

## IC-PQ3-PMCb

### PowerQUICC™III PrPMC with Dual Giga Ethernet & USB 2.0

**IC-PQ3-PMCb** is a PrPMC mezzanine card, based on the Freescale Power QUICC™III—MPC85xx. It is designed to provide the highest level of performance and integration available today.

The PowerQUICC™III is a high-performance embedded e500 core. It implements the enhanced Book E instruction set architecture and provides unprecedented levels of hardware and software debugging support.

**IC-PQ3-PMCb** can be used in conjunction with Compact-PCI, VME carriers or proprietary design. Many highly integrated applications can be used on-board :

- Processor with high performance and I/O throughput.
- Gigabit Ethernet interfaces for high performance network connectivity or redundancy with failsafe links.
- Powerful control element for network routers and switches, storage subsystems, network appliances, and print and imaging devices etc.



#### Description

**IC-PQ3-PMCb** is powered by a MPC8541E or a MPC8555E, being part of the PowerQUICC™III processor family. This 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 (1-cycle Ops) and one complex for integer multiply, divide. A 64-bit signal processing unit with 64-bit GPRs completes the embedded processor. The core also integrates 2 \* 32KB L1 caches and a 256KB L2 cache.

**IC-PQ3-PMCb** integrates two 10/100/1G and one 10/100 Ethernet controllers, a 64-bit PCI controller, a DDR memory controller, a 4-channel DMA, a multi-channel interrupt controller.

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

**IC-PQ3-PMCb** based on the MPC8555E provides a Communication Processor Module (CPM) with additional RISC processor. The main added functions are : one Fast Ethernet channels and 3 multi-purpose serial controllers. These I/O are available on the Pn4 without transceivers. The version with a MPC8541E provides only the additional Fast Ethernet controller.

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-PMCb** (MPC8555E only) provides optionally an additional USB 2.0 controller with an on-board connector.

**IC-PQ3-PMCb** can be used in several PMC or PrPMC configurations in compliance with PCI 2.2 32/64-bits at 33/66MHz.

#### Main features

##### Processor Unit

- ▶ e500 core running from 533 or 833 MHz with :
  - L1 caches : 32KB Inst. and 32KB Data with parity.
  - 256 KB of L2 integrated cache or private SRAM.
  - MMU and FPU-SP capabilities.
  - DMA-channel controllers.
- ▶ 128 or 256MB SDRAM-DDR266 with ECC.
- ▶ 32 or 128 MB soldered Flash.
- ▶ 32KB SPI EEPROM
- ▶ PPC Real Time clock and four 32 bit-timers.
- ▶ Calendar clock with lithium cell or supercap backup.
- ▶ This board provides the following additional functionalities :
  - An integrated security engine that supports DES, 3DES, MD-5, SHA-1, AES, ARC4, etc, encryption algorithms.
  - A USB 2.0 Full/low speed host or device (8555E only).

##### I/O subsystem

- ▶ Two Ethernet 10/100/1000TX ports with L2 acceleration and support for Jumbo frames.
- ▶ One Ethernet 10/100TX Port and one without transceiver.
- ▶ Ethernet ports are routed to front RJ45 or Pn4.
- ▶ Temperature sensor
- ▶ Communication Processor Module (8555E) providing :
  - 2 additional Enhanced Multi-protocol channels (ATM, TDM with 256 HDLC).
  - 3 Async/Synchronous serial controllers.
- ▶ Extension bus for Compactflash socket.

##### Accessories

- ▶ Engineering kit for debug : JTAG/COP and RS232 console.
- ▶ Add-on Adapter to plug an extension compliant with CompactFlash Type I & II (5mm thick) cards.
- ▶ Dual PMC VME64 carrier with VME2eSST capabilities : IC-PMC-VMEa.

