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# HN62454BN Series

262144-word × 16-bit CMOS Mask Programmable ROM

# HITACHI

ADE-203-470A (Z)  
Rev. 1.1  
Jun. 21, 1996

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## Description

The HN62454BN is a 262144 words by 16 bits CMOS Mask Programmable ROM, featuring page access mode to get very high speed 4-word serial access. A high speed access of 85/100 ns (max) and page access of 40 ns (max) is the most suitable to the system using a high speed micro-computer by 16 bits.

## Features

- Single 5 V supply
- High speed
  - Normal access time: 85/100 ns (max)
  - Page access time: 40 ns (max)
- Low power
  - Active: 660 mW (max)
  - Standby: 165  $\mu$ W (max)
- 4 word page access on word-wide mode
- Directly TTL compatible
  - All inputs and outputs
- Pin compatible with 4 Mbit EPROM (HN27C4096AG/ACC/ACP)

## Ordering Information

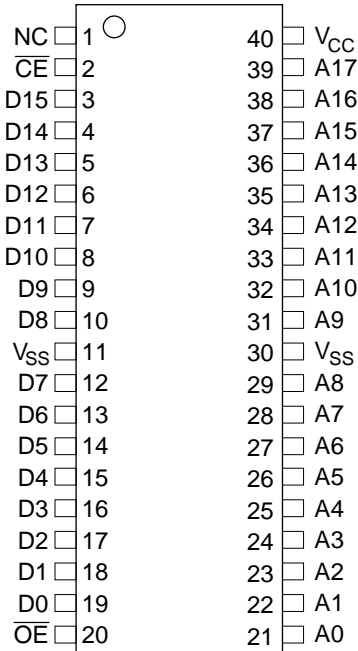
Type No.	Access time	Package
HN62454BNP-85	85 ns	600 mil 40-pin plastic DIP (DP-40)
HN62454BNP-10	100 ns	
HN62454BNCP-85	85 ns	44-pin plastic PLCC (CP-44)
HN62454BNCP-10	100 ns	

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# HN62454BN Series

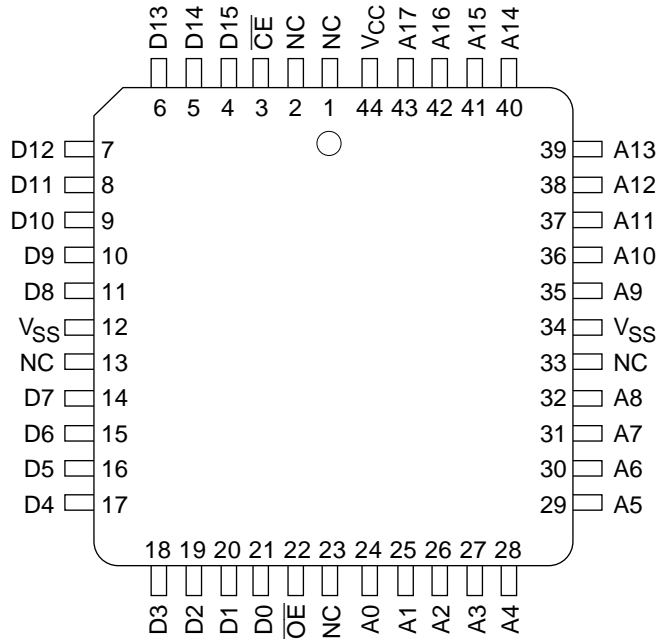
## Pin Arrangement

HN62454BNP Series



(Top View)

