PC7410 PowerPC™ Microprocessor Fact Sheet

The MPC7410 PowerPC™ microprocessor is a high-performance, low-power, 32-bit implementation of the PowerPC RISC architecture combined with a full 128-bit implementation of Motorola's AltiVec™ technology. This creates a microprocessor ideal for leading-edge computing, embedded network control, and signal processing applications. The MPC7410 offers the high-bandwidth MPX bus with minimized signal setup times and reduced idle cycles to increase maximum operating frequency to over 100 MHz, in addition to increased address and data bus bandwidth. To maintain compatibility for existing designs, the MPC7410 also supports the 60x bus protocol. MPC7410 microprocessors offer single-cycle double precision floating-point performance, full symmetric multi-processing, (SMP) capabilities, and support for up to 2MB of backside L2 cache. While the MPC7410 is software-compatible with existing PowerPC 603e, 740, and 750 microprocessors, to utilize the full potential of the AltiVec technology changes to existing source code is required.

AltiVec Technology

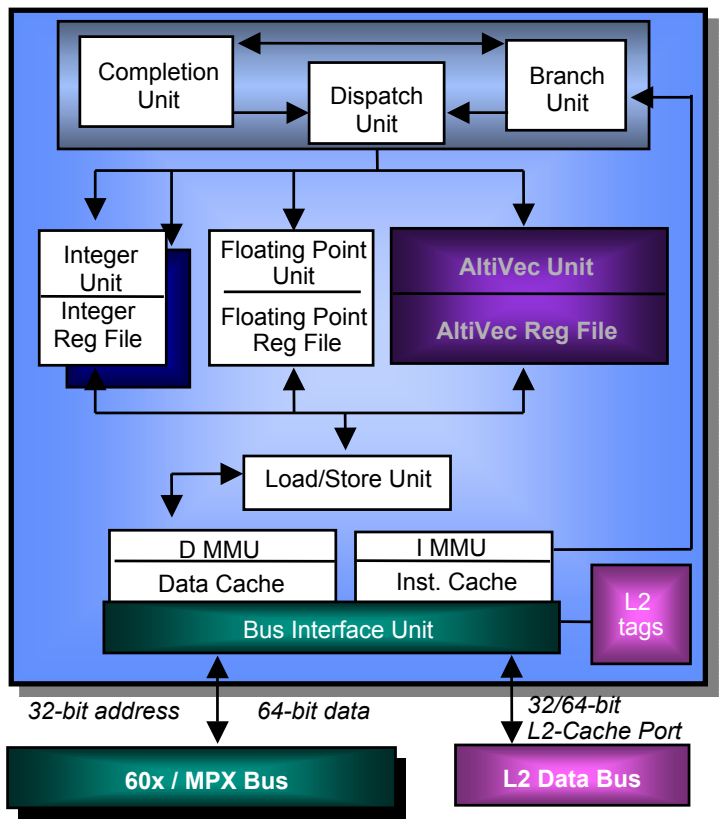
AltiVec Technology expands the capabilities of PowerPC microprocessors by providing leading-edge, general-purpose processing performance while concurrently addressing high-bandwidth data processing and algorithmic-intensive computations in a single-chip solution. AltiVec technology:

- Meets the computational demands of networking infrastructure such as multichannel modems, echo cancellation equipment, and basestation processing.
- Enables faster, more secure encryption methods optimized for the SIMD processing model
- Provides compelling performance for multimedia-oriented desktop computers, desktop publishing, and digital video processing.
- Enables real-time processing of the most demanding data streams (MPEG-2 encode, continuous speech recognition, real-time thigh-resolution 3D graphics, etc…)

PC7410 Main Features

- **Eight independent execution units :**
  - Two integer units
  - Double precision floating-point unit
  - Vector permit unit
  - Vector arithmetic logic unit
  - Load/store unit
  - System unit
  - Branch processing unit

