
HN624316N Series

High Speed and Burst (A0, A1 Burst)
1048576-word $\times$ 16-bit / 2097152-word $\times$ 8-bit CMOS Mask
Programmable Read Only Memory

HITACHI

Description

The HN624316N is a 16-Mbit CMOS mask-programmable ROM organized either as 1048576 words by 16 bits or as 2097152 words by 8 bits. Realizing low power consumption, this memory is allowed for battery operation. And a high speed access of 120/150 ns is the most suitable to the system using a high speed microcomputer by 16 bits as 8086 and 68000 e.t.c..

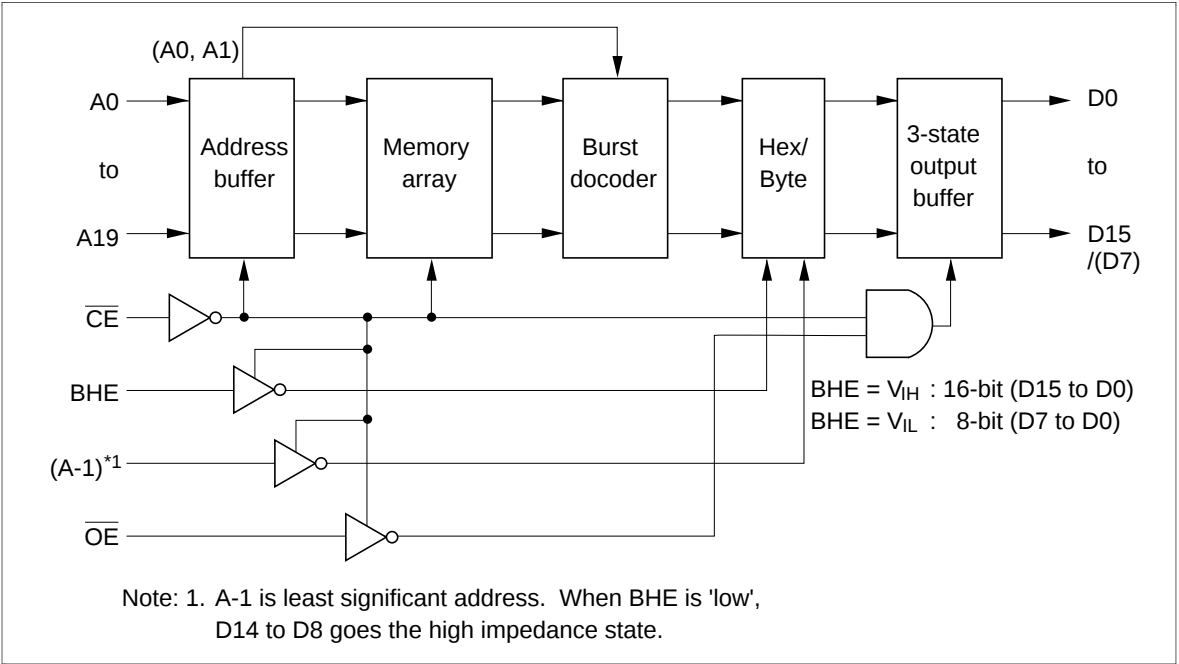
Features

- Single +5 V power supply
- Normal access time: 120 ns/150 ns (max)
- Burst access time: 60 ns/70 ns (max)
- Low power consumption: 300 mW (typ) active
5 μ W (typ) standby
- Byte-wide or word-wide data organization with BHE

