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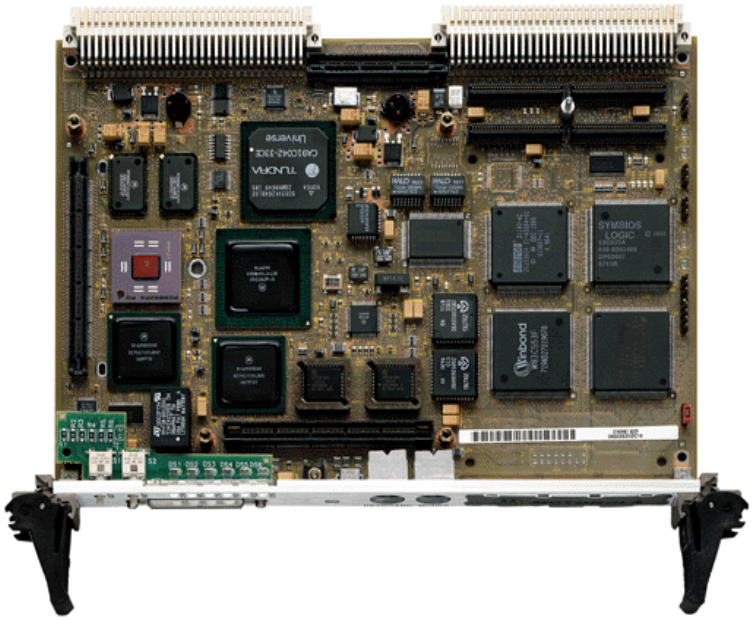
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# MVME2700

## VME Processor Modules



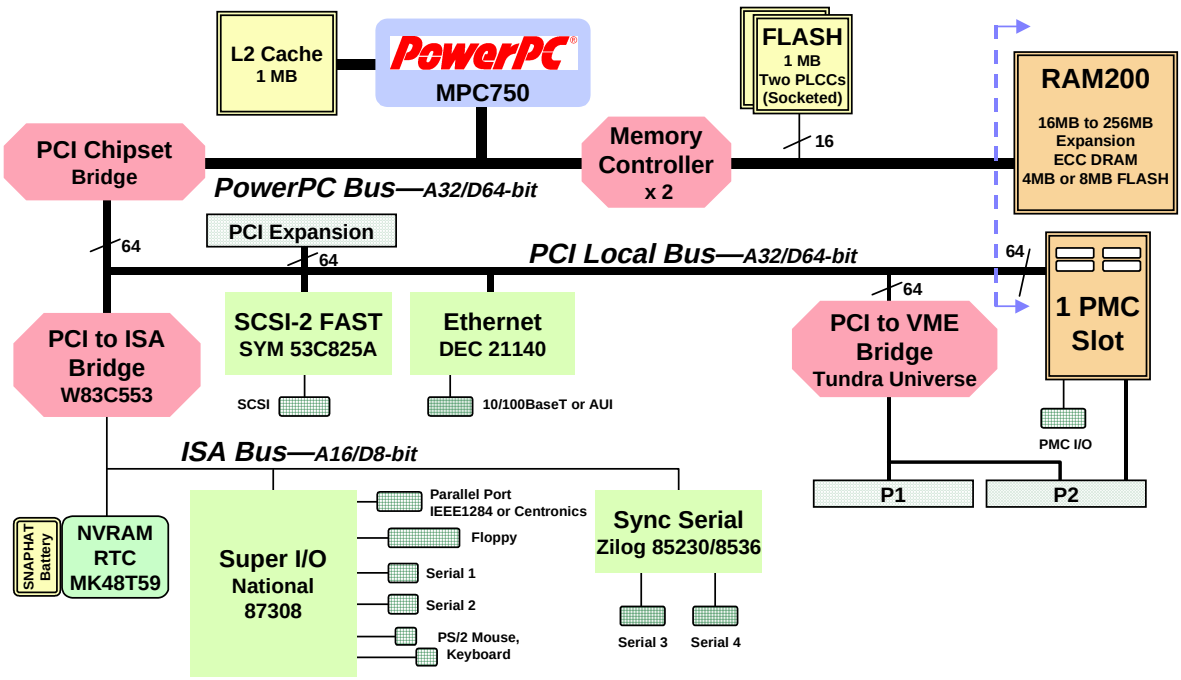
- PowerPC 750™ 32-bit microprocessor
- 32KB/32KB L1 cache
- 1MB backside L2 cache
- 16MB to 256MB ECC DRAM using RAM200 memory expansion modules
- 8MB on-board Flash, 1MB socketed
- 64-bit PCI mezzanine connector
- On-board debug monitor with self-test diagnostics
- IEEE P1386.1 compatible 32/64-bit PMC expansion slot
- 2 or 3 async, 1 or 2 sync/async serial ports
- Ethernet transceiver interface with 32–bit PCI local bus DMA
- 8- or 16-bit Fast SCSI-2 bus interface
- Parallel, floppy, keyboard and mouse interfaces
- 8KB x 8 NVRAM and time-of-day clock with replaceable battery backup
- Four 32-bit timers, one watchdog timer
- One VME slot, even when configured with PMC module

