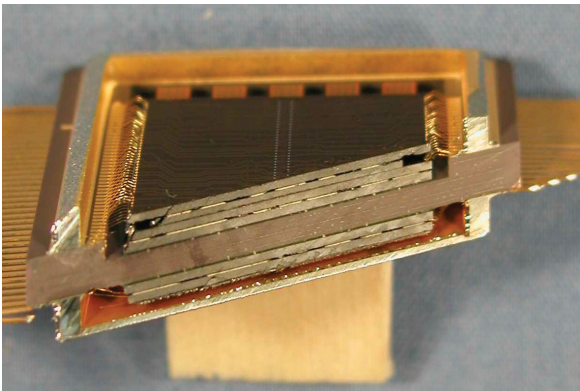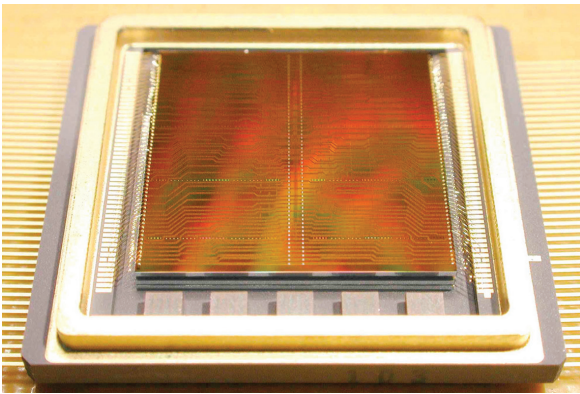# Millennium 4 Mb
# radiation–hardened SRAM





## High-speed memory product

The Millennium SRAM is our next-generation high-speed memory product for users in the space community.

## Description

Capable of withstanding the effects of natural space, Millennium has total dose tolerance of greater than 200 Krads and an upset rate of less than 1E-10 upsets per bit-day. Prompt dose levels are >1E9 rad/sec. Flight hardware being delivered now.

## Key features

- Read/write access times of 15-17 ns
- Operation from -55 degrees Celsius to +125 degrees Celsius
- Supply voltage of 2.5V
- I/O voltage of 2.5V or 3.3V
- Standby current 20-50 mA
- Asynchronous operation
- Prototype and flight flows
- Latch-up immune
- Operating power <13 mW per MHz

## System definitions

A:0-18 Address input pins that select a particular 8-bit word within the memory array.

DQ:0-7 Bi-directional data pins that serve as data outputs during a read operation and as data inputs during a write operation.

S Negative chip select at a low level allows normal read or write operation. At a high level, S forces the SRAM to a precharge condition, holds the data output drivers in a high-impedance state, and disables only the data input buffers. If this signal is not used, it must be connected to GND.

LS/LD LS0, LS1 selects and LD0, LD1 decode inputs provide externally programmable bankselect decode capability.

W Negative write enable at a low level activates a write operation and holds the data output drivers in a high-impedance state. At a high-level W allows normal read operation.

G Negative output enable at a high level holds the data output drivers in a high-impedance state. At a low level, the data output driver state is defined by S, W, and E. If this signal is not used, it must be connected to GND.

E Chip enable at a high level allows normal operation. At a low level, E forces the SRAM to a precharge condition, holds the data output drivers in a high-impedance state, and disables all the input buffers except the S input buffer. If this signal is not used, it must be connected to VDD.
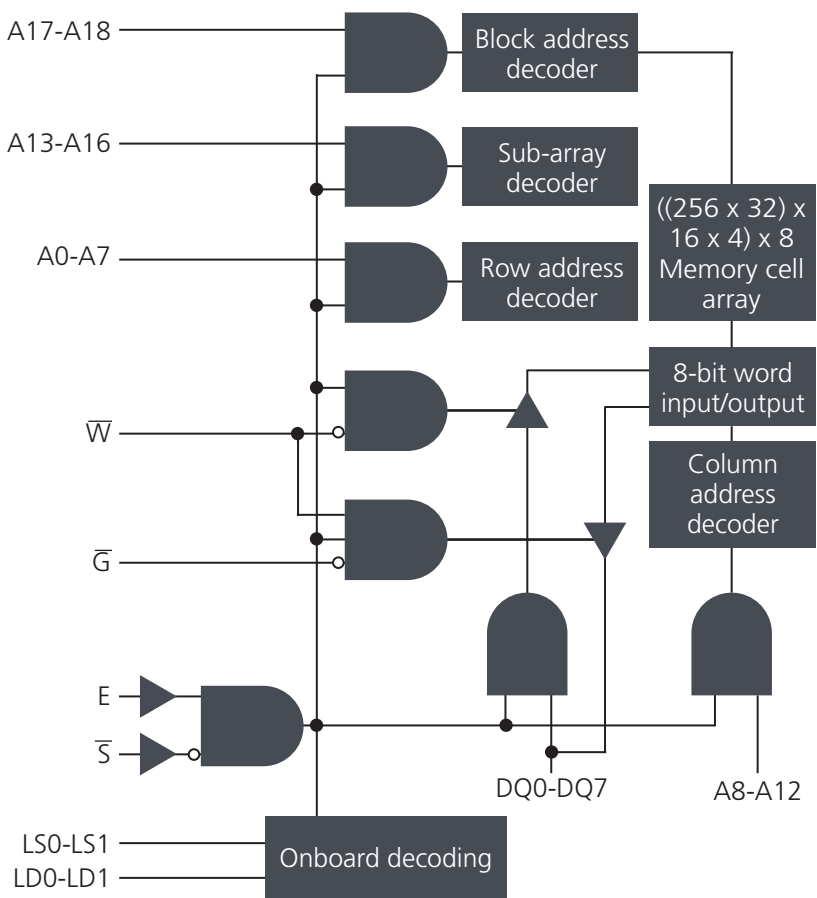


## Specifications

| Millennium 4 Mb family of products | 4 Mb single chip, up to 20 Mb multi-chip modules available |
| --- | --- |
| | 512K × 8 SRAM<br>– 40-lead flatpack<br>– 36-lead flatpack |
| | 512K × 32 SRAM<br>– 84-lead flatpack |
| | 512K × 40 SRAM<br>– 84-lead flatpack |
| | 1M × 8 and 2M × 8 configurations available |

BAE Systems | Millennium 4 Mb radiation-hardened SRAM