



SBC328

Rugged 3U VPX Single Board Computer with Intel® Xeon® Processor (6th Generation Intel Core™ Technology)

The SBC328 Rugged Single Board Computer (SBC) from Abaco Systems features the high performance, highly integrated 6th Generation Intel Core processor platform.

The Intel Xeon processor offers integrated graphics and memory controller plus quad core processing up to 2.8 GHz all in one device. Coupled with the CM236 chipset, this provides an upgraded level of I/O bandwidth for both on-board and off-board functions.

Features of the 6th Gen Core Technology

- Graphics support for DX11.1, OpenCL 1.2, OpenGL 3.2
- Significant CPU performance boost over previous generation
- Intel TurboBoost Technology
- Intel AVX 2.0 extensions and AES-NI instructions
- Hardware-assisted security features
- Hyper-Threading Technology – two threads per core

In addition to a comprehensive range of onboard I/O features, the SBC328 also offers an on-board mezzanine expansion site for enhanced system flexibility. Memory resources include 16 GB DDR4 SDRAM, up to 32 GB NAND Flash (SSD), 32 MB BIOS Flash and 16 MB BIOS backup Flash.

Designed to meet the requirements of a wide range of applications from industrial through

to fully rugged defense and aerospace programs, the SBC328 offers extended temperature capability and a range of air- and conduction-cooled build levels.

The SBC328 also incorporates a range of security features designed to assist with customers' Anti-Tamper and Information Assurance strategies. These include an inherently secure FPGA solution, and support for Intel's Trusted Execution Technology.

A rich software choice is planned for the SBC328, including:

- AMI UEFI including support of BIOS Guard for signed image execution
- FSP* enabled coreboot (Open Source bootloader)
- Open Linux (Fedora), Red Hat Enterprise Linux, Wind River Linux, VxWorks 7, Windows 10
- Comprehensive Deployed Test Software: FSP* enabled BIT (PBIT function), and BCS (CBIT and IBIT function)
- P2P (PCIe Peer-to-Peer protocol) for VxWorks and Linux
- AXIS environment for App optimization over many node / many channels, and including signal processing / vector math libraries

