

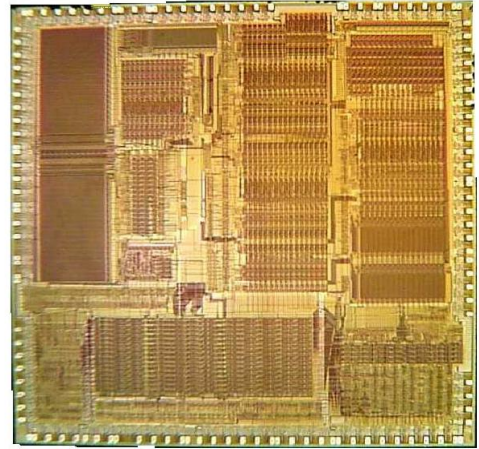
# HX1750

## MIL-STD-1750A Microprocessor

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The HX1750 is a true single chip implementation of the MIL-STD-1750A instruction set architecture, fabricated on Honeywell's Silicon on Insulator CMOS (SOI-IV) process. It combines a fast 16 bit microprocessor, a 40 bit floating point processor, counters, timers and other peripheral interface logic – all on a single chip. Advanced architectural features, innovative circuit design, and the high density and performance characteristics of the SOI-IV process enable device operation up to 40 MHz over the full military temperature range, even after exposure to ionizing radiation.

The HX1750 offers a wide range of features that provide for ease of use, versatility and minimum external components. Simplified memory interface and adjustable cycle times allow the use of slower, low cost memory devices.



Most of the options in the MIL-STD-1750A standard are implemented on the HX1750 chip as listed below:

- Discrete I/O Commands
- DMA Commands
- Console Interface Commands
- Programmed I/O Commands
- IOIC Registers
- Expanded Memory Addressing
- Memory Block Protect
- Two Interval Timers
- Trigger Go Counter
- Start-ROM Support

## FEATURES

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- Fabricated on Honeywell's Radiation Hardened 0.65 $\mu$ m  $L_{eff}$  SOI CMOS Silicon On Insulator (SOI-IV) process
- Single Supply 5V
- TTL and CMOS Compatible I/O
- 3.3 MIPS DAIS Mix Including Floating Point
- Maximum Clock Rates 40 MHz, Fully Static
- Separate Address and Data I/O Busses
- Two Programmable Timers
- Trigger-go Counter
- Sixteen Levels of Vectored Interrupts
- I/O Maintenance Console Interface
- Expanded Addressing to 1Meg with MMU
- Total Dose Hardness  $>1 \times 10^5$  rad(Si) (by process)
- Soft Error Rate  $< 1 \times 10^{-5}$  Errors/1750-day (equivalent to  $< 1 \times 10^{-9}$  errors/bit-day) (projected based on library data)
- No Latchup
- Low Power

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Several features are incorporated into the HX1750 to simplify the system interface, minimize external components, reduce external memory speed requirements, and ease software development.

- A separate address and data bus eliminates the need for external PIC chip, address demultiplexers and latches.
- Fast address and data buffers provide signals early in the cycle allowing use of slower, low cost memories.
- Enhanced Maintenance Console.
- Standard memory addressing to 64K – expanded to 1Meg with MMU.
- Access Lock and Key implemented.
- Simple DMA control implemented
- Coprocessor supported in separate address space.
- Variable System clock – internal programmable divider (tie Scale pin high or low) cuts the internal bus cycle time in half.
- Data, Instruction, and I/O access time independently programmable.
- Full synchronous or asynchronous operation – programmable wait states for instructions,

data, and I/O. Asynchronous operation is slaved to an external RDY signal.

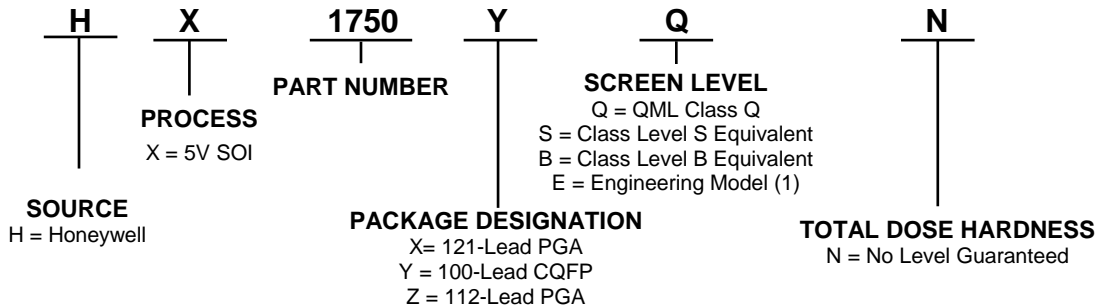
- Enhanced set of Built-In-Functions.
- Enhanced Configuration Register.
- Enhanced Maintenance Console – with single step operation.

The processor executes all mandatory MIL-STD-1750A instructions including floating point. Interrupts, fault handling, memory expansion, and I/O and the optional instructions related to these operations are also supported in accordance with MIL-STD-1750A. All instructions are re-startable after access faults for true demand paging operation.

## RADIATION CHARACTERISTICS

The HX1750 has inherent radiation tolerance because it is manufactured on SOI-IV CMOS technology and has many cells from a radiation hardened library. However, full radiation analysis and verification was not performed and therefore the radiation performance is not guaranteed.

## ORDERING INFORMATION



Note 1 – Engineering Model Description: Parameters are tested -55°C to 125°C and 24 hour burn-in.

## Standard Microcircuit Drawing

The HX1750 Microprocessor can be ordered under the SMD drawing 5962-0520701.

Orders may be faxed to 763-954-2051. Please contact our Customer Service Representative at 1-800-323-8295 for further information.

For more information about Honeywell's family of radiation hardened integrated circuit products and services, visit [www.honeywellmicroelectronics.com/](http://www.honeywellmicroelectronics.com/).

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