**Scalable high-performance VME computing with the flexibility of PMC expansion**

The MVME2700 Series is a family of VME processor modules based on the Motorola PowerPlus VME architecture with PowerPC® microprocessors that push performance and functionality to limits unprecedented on VME. The flexibility of the MVME2700 provides an excellent base platform that can be quickly and easily customized for a variety of industry-specific applications.

Designed to meet the needs of military and aerospace, industrial automation, and medical, MVME2700 applies to a variety of applications. DRAM expansion mezzanines enable memory upgrades to the maximum 256MB of ECC DRAM without requiring additional VME slots.

Digital DNA™ from Motorola




## MVME2700 Details

### PCI Expansion

MVME2700 modules have a 64-bit PCI connection to support PCI expansion carriers such as Motorola PMCspan. Design details for the connector and electrical specifications are available from your local Motorola representative.

### Memory Modules

The MVME2700 series has a modular memory design. Mezzanine arrays support from 16MB to 256MB of add-on DRAM. These RAM200 expansion modules allow field upgrades of the memory capacity and do not require additional VME slots.

### Transition Modules

Two artwork variants of the MVME2700 are available. One series provides backward compatibility with the MVME712M transition module I/O. The other series accepts the MVME761 transition module that features an additional sync/async serial port, a 10/100BaseT interface, Fast 16-bit SCSI, and an IEEE 1284 compatible parallel port.

*MVME761*

The MVME761 transition module provides industry-standard connector access to the IEEE 1284 parallel port, a 10BaseT or 100BaseT port via an RJ-45 connector, two DB-9 connectors providing access to the asynchronous serial ports configured as EIA-574 DTE, and two HD-26 connectors providing access to the sync/async serial ports. These serial ports, labeled as Serial 3 and Serial 4 on the face plate of the MVME761, are individually user configurable as EIA-232, EIA-530, V.35, or X.21 DCE or DTE via the installation of Motorola Serial Interface Modules (SIMs).

A P2 adapter provides interface module signals to the MVME761 transition module. The 3-row P2 adapter can be used for 8-bit SCSI. A 5-row P2 adapter supports 16-bit SCSI and PMC I/O.

*MVME712M*

The MVME712M transition module provides industry-standard connector access to the Centronics® parallel port, an AUI port, and four DB-25 connectors providing access to the asynchronous/synchronous serial ports jumper configurable as EIA-232 DCE or DTE.A P2 adapter provides interface signals to the MVME712M transition module. The 3-row P2 adapter can be used for 8-bit SCSI.

To gain access to the additional user definable I/O pins provided via the 5-row VME64 extension connector, a special P2 adapter board is available. This adapter panel replaces the traditional 3-row P2 adapter and extends its capability by providing access to the PMC I/O pins.

Several other variations of the MVME712M are available for combinations of I/O and connectors.

### Operating Systems and Real-Time Kernels

| | |
|---|---|
| **Motorola Computer Group:** | AIX |
| **Integrated Systems, Inc.:** | pSOSystem™ |
| **Lynx Real-Time Systems, Inc.:** | LynxOS™ |
| **Microware Systems Corporation:** | OS-9®/OS-9000™ |
| **Microtec:** | VRTX32™ |
| **Wind River Systems, Inc.:** | VxWorks® |

### Firmware Monitor

Firmware must fulfill the traditional functions of test and initialization, in addition to operating system boot support. The MVME2700 firmware monitor exceeds these requirements with a proven monitor from the embedded VME leader. It expands features like power-up tests with extensive diagnostics, as well as a powerful evaluation and debug tool for simple checkout or when high-level development debuggers require additional support. All this is included with the MVME2700 firmware, plus it supports booting both operating systems and kernels.

