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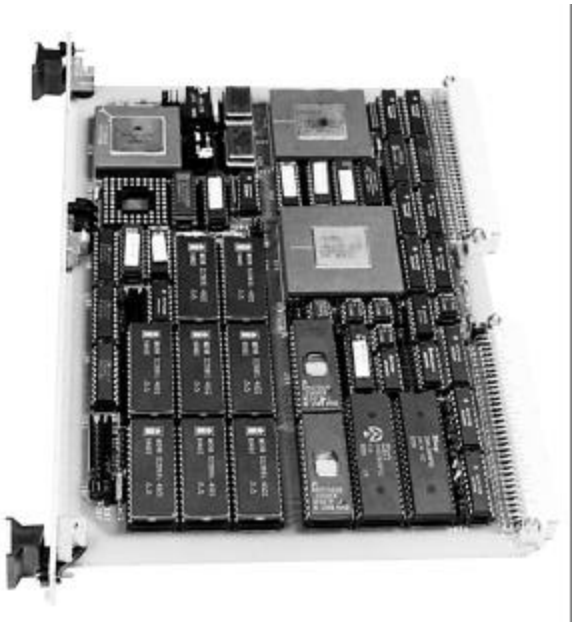
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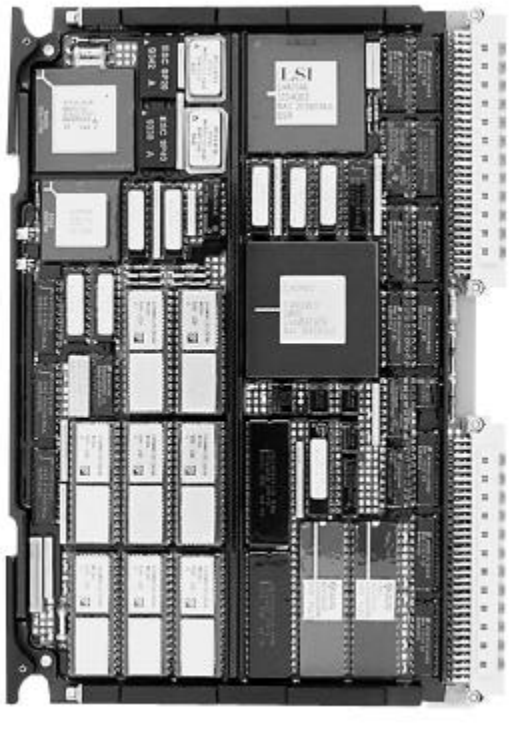
# SVME-153/DMV-152

## Single Board Computer (SBC)

## Features

- *20 MHz 68020 CPU, optional '882 FPP*
- *Ten 32-pin JEDEC sites for:*
  - *Four sites for SRAM*
  - *Four sites for SRAM, EPROM, Flash™ EPROM, or EEPROM*
  - *Two sites for EPROM, Flash™ EPROM, or EEPROM (boot)*
  - *SRAM capacity up to 4M bytes*
- *512 byte serial EEPROM*
- *Card-edge boot EPROM programmability*
- *Two serial channels, software-selectable EIA-232-C or EIA-485/422 compatible*
- *Three 16-bit timers*
- *Three P2 I/O lines*
- *Advanced VMEbus Interface Chip Set (AVICS)*
  - *A32:D32 VMEbus interface*
  - *Transmit and Receive FIFOs*
  - *DMA driven VMEbus transfers*
  - *Location monitor with FIFO buffer*
  - *System Controller functions*
  - *Auto-ID and Auto-SYSCON*
  - *Two P2 interrupt inputs*
- *Built-In-Test (BIT)*
- *Bus Isolation mode (BI-mode®)*
- *Conduction cooled per IEEE 1101.2 (0.65-inch pitch) for MIL-E-5400/4158, and MIL-STD-2036 applications*
- *Optional levels of ruggedization available*





## Description

The SVME-153/DMV-152 is a powerful 68020-based Single Board Computer (SBC) with two serial channels.

The SVME-153/DMV-152's design features address mission-critical demands of military and aerospace systems integrators with increased computing performance, self-test coverage and functional density.



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The card supports DY 4 Systems' common features including an AVICS-based VMEbus interface, Built-In-Test (BIT), BI-mode, location monitor, and Auto ID. These features bring benefits in performance, logistics and maintenance.