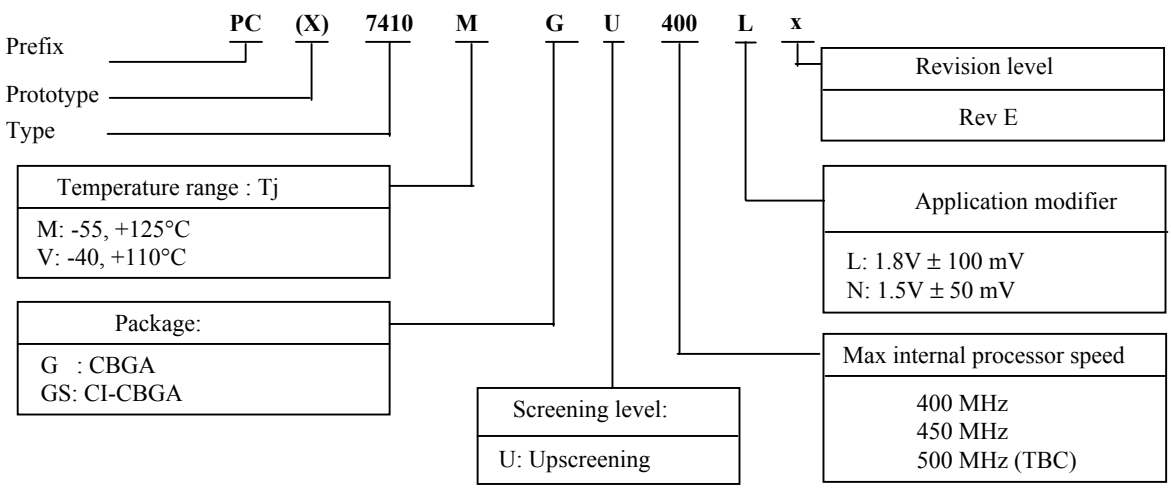
- **Cache and MMU support :**
  - 32-Kbytes physically -addressed instruction and data caches
  - 8 way set-associative
  - Dedicated L2 cache interface with on-chip L2 tags
  - Separate MMUs for instructions and data
  - Virtual memory support up to 4 Petabytes $(2)^{52}$
  - Real memory support up to 4 Gigabytes $(2)^{32}$
  - 128 entry instructions and data TLBs



PowerPC

- **Bus Interface**
  - Compatible with 60x interface
  - Support the MPX bus architecture
  - 32-bit address bus
  - 64- bit data bus
  - 12 Bus-to-Core frequency multiplier
  - Selectable interface voltages of 1.8 V or 2.5 V
- **Power Management**
  - Selectable 1.8 V interface voltage to reduce power in output buffers
  - 3 static power saving modes : doze, nap and sleep
  - Dynamic power management on decode
  - Full symmetric multiprocessing (MERSI) capability
  - Integrated thermal management unit (with software interrupt)
- **Packaging**
  - 360 pin CBGA & CI-CGA
- **Screening**
  - CBGA upscreening base upon Atmel -Grenoble standards
  - Full military temperature range (Tj = -55°C + 125°C)
  - Industrial temperature range (Tj = -40°C + 110°C)

CPU Summary	*PC7410 400 – 450 MHz*
Die Revision	1.4 = E
CPU Speeds - Internal	400 MHz
	450 MHz
CPU Bus Dividers	3x, 3.5x, 4x, 4.5x, 5x, 5.5x, 6x, 6.5x, 7x, 7.5x, 8x, 9x
Bus Interface	32-bit address, 64-bit data
Instructions per Clock	3 (2+Branch)
L1 Cache	32-KB Instruction and Data
L2 Cache	512KB, 1MB, 2MB
Core-to-L2 Frequency Divisions	1:1, 1.5:1, 2:1, 2.5:1, 3:1, 3.5:1, 4:1
Typ/Max Power Dissipation	est. 6.0W @ 500 MHz
Die Size	52 mm²
Package	360-pin Flip-Chip PBGA
	Ceramic Package if Identifications
Process	0.15 µ CMOS, 5LM
Voltage	1.8/2.5/3.3V I/O
	1.8V internal
SPECint95 (estimated)	22.8 @ 500 MHz
SPECfp95 (estimated)	17.0 @ 500 MHz
Other Performance	917 MIPS @ 500 MHz
atus	Preview
Samples	3Q/2001
Production	4Q/2001
Execution Units	Integer (2)
	Floating Point Unit
	Vector Unit
	Branch Unit
	Load/Store Unit
	System Register



For additional information and product availability:
contact your local ATMEL-Grenoble representative
or visit our web site at http://www.atmel.com

You may also contact the PowerPC technical hotline at std.hotline@gfo.atmel.com

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