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Find the *Abaco Systems / VMIC VMIVME-7698-345* at our website: ***Click HERE***

VMIVME-7698
Single-Slot Celeron™ Socket 370 Processor-Based VMEbus Single-Board Computer

- Celeron™ socket 370-based single-board computer (SBC) with operating system support for Windows NT®/Windows® 2000, Linux, VxWorks, QNX, and Solaris
- Special features for embedded applications
  - Up to 512 Mbyte IDE CompactFlash (optional)
  - Three programmable 16-bit timers
  - 32 Kbyte of battery-backed SRAM
  - Remote Ethernet booting supported
  - Software-selectable watchdog timer with reset
  - Supports VMEbus P2 connection to HD/floppy drive
  - PMC expansion site with VMEbus P2 I/O
  - PC•MIP expansion site supported
  - VME64 modes supported: A32/A24/D32/D16/D08(EO)/MBLT64/BLT32
  - VMEbus interrupt handler, interrupter, and system controller
  - Includes byte-swapping hardware for little-endian and big-endian data interfacing (patent no. 6,032,212)
  - Enhanced bus error handling
  - Passive heat sink design (no moving parts)
- Standard features include
  - Celeron socket 370 processor
  - Up to 256 Mbyte SDRAM using one 144-pin SODIMM
  - 64-bit Intel® AGP SVGA controller with 2 Mbyte SGRAM
  - On-board Fast Ethernet controller supporting 10BaseT and 100BaseTX interfaces
  - On-board Ultra DMA/33 hard drive and floppy drive controllers with VMEbus P2 I/O
  - Two high-performance 16550-compatible serial ports
  - PS/2-style keyboard and mouse port on front panel
  - Real-time clock and miniature speaker included

APPLICATIONS

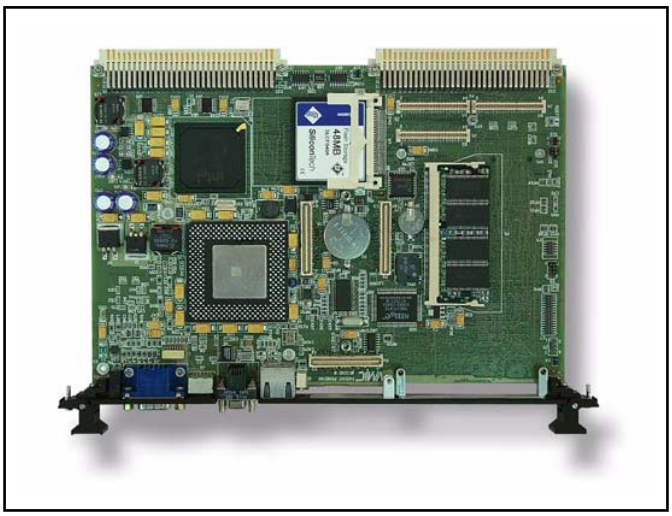
- Simulation and training
- Industrial test and measurement
- Industrial control
- Process control and monitoring
- Automation
- Intelligent networked PLC controllers
- Automated test
- Data acquisition and control

OPERATING SYSTEM SUPPORT AVAILABLE

- Windows NT/Windows 2000
- VxWorks
- QNX
- Solaris
- Linux
- LynxOS

MICROPROCESSOR — The VMIVME-7698 brings Intel Celeron processor with MMX™ to VMEbus, offering processor speeds up to 366 MHz. The Celeron processor has 32-bit addressing and a 64-bit data bus. Its superscalar architecture allows three instructions to be executed per clock cycle. A dynamic branch prediction unit, separate instruction and data caches, and MMX technology also increase the Celeron processor's performance. The Celeron processor also provides on-chip 128 Kbyte of L2 cache using dual independent bus architecture for high bandwidth and performance. This L2 cache operates at the same clock frequency as the processor, thus improving performance.

DRAM MEMORY — The VMIVME-7698 accepts one 144-pin SDRAM SODIMM for a maximum memory capacity of 256 Mbyte. The on-board DRAM is dual ported to the VMEbus.



