XVB603

Intel® Xeon® Based VME Single Board Computer

The XVB603 rugged single board computer (SBC) from Abaco Systems features the high performance, highly integrated Intel Xeon E3-1505 v6 processor platform.

Xeon offers integrated graphics and memory controller plus quad core processing up to 3.0 GHz all in one device. Coupled with the Intel CM238 chipset this provides an unmatched level of I/O bandwidth for both on-board and off-board functions.

Features of the Xeon processor
- Graphics support for DirectX12, OpenCL 2.0, OpenGL 4.4
- 5 to 15% CPU performance boost over 5th generation
- Intel TurboBoost Technology
- Intel AVX 2.0 extensions and AES-NI instructions
- Hardware-assisted security features
- Hyper-Threading Technology – two threads per core
- PCIe GEN3 capable PEG ports

In addition to a comprehensive range of onboard I/O features, the XVB603 also offers one on-board mezzanine expansion sites for enhanced system flexibility, which offers PMC and XMC capability. Memory resources include up to 16 GB DDR4 SDRAM, 512 KB NVRAM, up to 256 GB M.2 SSD, BIOS Flash and BIOS backup Flash.

The XVB603 is designed to meet the requirements of a wide range of industrial and commercial applications. It offers extended temperature capability in two air-cooled build levels.

A rich software choice is planned for the XVB603, including Built-in Test (BIT) and OS (64-bit) support for Windows 10, Fedora and RedHat Linux, and VxWorks®.

FEATURES:
- Single slot 6U VME Single Board Computer
- Intel Xeon quad core processor
- Two channels of soldered DDR4 SDRAM with ECC up to 16 GB
- Up to 8 MB shared cache
- Up to 256 GB M.2 SSD
- On-board Expansion site
- 1x XMC - x8 PCIe
- 1x PMC - PCI-X up to 133 MHz
- Comprehensive range of front and rear I/O features
- BIOS backup Flash
- Optional extended operating temperature range
- Windows®, Linux® and VxWorks OS support (64-bit only)
- Two Levels of Ruggedization
- Optional expansion board EXP238

abaco
SYSTEMS

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Specifications

Processor

- Intel Xeon processor
  - E3-1505M v6 @ 3.0 GHz (45W) base frequency, up to 4.0 GHz TurboBoost
  - E3-1505L v6 low power @ 2.2 GHz (25W), 3.0 GHz Turbo. (Note: CPU speed is dependent on environment, consult manual for details)
- 14 nm monolithic die processing technology
- 8 MB Last Level Cache

SDRAM

- Maximum memory configuration of dual channels up to 16 GB DDR4 SDRAM soldered with ECC

Onboard (optional) SSD

- Up to 256 GB M.2 SSD available

BIOS

- 1x 16 Mb SPI flash each for BIT and BIOS plus 1x 16 Mb SPI flash for BIOS backup

Ethernet

- Gigabit Ethernet interface via two Intel I210 Gigabit Ethernet controllers – routed to front panel.
- Dual Gigabit Ethernet interface via two Intel Gigabit Ethernet controllers: one I210 and one I219 – routed to rear. (Optional, only available if P0 connector is loaded.)

USB Ports

- Two USB 2.0 ports routed to rear P2 connector
- Three USB 3.0 port routed to front panel

VMEbus Backplane Interface

- 2eSST capable via new Vivo interface

Serial Ports

- Three 16550 compatible full duplex async serial ports
- COM3 routed to front panel RS-232
- Two routed to P2, with user selectable RS232/422/485
- Ports feature independent 16-byte FIFO supporting baud rates up to 115 Kbaud

PMC/XMC Expansion

- On-board mezzanine expansion site
  - Site 1 PMC (PCI-X up to 64-bit/133 MHz) and XMC (x8 PCIe); PMC rear IO routed to P0
- PCI signaling is 3.3V, 5V tolerant
- 25W per site capable mezzanine power supply (combined 3.3V and 5V rails)
- 12.5W per site capable without thermal degradation (Level 1)

Video

- Up to three independent displays
  - One DisplayPort routed to front panel
  - Two DVI ports routed to P0/P2 connectors. P0 DVI port availability is option dependant.

SATA

- Two SATA ports to rear I/O P2
- Two SATA ports to rear I/O P0 (option dependant)
- One eSATA port routed to front panel

GPIO

- 8 GPIO pins -- software configurable

LED

- 3x status LEDs and four BIT status

Power Requirements

- +5V only
- ±12V for mezzanine only

NVRAM/Watchdog/Timers/TPM

- 512 KB non-volatile RAM (NVRAM)
- Software programmable watchdog timer
- Two 32-bit timers in CPLD (SW programmable)
- HW support for TXT [VPRO]

Temperature Sensor

- Onboard ambient temperature; CPU

Transition Modules

- New RTM with Mezzio sites (VTM29)

