PRELIMINARY

CYM1861

2,048K x 32 Static RAM Module

Features

- **High-density 64-megabit SRAM module**
- **32-bit Standard Footprint supports densities from 16K x 32 through 2M x 32**
- **High-speed SRAMs**
  - **— Access time of 35 ns**
- **72 pins**
- **Available in SIMM format**

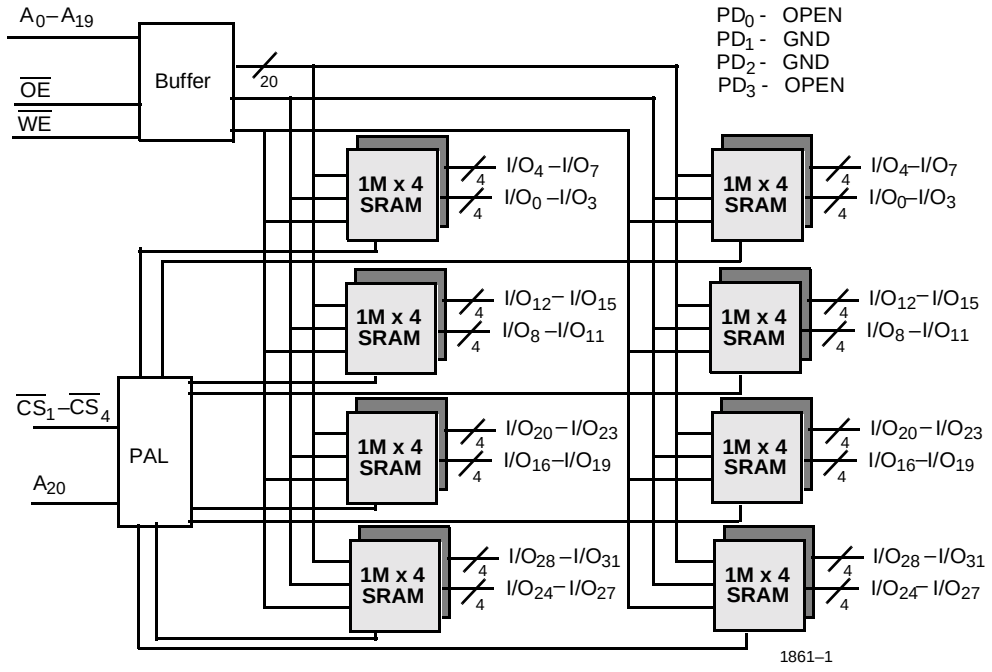
Functional Description

The CYM1861 is a high-performance 64-megabit static RAM module organized as 2,048K words by 32 bits. This module is constructed from sixteen 1,024K x 4 SRAMs in SOJ packages mounted on an epoxy laminate substrate. Four chip selects are used to independently enable the four bytes. Reading or writing can be executed on individual bytes or any combination of multiple bytes through proper use of selects.

The CYM1861 is designed for use with standard 72-pin SIMM sockets. The pinout is downward compatible with the 64-pin JEDEC SIMM module family (CYM1821, CYM1831, CYM1836, and CYM1841). Thus, a single motherboard design can be used to accommodate memory depth ranging from 16K words (CYM1821) to 2,048K words (CYM1861). The CYM1861 is offered in vertical SIMM configuration and is available with tin-lead edge contacts.

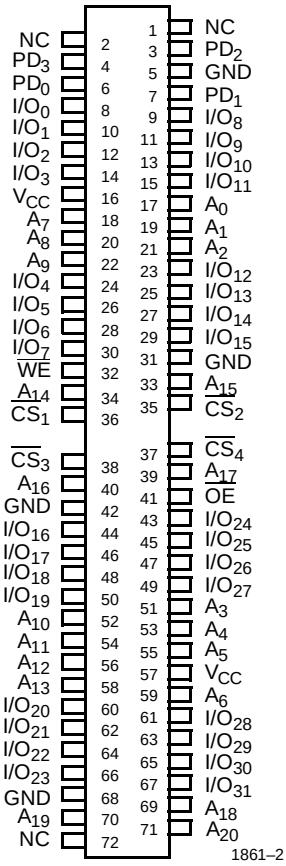
Presence detect pins (PD_0–PD_3) are used to identify module memory density in applications where modules with alternate word depths can be interchanged.

