

SBC3511

Rugged 3U VPX Single Board Computer with Intel Xeon E Processor (9th Generation Intel Core i7 Technology)

The SBC3511 Rugged Single Board Computer (SBC) from Abaco Systems features the new high performance, highly integrated Intel® Xeon® E processor (formerly known as 'Coffee Lake Refresh').

High Performance, High Reliability

The new Xeon E combines six 9th Generation Core™ i7 technology processing cores with a rich I/O mix, all with the backing of Intel's Embedded Use Conditions – ideal for long term, high reliability applications.

The SBC3511 offers memory resources including 32 GB of high speed DDR4 SDRAM and up to 256 GB NAND Flash (NVMe SSD), plus a range of I/O including DisplayPort™, USB, GPIO and serial comms. An on-board mezzanine expansion site is also provided for enhanced system flexibility.

In alignment with the SOSA™ technical standards and in support of the DOD's C4ISR/ EW Modular Open Suite of Standards (CMOSS), the SBC3511's data plane fabric connectivity is via a 40G capable Ethernet fat pipe, with a

Gen 3 capable PCIe™ fat pipe providing the expansion plane. Control plane connectivity on the backplane is via two 10G capable Ethernet ultra-thin pipes with an additional 1000BASE-T thin pipe for external connection.

Available in a range of air- and conduction cooled build levels with extended temperature capability, the SBC3511 is designed to meet the requirements of a wide range of applications from industrial through to fully rugged defense and aerospace programs.

Enhanced Security Features

The SBC3511 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 (Xilinx® Zynq® UltraScale+™), and support for Intel's Trusted Execution Technology. The FPGA can be utilized to instantiate a range of Abaco-defined security features, or by the customer to embed application specific features.

FEATURES:

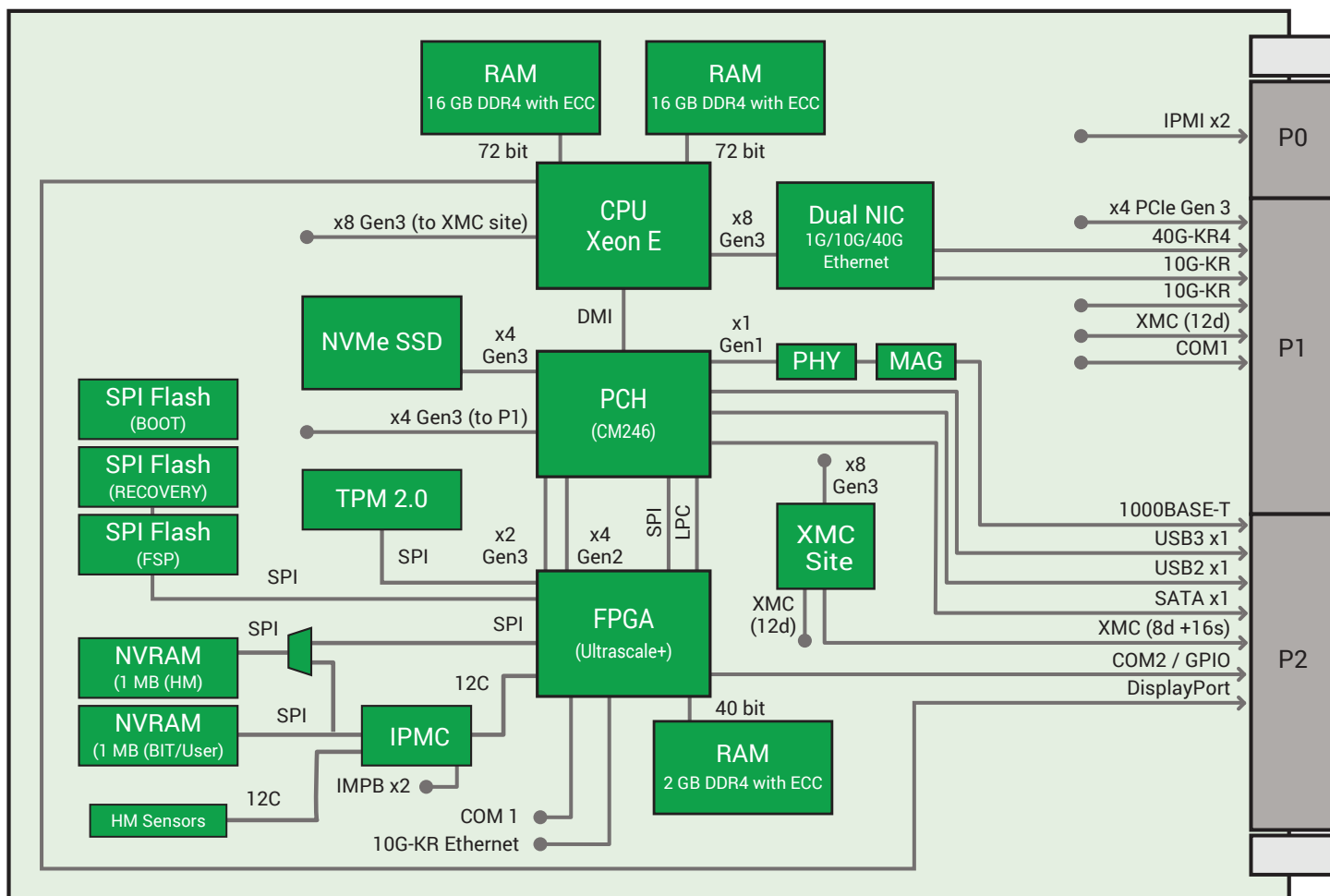
- Single slot 3U VPX Single Board Computer
- Xeon E CPU
- Two channels of soldered DDR4 SDRAM with ECC up to 32 GB
- Up to 256 GB NAND Flash (NVMe SSD)
- 40G Ethernet data plane
- x4 PCIe expansion plane
- 10G Ethernet control plane
- IPMI management plane
- One XMC site
- Rear I/O:
 - 1x 1000BASE-T
 - 1x SATA port
 - Up to 3x COM ports
 - 1x DisplayPort
 - 1x USB 2.0 port
 - 1x USB 3.1 port
 - 4x GPIO
- Convection- and conduction cooled variants
- AXIS and Deployed Test Software
- Windows, Linux and VxWorks operating system support