Expansion Card

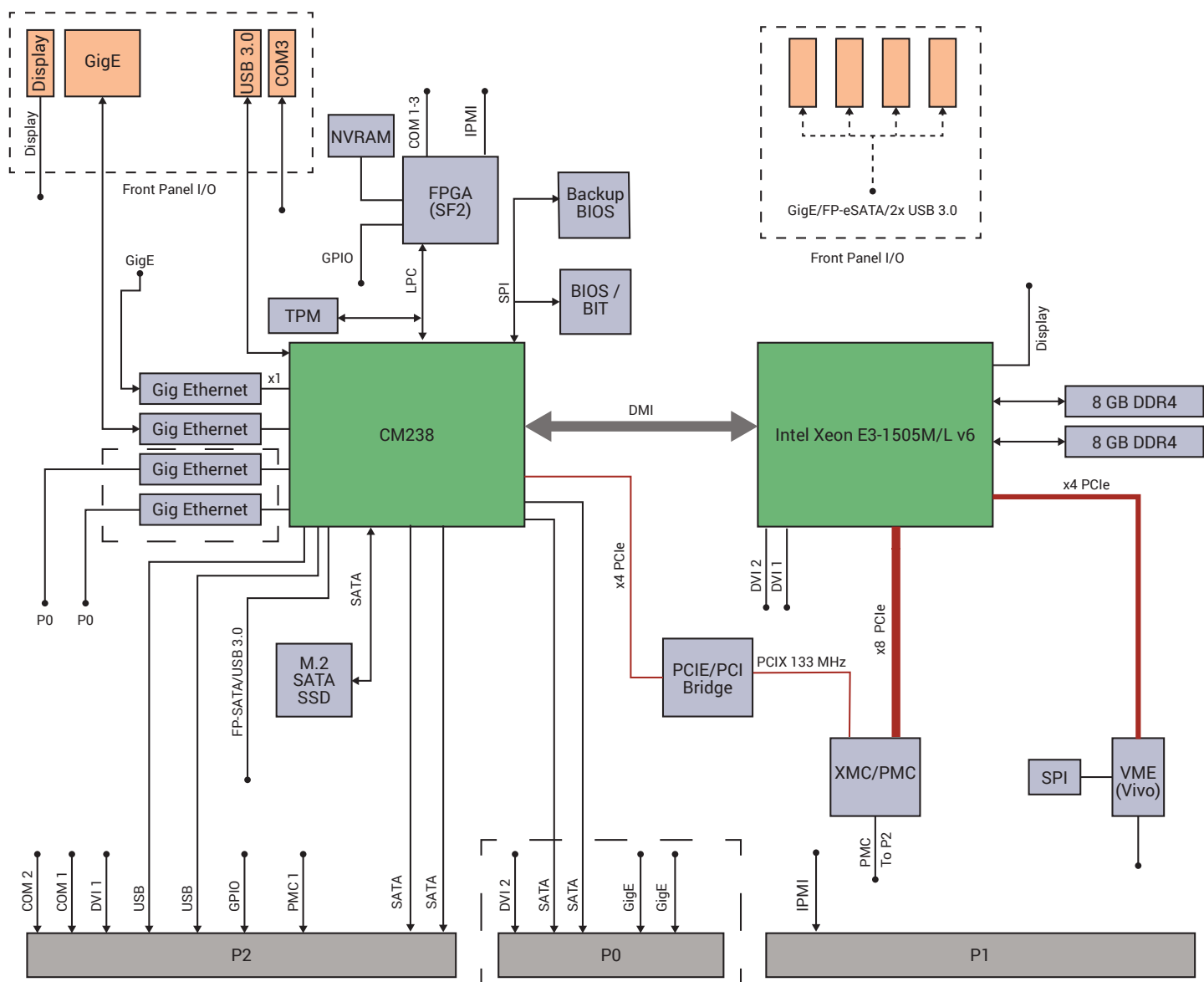- Provides three XMC/PMC expansion sites via PCI Express to the host processor through on-board connector

Other HW Features

- Hardware Write Protection
- Front power button
- BMC (IPMI)

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Block diagram

Block diagram showing the XVB603 architecture including Front Panel I/O, CM238, Intel Xeon E3-1505M/L v6, FPGA (SF2), TPM, NVRAM, Backup BIOS, BIOS/BIT, M.2 SATA SSD, Gig Ethernet ports, 8 GB DDR4 memory, PCIE/PCI Bridge, XMC/PMC, SPI, VME (Vivo), and P0/P1/P2 connectors.

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Environmental

	Level 1	**Level 2**
Cooling Method	Convection	Convection
Conformal Coating	Optional	Standard
High/Low Temp	0 to +55° C	-20 to +65° C
Operational	(300 ft/m)	(300 ft/m)
Random Vibration	0.002g2/Hz*	0.002g2/Hz*
Shock	20g**	20g**

* from 10 to 2000 Hz random and 2g sinusoidal from 5 to 500 Hz   ** Peak sawtooth 11 ms duration

Note: Processor performance and temperature are inter-dependent. For a given temperature, a maximum speed is achievable, and conversely for a given processor speed a maximum temperature is achievable. Consult the product manual for details.

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Americas: 866-OK-ABACO or +1-866-652-2226   **Asia & Oceania:** +81-3-5544-3973

Europe, Africa, & Middle East: +44 (0) 1327-359444

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