

# HN62344B Series

## 4M (512K x 8-bit) Mask ROM

### ■ DESCRIPTION

The Hitachi HN62344B is a 4-Megabit CMOS Mask Programmable Read Only Memory organized as 524,288 x 8-bit.

The low power consumption of this device makes it ideal for battery powered, portable systems. In addition, the high density and high speed provide enough capacity and high performance to be used as a character generator in laser printers.

Hitachi's HN62344B is offered with JEDEC-Standard Byte-Wide EPROM pinouts in 32-pin Plastic DIP and 32-lead Plastic SOP packages. This allows socket replacement with EPROMs and Flash Memory.

### ■ FEATURES

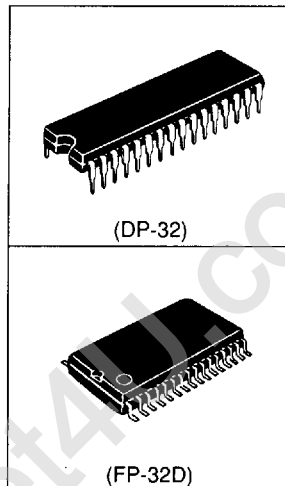
- Single Power Supply:  
 $V_{CC} = 5\text{ V} \pm 5\%$
- High Speed Access Time:  
100 ns (max)
- Low Power Consumption:  
Active Current: 150 mW (typ)  
Standby Current: 5  $\mu$ W (typ)
- Byte-Wide Data Organization
- TTL-Compatible Inputs and Outputs
- Three-State Data Outputs
- Pin Arrangements:  
JEDEC Standard Byte-Wide EPROM  
EPROM and Flash Memory Compatible
- Packages:  
32-pin Plastic DIP  
32-lead Plastic SOP

### ■ ORDERING INFORMATION

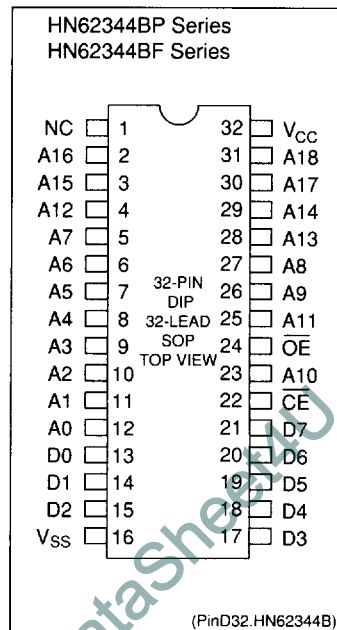
| Type No.     | Access Time | Package                         |
|--------------|-------------|---------------------------------|
| HN62344BP-10 | 100 ns      | 32-pin Plastic DIP<br>(DP-32)   |
| HN62344BF-10 | 100 ns      | 32-lead Plastic SOP<br>(FP-32D) |

### ■ PIN DESCRIPTION

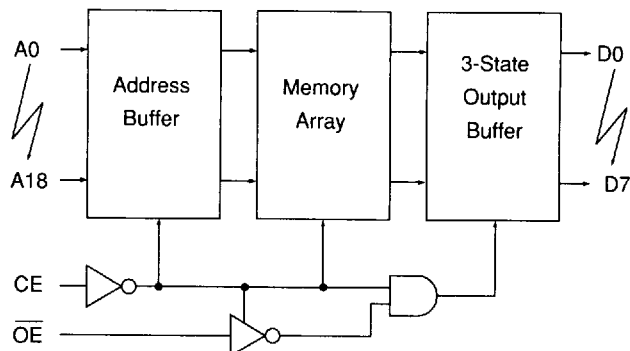
| Pin Name        | Function      |
|-----------------|---------------|
| $A_0 - A_{18}$  | Address       |
| $D_0 - D_7$     | Output        |
| $\overline{CE}$ | Chip Enable   |
| $\overline{OE}$ | Output Enable |
| $V_{CC}$        | Power Supply  |
| $V_{SS}$        | Ground        |
| NC              | No Connection |



### ■ PIN ARRANGEMENT



## ■ BLOCK DIAGRAM



(BD. HN62344B)

## ■ ABSOLUTE MAXIMUM RATINGS

| Item                                      | Symbol     | Value                  | Unit |
|-------------------------------------------|------------|------------------------|------|
| Supply Voltage <sup>1</sup>               | $V_{CC}$   | -0.3 to +7.0           | V    |
| All Input and Output Voltage <sup>1</sup> | $V_T$      | -0.3 to $V_{CC} + 0.3$ | V    |
| Operating Temperature Range               | $T_{OPR}$  | 0 to +70               | °C   |
| Storage Temperature Range                 | $T_{STG}$  | -55 to +125            | °C   |
| Temperature Under Bias                    | $T_{BIAS}$ | -20 to +85             | °C   |

Notes: 1. With respect to  $V_{SS}$ .

## ■ CAPACITANCE

 $(V_{CC} = 5V \pm 10\%, V_{SS} = 0V, T_a = 25^\circ C, V_{IN} = 0V, f = 1MHz)$ 

| Item                            | Symbol    | Min. | Max. | Unit |
|---------------------------------|-----------|------|------|------|
| Input Capacitance <sup>1</sup>  | $C_{IN}$  | -    | 15   | pF   |
| Output Capacitance <sup>1</sup> | $C_{OUT}$ | -    | 15   | pF   |

Notes: 1. This parameter is sampled and not 100% tested.