DY 4's custom-designed AVICS chip-set implements all VMEbus interface functions with software-programmable features. It combines low-latency access to the VMEbus with high sustained throughputs. Built-In-Test (BIT) hardware features verify all operational circuits on the module. Bus Isolation mode (BI-mode®) increases ease of testing and system fault location. The location monitor supports efficient interprocessor messaging, to minimize overhead in real-time software. Auto-ID allows boards to be self-configuring, based on slot location.

These features allow users to:

- build high-performance multi-processor systems
- detect and isolate faults during operation
- minimize field maintenance and sparing logistics.

All versions of the SVME-153/DMV-152 are functionally identical. SVME versions for use in air-cooled environments are available in DY 4 ruggedization levels 0, 2 and 3.

The conduction-cooled DMV version is 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. DY 4 Systems' conduction-cooled products are designed for severe environmental conditions defined by MIL-E-4158, MIL-E-5400, and MIL-STD-2036. A single-piece aluminum thermal plane bonded to the PWB conducts heat away from the electronics. Its integral stiffening ribs improve heat dissipation and vibration resistance. Standard wedgelock fasteners give a reliable thermal connection to the chassis.

Figure 1 is a functional block diagram of the SVME-153/DMV-152 SBC.

## Memory

The SVME-153/DMV-152 uses ten 32-pin JEDEC sites for all memory. It supports the following configurations.

There are three banks of memory; two banks have four 32-pin JEDEC sites and the third bank has only two 32-pin JEDEC sites. Bank 0 is installed with SRAM devices, Bank 1 can be populated with SRAM, Flash™ EPROM, EEPROM, or EPROM devices, and the third bank (the Boot PROM), can be installed with Flash™ EPROM, EEPROM, or EPROM devices.

Table 1 summarizes the memory configurations for the SVME-153/DMV-152.

To facilitate the use of the SVME-153/DMV-152 in severe vibration environments where all components must be soldered, the EPROM in Bank 3 (Boot EPROM) may be programmed on-board (by placing the card in a programming fixture). This simplifies the installation of application code and makes on-site firmware upgrades possible. Refer to the CCA-830 On-Board Programming Adapter, document number MS00154.

The SVME-153/DMV-152 also has 512 bytes of EEPROM for storing configuration data.

## VMEbus Interface

A complete VME master interface is capable of A32, A24, and A16 addressing modes and D32, D16, and D08 (EO) data transfers. A VME interrupt handler is also provided.

The VMEbus is supported by DY 4's Advanced VMEbus Interface Chip Set (AVICS). This chip set consists of the ACC (ASA (Advanced System Architecture) Control Circuit) and the DARF (Data Address Register File).

The ACC device places all system controller and interrupt functions for the VMEbus in a single package. This custom ASIC allows full programmability of requester modes and levels, arbiter modes, bus timers, interrupt grouping, and acknowledge techniques. The



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ACC also provides extensive BIT features and BI-mode®.

The DARF provides a fast efficient means of supporting the design limit of a 40M byte per second bus transfer rate. This is a result of a decoupled FIFO buffering mechanism between the local and VME buses. High-speed transfers are effectively transparent to the software and in full compliance to the IEEE 1014 bus specifications. The design allows for complete VMEbus data integrity through extensive BIT and BI-mode features.

## Serial Channels

Two serial channels are provided by a 8530 Serial Communication Controller. Each channel is capable of supporting EIA-232-C or EIA-485/422 modes of operation. The mode of operation is software-selectable.

