

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

DESCRIPTION

The Hitachi HN62335B 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 HN62335B Series is 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.

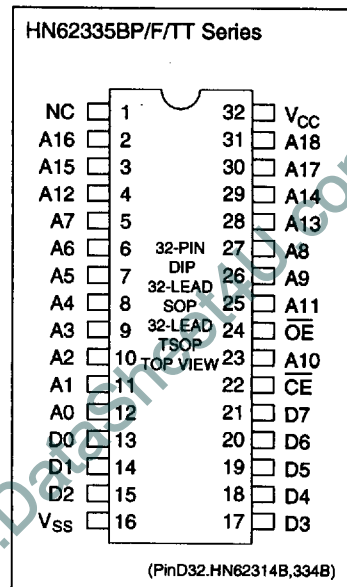
FEATURES

- Single Power Supply:
V_{CC} = 5 V ± 10%
- Fast Access Times:
120 ns/150 ns (max)
- Low Power Consumption:
Active Current: 150 mW (typ)
Standby Current: 5 μW (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
HN62335BP	120 ns 150 ns	32-pin Plastic DIP (DP-32)
HN62335BF	120 ns 150 ns	32-lead Plastic SOP (FP-32D)
HN62335BTT	120 ns 150 ns	32-lead Plastic TSOP (TTP-32D)

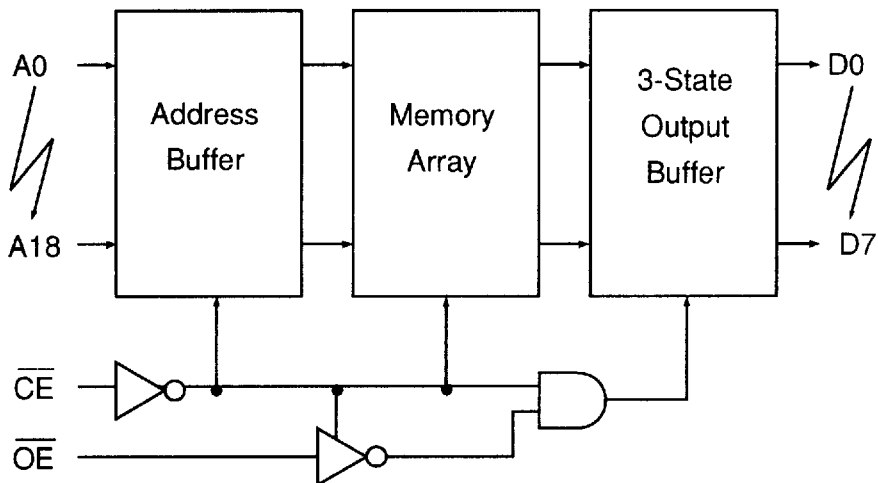
PIN ARRANGEMENT



■ 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

■ BLOCK DIAGRAM



(BD.HN62314B,334B)

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■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Value	Unit
Supply Voltage ¹	V _{CC}	-0.3 to +7.0	V
Terminal Voltage ¹	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 ± 10%, V_{SS} = 0V, T_a = 25°C, V_{IN} = 0 V, f = 1MHz)

Item	Symbol	Min.	Max.	Unit
Input Capacitance ¹	C _{IN}	-	15	pF
Output Capacitance ¹	C _{OUT}	-	15	pF

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

■ DC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

(V_{CC} = 5V ± 10%, V_{SS} = 0 V, T_a = 0 to 70°C)

Item	Symbol	Min.	Max.	Unit	Test Condition
Input Leakage Current	I _{LI}	-	10	μA	V _{IN} = 0 to V _{CC}
Output Leakage Current	I _{LO}	-	10	μA	$\overline{CE} = 2.2V$, V _{OUT} = 0 to V _{CC}
Operating V _{CC} Current	I _{CC}	-	60	mA	V _{CC} = 5.5 V, I _{DOUT} = 0 mA, t _{RC} = min.
Standby V _{CC} Current	I _{SB}	-	30	μA	V _{CC} = 5.5 V, $\overline{CE} \geq V_{CC} - 0.2V$
Input Voltage	V _{IH}	2.4	V _{CC} +0.3	V	
	V _{IL}	-0.3	0.6	V	
Output Voltage	V _{OH}	2.4	-	V	I _{OH} = -205 μA
	V _{OL}	-	0.4	V	I _{OL} = 1.6 mA

3

AC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

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

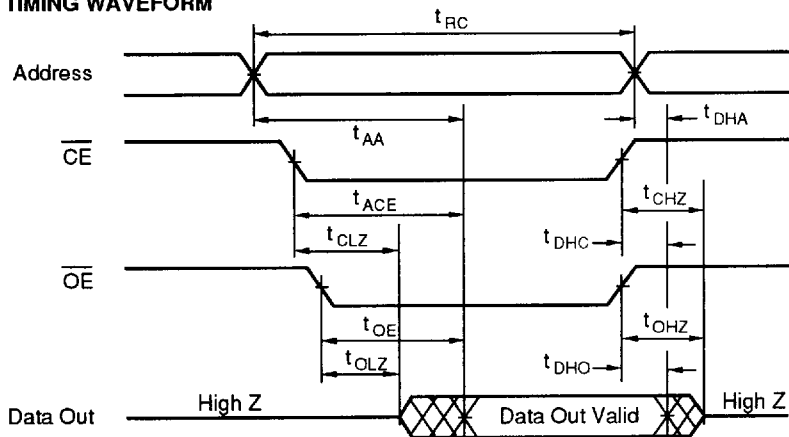
Test Conditions

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

Item	Symbol	HN62335B-12		HN62335B-15		Unit
		Min.	Max.	Min.	Max.	
Read Cycle Time	t_{RC}	120	-	150	-	ns
Address Access Time	t_{AA}	-	120	-	150	ns
\overline{CE} Access Time	t_{ACE}	-	120	-	150	ns
\overline{OE} Access Time	t_{OE}	-	60	-	70	ns
Output Hold Time from Address Change	t_{DHA}	0	-	0	-	ns
Output Hold Time from \overline{CE}	t_{DHC}	0	-	0	-	ns
Output Hold Time from \overline{OE}	t_{DHO}	0	-	0	-	ns
\overline{CE} to Output in High Z	t_{CHZ}^1	-	60	-	70	ns
\overline{OE} to Output in High Z	t_{OHZ}^1	-	60	- <td 70	ns	
\overline{CE} to Output in Low Z	t_{CLZ}	5	-	5	-	ns
\overline{OE} to Output in Low Z	t_{OLZ}	5	-	5	-	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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