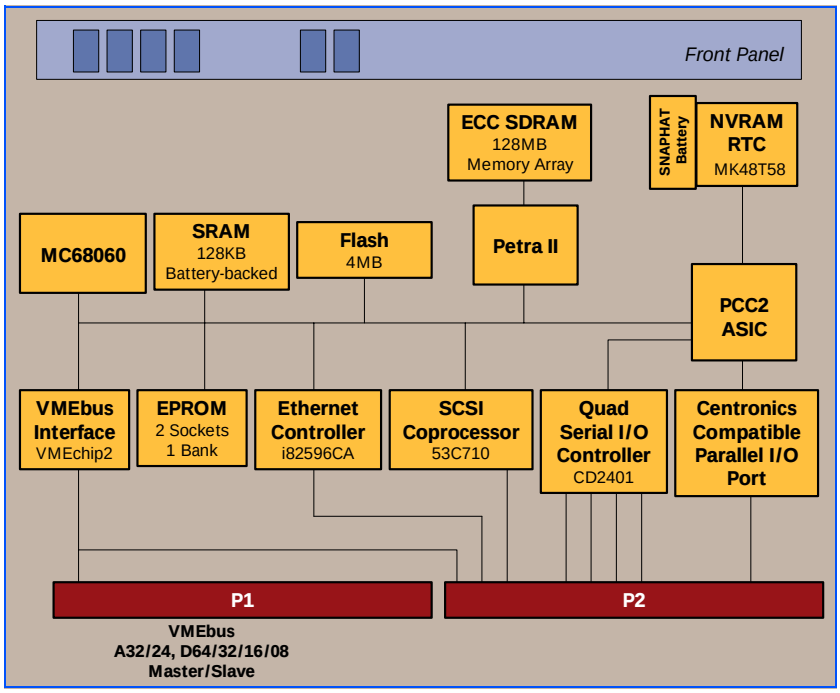
Combination of superscalar microprocessor and world-class quality VME products

The company that pioneered the VMEbus single-board computer has added new dimensions in performance and functionality. Motorola's third-generation single-board computer, the MVME177PA, upholds the tradition by combining a superscalar MC68060 microprocessor with the feature flexibility and world-class quality found only in Motorola VME products.

The MVME177PA's compatibility with existing M68000 family hardware and software allows users to realize RISC performance levels while protecting their chassis, peripheral, specialized I/O, and software investment. The MVME177PA makes an ideal solution for scientific, industrial, and high-end monitoring and control 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.

- 60 MHz MC68060 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
- 128MB configurable SDRAM, with ECC option
- 128KB SRAM with battery backup
- On-board SCSI and Ethernet interfaces
- 4MB of Flash ROM
- Up to 2MB 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 functions
- Completely programmable for maximum integration flexibility
- Low power consumption—less than 20 watts typical



MVME177PA DETAILS

MVME177PA 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	2, 3, 4
$FF800000–$FFBFFFFF	EEPROM/Flash	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. Flash/EPROM devices appear at $FF800000–$FFBFFFFF and also appear at $0–$3FFFFF if ROM0 bit in VMEchip2 EPROM control register is high (ROM0 = 1). ROM0 is set to 1 after each reset. ROM0 bit must be cleared before other resources (SDRAM or SRAM) can be mapped in this range ($0–$3FFFFF). On the MVME177PA, the Flash memory is mapped at $0–$3FFFFF by hardware default through VMEchip2.
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 and local-to-VSB 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 MVME177PA is the use of a second-generation application-specific integrated circuit (ASIC). The ASIC interfaces the MVME177PA 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. The MVME177PA 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 MVME177PA. This module takes the I/O connections for the peripherals on board the MVME177PA from the P2 connection of the module to a transition module that has industry-standard connections.

Development Software

Development software for the MVME177PA includes the on-board debugger/monitor firmware. 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:	MC68060
Clock Frequency:	60 MHz

Memory

Synchronous Dynamic RAM

Capacity:	128MB
Wait States:	3/0 (read/write)
Read Burst Mode:	4-1-1-1
Write Burst Mode:	2-1-1-1
Shared:	VMEbus/local bus

Flash (120ns)

Capacity:	4MB
Access Cycles:	5 read, 6 write

EPROM

Socket Type:	44-pin PLCC
Number of Sockets (Max. Capacity):	Two (256K x 16)
Data Width/Capacity:	32-bit/2MB

VMEbus (IEEE 1014)

DTB Master/Slave:	A16, A24, A32, D08(EO), 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:	M48T58; 8KB NVRAM

Timers

Timers:	Four 32-bit, 1µsec resolution
Local bus DMA:	Yes

Serial Ports

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

Power Dissipation

Maximum:	23 watts
+5V ±5%:	2.4 A max.; 2.1 A typical @ 60 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):	MVME177FW
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, forced air cooling	–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
MVME177PA-67SE	60 MHz, 128MB 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	
V177PA/IH	MVME177P 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	

Motorola Computer Group Regional Offices

NORTH AMERICA: Tempe, AZ 800-759-1107 or 602-438-5720

EUROPE: Loughborough, UK +44 1509 634300

EAST MEDITERRANEAN: Tel Aviv, Israel +972 3 568 4388

ASIA: Shanghai, China +86 21 5292 5693

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MV177-D10 02/03

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