

HB561008 Series

262,144-word x 8-bit Dynamic Random Access Memory Module

The HB561008AR/B is a 2M dynamic random-access memory module organized as 262,144 x 8 bits in a 30-pin single in-line package comprising eight HM50256CP, 262,144 x 1 bit dynamic RAMs in 18-pin Plastic Leaded Chip Carrier mounted on top of a substrate together with decoupling capacitors.

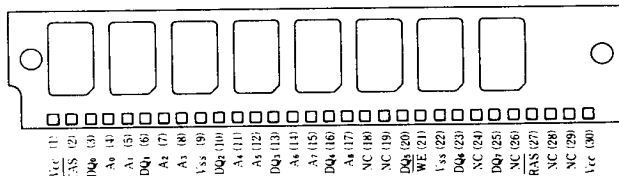
FEATURES

- 262,144 words x 8-bits Organization
- Industry standard 30-Pin Single In-line Package Memory Module
- Single 5V ($\pm 10\%$)
- Utilizes eight 256K Dynamic RAMs in PLCC (HM50256CP)
- HB561008AR/B operates as eight HM50256CPs as shown in the functional block diagram.
- Lower Power; Operating: 1,920mW typ. ($t_{RC} = 260\text{ns}$)
 Standby: 120mW typ.
- High speed:

	Access Time from RAS (max)	Access Time from CAS (max)	Read or Write Cycle (min)
HB561008AR/B-12	120ns	60ns	220ns
HB561008AR/B-15	150ns	75ns	260ns

- Page mode capability
- TTL compatible
- 256 refresh cycles: (4ms)
- 3 variations of refresh
 - RAS-only refresh
 - CAS-before-RAS refresh
 - Hidden refresh
- Operating Ambient Air Temperature: 0 to +70°C
- HB561008AR Leaded type
- HB561008B Leadless type (socket type)

PIN ARRANGEMENT



(Side View)

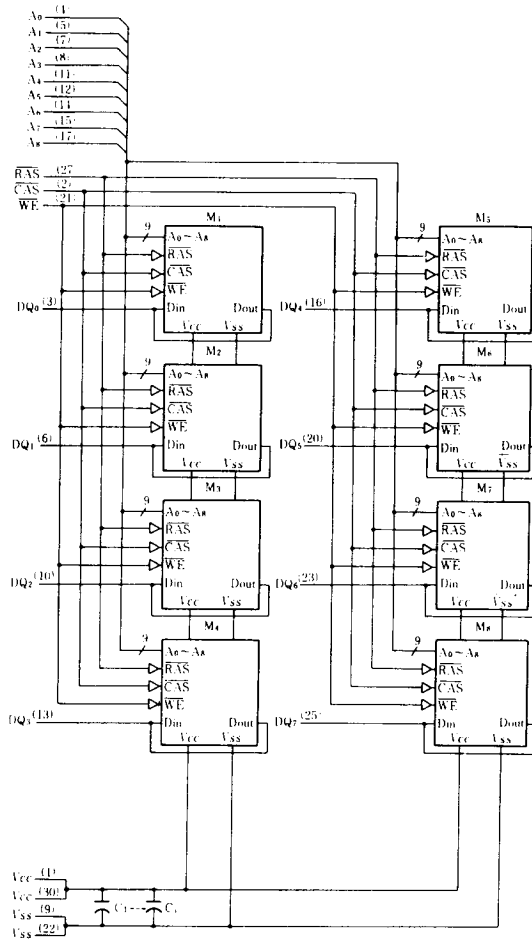
PIN DESCRIPTION

A0-A8	Address Inputs
CAS	Column Address Strobes
DQ0-DQ7	Data In/Data Out
NC	No Connection
RAS	Row Address Strobes
WE	Write Enable
Vcc	+5V Supply
Vss	Ground

- Notes:
1. HB561008AR's pin arrangement is same as HB561008B's.
 2. Common CAS control for eight common Data-In and Data-Out lines.
 3. The common I/O feature dictates the use of only early write operations to prevent contention on Data-in and Data-out.



