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Find the *Interface Concept IC-PQ2-PMCc* at our website: ***Click HERE***

IC-PQ2-PMCc

Embedded PowerPC module with 3 Fast Ethernet Controllers

IC-PQ2-PMCc PMC module is designed in accordance with IEEE1386 standard. It features a high performance 32 bits PowerPC processor with three Fast Ethernet controllers. A local co-processor takes in charge all communication functionalities unloa-ding thus the PowerPC processor.

IC-PQ2-PMCc can be used in conjunction with Compact-PCI, VME carriers or proprietary design. Many networks or embedded applications can be developed on-board :

- Processor module with a need of high level of integration and low power consumption.
- Low cost embedded application.
- Communication controller with Multi-Ethernet Links.
- Time stamping on the data flow, Traffic shaping, ...
- Ethernet channels with redundancy.



Description

IC-PQ2-PMCc is powered by a MPC8270, being part of the PowerQUICCII processor family. This embedded processor couples a 603e core with a RISC communication processor and three Fast Ethernet controllers. This low power design, less than 4W with three Ethernet ports, makes system integration easier.

IC-PQ2-PMCc CPU board implements a 64bits PowerPC local bus. This local bus is usable by the host via the 32 bit-PCI bus through a PowerPC-to-PCI bridge.

IC-PQ2-PMCc can be used in Monarch, Non-Monarch or in stand-alone mode. According to the application, the PMC processor module can be host or simple station.

IC-PQ2-PMCc provides three full-duplex 802.3 and Fast Ethernet controllers associated to three PHY 10/100TX interfaces. Each controller implements a local FIFO and DMA channel and supports the promiscuous mode.

IC-PQ2-PMCc is specially designed for industrial environment as it is available in extended and rugged versions with coating. A temperature sensor monitors the operational constraints. Surge protections implemented on each Ethernet lines make this board particularly fitted to harsh conditions.

IC-PQ2-PMCc provides four multi-purpose serial controllers (each with a data rate up to 10Mbits) on the Pn4 rear I/O or the reverse optional Pn3 connector. SPI and I²C bus are also available on these connectors. In addition Pn3 provides several GPIO.

IC-PQ2-PMCc is fully backward compatible with the IC-PQ2-PMCa.

A specific engineering kit is available. It makes easier the use of the debug tools : JTAG/COP/Async RS232 port and external reset.

Main features

Processor core

- ► PPC603e with FPU 32 bits RISC architecture with : 400/450 MHz
  - 16KB Instruction Cache and 16KB Data Cache.
  - 24KB on-board fast dual-port SRAM.
  - MMU and FPU capabilities.
  - DMA-channel controllers.
- ► Up to 256MB of shared SDRAM.
- ► 128KB SRAM
- ► 8, or 32 MB of Nor Flash EPROM.
- ► 32KB SPI EEPROM
- ► Time of day Calendar clock.
- ► Real Time clock and four 32 bit-timers.
- ► PCI interface Initiator, Target & Host:
  - 32 bits @ 33/66 MHz
  - 3.3V only PCI signaling Rev 2.2

I/O subsystem

- ► Up to three Ethernet 10/100TX auto-sensing ports are routed to the front panel RJ45 or Pn4 connector.
- ► One asynchronous RS232 port routed on a front mini-USB connector.
- ► On the rear I/O Pn4 and reverse Pn3 connectors :
  - 4*Multi-purpose serial controller SCC[1..4].
  - 4 TDM with 128 HDLC channels.
  - I²C bus (400Kbs), SPI and one RS232 serial port.
- ► On the reverse Pn3, several general logical I/O.
- ► On the debug connector : JTAG/COP and SMC1.

Options

- ► Up to 1GB soldered Flash Disk.
- ► Reverse Pn3 to mezzanine board connection.

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On-board firmware

IC's on-board firmware is a comprehensive set of software stored in flash memory including:

IC_Boot
This module is called by the reset vector when the board is powered up. It initializes the PowerQUICCII, the memory controller, performs the Power on self tests, the module IC_Bios, before using the PCI bridge and jumping in different applications according to the values stored in memory.

IC_Bios
This module allows the user to access the specific IC-PQ2-PMCc hardware resources via an easy-to-use API. A set of about 60 libraries functions are provided.

IC_Tools
It is a firmware monitor which allows loading files from Ethernet via Bootp, running files in RAM or flashing them. In addition it permits to display or modify the RAM data. To end with, it enables the user to perform maintenance tests.

IC-BSP or IC-LSP
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, basic serial for SMC/SCC (pseudo-driver for VxWorks®) and MAC driver for Fast Ethernet ports. The advanced CPM functionalities require specific protocol drivers.

IC-Protocol Modules
These software provide optimized drivers with new functions for serial controllers : asynchronous with frame, HDLC/SDLC, Bisync, Transparent mode, Ethernet, PPP, etc. These communication drivers are designed to minimize the buffer's copy.

Interface Concept provides BSP for VxWorks® and Linux® operating systems. Other RTOS (LynxOS,...) can be ported on request.

Powerful software debugging tools for application development on IC-PQ2-PMCa board are available for OS supported in-house.
Hosts supported by Interface Concept are Linux® OS and VxWorks.

Board specifications

Environmental
Standard, extended or rugged grade.
Refer to IC-PQ2-PMCb for conduction-cooled application.

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

Power requirements
3.3VDC only with less than 3.5 W for maximum configuration.

EM compatibility
EMC/EMI : 89/336/ECC, EN55022 ClE, EN50082-2

Interface features

PowerPC embedded core
►630 MIPS and 11.5SPEC95 @ 450MHz.
►FPU, MMU, 16KB IC & 16KB ID.
►64 KB internal SRAM.

SDRAM
►64,128 or 256 MB 64-bits wide.
►Power management with self-refresh.
►Fast access 10ns (6.1.1.1).

Flash or EEprom
►Up to 128MB Mirror-NOR Flash.
►32KB of EEPROM on the SPI bus.
►Optional Nand Flash up to 1GB.

SRAM
►128 KB

DMA controller
►4 virtual independent channels.
►8, 16, 32 bits peripheral support.
►Scatter/gather with command/data chaining.
►Transfers supported include: PCI, memory, internal I/O.

PCI interface
►32-bit, 33/66MHz PCI version 2.2 compatible.
►Signalization 3.3VDC only.
►A poll of read and write buffers.
►PCI host bridge and peripheral capabilities.
►Monarch, Non-Monarch or stand-alone mode.
► 4 independent DMA channels.
►I²O standard

Ethernet Port
►Compliant with IEEE802.3, 802.3u, 802.3x.
►10/100Base TX auto-sensing.
►Surge protection.

Other on-board functions
►RS232 (SMC) Debug port available on a front mini-USB connector.
►Temperature sensor usable via the SPI bus.
►I²C bus, SCC signals and multipurpose I/O on PMC I/O.
►On-board DC/DC generation.
►Calendar clock and supercap for backuped SRAM.
►4 multi-purposes serial controllers SCC configurable as :
  • asynchronous or synchronous ports.
  • 10Mbs Ethernet channels.
►TDM link at 2Mbs with 128 HDLC channels with TSA capability.
►These functionalities are provided without phy interface.
►USB 1.1 on SCC4 (no transceiver on board).

Accessories
►Engineering kit :
  • RS232 serial link based on SMC UART.
  • JTAG - COP
►RS232 cable (mini-USB toward SUBD9).

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Environnement Specifications:
Please refear to information below.

Ordering Information:
Please consult the **IC-PQ2-PMCc datasheet** at **www.interfaceconcept.com** (listing all products reference and envirronment grades availability).

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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