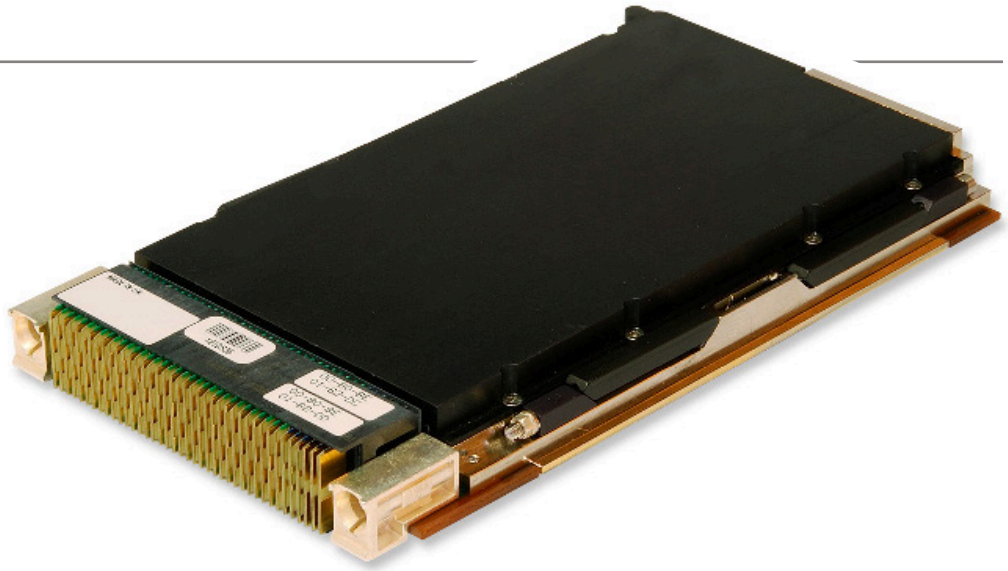


SBC347D

Intel® Xeon® D based Rugged 3U VPX Single Board Computer

The SBC347D Rugged Single Board Computer (SBC) from Abaco Systems features the ultra-high performance, highly integrated Xeon D processor from Intel.

The Xeon D brings the high performance of Intel Xeon processors into a dense, low power system-on-chip solution, ideal for High Performance Embedded Computing (HPEC) applications where high core count and massive memory capacity are paramount.

Based on Intel's 14 nm silicon technology, the Xeon D-1500 product family offers up to 16 CPU cores and an integrated platform controller hub (PCH), integrated I/O, two integrated 10 Gigabit Ethernet ports, and a thermal design point (TDP) up to 45 watts. The SBC347D offers memory resources including up to 64 GB of high speed DDR4 SDRAM, up to 32 GB NAND Flash (SSD), 32 MB BIOS Flash and 16 MB BIOS backup Flash.

In addition the SBC347D is designed to offer maximum PCIe® bandwidth to the back-plane with a total of 20 PCIe lanes (x4 and x16 ports) across the P1 and P2 connectors. The x16 link is ideal for connection to ultra-high performance GPGPU modules such as the GRA112 and GRA113.

Available in a range of air- and conduction cooled build levels with extended temperature capability, the SBC347D is designed to meet the requirements of a wide range of applications from industrial through to fully rugged defense and aerospace programs.

The SBC347D incorporates a range of security features designed to assist with user defined Anti-Tamper and Information Assurance strategies. These include an inherently secure FPGA solution (SmartFusion2 from Microsemi), and support for Intel's Trusted Execution Technology.

A rich software choice is planned for the SBC347D, 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. [*FSP = Intel Firmware Support Package].

FEATURES:

- Single slot 3U VPX Single Board Computer
- Xeon D high density, low power SoC Processor
- Two channels of soldered DDR4 SDRAM with ECC up to 64 GB
- Up to 32 GB NAND Flash
- Up to 20 PCIe lanes (Gen 3 capable) for Data and Expansion planes
- Rear IO:
  - Up to 3x Gigabit Ethernet ports (either one 1000BASE-T plus two 1000BASE-BX or two 1000BASE-T)
  - 2x 10G Ethernet ports
  - 2x SATA 6 Gb/s ports
  - 2x COM ports
  - 4x USB 2.0 ports
  - Up to 8x GPIO
- Five levels of ruggedization (convection and conduction cooling variants)
- AXIS and Deployed Test Software
- Windows®, Linux® and VxWorks® OS support X

abaco SYSTEMS

SBC347D *Intel® Xeon® D based Rugged 3U VPX Single Board Computer*

Specifications

Processor
- Xeon D high density, low power SoC (formerly known as Broadwell DE)
- 12-core CPU standard (4-, 8-, 16-core configurations available)
- 14 nm monolithic die processing technology
- Up to 18 MB Last Level Cache