Ordering Options

Jan. 7, 2002 800-007698-000 M		A	B	C	–	D	E	F
VMIVME-7698	–				–			

A = Processor
0 = Reserved
1 = 300 MHz Celeron PPG Processor
2 = Reserved
3 = 366 MHz Celeron PPG Processor

B = SDRAM Memory
0 = Reserved
1 = Reserved
2 = Reserved
3 = 32 Mbyte
4 = 64 Mbyte
5 = 128 Mbyte
6 = 256 Mbyte

C = CompactFlash Drive
0 = No Flash
1 = 8 Mbyte
2 = Reserved
3 = Reserved
4 = Reserved
5 = 64 Mbyte
6 = 96 Mbyte
7 = Reserved
8 = 160 Mbyte
9 = 192 Mbyte
G = 256 Mbyte
H = 512 Mbyte

Companion Single-Slot VMEbus Floppy/Hard Disk Module

		A	B	C	–	D	E	F
VMIVME-7452	–	5			–			

A = 5
BC = Indicates Disk Module Configuration
(See the VMIVME-7452 specification for details on disk module configuration options.)

Connector Adapters

360-010050-001

The connector adapter is a 9-pin micro-D to standard-D serial port adapter.

For Ordering Information, Call:
1-800-322-3616 or 1-256-880-0444 • FAX (256) 882-0859
E-mail: info@vmic.com Web Address: www.vmic.com
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BIOS — System and video BIOS are provided in reprogrammable flash memory.

SUPER VGA CONTROLLER — High-resolution graphics and multimedia-quality video are supported on the VMIVME-7698 by an Intel AGP graphics adapter. The adapter is complemented by 2 Mbyte internal synchronous DRAM with a high-bandwidth 64-bit data interface. Screen resolutions up to 1,280 x 1,024 x 256 colors are supported by the graphics adapter.

Ethernet CONTROLLER — The VMIVME-7698 supports Ethernet LANs with the Intel 82559 Ethernet controller. 10BaseT and 100BaseTX options are supported via an RJ45 connector. Remote LAN booting is supported.

SERIAL PORTS — Two 16550-compatible serial ports are featured on the VMIVME-7698 front panel. The serial channel has a 16-byte FIFO to support baud rates up to 56 Kbps. Requires two micro-DB9 to standard DB-9 adapters, VMIC P/N 360-010051-001. Both ports comply with the RS-232C standard, which imposes a cable length of 50 feet.

KEYBOARD AND MOUSE PORTS — The VMIVME-7698 has a combined PS/2 keyboard and mouse connector. A **Y**-adapter cable is included.

FLASH MEMORY — The VMIVME-7698 provides up to 512 Mbyte of IDE CompactFlash memory accessible through the secondary IDE port. The VMIVME-7698 BIOS includes an option to allow the board to boot from the Flash memory.

16-bit TIMERS — The VMIVME-7698 provides the user with three 16-bit timers (in addition to system timers) that are 82C54 compatible. These timers are mapped in I/O space, and are completely software programmable.

WATCHDOG TIMER — The VMIVME-7698 provides a software-programmable watchdog timer. The watchdog timer is enabled under software control. Once the watchdog timer is enabled, on-board software must access the timer within the specified timer period, or a timeout will occur. A user jumper allows the timeout to cause a reset or a nonmaskable interrupt (NMI). Independent of the jumper, software can enable the watchdog timeout to cause a VMEbus SYSFAIL.

BATTERY-BACKED SRAM — The VMIVME-7698 provides 32 Kbyte of battery-backed SRAM. The contents of the SRAM are preserved when +5 V power is interrupted or removed from the unit.

RESET SWITCH AND ANNUNCIATORS — A small push-button switch on the front panel will reset the VMIVME-7698. If the system controller is enabled, a SYSRESET* will also be generated on the VMEbus. Five LEDs are visible on the front panel: power good status, status of VMEbus SYSFAIL, IDE activity, LAN activity, and LAN Mode (10 or 100 MHz mode). A small speaker is also included on the VMIVME-7698 to provide PC/AT sound output.

