

# HN62314B Series

# HN62334B Series

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

### DESCRIPTION

The Hitachi HN62314B/HN62334B Series 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.

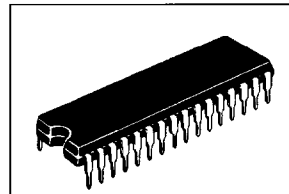
Hitachi's HN62314B/HN62334B Series are offered with JEDEC-Standard Byte-Wide EPROM pinouts in 32-pin Plastic DIP and 32-lead Plastic SOP and TSOP packages. This allows socket replacement with EPROMs and Flash Memory.

### FEATURES

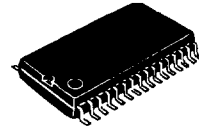
- Single Power Supply:
  - $V_{CC} = 5 V \pm 10\%$
- Fast Access Times:
  - 150 ns/170 ns/200 ns (max)
- Low Power Consumption:
  - Active Current: 100 mW (typ)
  - Standby Current: 5  $\mu$ W (typ)
- Byte-Wide Data Organization
- TTL-Compatible Inputs and Outputs
- Three-State Data Outputs
- Pin Arrangement:
  - JEDEC Standard Byte-Wide EPROM
  - EPROM and Flash Memory Compatible
- Packages:
  - 32-pin Plastic DIP
  - 32-lead Plastic SOP
  - 32-lead Plastic TSOP (Type II)

### ORDERING INFORMATION

Type No.	Access Time	Package
HN62334BP	150 ns	32-pin Plastic DIP
HN62314BP	170 ns/200 ns	(DP-32)
HN62334BF	150 ns	32-lead Plastic SOP
HN62314BF	170 ns/200 ns	(FP-32D)
HN62334BTT	150 ns	32-lead Plastic TSOP
HN62314BTT	170 ns/200 ns	(TTP-32D)



(DP-32)



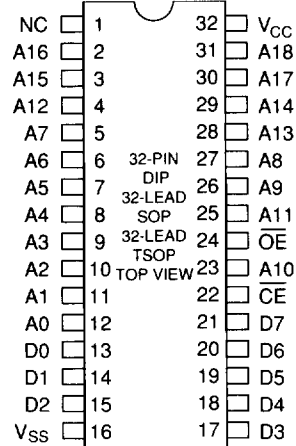
(FP-32D)



(TTP-32D)

### PIN ARRANGEMENT

HN62314BP/F Series  
HN62334BP/F Series



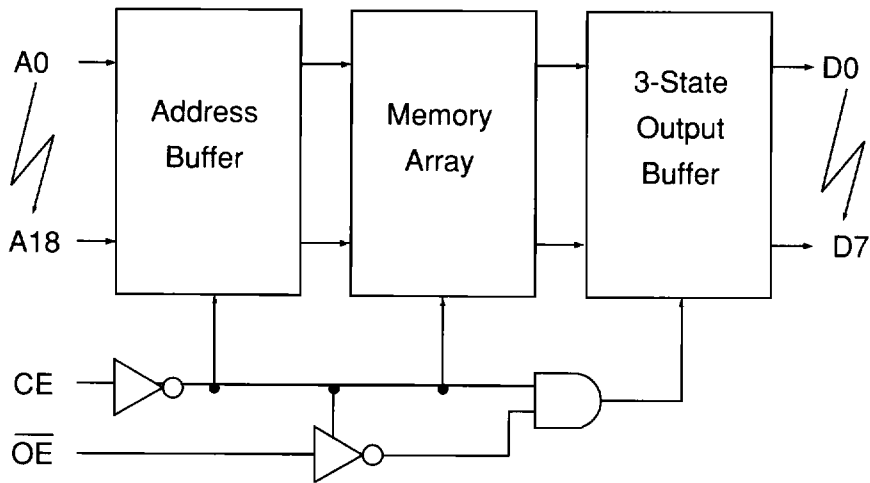
(PinD32.HN62314B.334B)

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■ PIN DESCRIPTION

Pin Name	Function
A <sub>0</sub> - A <sub>18</sub>	Address
D <sub>0</sub> - D <sub>7</sub>	Output
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
V <sub>CC</sub>	Power Supply
V <sub>SS</sub>	Ground
NC	No Connection

■ BLOCK DIAGRAM



(BD.HN62314B.334B)

