

IC-PQ3-PMcC PowerPC PrPMC with Giga Ethernet, USB 2.0 & Solid-state Disk

IC-PQ3-PMcC is, nowadays, one of the highest integrated processing board which provides a high level of computation capability with two high-speed communication standard channels : GigaEthernet and USB2 together with an on-board Solid-State-Disk. This PrPMC mezzanine card is based on the new Freescale Power QUICC™III—MPC8548E (90nm).

This PowerQUICC™III implements the new enhanced e500 core (V2). It implements the enhanced Book E instruction set architecture and provides unprecedented levels of hardware and software debugging support.

IC-PQ3-PMcC is ideally suited for a large range of embedded applications such as :

- Processing Solution with intensive I/O transactions
- Gigabit Ethernet interfaces for high performance network connectivity or redundant failsafe links.
- Powerful control element for network switches, storage subsystems, network appliances, print and imaging devices etc.

Description

IC-PQ3-PMcC is powered by a MPC8548E, being part of the new PowerQUICC™III processor family. This new e500 core is a 2-way super-scalar and 7-stage pipeline design with out-of-order issue and execution. The core implements three integer units : two simple and one complex for integer multiply and divide. In addition, the 8548E offers a double-precision floating point processing unit. A 64-bit processing unit with 64-bit GPRs completes the processor.

The core also integrates 2 * 32KB L1 caches and a 512KB L2 cache (sharable with high-speed SRAM). The Memory Management Unit supports 32 or 36-bit address access to the physical memory.

The revolutionary on-chip 128 Gb/s non-blocking cross-bar switch fabric allows full duplex and independent connections between these sub-systems and the e500 core.

A security engine is also available for instance to perform single-pass encryption and authentication as required by security protocols such as IPsec.

IC-PQ3-PMcC integrates four enhanced 10/100/1G MAC controllers. Two or three ports are available on the front bezel and the fourth one is available on the rear IO connector.

IC-PQ3-PMcC provides an additional USB 2.0 controller with one rear port, one front, the third is connected to the Flashdrive controller.

The memory resources of the IC-PQ3-PMcC are filled out by a solid-state disk based on NandFlash with an access through an USB2 channel.

IC-PQ3-PMcC can be used in several PMC or PrPMC configurations in compliance with PCI or PCI-X 32/64-bits.



Main features

Processor Unit

- ▶ e500 core running at 1GHz (scaling up to 1.5) with :
 - L1 caches : 32KB Inst. and 32KB Data with parity
 - 512 KB of L2 integrated cache or private SRAM
 - MMU and FPU-DP capabilities
 - DMA-channel controllers
- ▶ 512MB or 1GB SDRAM-DDR2 with ECC
- ▶ 128 MB soldered Flash
- ▶ Up to 4GB of Solid-state Disk
- ▶ PPC Real Time clock and four 32 bit-timers
- ▶ RTC and 256KB BSRAM (supercap backup)

This board provides a XOR accelerator and an integrated security engine that supports DES, 3DES, MD-5, SHA-1, AES, ARC4, etc. encryption algorithms.

I/O subsystem

- ▶ Four Giga Ethernet ports with L2 acceleration and support for Jumbo frames : three (or two) auto-sensing on the front and one (or two) without transformer on PnIO.
- ▶ One USB2 (High/full speed) channels on PnIO and a second one on the front bezel (exclusive with the console connector).
- ▶ Temperature sensor
- ▶ 2 RS232 UART (front or rear connections)
- ▶ One I2C bus on PnIO
- ▶ Four GPIO

Accessories

- ▶ Engineering kit for debug : JTAG/COP and RS232 console.
- ▶ Several PMC carriers to build CPU for the main industrial standards : VME64-2eSST with our IC-PMC-VMEa, cPCI-3U with our IC-PMC-cPCIa, etc.

