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IC-PPC-VMEb

Single or Dual T2081 (or T1042) VME SBC

with on-board Embedded L2 switch and user-programmable FPGA

The **IC-PPC-VMEb**, featuring the QorIQ® T2081 (or T1042) processor, offers unparalleled performance to VME legacy applications and provides ruggedized and highly secure solutions.

Superseding our **IC-De6-VMEb**, it ensures compatibility with existing equipments while offering increased embedded computing power.

The **IC-PPC-VMEb** board provides a flexible combination of interfaces offering a highly versatile open platform in a single slot VME to optimize weight, size, power and cost.

This SBC has been designed to meet the needs of OEMs servicing the mil-aero and industrial market fields.

Description

The computing nodes are populated with QorIQ® T2081 (four dual threaded e6550 cores) implementing the Altivec™ technology or T1042 (four e5500), and a suitable memory bank from 4 to 8 GB DDR3 with ECC/node.

When delivered with its VME interface (VME64x IP in dedicated FPGA), the **IC-PPC-VMEb** can run as a system controller as well as a standard peripheral board.

The **IC-PPC-VMEb** integrates many communication functions.

- Its embedded Ethernet switch enlarges the communication capabilities usually existing on such a board. Each processor features two Giga Ethernet ports: one on the backplane and one attached to the switch. Five additional Giga Ethernet ports are filled out by the Ethernet L2+ switch. (note, when populated with only one CPU, the Ethernet ports of CPU B are linked to CPU A)
- Two mezzanine slots (PMC/XMC and FMC/XMC) allow to increase the computing power or the range of available IOs on the board.
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- Standard IO : USB2, RS232/RS422
- The PCIe advanced switch offers versatile coupling between the two processors and the end-points (PMC/XMC slots, FPGA...).

Moreover, the **IC-PPC-VMEb** offers a user-programmable FPGA interfacing the CPU and a FMC HPC connector, dedicated to proprietary applications. This feature makes the SBC adaptive to the very specific customer needs.

The FMC connector directly attached to both processors via two Serdes, allows additional expansion like 10GigaE, managed by the processor.

In the same way, IC supplies and supports several IP VHDL functions (UART, SFPDP, GPIOs, SSD...) dramatically reducing time-to-market while providing the real-time performance needed.

Main features

Processor Unit

One or Two QorIQ® T2081 (1..1,8 GHz or T1042) with:

- up to 8 GB DDR3-ECC per CPU
- 128MB SPI Mirrorbit flash (with backup device for recovery)
- 128/256MB of Mirror Flash per CPU
- 512KB of nvRAM per CPU
- Temperature sensors and monitoring per CPU
- Calendar clock with supercap backup per CPU
- Elapse Time Counter
- DC and Thermal monitoring

Storage subsystem

- 1*eUSB slot for SSD Disk per CPU

Communication subsystem

- 7*GigaEthernet ports
- 1*L2+ Giga switch (QoS, VLAN, etc.)
- up to 3*USB2 external ports
- 1*RS232 and 2*RS422 port per CPU
- GPIOs

I/O subsystem

- VME64x capability (option)
- One FMC/XMC slots (exclusive):
  - XMC PCIe x4, or
  - HPC connector (for FMC)
- One PMC/XMC slots:
  - PCI 32/64-bit at 33/66MHz, PCI-X up to 100 MHz
  - PCIe x4
  - IO report compatible with VITA35 P4V2-64ac
- One Open FPGA for customer applications, offering 4 Serdes and LVDS differential pairs to HPC connector

Accessories

- Engineering kit for debug : JTAG/COP, console,...
- 6U Rear Transition Module

The **IC-PPC-VMEb** is available in standard, rugged and conduction-cooled grades (please consult us).

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On-board firmware

UBoot

Our basic firmware takes in charge new Freescale's T1042/T2080 initialization. This on-board firmware, based on UBOOT, is an efficient set of software stored in a secured flash. It is called by the reset vector when the board is powered up. It initializes the QorIQ and its environment, performs a comprehensive Power-on self-tests (PBIT), before jumping into different applications according to the values stored in memory.
The firmware allows loading files from Ethernet via Bootp, running files in RAM or flashing them. In addition, it allows some monitor functions such as : display or modify the RAM data. To end with, it enables the user to perform maintenance tests.

