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Find the *Emerson / Motorola MVME7100-0173* at our website: ***Click HERE***

MVME7100 Series

VMEbus Single-Board Computer

Embedded Computing for Business-Critical Continuity™

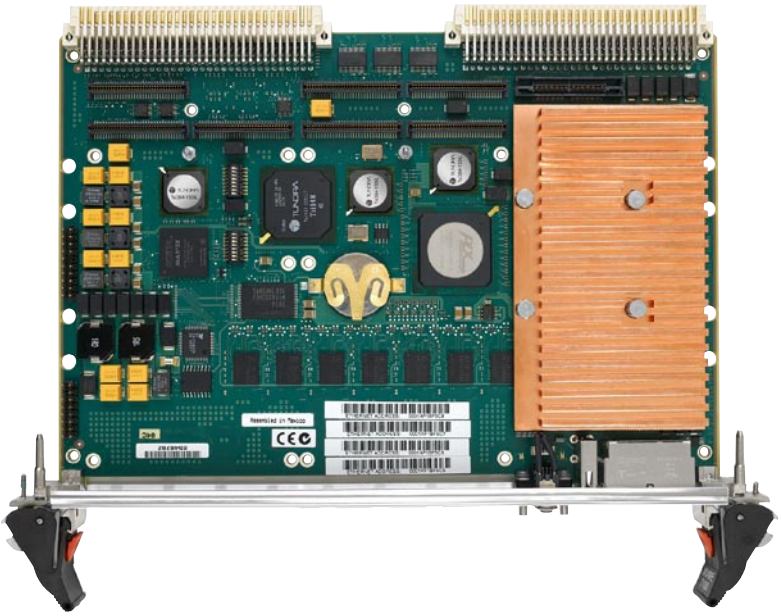
The MVME7100 adds performance and features while protecting the fundamental investment in VMEbus and related technologies

- Up to 1.3 GHz system-on-chip Freescale MPC864xD with dual PowerPC® e600 processor cores, dual integrated memory controllers, DMA engine, PCI Express interface, Ethernet, and local I/O
- Four Gigabit Ethernet ports
- Up to 2GB of DDR2 ECC memory, 128MB NOR flash and 4 or 8GB NAND flash
- USB 2.0 controller for integrating cost-effective peripherals
- 2eSST VMEbus protocol with 320MB/s transfer rate across the VMEbus
- Board support packages for VxWorks, LynxOS, and Linux
- Dual 33/66/100MHz PMC-X sites for expansion via industry standard modules with support for processor PMCs
- 8x PCI Express expansion connector for PMC-X and XMC expansion using Emerson XMCspan
- MVME7216E direct-connect rear transition module (RTM) for I/O routing through rear of a VMEbus chassis

The Emerson Network Power MVME7100, one of the first VMEbus products with the system-on-chip MPC864xD processor, offers a growth path for VMEbus customers with applications on the previous generation of VME, specifically the MPC74xx processors. The system-on-chip implementation offers power/thermal, reliability, and lifecycle advantages not typically found in alternative architectures.

The Emerson MVME7100 single-board computer (SBC) helps OEMs of industrial, medical, and defense/aerospace VMEbus platforms add performance and features for competitive advantage while still protecting the fundamental investment in VMEbus and related technologies. Customers can keep their VMEbus infrastructure (chassis, backplanes, and other VMEbus and PMC boards) while improving performance and extending the lifecycle. Also, the extended lifecycle of Emerson computing products helps reduce churns in development and support efforts resulting from frequent product changes.

The faster processor and 2eSST VMEbus interface combine to offer significant performance improvement. New cost-effective peripherals can be integrated easily using USB interfaces.

