

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 that 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. Customers who wish to embed their own application specific features, can also be supported. Contact factory for details.

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



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Rich range of Software options

- 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.

[*FSP = Intel Firmware Support Package].

Block diagram



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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

 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 PCle 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 LVCMOS port.
- COM2 can be configured as a 4-wire RS422 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

- Slot Profile SLT3-PAY-1F1F2U1TU1T1U1T-14.2.16
- Module Profile MOD3-PAY-
- 1F1F2U1TU1T1U1T-16.2.15-4

Power Requirements

- +12V (Vs1)
- +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

FPU

 Xilinx Zynq UltraScale+ FPGA (ZU5EG) with advanced security features

Other Hardware Features

- Hardware Write Protection
- On board three axis accelerometer

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*	0.04g²/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

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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