HN62331AP/F

131,072 × 8-Bit CMOS MASK Programmable Read Only Memory

■ DESCRIPTION

The HN62331A is a 1-Mbit CMOS mask-programmable ROM organized as 131,072-words × 8-bits. Realizing low power consumption, this memory is allowed for battery operation. In addition, the HN62331A, which provides large capacity of 1M bits, is ideally suited for kanji character generators.

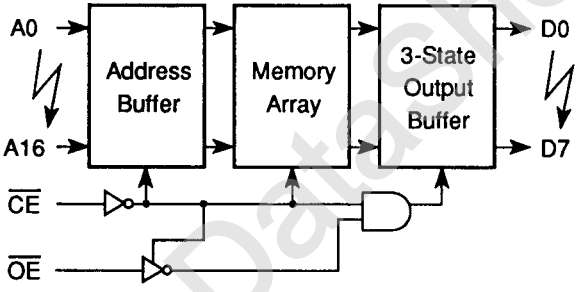
■ FEATURES

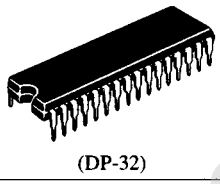
- Single +5V Power Supply
- Three-State Data Output for OR-Tieing
- TTL Compatible
- Maximum Access Time .....120ns (max.)
- Low Power Consumption .....100mW (typ.) Active
  5μW (typ.) Standby
- Byte-wide Data Organization
- Pin Compatible with JEDEC

■ ORDERING INFORMATION

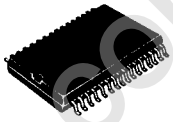
Type No.	Access Time	Package
HN62331AP	120ns	600 mil 32 pin Plastic DIP
HN62331AF	120ns	32 pin Plastic SOP

■ BLOCK DIAGRAM



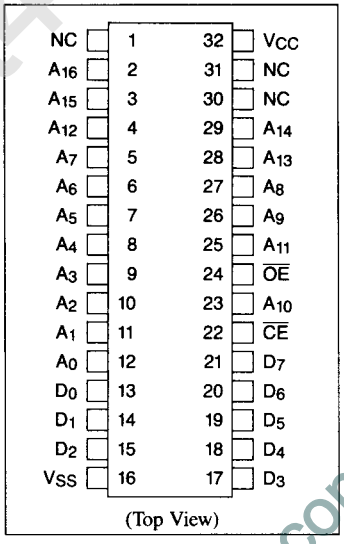


(DP-32)



(FP-32D)

■ PIN ARRANGEMENT



(Top View)

■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Value	Unit	Note
Supply Voltage	V_{CC}	-0.3 ~ +7.0	V	1
All Input and Output Voltage	V_T	-3.0 ~ V_{CC} +0.3	V	1
Operating Temperature Range	T_{opr}	0 ~ +70	°C	
Storage Temperature Range	T_{stg}	-55 ~ +125	°C	
Temperature Under Bias	T_{bias}	-20 ~ +85	°C	

NOTE: 1. With respect to V_{SS}.

■ RECOMMENDED OPERATING CONDITIONS (V_{SS} = 0V, T_a = 0 ~ 70°C)

Item	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	4.5	5.0	5.5	V
Input Voltage	V_{IH}	2.4	—	V_{CC} + 0.3	V
	V_{IL}	-0.3	—	0.45	V

■ DC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V ± 10%, V_{SS} = 0V, T_a = 0 ~ 70°C)

Item		Symbol	Test Condition	Min.	Max.	Unit
Supply Current	Active	I_{CC}	V_{CC} = 5.5V, ID_{OUT} = 0mA, t_{RC} = Min.	—	50	mA
	Standby	I_{SB}	V_{CC} = 5.5V, $\overline{CE} \geq V_{CC}$ - 0.2V	—	30	μA
Input Leakage Current		$\|I_{IL}\|$	V_{IN} = 0 ~ V_{CC}	—	10	μA
Output Leakage Current		$\|I_{OL}\|$	$\overline{CE}$ = 2.4V, V_{OUT} = 0 ~ V_{CC}	—	10	μA
Output Voltage		V_{OH}	I_{OH} = -205μA	2.4	—	V
		V_{OL}	I_{OL} = 1.6mA	—	0.4	V

■ CAPACITANCE (V_{CC} = 5V ± 10%, V_{SS} = 0V, T_a = 25°C, V_{IN} = 0V, f = 1MHz)

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

NOTE: * This parameter is sampled and not 100% tested.

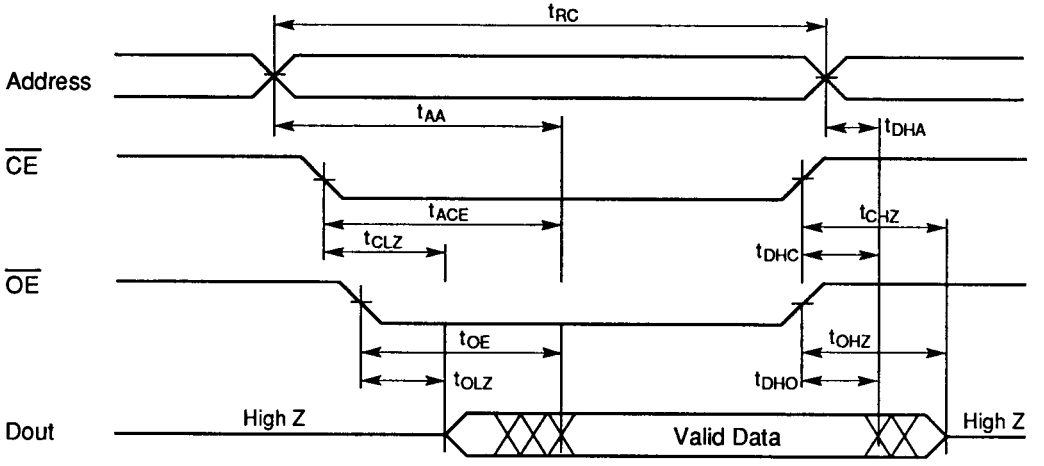
■ AC ELECTRICAL CHARACTERISTICS (V_{CC} = 5V ± 10%, V_{SS} = 0V, T_a = 0 ~ 70°C)

Item	Symbol	Min.	Max.	Unit
Read Cycle Time	t_{RC}	120	—	ns
Address Access Time	t_{AA}	—	120	ns
$\overline{CE}$ Access Time	t_{ACE}	—	120	ns
$\overline{OE}$ Access Time	t_{OE}	—	60	ns
Output Hold Time From Address Change	t_{DHA}	0	—	ns
Output Hold Time From $\overline{CE}$	t_{DHC}	0	—	ns
Output Hold Time From $\overline{OE}$	t_{DHO}	0	—	ns
$\overline{CE}$ to Output in High Z	t_{CHZ}*	—	60	ns
$\overline{OE}$ to Output in High Z	t_{OHZ}*	—	60	ns
$\overline{CE}$ to Output in Low Z	t_{CLZ}	5	—	ns
$\overline{OE}$ to Output in Low Z	t_{OLZ}	5	—	ns

NOTE: * 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.

- **Test Conditions**
  - Input Pulse Level: 0.45 ~ 2.4V
  - Input and Output Timing Reference Level: 1.5V
  - Input Rise and Fall Time: 10ns
  - Output Load: 1 TTL gate + CL = 100pF (including scope and jig capacitance)

■ TIMING WAVEFORM



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.