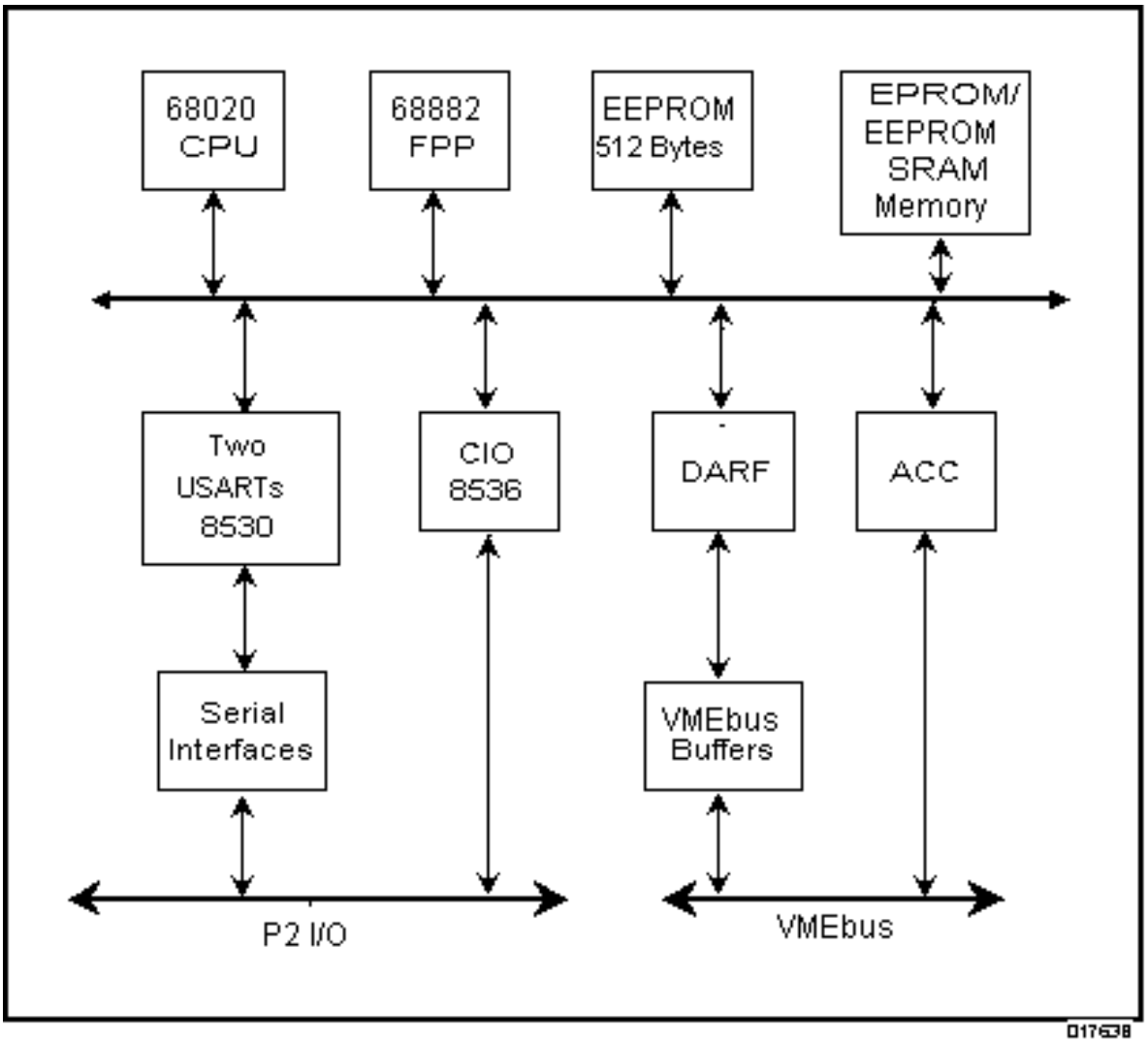



**Figure 1: SVME-153/DMV-152 SBC Block Diagram**



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**Table 1**
**Byte-Wide Memory Configurations**

| Parameter | Bank 0 | Bank 1 | Boot PROM | Total |
|---|---|---|---|---|
| **Data Width** | 32 Bits | 32 Bits | 16 Bits | |
| **Memory Type** | | | | |
| SRAM | 2M bytes<br>1M byte<br>512K bytes<br>128K bytes | 2M bytes<br>1M byte<br>512K bytes<br>128K bytes | | up to 4M bytes |
| Flash™<br>EPROM | | 1M byte<br>512K bytes | 512K bytes<br>256K bytes | up to 1.5M bytes |
| EEPROM | | 2M bytes<br>1M byte<br>512K bytes<br>128K bytes | 1M byte<br>512K bytes<br>256K bytes<br>64K bytes | up to 3M bytes |
| EPROM | | 4M bytes<br>2M bytes<br>1M byte<br>512K bytes<br>128K bytes | 2M bytes<br>1M byte<br>512K bytes<br>256K bytes<br>64K bytes | up to 6M bytes |

In EIA-485/422 serial mode, the following signals on the Serial Communications Controller (SCC) are used:

- TxD and RxD
- TRxC and RTxC (strapping option)
- CTS and RTS (strapping option only on JEDEC site version).

In EIA-232-C serial mode, TxD, RxD, RTS, and CTS are used.

The software-selectable serial mode affects the selection of receivers used, (EIA-232-C or EIA-485/422).

The serial channels are driven with a 2.4615 MHz clock and provide asynchronous communications with baud rates from 50 baud to 19.2K baud, and synchronous communications at rates up to 600K bits/sec.

