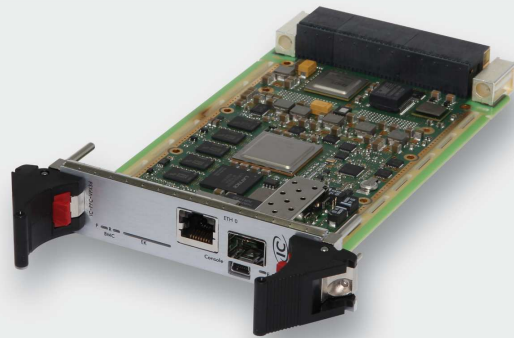


# IC-PPC-VPX3d

## 3U VPX QorIQ T2080 Single Board Computer

- 3U VPX
- NXP QorIQ T2080 processor
- up to 8 GB DDR3-ECC
- PCIe switch
- 1GB NAND Flash
- XMC slot



## Overview

Designed for applications requiring high performance, low power, and multiple I/O capabilities, the **IC-PPC-VPX3d** is a complete and versatile SBC dedicated to 3U VPX compact systems.

Coming with the latest PowerPC QorIQ multicore processor, the **IC-PPC-VPX3d** is capable of meeting compute-intensive needs, in industrial and harsh environments.

In order to meet High Performance Embedded Computing systems (HPEC) requirements, the Interface Concept software suite makes the integration of the IC-INT-VPX3d together with the IC FPGA (IC-FEP-xxx), switch (ComEth) and carrier boards easy.

## Description

The Freescale® QorIQ T2080 processor is based on the 64-bit e6500 core, built on Power Architecture® technology, and runs up to 1.8 GHz. The four e6500 cores share a low-latency backside 2MB L2 cache, allowing efficient code and data sharing. Each e6500 core implements the Freescale AltiVec technology SIMD engine, dramatically boosting the performance of the platform.

The **IC-PPC-VPX3d** provides up to 8GB of DDR3-ECC.

The OpenVPX standard allows system designers to have flexibility in topology for large mesh designs, or designs

with heavy traffic on particular backplane segments. The IC-PPC-VPX3d board expands this flexibility.

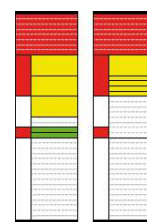
In addition to a direct PCIe Gen2/gen3 port on P1A, a PCI Express switch allows versatile coupling between the processor and the other slots. The PCIe Gen2 x4 ports on P1B and P1C can be aggregated to form a PCIe x8 link or spread to form up to eight PCIe x1 links.

For the Control Plane, the **IC-PPC-VPX3d** board provides two GigaEthernet KX ports offering compliance with the Ethernet on VPX. Those two ports can also be used in 10Gbase-KR mode, to offer, with an additional 10Gbase-T port, three 10G Ethernet ports for Data/expansion planes application.

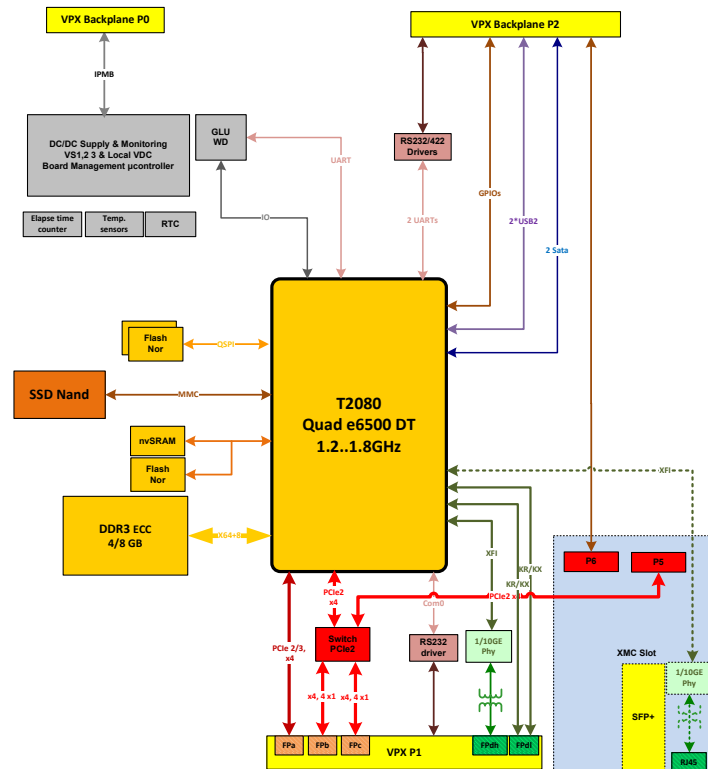
An XMC slot is also available to support legacy mezzanines or custom designs. As an option, the XMC slot can be replaced by connectors to offer an additional front 10G Ethernet port (auto-media detect 10GBase-T/SFP+)

The **IC-PPC-VPX3d** is compliant with the OpenVPX slot profiles (VITA 65) :

- SLT3-PAY-3F2U-14.2.13
- SLT3-PAY-1F4U-14.2.8



### Block Diagram



### Main features

#### Processing Unit

- One QorIQ T2080 (1.2 to 1.8 GHz) with
- 4 GB (up to 8 GB) DDR3-ECC
- Flash NOR
- nvSRAM
- SSD

#### Communication subsystem

- one PCIe Gen2/3 x4 port (P1a)
- two PCIe Gen2 x4 port (P1b, P1c), each configurable as four x1 ports
- 2 \* Ethernet ports available as 10GBase-KR or GigaBase-KX (P1d)
- 1 \* Ethernet port available as 10GBase-T (P1d)
- 1 \* RS232 console port available on P1
- 2 \* RS422/RS422 UART available on P2
- 2 \* USB2 ports available on P2
- 2 \* SATA ports available on P2
- GPIOs on P2

#### Options (exclusive)

- 1 \* XMC slot:
  - XMC PCIe x4,
  - IOs on P2 (VITA 46.9 X8d + X12d)
- 1 \* 10G Ethernet port (auto-media detect 10GBase-T/SFP+)

#### Board Management Controller

- PIC  $\mu$ -controller for System Management (per VITA 46.11):
- RTC with supercap backup
  - Elapse Time Counter
  - DC and Thermal monitoring

#### Accessories

- Engineering kit for debug : JTAG/COP, console,...
- 3U Rear Transition Module

The **IC-PPC-VPX3d** is a VPX 3U board compliant with 3U module definitions of the VITA 46.0 standard.

The **IC-PPC-VPX3d** is available in air-cooled and conduction-cooled versions.

### Interface features

#### Front connectors

- Leds
- Option: RJ45/SFP+ for 10G Ethernet port

#### P1 connector

- one PCIe Gen3 x4 port (P1A)
- two PCIe Gen2 x4 ports (P1B, P1C)
- two 10GBase-KR/GigaBase-KX ports (P1D)
- one 10GBase-T port (P1D)
- one RS232 cosnole port

#### P2 connector

- two RS232/RS422 UART
- 6\*GPIOs. Each input can be individually configured as a source of interrupt (level or front)
- two USB2 ports
- two SATA ports
- Option: XMC IOs (VITA 46.9 X8d + X12d)

### On-board firmware

#### UBoot

The IC basic firmware initializes Freescale's T2080 processor. 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.

#### Basic IC-BSP

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 IC-SDK, our Linux distribution builder and cross development tool).

Other RTOS (PikeOS, LynxOS, Integrity...) can be supported on request (please consult us).

### 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.

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