

AKN62412 Series

AKN62422 Series

131072-Word × 16-Bit/262144-Word × 8-Bit CMOS Mask Programmable ROM

AKN62412, AKN62422 Series is a 2-Mbit CMOS mask-programmable ROM organized either as 131072-word x 16-bit or as 262144-word x 8-bit. It can be operated with a battery because of low power consumption. The large capacity of 2M bits is optimum for a kanji character generator.

Features

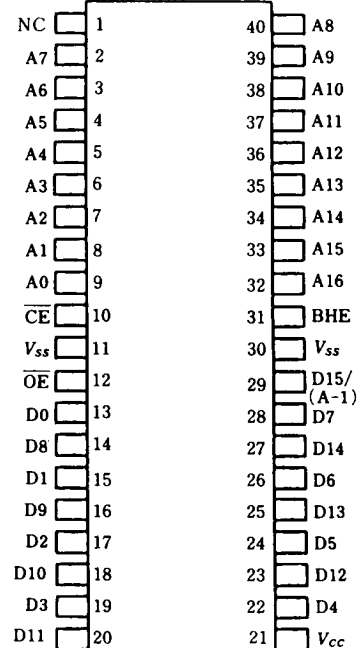
- Single +5V power supply
- Wired OR is permitted for the output in three states
- TTL compatible
- Address access time: 150/200 ns (max)
- Low power: Active 100 mW (typ)
Standby 5 μ W (typ)
- Byte-Wide or Word-Wide Data Organization (switched by BHE terminal)

Ordering Information

Type No.	Address Access Time	Package
AKN62412P	200 ns	600 mil 40-pin plastic DIP
AKN62422P	150 ns	44-pin plastic QFP
AKN62412FP	200 ns	44-pin plastic QFP
AKN62422FP	150 ns	44-pin plastic QFP

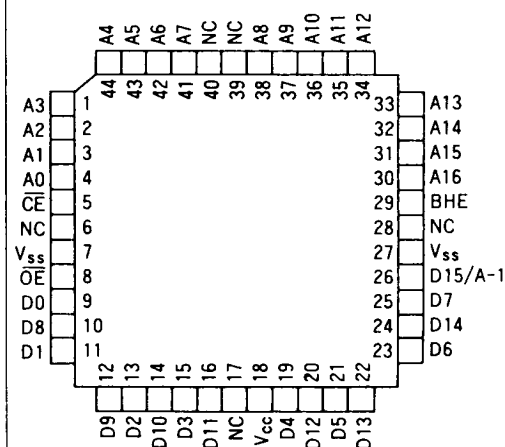
PIN CONFIGURATION

AKN62412P, AKN62422P



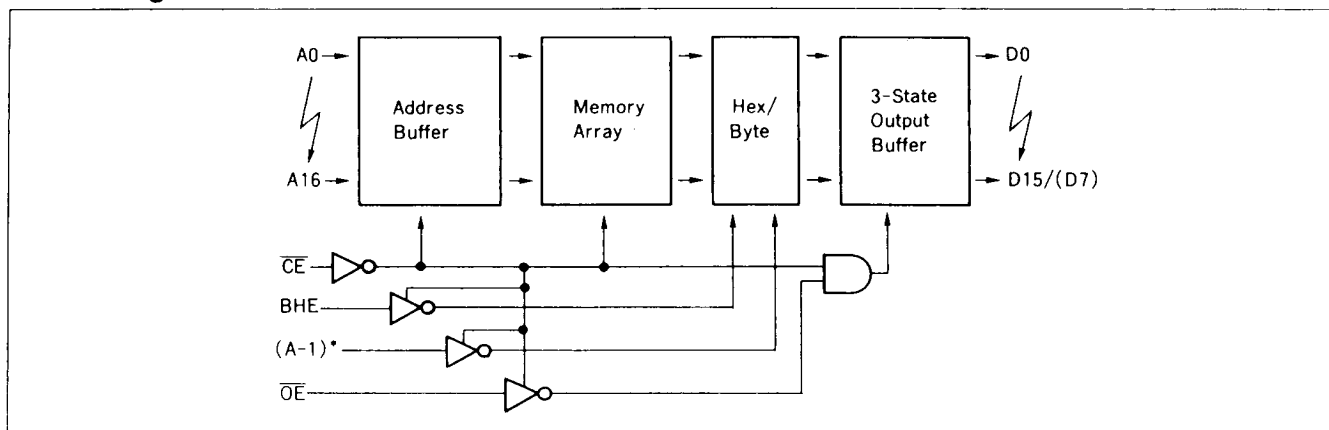
(Top View)

AKN62412FP, AKN62422FP



(Top View)

Block Diagram



BHE = V_{IH} : 16 bits (D15–D0)

BHE = V_{IL} : 8 bits (D7–D0)

*1 A-1 is least significant address input, and D14–D8 are of high impedance.

Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Power 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	T_{opr}	0 to +70	°C
Storage temperature	T_{stg}	–55 to +125	°C
Bias temperature	T_{bias}	–20 to +85	°C

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

Recommended Operating Conditions ($V_{SS} = 0$ V, $T_a = 0$ to +70°C)

Item	Symbol	Min	Typ	Max	Unit
Power supply voltage	V_{CC}	4.5*1	5.0	5.5*2	V
Input voltage	V_{IH}	2.2	—	$V_{CC} + 0.3$	V
	V_{IL}	–0.3	—	0.8	V

Note: *1. AKN62422 Series is 4.75 V

*2. AKN62422 Series is 5.25 V.

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

Item	Symbol	Min	Max	Unit	Test Conditions
Power supply current	Active I_{CC}	—	50	mA	$V_{CC} = 5.5$ V, $I_{DOUT} = 0$ mA, $t_{RC} = \text{Min}$
	Standby I_{SB}	—	30	μA	$V_{CC} = 5.5$ V, $\overline{CE} \geq V_{CC} - 0.2$ V
Input leak current	$ I_{LI} $	—	10	μA	$V_{IN} = 0$ to V_{CC}
Output leak current	$ I_{LO} $	—	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

Note: AKN62422 Series is 5 V $\pm 5\%$.

Capacitance ($V_{CC} = 5\text{ V} \pm 10^{*2}\%$, $V_{SS} = 0\text{ V}$, $T_a = 25^\circ\text{C}$, $V_{in} = 0\text{ V}$, $f = 1\text{ MHz}$)

Item	Symbol	Min	Max	Unit
Input capacitance*1	Cin	—	15	pF
Output capacitance*1	Cout	—	15	pF

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

*2. AKN62422 Series is $5\text{ V} \pm 5\%$.

AC Operating Characteristics ($V_{CC} = 5\text{ V} \pm 10^{*2}\%$, $V_{SS} = 0\text{ V}$, $T_a = 0\text{ to }+70^\circ\text{C}$)

Test Conditions

Input pulse level: 0.8 to 2.4 V

Output load:

1 TTL gate + $C_L = 100\text{ pF}$

I/O timing reference level: 1.5 V

(including jig capacitance)

Input rise/fall time: 10 ns

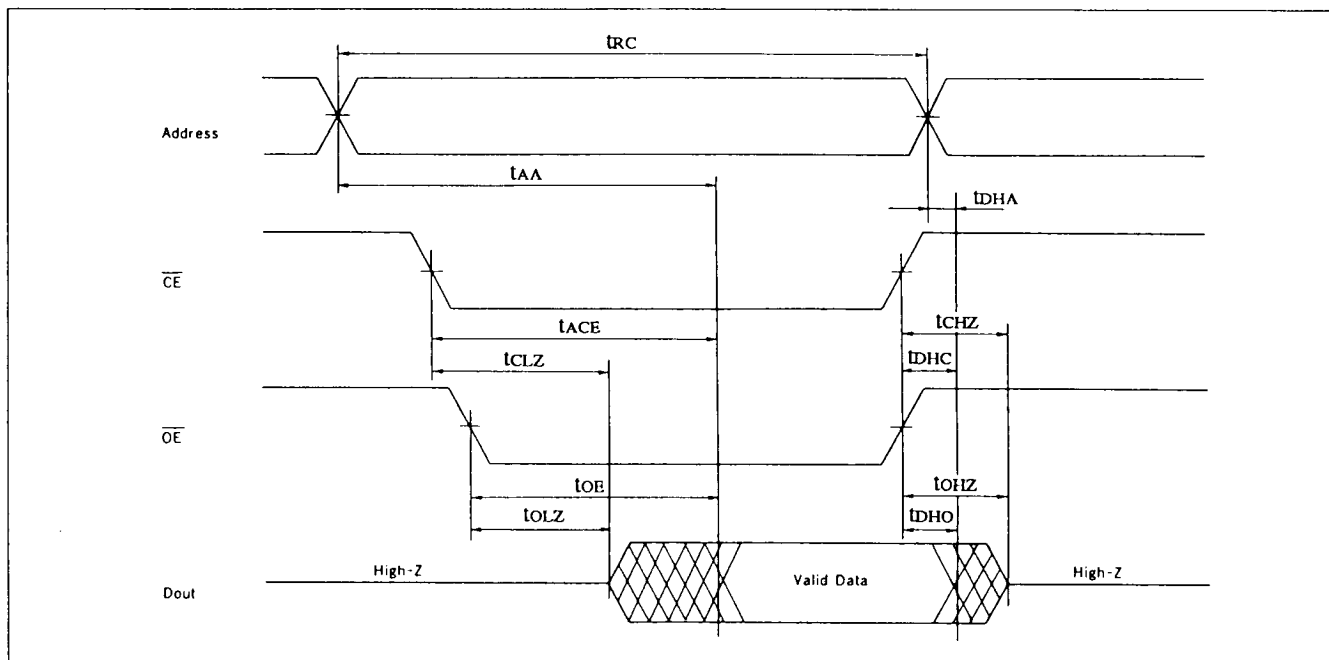
Item	Symbol	AKN62422		AKN62412		Unit
		Min	Max	Min	Max	
Cycle time	tRC	150	—	200	—	ns
Address access time	tAA	—	150	—	200	ns
$\overline{\text{CE}}$ access time	tACE	—	150	—	200	ns
$\overline{\text{OE}}$ access time	tOE	—	70	—	100	ns
BHE access time	tBHE	—	150	—	200	ns
Output Hold Time from Address Change	tDHA	0	—	0	—	ns
Output Hold Time from $\overline{\text{CE}}$	tDHC	0	—	0	—	ns
Output Hold Time from $\overline{\text{OE}}$	tDHO	0	—	0	—	ns
Output Hold Time from BHE	tDHB	0	—	0	—	ns
$\overline{\text{CE}}$ to Output in High Z	tCHZ*1	—	70	—	70	ns
$\overline{\text{OE}}$ to Output in High Z	tOHZ*1	—	70	—	70	ns
BHE to Output in High Z	tBHZ*1	—	70	—	70	ns
$\overline{\text{CE}}$ to Output in Low Z	tCLZ	10	—	10	—	ns
$\overline{\text{OE}}$ to Output in Low Z	tOLZ	10	—	10	—	ns
BHE to Output in Low Z	tBLZ	10	—	10	—	ns

