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 ±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 × 10^5 rad (Si)
  - Single-event upset < 1 × 10^{-10} bit/day (90% Geo)
  - Prompt dose upset > 1 × 10^9 rad (Si)/s
  - Prompt dose survival > 1 × 10^{12} rad (Si)/s
  - Neutron fluence > 1 × 10^{13} n/cm²
  - 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.

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.

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

<table>
<thead>
<tr>
<th>Magnum 4 Mb family of products</th>
<th>4 Mb single-chip, up to 16 Mb multi-chip module packages available</th>
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</thead>
<tbody>
<tr>
<td>512K x 8 SRAM</td>
<td>40-lead flatpack</td>
</tr>
<tr>
<td>512K x 16 SRAM</td>
<td>64-lead flatpack</td>
</tr>
<tr>
<td>1M x 16 SRAM</td>
<td>64-lead flatpack</td>
</tr>
<tr>
<td>512K x 32 SRAM</td>
<td>84-lead flatpack</td>
</tr>
</tbody>
</table>

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