PMC EXPANSION SITE — The VMIVME-7698 supports IEEE P1386 common mezzanine card specification with a 5 V PCI mezzanine card expansion site. The PMC site provides for standard I/O out the VMEbus front panel and I/O connection to the VMEbus P2 connection, as well. This expansion capability allows your favorite devices to be used with the VMIVME-7698, as shown in Figure 1.

Contact VMIC for more information concerning PMC modules and compatibility.

PC•MIP EXPANSION SITE — A small footprint mezzanine card expansion slot is provided with the VMIVME-7698. This expansion capability allows use of type II front panel I/O PC•MIP modules.

VMEbus INTERFACE — The VMIVME-7698 VMEbus interface is based on the Universe II high-performance PCI-to-VME interface from Tundra.

SYSTEM CONTROLLER — The on-board VMEbus system controller allows the board to work as slot 1, or it may be disabled when another board is acting as the system controller. The system controller may be programmed to provide the following modes of arbitration:

Round Robin (RRS)
Single Level (SGL)
Priority (PRI)

The system controller provides a SYSCLK driver, IACK* daisy-chain driver, and a VMEbus access timeout timer. The system controller also provides an arbitration timeout if BBSY* is not seen within a specified period after a BGOUT* signal is issued. This period is programmable for 16 µs, 64 µs, 256 µs, or 1 ms.

The VMIVME-7698 autodetects whether it is inserted in slot 1 and configures itself as the system controller automatically.

VMEbus REQUESTER — The microprocessor can request and gain control of the bus using any of the VMEbus request lines (BR3* to BR0*) under software control. The requester can be programmed to operate in any of the following modes:

Release-On-Request (ROR)
Release-When-Done (RWD)
VMEbus Capture and Hold (BCAP)

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MAILBOXES — The VMEbus interface provides four 32-bit mailboxes, which are accessible from both the microprocessor and the VMEbus providing interprocessor communication. The mailboxes have the ability to interrupt the microprocessor when accessed by VMEbus, and VMEbus interrupts may be generated on mailbox access from the SBC.

INTERRUPT HANDLER — The interrupt handler monitors, and can be programmed to respond to any or all VMEbus IRQ* lines. All normal-process VMEbus-related interrupts can be mapped to PCI INTA# or SERR# interrupts. These include:

Mailbox interrupts
VMEbus interrupts
VMEbus interrupter IACK cycle (acknowledgment of VMIVME-7698 VMEbus-issued interrupts)

All error processing VMEbus-related interrupts can be mapped to PCI INTA# or SERR#. Note: PCI SERR# initiates a SBC NMI. These include:

ACFAIL* interrupt
BERR* interrupt
SYSFAIL* interrupt

The interrupt handler has a corresponding STATUS/ID register for each IRQ* interrupt. Once the handler receives an IRQ*, it requests the VMEbus and, once granted, it performs an IACK cycle for that level. Once the IACK cycle is complete and the STATUS/ID is stored in the corresponding ID register, an appropriate interrupt status bit is set in an internal status register, and a PCI interrupt is generated. The PCI interrupt can be mapped to PCI INTA# or SERR#.

INTERRUPTER — Interrupts can be issued under software control on any or all of the seven VMEbus interrupt lines (IRQ7* to IRQ1*). A common ID register is associated with all interrupt lines. During the interrupt acknowledge cycle, the interrupter issues the ID to the interrupt handler.

The interrupter can be programmed to generate a PCI INTA# or SERR# interrupt when a VMEbus interrupt handler acknowledges a software-generated VMEbus interrupt.

ENDIAN CONVERSION — The Intel 80x86 family of processors use little-endian format. To accommodate other VMEbus modules that transfer data in big-endian format such as the 680x0 processor family, the VMIVME-7698 incorporates byte-swapping hardware. This provides independent byte swapping for both the Master and Slave interfaces. Both Master and Slave interface byte swapping are under software control.

