

HM6207H Series

262,144-word × 1-bit High Speed CMOS Static RAM

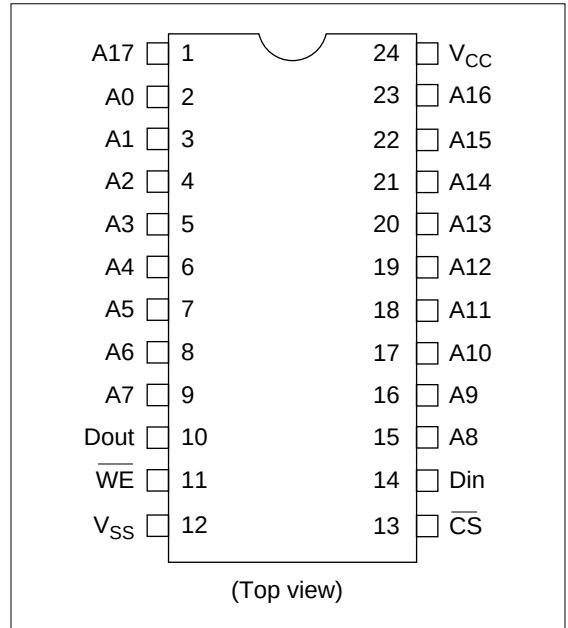
Features

- Single 5 V supply and high density 24-pin package
- High speed
Access time: 25/35/45 ns (max)
- Low power
 - Operation: 300 mW (typ)
 - Standby: 100 μ W (typ)
30 μ W (typ) (L-version)
- Completely static memory required, no clock or timing strobe required
- Equal access and cycle time
- Directly TTL compatible, all inputs and outputs
- Battery back-up operation capability (L-version)

Ordering Information

Type No.	Access time	Package
HM6207HP-25	25 ns	300-mil 24-pin plastic DIP (DP-24NC)
HM6207HP-35	35 ns	
HM6207HP-45	45 ns	
HM6207HLP-25	25 ns	300-mil 24-pin SOJ (CP-24D)
HM6207HLP-35	35 ns	
HM6207HLP-45	45 ns	
HM6207HJP-25	25 ns	300-mil 24-pin SOJ (CP-24D)
HM6207HJP-35	35 ns	
HM6207HJP-45	45 ns	
HM6207HLJP-25	25 ns	300-mil 24-pin SOJ (CP-24D)
HM6207HLJP-35	35 ns	
HM6207HLJP-45	45 ns	

