**ADVANCED**

## Features

256Kx32 bit CMOS Static
Random Access Memory Array

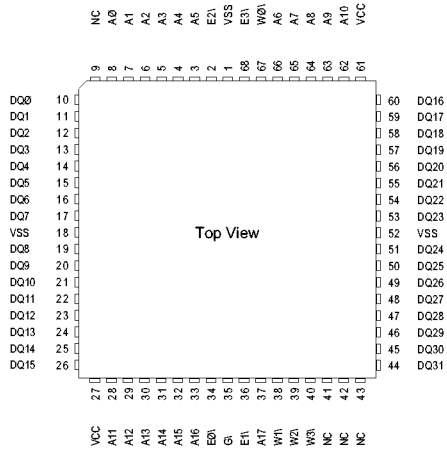
- Fast Access Times: 12, 15 and 20ns
- Individual Byte Enables
- User Configurable Organization with Minimal Additional Logic
- Master Output Enable and Write Control
- TTL Compatible Inputs and Outputs
- Fully Static, No Clocks

Surface Mount Package

- 68 Lead PLCC, No. 99
- Small Footprint, 0.990 Sq. In.
- Multiple Ground Pins for Maximum Noise Immunity

Single 3.3V (±5%) Supply Operation

## Pin Configurations and Block Diagram




## Pin Names

| | |
|---|---|
| AØ-A17 | Address Inputs |
| $\overline{E0}$-$\overline{E3}$ | Chip Enables |
| $\overline{W0}$-$\overline{W3}$ | Write Enable |
| $\overline{G}$ | Output Enable |
| DQØ-DQ31 | Data Input/Output |
| VCC | Power (3.3V±5%) |
| VSS | Ground |
| NC | No Connect |

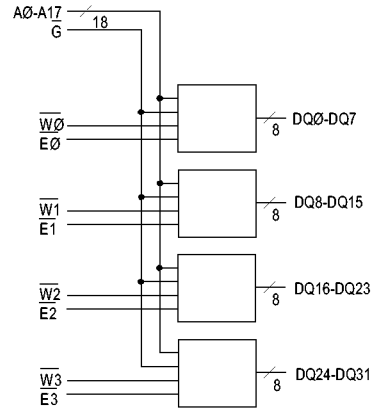
## *256Kx32 CMOS High Speed Static RAM*

The EDI8LM32257V is a high-speed 8-Megabit static RAM device with access times of 12, 15 and 20ns over the Commercial, Industrial and Military temperature range. The device allows the user to capitalize on the cost advantages of a plastic component while not sacrificing all of the reliability available in a full military component.

Extended temperature testing is performed using the same test patterns as those used on EDI's ceramic military product line. EDI fully characterizes the devices to determine the proper test patterns required for testing at the temperature extremes. This is a critical process, since the operating characteristics of the devices change when they are operated beyond the commercial temperature range. Users of EDI's ruggedized plastic components will benefit from EDI's extensive experience in characterizing SRAMs for use in military systems.

The EDI8LM32257V can also be used as a direct replacement for EDI's ceramic 68-pin JLCC product, the EDI8C32128CA or the plastic EDI8LM32129C.The plastic product provides 50% in weight reduction on 50% savings in capacitance loading. The EDI8LM32257V also provides a cost effective alternative for COTs programs.

**NOTE: Solder Reflow temperature should not exceed 260°C for 10 seconds.**

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## Absolute Maximum Ratings*

| | |
|---|---|
| Voltage on any pin relative to VSS | -0.5V to 4.6V |
| Operating Temperature TA (Ambient) | |
| Commercial | 0°C to + 70°C |
| Industrial | -40°C to +85°C |
| Military | -55°C to +125°C |
| Storage Temperature | -55°C to +150°C |
| Power Dissipation | 2 Watts |
| Output Current. | 20 mA |
| Junction Temperature, TJ | 175°C |

*Stress greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions greater than those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

## Recommended DC Operating Conditions

| Parameter | Sym | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Supply Voltage | VCC | 3.135 | 3.3 | 3.465 | V |
| Supply Voltage | VSS | 0 | 0 | 0 | V |
| Input High Voltage | VIH | 2.2 | -- | VCC+0.3 | V |
| Input Low Voltage | VIL | -0.3 | -- | 0.8 | V |

