BRE440™ RadHard CPU
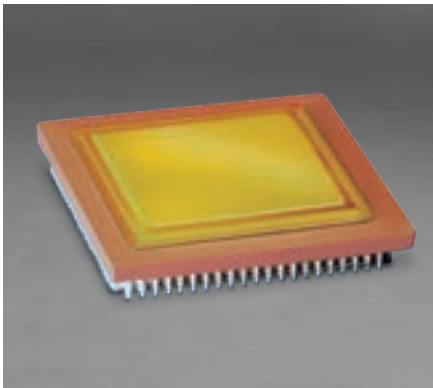
The Moog Broad Reach BRE440 CPU meets the requirements of a wide variety space and high reliability applications. The BRE440 CPU is a fully radiation hardened implementation of the PowerPC 440 processor core in a true System-On-a-Chip design, including floating point unit.

The BRE440 integrates a mix of peripheral controllers by implementing IBM's high speed CoreConnect™ technology and contains the PPC440x5 version of the PPC440 core. The BRE440 Embedded Processor provides high performance and low power consumption. The BRE440 CPU executes at sustained speeds approaching two instructions per cycle. On-chip peripherals reduce chip count and design complexity in systems and improve system throughput. The 440 core combined with wide peripheral mix provides an ideal foundation for compact systems.

The BRE440 Chip represents the culmination of several years of internal development effort aimed at producing the highest level of space based processing capabilities.

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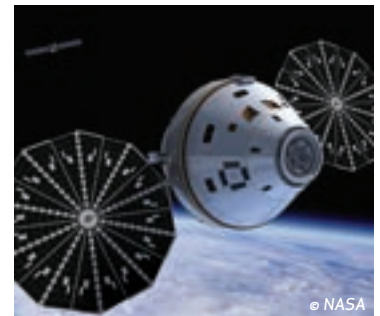
BRE440™ RadHard CPU

SPECIFICATIONS

Features

High Performance IBM PPC440 Core, 2 MIPS/MHz
ANSI/IEEE 754-1985 compliant FPU
Manufactured on Honeywell 150nm HX5000 Radiation Hardened ASIC Line
Superscalar, Dual Issue, 32-bit RISC, Book E Compliant

Memory

32 kByte L1 Instruction & Data Caches
256 kByte unified L2 Cache (can be configured as general purpose SRAM)
On-Chip 8 kByte SRAM
High Bandwidth Main Memory Access with Error Detection and Correction

Interfaces

PCI Interface for Peripheral Communication
PCI Arbitration for up to 6 External Peripherals (Clock Distribution)
4 Channel DMA with Scatter/Gather Capability
32-Bit Peripheral Bus with EDAC
32-Bit DDR DRAM Bus with EDAC
External Expansion Bus
2 Ethernet Media Access Controllers
2 UART Ports (16750 Compatible)
JTAG

Radiation Capability

TID >1 MRad; Latch-up immune
SEU >40 Years/Upset (Adams 90% worst case environment)

Core Clock Frequency

100 MHz @ -55°C to 125°C
133 MHz @ -10°C to 80°C
Typical Power 8.0W @ 133MHz
Typical Power 3.5W @ 83MHz

Availability

Available in many of Moog Broad Reach next generation avionics and board products.
Engineering and flight units available now.

Engineering and flight units available now.
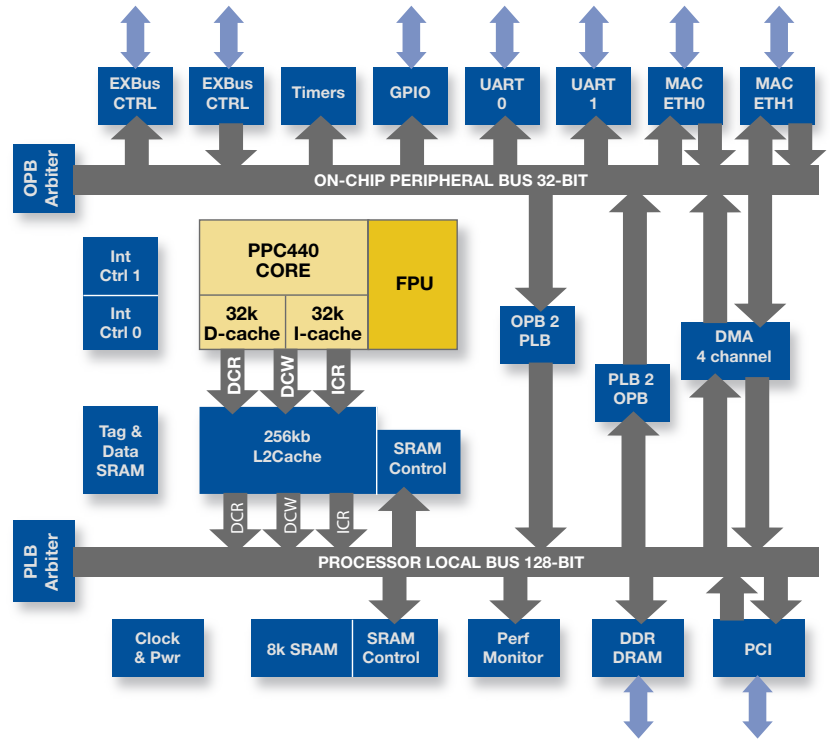
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