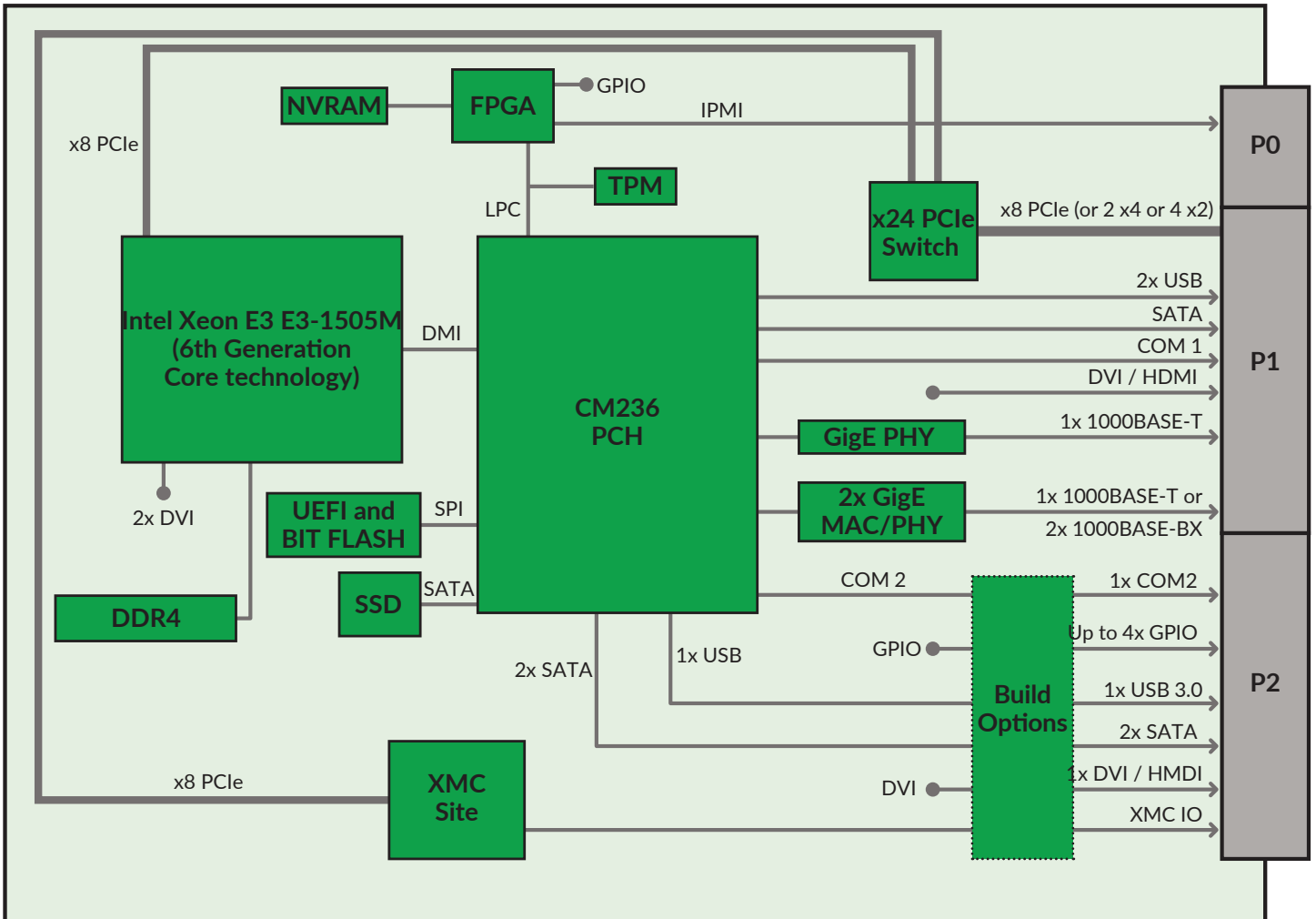
Examples and assistance are also available for integrating 'chain of trust' operation (from power-up to application start), plus Wind River's FSP* enabled VxWorks Boot Loader, into system scenarios. Other Operating System support is available on request.

FEATURES:

- Single slot 3U VPX Single Board Computer
- Intel Xeon E3-1505M Quad Core CPU (6th Generation Intel Core technology)
- Up to 16 GB DDR4 SDRAM with ECC
- 32 GB NAND Flash
- 512kB NVRAM
- FPGA with advanced security features
- TPM (Trusted Platform Module)
- Rear IO:
 - 8x PCIe lanes from Gen-3 capable switch
 - Up to 3x Gigabit Ethernet ports
 - Up to 2x DVI / HDMI ports
 - Up to 3x SATA ports
 - Up to 2x COM ports
 - Up to 3x USB ports
 - Up to 4x GPIO lines
- Five levels of ruggedization (convection and conduction cooling variants)
- AXIS and Deployed Test Software
- Microsoft® Windows®, Linux® and VxWorks OS support

SBC328 Rugged 3U VPX Single Board Computer with Intel® Xeon® Processor (6th Generation Intel Core™ Technology)

Block diagram



SBC328 Rugged 3U VPX Single Board Computer with Intel® Xeon® Processor (6th Generation Intel Core™ Technology)

Specifications

Processor

- Intel Xeon E3-1505M (Quad Core) @ 2.8 GHz (45W) base frequency, up to 3.7 GHz TurboBoost (Note: CPU speed is dependent on environment, consult manual for details)
- 14 nm monolithic die processing technology
- 8 MB Last Level Cache

SDRAM

- Up to 16 GB DDR4 SDRAM soldered with ECC

Non-Volatile RAM

- 512 kB FRAM

On Board Solid State Disk Drive (SSD)

- Up to 32 GB

BIOS

- 2x 16 MB SPI Flash for BIT and BIOS plus 1x 16 MB SPI Flash for Recovery

Data Plane / Expansion plane

- 8x PCIe lanes from Gen-3 capable switch to P1, can be configured as 1 x8, 2 x4 or 4 x2 ports PCIe REFCLK can be driven or received

Control Plane (Gig Ethernet)

- ETH0 is driven from C236 (VPRO compliant) to P1 and is always configured as 1000BASE-T
- ETH1 and ETH2 are routed to P1 and are configured as 1000BASE-BX by default. Optionally ETH1 can be configured as 1000BASE-T and ETH2 is then unused.