SDRAM
- 64 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
- Four lanes of Gen 3 capable PCI-Express to P1, PCIe REFCLK can be driven or received. Can be configured as 1 x4 or 2 x2 lanes (one port NT capable)
- 16 lanes of Gen 3 capable PCI-Express to P1/P2, configurable as x16, 2 x8 or 2 x4 plus 1 x8 (one port NT capable) Control Plane (Gig Ethernet)
- ETH0 is always present and configured as 1000BASE-T (VPRO-compliant) and routed to P1
- ETH1 and ETH2 are routed to P1 and are configured as 1000BASE-BX by default. Optionally ETH1 can be configured as 1000BASE-T: ETH2 is then unused.

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

USB Ports
- Four USB 2.0 ports are routed to the P1 connector

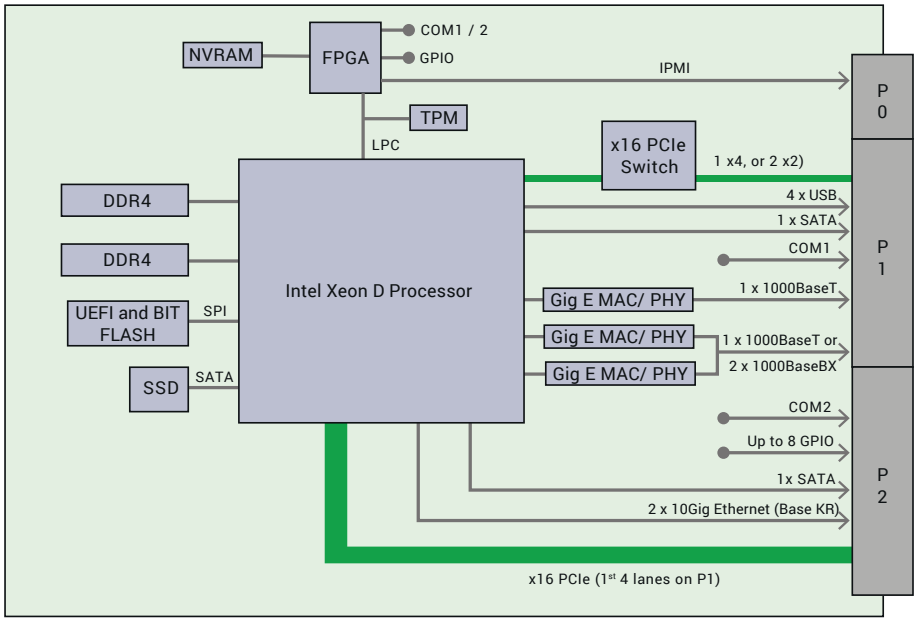
Serial Ports
- Two 16C550 compatible async serial ports are available on P1 and P2
- COM1 can be configured as a 2-wire RS-232 port or a 4-wire RS-232/422 port
- COM2 and can be configured as a 2-wire RS-232 port or a 4-wire RS-232/422 port
- 10 Gig Ethernet Ports
- Two 10GBASE-KR ports routed to P2

SATA Ports
- Two SATA ports are available on P1 and P2. Both ports are 6 Gb/s capable

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)

GPIO
- Up to 8 GPIO pins (5V Tolerant) 4 of which share pins with other functions – so number is dependent on exact variant selected

Block diagram



FPGA
- SmartFusion2 FPGA with advanced security features
  - Enhanced Anti-Tamper features
  - Zeroization

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

Power Requirements
- +12V (Vs1), +5V (Vs3), +3.3V (Vs2) for main power
- +3.3V for P3V3_AUX is required

Temperature Sensor
- PCB and PCIe Switch temperature sensors

Other HW Feature
- Hardware Write Protection

Transition Modules
- SBC340RTM (6U high for use in SCVPX3U-12 starter cage)
- VPX3UX304 (3U high for use in OpenVPX starter cages)

Environmental

	Level 1	Level 2	Level 3	Level 4	Level 5
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 +85°C	-40 to +85°C
Operational	(300 ft/m)	(300 ft/m)	(600 ft/m)	At cold wall	At cold wall
Random Vibration	0.002g2/Hz*	0.002g2/Hz*	0.04g2/Hz**	0.1g2/Hz**	0.1g2/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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