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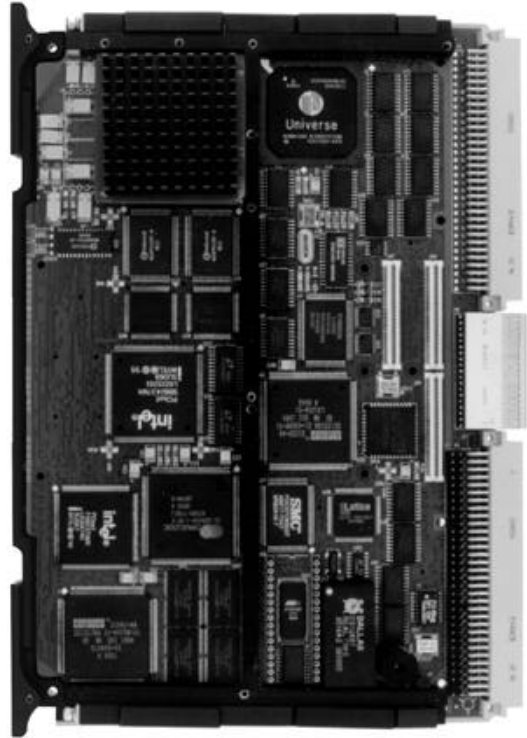
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SVME/DMV-190

Pentium™-Based Single Board Computer with PMC Interface

Features

- Harsh environment, military and commercial applications
- Air-cooled and conduction-cooled versions
- VME64 ANSI/VITA-1-1994 compliant for master or slave applications
- Pentium™ chip processing
 - 120 and 133 MHz (SPECint 130 and SPECint 147)
- PCI local bus and PCI mezzanine card (PMC) Interface
- Supports Windows NT, Windows '95, DOS, QNX and other PC/AT compatible applications
- 256 KBytes of level 2 cache memory
- 1 MByte of Flash™ EPROM and Disk-On-Chip expansion
- Available with up to 64 MBytes of DRAM
- Two serial channels
- Parallel IBM PC-compatible bi-directional interface
- EIDE interface for mass data storage
- SVGA video, with display resolution up to 1280x1024 pixels
- 2 MByte video RAM
- On-board Fast SCSI-2 interface
- On-board Ethernet with AUI interface
- Tundra advanced VME interface chip (Universe)
 - D32 and D64 VMEbus (ANSI/IEEE Std. 1014-1987) interface
 - Bus Isolation mode (BI-mode®)
- System controller functions
- Real-time clock with battery backup via +5VDC standby



Description

The SVME/DMV-190 is a high-performance state-of-the-art Intel Pentium™ microprocessor-based single board computer, designed for both military and commercial applications.

The conduction-cooled DMV version is specifically designed for airborne, land-mobile, and naval military applications, where circuit cards are sealed in a chassis to prevent moisture, salt-fog, sand and dust contamination. The DMV version is available as a level 100 (extended temperature, shock and vibration) ruggedized product, while the SVME version, which operates in an air-cooled environment, is available in both a level 000 product, suitable for benign environments, and a level 100 product for more harsh environments.



SVME/DMV-190

The SVME/DMV-190 has been designed to provide all the features of a fully-configured PC/AT motherboard, along with additional features such as a built-in Ethernet interface, PMC interface, SCSI-2 interface, Video RAM, Flash™ EPROM with BIOS code, SVGA graphics controller and full VME64 interface. Additionally, it provides a compliment of standard desktop I/O including one parallel and two serial I/O ports, keyboard and mouse interface. Built-in hardware extensions enable the card to be used as a VMEbus Master/Slave component. The SVME/DMV-190 incorporates an advanced PCI Triton MX chip set which is completely compatible with industry standard PC hardware and software. The chip set has many uses, some of which include: main memory control, memory data buffering, PCI interfacing and PCI to X bus translations.

The DMV version has been designed to meet the physical dimensions required by the IEEE 1101.2 specification for conduction-cooled VMEbus modules. The DMV version is equipped with a P0 interface which provides I/O signals mapped from the PMC interface.

The SVME/DMV-190 has many non-PC features which allow it to be configured with embedded software. Figure 1 shows a functional block diagram of the SVME/DMV-190, including its component interconnections.

Software Compatibility

The SVME/DMV-190 single board computer is compatible with software written for IBM PC-type computers, and as such, can run a wide variety of off-the-shelf operating systems and applications available for 80x86-based computers. Examples of operating systems include Microsoft MS DOS, Windows '95 and Windows NT. Real-time operating systems such as QNX are also supported.