MASTER INTERFACE — MA32:MBLT32:MBLT64 (A32:A24:A16:D32:D16:D8 (EO):BLT32)

The VMEbus master interface provides nine separate memory *windows* into VMEbus resources. Each window has separate configuration registers for mapping PCI transfers to the VMEbus (that is, PCI base address, window size, VMEbus base address, VMEbus access type, VMEbus address/data size, etc.). The maximum/minimum window sizes for the windows are as follows:

Window	Minimum Size	Maximum Size
0, 4	4 Kbyte	4 Gbyte
1 to 3, 5 to 7	64 Kbyte	4 Gbyte
Special Cycle	64 Mbyte	64 Mbyte

SLAVE INTERFACE — Memory Access SAD032:SD32:SBLT32:SBLT64 (A32:A24:A16:D32:D16:D8 (EO): BLT32)

The VMEbus slave interface provides eight separate memory *windows* into PCI resources. Each window has separate configuration registers for mapping VMEbus transfers to the PCI bus (that is, VMEbus base address, window size, PCI base address, VMEbus access type, VMEbus address/data size, etc.). The maximum/minimum window sizes for the windows are as follows:

Window	Minimum Size	Maximum Size
0, 4	4 Kbyte	4 Gbyte
1 to 3, 5 to 7	64 Kbyte	4 Gbyte

In addition, each window can be programmed to operate in coupled or decoupled mode. In decoupled mode, the window utilizes a write-posting FIFO and/or a read prefetching FIFO for increased system performance. In coupled mode, the FIFOs are bypassed and VMEbus transactions are directly coupled to the PCI bus (that is, transfers on VMEbus are not completed until they are completed on the PCI bus).

ENHANCED BUS ERROR HANDLING — Enhancements over the Universe chip's bus error handling features are provided. A latch and register are provided to allow the SBC to read the VMEbus address that caused a bus error in all modes. The Universe chip's support is limited to decoupled mode.

Support for bus cycle timeout and assertion of bus error is provided. The board may be configured to assert bus error upon timeout regardless of its status as system controller. The Universe chip asserts bus error only if it is system controller. In addition, this board may be configured to assert an interrupt upon bus cycle timeout.

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OPERATING SYSTEM AND SOFTWARE SUPPORT — The VMIVME-7698 provides embedded features beyond PC/AT functionality. These features are supported by VMIC software products aimed at developers who are incorporating VMIC SBCs, I/O boards, and workstations into systems. Windows NT/Windows 2000, Linux, VxWorks, QNX, and Solaris are the most common operating systems supported by VMIC software products.

Windows NT/Windows 2000 — The IOWorks®, software family is a set of software components that can work together or separately to provide a total development environment for any application in a Windows NT/ Windows 2000 OS.

VMISFT-9420 VMEbus Access™ for Windows NT/Windows 2000 — The VMEbus Access product is specifically designed for accessing the advanced VMEbus architecture of the VMIVME-7698. Running on Windows NT/Windows 2000, VMEbus Access is both sophisticated and easy to use.

The function library, VMEbus toolset, and open architecture VMEbus Access offers make it one of the most powerful products on the market today. It provides compatibility with existing VMIC VMEbus PC platforms and compatibility with future VMEbus PC platforms VMIC creates.

The VMEbus Access development package gives you everything you need to develop applications for your VME operations. This package includes the *VMEmanager*™ function library and four utilities that enable you to easily configure a VMEbus, dynamically monitor VMEbus activities, manage VMEbus data, and use DDE-client applications.

VMEbus Access provides powerful tools for developing, debugging, and monitoring VMEbus applications and increasing VMEbus performance. The flexible design of VMEbus Access enables you to incorporate it as a stand-alone solution, or use it to open your VMEbus operations to the IOWorks product suite.

VMEbus Access manipulates the hardware behind the scenes. With VMEbus Access, you can develop applications in or use existing applications developed in most programming environments. For example, VMEbus Access enables your VMEbus to recognize applications developed in these popular programming environments:

- IOWorks Manager™
- LabVIEW
- Citect
- Wonderware InTouch
- Visual IOWorks®
- Visual Basic®
- Visual C++®

VxWorks OS SUPPORT

VMISFT-7418 BOARD SUPPORT PACKAGE — The VMISFT-7418 is a Wind River Systems, Inc.'s certified board support package (BSP) for VMIC's series of VMEbus Pentium® processor-based computers which is required to run the VxWorks OS. With the SBC, VxWorks, the BSP, and other VMEbus equipment from VMIC, implementations can be created for a wide variety of applications including real-time factory automation, simulation, instrumentation and control, and process control and monitoring.