Note: *1. tCHZ, tOHZ, and tBHZ define the time at which the output goes to the high impedance state and is not referenced to output voltage level.

*2. AKN62422 Series is $5\text{ V} \pm 5\%$.

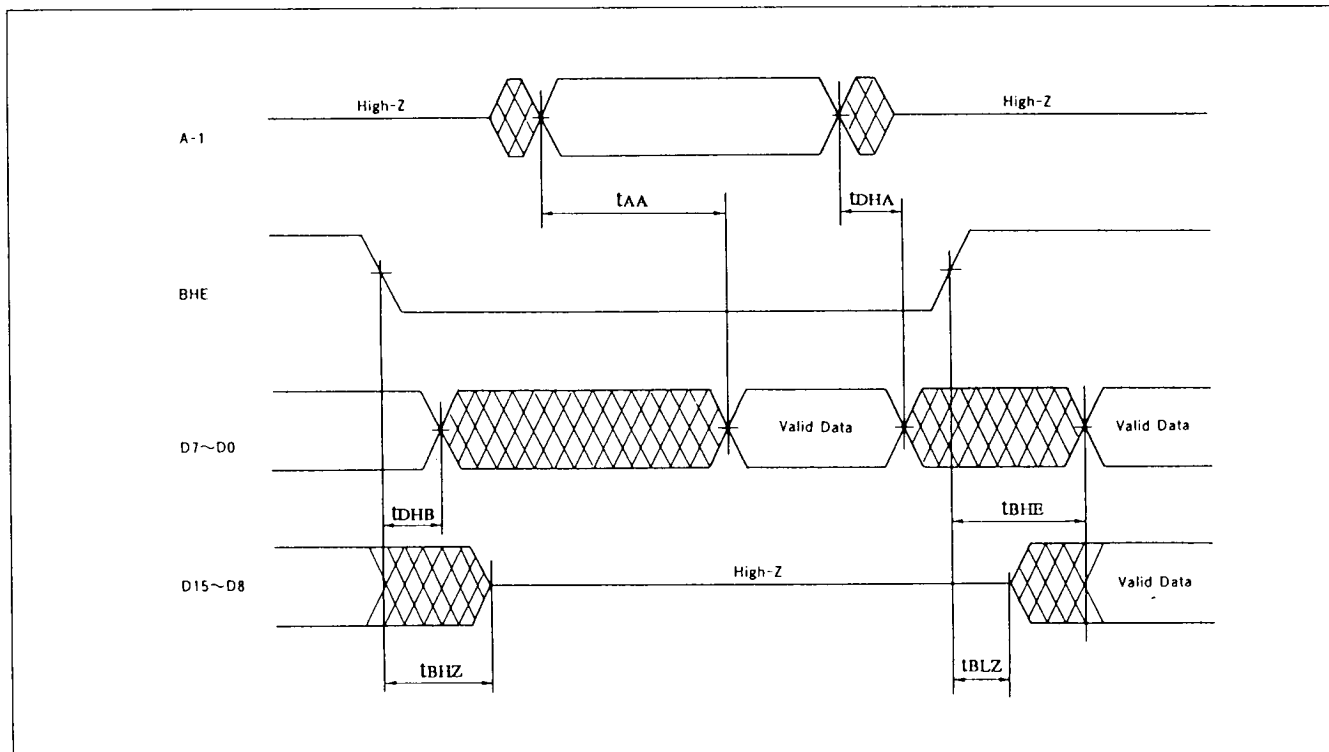
Timing Waveform

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



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

Switching between Word Mode and Byte Mode



- Notes:
1. $\overline{CE}$, $\overline{OE}$ are of selected status. A16-A0 are fixed.
 2. D15/A-1 pin becomes output when BHE = V_{IH} and CE and OE are enabled. In this mode, an input signal should not be applied to this pin.