

# 64-Bit MIPS RISC Microprocessor with Integrated L2 Cache

#### **FEATURES**

- Dual-Issue symmetric superscalar microprocessor
  - 600MHz max CPU frequency
  - Capable of issuing two instructions per clock cycle
- Integrated primary and secondary caches
  - 16KB Instruction, 16KB Data, and 256KB on-chip secondary
  - All are 4-way set associative with 32-byte line size
  - Per-line locking in primary and secondary caches
  - Fast Packet Cache<sup>™</sup> increases system efficiency in networking applications
- · Integrated external cache controller
  - Allows up to 64Mbyte of external cache for applications with large data sets
  - Enhanced protocol eliminates requirement for TAG RAMS
- High-performance system interface

- 1600 Mbyte per-second peak throughput
- 200 MHz max. freq., HSTL multiplexed address/data bus (SysAD200)
- Supports two outstanding reads with out-of-order return
- · High-performance floating-point unit
  - 1200 MFLOPS maximum
  - IEEE754 compliant single and double precision floating-point operations
- · 64-bit MIPS instruction set architecture
  - Data PREFETCH instruction allows the processor to overlap cache miss latency and instruction execution
  - Single-cycle floating-point multiplyadd
- Integrated memory management unit
  - · Fully associative TLB
  - 64/48 dual entries map 128/96 pages
  - Variable page size
- Embedded application enhancements

- Fourteen fully prioritized vectored interrupts-10 external, 2 internal, 2 software
- Specialized DSP integer Multiply-Accumulate instructions (MAD/MADU), and three-operand Multiply instruction (MUL)
- I and D Test/Break-point (Watch) registers for emulation and debug
- Performance counter for system and software tuning and debug

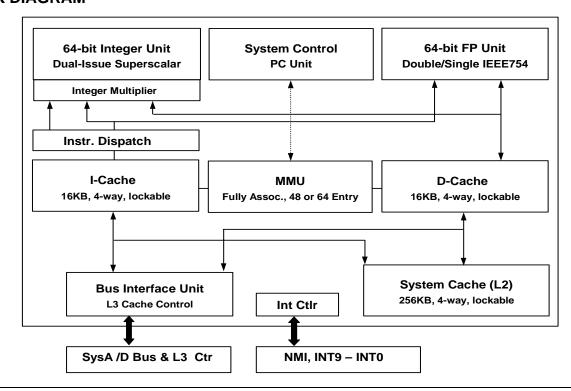
### **PACKAGING**

- Fully Static 0.13µ CMOS design with dynamic power down logic
- 304 pin TBGA package, 31x31 mm

#### **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

## **BLOCK DIAGRAM**



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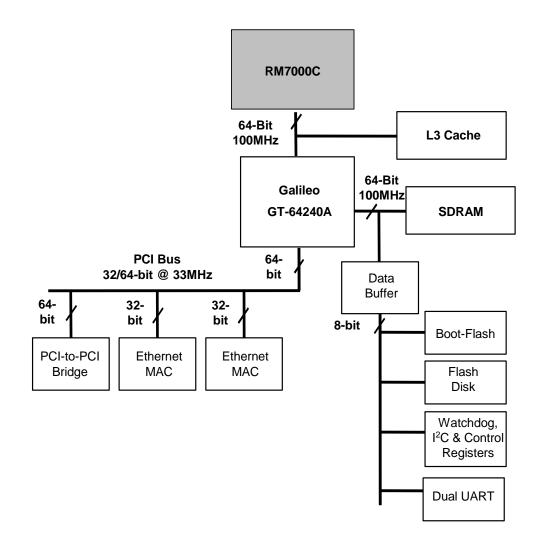
- Algorithmics
- · Green Hills Software
- · Red Hat
- Evaluation Boards and Companion Chips
  - · Galileo Technology
    - EV-64120A-7000: 32/64-bit, 33/66MHz PCI
    - EV-64240-7000: 32/64-bit, 33/66MHz PCI
  - · Momentum Computer

- Ocelot: 6U RM7000 Compact PCI Single Board Computer
- · 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 APPLICATION



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