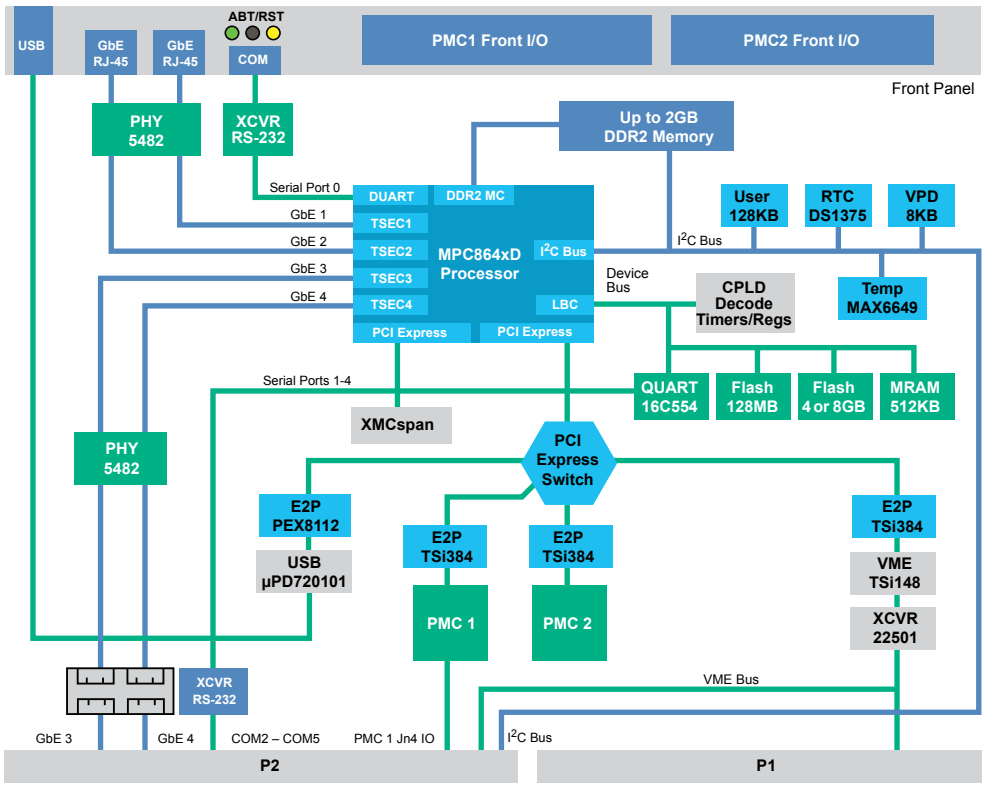


RoHS 6/6 COMPLIANT

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MVME7100 Block Diagram



Overview

VMEBUS 2ESST PERFORMANCE

The 2eSST protocol offers an available VME bus bandwidth of up to 320MB/s, an increase of up to 8x over VME64, while maintaining backward compatibility with VME64 and VME32. The combination of the latest Texas Instruments VMEbus transceivers and the Tundra Tsi148 VMEbus bridge's legacy protocol support allows customers to integrate the MVME7100 series into their existing infrastructure providing backward compatibility and thereby preserving their investment in existing VMEbus boards, backplanes, chassis and software.

BALANCED PERFORMANCE

The MVME7100 series provides more than just faster VMEbus transfer rates; it provides balanced performance from the processor, memory subsystem, local busses and I/O subsystems. This coupled with a wealth of I/O interfaces make the MVME7100 series ideal for use as an application-specific compute blade, or an intelligent I/O blade/carrier. The Freescale MPC864xD system-on-chip (SoC) processor, running at speeds up to 1.3 GHz, is well-suited for I/O and data-intensive applications. The integrated SoC design creates an I/O intensive state-of-the-art package that combines dual low power processing cores with on-chip L2 cache and dual integrated DDR2 memory controllers, PCI Express, DMA , Ethernet and local device I/O. The on-chip PCI Express interface and dual DDR2 memory busses are well matched to the processor. To ensure optimal I/O performance, the 8x PCI Express port is connected to a five-port PCI Express switch. Three 4x PCI Express ports are connected to PCI Express-to-PCI-X bridges which provide independent PCI-X busses for the two PMC-X sites and VME bus interface. A 1x PCI Express port is connected to a PCI Express-to-PCI bridge which is connected to the USB chip. The MVME7100 also offers quad Gigabit Ethernet interfaces, USB 2.0, and five (5) RS-232 serial connections. All of this adds up to a set of well-balanced, high-performance subsystems offering unparalleled performance.

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Backward Compatibility

The MVME7100 series continues the direction of providing a migration path from Emerson's embedded controllers such as the MVME16x, MVME17x, MVME2300/MVME2400, and from Emerson SBCs such as the MVME2600/2700 to a single platform. The MVME7100 series, like the MVME3100, MVME5100, MVME5500, and MVME6100 series, merged the best features of Emerson's embedded controllers and SBCs enabling OEMs to support varying I/O requirements with the same base platform, simplifying part number maintenance, technical expertise requirements, and sparing.

