

C-RAM™ 2 Mb

radiation-hardened non-volatile RAM

C-RAM FAMILY OF PRODUCTS

FEATURES AND CAPABILITIES

The 256K x 8 radiation-hardened, non-volatile RAM with single-bit error correction (SEC) is a high-performance, 266,144-word x 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. The NVRAM operates over an extended temperature range and requires a single 3.3V ± 10% power supply.

- 2 Mb single chip, up to 8 Mb multi-chip module

- 256K x 8 C-RAM
 - 40-lead flatpack (0.640" x 1.006")

- 256K x 16 C-RAM
 - 88-lead flatpack (0.88" x 1.03")
 - In development

- 256K x 32 C-RAM
 - 88-lead flatpack (0.88" x 1.03")
 - In development

- Minimum read-cycle times ≤ 70 ns

- Minimum write-cycle times ≤ 1000 ns

- Single 3.3V ± 10% power supply

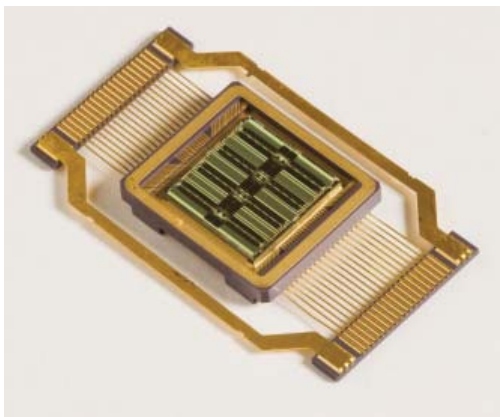
- Low operating power
 - 200 mW (typical) active read (70ns)
 - 130 mW (typical) active write (1000ns)
 - 60 mW (typical) standby (maximum)

- Operating temperatures from -40°C to 110°C

- Write-cycle endurance > 10⁵ cycles

- Data retention
 - 0.3 years at 90°C
 - 1.1 years at 85°C
 - 3.8 years at 80°C
 - 13.5 years at 75°C
 - 50 years at 70°C

- Radiation levels
 - Total ionizing dose ≥ 5 × 10⁵ rad (Si)
 - Single event upset < 1 × 10⁻¹¹ upsets/bit day
 - Neutron fluence > 1 × 10¹³ particles/cm²
 - Latchup-immune ≤ 120 MeV-cm²/mg



FUNCTIONAL DIAGRAM

A:0-17 Address input pins that select a particular 8-bit word within the memory array.

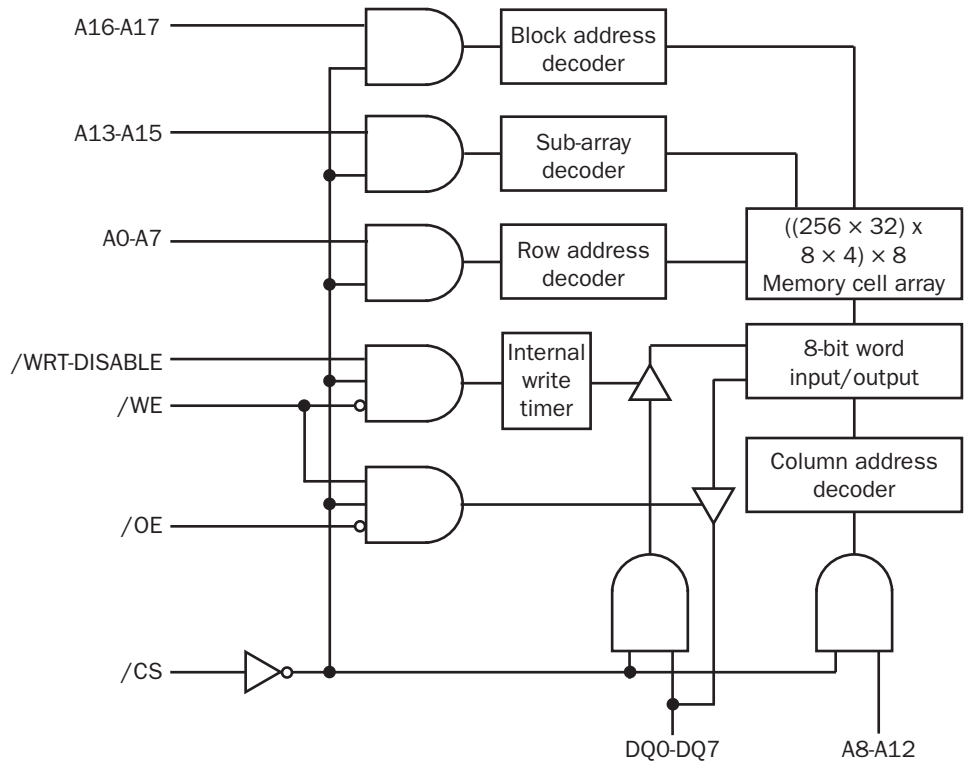
DQ:0-7 Bi-directional data pins that serve as data outputs during a read operation and as data inputs during a write operation.

/CS Negative-active chip-select, when low, allows normal read or write operation. When high, /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.

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

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

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



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