

64-Bit MIPS RISC Microprocessor with Integrated L2 Cache

FEATURES

- Dual issue symmetric superscalar microprocessor with instruction prefetch optimized for system level price/performance:
 - 533, 600 MHz operating frequency.
 - >1380 Dhrystone 2.1 MIPS @ 600 MHz.
- High-performance system interface:
 - 1600 Mbyte/s peak throughput.
 - 200 MHz maximum frequency using HSTL signaling on the SysAD bus.
 - Multiplexed address/data bus (SysAD) supports 1.5 V, 2.5 V, 3.3 V I/O logic.
 - Processor clock multipliers 2, 2.5, 3, 3.5, 4, 4.5, 5, 6, 7, 8, 9.
- Integrated primary and secondary caches:
 - All are 4-way set associative with 32-byte line size.

- 16 Kbytes instruction, 16 Kbytes data, 256 Kbytes on-chip secondary.
- Per line cache locking in primaries and secondary.
- Fast Packet Cache increases system efficiency in networking applications.

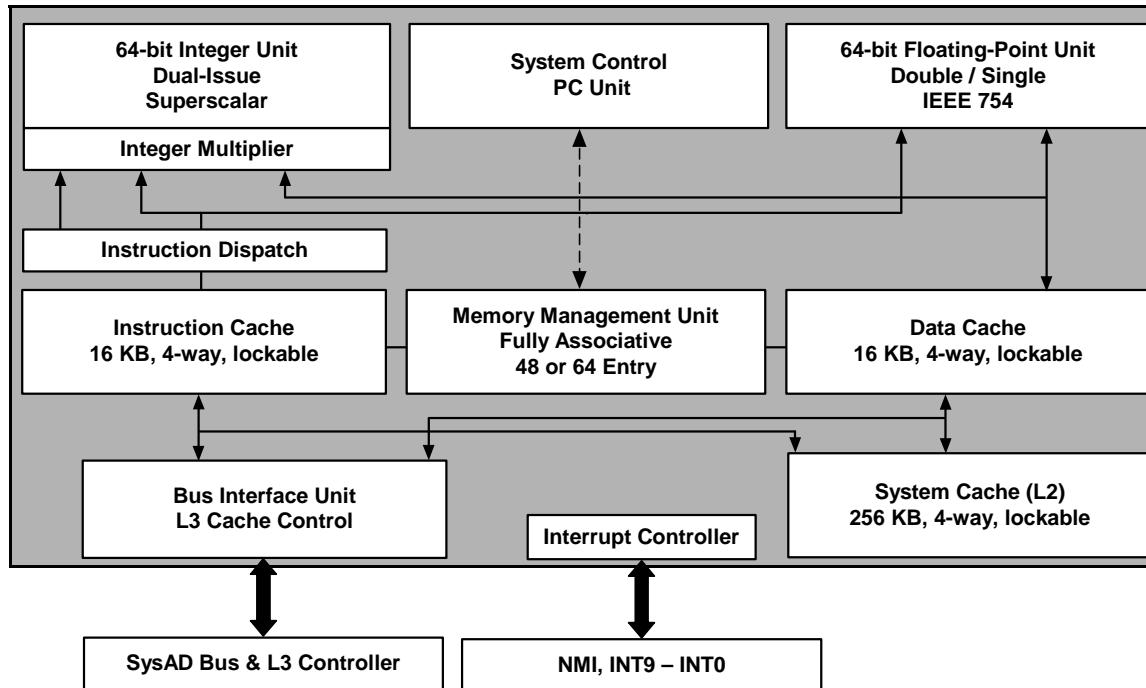
Integrated external cache controller (up to 64 Mbytes).

High-performance floating-point unit - 1600 MFLOPS maximum:

- Single cycle repeat rate for common single-precision operations and some double-precision operations.
- Single cycle repeat rate for single-precision combined multiply-add operations.
- Two cycle repeat rate for double-precision multiply and double-precision combined multiply-add operations.

- MIPS IV superset instruction set architecture:
 - Data PREFETCH instruction allows the processor to overlap cache miss latency and instruction execution.
 - Single-cycle floating-point multiply-add.
- Integrated memory management unit:
 - Fully associative joint TLB (shared by I and D translations).
 - 64/48 dual entries map 128/96 pages.
 - Variable page size.
- Embedded application enhancements:
 - Specialized DSP integer Multiply-Accumulate instructions, (MAD/MADU) and three-operand multiply instruction (MUL).
 - I&D Test/Break-point (Watch) registers for emulation & debug.
 - Performance counter for system and software tuning & debug.
 - 14 fully prioritized vectored interrupts - 10 external, 2 internal, 2 software.