## AC Test Conditions

| | |
|---|---|
| Input Pulse Levels | VSS to 3.0V |
| Input Rise and Fall Times | 5ns |
| Input and Output Timing Levels | 1.5V |
| Output Load | Figure 1 |

(note: For TEHQZ,TGHQZ and TWLQZ, see figure 2)

Figure 1

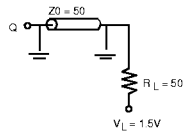
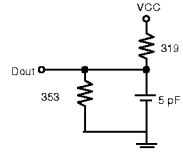



Figure 2




## DC Electrical Characteristics

| Parameter | Sym | Conditions | Min | Max 12 | Max 15 | Max 20 | Units ns |
|---|---|---|---|---|---|---|---|
| Operating Power Supply Current | ICC1 | $\overline{W}$= VIL, II/O = 0mA, Min Cycle | | 480 | 460 | 440 | mA |
| Standby (TTL) Supply Current | ICC2 | $\overline{E} \geq$ VIH, VIN- VIL or VIN $\leq$ VIH, f=ØMHz | | 100 | 100 | 100 | mA |
| Full StandbySupply Current | ICC3 | $\overline{E} \geq$ VCC-0.2V VIN $\geq$ VCC-0.2V or VIN $\leq$ 0.2V | | 20 | 20 | 20 | mA |
| Input Leakage Current | ILI | VIN = 0V to VCC | | ±10 | ±10 | ±10 | µA |
| Output Leakage Current | ILO | V I/O = 0V to VCC | | ±10 | ±10 | ±10 | µA |
| Output High Volltage | VOH | IOH = -4.0mA | 2.4 | | | | V |
| Output Low Voltage | VOL | IOL = 8.0mA | | 0.4 | 0.4 | 0.4 | V |

## Truth Table

| $\overline{E}$ | $\overline{W}$ | $\overline{G}$ | $\overline{BS}$Ø-3 | Mode | Output | Power |
|---|---|---|---|---|---|---|
| H | X | X | X | Standby | High Z | ICC2,ICC3, |
| L | H | H | X | Output Disable | High Z | ICC1 |
| L | X | X | H | Output Disable | High Z | ICC1 |
| L | H | L | L | Read | DOUT | ICC1 |
| L | L | X | L | Write | DIN | ICC1 |

X Means Don't Care

## Capacitance

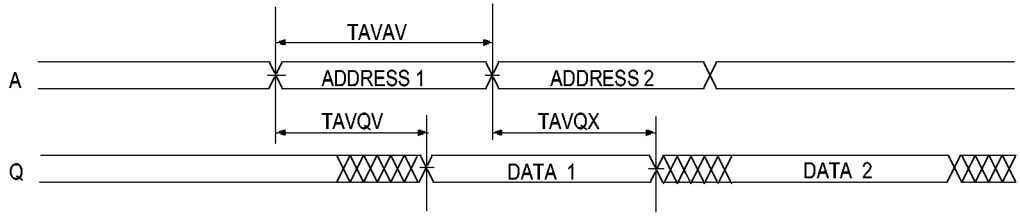
(f=1.0MHz, VIN=VCC or VSS)

| Parameter | Sym | Max | Unit |
|---|---|---|---|
| Address Lines | CA | 20 | pF |
| Data Lines | CD/Q | 10 | pF |
| Write & Output Enable Lines | $\overline{W}$, $\overline{G}$ | 6 | pF |
| Chip Enable Lines/Byte Select | $\overline{E}$, $\overline{BS}$ | 9 | pF |

