Datasheet

MVME2400 Series

VME Processor Modules

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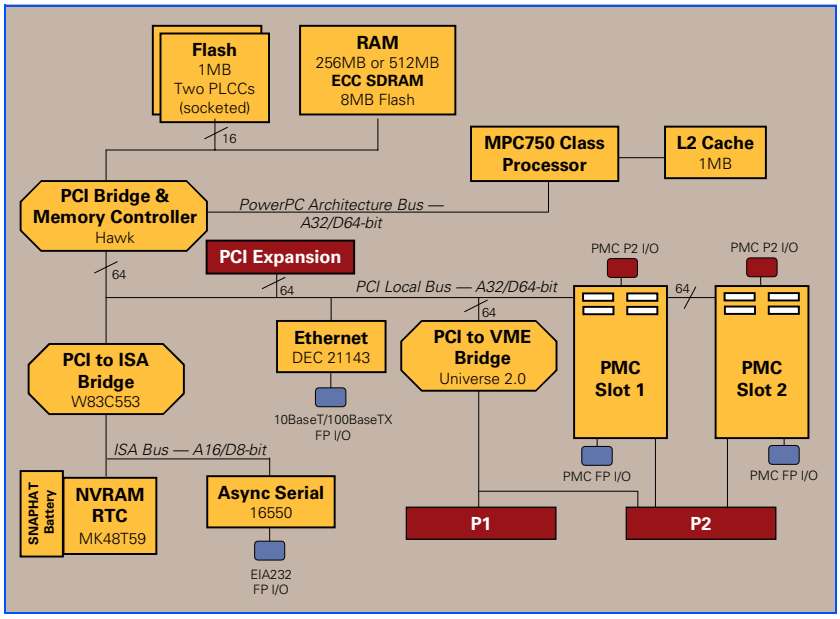
Low-power, high-performance microprocessor suitable for a variety of applications

The MVME2400 series of VME boards provides the performance of Motorola's PowerPlus II Architecture and the ability to be fully customized to satisfy your application needs with two PCI mezzanine cards (PMCs). The flexibility of the MVME2400 provides an excellent base platform that can be quickly and easily customized for a variety of industry-specific applications.

Utilizing Motorola's low-power, high-performance MPC750 class microprocessors, the peripheral component interconnect (PCI) bus for the on-board peripherals, processor/memory bus to PCI bus bridge, and a VME interface, the MVME2400 processor modules pack optimum levels of flexibility and performance into a single VME slot.

- MPC750 class 32-bit microprocessor
- 32KB/32KB L1 cache
- 1MB backside L2 cache
- 256MB or 512MB of on-board ECC SDRAM
- Up to 1MB capacity for on-board firmware or user-specified requirements
- 8MB on-board Flash memory for user-specified requirements
- On-board debug monitor with self-test diagnostics
- Two 32/64-bit PMC expansion slots with front-panel and P2 I/O
- 64-bit PCI expansion mezzanine connector
- 8K x 8 NVRAM and time-of-day clock with replaceable battery backup
- One asynchronous serial debug port
- Four 32-bit timers, one 16-bit timer, one watchdog timer
- 10/100Mb/s Ethernet interface
- 4-level requester, 7-level interrupter, and 7-level interrupt handler for VMEbus



MVME2400 DETAILS

IEEE P1386.1 Compliant PMC Slots

The MVME2400 features dual PMC ports with support for both front-panel and P2 I/O. P2 I/O-based PMCs that follow the PMC committee recommendation for PCI I/O when using the VME64 extension connector will be pin-out compatible with the MVME2400.

In addition to providing high-performance expansion I/O, the IEEE P1386.1 compliant PMC ports form a common architecture for future generations of products. Changing I/O requirements can be satisfied by simply replacing PMCs while reusing the same base platform, reducing the long-term cost of ownership.

VME64 Extension Connectors

To maximize the capabilities of the MVME2400, 5-row 160-pin DIN connectors replace the 3-row 96-pin connectors historically used on VME for P1 and P2. Two rows, Z and D, have been added to the VME P1/J1 and P2/J2 connectors providing a user with additional I/O. The VME64 extension connector is 100 percent backward compatible with existing VME card systems.

PowerPlus Architecture

A second-generation architecture, PowerPlus II Architecture is a processor and bus architecture fully optimized to get the maximum performance from the PowerPC architecture microprocessor family, the PCI bus, and the VMEbus. Features added to the original PowerPlus Architecture include support for 100 MHz local bus operation, and utilization of synchronous DRAM (SDRAM) technology. The outstanding performance of VME processor boards based on the PowerPlus II Architecture is not due to a single factor. A number of elements in the design of the PowerPlus II Architecture contribute to its outstanding performance including the processor/memory subsystem, high-speed local bus, optimally decoupled architecture, decoupling the processor from PCI, and the advanced VME interface that reduces PCI delays.