- AMI UEFI including support of BIOS
- Guard for signed image execution
- Intel Slim BootLoader (SBL)
- Open Linux® (Fedora), Red Hat Enterprise Linux, VxWorks® 7, Windows® 10

- Comprehensive Deployed Test Software: FSP* enabled BIT (PBIT function), and CIBIT (CBIT and IBIT function)
- AXIS environment for app optimization over many nodes/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) into system scenarios. Other operating system support is available on request.

Block diagram



SBC3511 Rugged 3U VPX SBC with Intel Xeon E Processor (9th Generation Intel Core Technology)

Specifications

Processor

- Xeon E CPU (E-2276ME) formerly known as Coffee Lake Refresh
- 6-cores at 2.8 GHz
- 45W TDP
- CM246 PCH (Platform Controller Hub)

SDRAM

- Up to 32 GB DDR4 SDRAM (dual channel) soldered with ECC (roadmap to 64 GB)

Non-Volatile RAM

- 1 MB FRAM (BIT / User)

On-board NVMe Solid State Disk Drive (SSD)

- Up to 256 GB (64 GB as standard)

BIOS

- 2x 32 MB SPI Flash for BIT and BIOS plus 1x 32 MB SPI Flash for Recovery

Data Plane

- 40GBASE-KR4

Expansion Plane

- Four lanes of Gen 3 capable PCIe to P1

Control Plane (Gigabit Ethernet)

- ETH0 is always present, configured as 1000BASE-T (VPRO-compliant), and routed to P2
- ETH1 and ETH2 are routed to P1 and configured as 10GBASE-KR by default. These can also operate as 1000BASE-KX ports.

XMC Site

- x8 PCIe Gen 3
- x8d+x16s tracked to P2
- x12d tracked to P1
- Profile P1w9-X12d+P2w9-X16s+X8d

Management Plane

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

USB Ports

- One USB 2.0 port is routed to P2
- One USB 3.1 port is routed to P2

Graphics Port

- One DisplayPort is routed to P2

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 2-wire 3.3V-tolerant LVC MOS port.
- COM2 can be configured as a 4-wire RS-232/422 port, or two 2-wire RS-232 (adding COM3)

SATA Port

- One SATA 6 Gb/s capable port is routed on P2

GPIO

- Four GPIO pins, 3.3V tolerant

OpenVPX Profile Compatibility

- Compatible with Slot Profile SLT3-PAY-1F1F2U1T1U1T-14.2.16

Power Requirements

- +12V (V_{s1})
- +3.3V for P3V3_AUX is required

Watchdog/ Timers/ TPM/ ETI

- Software programmable windowed watchdog in FPGA
- Timers in FPGA (software programmable)
- TPM 2.0 (Trusted Platform Module)
- ETI (Elapsed Time Indicator)