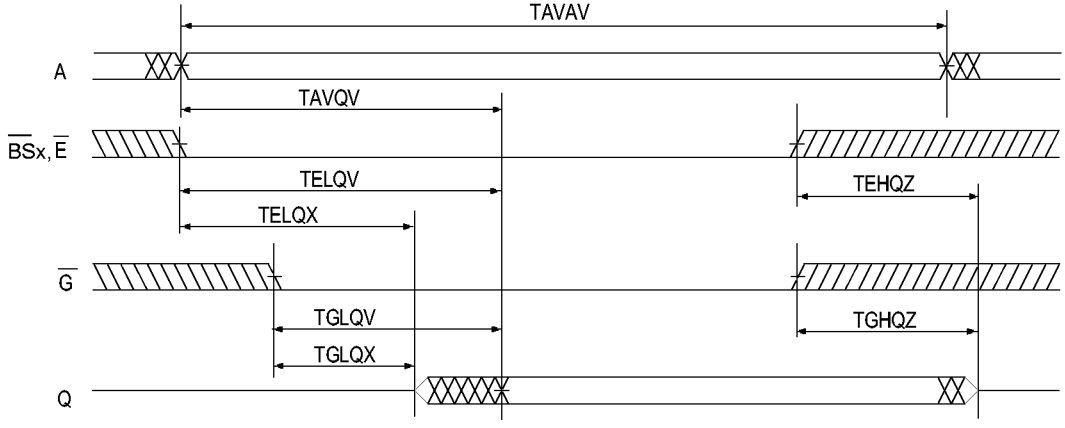
## AC Characteristics Read Cycle

| | Symbol | | 12ns | | 15ns | | 20ns | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | JEDEC | Alt. | Min | Max | Min | Max | Min | Max | Units |
| Read Cycle Time | TAVAV | TRC | 12 | | 15 | | 20 | | ns |
| Address Access Time | TAVQV | TAA | | 12 | | 15 | | 20 | ns |
| Chip Enable Access Time | TELQV | TACS | | 12 | | 15 | | 20 | ns |
| Byte Select Access Time | TBLQX | TBLZ | | 12 | | 15 | | 20 | ns |
| Chip Enable to Output in Low Z (1) | TELQX | TCLZ | 3 | | 3 | | 3 | | ns |
| Byte Select to Output in Low Z | TBLQX | TBLZ | 3 | | 3 | | 3 | | ns |
| Chip Disable to Output in High Z (1) | TEHQZ | TCHZ | | 7 | | 8 | | 10 | ns |
| Byte Select to Output in High Z | TBHQZ | TBHZ | | 7 | | 8 | | 10 | ns |
| Output Hold from Address Change | TAVQX | TOH | 3 | | 3 | | 3 | | ns |
| Output Enable to Output Valid | TGLQV | TOE | | 5 | | 6 | | 10 | ns |
| Output Enable to Output in Low Z (1) | TGLQX | TOLZ | 2 | | 2 | | 2 | | ns |
| Output Disable to Output in High Z(1) | TGHQZ | TOHZ | | 4 | | 5 | | 8 | ns |