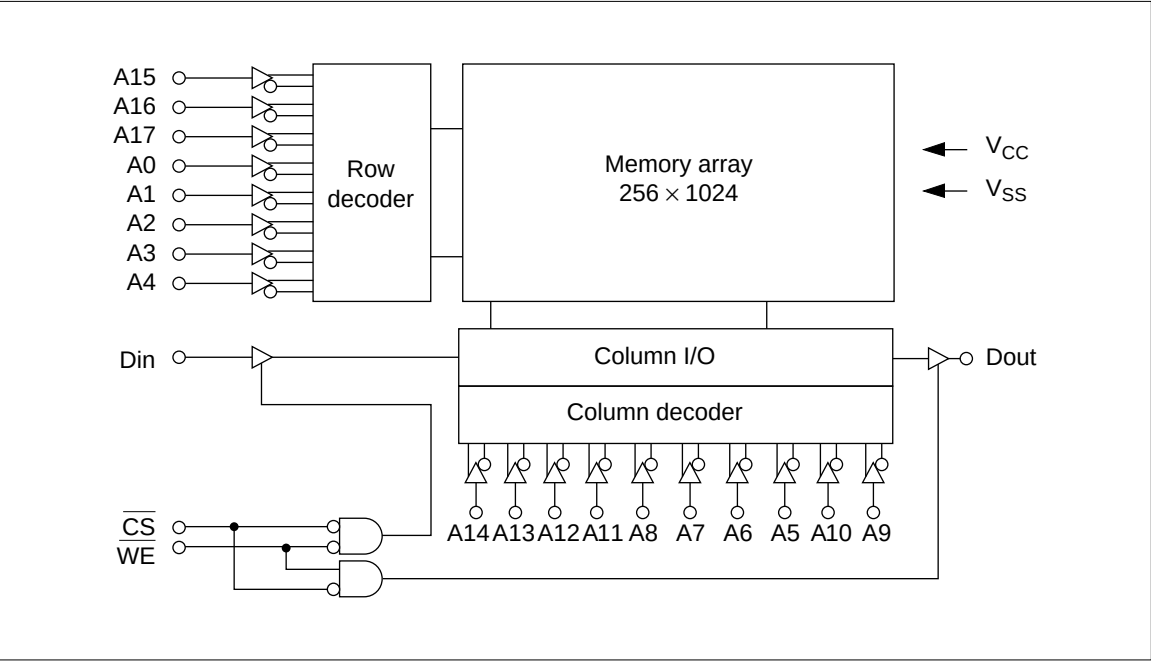
Pin Arrangement



Pin Description

Pin name	Function
A0–A17	Address
Din	Data input
Dout	Data output
$\overline{CS}$	Chip select
$\overline{WE}$	Write enable
V _{CC}	Power supply
V _{SS}	Ground

Block Diagram



Function Table

$\overline{\text{CS}}$	$\overline{\text{WE}}$	Mode	V_{CC} current	I/O pin	Ref. cycle
H	×	Not selected	$I_{\text{SB}}, I_{\text{SB1}}$	High-Z	—
L	H	Read	I_{CC}	Dout	Read cycle
L	L	Write	I_{CC}	High-Z	Write cycle

Note: × = Don't care.

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Voltage on any pin relative to V_{SS}	V_{in}	−0.5*1 to +7.0	V
Power dissipation	P_{T}	1.0	W
Operating temperature range	T_{opr}	0 to +70	°C
Storage temperature range	T_{stg}	−55 to +125	°C
Storage temperature range under bias	T_{bias}	−10 to +85	°C

Note: 1. $V_{\text{in min}} = -2.5$ V for pulse width < 10 ns.

Recommended DC Operating Conditions ($T_{\text{a}} = 0$ to +70°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	4.5	5.0	5.5	V
	V_{SS}	0	0	0	V
Input high (logic 1) voltage	V_{IH}	2.2	—	6.0	V
Input low (logic 0) voltage	V_{IL}	−0.5*1	—	0.8	V

Note: 1. $V_{\text{IL min}} = -2.0$ V for pulse width ≤ 10 ns.

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

Parameter	Symbol	HM6207H-25			HM6207H-35/45			Unit	Test conditions
		Min	Typ*1	Max	Min	Typ*1	Max		
Input leakage current	I_{LI}	—	—	2.0	—	—	2.0	μA	$V_{CC} = \text{Max}$, $V_{in} = V_{SS}$ to V_{CC}
Output leakage current	I_{LO}	—	—	10.0	—	—	10.0	μA	$\overline{CS} = V_{IH}$, $V_{I/O} = V_{SS}$ to V_{CC}
Operating power supply current	I_{CC}	—	60	120	—	50	100	mA	$\overline{CS} = V_{IL}$, $I_{I/O} = 0\text{ mA}$, min cycle, duty = 100%
	I_{CC1}	—	40	80	—	40	80	mA	$\overline{CS} = V_{IL}$, $I_{I/O} = 0\text{ mA}$, t cycle = 50 ns, duty = 100%
Standby power supply current	I_{SB}	—	20	40	—	15	30	mA	$\overline{CS} = V_{IH}$, min cycle
Standby power supply current (1)	I_{SB1}	—	0.02	2.0	—	0.02	2.0	mA	$\overline{CS} \geq V_{CC} - 0.2\text{ V}$, $0\text{ V} \leq V_{in} < 0.2$, or $V_{in} \geq V_{CC} - 0.2\text{ V}$
	L-Version	—	0.006	0.1	—	0.006	0.1		
Output low voltage	V_{OL}	—	—	0.4	—	—	0.4	V	$I_{OL} = 8\text{ mA}$
Output high voltage	V_{OH}	2.4	—	—	2.4	—	—	V	$I_{OH} = -4.0\text{ mA}$

Note: 1. Typical values are at $V_{CC} = 5.0\text{ V}$, $T_a = +25^\circ\text{C}$ and not guaranteed.

