# MOS INTEGRATED CIRCUIT

# M 2316E

## 16384 BIT READ ONLY MEMORY

- SINGLE +5V ± 10% POWER SUPPLY
- ACCESS TIME 450 ns (MAX.)
- INPUTS AND OUTPUTS TTL COMPATIBLE
- THREE PROGRAMMABLE CHIP SELECTS FOR SIMPLE MEMORY EXPANSION AND SYSTEM INTERFACE
- COMPLETLY STATIC OPERATION
- THREE-STATE OUTPUT FOR DIRECT BUS INTERFACE

The M 2316E is a 16384 bit static Read Only Memory N-channel Si-Gate MOS organized as 2048 words by 8 bits. Its high bit density is ideal for large, non-volatile data storage applications such as program storage. The three-state outputs and TTL input/output levels allow for direct interface with common system bus structures.
The M 2316E is available in 24-lead dual-in-line plastic package.

## ABSOLUTE MAXIMUM RATINGS

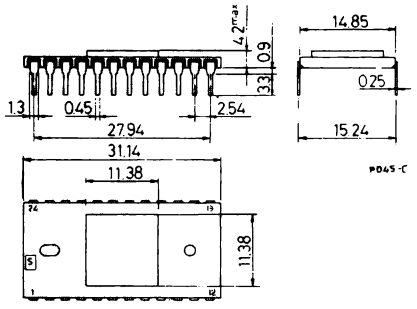
| | | | |
|---|---|---|---|
| $V_i$* | Input voltage (at any pin) | -0.5 to 7 | V |
| $P_{tot}$ | Total power dissipation | 1 | W |
| $T_{stg}$ | Storage temperature | -55 to +125 | °C |
| $T_{op}$ | Operating temperature under bias | -10 to 80 | °C |

* This voltage is with respect to Ground

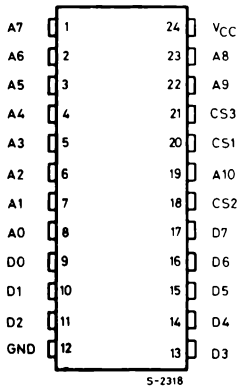
**ORDERING NUMBER:** M 2316E B1 for dual in-line plastic package

## MECHANICAL DATA

Dimensions in mm



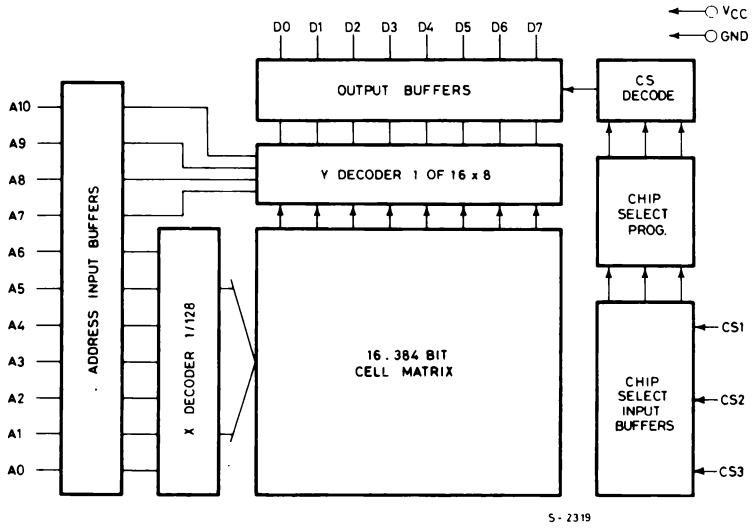
## PIN CONNECTIONS




## PIN NAMES

| | |
|---|---|
| A0 - A10 | ADDRESS INPUTS |
| D0 - D7 | DATA OUTPUTS |
| CS1 - CS3 | CHIP SELECT INPUTS |

## BLOCK DIAGRAM



## STATIC ELECTRICAL CHARACTERISTICS ($T_{amb}$= 0°C to +70°C, $V_{CC}$= 5V ± 10% unless otherwise specified)

| Parameter | | Test conditions | Min. | Typ.(1) | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{LI}$ | Input load current(All input pins) | $V_I$= 0 to 5.25V | | | 10 | μA |
| $I_{LOH}$ | Output leakage current | Chip deselected $V_O$= 4V | | | 10 | μA |
| $I_{LOL}$ | Output leakage current | Chip deselected $V_O$= 0.4V | | | -20 | μA |
| $I_{CC}$ | Power supply current | All inputs 5.25V Data out open | | 70 | 120 | mA |
| $V_{IL}$ | Input low voltage | | -0.5 | | 0.8 | V |
| $V_{IH}$ | Input high voltage | | 2.4 | | $V_{CC}$+1V | V |
| $V_{OL}$ | Output low voltage | $I_{OL}$= 2.1 mA | | | 0.4 | V |
| $V_{OH}$ | Output high voltage | $I_{OH}$= -400 μA | 2.4 | | | V |

**Note:** 1 Typical values for $T_{amb}$= 25°C and nominal supply voltage.

## DYNAMIC ELECTRICAL CHARACTERISTICS ($T_{amb}$= 0°C to 70°C, $V_{CC}$= +5V ± 10%unless otherwise specified)

| Parameter | | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $t_A$ | Address to output delay time | Output load = 1 TTL gate and $C_L$= 100 pF<br>Input pulse levels -0.8 to 2.4V<br>Input pulse rise and fall times (10% to 90%) -20 ns<br>Timing Measurement Reference level:<br>Input = 1V and 2.2V<br>Output = 0.8V and 2.2V | | | 850 | ns |
| $t_{CO}$ | Chip select to output enable delay time | | | | 120 | ns |
| $t_{DF}$ | Chip deselect to output data float delay time | | 10 | | 100 | ns |
| $C_I$ | Input capacitance | $T_{amb}$= 25°C f = 1 MHz<br>All pins except pin under test tied to AC ground | | 5 | 10 | pF |
| $C_O$ | Output capacitance | $T_{amb}$= 25°C f = 1 MHz<br>All pins, except pin under test tied to AC ground | | 10 | 15 | pF |

## A.C. Waveforms