The MVME7100 series offers customers an alternate migration path from the MVME2100, MVME2300, MVME2400, MVME2600, MVME2700, MVME3100, MVME5100, MVME5500 and MVME6100 boards to allow them to take advantage of features such as the integrated MPC864xD SoC processor, DDR2 memory, Gigabit Ethernet, PCI-X, PCI Express, USB, and 2eSST.

PCI EXPANSION

The MVME7100 has an 8x PCI Express connection to support PCI Express expansion carriers such as the Emerson XMCspan.

TRANSITION MODULES

The MVME7216E transition module provides industry-standard connector access to two 10/100/1000BaseTX ports, and four asynchronous serial ports configured as RS-232 DTE. All of these are via RJ-45 connectors. The MVME7216E RTM is designed to directly connect to the VME backplane in chassis' with an 80mm deep rear-transition area.

Software Support

FIRMWARE MONITOR

The MVME7100 firmware (known as MOTLoad) is resident in the MVME7100 flash and provides power-on self-test, initialization and operating system booting capabilities. In addition, it provides a debugger interface similar to the time proven "BUG" interface on previous VMEbus boards from Emerson.

OPERATING SYSTEMS AND KERNELS

The MVME7100 series supports booting a variety of operating systems including a complete range of real-time operating systems and kernels. Emerson Network Power Embedded Computing Linux (2.6.25 kernel) is available now. VxWorks BSPs (5.5.1 AMP, 6.6 AMP & 6.6 SMP) are provided and supported by Wind River Systems. Also in development are Linux kernels from Sysgo, Timesys and LynuxWorks.

Specifications

PROCESSOR

- Microprocessor: Freescale MPC864xD with dual PowerPC e600 cores
- Clock Frequency: 1.06 or 1.3 GHz
- On-chip L1 Cache (I/D): 32K/32K per core
- On-chip L2 Cache: 1MB per core

SYSTEM CONTROLLER

- Integrated within MPC864xD

MAIN MEMORY

- Type: Double data rate (DDR2) SDRAM
- Speed: DDR2-533
- Capacity: 1GB or 2GB
- Configuration: Dual memory controller

FLASH MEMORY

- Type: NOR flash, on-board programmable
  - Capacity: 128MB
  - Write Protection: Hardware via switch, software via register or sector lock
- Type: NAND flash, on-board programmable
  - Capacity: 4GB or 8GB
  - Write Protection: Software via register
  - Supported by YAFFS (Linux) or Datalight FlashFX® Pro (VxWorks) under separate license

NON-VOLATILE MEMORY

- Type: SEEPROM, on-board programmable
  - Capacity: 128KB (available for users), 8KB baseboard Vital Product Data (VPD), and two (2) 256B Serial Presence Detect (SPD)
- Type: MRAM
  - Capacity: 512KB

VMEBUS INTERFACE

- Compliance: ANSI/VITA 1-1994 VME64 (IEEE STD 1014), ANSI/VITA 1.1-1997 VME64 Extensions, VITA 1.5-199x 2eSST
- Controller: Tundra Tsi148 PCI-X to VMEbus bridge with support for VME64 and 2eSST protocols

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- DTB Master: A16, A24, A32, A64; D08-D64, SCT, BLT, MBLT, 2eVME, 2eSST
- DTB Slave: A16, A24, A32, A64; D08-D64, SCT, BLT, MBLT, 2eVME, 2eSST, UAT
- Arbiter: RR/PRI
- Interrupt Handler/Generator: IRQ 1-7/Any one of seven IRQs
- System Controller: Yes, switchable or auto detect
- Location Monitor: Two, LMA32

ETHERNET INTERFACE

- Controller: MPC864xD Triple Speed (TSEC) Ethernet Controllers
- Interface Speed: Four @ 10/100/1000Mbps (TSEC)
- Connector: Two Gigabit Ethernet ports routed to front panel RJ-45, two Gigabit Ethernet ports to VMEbus P2 connector, pin out matching MVME7216E RTM
- Indicators: Link status/speed/activity