## Specifications

### Processor

| | | | |
|---|---|---|---|
| **Microprocessor:** | MPC750 | MPC750 | MPC750 |
| **Clock Frequency:** | 233 MHz | 266 MHz | 366 MHz |
| **On-chip Cache (I/D):** | 32K/32K | 32K/32K | 32K/32K |
| **Memory Type:** | 60ns FPM | 50ns EDO | 60ns FPM 50ns EDO |
| **SPECint95, estimated:** | 10.2 | 10.5 | 16.4 (peak) |
| **SPECfp95, estimated:** | 8.2 | 8.4 | 9.98 (peak) |

### Memory

| | |
|---|---|
| **MAIN MEMORY:** | Dynamic RAM |
| **Capacity (60ns FPM):** | 16, 32, or 64MB on RAM200 |
| **Capacity (50ns EDO):** | 128 or 256MB on RAM200 |
| **Single Cycle Accesses:** | 9 Read/4 Write |
| **Read Burst Mode (60ns FPM):** | 9-1-2-1 idle; 3-1-2-1 aligned page hit |
| **Read Burst Mode (50ns EDO):** | 8-1-1-1 idle; 2-1-1-1 aligned page hit |
| **Write Burst Mode:** | 4-1-1-1 idle; 3-1-1-1 aligned page hit |
| **Architecture:** | 128-bit, two-way interleaved |
| **Parity/ECC:** | No/Yes |
| **L2 CACHE:** | 1MB |
| **Cache Bus Clock Frequency:** | Processor clock divided by 2 |
| **FLASH:** | On-board programmable |
| **Capacity:** | 1MB via two 32-pin PLCC/CLCC sockets; 4 or 8MB surface mount |
| **Read Access (8MB port):** | 68 clocks (32 byte burst) |
| **Read Access (1MB port):** | 260 clocks (8 byte burst) |
| **Write Access (1MB/8MB):** | 19 clocks (2 bytes/8 bytes) |
| **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 |

### PCI Expansion Connector

| | |
|---|---|
| **Address/Data:** | A32/D32/D64 |
| **PCI Bus Clock:** | 33 MHz |
| **Signaling:** | 5V |
| **Connector:** | 114-pin connector located on the planar of the MVME2700 between P1 and P2 |

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

| | |
|---|---|
| **Controller:** | Tundra Universe |
| **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

| | MVME761 | MVME712M |
|---|---|---|
| **Controller** | DEC 21140 | DEC 21140 |
| **Interface Speed:** | 10/100Mb/s | AUI (10Mb/s) |
| **PCI Local bus DMA:** | Yes, with PCI burst | Yes, with PCI burst |
| **Connector:** | Routed to P2, RJ-45 on MVME761 | Routed to P2, DB-15 AUI on MVME712M |

### SCSI Interface

| | MVME761 | MVME712M |
|---|---|---|
| **Controller:** | Symbios 53C825A | Symbios 53C825A |
| **PCI Local Bus DMA:** | Yes, with PCI local bus burst | Yes, with PCI local bus burst |
| **Asynchronous:** | 5.0MB/s | 5.0MB/s |
| **Synchronous:** | 10.0MB/s (8-bit mode), 20.0MB/s (16-bit mode) | 10.0MB/s (8-bit mode), 20.0MB/s (16-bit mode) |
| **Connector:** | Routed to P2, 50- or 68-pin on MVME761EXT | Routed to P2, SCSI D-50 on MVME712M |

### Asynchronous Serial Ports

| | MVME761 | MVME712M |
|---|---|---|
| **Controller** | PC87308 | PC87308 |
| **Number of Ports:** | Two, 16550 compatible | Two 16550 compatible and one 85230/8536 |
| **Configuration:** | EIA-574 DTE | EIA-232 DCE/DTE |
| **Async Baud Rate, bps max.:** | 38.4K EIA-232, 115Kbps raw | 38.4K EIA-232, 115Kbps raw |
| **Connector:** | Routed to P2, DB-9 on MVME761 | Routed to P2, DB-25 on MVME712M |

### Synchronous Serial Ports

| | MVME761 | MVME712M |
|---|---|---|
| **Controller** | 85230/8536 | 85230/8536 |
| **Number of Ports:** | Two | One |
| **Configuration:** | TTL to P2 (both ports), SIM on MVME761 | EIA-232 DCE/DTE |
| **Baud Rate, bps max.:** | 2.5M sync, 38.4K async | 2.5M sync, 38.4K async |
| **Oscillator Clock Rate (PCLK):** | 10 MHz/5 MHz | 10 MHz/5 MHz |
| **Connector:** | Routed to P2, HD-26 on MVME761 | Routed to P2, DB-25 on MVME712M |

