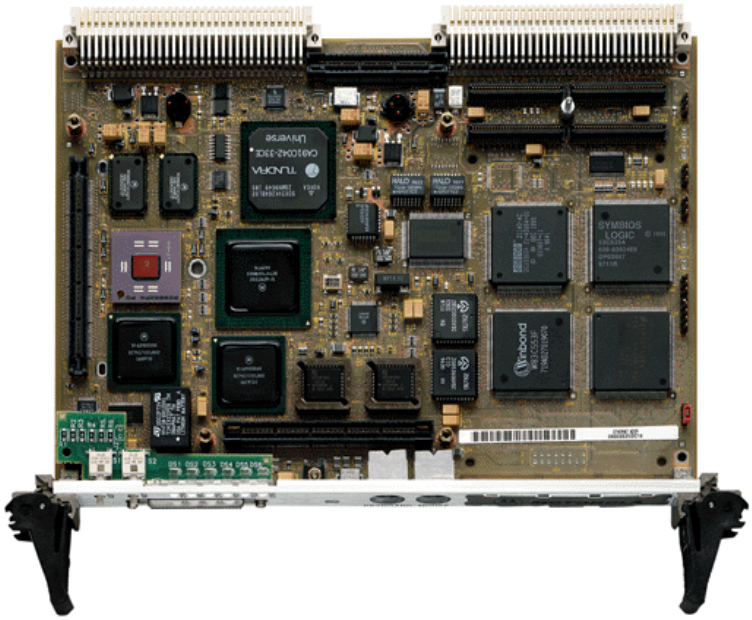
MVME2700

VME Processor Modules



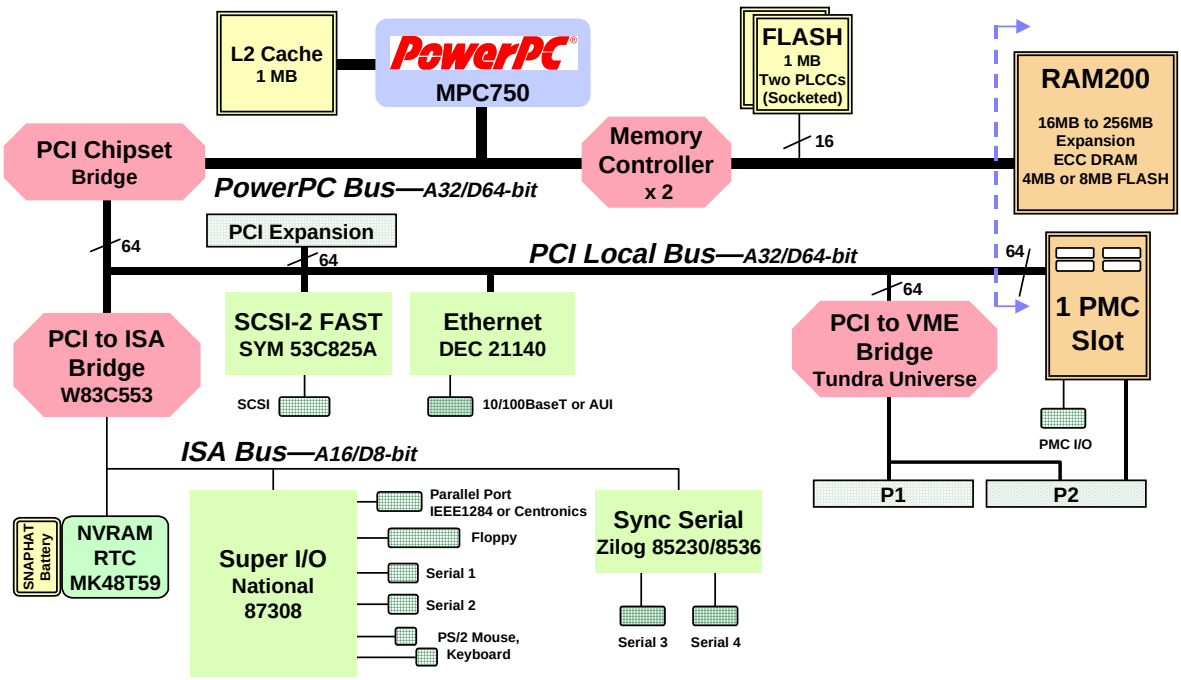
- PowerPC 750™ 32-bit microprocessor
- 32KB/32KB L1 cache
- 1MB backside L2 cache
- 16MB to 256MB ECC DRAM using RAM200 memory expansion modules
- 8MB on-board Flash, 1MB socketed
- 64-bit PCI mezzanine connector
- On-board debug monitor with self-test diagnostics
- IEEE P1386.1 compatible 32/64-bit 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. 6.5 A max.	8 mA typ.
MVME2700 w/ MVME761:	5.5 A typ. 6.5 A max.	250 mA typ. 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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www.motorola.com/computer
1-800-759-1107

Motorola Computer Group
2900 S. Diablo Way
Tempe, AZ 85282

Regional Sales Offices

Canada & Central Pan America
400 Matheson Blvd. West
Mississauga, Ontario
L5R 3M1 Canada
905-507-7135 or 888-366-3624

Eastern Pan America
1650 Tysons Boulevard, Suite 250
McLean, VA 22102
703-714-0725

Western Pan America
1150 Kifer Road, Suite 202
Sunnyvale, CA 94086
408-991-8633

Asia Pacific and Japan
34/F Nat West Tower
Times Square, 1 Matheson St
Causeway Bay, Hong Kong
852-2966-3209

East Mediterranean
6 HaTaas Street
Ramat-Gan, Isreal 52523
972-3-610-4388

France
Zone Technopolis - Immeuble
THETA 3, avenue du Canada - BP304
91958 LES ULIS
Courtaboeuf Cedex, France
+33 (0) 1 64 86 64 00

Germany
Hagenauer Strasse 47
D-65203 Wiesbaden, Germany
+49 (0) 611-3611 604

Benelux
De Waal 26, 5684 PH Best
PO Box 350, 5680 AJ Best
Netherlands
+31 4993 61250

Nordic
Dalvagen 2
S-169 56 Solna, Sweden
+46 (0) 8 734 8800

United Kingdom
London Road, Old Basing,
Basingstoke, Hampshire
RG24 7JL England
+44 (0) 1256 790555

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