IC-De6-VMEb

Single or Dual MPC8640 (Single or Dual Core) SBC with Embedded L2 switch and Open FPGA

IC-De6-VMEb is a VME64x board based on the Freescale e600 processor.
IC-De6-VMEb is powered either by one or two MPC8640 available in Dual core version (Single core on demand).

Designed for applications requiring a very high level of performance, the **IC-De6-VMEb** board also provides a very flexible combination of interfaces offering thus the ideal open platform for demanding customers.

Two GigaEthernet ports (one from a CPU, the second fromethe switch) provide the compatibility with VITA31.1 standard regarding packet switched architecture.

Its embedded Ethernet switch enlarge the communication capabalities usually existing on such a board, while the two PMC XMC slots allow to increase the computing power or the range of available IOs.
An open FPGA completes the incredible flexibility of this board.

RoHS 2002 / 95 / EC

Description

The MPC8640 processors of the IC-De6-VMEb use e600 core (formerly G4) and high-speed interconnect technology to balance processor performance with I/O system throughput. Each core is a high performance supercalar design supporting multiple execution units. Each includes 32-Kbyte separate I/D L1 caches and a 1-Mbyte L2 cache.

IC-De6-VMEb implements up to 4GB oF DDR2-ECC (max 1Gbyte per Core). The integration of the system controller provides spectacular memory bandwidth and memory latency performances.

IC-De6-VMEb runs as a system controller or a standard board. An automatic detection can be used with the VME64x 2eSST backplane. In order to ensure the best software compatibility, the VMEbus interface is based on a combination of the Tundra Tsi148 VME bridge and the latest generation of Texas Instrument transceivers.

IC-De6-VMEb integrates many additional communication functions :

- 4 Giga Ethernet ports filled out by a Giga Ethernet L2+ switch.
- 2 Giga Ethernet ports per processor (one on the backplane and one attached to the switch)
- An USB2 controller provides two high/full speed ports.
- Two serial ports (RS232 and RS422) are also available (on each processor).

Two PMC (PCI-X) / XMC (PCIe) slots enhance the SBC flexibility.

A PCIe advanced switch and a PCIe Mux allow versatile coupling between the processors and the XMC slots.

Moreover, the **IC-De6-VMEb** offers an Open FPGA interfacing the CPU and the backplane, dedicated to proprietary application. IC supports several IP VHDL functions (UART, GPIOs ...).

Main features

Processor Unit

- One or Two MPC8640 (D) running at 1GHz with :
  - L1 caches : 32KB Inst. and 32KB Data with parity
  - 1MB*2 of L2 integrated cache with ECC
- Two or Four*DDRII banks with each up to 1 GB
- One or Two 128MB of soldered Mirror Flash
- One or Two 256KB of nvRAM (non-volatile memory)
- One or Two PPC 64-bit Real Time clock and 32 bit-timers
- One or Two Temperature sensors and monitoring
- One or Two Calendar clock with supercap backup
- Elapse Time Counter
- DC and Thermal monitoring

Storage subsystem

- Up to 16GB of Soldered SSD Disk.

Communication subsystem

- up to 6*GigaEthernet ports
- 1*L2+ Giga switch (QoS, VLAN, etc.)
- 3*USB2 external ports
- 1* RS232 and 1* RS422 port per CPU.
- I2C bus

I/O subsystem

- VME64x with 2eSST (Tsi148)
- Two PMC/XMC slots :
  - PCI 32/64-bit at 33/66MHz, PCI-X up to 100 MHz
  - PCIe x4
  - Slot 0 compatible with VITA35 P4V2-64ac, or Slot 0 & Slot 1 compatible with VITA35 P4V2-32+32ac
- One Open FPGA for customer applications (Virtex 5), offering single ended LVTTL IOs, GTP ports and LVDS differential pairs

Accessories

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

IC-De6-VMEb is available in standard, extended, rugged and conduction-cooled grades (depending on version, please consult us).

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On-board firmware

Our basic firmware takes in charge Freescale's new MPC8640D and its internal chipset initialization. This on-board firmware, based on UBOOT, is an efficient set of software stored in a secured flash.

UBoot

It is called by the reset vector when the board is powered up. It initializes the PowerPC and its system controller, 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_Bios

This module allows the user to access the specific IC-De6-VMEb hardware resources via an easy-to-use API. This module is used as a library with Vx-Works and as a dynamically loaded library module for Linux.