Capacitance ($T_a = 25^\circ\text{C}$, $f = 1\text{ MHz}$)*1

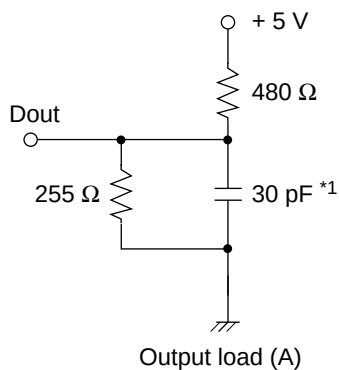
Parameter	Symbol	Min	Max	Unit	Test conditions
Input capacitance	C_{in}	—	6	pF	$V_{in} = 0\text{ V}$
Output capacitance	C_{out}	—	10	pF	$V_{out} = 0\text{ V}$

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

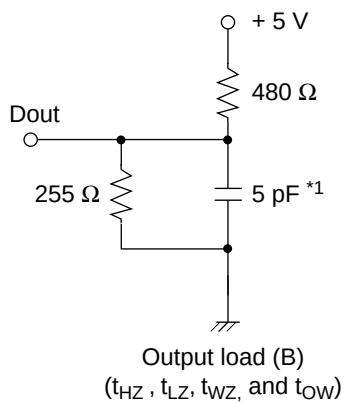
AC Characteristics ($T_a = 0$ to $+70^\circ\text{C}$, $V_{CC} = 5\text{ V} \pm 10\%$ unless otherwise noted)

AC Test Conditions

- Input pulse levels: V_{ss} to 3.0 V
- Input and output timing reference levels: 1.5 V
- Input rise and fall times: 5 ns
- Output load: See figures



Output load (A)



Output load (B)
(t_{HZ} , t_{LZ} , t_{WZ} , and t_{OW})

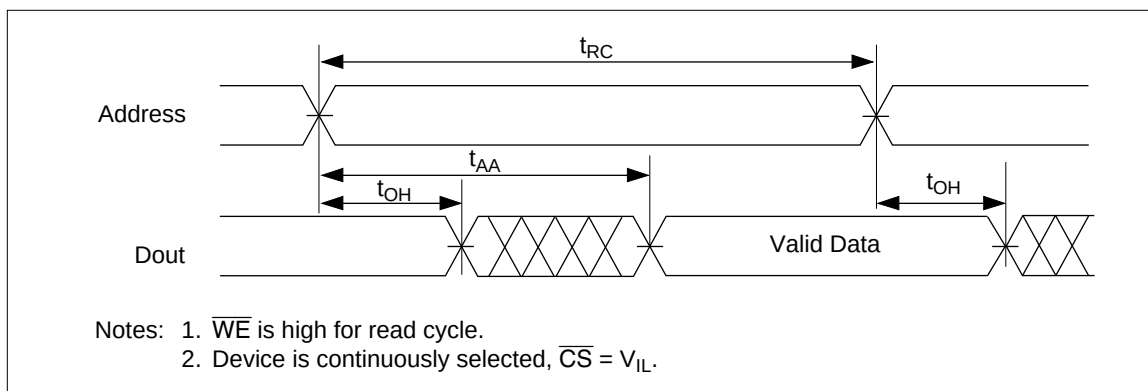
Note: 1. Including scope and jig

Read Cycle

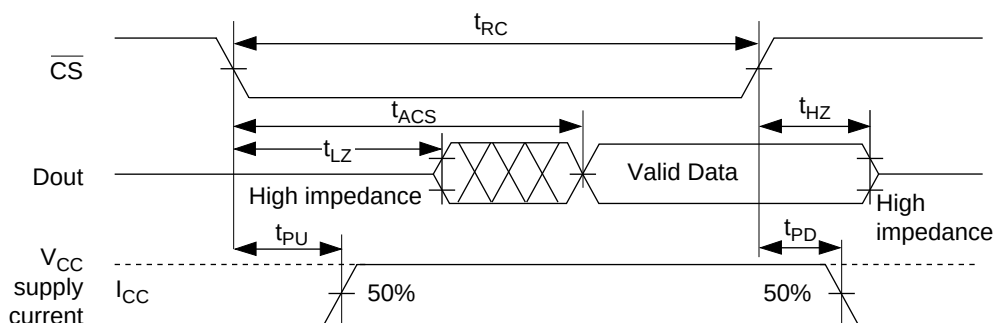
Parameter	Symbol	HM6207H-25		HM6207H-35		HM6207H-45		Unit
		Min	Max	Min	Max	Min	Max	
Read cycle time	t_{RC}	25	—	35	—	45	—	ns
Address access time	t_{AA}	—	25	—	35	—	45	ns
Chip select access time	t_{ACS}	—	25	—	35	—	45	ns
Output hold from address change	t_{OH}	5	—	5	—	5	—	ns
Chip selection to output in low-Z	t_{LZ}^{*1}	5	—	5	—	5	—	ns
Chip deselection to output in high-Z	t_{HZ}^{*1}	0	15	0	20	0	20	ns
Chip selection to power up time	t_{PU}	0	—	0	—	0	—	ns
Chip deselection to power down time	t_{PD}	—	15	—	25	—	30	ns