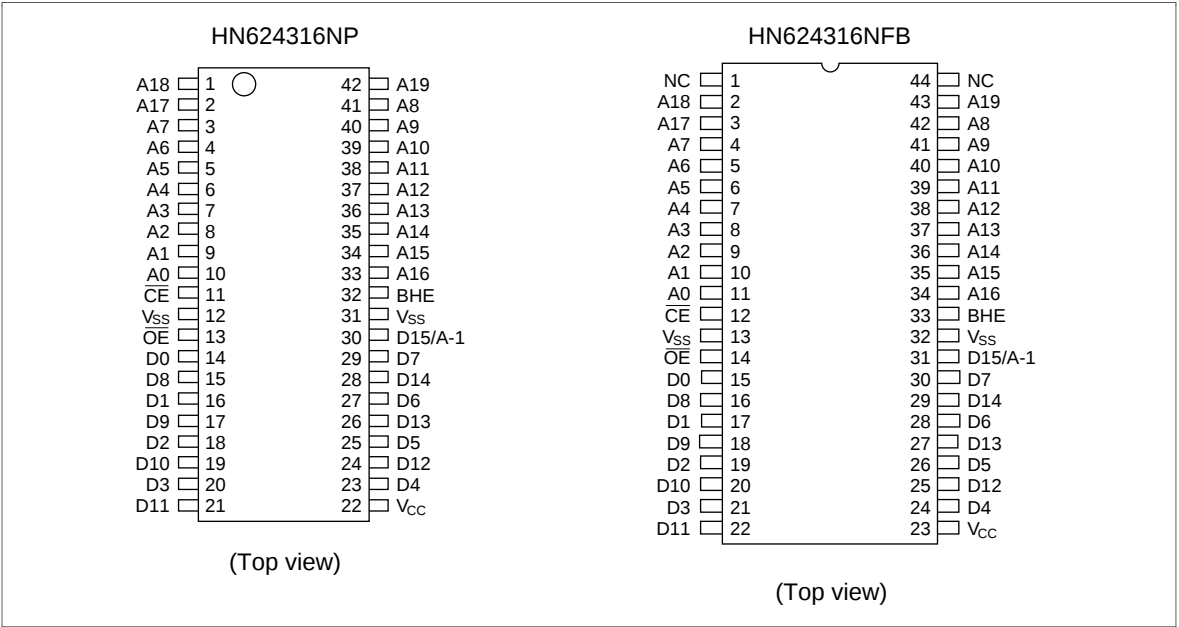
Ordering Information

Type No.	Access Time	Package
HN624316NP-12 HN624316NP-15	120 ns 150 ns	600 mil 42-pin plastic DIP (DP-42)
HN624316NFB-12 HN624316NFB-15	120 ns 150 ns	44-pin plastic SOP (FP-44D)

Block Diagram



Pin Arrangement



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Note
Supply voltage	V_{CC}	−0.3 to +7.0	V	1
All input and output voltage	V_{in}, V_{out}	−0.3 to $V_{CC} + 0.3$	V	1
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 ($V_{SS} = 0$ V, $T_a = 0$ to +70°C)

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

DC Characteristics ($V_{CC} = 5$ 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/ 110	mA	$V_{CC} = 5.5$ V, $I_{DOUT} = 0$ mA, $t_{RC} = 120$ ns/150 ns
	Standby	I_{SB1}	—	30	μA	$V_{CC} = 5.5$ 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	μA	$V_{IN} = 0$ to V_{CC}
Output leakage current		$ I_{OL} $	—	10	μA	$\overline{CE} = 2.2$ V, $V_{OUT} = 0$ to V_{CC}
Output voltage		V_{OH}	2.4	—	V	$I_{OH} = -205$ μA
		V_{OL}	—	0.4	V	$I_{OL} = 1.6$ mA

HN624316N Series

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

Parameter	Symbol	Min	Max	Unit
Input capacitance	Cin	—	15	pF
Output capacitance	Cout	—	15	pF

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

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

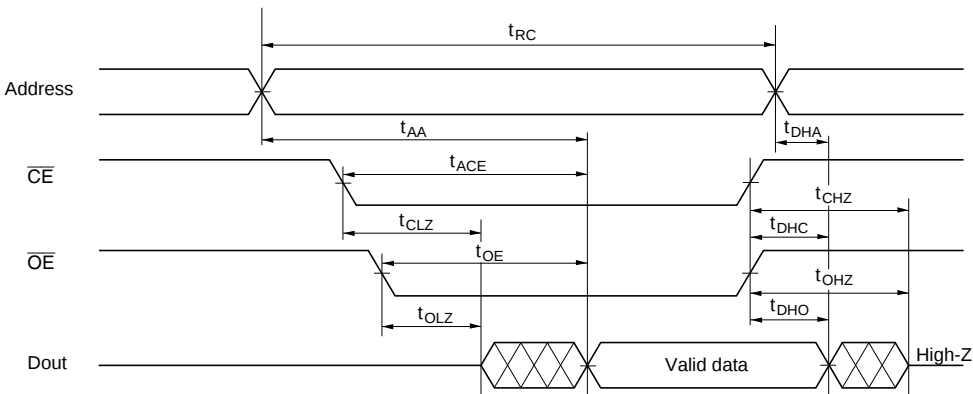
- Output load: 1TTLgate + $C_L = 100\text{ pF}$ (including jig capacitance)
- Input pulse level: 0.45 to 2.4 V
- Input and output timing reference level: 1.5 V
- Input rise and fall time: 5 ns

