PC7400 PowerPC™ Microprocessor Fact Sheet

The PC7400 PowerPC microprocessor is a high-performance, low-power, 32-bit implementation of the PowerPC Reduced Instruction Set Computer (RISC) architecture combined with a full 128-bit implementation of Motorola's AltiVec™ technology instruction set, creating a high-performance RISC microprocessor ideal for leading-edge computing, control, and signal processing functions. The MPC7400 supports the high-bandwidth MPX bus with minimized signal setup times and reduced idle cycles to increase maximum operating frequency to over 100 MHz, increased address bus bandwidth, increased data bus bandwidth, and more enhancements. To maintain backward compatibility for existing applications, thePC7400 also supports the 60x bus protocol. MPC7400 microprocessors offer single-cycle double-precession floating-point performance, provide full symmetric multiprocessing, (SMP) capabilities, and support up to 2MB of backside L2 cache. While the PC7400 is software-compatible with existing applications for PowerPC 603e™, PowerPC 740™, and PowerPC750™ microprocessors, to utilize the full potential of this AltiVec technology-enabled device, some instruction changes in existing source code are required to interface with the vector execution unit.

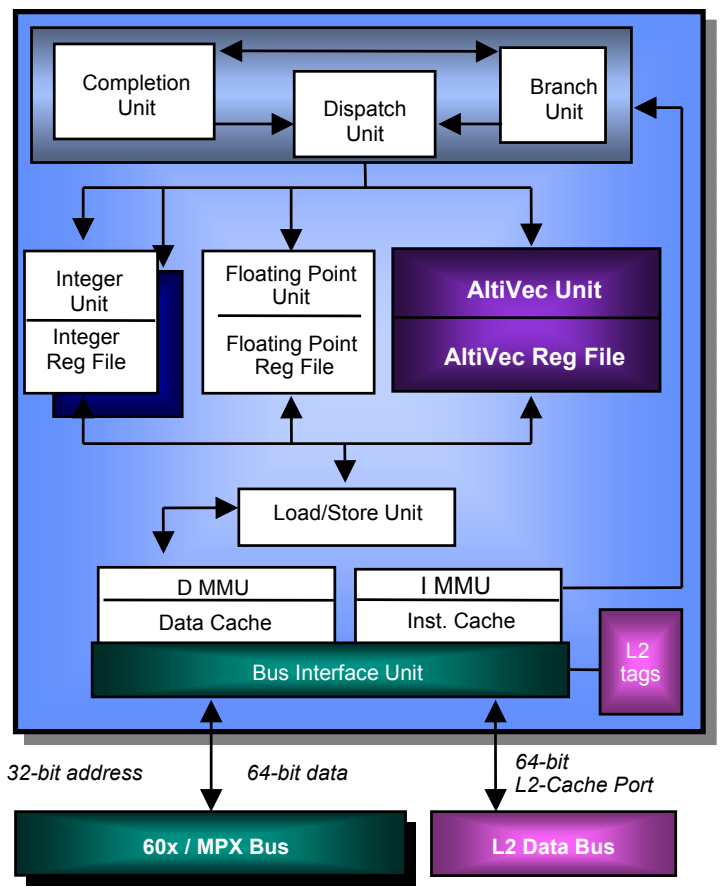
AltiVec Technology

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…)

PC7400 Main Features

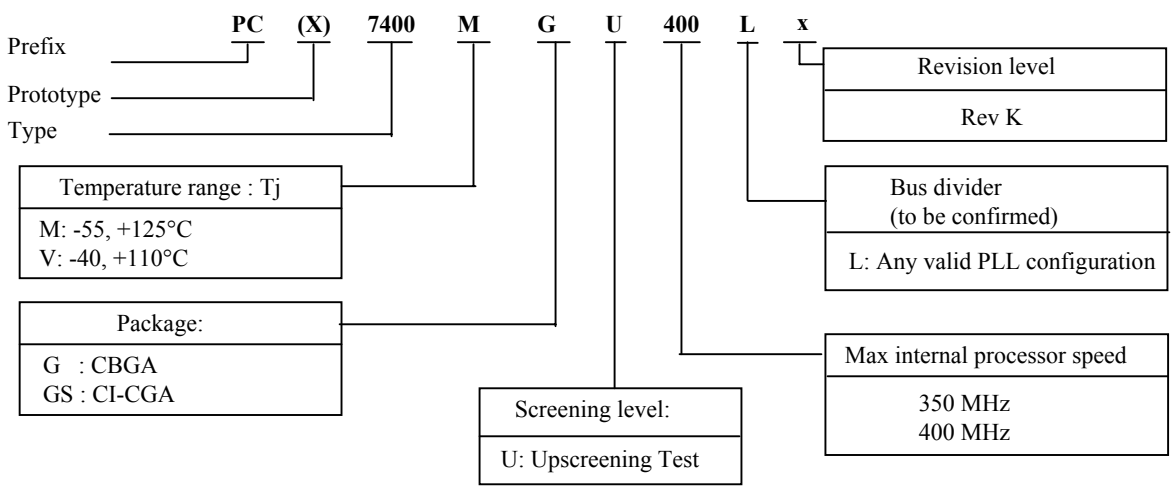
- **Seven independent execution units :**
  - Two integer units
  - Double precision floating-point unit
  - Vector unit (AltiVec™)
  - Load/store unit
  - System unit
  - Branch processing unit
- **Cache and MMU support :**
  - 32-Kbytes physically -addressed instruction and data caches
  - 8 way set-associative
  - Dedicated L2 cache interface with on-chip L2 tags
  - Separate memory management units (MMU) for instructions and data
  - Virtual memory support up to 4 Petabytes (2^{52})
  - Real memory support up to 4 Gigabytes (2^{52})
  - 128 - entry instruction and data TLBs



PowerPC

- **Bus Interface**
  - Compatible with 60x processor 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 3.3 V
- **Power Management**
  - Selectable 1.8 V interface voltage 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
- **Packaging**
  - 360 pin CBGA & CI-CGA
- **Screening**
  - CBGA upscreening based upon Atmel -Grenoble standards
  - Full military temperature range (Tj = -55°C + 125°C)
  - Industrial temperature range (Tj = -40°C + 110°C)

CPU Summary	*PC7400 350-400 MHz*
Die Revision	2.9 = K
CPU Speeds – Internal	350 MHz
	400 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	5.0W/11.5W @ 400 MHZ
Die Size	83 mm²
Package	360-pin Flip-Chip CBGA
	360-pin Flip-Chip CI-CGA
Process	0.18 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 MHs
Status	Active
Samples	Now
Production	Now
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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