## Timers

The SVME-153/DMV-152 incorporates a 8536 Counter/Timer and I/O device (CIO). This device provides three 16-bit timers; all timers can be used as general purpose timers with vectored interrupt capability.

An on-board tick timer can be programmed to interrupt the CPU at regular intervals. A watchdog timer provides a fail indication and resets the CPU if it detects an execution failure.



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## System Interrupt and I/O

There are three I/O lines from the CIO available at the P2 connector. Also, there are two interrupt inputs from the P2 connector to the ASA Control Circuit (ACC); one is vectored and the other one is auto-vectored.

## System Status Interface

System status signals provided on the P2 connector allow interfacing to a test connector when the card is installed in a sealed conduction-cooled chassis.

One signal, CARDFAIL, asserts during fail conditions equivalent to the front panel LED and VME SYSFAIL signal. The other signal, CARDSTAT, asserts equivalent to the front panel Status LED.

## Low Power Dissipation

The typical power dissipation is 13 W. Power consumption has been minimized by extensive use of CMOS components.

## Foundation Firmware

The SVME-153/DMV-152 is supplied with a foundation firmware package. This package consists of the following:

- General Purpose Monitor (GPM) - provides comprehensive monitoring and debug functions for the system integrator (refer to General Purpose Monitor, document number MS00053)
- Card Level Diagnostics (CLD) - provides diagnostic routines which perform a self-test function in conjunction with the Built-In-Test equipment (refer to Card Level Diagnostics, document number MS00050)
- Card Support Services (CSS) - provides a common software interface to the hardware features on the card, device independent I/O functions generic exception processing routines, and Auto-ID services (refer to Card Support Services, document number MS00180)
- Execution Sequencer (ES) - controls the invocation order of the Software Configuration Items on the card (refer to Execution Sequencer, document number MS00181).

## Accessories/Variants

The SVME-153/DMV-152 SBC is available in varying configurations to match the features, performance and ruggedizaton required for the target application. Additional items to assist in software development and system integration are available. The SVME-153/DMV-152 options and accessories consist of:

- 68882 FPP
- memory type and speed
- P2 I/O cable for development system use
- FlashProg Flash EPROM programming utility

The SVME-153 cards are available in ruggedization levels 0, 2 and 3. The DMV-152 cards are available in levels 2 and 3.

The SVME-153 is functionally identical to the DMV-152, which is designed for use in commercial or military convection-cooled environments.



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**Table 2**
**Specifications**

| | | |
|---|---|---|
| **ENVIRONMENTAL SPECIFICATIONS** | | |
| **Temperature** | **(Levels 0)** | |
| †Operating | 0°C to 50°C | MIL-STD-810 |
| Storage | -40°C to 85°C | Methods 501.3 & 502.3 |
| **Temperature** | **(Levels 2,3)** | |
| †Operating | -55°C to 85°C | MIL-STD-810 |
| Storage | -62°C to 125°C | Methods 501.3 & 502.3 |
| **Humidity (DMV CCA and SVME CCA - Level 3)** | | |
| Operating | 0 to 95% non-condensing | MIL-STD-810 Method 507.3 |
| Non-Operating | 0 to 100% condensing | |
| **Vibration (DMV CCA)** | | |
| Sine | 5g at 15 to 2,000 Hz | MIL-STD-810 Method 514.4 |
| Random | $0.1g^2/Hz$ | |
| **Shock (DMV CCA)** | | |
| | 40g/11ms half sine | MIL-STD-810 Method 516.4, Proc 1 |
| **Altitude (DMV CCA)** | | |
| | 21,350m (70,000 ft) | MIL-STD-810 Method 500.3 |

| **PHYSICAL 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 | 15.0 mm (0.6 in.) | 20.0 mm (0.8 in.) |
| Weight | <900g (<2 lb) | <570g (<1.28 lb) |

| **POWER REQUIREMENTS** | | |
|---|---|---|
| +5v (+5%, -2.5%) | 3.5 A (maximum) | 2.5 A (typical) |
| +12v (+5%, -2.5%) | 25 mA (maximum) | 18 mA (typical) |
| -12v (+5%, -2.5%) | 25 mA (maximum) | 10 mA (typical) |

† As a general design objective, the junction temperature of all components on the DMV-152-XXX is limited to 110°C maximum (when the chassis cold-wall temperature is 85°C.) When reliability or performance factors permit, a component's junction temperature may exceed 110°C marginally.

SVME board operating temperature is based on air flow of 11 cfm.



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