The BSP is linked with VxWorks OS, thus allowing software applications created with Wind River Systems, Inc.'s development system to load and run on the particular VMIC SBC hardware being used. Serial ports, parallel ports, keyboard, text mode video, and Ethernet transceivers are all supported, as well as floppy and IDE hard disk drives that can be connected to the computer boards. The BSP provides Flash boot, NVRAM, and timer support.

The BSP allows VxWorks applications to have access to the VMEbus. When hardware includes single cycle and block transfers using DMA devices, they are supported by the BSP as well as interprocessor communications with mailbox registers. VMEbus interrupt handling and error handling are supported. Since the VMEbus environment often contains a mixture of devices from various manufacturers, the byte-swapping feature is provided to allow big-endian and little-endian devices to share data correctly.

QNX OS SUPPORT

VMISFT-7417 BOARD SUPPORT PACKAGE — The VMISFT-7417 board support package (BSP) provides QNX support and includes a VMEbus manager, user API, and configuration files needed to run the QNX OS on VMIC's VMIVME-7xxx SBC products. This BSP provides customizable VMEbus access. QNX provides the applications programmer with a real-time extensible POSIX OS. This combination provides a self-hosted development environment without requiring any external host systems.

Solaris OS SUPPORT

VMISFT-7416 BOARD SUPPORT PACKAGE — The VMISFT-7416 BSP includes everything necessary to allow installation of the Solaris Intel edition OS (available separately from Sun Microsystems, Inc.) onto VMIVME-7xxx SBC products. This BSP includes a nexus driver for VMEbus access. It allows military and telecommunications and other applications to take advantage of Sun Microsystems, Inc's Solaris OS on a VMEbus-based Intel SBC VMEbus Access. This BSP and the Solaris OS provides POSIX-compliant real-time characteristics.

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LynxOS x86 OS SUPPORT

VMISFT-7419 BOARD SUPPORT PACKAGE — The VMISFT-7419 BSP includes all of the device drivers and configuration tables needed to install the LynxOS x86 development system (available separately from Lynx Real-Time Systems, Inc.) onto VMIC's VMIVME-7698.

Using the LynxOS on the VMIC SBCs provides a computing platform suitable for hard real-time applications. LynxOS provides the applications programmer with a stable development environment based on industry-wide standards such as POSIX and Motif.

COMPATIBLE PRODUCTS

The VMIVME-7698 can be used with a number of VMIC PMC bus and VMEbus products.

Floppy/Hard Disk: VMIC produces floppy/hard drive modules to support the built-in IDE and floppy controller ports. The VMIVME-7452 provides hard disk storage and a 3.5-inch floppy drive. The unit fits into a standard VMEbus 6U single-slot form factor. The VMIVME-7698 requires a P2 backplane connection option of the VMIVME-7452.

Accessory Header Boards: The VMIACC-0562 provide ribbon cable connection to floppy and hard drives.

CD-ROM Support: Since much of today's advanced software is delivered on CD-ROM, the VMIVME-7455 provides CD-ROM capability within a single 6U VME slot.

VMEbus: The VMIVME-7698 enables access to VMIC's wealth of VMEbus products. If you have real-world control, monitoring, and real-time networking requirements, VMIC has a solution for you. Today's system requirements demand state-of-the-art solutions. Our advanced I/O features such as Built-in-Test, self-test, isolation, digital autocalibration, and intelligent on-board DSP give our customers those solutions.

The I/O Solution for Your I/O Problem: VMIC's 16 years of experience in suppling high-performance deterministic controllers for multiple markets lead to the development of IOWorks software with features, benefits, and capabilities to solve just about any I/O problem. From PLC alternatives to data servers that support the seamless interconnection of dissimilar systems, VMIC has the solution for simple to complex, high-speed, deterministic requirements.