**■ ABSOLUTE MAXIMUM RATINGS**

Item	Symbol	Value	Unit
Supply Voltage <sup>1</sup>	$V_{CC}$	-0.3 to +7.0	V
Terminal 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**

( $V_{CC} = 5V \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = 0$  to  $70^\circ C$ )

Item	Symbol	Min.	Max.	Unit	Test Condition
Input Leakage Current	$I_{LI}$	-	10	$\mu A$	$V_{IN} = 0$ to $V_{CC}$
Output Leakage Current	$I_{LO}$	-	10	$\mu A$	$\overline{CE} = 2.2V$ , $V_{OUT} = 0$ to $V_{CC}$
Operating $V_{CC}$ Current	$I_{CC}$	-	50	mA	$V_{CC} = 5.5V$ , $I_{DOUT} = 0$ mA, $t_{RC} = \text{min.}$
Standby $V_{CC}$ Current	$I_{SB}$	-	30	$\mu A$	$V_{CC} = 5.5V$ , $\overline{CE} \geq V_{CC} - 0.2V$
Input Voltage	$V_{IH}$	2.2	$V_{CC} + 0.3$	V	
	$V_{IL}$	-0.3	0.8	V	
Output Voltage	$V_{OH}$	2.4	-	V	$I_{OH} = -205 \mu A$
	$V_{OL}$	-	0.4	V	$I_{OL} = 1.6$ mA

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■ AC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

( $V_{CC} = 5V \pm 10\%$ ,  $V_{SS} = 0V$ ,  $T_a = 0$  to  $70^\circ C$ )

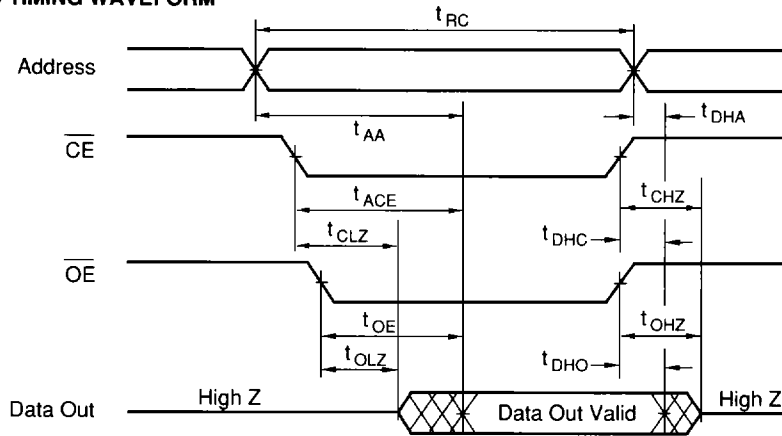
Test Conditions

- Input pulse levels: 0.8 V / 2.4 V
- Input rise and fall times:  $\leq 10$  ns
- Output load: 1 TTL Gate + CL = 100 pF (Including jig capacitance)
- Input/Output Timing Reference level: 1.5 V

Item	Symbol	HN62334B-15		HN62314B-17		HN62314B-20		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Read Cycle Time	$t_{RC}$	150	-	170	-	200	-	ns
Address Access Time	$t_{AA}$	-	150	-	170	-	200	ns
$\overline{CE}$ Access Time	$t_{ACE}$	-	150	-	170	-	200	ns
$\overline{OE}$ Access Time	$t_{OE}$	-	70	-	70	-	100	ns
Output Hold Time from Address Change	$t_{DHA}$	0	-	0	-	0	-	ns
Output Hold Time from CE	$t_{DHC}$	0	-	0	-	0	-	ns
Output Hold Time from OE	$t_{DHO}$	0	-	0	-	0	-	ns
$\overline{CE}$ to Output in High Z	$t_{CHZ}^1$	-	70	-	70	-	70	ns
$\overline{OE}$ to Output in High Z	$t_{OHZ}^1$	-	70	-	70	-	70	ns
$\overline{CE}$ to Output in Low Z	$t_{CLZ}$	10	-	10	-	10	-	ns
$\overline{OE}$ to Output in Low Z	$t_{OLZ}$	10	-	10	-	10	-	ns

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

■ READ TIMING WAVEFORM



(TD.R.HN62314B.334B)

- 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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