Logic Block Diagram



Pin Configuration

ZIP/SIMM
Top View



Selection Guide

	1861-25	1861-35
Maximum Access Time (ns)	25	35
Maximum Operating Current (mA)	1200	960
Maximum Standby Current (mA)	480	480

Shaded area contains advance information.

Maximum Ratings

(Above which the useful life may be impaired. For user guidelines, not tested.)

Storage Temperature ..... –55°C to +125°C

Ambient Temperature with Power Applied ..... –10°C to +85°C

Supply Voltage to Ground Potential ..... –0.5V to +7.0V

DC Voltage Applied to Outputs in High Z State ..... –0.5V to +V_{CC}

DC Input Voltage ..... –0.5V to +7.0V

Operating Range

Range	Ambient Temperature	V_{CC}
Commercial	0°C to +70°C	5V ± 10%

Electrical Characteristics Over the Operating Range

Parameter	Description	Test Conditions		Min.	Max.	Unit
V_{OH}	Output HIGH Voltage	V_{CC} = Min., I_{OH} = –4.0 mA		2.4		V
V_{OL}	Output LOW Voltage	V_{CC} = Min., I_{OL} = 8.0 mA			0.4	V
V_{IH}	Input HIGH Voltage			2.2	V_{CC} + 0.3	V
V_{IL}	Input LOW Voltage			–0.5	0.8	V
I_{IX}	Input Load Current	GND ≤ V_I ≤ V_{CC}		–2	+2	µA
I_{OZ}	Output Leakage Current	GND ≤ V_O ≤ V_{CC}, Output Disabled		–20	+20	µA
I_{CC}	V_{CC} Operating Supply Current	V_{CC} = Max., I_{OUT} = 0 mA, $\overline{CS}_N$ ≤ V_{IL}	-25, -35		2582	mA
I_{SB1}	Automatic $\overline{CS}$ Power-Down Current[1]	Max. V_{CC}, $\overline{CS}$ ≥ V_{IH}, Min. Duty Cycle = 100%			960	mA
I_{SB2}	Automatic $\overline{CS}$ Power-Down Current[1]	Max. V_{CC}, $\overline{CS}$ ≥ V_{CC} – 0.2V, V_{IN} ≥ V_{CC} – 0.2V, or V_{IN} ≤ 0.2V	-25, -35		160	mA

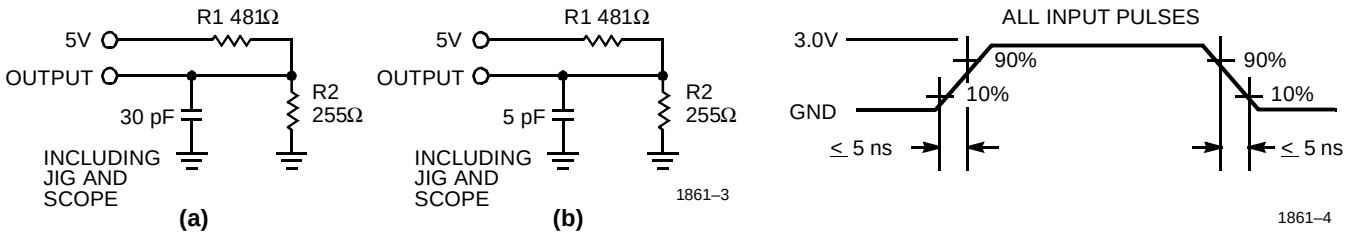
Capacitance[2]

Parameter	Description	Test Conditions	Max.	Unit
C_{IN}	Input Capacitance	T_A = 25°C, f = 1 MHz, V_{CC} = 5.0V	10	pF
C_{OUT}	Output Capacitance		20	pF

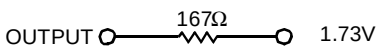
Notes:

1. A pull-up resistor to V_{CC} on the $\overline{CS}$ input is required to keep the device deselected during V_{CC} power-up, otherwise I_{SB} will exceed values given.
2. Tested on a sample basis.

