Secure Intel® VPX SBCs with Integrated FPGA Solutions from X-ES

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Extreme Engineering Solutions, Inc. (X-ES) announces a selection of rugged, Intel® processor-based VPX SBCs featuring onboard FPGA modules from the Xilinx Kintex UltraScale and Microsemi SmartFusion®2 families.

Rapid Signal Processing from Customizable Xilinx Kintex UltraScale FPGA Module

The 6U OpenVPX™ XCalibur4643 provides a powerful combination of a high-end System-on-Chip (SoC) and high-end FPGA integrated on a single, industry-standard card. The Xilinx Kintex UltraScale KU040 FPGA is optimized to support signal processing and RAM-intensive applications at leading performance-per-watt levels. A high-speed x8 PCI Express Gen3-capable interface to the Intel® Xeon® D SoC provides tight integration between the two.

Abundant I/O bandwidth is available with 10 Gigabit Ethernet interfaces on the CPU and high-speed serial transceivers on the FPGA. The Kintex UltraScale FPGA can accommodate secure boot applications with Trusted Platform Module (TPM) support and an interface to the CPU's boot flash.

Host Custom Functions to Protect Data from Being Modified or Observed

The 3U OpenVPX™ XPedite7572 with a 5th Gen Intel® Core™ i7 (formerly Broadwell-H) processor and XPedite7672 with the Intel® Xeon® D (formerly Broadwell-DE) processor are low-power, high-performance SBCs that offer a sophisticated set of features for securing a critical application or securing an entire system and the information within it, while also providing best-in-class processing performance with Intel® processors. Both small form factor 3U VPX cards incorporate the Microsemi SmartFusion®2 SoC as its root of trust. As implemented on these SBCs, the power-on control and boot path is entirely controlled and monitored by the SmartFusion®2 to provide authentication and detection against many types of attacks. The SmartFusion®2's integrated Physically Unclonable Function (PUF), protection against Differential Power Analysis (DPA) attacks, flash-based FPGA fabric, and advanced cryptographic processing elements make this an ideal platform for implementing security throughout the supply chain in military, aviation, communication, and industrial environments.

The XPedite7572 and XPedite7672 have 1 GB of ECC DDR3 and up to 64 MB of SPI NOR flash attached to the SmartFusion®2, which also has a high-speed x4 PCI Express Gen2 interface to the Intel® CPU. This architecture, combined with the SmartFusion®2's integrated ARM® Cortex™-M3 processor, allows great flexibility for implementing custom IP as an encryption/decryption co-processor, data path monitor, or tools to extend run-time trust into the OS, application, or system. The SmartFusion®2 SoC also performs basic system health monitoring, but can be combined with advanced IP to implement system penalties appropriate to the program needs.

These features, in addition to advanced PCB fabrication techniques and heatframe design, encompass X-ES SecureCOTS™ technology. Flexible backplane I/O, such as hi-bandwidth PCI-Express Gen3, 10GBASE-KR, 1000BASE-BX, SmartFusion®2 GPIO, SATA, and USB, allow these cards to fit perfectly wherever high security and reliability is needed.

Contact X-ES today for more information on our Intel®-based VPX SBCs with onboard FPGAs.

About X-ES — Extreme Engineering Solutions, Inc. (X-ES), a 100% U.S.A.-based company, designs and builds single board computers, I/O boards, power supplies, backplanes, chassis, and system-level solutions for embedded computing customers. X-ES offers cutting-edge performance and flexibility in design, plus an unparalleled level of customer support and service.

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