## Read Cycle 1 - $\overline{W}$ High, $\overline{G}$, $\overline{E}$ Low




## Read Cycle 2 - $\overline{W}$ High

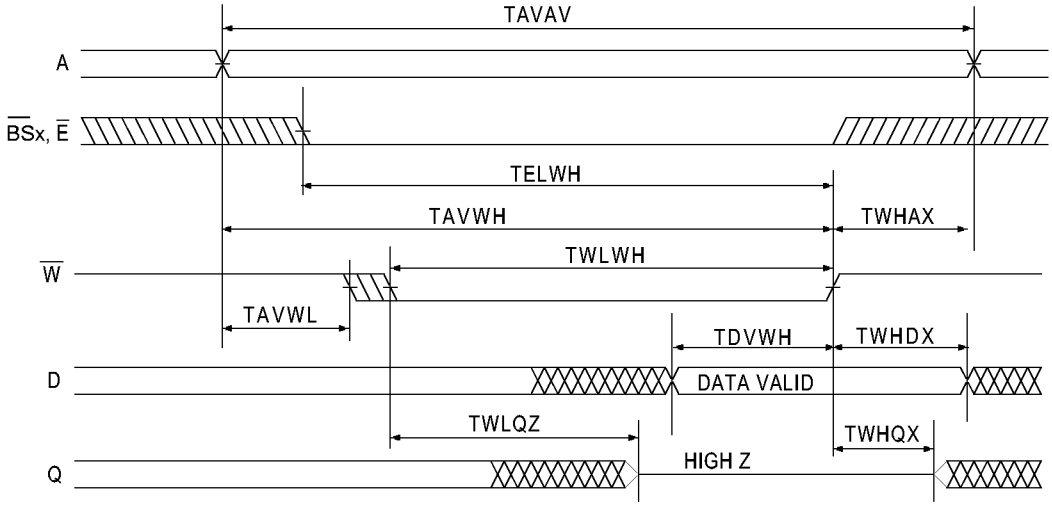


## AC Characteristics Write Cycle

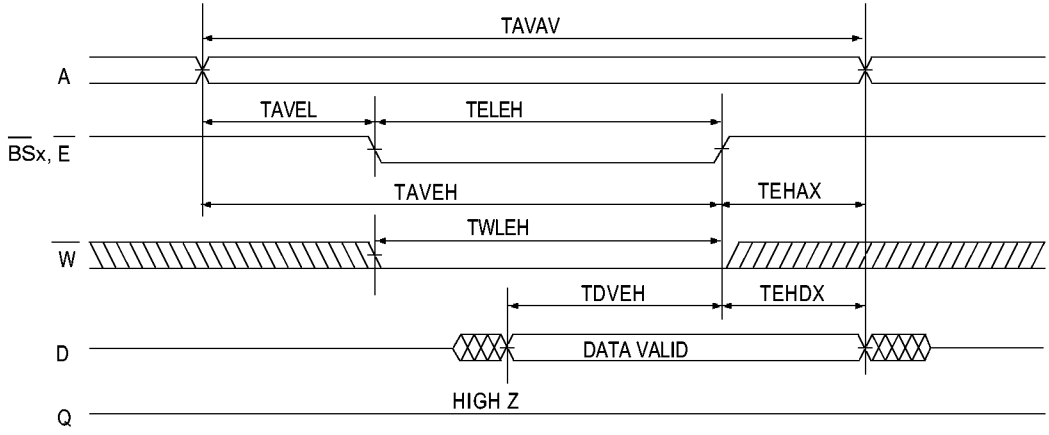
| Parameter | Symbol JEDEC | Symbol Alt. | 12ns Min | 12ns Max | 15ns Min | 15ns Max | 20ns Min | 20ns Max | Units |
|---|---|---|---|---|---|---|---|---|---|
| Write Cycle Time | TAVAV | TWC | 12 | | 15 | | 20 | | ns |
| Chip Enable to End of Write | TELWH | TCW | 8 | | 9 | | 15 | | ns |
| | TELEH | TCW | 8 | | 9 | | 15 | | ns |
| Byte Select to End of Write | TBLWH | TBW | 8 | | 9 | | 15 | | ns |
| Address Setup Time | TAVWL | TAS | 0 | | 0 | | 0 | | ns |
| | TAVEL | TAS | 0 | | 0 | | 0 | | ns |
| Address Valid to End of Write | TAVWH | TAW | 9 | | 10 | | 15 | | ns |
| | TAVEH | TAW | 9 | | 10 | | 15 | | ns |
| Write Pulse Width | TWLWH | TWP | 9 | | 10 | | 15 | | ns |
| | TWLEH | TWP | 9 | | 10 | | 15 | | ns |
| Write Recovery Time | TWHAX | TWR | 0 | | 0 | | 0 | | ns |
| | TEHAX | TWR | 0 | | 0 | | 0 | | ns |
| Data Hold Time | TWHDX | TDH | 0 | | 0 | | 0 | | ns |
| | TEHDX | TDH | 0 | | 0 | | 0 | | ns |
| Write to Output in High Z (1) | TWLQZ | TWHZ | 0 | 5 | 0 | 6 | 0 | 7 | ns |
| Data to Write Time | TDVWH | TDW | 5 | | 6 | | 8 | | ns |
| | TDVEH | TDW | 5 | | 6 | | 8 | | ns |
| Output Active from End of Write (1) | TWHQX | TWLZ | 2 | | 2 | | 2 | | ns |

Note 1: Parameter guaranteed, but not tested.

## Write Cycle 1 - $\overline{W}$ Controlled



## Write Cycle 2 - $\overline{E}$ Controlled



## Ordering Information

**Commercial (0°C to +70°C)**

| Part Number | Speed (ns) | Package No. |
|---|---|---|
| EDI8LM32257V12AC | 12 | 99 |
| EDI8LM32257V15AC | 15 | 99 |
| EDI8LM32257V20AC | 20 | 99 |

**Industrial (-40°C to +85°C)**

| Part Number | Speed (ns) | Package No. |
|---|---|---|
| EDI8LM32257V15AI | 15 | 99 |
| EDI8LM32257V20AI | 20 | 99 |

**Military (-55°C to +125°C)**

| Part Number | Speed (ns) | Package No. |
|---|---|---|
| EDI8LM32257V15AM | 15 | 99 |
| EDI8LM32257V20AM | 20 | 99 |

## Package Description

***Package No. 99***
***68 Lead PLCC***
***JEDEC MO-47AE***

***Theta Ja = 40°C/W***

***Theta Jc = 15°C/W***

***Weight = 4.2g***