CPU

Intel's Pentium™ combined with the SVME/DMV-190's rugged design provides a

high performance platform for COTS software in embedded environments.

A number of innovative product features contribute to the Pentium™ processor's unique combination of high-performance, compatibility for both hardware and software, data integrity and advanced functionality. These features include:

- Superscalar architecture
- Branch prediction
- High-performance floating-point unit
- System management mode
- Internal parity checking
- Enhanced 64-bit data bus
- Data integrity
- SL technology power management
- SPECint 92:
 - 130 for 120 MHz Pentium™ processor
 - 147 for 133 MHz Pentium™ processor
- Multiprocessing support
- Performance monitoring
- Memory page size feature

Memory

The SVME/DMV-190 can be configured to support 16, 32, 48 or 64 MBytes of DRAM system memory.

The card is equipped with 256 KBytes of L2 cache synchronous pipelined static RAM, in order to increase its performance.

The card is equipped with a memory bank of one MByte of Flash™ EPROM. The application of Flash™ memory provides the capability of high-performance code execution of both boot and BIOS firmware.

Additionally this card supports extensions to the on-card Flash™ by allowing for a socketed Disk-On-Chip which can increase available Flash™ memory to as much as 12 Mbytes. This Disk-On-Chip option is ideal for embedded DOS applications which need more than the standard 1 Mbyte of ROM yet cannot use a conventional rotating disk drive.

