INTERFACE CONCEPT
ADVANCED ELECTRONIC SOLUTIONS

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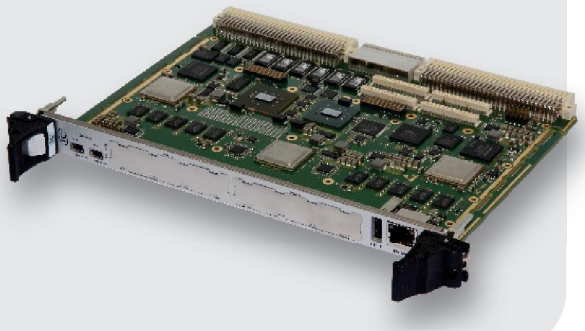
IC-PPC-VMEb

6U VME QorIQ Single Board Computer with on-board switch and FPGA

- *6U VME*
- *Single or Dual QorIQ® T2081/T1042*
- *Up to 8 GB DDR3 with ECC*
- *User-programmable FPGA*
- *Giga Ethernet switch*
- *1 * XMC slot, 1 * PMC/XMC slot*



Overview

The **IC-PPC-VMEb** based on one or two QorIQ® T2081 (or T1042) processors, 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 (XMC and PMC/XMC) allow to increase the computing power or the range of available I/Os on the board.

• Standard I/O : 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, dedicated to proprietary applications. This feature makes the SBC adaptive to the very specific customer needs.

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

The **IC-PPC-VMEb** is available in standard, rugged and conduction-cooled versions.

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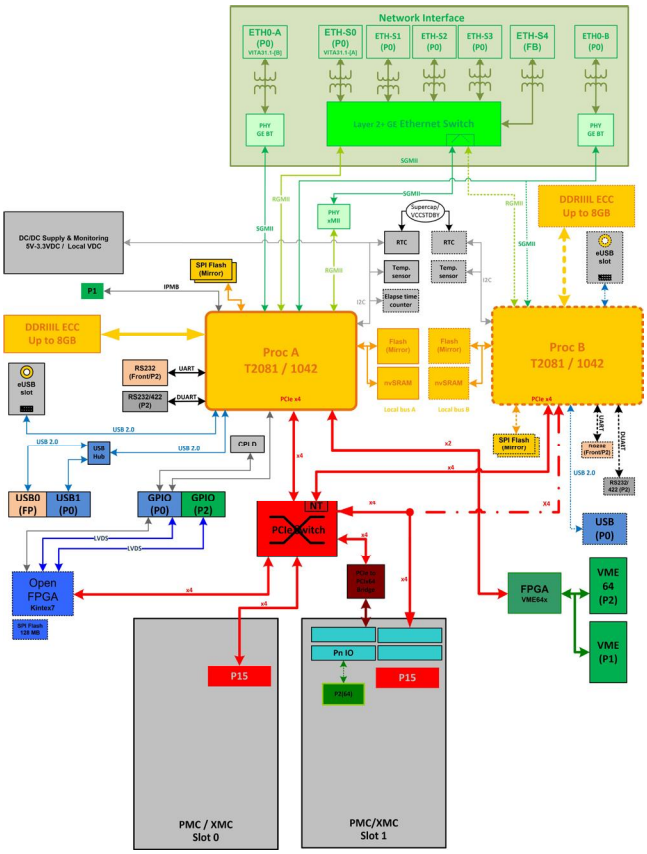
Block Diagram



Main features

Processing Unit

- 1 or 2 * QorIQ® T2081(1.8 GHz)/T1042 (1.4 GHz) 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)
- 1 * XMC slot
- 1 * PMC/XMC slot
- 1 * Open FPGA for customer applications

Accessories

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

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

XMC slot 0

- PCIe x4

PMC/XMC slot 1

- Signaling: 3.3 tolerant
- PCI 32/64-bit at 33/66MHz, PCI-X up to100 MHz
- PCIe x4 (attached to the PCIe switch or to the CPU B as an optional factory setting)
- IOs routed on P2 (VITA35 P4V2-64ac)

P0 connector

- 2 * Giga Ethernet compliant with VITA31.1
- 4 * additional GigaEthernet ports
- 2 * USB2
- GPIOs
  - 13 * single-ended GPIOs from the FPGA
  - 2 * single-ended GPIOs from each node
  - 4 * differential pairs from the FPGA

P2 connector

- Pn4 IOs
- 1 or 2 RS232, 2 or 4 RS232/RS422
- GPIOs (15 differential pairs from the FPGA)

Front connectors

- 1 * Giga Ethernet port (RJ45)

Software Features

BMC

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

OS Support

- Supported Linux distributions
  - Yocto
- BSP Features
  - VME driver
  - 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)
  - Other utilities

Please consult us for other Linux distributions and VxWorks®.

Firmware

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

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 75°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.

For more information, please contact:

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