HN62454BNCP Series

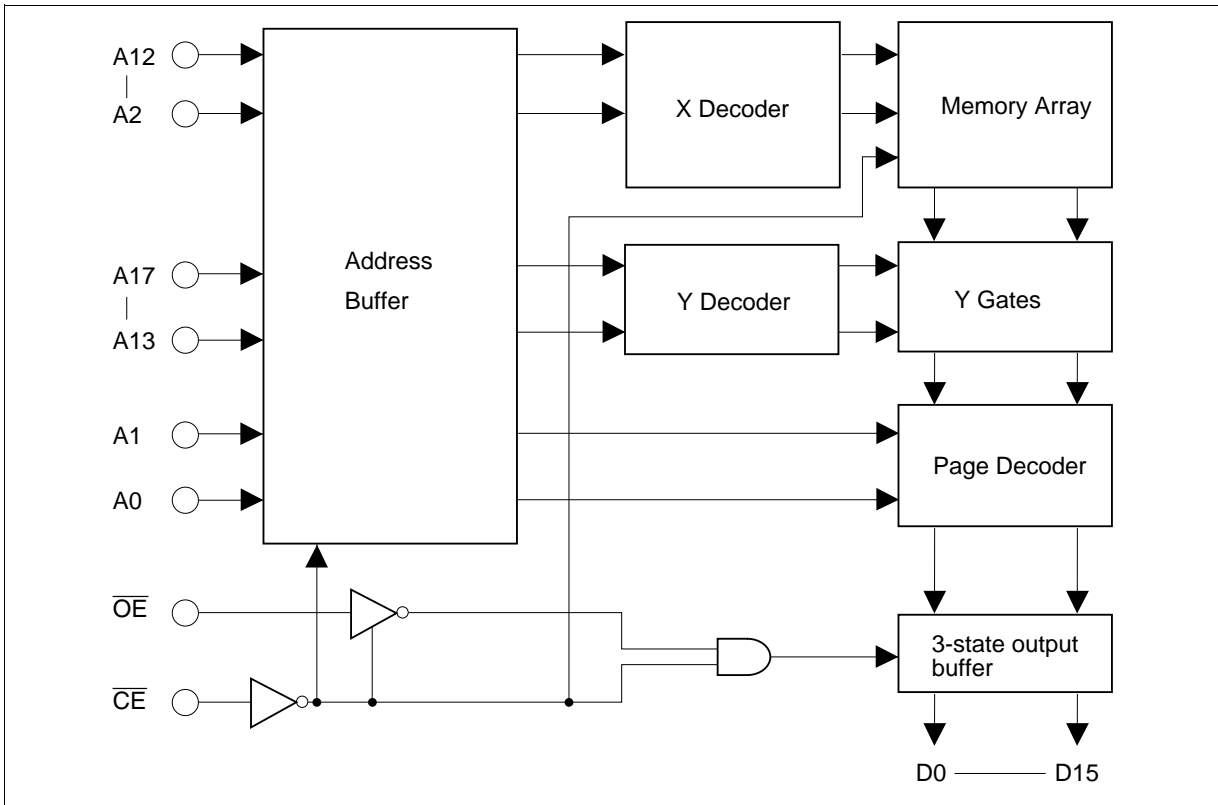


(Top View)

## Pin Description

Pin name	Function
A2 to A17	Address inputs
A0, A1	Page address inputs
D0 to D15	Data outputs
$\overline{CE}$	Chip enable
$\overline{OE}$	Output enable
NC	No connection
V <sub>CC</sub>	Power supply
V <sub>SS</sub>	Ground

**Block Diagram**



**Mode Selection**

Mode	Pin		Data output	Address input	
	$\overline{CE}$	$\overline{OE}$		LSB	MSB
Standby	H	$\times^{*1}$	High-Z <sup>*2</sup>	—	—
Output disable	L	H	High-Z	—	—
Read	L	L	Dout	A0	A17

Notes: 1.  $\times$ : Don't care.  
 2. High-Z: High impedance

# HN62454BN Series

## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply voltage*1	$V_{CC}$	-0.3 to + 7.0	V
All input and output voltage*1	$V_{in}, V_{out}$	-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

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

## Recommended DC Operating Conditions ( $T_a = 0$ to + 70°C)

Parameter	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.5	5.0	5.5	V
	$V_{SS}$	0	0	0	V
Input voltage	$V_{IH}$	2.2	—	$V_{CC} + 0.3$	V
	$V_{IL}$	-0.3	—	0.8	V

## DC Characteristics ( $V_{CC} = 5.0$ V $\pm$ 10%, $V_{SS} = 0$ V, $T_a = 0$ to + 70°C)

Parameter		Symbol	Min	Max	Unit	Test conditions
Supply current	Active	$I_{CC}$	—	120/100	mA	$V_{CC} = 5.5$ V, $I_{DOUT} = 0$ mA, $t_{RC} = 85/100$ ns
	Standby	$I_{SB1}$	—	30	$\mu$ A	$V_{CC} = 5.5$ V, $\overline{CE} \geq V_{CC} - 0.2$ V
	Standby	$I_{SB2}$	—	3	mA	$V_{CC} = 5.5$ V, $\overline{CE} \geq 2.2$ V
Input leakage current		$ I_{IL} $	—	10	$\mu$ A	$V_{in} = 0$ to $V_{CC}$
Output leakage current		$ I_{OL} $	—	10	$\mu$ A	$\overline{CE} = 2.2$ V, $V_{out} = 0$ to $V_{CC}$
Output voltage		$V_{OH}$	2.4	—	V	$I_{OH} = -400$ $\mu$ A
		$V_{OL}$	—	0.4	V	$I_{OL} = 2.1$ mA