AC Test Loads and Waveforms



Equivalent to: THÉVENIN EQUIVALENT



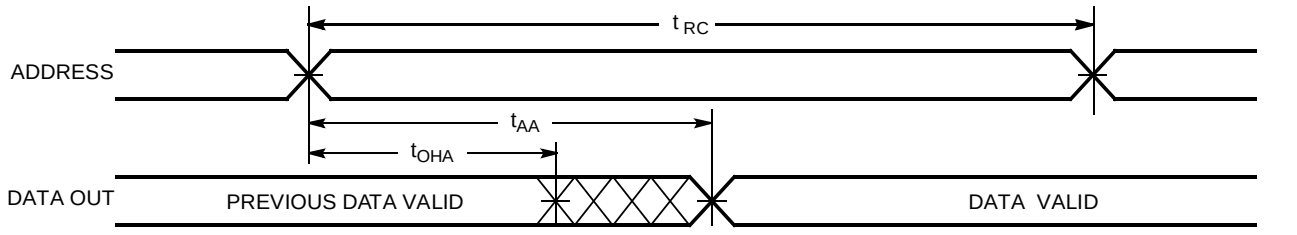
Switching Characteristics Over the Operating Range[3]

Parameter	Description	1861-25		1861-35		Unit
		Min.	Max.	Min.	Max.	
READ CYCLE						
t_{RC}	Read Cycle Time	25		35		ns
t_{AA}	Address to Data Valid		25		35	ns
t_{OHA}	Data Hold from Address Change	3		3		ns
t_{ACS}	$\overline{CS}$ LOW to Data Valid		25		35	ns
t_{DOE}	$\overline{OE}$ LOW to Data Valid		15		18	ns
t_{LZOE}	$\overline{OE}$ LOW to Low Z	0		0		ns
t_{HZOE}	$\overline{OE}$ HIGH to High Z		12		15	ns
t_{LZCS}	$\overline{CS}$ LOW to Low Z[4]	3		3		ns
t_{HZCS}	$\overline{CS}$ HIGH to High Z[4, 5]		12		15	ns
t_{PD}	$\overline{CS}$ HIGH to Power-Down		25		35	ns
WRITE CYCLE[6]						
t_{WC}	Write Cycle Time	25		35		ns
t_{SCS}	$\overline{CS}$ LOW to Write End	20		30		ns
t_{AW}	Address Set-Up to Write End	20		30		ns
t_{HA}	Address Hold from Write End	3		3		ns
t_{SA}	Address Set-Up to Write Start	2		2		ns
t_{PWE}	$\overline{WE}$ Pulse Width	20		30		ns
t_{SD}	Data Set-Up to Write End	15		20		ns
t_{HD}	Data Hold from Write End	2		2		ns
t_{LZWE}	$\overline{WE}$ HIGH to Low Z	3		3		ns
t_{HZWE}	$\overline{WE}$ LOW to High Z[5]	0	12	0	15	ns

Shaded area contains advance information.

Switching Waveforms

Read Cycle No. 1 [7,8]



