RAD750® 3U CompactPCI single-board computer

The 3U CompactPCI standard single-board computer, available in flight and prototype versions, employs the PowerPC RAD750 microprocessor, the radiation-hardened version of the IBM PowerPC750. The companion PowerPC bridge ASIC provides access to the memory and the PCI version 2.2 backplane bus.

Software features
– Example startup ROM and VxWorks board support package provided for all hardware configurations.
– Green Hills Software's INTEGRITY real-time operating system can serve as an alternate board-support package.
– Hardware reference manuals and software users guide provided.
– Software developed for the RAD6000® processor is easily ported to the RAD750.
– All compilers currently available for the commercial PowerPC 750 are fully compatible with the RAD750 processor.
– Operating systems for PowerPC 750-based computers are easily ported to RAD750 computers. VxWorks and INTEGRITY are both currently available.
– Virtutech offers a RAD750 simulator.

Form factor
– CompactPCI 3U (100 mm x 160 mm)
– Weight: 549 grams

Memory
– 128 MB SDRAM, 256 kB SUROM

Radiation-hardness
– Total dose: >100 Krad (Si)
– SEU: 1.9 E-4 errors/card-day (90% W. C. GEO) varies with orbit
– Latchup-immune

Performance
– >260 Dhrystone 2.1 MIPS @ 132 MHz
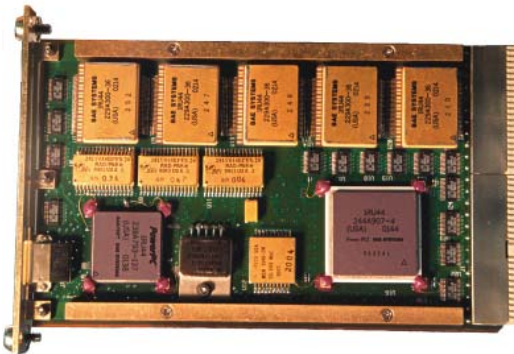– 4.3 SPECint95 4.6 SPECfp95 at 132 MHz

Power supply
– 3.3V ± 10%
– (2.5V generated via on-board regulator)

Power dissipation
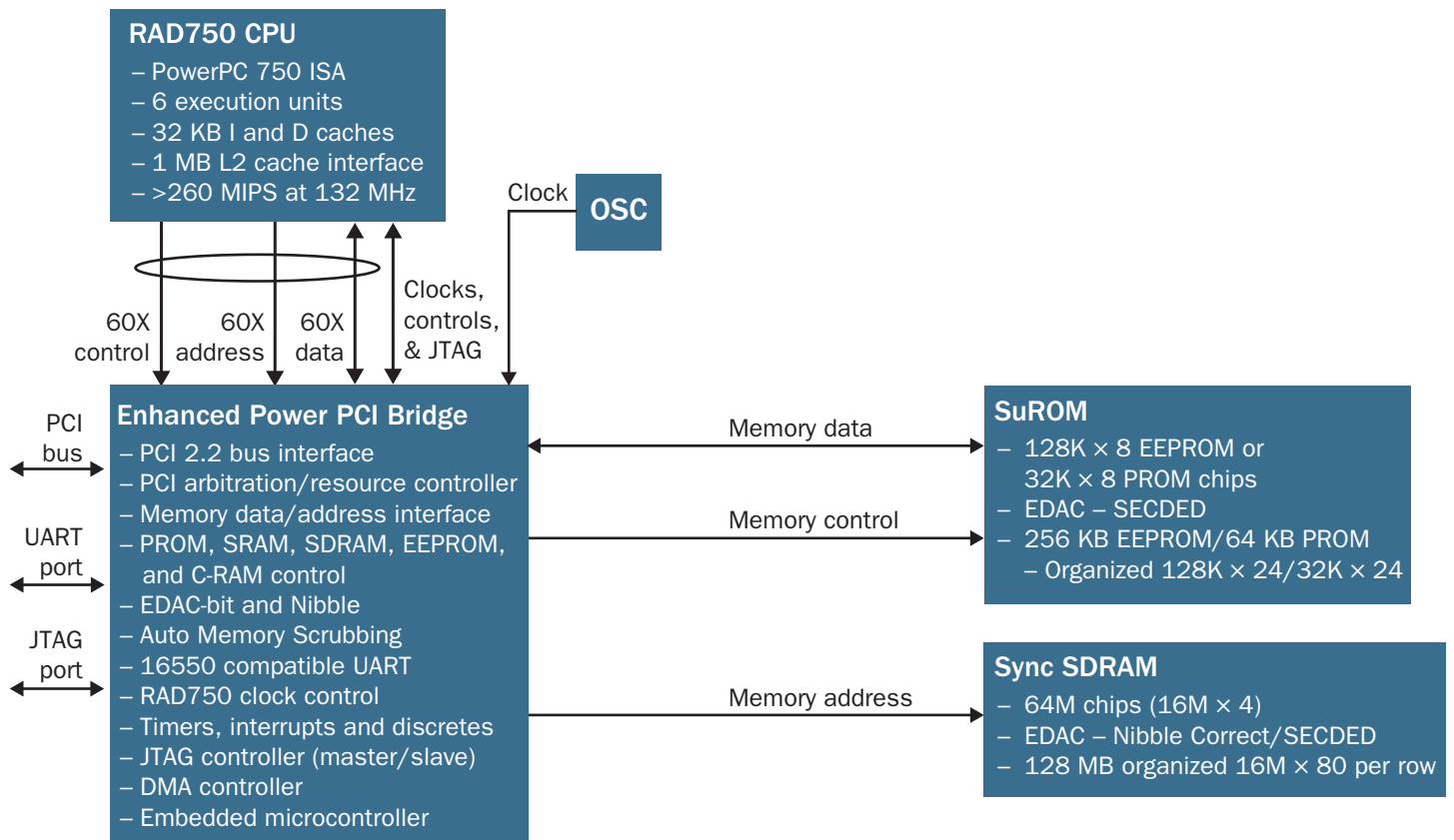– <10.8W

Rail temperature range
– -55°C to +70°C

BAE SYSTEMS

RAD750 CPU

– PowerPC 750 ISA
– 6 execution units
– 32 KB I and D caches
– 1 MB L2 cache interface
– >260 MIPS at 132 MHz

Clock

OSC

Clocks, controls, & JTAG

60X control   60X address   60X data

PCI bus

UART port

JTAG port

Enhanced Power PCI Bridge

– PCI 2.2 bus interface
– PCI arbitration/resource controller
– Memory data/address interface
– PROM, SRAM, SDRAM, EEPROM, and C-RAM control
– EDAC-bit and Nibble
– Auto Memory Scrubbing
– 16550 compatible UART
– RAD750 clock control
– Timers, interrupts and discretes
– JTAG controller (master/slave)
– DMA controller
– Embedded microcontroller

Memory data

SuROM

– 128K × 8 EEPROM or 32K × 8 PROM chips
– EDAC – SECDED
– 256 KB EEPROM/64 KB PROM
  – Organized 128K × 24/32K × 24

Memory control

Memory address

Sync SDRAM

– 64M chips (16M × 4)
– EDAC – Nibble Correct/SECDED
– 128 MB organized 16M × 80 per row

RAD750® FAMILY OF PRODUCTS

RAD750® radiation-hardened powerPC microprocessor

RAD750® 6U CompactPCI single-board computer

RAD750® 6U CompactPCI extended single-board computer

RAD750® 3U CompactPCI single-board computer

RAD750® space computers Virtutech Simics virtual platform

RAD750® custom single-board computers

FOR MORE INFORMATION, CONTACT:

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