Management Plane

- Baseboard Management Controller (BMM) in accordance with VITA 46.11

USB Ports

- Two USB 2.0 ports (USB0, USB1) are routed to P1 connector and are available on all variants
- One additional USB 3.0 port (USB2) is routed to P2 but shares pins with XMCI0 – so is only available on selected variants

Serial Ports

- Two 165C50 compatible async serial ports are available on P1 and P2
- COM1 is 2-wire RS-232 port
- COM2 shares pins with GPIO lines and can be configured as a 2-wire RS-232 port, a 4-wire RS-232/422 port or as not present

XMCI Site

- x8 PCIe
- Tracked as P2w1-X24s+X8d+X12d in accordance with VITA 46.9
- X12d is always available
- X8d shares pins with DVI2
- X24s shares pins with SATA1, SATA2 and USB2

Video

- One DVI / HDMI port (DVI0) routed to P1
- One additional DVI / HDMI port (DVI1) is routed to P2 but shares pins with XMCI0 – so is only available on selected variants

SATA

- One SATA port (SATA0) is always available on P1
- Two additional SATA ports (SATA1, SATA2) are routed to P2 but share pins with XMCI0 – so are only available on selected variants
- All three ports are SATA 6 Gb/s capable

GPIO

- Up to 4 GPIO pins (5V Tolerant) all of which share pins with other functions – so number is dependent on variant selected.
- FPGA
 - SmartFusion2 FPGA with advanced security features
 - Enhanced Anti-Tamper Features
 - Zeroization

LED

- 3x power/ reset status LED
- 4x BIT status LED
- 8x Port-80 POST code
- Ethernet/SATA/PCIe link status LEDs

Power Requirements

- +12V (Vs1), +5V (Vs3), +3.3V (Vs2) for main power
- +3.3V for P3V3_AUX is required
- +/-12V AUX only required for mezzanines

Watchdog/ Timers/ TPM / ETI

- Software programmable watchdog
- Timers in PCH (SW programmable)
- TPM (Trusted Platform Module)
- ETI (Elapsed Time Indicator)

Temperature Sensor

- PCB, CPU and PCIe Switch temperature sensors

Other HW Feature

- Hardware Write Protection

Transition Modules

- VPX3UX301 (3U high RTM for use with OpenVPX backplanes)
- VPX3UX601 (6U high for use in SCVPX3U starter cage)

OpenVPX Profile Compatibility

- MOD3-PAY-2F2T-16.2.5-3
 - (Board configured for 2x 1000BASE-T ports)
- MOD3-PAY-2F2U-16.2.3-3
 - (Board configured for 2x 1000BASE-BX ports)

Environmental

	Level 1	Level 2	Level 3	Level 4	Level
Cooling Method	Convection	Convection	Convection	Conduction	Conduction
Conformal Coating	Optional	Standard	Standard	Standard	Standard
High/Low Temp	0 to +55°C	-20 to +65°C	-40 to +75°C	-40 to +75°C	-40 to +85°C
Operational	(300 ft/m)	(300 ft/m)	(600 ft/m)	At cold wall	At cold wall
Random Vibration	0.002g ² /Hz*	0.002g ² /Hz*	0.04g ² /Hz**	0.1g ² /Hz**	0.1g ² /Hz**
Shock	20g***	20g***	20g***	40g***	40g***

With a flat response to 1000 Hz, 6 dB/Oct roll-off from 1000 to 2000 Hz ** From 10 to 1000 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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