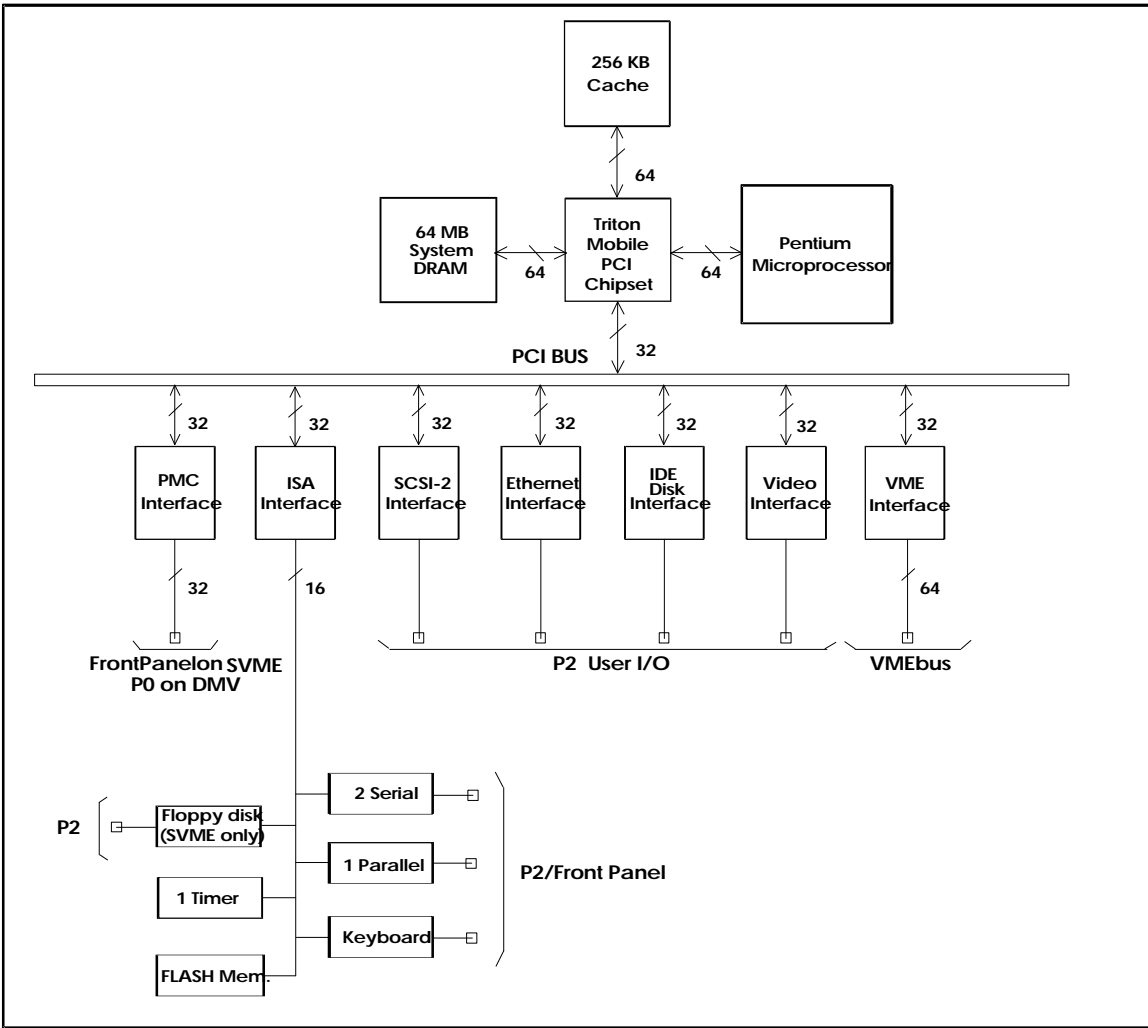


Figure 1: SVME/DMV-190 Functional Block Diagram

SVME/DMV-190

I/O Configurations

The SVME version provides I/O on the front panel connectors and on the card's VMEbus P2 and P0 connectors.

The DMV version provides I/O on the VMEbus P2 and P0 connectors only.

The I/O connector configurations for both versions are as follows:

DMV Version

- P1 connector for VMEbus signals
- P2 connector for extended VMEbus signals
- P0 connector with I/O signals mapped from the PMC interface

SVME Version

- P1 connector for VMEbus signals
- P2 connector for extended VMEbus signals
- Serial data front panel connector for mouse operation
- Serial data front panel connector for standard ASCII keyboard
- Serial data front panel COM 1 connector for an EIA-232 interface
- Serial data front panel COM 2 connector for EIA-232/422/485 interfaces
- Parallel data front panel connector (LPT1) for a bi-directional interface to a printer
- Video front panel connector for connection to a VGA or SVGA monitor
- PMC I/O signals are available through the front panel and on the P0 connector

Disk Interfaces

For the storage of data on hard disks and other mass storage media such as tapes, the SVME/DMV-190 provides fast IDE and SCSI interfaces. This allows the choice of data storage peripherals that are best suited for the application. The industry standard IDE interface is common on desktop PCs and allows the use of widely available low-cost IDE disk drives. The SCSI-2 interface is generally more flexible and supports a number of peripherals. This interface is commonly used with CD ROM drives, high-performance computer workstations and

servers.

The SVME/DMV-190 is also capable of controlling a floppy disk drive with a data storage capability of 2 MBytes.

Video Interface

The video interface can be configured for many types of standard screen displays including VGA and Super VGA. The SVME/DMV-190 uses 2 MBytes of video RAM in order to enhance the display capability. The 2 MBytes of video RAM enable the display of 16.7 million colors at a resolution of 800x600, and 256 colors at a resolution 1280x1024, non-interlaced.

VMEbus Interface

The SVME/DMV-190 VMEbus interface uses a high-performance 64-bit Tundra Universe chip. The Universe, which is a PCI to VMEbus interface controller, deals with system functions that are ideally suited for CPU cards acting as both master and slave in the VMEbus system, and is particularly fitted for PCI local systems. Being a PCI resident device, the VMEbus interface allows high-speed data transfers to and from the VMEbus. Write operations are buffered and decoupled from the processor which further aids performance, as does the VME64 capability. Additionally, the SVME/DMV-190 supports Master and Slave Block Transfers on 16-, 32-, or 64-bit data paths for fast VMEbus data transmission.

As a VMEbus Slave, the SVME/DMV-190 allows VMEbus Masters to access on-board resources such as the system DRAM. Programmable "Slave Images" dictate what local devices are made available to the VMEbus and at what VMEbus address they will appear. As such, VME access to critical regions and devices can be disallowed.

To make integration of the Pentium™ microprocessor-based SVME/DMV-190 into the traditionally 68000-oriented VMEbus easier, the VME BIOS provides software routines for configuring the VMEbus interface

and performing VME I/O accesses and data transfers.

PMC Mezzanine Card Interface

The SVME/DMV-190 can be equipped with a PCI Mezzanine Card (PMC) to extend its I/O capabilities. The single slot PMC specification interface, which meets the IEEE 1386.1 PMC standard, has a Peripheral Component Interconnect (PCI) bus, which is currently being used as the de-facto standard mezzanine bus for many VME CPU boards. PCI is an electrical and mechanical standard that defines how options plug into a table top PC system.

Ethernet Interface

To support local area networking (LAN), the SVME/DMV-190 has an IEEE 802.3-compatible interface which is accessible via a connector attached to the card's front panel.