SPECIFICATIONS

Processor

Microprocessor:	MPC750 class	MPC750 class
Clock Frequency:	350 MHz	450 MHz
On-chip Cache (I/D):	32KB/32KB	32KB/32KB

VMEbus ANSI/VITA 1-1994 VME64 (IEEE STD 1014)

Controller:	Tundra Universe 2.0
DTB Master:	A16–A32; D08–D64, BLT
DTB Slave:	A24–A32; D08–D64, BLT, UAT
Arbiter:	RR/PRI
Interrupt Handler/Generator:	IRQ 1–7/Any one of seven IRQs
System Controller:	Yes, jumperable or auto detect
Location Monitor:	Two, LMA32

Ethernet Interface

Controller:	DEC 21143
PCI Local bus DMA:	Yes
Connector:	Routed to front panel via an RJ-45

Memory

ECC Protected Main Memory:	PC100 SDRAM with 100 MHz bus
Capacity:	256MB or 512MB
Single Cycle Accesses:	10 read/5 write
Read Burst Mode:	7-1-1-1 idle; 2-1-1-1 aligned page hit
Write Burst Mode:	4-1-1-1 idle; 2-1-1-1 aligned page hit
Architecture:	64-bit, single interleave
L2 Cache:	1MB
Cache Bus Clock Frequency:	140 MHz (350 MHz processor), 180 MHz (450 MHz processor)
EEPROM/Flash:	On-board programmable
Capacity:	1MB via two 32-pin PLCC/CLCC sockets; 8MB surface mount
Read Access (8MB port):	70 clocks (32 byte burst)
Read Access (1MB port):	262 clocks (32 byte burst)
NVRAM:	8KB; 4KB available for users
Cell Storage Life:	50 years at 55° C
Cell Capacity Life:	10 years at 100% duty cycle
Removable Battery:	Yes

Asynchronous Serial Port

Controller:	W83C553
Number of Ports:	One, 16550 compatible
Configuration:	EIA-574 DTE
Async Baud Rate, bps max.:	38.4K EIA-232, 115Kbps raw

Counters/Timers

TOD Clock Device:	M48T559; 8KB NVRAM
Real-Time Timers/Counters:	One 16-bit, four 32-bit programmable
Watchdog Timer:	Time-out generates reset

Miscellaneous

Reset and Abort switches and four LEDs for Fail, CPU, PMC1, PMC2 on front panel

IEEE P1386.1 PCI Mezzanine Card Slot

Address/Data:	A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors
PCI Bus Clock:	33 MHz
Signaling:	5 V
Power:	+3.3 V, +5 V, ±12 V, 7.5 watts maximum per PMC slot
Module Types:	One double-wide or two single-wide front-panel I/O or P2 I/O

Note: P2 I/O from PMC slot 2 is only accessible to systems equipped for VME64 extension connectors

PCI Expansion Connector

Address/Data:	A32/D32/D64
PCI Bus Clock:	33 MHz
Signaling:	5 V
Connector:	114-pin connector located on the planar of the MVME2400

Power Requirements

	+ 5 V ±5%
MVME2400 w/ MPC750 @ 350 MHz:	4.5 A typ., 5.5 A max.
MVME2400 w/ MPC750 @ 450 MHz:	3.93 A typ., 4.31 A max.

Note: Power requirements are PMC dependent at +12 and –12 volts.

Board Size

Height:	233.4 mm (9.2 in.)
Depth:	160.0 mm (6.3 in.)
Front Panel Height:	261.8 mm (10.3 in.)
Width:	19.8 mm (0.8 in.)
Max. Component Height:	14.8 mm (0.58 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 +70° C
Humidity (NC):	5% to 85%	5% to 95%
Vibration:	1 G Sine Sweep 5–100 Hz	.5 G Sine Sweep 5–50 Hz; 3 G Sine Sweep 50–500 Hz

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

Canada: ICES-003, Class A

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: EN55024

Software Support

The MVME2400 is supported by a variety of operating systems, including a complete range of real-time operating systems and kernels.

ORDERING INFORMATION

Part Number	Description
All models include 1MB backside L2 cache, 9MB Flash, and the option of either the original VME Scanbe front panel and handles or the MCG1101 compatible front panel with injector/ejector handles.	
MVME2434-1	350 MHz MPC750 class processor, 256MB ECC SDRAM, Scanbe handles
MVME2434-3	350 MHz MPC750 class processor, 256MB ECC SDRAM, MCG1101 handles
MVME2400-0361	450 MHz MPC750 class processor, 512MB ECC SDRAM, Scanbe handles
MVME2400-0363	450 MHz MPC750 class processor, 512MB ECC SDRAM, MCG1101 handles
Related Products	
PMCSPAN-002	Primary PCI expansion, mates directly to the MVME2400 providing slots for either two single-wide or one double-wide IEEE P1386.1 compliant PMC cards; optional PMCSPAN-010; for MCG1101 handles
PMCSPAN1-002	PMCSPAN-002 with original VMEbus Scanbe handles
PMCSPAN-010	Secondary PCI expansion, plugs directly into PMCSPAN-002 providing two additional PMC slots; for MCG1101 handles
PMCSPAN1-010	PMCSAN-010 with original VMEbus Scanbe handles
Documentation	
V2400A/IH	MVME2400 Installation and Use
V2400A/PG	MVME2400 Programmer's Reference Guide
PMCSPANA/IH	PMCspan Installation and Use
PPCBUGA1/UM	PPCBug User's Manual, Part 1 of 2
PPCBUGA2/UM	PPCBug User's Manual, Part 2 of 2
PPCDIAA/UM	Firmware Diagnostics Manual
Documentation is available for online viewing and ordering at http://www.motorola.com/computer/literature	

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