IC-PQ3-PMCC

PowerPC Processor PMC with Giga Ethernet & USB 2.0 & Solid-state Disk

On-board firmware

Our basic firmware takes in charge Freescale's new MPC8548 and its internal chipset initialization. This on-board firmware, based on the open-source 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. If the board acts as a Monarch PMC, the software executes an enumeration step, otherwise it waits for the PCI startup sequence from the host. In standalone mode the board directly runs the configured application.

IC_Bios

This module allows the user to access the specific IC-PQ3-PMCC hardware resources via an easy-to-use API. This module is used as a library with Vxworks 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, MAC driver for Gigabit ports. Interface Concept provides BSP for VxWorks® and Linux® operating systems. Other RTOS (LynxOS, Integrity...) can be ported on request.

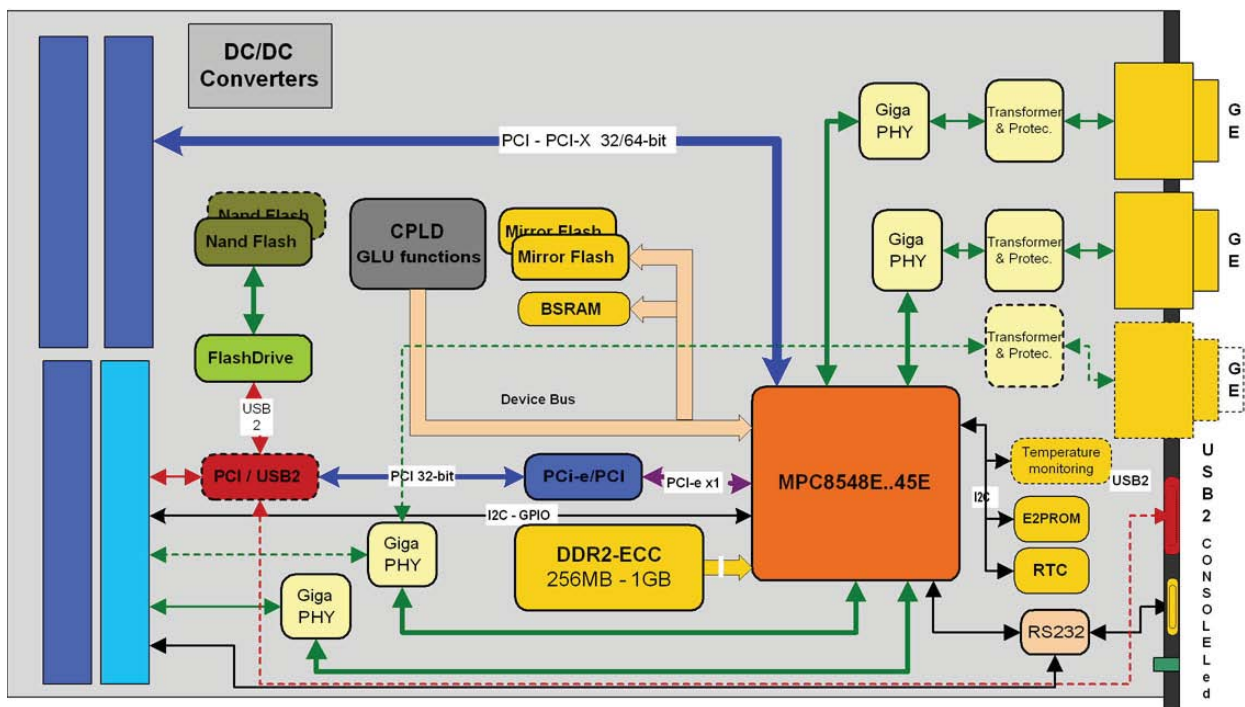
Board specifications

PMC Module single width, IEEE P1386 compliant (150 mm * 75 mm)

Weight less than 125 grs

Typical consumption in full-operational configuration 7.5W on 3.3VDC plus 7.5W on 5VDC

Block Diagram



Environnement Specifications:

Please consult the IC-PQ3-PMCC 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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