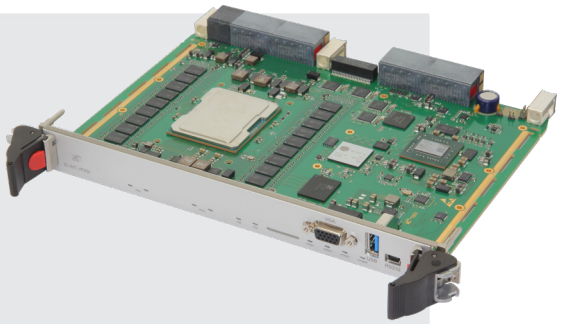
IC-INT-VPX6i

6U VPX Intel® Xeon® D-2700 Single Board Computer

- *6U VPX*
- *Intel® Xeon® D-2700 processor (Ice Lake-D HCC)*
- *100 GbE & PCIe Gen4 interfaces*
- *GPU HDMI/VGA interface*
- *AMD UltraScale™ FPGA*



Overview

Interface Concept leverages its design expertise in rugged, high quality, secure solutions together with the cutting-edge technical enhancements of the Intel Intel® Xeon® D-2700 processor, (12, 16 or 20 cores) to devise a concentrate of technology on a 6U OpenVPX platform - the **IC-INT-VPX6i** SBC.

Dedicated to Edge applications and High computer needs, the ICX-D (code name Ice Lake-D) processor provides the **IC-INT-VPX6i** module with performance, efficiency and flexibility required by the most demanding applications in the industrial and mil-aero sectors: intelligence surveillance (C4ISR), electronic warfare and broadly speaking, all applications requiring AI hardware platforms.

Description

The **IC-INT-VPX6i** takes advantage of the ICX-D density and scalability, enabling integrators to choose from various board configurations depending on whether they require processing power or power management. To meet their needs, the board can be factory-built with a 12, 16 or 20-core processor and a Dynamic Random Access Memory (DRAM) capacity up to 64 GB bearing in mind that this processor can support up to 4 fast DDR4 channels.

In addition, with the ICX-D, the **IC-INT-VPX6i** benefits not only from the well-proven Intel® Advanced Vector Extensions 512 (AVX-512) instruction suited for Real-Time applications, but also from a complete set of high speed interfaces featured by this processor.

Indeed, the 16 PCIe Gen4 lanes and the two 40/100GB Ethernet interfaces with RDMA supported by the **IC-INT-VPX6i**, make it the ideal solution for scalable edge computer platforms requiring multiprocessing and sofisticated network features with low latency.

The on-board open FPGA allows, among others, a couple of capabilities such as providing the board with extra interfaces (HDLC, SFPDP, ARINC818). Also, the **IC-INT-VPX6i** features advanced protect and security features.

The **IC-INT-VPX6i** can act as System or a non-System controller module in a 6U VPX integrated system.

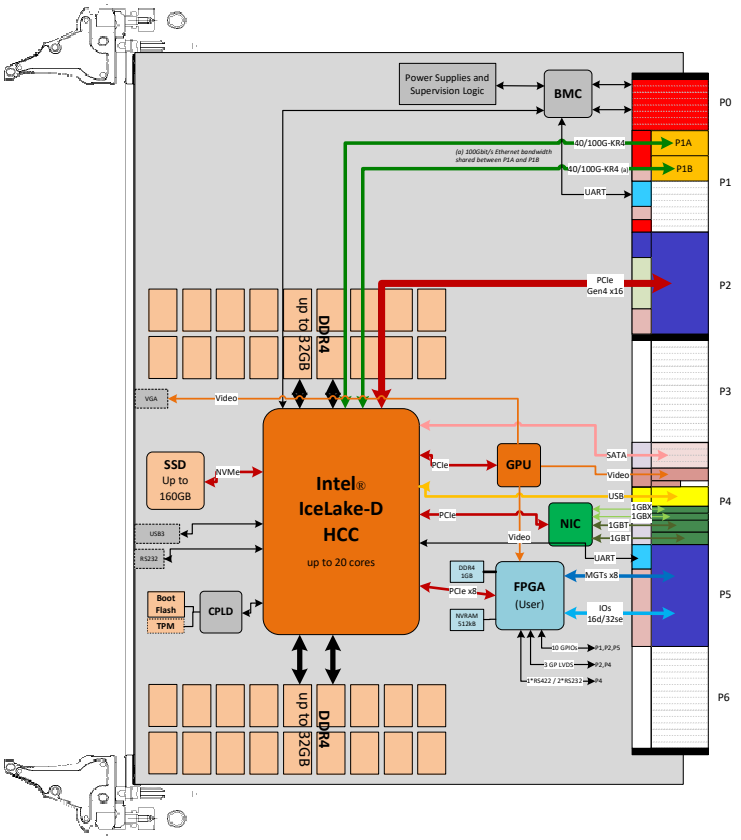
Integrators can rely on the **IC-INT-VPX6i** and Interface Concept's well-proven COTS FPGA processing boards, Ethernet switches and GPU boards, to build a complete 6U VPX HPEC system, offering faster time to their system deployment.

The **IC-INT-VPX6i** provides :

- 2 * 40G/100GBASE-KR4 (Data Plane)
- 1 * PCIe x16 Gen4 (Expansion Plane)
- 2 * 1000BASE-T Ethernet (Control Plane)
- 2 * 1000BASE-KX Ethernet (Control Plane)
- 1* HDMI + 4 * SATA + 2 * USB3 interfaces
- MGTs and GPIOs from FPGA

The **IC-INT-VPX6i** board is available in air-cooled and conduction-cooled (without any front I/O) versions.

