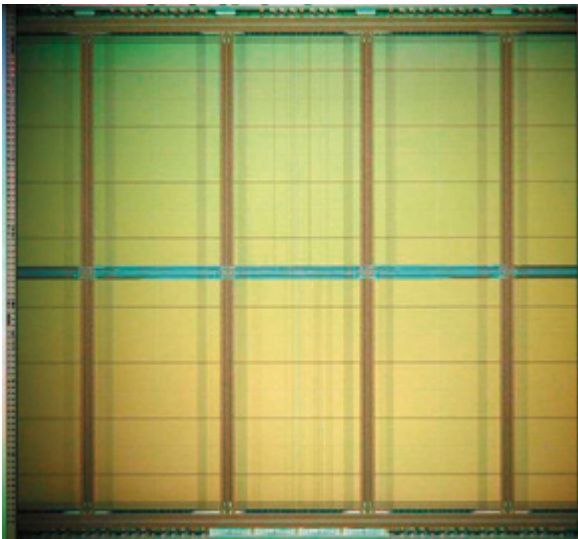


# Magnum 4 Mb radiation-hardened SRAM



## High-speed memory product

Magnum is BAE Systems' third-generation 3.3V radiation-hardened, static random-access memory, designed to withstand the effects of natural space, and radiation-hardened environments.

## Key features

- Standard microcircuit drawing #596207210
- DoD Qualified Manufacturer List compliant part
- Read and write access time 25 to 30 ns
- Single power supply 3.3V  $\pm$ 10 percent
- Standby current 5 to 15 mA
- Operating temperature range -55 degrees Celsius to 125 degrees Celsius
- Operating power < 23 mW per MHz
- Asynchronous operation
- Radiation levels
  - Total ionizing dose  $>5 \times 10^5$  rad (Si)
  - Single-event upset  $< 1 \times 10^{-10}$  bit/day (90% Geo)
  - Prompt dose upset  $> 1 \times 10^9$  rad (Si)/s
  - Prompt dose survival  $> 1 \times 10^{12}$  rad (Si)/s
  - Neutron fluence  $> 1 \times 10^{13}$  n/cm<sup>2</sup>
  - Latchup immune

## System definitions

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

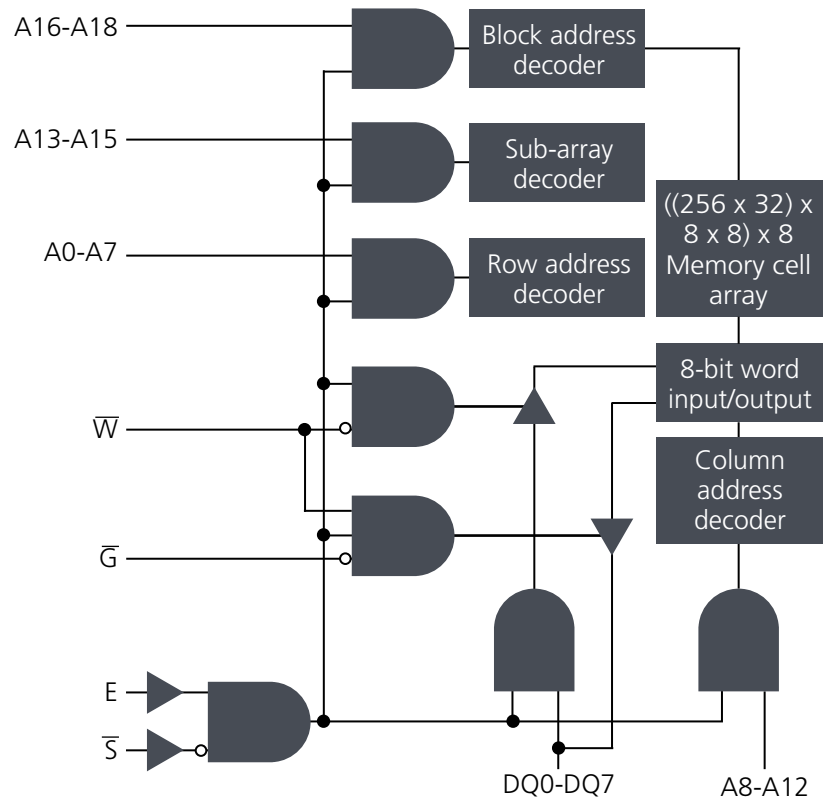
**DQ:0-7** Bi-directional data pins that serve as data outputs during a read operation and as data inputs during a write operation.

**$\bar{S}$**  Negative chip select at a low level allows normal read or write operation. At a high level,  $\bar{S}$  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.

**$\bar{W}$**  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  $\bar{W}$  allows normal read operation.

**$\bar{G}$**  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  $\bar{S}$ ,  $\bar{W}$ , 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

Magnum 4 Mb family of products	4 Mb single-chip, up to 16 Mb multi-chip module packages available
	512K $\times$ 8 SRAM – 40-lead flatpack
	512K $\times$ 16 SRAM – 64-lead flatpack
	1M $\times$ 16 SRAM – 64-lead flatpack
	512K $\times$ 32 SRAM – 84-lead flatpack

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