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® (starting with 6.7) and LSP for Linux® (Interface Concept or WindRiver SDK) operating systems. Other RTOS (LynxOS, Integrity...) can be ported on request. Vxworks-SMP and Linux-SMP are supported for dual core configurations (Please consult us for AMP).

Interface features

VMEbus 64x interface (P1/P2)

- ►DTB Master : A16/32/64 ; D08-D64, SCT, BLT, MBLT, 2eVME, 2eSST
- ►DTB Slave : A16/24/32/64 ; D8-64, SCT, BLT, MBLT,
- ►2eVME, 2eSST, UAT
- ►Arbiter : RR/PRI
- ►Interrupt : handler/generator with IRQ[1..7]
- ►System controller with auto detect.

PMC/XMC slot

- ►Signaling : 3.3 tolerant
- ►PCI 32/64-bit at 33/66MHz, PCI-X up to 100 MHz
- ►PCIe x4
- ►PMC0 IOs routed on P2 (VITA35 P4V2-64ac) or PMC0 & PMC1 IOs routed on P2 (VITA35 P4V2-32+32ac)

P0 connector

- ►2 Giga Ethernet Compliant with Vita31.1
- ►4 additional GigaEthernet ports
- ►2* USB2 , 1 or 2*RS232(*)
- ►Open FPGA IOs

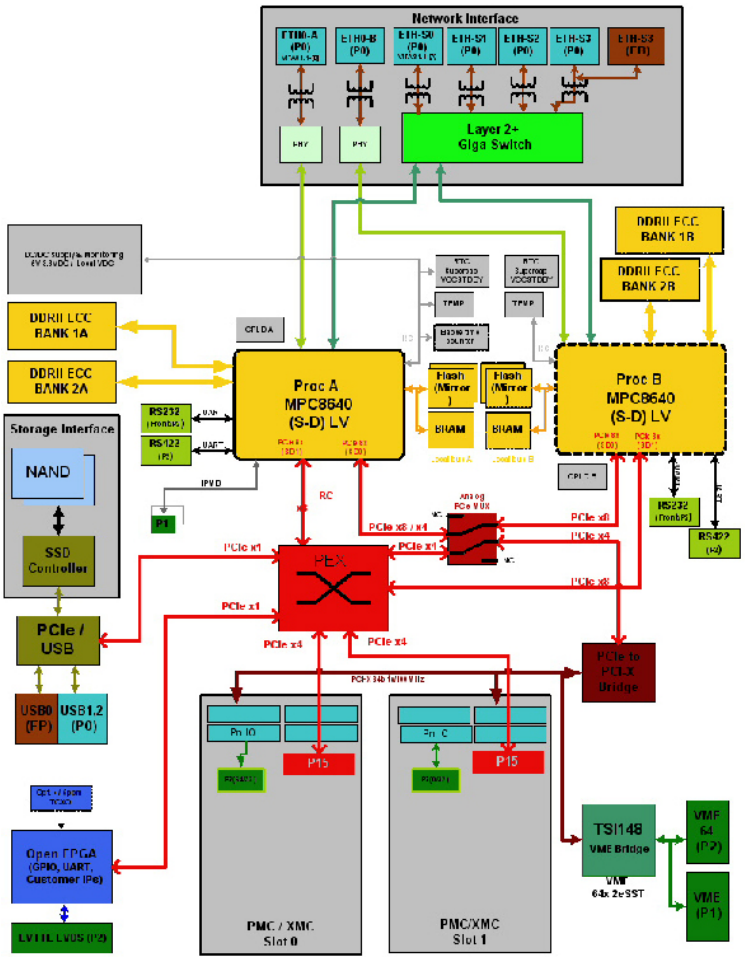
P2 connector

- ►Pn4 IOs
- ►1 or 2 RS422
- ►Open FPGA IOs (LV-TTL, LVDS...)

Front connectors :

- ►1 Giga Ethernet port (RJ45)
  - exclusive with one of the P0 port of the switch
- ►1 or 2*RS232(*)
- ►1 USB

Block Diagram



Environnement Specifications:

Please consult the **IC-De6-VMEb** page at **www.interfaceconcept.com**.

Ordering Information:

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

This document supersedes any earlier documentation relating to the products referred to herein. The information contained in this document is current at the date of publication. It may subsequently be updated or withdrawn without notice.

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