SPECIFICATIONS

6U Eurocard format, one slot

Height	9.2 in. (233.4 mm)
Depth	6.3 in. (160 mm)
Thickness	0.8 in. (20.3 mm)

Power Requirements:

+5 VDC (±5 percent), 6.0 (typical), 8.0 A maximum

±12 VDC (±5 percent), 180 mA (typical), 250 mA maximum

Note: The currents at +12 and -12 VDC are specified with the serial connectors open.

Operating Temperature:

0 to 50 °C	350 LFM minimum forced air cooling required

Storage Temperature: -25 to 80 °C

Relative Humidity: 10 to 90 percent, noncondensing

VMEbus Interface:

DTB Master:	BLT32/BLT64, A32/D32, A24/D32, A16/D32
DTB Slave:	BLT32/BLT64, A32/D32, A24/D32, A16/D32
Requester:	Programmable, BR(3 to 0), ROR, RWD, BCAP
Interrupt Handler:	IH(1 to 7) D8(O)
Interrupter:	Programmable, IRQ7* to IRQ1*
Arbiter:	SGL, PRI, RRS
BTO:	Programmable (16 to 1,024 µs)
Compliance:	Rev. C.1

PMC Expansion Site Connector:

5 V signaling, types I and II
32-bit PCI bus, 33 MHz maximum

PC•MIP Expansion Site:

3.3 V signaling, type II only
32-bit PCI bus, 33 MHz maximum

MTBF: 116,042 hours (Bellcore)

TRADEMARKS

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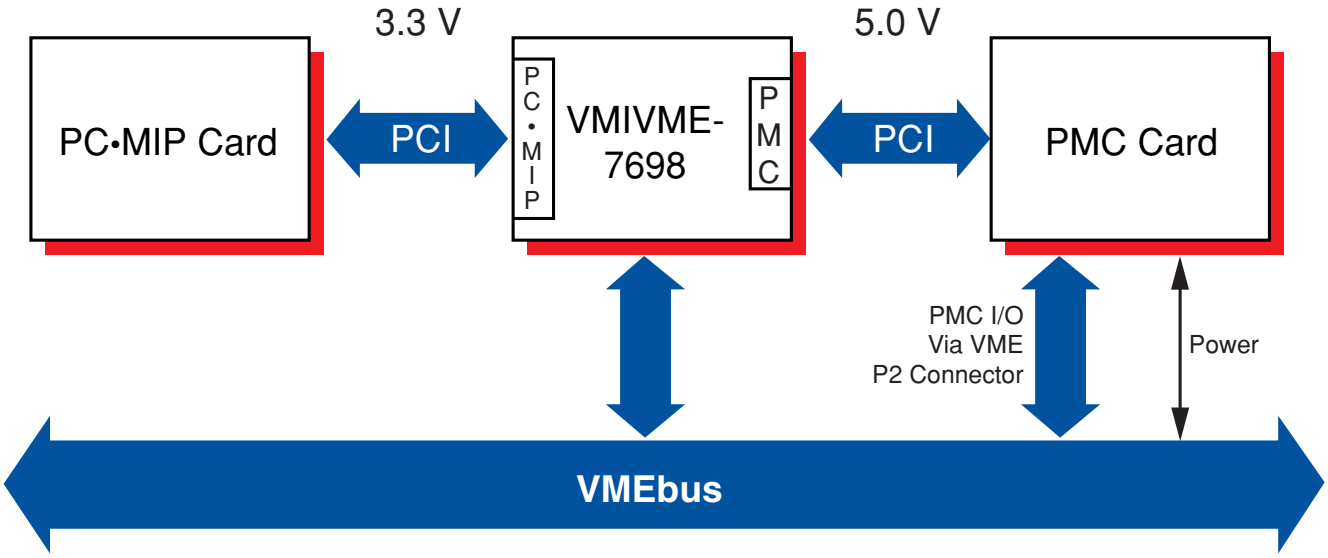