SCSI-2 Interface

The SVME/DMV-190 provides a single-ended, 8-bit wide Fast SCSI-2 interface which supports SCSI-2 bus speeds of 5 MBytes/second (asynchronous) or 10 MBytes/second (synchronous).

Timers

The SVME/DMV-190 provides the programmer with a user-configurable timer. The tick timer functionality is part of the real time clock and can be programmed to interrupt the CPU at regular intervals in order to support multi-tasking operating systems.

System Status Signals

The SVME/DMV-190 provides two system status signals which are connected to front panel LED indicators. The System Fail Status (SYSFAIL) is asserted in the event of the card failure and its status corresponds to the card front panel red LED indicator. The System Run Status (RUN) signal corresponds to the card front panel green LED indicator. This

signal in its normal mode indicates to the user that the card is operating correctly.

Card Configuration

An important feature of the SVME/DMV-190 is that it can be configured entirely by software, eliminating the need for cumbersome hardware jumpers. Each card configuration option is controlled by programmable non-volatile switches. These switches are set by the embedded setup or by the user's software. This "jumperless setup" capability allows foolproof setup of the card without having to remove it from the VMEbus chassis.

Product Variants

Optional variants of this product are available to provide customer flexibility in achieving the desired trade-offs of functionality, performance and ruggedization versus cost. The SVME/DMV-190 SBC options consist of:

- DRAM capacity of 16M/32M/64 MBytes
- 120/133 Mhz Pentium CPU
- Optional P0 connector for PMC I/O
- Expansion options for Disk-On-Chip Flash (consult DY 4 Systems for details)

The SVME/DMV-190 is designed to meet DY 4 Systems Inc. level 000 and 100 ruggedization levels. Table 1 identifies the performance specification for the two levels of ruggedization.

Software Packages and Peripherals

In addition to the built-in BIOS, other software products available for the '190 include the following operating system support packages which provide VMEbus extensions:

- *DSW-190-DOSSP* DOS Support Package
- *DSW-190-WINNTSP* Windows NT Support Package
- *DSW-190-WIN95SP* Windows 95 Support Package
- *DSW-190-QNXSP* QNX Support Package

SVME/DMV-190

An integrated IDE hard drive and floppy disk drive is available for use with the SVME-190 version of this SBC (part number CCA-190-EIDE). The CCA-190-EIDE is designed for use together with the SVME -190 Pentium™ Single Board Computer (SBC), providing a complete PC/AT system in two VMEbus slots.

All drive modules are VMEbus 6U format with external SCSI, Ethernet AUI, P1 and P2 connectors.

**Table 1
Specifications**

ENVIRONMENTAL SPECIFICATIONS		
Temperature	(Level 0)	
Operating	0°C to +50°C	MIL-STD-810
Storage	-40°C to +85°C	Methods 501.3 & 502.3
Temperature	(Level 100)	
Operating	-40°C to +71°C	MIL-STD-810
Storage	-40°C to +85°C	Methods 501.3 & 502.3
Humidity (DMV CCA and SVME CCA - Level 100)		
Operating	0 to 95% non-condensing	MIL-STD-810
Non-Operating	0 to 95% condensing	Method 507.3
Vibration (DMV)		
Sine	10g at 15 to 2,000 Hz	MIL-STD-810
Random	0.1g ² /Hz	Method 514.4
Shock (DMV)	30g/11ms half sine	MIL-STD-810 Method 516.4, Proc 1
DIMENSIONS		
	DMV CCA	SVME CCA
Height	233.4 mm (9.2 in.)	233.4 mm (9.2 in.)
Depth	160 mm (6.3 in.)	160 mm (6.3 in.)
Thickness	20.0 mm (0.8 in.)	20.0 mm (0.8 in.)
Weight	<900g (<2 lb)	<570g (<1.28 lb)
POWER REQUIREMENTS (Base card, fully populated)		
+5v (+5%, -2.5%)	tbd A (maximum)	tbd A (typical)
+5v STDBY (operating)	tbd A (maximum)	tbd A (typical)
+5v STDBY (standby)	tbd mA (maximum)	tbd mA (typical)
+12v (+5%, -3.0%)	18 mA (maximum)	11 mA (typical)
-12v (+5%, -3.0%)	18 mA (maximum)	11 mA (typical)

As a general design objective, the junction temperatures of all components on the conduction-cooled DMV-190-1XX are limited to design maximums of 110°C (based on a chassis cold-wall temperature of 71°C.) The air-cooled SVME board operating temperature assumes a minimum air flow of 11cfm.

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