## ■ DC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

 $(V_{CC} = 5V \pm 5\%, V_{SS} = 0V, T_a = 0 \text{ to } 70^\circ C)$ 

| Item                       | Symbol    | Min. | Max.           | Unit    | Test Condition                                         |
|----------------------------|-----------|------|----------------|---------|--------------------------------------------------------|
| Input Leakage Current      | $I_{LI}$  | -    | 10             | $\mu A$ | $V_{IN} = 0 \text{ to } V_{CC}$                        |
| Output Leakage Current     | $I_{LO}$  | -    | 10             | $\mu A$ | $\overline{CE} = 2.4V, V_{OUT} = 0 \text{ to } V_{CC}$ |
| Operating $V_{CC}$ Current | $I_{CC}$  | -    | 60             | mA      | $V_{CC} = 5.5V, I_{DOUT} = 0mA, t_{RC} = \text{min.}$  |
| Standby $V_{CC}$ Current   | $I_{SB1}$ | -    | 30             | $\mu A$ | $V_{CC} = 5.5V, \overline{CE} \geq V_{CC} - 0.2V$      |
|                            | $I_{SB2}$ | -    | 3              | mA      | $V_{CC} = 5.5V, \overline{CE} \geq 2.4V$               |
| Input Voltage              | $V_{IH}$  | 2.4  | $V_{CC} + 0.3$ | V       |                                                        |
|                            | $V_{IL}$  | -0.3 | 0.45           | V       |                                                        |
| Output Voltage             | $V_{OH}$  | 2.4  | -              | V       | $I_{OH} = -205 \mu A$                                  |
|                            | $V_{OL}$  | -    | 0.4            | V       | $I_{OL} = 1.6mA$                                       |

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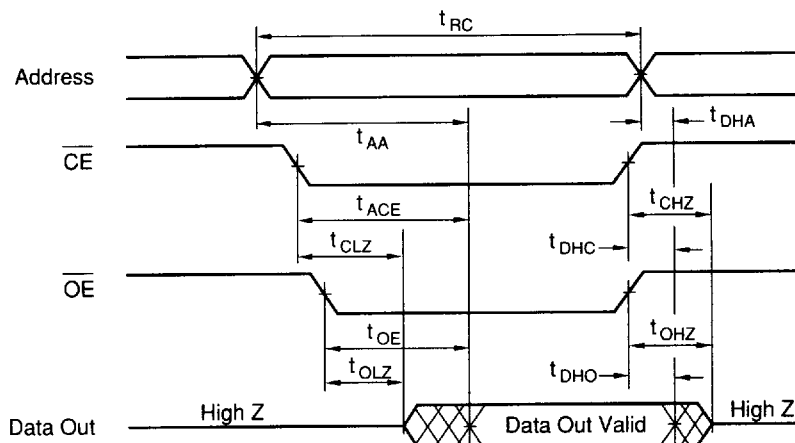
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**■ AC ELECTRICAL CHARACTERISTICS FOR READ OPERATION**
 $(V_{CC} = 5V \pm 5\%, V_{SS} = 0V, T_a = 0 \text{ to } 70^\circ\text{C})$ 
**Test Conditions**

- Input pulse levels: 0.45 V / 2.4 V
- Input rise and fall times:  $\leq 10 \text{ ns}$
- Output load: 1 TTL Gate +  $CL = 100 \text{ pF}$  (Including jig capacitance)
- Input/Output Timing Reference level: 1.5 V

| Item                                 | Symbol      | Min. | Max. | Unit |
|--------------------------------------|-------------|------|------|------|
| Read Cycle Time                      | $t_{RC}$    | 100  | -    | ns   |
| Address Access Time                  | $t_{AA}$    | -    | 100  | ns   |
| Chip Enable Access Time              | $t_{ACE}$   | -    | 100  | ns   |
| Output Enable Access Time            | $t_{OE}$    | -    | 55   | ns   |
| Output Hold Time from Address Change | $t_{DHA}$   | 0    | -    | ns   |
| Output Hold Time from Chip Enable    | $t_{DHC}$   | 0    | -    | ns   |
| Output Hold Time from Output Enable  | $t_{DHO}$   | 0    | -    | ns   |
| Chip Enable to Output in High Z      | $t_{CHZ}^1$ | -    | 40   | ns   |
| Output Enable to Output in High Z    | $t_{OHZ}^1$ | -    | 40   | ns   |
| Chip Enable to Output in Low Z       | $t_{CLZ}$   | 5    | -    | ns   |
| Output Enable to Output in Low Z     | $t_{OLZ}$   | 5    | -    | ns   |

Note: 1.  $t_{CHZ}^1$  and  $t_{OHZ}^1$  define the time at which the output becomes an open circuit and are not referenced to output voltage levels.

**■ READ TIMING WAVEFORM**


(TD R.HN62344B)

- Note:
1.  $t_{DHA}$ ,  $t_{DHC}$ ,  $t_{DHO}$  are determined by the faster time.
  2.  $t_{AA}$ ,  $t_{ACE}$ ,  $t_{OE}$  are determined by the slower time.
  3.  $t_{CLZ}$ ,  $t_{OLZ}$  are determined by the slower time.

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