

HN62321 Series

HN62331 Series

1M (128K x 8-bit) Mask ROM

DESCRIPTION

The Hitachi HN62321/HN62331 Series is a 1-Megabit CMOS Mask Programmable Read Only Memory organized as 131,072 x 8-bit.

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

Hitachi's HN62321/HN62331 Series is offered with pinouts in 28-pin Plastic DIP and 28-lead Plastic SOP packages.

FEATURES

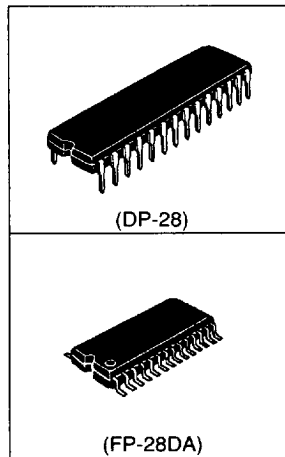
- Single Power Supply:
 $V_{CC} = 5V \pm 10\%$
- Fast Access Times:
120/150/200 ns (max)
- Low Power Consumption:
Active Current: 100 mW (typ)
Standby Current: 5 μ W (typ)
- Byte-Wide Data Organization
- TTL-Compatible Inputs and Outputs
- Three-State Data Outputs
- Packages:
28-pin Plastic DIP
28-lead Plastic SOP

ORDERING INFORMATION

Type No.	Access Time	Package
HN62331P	120/150 ns	28-pin
HN62331BP	200 ns	Plastic DIP (DP-28)
HN62331F	120/150 ns	28-lead
HN62331BF	200 ns	Plastic SOP (FP-28DA)

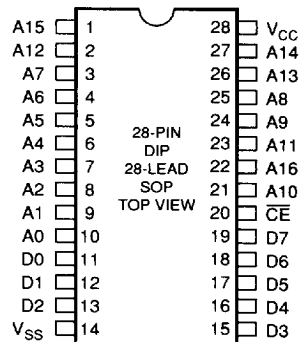
PIN DESCRIPTION

Pin Name	Function
$A_0 - A_{16}$	Address
$D_0 - D_7$	Output
$\overline{CE}$	Chip Enable
V_{CC}	Power Supply
V_{SS}	Ground



PIN ARRANGEMENT

HN62321/331P Series
HN62321BP Series
HN62321/331F Series
HN62321BF Series



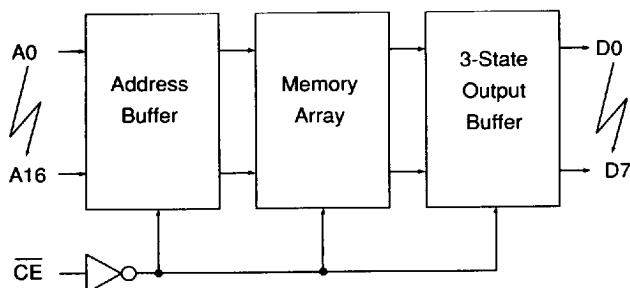
(PinD28.HN62321/331)

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■ BLOCK DIAGRAM


(BD.HN62321/331)

■ 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

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

Item	Symbol	Min.	Max.	Unit
Input Capacitance ¹	C_{IN}	-	10	pF
Output Capacitance ¹	C_{OUT}	-	15	pF

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

■ DC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

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

Item	Symbol	Min.	Max.	Unit	Test Condition
Input Leakage Current	I_{LI}	-	10	μA	$V_{IN} = 0$ to V_{CC}
Output Leakage Current	I_{LO}	-	10	μA	$\overline{CE} = 2.2^1 V$, $V_{OUT} = 0$ 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	μA	$V_{CC} = 5.5V$, $\overline{CE} \geq V_{CC} - 0.2V$
Input Voltage	V_{IH}	2.2 ¹	$V_{CC} + 0.3$	V	
	V_{IL}	-0.3	0.8 ¹	V	
Output Voltage	V_{OH}	2.4	-	V	$I_{OH} = -205 \mu A$
	V_{OL}	-	0.4	V	$I_{OL} = 3.2$ mA

 Notes: 1. HN62331 Series is $V_{IH} = 2.4V$ (min.) and $V_{IL} = 0.45V$ (max.).

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■ AC ELECTRICAL CHARACTERISTICS FOR READ OPERATION

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

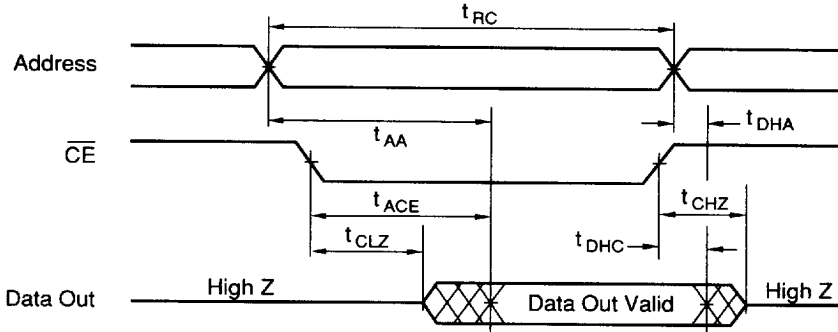
Test Conditions

- Input pulse levels: HN62321 Series: 0.8 V / 2.4 V HN62331 Series: 0.45 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	HN62331		HN62321		HN62321B		Unit
		Min.	Max.	Min.	Max.	Min.	Max.	
Read Cycle Time	t_{RC}	120	-	150	-	200	-	ns
Address Access Time	t_{AA}	-	120	-	150	-	200	ns
$\overline{CE}$ Access Time	t_{ACE}	-	120	-	150	-	200	ns
Output Hold Time from Address Change	t_{DHA}	0	-	0	-	0	-	ns
Output Hold Time from $\overline{CE}$	t_{DHC}	0	-	0	-	0	-	ns
$\overline{CE}$ to Output in High Z	t_{CHZ}^1	-	60	-	70	-	100	ns
$\overline{CE}$ to Output in Low Z	t_{CLZ}	5	-	10	-	10	-	ns

Notes: 1. t_{CHZ} defines the time at which the output becomes an open circuit and is not referenced to output voltage levels.

■ READ TIMING WAVEFORM



(TD.R.HN62321/331)

- Note: 1. t_{DHA} , t_{DHC} are determined by the faster time.
 2. t_{AA} , t_{ACE} are determined by the slower time.

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