IC-INT-VPX6e

6U VPX Dual Intel® Xeon® D-15xx DSP board

The **IC-INT-VPX6e**, powered by an Intel® Xeon® D Series Broadwell DE SOC, offers unparalled capabilities to applications requiring high-performance computing in critical and rugged environments.

This server class VPX6U DSP board is the result of the experience and expertise gained by Interface Concept in the High Performance Embedded Computing (HPEC) field.

The **IC-INT-VPX6e** that takes advantages of the Intel® latest 14nm Xeon enhancements and of the DDR4 memory benefits is the current most comprehensive dual Intel® processors design for systems requiring the highest processing capabilities together with power consumption decrease.

The **IC-INT-VPX6e** like any IC Intel® board is delivered with IC's own UEFI. This capability to master Boot firmware allows Interface Concept to implement accurate power-up sequence. Moreover, highly secured boot can be implemented thanks to an original design.

Description

Each node is populated with a multicore (up to 12) Xeon®D-15xx processor implementing the Intel AVX-2 technology, and a suitable memory bank scalable up to 32GB DDR4 with ECC/node.

Complying with the OpenVPX™ standard and featuring a PCIe 2.0/3.0 switch as well as a GigaEthernert low latency switch, the **IC-INT-VPX6e** offers a wide range of possibilities for the board rear interconnections :

▶ On the Data and Expansion Planes, the **IC-INT-VPX6e** offers an overall number of 16 lanes on P1 connector, via the PCIe switch. These lanes are configurable as PCIe 2.0/3.0 x4 and x8 interfaces, and the other optimized features of the PCIe switch are easily manageable via the Interface Concept **Multiware** application. The two processors are also interconnected via a PCIe 3.0 x8 interface.

▶ On the Control Plane, 7 GigaEthernet ports are filled out by the L2+ switch, and 2 independent 10GigaEthernet interfaces are direcly controlled by the processors.

The **IC-INT-VPX6e** features additional storage and communication capabilities. In that way, the board offers for each node: one scalable and secured SATA Nand SDD, GPIOs, USB, SATA ports as well as one VGA interface provided by one Silicon Motion SM750 GPU.

One core FPGA (dedicated to securisation) can be used to implement custom features on available rear IOs (16 * LVDS and 2 * SERDES / please consult us)

The **IC-INT-VPX6e** is compliant at a minimum with the following *OpenVPX* profiles (VITA 65): SLT6-PAY-4F2T, SLT6-PAY-8F, SLT6-PAY-2F2U2T.

Main features

Processor Unit (per processor)
▶ Xeon® Processor D-15xx (up to 12 cores)
▶ DDR4 with ECC (up to 2x16GB)
▶ Secured Boot flash memory
▶ on board Secured SATA SSD (up to 64GB)

Communication subsystem (per processor)
▶ 1 * PCIe x8 port to the PCIe switch
▶ 1 * PCIe x8 port to the second processor
▶ 1 * PCIe x4 port to (rear P2)
▶ 2 * USB 2.0 ports (rear)
▶ 1 * Console port (rear)
▶ 2 * SATA ports (rear)
▶ 1 * VGA interface (rear)
▶ 4 * GPIOs (Rear)
▶ 1 * GigE port (attached to the Control Plane Ethernet switch)
▶ 1 * 10GBase-KR port (rear)

Ethernet Switch
▶ 2 * 1000Base-T Ethernet ports (rear P4)
▶ 2 * 1000Base-BX Ethernet ports (rear P4 / 2.5G capable)
▶ 1 * 1000Base-BX Ethernet port (rear P5)
▶ 2 * 1000Base-T or 2*1000Base-BX Ethernet ports (rear P5)[*]
    [*] factory setting

PCIe Switch
▶ 8 * PCIe x4 ports (rear P1)

Miscellaneous
▶ Status LEDs
▶ PIC μ-controller for System Management (per VITA 46.11)
▶ Power supply monitoring / Temperature sensor...
▶ Engineering kit for debug : JTAG/COP...
▶ 6U Rear Transition Module

The **IC-INT-VPX6e** is a VPX board compliant with 1" 6U module definitions of the VITA standards.
It is available in air-cooled and conduction cooled versions compliant with VITA 47 classes.

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On-board firmware

Interface Concept Single Board Computers based on Intel CPUs, use the new UEFI firrmware technology.
This Boot Loader, **developed and tested by our R&D team**, implements all the initializations and optimized PBITs while ensuring the shortest boot time before launching the UEFI shell or loading the Operating System from storage devices (CD, DVD, HDD, USB…) or network.

When the final application is running, Runtime services remain in memory thus allowing the user to access UEFI variables for monitoring (e.g. PBIT results) or setup operations.
On request, we can customize the Boot Loader to keep only what is strictly necessary for customer's applications.