BLOCK DIAGRAM



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PACKAGING

- Fully Static 0.13 μ CMOS design with dynamic power down logic.
- 304-pin TBGA package, 31 x 31 mm.
- Lead-free (Pb-free) option available.
- Pin compatible with RM5271, RM7000, RM7000A and RM7000B.

DEVELOPMENT TOOLS

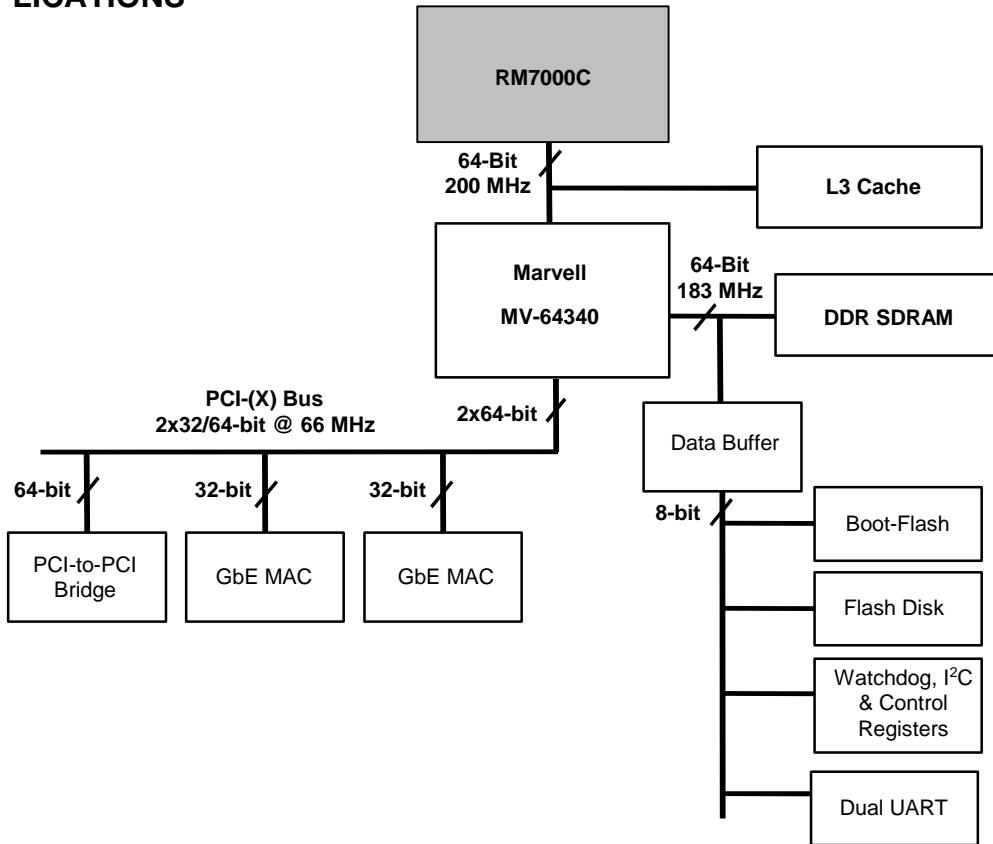
- Operating Systems:
 - Linux by MontaVista and Red Hat
 - VxWorks by Wind River Systems
 - Nucleus by Accelerated Technology
 - Neutrino by QNX Software Systems
- Compiler Suites
 - GNU
 - MIPS Technologies

- Green Hills Software
- Red Hat
- Evaluation Boards and Companion Chips
 - Marvell Semiconductor
 - System controllers: MV-64340, GT-64240, GT-96122
 - Evaluation platforms: EV-64340, EV-64240.
- Momentum Computer
 - Ocelot-C Compact PCI Development Platform
- Logic Analyzers and Emulation
 - HP
 - Tektronix
 - Corelis
 - Crescent Heart Software

APPLICATIONS

- Voice Gateways
- Multi-Service Access Platforms
- DSLAMs/Access Concentrators
- Remote Access Switches
- Web Switches
- Layer 3 Switches
- Backbone Switches/Routers
- RAIDs
- Set Top Boxes
- Networked Printers
- Cellular Base Stations

TYPICAL APPLICATIONS



Head Office:
 PMC-Sierra, Inc.
 8555 Baxter Place
 Burnaby, B.C. V5A 4V7
 Canada
 Tel: 1.604.415.6000
 Fax: 1.604.415.6200

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