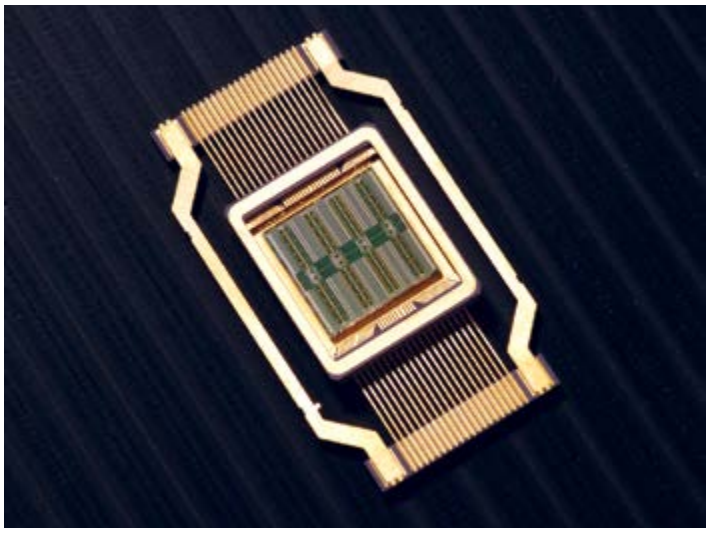
BAE SYSTEMS

C-RAM™ 4M radiation-hardened non-volatile RAM

Non-volatile memory product

The 256K × 8 radiation-hardened non-volatile RAM with a single-bit error correction (SEC) is a high-performance, 266, 144-word × 8-bit random-access, non-volatile memory with industry-standard functionality.

It is fabricated with BAE Systems' radiation-hardened, 0.25 µm bulk CMOS technology, and is designed for use in systems operating in radiation environments. This NVRAM operates over an extended temperature range and requires a single 3.3 V ±10 percent power supply.



System definitions

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

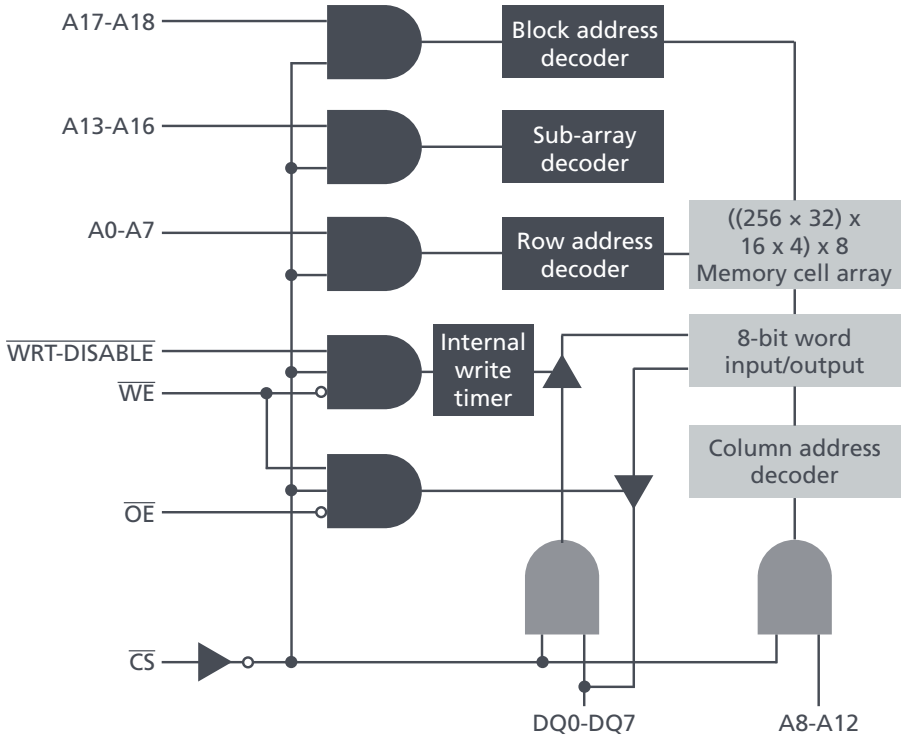
DQ:0-7 Bi-directional data pins that serve as data outputs during a read operation and as data inputs during a write operation.

$\overline{CS}$ Negative-active chip select when low level allows normal read or write operation. When high, $\overline{CS}$ forces the NVRAM to a precharge condition, holds the data output drivers in a high-impedance state, and disables write operations. If this signal is not used, it must be connected to GND.

$\overline{WE}$ Negative-active write-enable. When low (and WRT-DISABLE inactive), $\overline{WE}$ activates a write operation and holds the data output drivers in a high-impedance state. When high, $\overline{WE}$ allows normal-read operation.

$\overline{OE}$ Negative-active output-enable. When high, $\overline{OE}$ holds the data output drivers in a high-impedance state. When low, the data output driver state is defined by $\overline{CS}$ and $\overline{WE}$. If this signal is not used, it must be connected to GND.

$\overline{WRT\text{-}DISABLE}$ Negative-active write-disable. When low (power-on reset, PROM mode, etc.), disables write operations while maintaining read- operation availability. When high, $\overline{WRT\text{-}DISABLE}$ permits write operations. If this signal is not used, it must be connected to VDD.



C-RAM family of products

4 Mb single chip

256K x 8 C-RAM

40-lead flatpack (0.640 x 1.006 inches)

Also available

2 Mb (256K x 8 with ECC) monolithic and 20 Mb (512K x 40) MCM configurations

Key features

Minimum read cycle times
≤ 70 ns
Minimum write-cycle times
<1000 ns
Single power supply
3.3 V ±10 percent
Operating temperature range
-40 to 110 degrees Celsius
Low operating power
155 mW (typical) active read (70 ms)
105 mW (typical) active write (1000 ns)
60 mW (typical) standby (maximum)
Write cycle endurance
> 1e5 cycles
Data retention
0.1 years at 90 degrees Celsius
0.3 years at 85 degrees Celsius
0.9 years at 80 degrees Celsius
3.1 years at 75 degrees Celsius
11.6 years at 70 degrees Celsius
Radiation levels
Total ionizing dose: $> 5 \times 10^5$ rad (Si)
Single event upset: $< 1 \times 10^{-11}$ upsets/bit day
Neutron fluence: $> 1 \times 10^{13}$ particles/cm^2
Latchup-immune: ≤ 120 MeV-cm^2/mg

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