## Capacitance ( $V_{CC} = 5.0$ V $\pm$ 10%, $V_{SS} = 0$ V, $T_a = 25$ °C, $V_{in} = 0$ V, $f = 1$ MHz)

Parameter	Symbol	Min	Max	Unit
Input capacitance*1	$C_{in}$	—	10	pF
Output capacitance*1	$C_{out}$	—	15	pF

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

**AC Characteristics** ( $V_{CC} = 5.0 \text{ V} \pm 10\%$ ,  $V_{SS} = 0 \text{ V}$ ,  $T_a = 0 \text{ to } +70^\circ\text{C}$ )

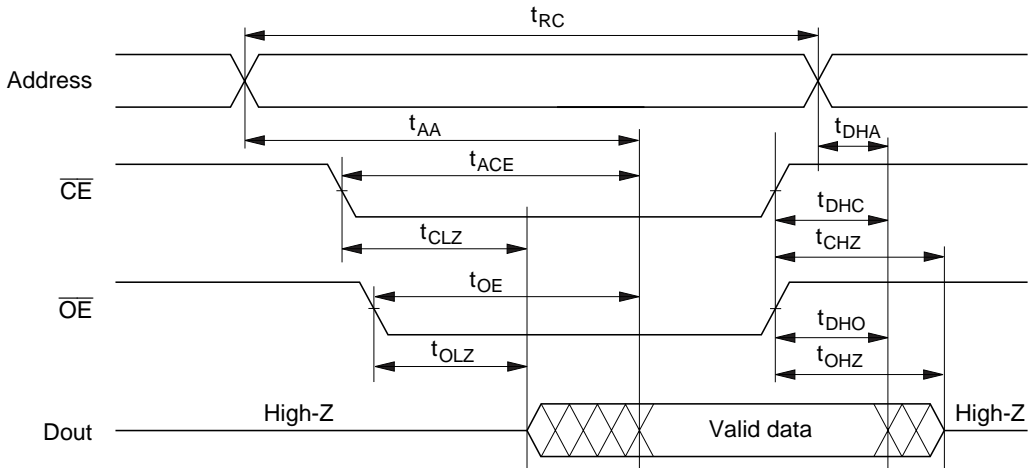
- Output load: 1TTL +  $C_L = 100 \text{ pF}$  (including jig)
- Input pulse level: 0.45 to 2.8 V
- Input and output timing reference level: 1.5 V
- Input rise and fall time: 5 ns

Parameter	Symbol	HN62454BN-85		HN62454BN-10		Unit	Note
		Min	Max	Min	Max		
Read cycle time	$t_{RC}$	85	—	100	—	ns	
Page read cycle time	$t_{PC}$	40	—	40	—	ns	
Address access	$t_{AA}$	—	85	—	100	ns	
Page address access time	$t_{PA}$	—	40	—	40	ns	
$\overline{CE}$ access time	$t_{ACE}$	—	85	—	100	ns	
$\overline{OE}$ access time	$t_{OE}$	—	40	—	40	ns	
Output hold time from address change	$t_{DHA}$	5	—	5	—	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	$t_{CHZ}$	—	30	—	30	ns	1
$\overline{OE}$ to output in high-Z	$t_{OHZ}$	—	30	—	30	ns	1
$\overline{CE}$ 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  $t_{OHZ}$  are defined as the time at which the output achieves the open circuit conditions and are not referred to output voltage levels.

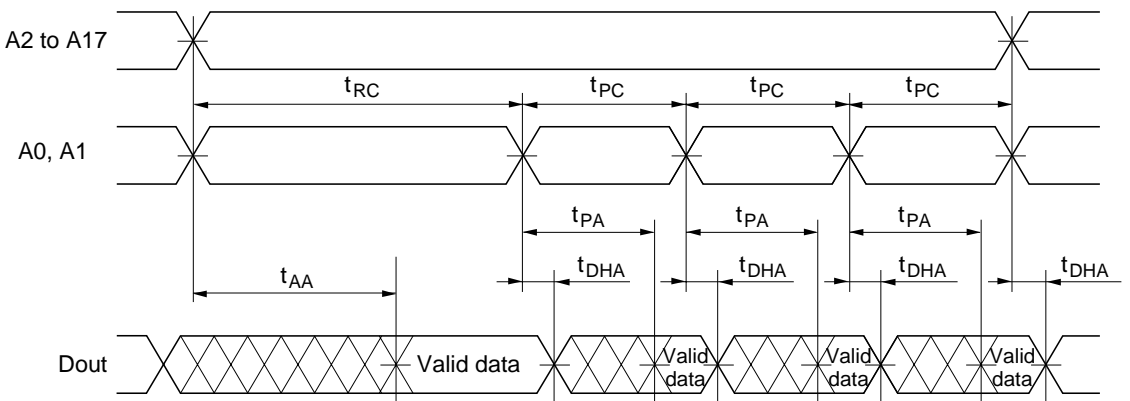
## Timing Waveforms

### Normal Mode



- Notes: 1.  $t_{DHA}$ ,  $t_{DHC}$ ,  $t_{DHO}$ : Determined by faster.  
 2.  $t_{AA}$ ,  $t_{ACE}$ ,  $t_{OE}$ : Determined by slower.  
 3.  $t_{CLZ}$ ,  $t_{OLZ}$ : Determined by slower.