IC-BSP basic

These BSPs products are based on the standard distribution of the OS editor. They take in charge hardware initialization, interrupt handling and generation, hardware clock and timer services, memory management, PCI management, mapping of memory spaces, serial ports, GE MAC driver ports, USB2 driver, SATA drivers with Raid functions (Linux only), Nand and Nor Flash files systems, etc

Interface Concept provides BSP for VxWorks® and LSP for Linux® (with Yaeld, our Linux distribution builder and cross development tool). Other RTOS (PikeOS, LynxOS, Integrity...) can be ported on request (please consult us).

Interface features

VMEbus 64x interface (P1/P2)

- ►DTB Master : A16/24/32/64 ; D08-D64, SCT, BLT, MBLT, 2eVME
- ►DTB Slave : A16/24/32/64 ; D08-D64, SCT, BLT, MBLT, 2eVME
- ►Arbiter : RR/PRI/SGL
- ►Interrupt : handler/generator with IRQ[1..7]
- ►System controller

FMC/XMC slot 0

- ►PCIe x4
- ►Optional FMC connector

PMC/XMC slot 1

- ►Signaling : 3.3 tolerant
- ►PCI 32/64-bit at 33/66MHz, PCI-X up to 100 MHz
- ►PCIe x4
- ►IOs routed on P2 (VITA35 P4V2-64ac)

P0 connector

- ►2 Giga Ethernet compliant with VITA31.1
- ►4 additional GigaEthernet ports
- ►2*USB2
- ►GPIOs

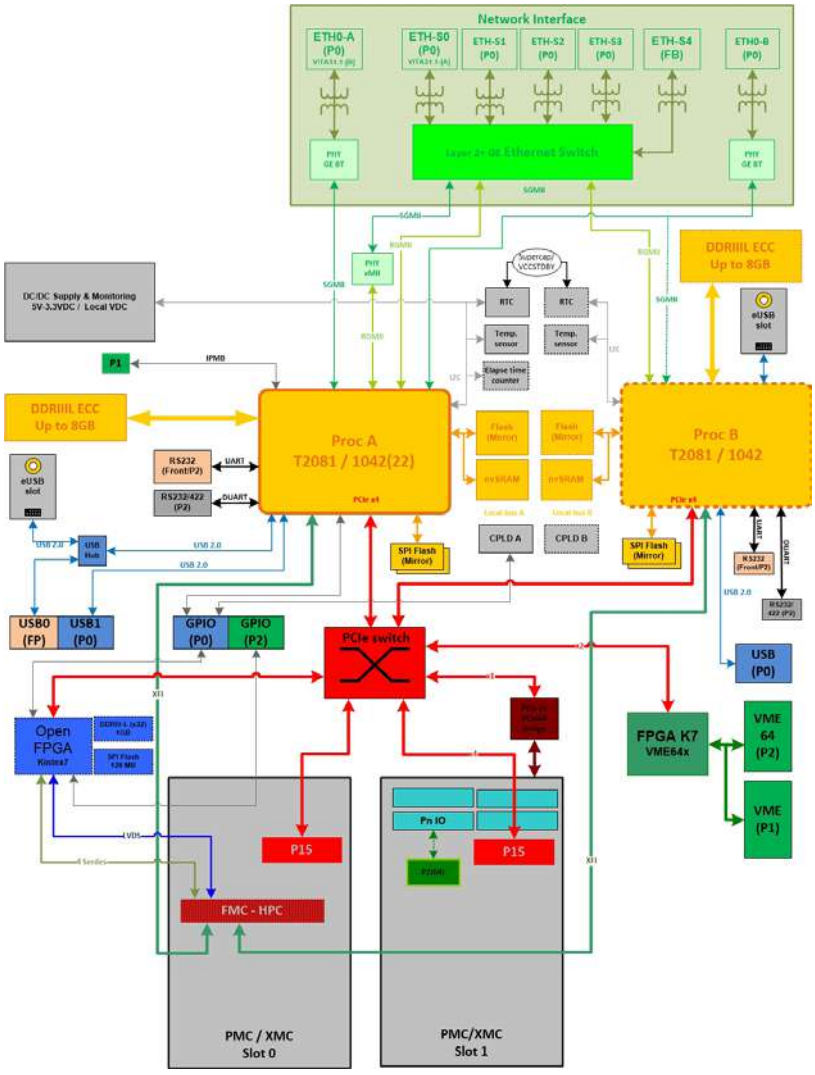
P2 connector

- ►Pn4 IOs
- ►1 or 2 RS232, 2 or 4 RS232/RS422
- ►GPIOs (from FPGA)

Front connectors :

- ►1 Giga Ethernet port (RJ45)

Block Diagram



Environmental Specifications:

Please consult the **IC-PPC-VMEb** 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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