		HN624316N-12		HN624316N-15		
Parameter	Symbol	Min	Max	Min	Max	Unit
Read cycle time	t_{RC}	120	—	150	—	ns
Burst read cycle time	t_{BC}	60	—	70	—	ns
Address access time	t_{AA}	—	120	—	150	ns
Burst address access time	t_{BA}	—	55	—	70	ns
$\overline{CE}$ access time	t_{ACE}	—	120	—	150	ns
$\overline{OE}$ access time	t_{OE}	—	55	—	70	ns
BHE access time	t_{BHE}	—	120	—	150	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
Output hold time from BHE	t_{DHB}	0	—	0	—	ns
$\overline{CE}$ to output in high-Z	t_{CHZ}^{*1}	—	40	—	70	ns
$\overline{OE}$ to output in high-Z	t_{OHZ}^{*1}	—	40	—	70	ns
BHE to output in high-Z	t_{BHZ}^{*1}	—	40	—	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
BHE to output in low-Z	t_{BLZ}	5	—	5	—	ns

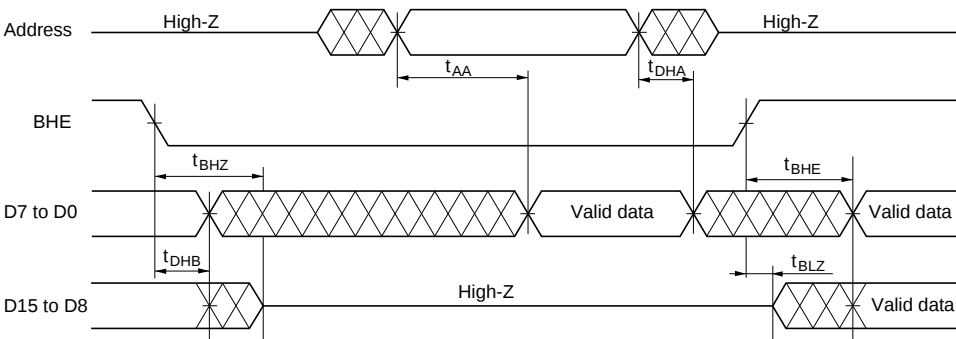
Note: 1. t_{CHZ} , t_{OHZ} and t_{BHZ} are defined as the time at which the output achieves the open circuit conditions and are not referred to output voltage levels.

Timing Waveforms

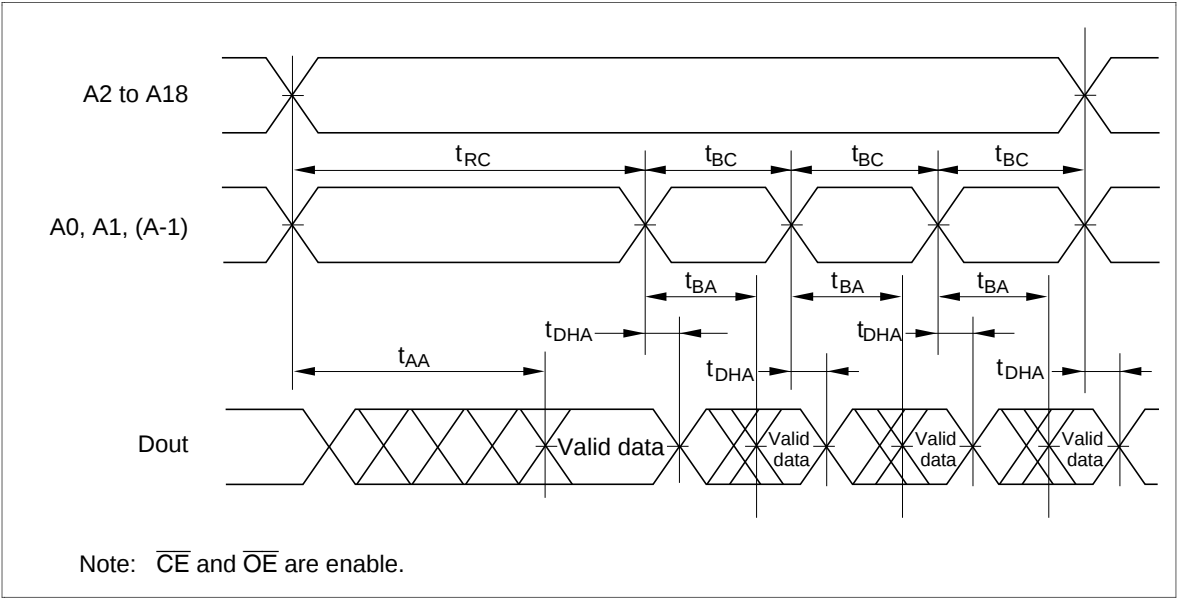
Word Mode (BHE = ‘V_{IH}’) or Byte Mode (BHE = ‘V_{IL}’)