ASYNCHRONOUS SERIAL PORTS

- Port 1
  - Controller: MPC864xD DUART (second port N/C)
  - Number of Ports: One 16550 compatible
  - Configuration: RS-232 DTE (RxD, TxD, RTS, CTS)
  - Async Baud Rate, bps max.: 38.4K RS-232, 115Kbps raw
  - Connector: One front panel Mini DB-9
  - Mini DB-9 to DB-9 adapter cable: SERIAL-MINI-D2
- Ports 2-5
  - Controller: Exar ST16C544D QUART
  - Number of Ports: Four 16550 compatible
  - Configuration: RS-232 (RxD, TxD, RTS, CTS)
  - Async Baud Rate, b/s max: 38.4K RS-232, 115Kbps raw
  - Connector: Via VMEbus P2 connector, pinout matching MVME7216E RTM
- USB Interface
  - Controller: NEC µ720101
  - Configuration: USB 2.0
  - Number of ports: One
  - Connector: One powered port routed to front panel

DUAL IEEE P1386.1 PCI MEZZANINE CARD SLOTS

- Address/Data: A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors (PN4 for PMC1 only)
- PCI Bus Clock: 33 MHz, 66 MHz or 100 MHz PCI/PCI-X
- Signaling: 3.3V
- Power: +3.3V, +5V, ±12V
- Module Types: Two single-wide or one double-wide, front panel or P2 I/O, PMC and PrPMC support, PMC1 site Pn4 routed to VMEbus P2 connector rows A and C

PCI EXPANSION CONNECTOR FOR INTERFACE TO XMCSPAN BOARDS

- 8x PCI Express interface
- One 76-pin connector located on MVME7100 planar

COUNTERS/TIMERS

- TOD Clock Device: Maxim DS1375 I^2C device with battery backup
- Cell Storage Life: 10 years at 25° C
- Cell Capacity Life: One year at 100% duty cycle, 25° C
- Removable Battery: Yes
- Real-Time Timers/Counters: Four, 32-bit programmable timers in PLD; four, 32-bit programmable/cascadable timers in MPC864xD
- Watchdog Timer: In PLD

BOARD SIZE AND WEIGHT

- 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.)
- Weight: .68 kg (1.5 lbs.)

POWER REQUIREMENTS

Board Variant	Power (+5V ± 5%)
MVME7100-0161	Typical: 40W Maximum: 55W
MVME7100-0163	Typical: 40W Maximum: 55W
MVME7100-0171	Typical: 45W Maximum: 60W
MVME7100-0173	Typical: 45W Maximum: 60W

CALCULATED MTBF

- TBD

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OTHER FEATURES

- RoHS compliant
- Jumper-less configuration
- On-board temperature sensor (Maxim MAX6649)
- JTAG header for connection of diagnostic tools

FRONT PANEL

- IEEE or Scanbe handles
- Connectors for serial, Gigabit Ethernet and USB ports
- Openings for PMC sites

Transition Modules

I/O CONNECTORS

- MVME7216E
  - Asynchronous Serial Ports: Four, RJ-45, labeled as COM2-5
  - Ethernet: Two 10/100/1000BaseTX, RJ-45

NON-VOLATILE STORAGE

- 8KB VPD SEEPROM

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.)
- Front Panel Width: 19.8 mm (0.8 in.)

CALCULATED MTBF

- TBD

All Modules

ENVIRONMENTAL

	Operating	Non-operating
Temperature:	0° C to +55° C (inlet air temp. with forced air cooling)	–40° C to +85° C
Humidity (NC):	5% to 90%	5% to 90%
Vibration:		1 G RMS, 5-100 Hz sine 2 G RMS, 15-2000 Hz sine 0.01g2/Hz (4.5 GRMS) 15-2000 Hz random
Shock:		20 G peak (half sine) 11ms

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)
- Emerson board products are tested in a representative system to the following standards, results pending:
  - CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

Ordering Information

Part Number	Description
MVME7100-0161	1.06 GHz MPC8640D, 1 GB DDR2 memory, 4GB NAND flash, SCANBE
MVME7100-0163	1.06 GHz MPC8640D, 1 GB DDR2 memory, 4GB NAND flash, IEEE
MVME7100-0171	1.3 GHz MPC8641D, 2 GB DDR2 memory, 8GB NAND flash, SCANBE
MVME7100-0173	1.3 GHz MPC8641D, 2 GB DDR2 memory, 8GB NAND flash, IEEE
Related Products	
XMCSPAN-001	XMC Expansion, IEEE handles
XMCSPAN-002	XMC Expansion, SCANBE handles
MVME7216E-101	Rear transition module

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