Note: 1. Transition is measured ± 200 mV from steady-state voltage with Load (B).
These parameters are sampled and not 100% tested.

Read Timing Waveform (1)



Read Timing Waveform (2)



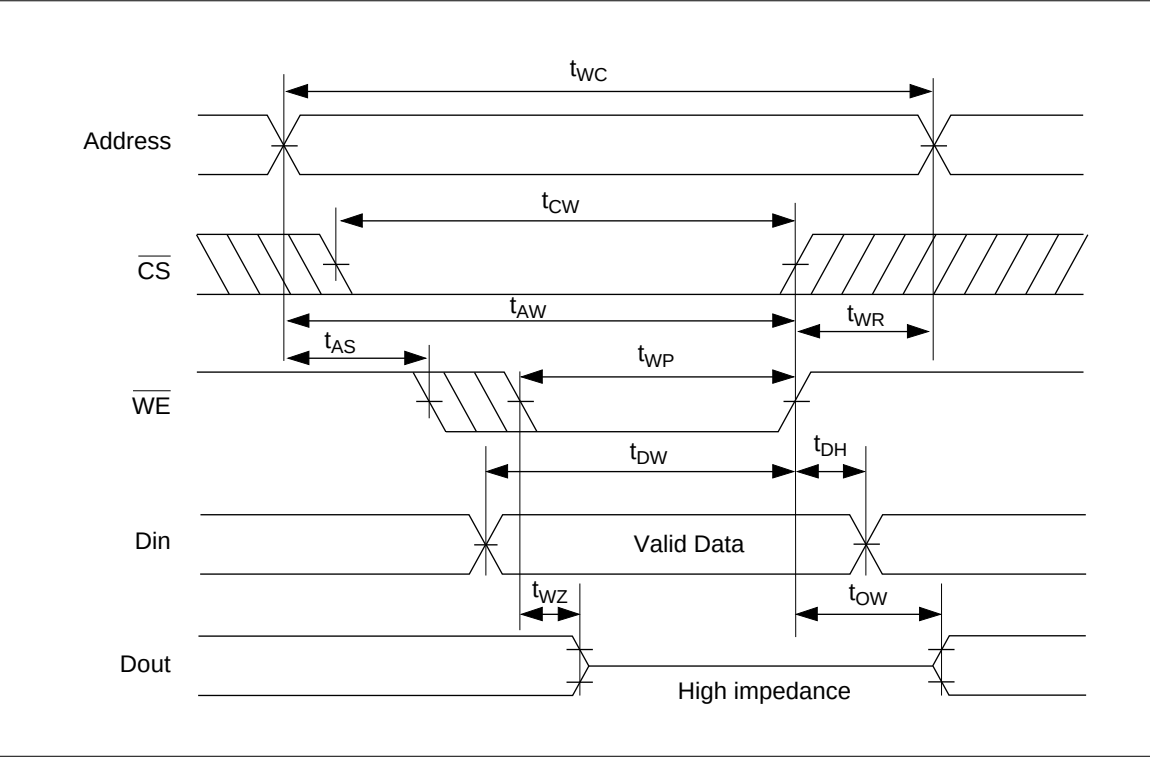
- Notes: 1. $\overline{WE}$ is high for read cycle.
2. Address valid prior to coincident with $\overline{CS}$ transition low.