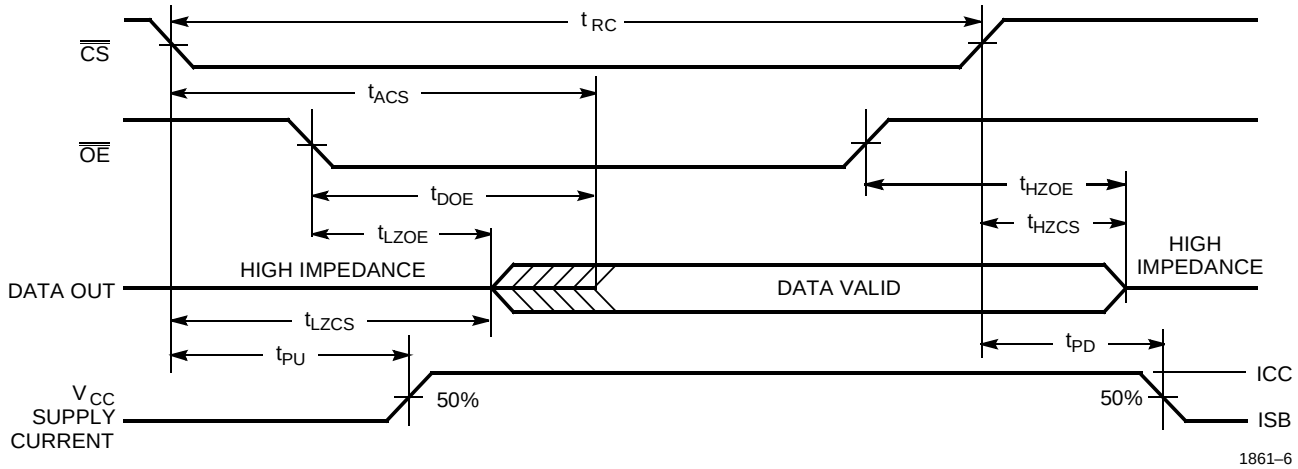
1861–5

Notes:

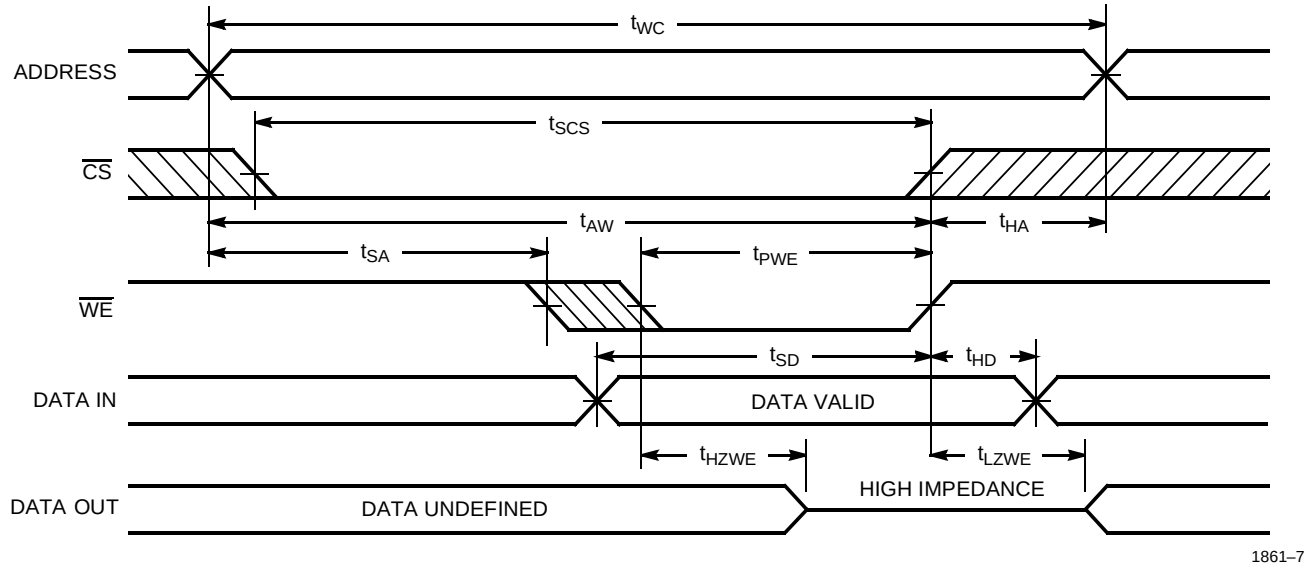
3. Test conditions assume signal transition times of 5 ns or less, timing reference levels of 1.5V, input pulse levels of 0 to 3.0V, and output loading of the specified I_{OL}/I_{OH} and 30-pF load capacitance.
4. At any given temperature and voltage condition, t_{HZCS} is less than t_{LZCS} for any given device. These parameters are guaranteed and not 100% tested.
5. t_{HZCS} and t_{HZWE} are specified with C_L = 5 pF as in part (b) of AC Test Loads and Waveforms. Transition is measured ±500 mV from steady-state voltage.
6. The internal write time of the memory is defined by the overlap of $\overline{CS}$ LOW and $\overline{WE}$ LOW. Both signals must be LOW to initiate a write and either signal can terminate a write by going HIGH. The data input set-up and hold timing should be referenced to the rising edge of the signal that terminates the write.
7. $\overline{WE}$ is HIGH for read cycle.
8. Device is continuously selected, $\overline{CS}$ = V_{IL}, and $\overline{OE}$= V_{IL}.