### Page Mode

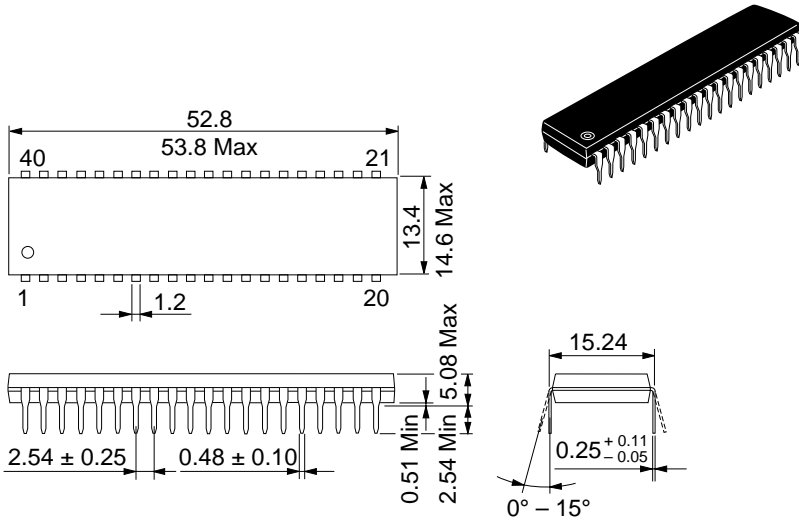


- Note: 1.  $\overline{CE}$  and  $\overline{OE}$  are enable.

Package Dimensions

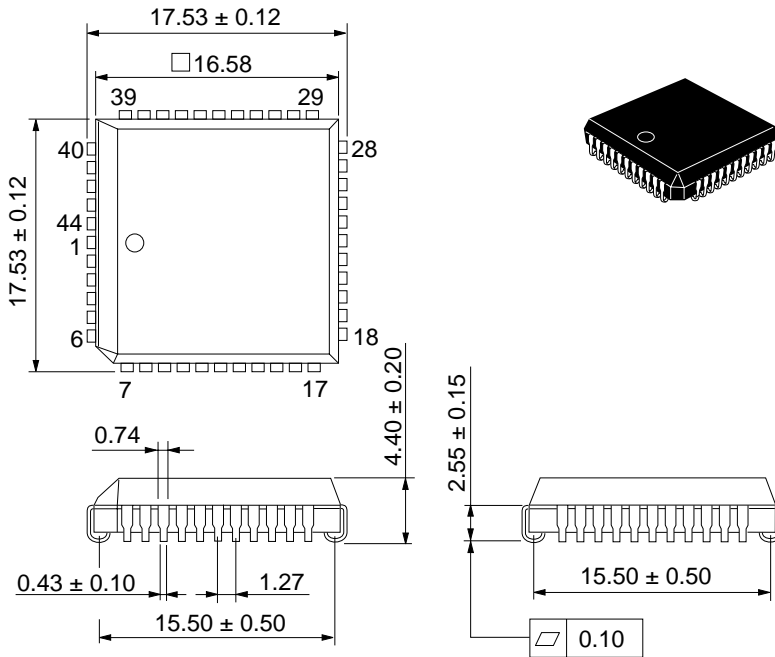
HN62454BNP Series (DP-40)

Unit: mm



HN62454BNCP Series (CP-44)

Unit: mm



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**Revision Record**

<b>Rev.</b>	<b>Date</b>	<b>Contents of Modification</b>	<b>Drawn by</b>	<b>Approved by</b>
0.0	Oct. 25, 1995	Initial issue	M. Shirai	H. Moriuchi
1.0	May. 21, 1996	Change of format AC Characteristics Input pulse level: 0.45 to 2.4 V to 0.45 to 2.8 V $t_{PC}$ (max): 35 ns to 40 ns $t_{PA}$ (max): 35 ns to 40 ns $t_{OE}$ (max): 35 ns to 40 ns	M. Shirai	T. Wada
1.1	Jun. 21, 1996	Correct error		

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