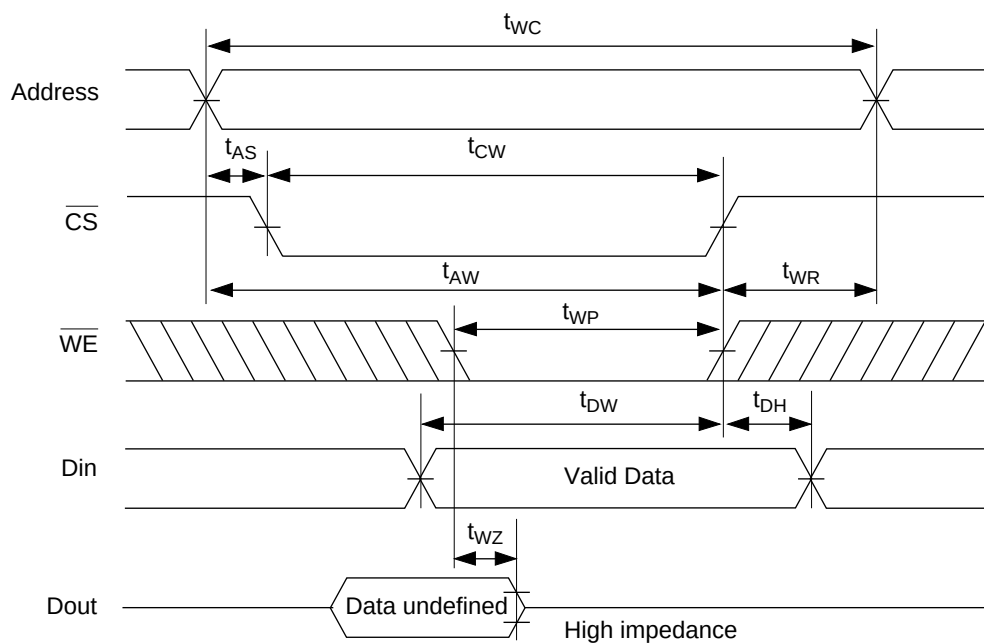
Write Cycle

Parameter	Symbol	HM6207H-25		HM6207H-35		HM6207H-45		Unit
		Min	Max	Min	Max	Min	Max	
Write cycle time	t_{WC}	25	—	35	—	45	—	ns
Chip selection to end of write	t_{CW}	20	—	30	—	40	—	ns
Address valid to end of write	t_{AW}	20	—	30	—	40	—	ns
Address setup time	t_{AS}	0	—	0	—	0	—	ns
Write pulse width	t_{WP}	20	—	25	—	25	—	ns
Write recovery time	t_{WR}	3	—	3	—	3	—	ns
Data valid to end of write	t_{DW}	15	—	20	—	20	—	ns
Data hold time	t_{DH}	0	—	0	—	0	—	ns
Write enabled to output in high-Z	t_{WZ}^{*1}	0	15	0	20	0	25	ns
Output active from end of write	t_{OW}^{*1}	0	—	0	—	0	—	ns

Note: 1. Transition is measured ± 200 mV from high-impedance voltage with Load (B).
This parameter is sampled and is not 100% tested.

Write Timing Waveform (1) ($\overline{\text{WE}}$ Controlled)



Write Timing Waveform (2) ($\overline{\text{CE}}$ Controlled)

- Notes:
1. A write occurs during the overlap of a low $\overline{\text{CS}}$ and a low $\overline{\text{WE}}$.
 2. t_{WR} is measured from the earlier of $\overline{\text{CS}}$ or $\overline{\text{WE}}$ going high to the end of the write cycle.
 3. If the CS low transition occurs simultaneously with the WE low transition, the output buffers remain in a high impedance state.
 4. Dout has the same phase as write data in this write cycle, if t_{WR} is long enough.

Low V_{CC} Data Retention Characteristics (T_a = 0 to +70°C)

These characteristics are guaranteed for the L-version only.

Parameter	Symbol	Min	Typ	Max	Unit	Test conditions
V _{CC} for data retention	V _{DR}	2.0	—	—	V	$\overline{CS} \geq V_{CC} - 0.2 \text{ V}$, $V_{in} \geq V_{CC} - 0.2 \text{ V}$, or $0 \text{ V} \leq V_{in} \leq 0.2 \text{ V}$
Data retention current	I _{CCDR}	—	2	50*1	μA	
Chip deselect to data retention time	t _{CDR}	0	—	—	ns	
Operation recovery time	t _R	5	—	—	ms	

Note: 1. V_{CC} = 3.0 V

Low V_{CC} Data Retention Timing Waveform