## Parallel Port

| | MVME761 | MVME712M |
|---|---|---|
| **Controller** | PC87308 | PC87308 |
| **Configuration:** | 8-bit bidirectional, full IEEE 1284 support; Centronics compatible | 8-bit bidirectional, IEEE 1284 minus EPP and ECP |
| **Modes:** | Master only | Master only |
| **Connector:** | Routed to P2, HD-36 on MVME761 | Routed to P2, D-36 on MVME712M |

## Counters/Timers

**TOD Clock Device:** M48T18; 8KB NVRAM

**Real-Time Timers/ Counters:** Four, 32-bit programmable

**Watchdog Timer:** Time-out generates reset

## Floppy

**Controller:** PC87308

**Compatible Controllers:** DP8473, 765A, N82077

**Configuration:** 3.5" 2.88MB and 1.44MB; 5.25" 1.2MB

**Connector:** HD-50 on front panel

## Mouse Interface

**Controller:** PC87308

**Connector:** 6-pin circular female mini DIN on front panel

## Keyboard Interface

**Controller:** PC87308

**Connector:** 6-pin circular female mini DIN 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:** 5V

**Power:** +3.3V, +5V, ±12V; 7.5 watts maximum per PMC slot

**Module Types:** Basic, single-wide, front panel I/O or P2 I/O (Note: P2 I/O is only accessible to systems equipped for VME64 extension connectors.)

## 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.)

## Miscellaneous

Reset and abort switches on front panel; six LEDs for FAIL, CHKSTP, CPU, PCI, SCON, and FUSE

Transition Modules

## I/O Connectors

| | MVME761 | MVME712M |
|---|---|---|
| **Asynchronous Serial Ports:** | Two, DB-9 labeled as COM1 and COM2 | Three, DB-25 labeled as Serial 1, Serial 2, and Serial 3 |
| **Synchronous Serial Ports:** | Two HD-26 labeled as Serial 3 and Serial 4 (user configurable via installation of SIMs), Two 60-pin connectors on MVME761 planar for installation of two SIMs | One, DB-25 labeled as Serial 4 |
| **Parallel Port:** | HD-36, Centronics compatible | D-36, Centronics compatible |
| **Ethernet:** | 10BaseT or 100BaseTX RJ-45 | 10Mb/s Ethernet DB-15 AUI |
| **SCSI:** | 8- or 16-bit, 50- or 68-pin connector via P2 adapter | 8-bit, standard SCSI D-50 |

## Board Size

**Height:** 233.4 mm (9.2 in.)

**Depth:** 80.0 mm (3.1 in.)

**Front Panel Height:** 261.8 mm (10.3 in.)

**Width:** 19.8 mm (0.8 in.)

All Modules

## Power Requirements

(not including power required by PMC or external AUI transceiver)

| | +5V ± 5% | +12V ± 10% |
|---|---|---|
| **MVME2700:** | 5.5 A typ.<br>6.5 A max. | 8 mA typ. |
| **MVME2700 w/ MVME761:** | 5.5 A typ.<br>6.5 A max. | 250 mA typ.<br>500 mA max. |

–12V power is not used on the MVME2700 but is supplied for use by other devices (such as PMC); requirements vary by device

## 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 |
| **Altitude:** | 5,000 m | 15,000 m |
| **Humidity (NC):** | 10% to 80% | 10% to 90% |
| **Vibration:** | 2 Gs RMS, 20–2000 Hz random | 6 Gs RMS, 20–2000 Hz random |

### 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 B; Immunity: EN50082-1

### Safety

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

## Ordering Information

| Part Number | Description |
|---|---|
| **MVME2700 with MVME761 I/O** | |
| All models of the MVME2700 include 1MB backside L2 cache | |
| **MVME2700-1221A to MVME2700-1251A** | 233 MHz MPC750, 16MB–128MB ECC DRAM, 9MB Flash, IEEE 1101 compatible front panel with injector/ejector handles |
| **MVME2700-3221A to MVME2700-3251A** | 233 MHz MPC750, 16MB–128MB ECC DRAM, 9MB Flash, original VME Scanbe front panel and handles |
| **MVME2700-1321 to MVME2700-1361** | 266 MHz MPC750, 16MB–256MB ECC DRAM, 5MB Flash, IEEE 1101 compatible front panel with injector/ejector handles |
| **MVME2700-3321 to MVME2700-3361** | 266 MHz MPC750, 16MB–256MB ECC DRAM, 5MB Flash, original VME Scanbe front panel and handles |
| **MVME2700-1421 to MVME2700-1461** | 366 MHz MPC750, 16MB–256MB ECC DRAM, 9MB Flash, IEEE 1101 compatible front panel with injector/ejector handles |
| **MVME2700-3421 to MVME2700-3461** | 366 MHz MPC750, 16MB–256MB ECC DRAM, 9MB Flash, original VME Scanbe front panel and handles |
| **MVME2700 with MVME712 I/O** | |
| **MVME2700-4221A to MVME2700-4251A** | 233 MHz MPC750, 16MB–128MB ECC DRAM, 9MB Flash, original VME Scanbe front panel and handles |
| **MVME2700-4321 to MVME2700-4361** | 266 MHz MPC750, 16MB–256MB ECC DRAM, 5MB Flash, original VME Scanbe front panel and handles |
| **MVME2700-4421 to MVME2700-4461** | 366 MHz MPC750, 16MB–256MB ECC DRAM, 9MB Flash, original VME Scanbe front panel and handles |