Switching Waveforms (continued)

Read Cycle No. 2 [7,9]



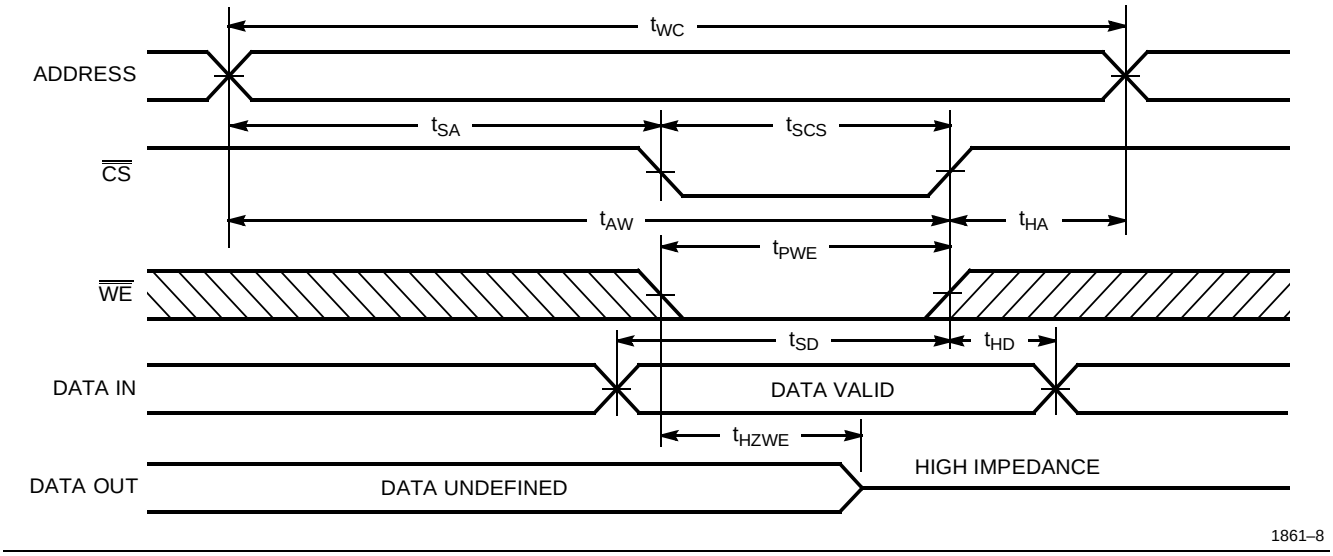
Write Cycle No. 1 (WE Controlled) [6]



Note:
9. Address valid prior to or coincident with CS transition LOW.

Switching Waveforms (continued)

Write Cycle No. 2 ($\overline{CS}$ Controlled) [6,10]



Note:
10. If $\overline{CS}$ goes HIGH simultaneously with $\overline{WE}$ HIGH, the output remains in a high-impedance state.

Truth Table

$\overline{CS}$	$\overline{WE}$	$\overline{OE}$	Inputs/Output	Mode
H	X	X	High Z	Deselect/Power-Down
L	H	L	Data Out	Read
L	L	X	Data In	Write
L	H	H	High Z	Deselect

Ordering Information

Speed (ns)	Ordering Code	Package Type	Package Type	Operating Range
25	CYM1861PM-25C	PM48	72-Pin Plastic SIMM Module	Commercial
35	CYM1861PM-35C	PM48	72-Pin Plastic SIMM Module	Commercial

Shaded area contains advance information.

Document #: 38-M-00086

Package Diagram

72-Pin SIMM Module PM48