OS support

Interface Concept provides LSP Linux® distributions (IC SDK, others...) and VxWorks®.

Multiware

In oder to empower customers to concentrate their efforts on their most critical tasks, Interface Concept developed a Fabric Management Software implementing optimized services between PCIe domains over non transparent bridges NTB) such as: DMA transfers, Ethernet emulation over PCIe, management of shared memory, messages and semaphores, etc.
(please consult us for details)

Block Diagram
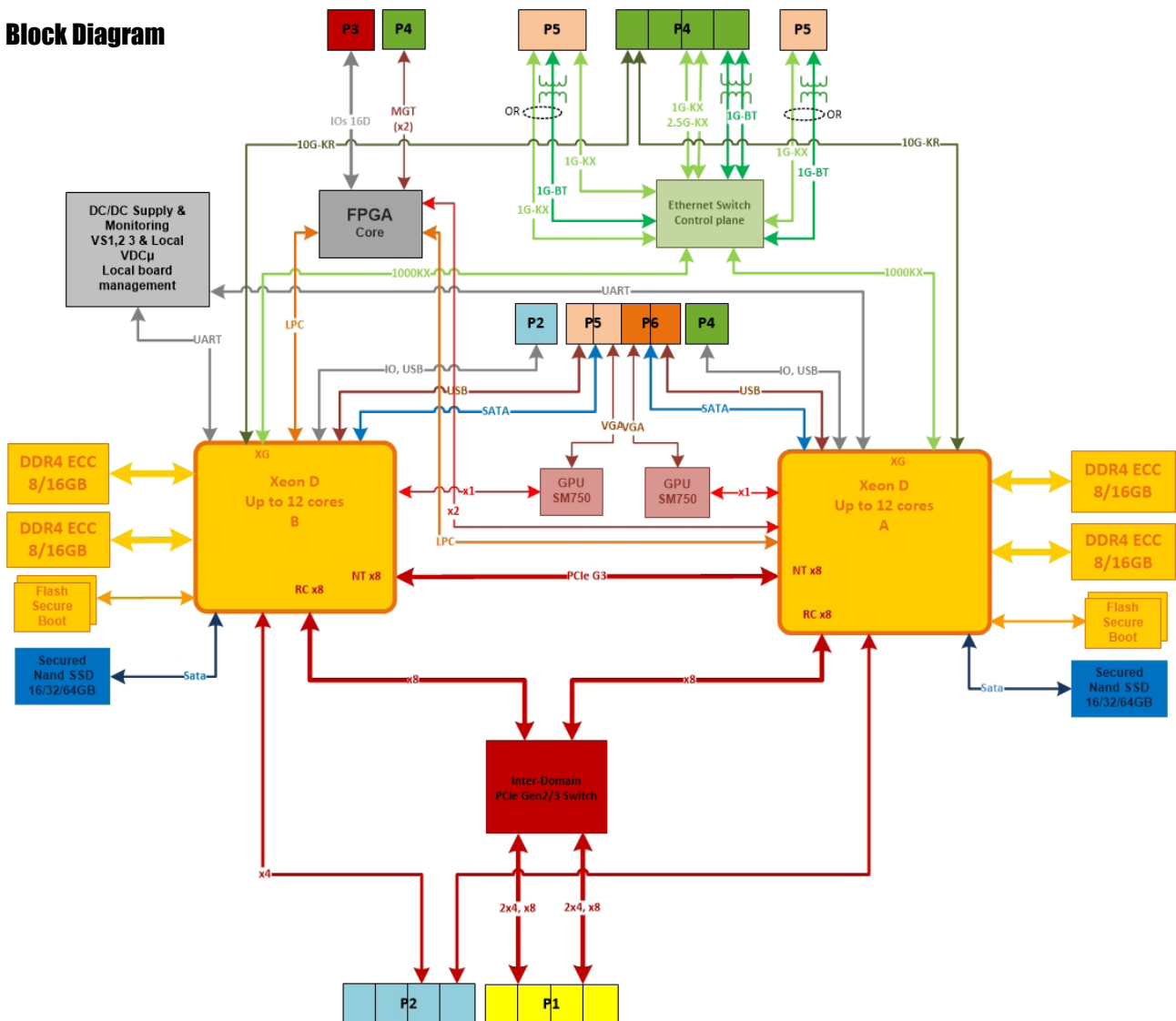
Environmental Specifications:

Please consult the **IC-INT-VPX6e** page at **www.interfaceconcept.com**.

Ordering Information:

Please contact our sales department : tel. **+33 (0)2 98 573 030** - email : **info@interfaceconcept.com**

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