Temperature Sensor

- PCB and FPGA temperature sensors

FPGA

- Xilinx Zynq UltraScale+ FPGA (ZU5EG) with advanced security features
 - Enhanced Anti-Tamper features
 - Encryption
 - Physically unclonable functions (PUF)
 - Zeroization

Other Hardware Feature

- Hardware Write Protection

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 +70° 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***

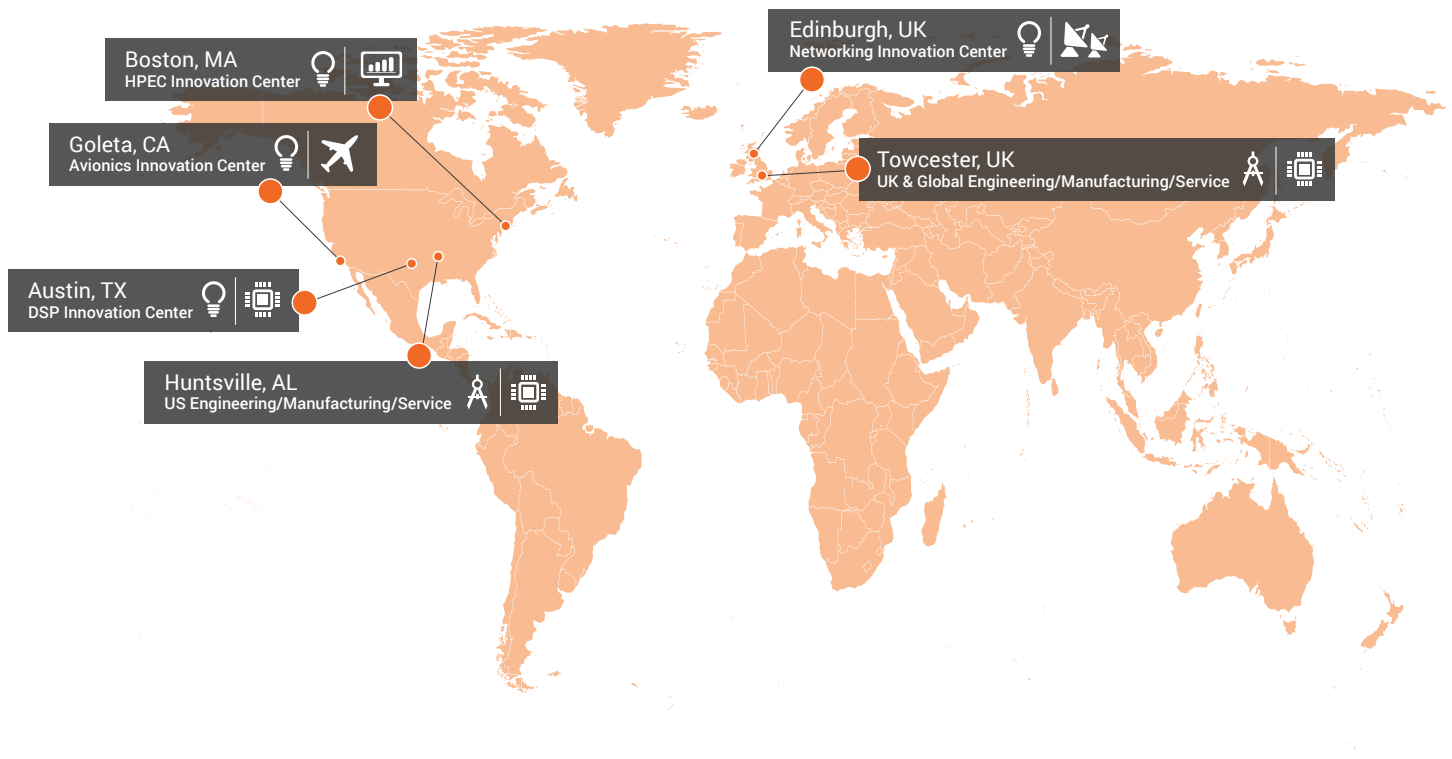
* With a flat response to 1000 Hz, 6 dB/Oct roll-off from 1000 to 2000 Hz ** From 10 to 1000 Hz *** Peak sawtooth 11 ms duration

1. 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

2. Level 2 and 3 will not be available at initial launch but may be available on demand. Please contact factory for more details.



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