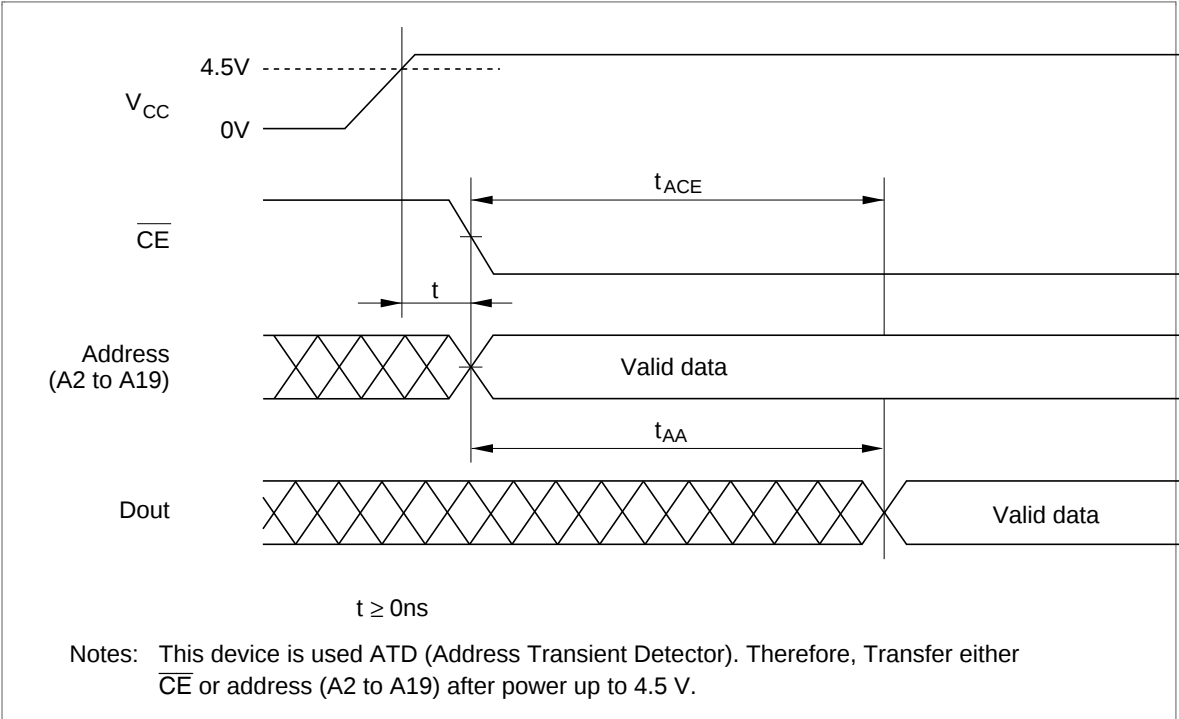
Word Mode, Byte Mode Switch



Burst Mode



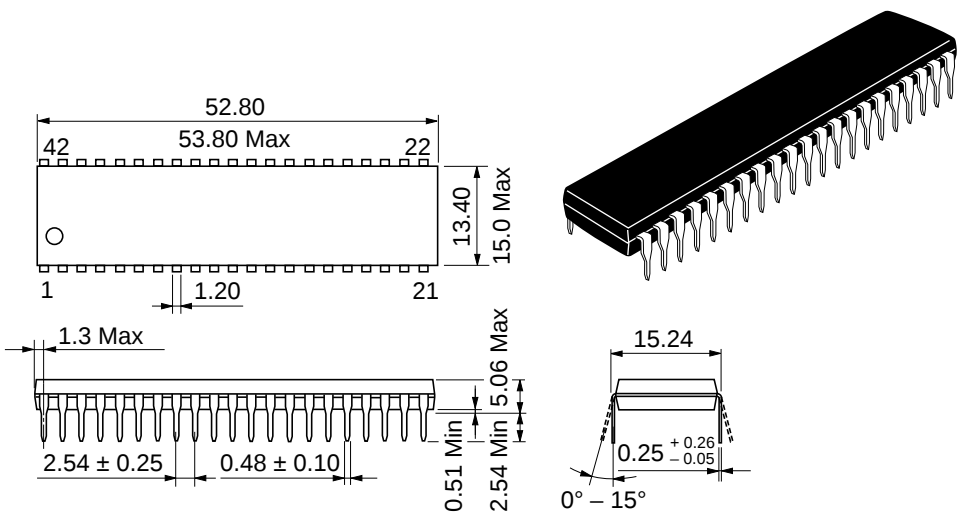
Power Up Sequence



Package Dimensions

HN624316NP Series (DP-42)

Unit: mm



HN624316NFB Series (FP-44D)

Unit: mm