Block Diagram



The **IC-INT-VPX6i** is compliant with VITA 65.0 SLT6-PAY-4F2Q1H4U1T1S1S1TU2U2T1H-10.6.4-n Slot Profile.

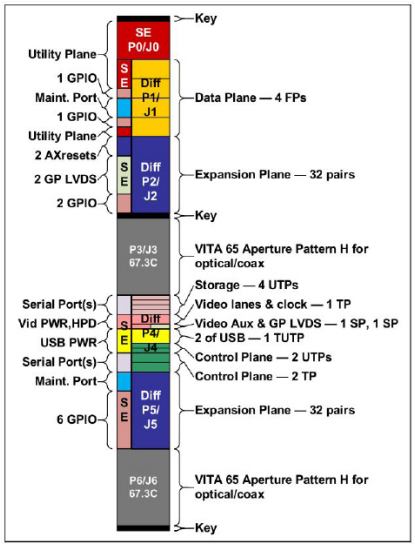


Figure 10.6.4-1 SLT6-PAY-4F2Q1H4U1T1S1S1TU2U2T1H-10.6.4-n

Main features

Processing Unit

- Intel® Xeon® D-2700 (20 cores)
- 4 channels of DDR4 with ECC (up to 16GB per channel)
- SSD NVME (40 to 160 GB)
- 4 * SATA Gen3 ports [RB_P4]
- 2 * USB3 ports [RB_P4]
- 10 * GPIOs [RB_P1, P2 and P5]
- 2 * GP LVDS (P2)

1 * AMD UltraScale™ FPGA

- KU35 or KU3P
- DDR4 1GB
- NVSRAM 512kB
- 8 SerDes ports to VPX [RB_P5]
- 16 Diff. IOs to VPX [RB_P5]

Data Plane

- 2 * 40G/100GKR4 (100Gbit/s Ethernet bandwidth shared between P1A and P1B)

Control Plane

- 2 * 1000BASE-T Ethernet
- 2 * 1000BASE-KX Ethernet

Expansion Plane

- 1 * PCIe x16 Gen4 [RB_P2] splittable as 2* x8 or 4* x4 PCIe ports

Graphic

- 1 * GPU DVI Interface

Others video capabilities (eg : ARINC818) are available on request.

Front Panel (air-cooled only)

- 1 * VGA output
- 1 * USB3 port
- 1 * RS232 console port

The **IC-INT-VPX6i** is a 6U x 5HP (1") VPX board compliant with 6U module definitions of the VITA 46.0 standard (0.80" or 0.85": please consult us).

Software Features

BMC

- VITA46.11 IPMC
  - TIER-2 IPMI
  - Redundant IPMB
- Power-on Built-In Test
  - On-board hardware components
    - Accessible from the OS
- Human Machine Interface
  - Devices management
  - Health management
  - Password
  - Log
- Over-temperature board protection

Firmware

- UEFI-compliant Boot Firmware
  - Based on InsydeH2O® UEFI BIOS
  - Integrated and tested by IC R&D team
- Boot options
  - UEFI shell
  - Storage devices (HDD, USB, CD, DVD)
  - Network
- Power-on Built-In Tests (PBIT)
  - On-board hardware components
  - Add-on connectivities (VPX PCIe, PCIe, SATA disks, USB devices...)
  - Results accessible from the OS

OS Support

- Supported Linux distributions
  - Red Hat Enterprise Linux
  - Ubuntu
  - Yocto
- BSP Features
  - Standard or Preemp-RT kernel (Yocto only)
  - BMC drivers
  - IC Control Node driver
  - Board information (P/N, S/N, PBIT results...)
  - IBIT/CBIT (Integrated/Continuous)
  - FPGA IP drivers
  - Other utilities

Please consult us for other Linux distributions (Debian, Fedora, etc), VxWorks® and Windows.

Multiware

- In-house software for Linux and VxWorks
- PCIe domains exchanges over Non-Transparent Bridges (NTB)
  - DMA transfers
  - Ethernet emulation over PCIe
  - Shared memory
  - Messages and semaphores, etc.
- API (Application Programming Interface)
  - Kernel-space functions
  - I/O devices
  - Ethernet socket
  - Sysfs (Linux)

Grades

Criterion	Coating	Operation Temperature	Rec. Airflow	Oper. HR% no cond.	Storage Temperature	Sinusoidal Vibration	Random Vibration	Shock 1/2 Sin. 11ms
Standard	Optional	0 to 55°C	1 .. 2 m/s	5 to 90%	-45 to 85°C	2G [20..2000]Hz	0.002g2 /Hz [10..2000]Hz	20G
Extended	Yes	-20 to 65°C	2 .. 3 m/s	5 to 95%	-45 to 85°C	2G [20..2000]Hz	0.002g2 /Hz [10..2000]Hz	20G
Rugged	Yes	-40 to 71°C or 85° C (*)	2 .. 5 m/s	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g2 /Hz [10..2000]Hz	40G
Conduction-Cooled 71°C	Yes	-40 to 71°C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g2 /Hz [10..2000]Hz	40G
Conduction-Cooled 85°C	Yes	-40 to 85° C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.1g2 /Hz [10..2000]Hz	40G

(*) : Temperature grades are subject to availability according to IC products. Please consult us.

All information contained herein is subject to change without notice.

For more information, please contact:

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