| | |
|---|---|
| **MVME761 Transition Module** | |
| **MVME761-001** | Transition module: Two DB-9 async serial port connectors, two HD-26 sync/async serial port connectors, one HD-36 parallel port connector, one RJ-45 10/100 Ethernet connector; includes 3-row DIN P2 adapter module and cable |
| **MVME761-011** | Transition module: Two DB-9 async serial port connectors, two HD-26 sync/async serial port connectors, one HD-36 parallel port connector, one RJ-45 10/100 Ethernet connector; includes 5-row DIN P2 adapter module and cable; requires backplane with 5-row DIN connectors |
| **MVME761P2-011** | 5-row DIN P2 adapter compatible with MVME761; connectors for 16-bit (wide) SCSI and PMC I/O; requires backplane with 5-row DIN connectors |
| **MVME761EXT** | MVME761 I/O extension module, connectors for Ethernet, SCSI and PMC I/O |
| **SIM232DCE or DTE** | EIA-232 DCE or DTE Serial Interface Module |
| **SIM530DCE or DTE** | EIA-530 DCE or DTE Serial Interface Module |
| **SIMV35DCE or DTE** | V.35 DCE or DTE Module |
| **SIMX21DCE or DTE** | X.21 DCE or DTE Serial Interface Module |
| **MVME712 Transition Module** | |
| **MVME712M** | Transition module connectors: One DB-25 sync/async serial port, three DB-25 async serial port, one AIU connector for Ethernet, one D-36 parallel port, and one 50-pin 8-bit SCSI; includes 3-row DIN P2 adapter module and cable |
| **Related Products** | |
| **PMCSPAN-001** | Primary 32-bit PCI expansion, mates directly to the MVME2700 providing slots for either two single-wide or one double-wide PMC card, accepts optional PMCSPAN-010, IEEE 1101 compatible front panel with injector/ejector handles |
| **PMCSPAN1-001** | PMCSPAN-001 with original VME Scanbe front panel and handles |
| **PMCSPAN-010** | Secondary 32-bit PCI expansion, plugs directly into PMCSPAN-001 providing two additional PMC slots |
| **PMCSPAN1-010** | PMCSPAN-010 with original VME Scanbe front panel and handles |
| **MPMC*xxx*** | Motorola's family of PMC modules; ask your sales representative for details |
| **RAM200-043A** | 32MB ECC DRAM mezzanine, 8MB Flash, non–stackable |
| **RAM200-044A** | 64MB ECC DRAM mezzanine, 8MB Flash, non–stackable |
| **RAM200-045A** | 128MB ECC DRAM mezzanine, 8MB Flash, non–stackable |
| **RAM200-046A** | 256MB ECC DRAM mezzanine, 8MB Flash, non–stackable |
| **RAM200-047A** | 512MB ECC DRAM mezzanine, 8MB Flash, non-stackable |

| Documentation | |
|---|---|
| **V2700A/IH** | MVME2700 Installation and Use |
| **V2600A/PG** | MVME2600/2700 Programmer's Reference Guide |
| **VME761A/IH** | MVME761 Transition Module Installation and Use |
| **VME712A/IH** | MVME712 Transition Module Installation and Use |
| **PPCBUGA1/UM and PPCBUGA2/UM** | PPCBug Firmware Package User's Manual |
| **PPCDIAA/UM** | PPCBug Diagnostics Manual |

**Notes on Ordering Information**

1. Major revision levels are indicated by alpha character at end of part number.
2. Board support package source and object modules available upon request.
3. Documentation is available for on-line viewing and ordering at http://www.motorola.com/computer/literature.

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