Figure 1. PMC/PC•MIP Expansion

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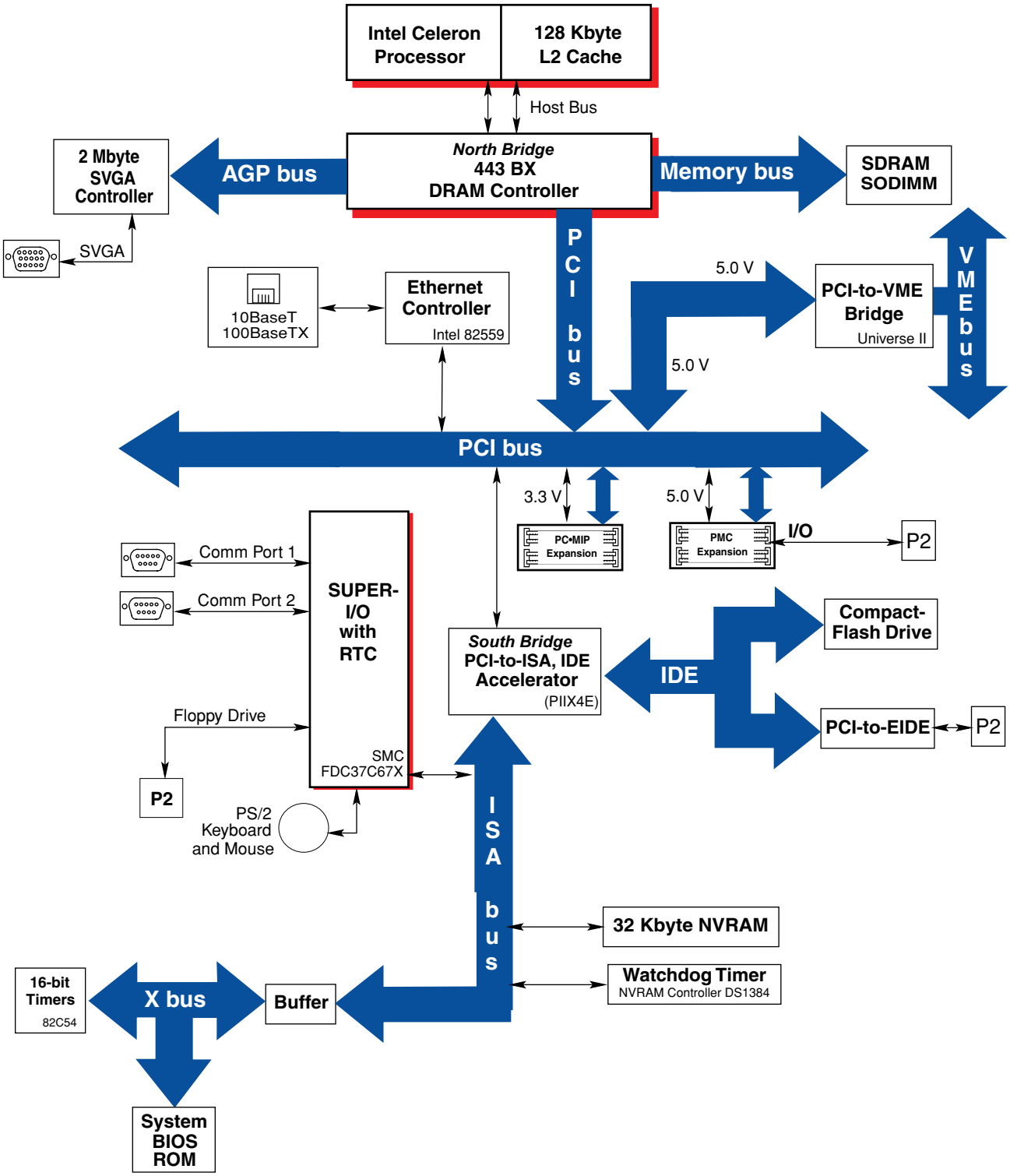


Figure 2. VMIVME-7698 Block Diagram

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