■ FUNCTIONAL BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

- Voltage on any pin relative to V_{SS} : -1V to +7V
- Operating temperature, T_a (Ambient): 0°C to +70°C
- Storage temperature (Ambient): -55°C to +125°C
- Power dissipation: 8W
- Short circuit output current: 50mA

■ RECOMMENDED DC OPERATING CONDITIONS ($T_a=0$ to +70°C)

Parameter	Symbol	min.	typ.	max.	Unit	Notes
Supply Voltage	V_{CC}	4.5	5.0	5.5	V	1
Input High Voltage	V_{IH}	2.4	-	6.5	V	1
Input Low Voltage	V_{IL}	1.0	-	0.8	V	1

Note) 1 All voltages referenced to V_{SS} .

■ DC ELECTRICAL CHARACTERISTICS (Ta=0 to +70°C, Vcc=5V±10%, Vss=0V)

Parameter	Test Conditions	Symbol	min.	max.	Unit	Notes
Operating current	$\overline{RAS}, \overline{CAS} = \text{cycle}$ $t_{RC} = \text{min}$ $t_{RC} = 260\text{ns}$ $t_{RC} = 220\text{ns}$	I_{CC1}	—	560 660	mA	1
Standby current	$\overline{RAS} = V_{IH}, D_{out} = \text{High Z}$	I_{CC2}	—	36	mA	
Refresh current	\overline{RAS} only refresh $t_{RC} = \text{min}$ $t_{RC} = 260\text{ns}$ $t_{RC} = 220\text{ns}$	I_{CC3}	—	425 495	mA	
Standby current	$\overline{RAS} = V_{IH}, D_{out} = \text{enable}$	I_{CC5}	—	80	mA	1
Refresh current	\overline{CAS} before \overline{RAS} refresh $t_{RC} = \text{min}$ $t_{RC} = 260\text{ns}$ $t_{RC} = 220\text{ns}$	I_{CC6}	—	465 550	mA	
Page mode supply current	$\overline{RAS} = V_{IL}, \overline{CAS} = \text{cycle}$, $t_{PC} = \text{min}$ $t_{PC} = 145\text{ns}$ $t_{PC} = 120\text{ns}$	I_{CC7}	—	385 455	mA	
Input leakage	$0 < V_{in} < 7V$	I_{LI}	-10	10	μA	
Output leakage	$0 < V_{out} < 7V, D_{out} = \text{disable}$	I_{LO}	-10	10	μA	
Output levels	High ($I_{out} = -5\text{mA}$)	V_{OH}	2.4	V_{CC}	V	
	Low ($I_{out} = 4.2\text{mA}$)	V_{OL}	0	0.4	V	

■ CAPACITANCE (Vcc=5V±10%, Ta=25°C)

Parameter	Symbol	typ.	max.	Unit	Notes
Address	C_{I1}	—	55	pF	2
Clocks	C_{I2}	—	70	pF	2, 3
DQ	$C_{I/O}$	—	17	pF	2, 3

- Notes: 1. I_{CC} depends on output loading condition when the device is selected, I_{CC} max is specified at the output open condition.
 2. Capacitance measured with Boonton Meter or effective capacitance measuring method.
 3. $\overline{CAS} = V_{IH}$ to disable D_{out} .

■ AC CHARACTERISTICS

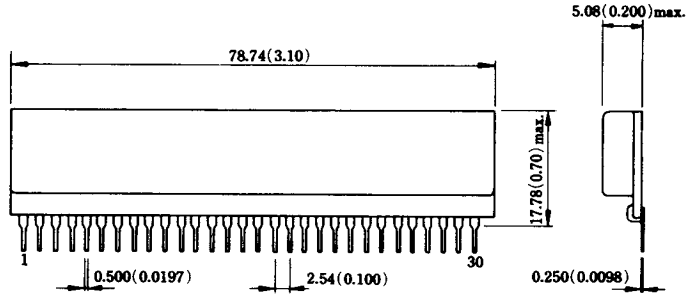
Refer to the HM50256CP data sheet.

The HB561008 writes data only in early write cycle ($t_{WCS} \geq t_{WCS}(\text{min})$). Delayed write cycle is not available because of I/O common.



■ PACKAGE OUTLINE; Unit: mm (inch)

● HB561008AR Series



● HB561008B Series

